



**IE3**

## **Asynchronous geared motors**



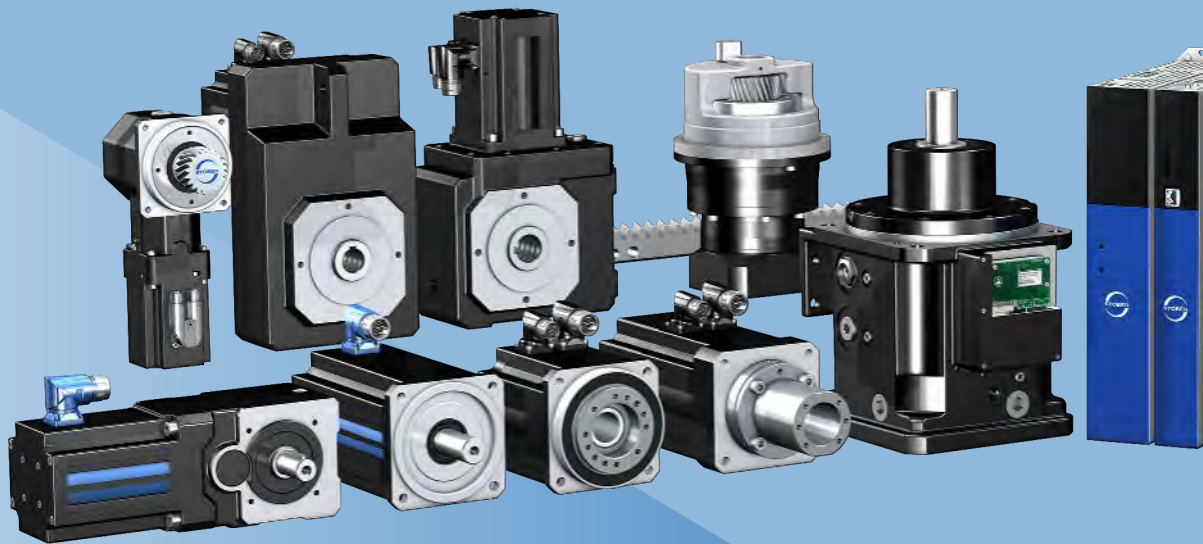
**STÖBER**



## **Asynchronous geared motors**

# STOBER drive technology for perfectionists

Sooner or later, design engineers never satisfied with the second-best solution end up at STOBER. That is because they can find everything here, with the broadest range of all imaginable drive technology components. Available with the highest level of design granularity to satisfy any individualized requirements perfectly. And the result is a complete STOBER system, from the gear rack and geared motor to open-loop or closed-loop control to intuitive project configuration software. With open interfaces based on established industry standards and reliably functioning communication between the individual components. The STOBER system also includes a complete package of services and practical support. Find out more on the following pages.

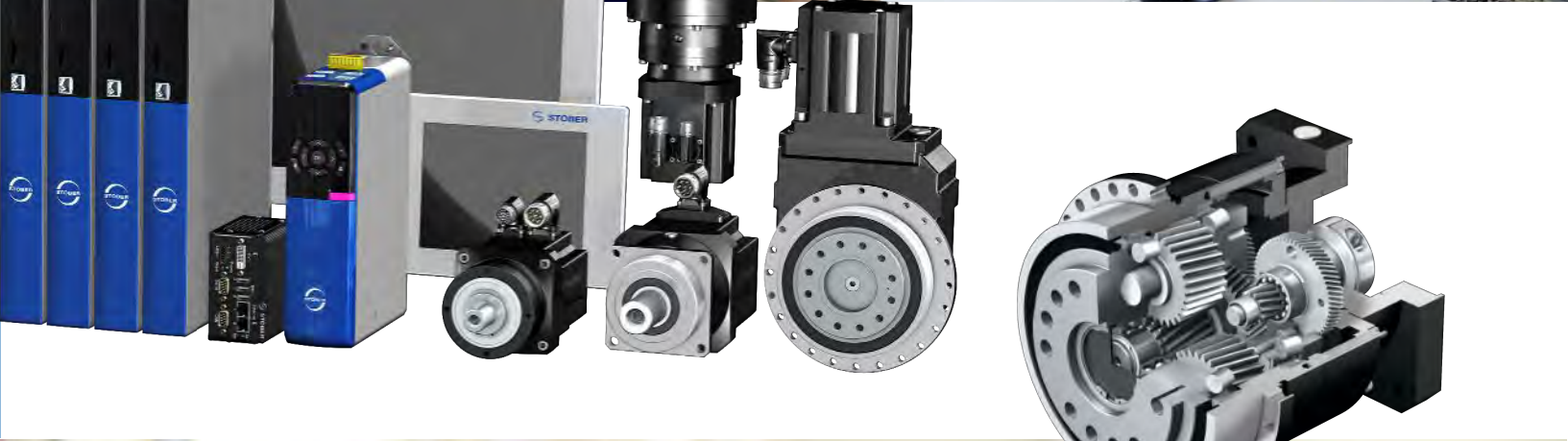


## You can put your trust in STOBER

STOBER has been building excellent drive technology for more than 80 years. As a medium-sized, owner-operated company, STOBER understands the needs of its customers. Our company is down-to-earth, innovative, dynamic and focused on the customer. Our customers can find certified experts in every area, whether in research and development, production, technical consultation or design support. This goes beyond the technical qualifications. It also includes an equal measure of dedication, dependability and friendly, clear communication.











## STOBER in motion

Despite our sense of tradition, we always enjoy something new. We continue to push ourselves forward and to refine our products further. We do this by implementing suggestions from real-world use, giving due consideration to customer requests and constantly seeking out even better solutions. This is all made possible by the competitive spirit with which we face every exciting challenge. The strong STOBER team spirit provides for productive collaboration. Both at work and outside the company doors. Our customers benefit from the extraordinary constancy of our employee base. This provides the astounding result where we can provide contacts familiar with a customer's industry and who can identify with a customer's needs.









# The team that works well together wins

## STOBER supplies the complete system: controller, automation, geared motors

STOBER has its roots in developing and building geared motors. We have also been developing and manufacturing drive controllers for decades. These STOBER components form drive systems with dependable functionality thanks to their plug-and-play design. Electronics and mechanical systems that speak the same language are critical for this. They understand each other without any adapters. All of the system components can recognize each other by their "electronic nameplate."



## Systematic quality assurance

We check every single component and how it works together with others. Mass-producers are not able to do that. We assume responsibility for the complete system. This means certified operational reliability and the highest machine availability are guaranteed.

## Technical system advantages

The STOBBER system is flexible. One example is the freedom to choose between drive-based mode and controller-based mode. Or the feature allowing you to combine drive controllers in a multi-axis drive system and stand-alone controllers with special functions as you wish. This allows the modular design and free scalability of a drive system. This enables full utilization of capacity.



## STOBBER engineering software

Our AS6 engineering software based on Codesys plays a leading role in the STOBBER system. The AS6 has a whole series of new and useful features integrated into it that make your work easier in every phase of the project. Comprehensive libraries provide direct access to STOBBER products from every level of the drive system. You can find detailed technical information and have ready access to presets for standard functions.



## STOBBER is your partner

Our role does not end with the delivery of hardware and software. If you like, we will accompany and support you throughout your entire project. You can call on programming manpower at STOBBER. Our experienced Codesys professionals will be happy to handle tricky special tasks or help you find the right template. This is even possible if components from other manufacturers are part of the bigger picture. You have direct, one-on-one contact with your project engineer. Your personal contact understands your needs and works with you to find the ideal solution.



You receive quick, professional feedback using the 24-hour hotline. You are not a number—you are our priority. We at STOBBER do not have anything like a "service ticket."

Geographic proximity is also an intrinsic part of this personal contact. STOBBER has four customer support centers throughout Germany. These support centers provide you with a high level of decision-making expertise. Your contacts have technical experience. And STOBBER is international. We have 10 subsidiaries across 3 continents. This is also a valuable part of being near to our customers.



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# 1 Selection tool

## 1.1 Asynchronous geared motors



Product chapter

C

F

Chapter number

[▶ 2\]](#)

[\[ 3\]](#)

### Technical data

|                     |               |               |
|---------------------|---------------|---------------|
| $P_N$               | 0.12 – 45 kW  | 0.12 – 7.5 kW |
| $i$                 | 2 – 274       | 4.3 – 547     |
| $M_{2N}$            | 2.3 – 8677 Nm | 5.1 – 1338 Nm |
| $\eta_{\text{get}}$ | 96 – 97 %     | 96 – 97 %     |

An explanation of the formula symbols can be found in the chapter [▶ 13.1](#).

### Features

|                        |                                                           |       |
|------------------------|-----------------------------------------------------------|-------|
| Power density          | ★☆☆☆☆                                                     | ★☆☆☆☆ |
| Price category         | €                                                         | €     |
| Shaft load             | ★☆☆☆☆                                                     | ★☆☆☆☆ |
| Smooth operation       | ★☆☆☆☆                                                     | ★☆☆☆☆ |
| Torsional stiffness    | ★☆☆☆☆                                                     | ★☆☆☆☆ |
| Mass moment of inertia | ★★★★★                                                     | ★★★★★ |
| Key:                   | ★☆☆☆☆ good   ★★★★★ excellent<br>€ Economy   €€€€€ Premium |       |

|                                 |                                       |   |
|---------------------------------|---------------------------------------|---|
| <b>Shaft design</b>             |                                       |   |
| Solid shaft with feather key    | ✓                                     | ✓ |
| Solid shaft without feather key | C0 – C5: ✓<br>Starting at C6: Request |   |
| Hollow shaft with keyway        |                                       | ✓ |
| Hollow shaft with shrink ring   |                                       | ✓ |

|                         |            |   |
|-------------------------|------------|---|
| <b>Bearing design</b>   |            |   |
| Standard                | ✓          | ✓ |
| <b>Maintenance-free</b> | C0 – C5: ✓ | ✓ |

1

Selection tool

1.1 Asynchronous geared motors



|                 |        |
|-----------------|--------|
| Product chapter | K      |
| Chapter number  | [ > 4] |

Technical data

|                     |                |
|---------------------|----------------|
| $P_N$               | 0.12 – 45 kW   |
| $i$                 | 4 – 381        |
| $M_{2N}$            | 6.5 – 14123 Nm |
| $\eta_{\text{get}}$ | 94 – 97 %      |

An explanation of the formula symbols can be found in the chapter [▶ 13.1](#).

Features

|                                 |                                                           |
|---------------------------------|-----------------------------------------------------------|
| Power density                   | ★★☆☆☆                                                     |
| Price category                  | €€                                                        |
| Shaft load                      | ★★★★☆                                                     |
| Smooth operation                | ★★★★☆                                                     |
| Torsional stiffness             | ★★☆☆☆                                                     |
| Mass moment of inertia          | ★★★★★                                                     |
| Key:                            | ★☆☆☆☆ good   ★★★★★ excellent<br>€ Economy   €€€€€ Premium |
| Shaft design                    |                                                           |
| Solid shaft with feather key    | ✓                                                         |
| Solid shaft without feather key | K1 – K4: ✓<br>Starting at K5: Request                     |
| Solid shaft on both sides       | ✓                                                         |
| Hollow shaft with keyway        | ✓                                                         |
| Hollow shaft with shrink ring   | ✓                                                         |
| Bearing design                  |                                                           |
| Standard                        | ✓                                                         |
| Maintenance-free                | K1 – K4: ✓                                                |



# 1 Selection tool

## 1.2 Asynchronous motors



Product chapter

IE3D

Chapter number

[ 5 ]

### Technical data

|       |                 |
|-------|-----------------|
| $n_2$ | 1400 – 1480 rpm |
| $P_N$ | 0.12 – 45 kW    |
| $M_N$ | 0.82 – 291 Nm   |
| $I_N$ | 0.35 – 83 A     |

An explanation of the formula symbols can be found in the chapter [▶ 13.1](#).

### Features

|                |                                                           |
|----------------|-----------------------------------------------------------|
| Efficiency     | ★★★★☆                                                     |
| Price category | €€                                                        |
| Key:           | ★☆☆☆☆ good   ★★★★★ excellent<br>€ Economy   €€€€€ Premium |

|                                           |   |
|-------------------------------------------|---|
| <b>Shaft design</b>                       |   |
| Direct attachment onto STOBBER gear units | ✓ |
| IEC design                                | ✓ |

|                                               |   |
|-----------------------------------------------|---|
| <b>Encoder</b>                                |   |
| Incremental encoders                          | ✓ |
| SSI multi-turn absolute encoders <sup>1</sup> | ✓ |

|                              |   |
|------------------------------|---|
| <b>Electrical connection</b> |   |
| Terminal box                 | ✓ |

|                    |   |
|--------------------|---|
| <b>Cooling</b>     |   |
| Self-ventilation   | ✓ |
| Forced ventilation | ✓ |

|                     |   |
|---------------------|---|
| <b>Brake</b>        |   |
| Spring-loaded brake | ✓ |

|                                |   |
|--------------------------------|---|
| <b>Marks and test symbols</b>  |   |
| CE                             | ✓ |
| cURus                          | ✓ |
| EISA CC number including cURus | ✓ |

<sup>1</sup> only in combination with forced ventilation

# 1 Selection tool

## 1.3 Drive controllers



SC6



SI6



SD6

Product chapter

Chapter number

[▶ 6\]](#)

[▶ 7\]](#)

[▶ 8\]](#)

### Technical data

|              |              |              |             |
|--------------|--------------|--------------|-------------|
| $I_{2N,PU}$  | 4.5 – 19 A   | 5 – 50 A     | 2.3 – 85 A  |
| $I_{2N,PU}$  | 4 – 15 A     | 4.5 – 40 A   | 1.7 – 60 A  |
| $I_{2maxPU}$ | 9.5 – 39.9 A | 10.5 – 105 A | 4.2 – 153 A |
| $I_{2maxPU}$ | 10 – 37.5 A  | 11.3 – 100 A | 4.3 – 150 A |

An explanation of the formula symbols can be found in the chapter [▶ 13.1\]](#).

### Features

#### Optimal application area

|                |             |                  |                                   |
|----------------|-------------|------------------|-----------------------------------|
| Number of axes | 1 – 4       | > 4              | 1 – 8                             |
| Application    | Drive based | Controller based | Drive based synchronous operation |

#### Motor types

|                          |   |   |   |
|--------------------------|---|---|---|
| Lean motors              | ✓ | ✓ |   |
| Asynchronous motors      | ✓ | ✓ | ✓ |
| Synchronous servo motors | ✓ | ✓ | ✓ |
| Linear motors            |   |   | ✓ |
| Torque motors            | ✓ | ✓ | ✓ |

#### Encoder interfaces

|                         |   |   |     |
|-------------------------|---|---|-----|
| EnDat 2.1/2.2 digital   | ✓ | ✓ | ✓   |
| Incremental             | ✓ | ✓ | ✓   |
| SSI                     | ✓ | ✓ | ✓   |
| Resolver                | ✓ | ✓ | (✓) |
| Pulse/direction signals | ✓ | ✓ | (✓) |
| EnDat 2.1 sin/cos       |   |   | (✓) |
| Sin/cos                 |   |   | (✓) |
| HIPERFACE DSL           | ✓ | ✓ |     |

(✓): Terminal module required

#### Communication

|                                        |   |   |     |
|----------------------------------------|---|---|-----|
| Isochronic system bus (IGB motion bus) |   |   | ✓   |
| CANopen                                |   |   | (✓) |
| EtherCAT                               | ✓ | ✓ | (✓) |
| PROFINET                               | ✓ | ✓ | (✓) |

(✓): Communication module required

# 1 Selection tool

## 1.3 Drive controllers



SC6



SI6



SD6

Product chapter

Chapter number

[▶ 6\]](#)

[▶ 7\]](#)

[▶ 8\]](#)

### Features

#### Motor temperature sensor

PTC thermistor

✓

✓

✓

Pt1000 temperature sensor

✓

#### Safety functions

STO, SS1: SIL 3, PL e (cat. 4)

(✓)

(✓)

(✓)

SS2, SLS, SBC, SBT, SDI, SLI: SIL 3, PL e (cat. 4)

(✓)

(✓): Safety module required

#### Terminals

IO6

RI6

XI6

Digital inputs

8

8

(5)

(5)

(13)

Digital outputs

—

—

(2)

(2)

(10)

Analog inputs

—

—

(2)

(2)

(3)

Analog outputs

—

—

(2)

(2)

(2)

Expanded encoder support

—

—

—

(✓)

—

(x): Terminal module required

### Features

Multi-axis drive system

✓

Stand-alone

✓

✓

One Cable Solution

✓

✓

Double-axis controller available

✓

✓

Live firmware update

✓

✓

✓

Display and keyboard

✓

Removable data storage

✓

✓

✓

DC link connection

✓

✓

✓

### Applications

Torque/force mode

✓

✓

✓

Velocity mode

✓

✓

✓

Positioning mode

✓

✓

✓

Master/slave mode

✓

Interpolating mode

✓

✓

✓

### Conformity

cULus

✓

✓

✓

CE

✓

✓

✓



# 1 Selection tool

## 1.3 Drive controllers



SDS 5000



FDS 5000

Product chapter

Chapter number

[ 9 ]

[ 10 ]

### Technical data

|              |             |              |
|--------------|-------------|--------------|
| $I_{2N,PU}$  | 2.3 – 85 A  | 1.3 – 16 A   |
| $I_{2N,PU}$  | 1.7 – 60 A  | 1 – 10 A     |
| $I_{2maxPU}$ | 4.2 – 153 A | 2.4 – 28.8 A |
| $I_{2maxPU}$ | 4.3 – 150 A | 2.5 – 25 A   |

An explanation of the formula symbols can be found in the chapter [\[ 13.1 \]](#).

### Features

| Optimal application area |                                   |             |
|--------------------------|-----------------------------------|-------------|
| Number of axes           | 1 – 8                             | 1 – 4       |
| Application              | Drive based synchronous operation | Drive based |

| Motor types              |   |   |
|--------------------------|---|---|
| Asynchronous motors      | ✓ | ✓ |
| Synchronous servo motors | ✓ |   |

| Encoder interfaces      |     |   |
|-------------------------|-----|---|
| EnDat 2.1/2.2 digital   | ✓   |   |
| Incremental             | ✓   | ✓ |
| SSI                     | ✓   |   |
| Resolver                | (✓) |   |
| Pulse/direction signals | (✓) | ✓ |
| EnDat 2.1 sin/cos       | (✓) |   |

(✓): Terminal module required

| Communication                          |     |     |
|----------------------------------------|-----|-----|
| Isochronic system bus (IGB motion bus) | ✓   |     |
| CANopen                                | (✓) | (✓) |
| EtherCAT                               | (✓) | (✓) |
| PROFINET                               | (✓) | (✓) |
| PROFIBUS DP                            | (✓) | (✓) |

(✓): Communication module required

| Motor temperature sensor  |   |   |
|---------------------------|---|---|
| PTC thermistor            | ✓ | ✓ |
| Pt1000 temperature sensor | ✓ | ✓ |

# 1 Selection tool

## 1.3 Drive controllers



SDS 5000



FDS 5000

Product chapter

Chapter number

[ 9]

[ 10]

### Features

#### Safety functions

STO, SS1: SIL 3, PL e (cat. 3)

(✓)

(✓)

(✓): Safety module required

#### Terminals

SEA 5001

REA 5001

XEA 5001

Base unit

LEA 5001

Digital inputs

(5)

(5)

(13)

5

(8)

Digital outputs

(2)

(2)

(10)

2

(8)

Analog inputs

(2)

(2)

(3)

2

—

Analog outputs

(2)

(2)

(2)

2

—

Expanded encoder support

—

(✓)

—

—

—

(x): Terminal module required

### Features

Stand-alone

✓

✓

Live firmware update

✓

Display and keyboard

✓

✓

Removable data storage

✓

✓

DC link connection

✓

✓

### Applications

Torque/force mode

✓

✓

Velocity mode

✓

✓

Positioning mode

✓

✓

Master/slave mode

✓

✓

Electronic cam disk

✓

✓

### Conformity

cULus

✓

✓

CE

✓

✓

# 1 Selection tool

## 1.4 Connection method



Product chapter

Cables

Chapter number

[▶ 11\]](#)

### Encoder cables

| Encoder           | Motor plug connector size |
|-------------------|---------------------------|
|                   | con.23                    |
| Incremental (HTL) | ✓                         |
| SSI               | ✓                         |

| Encoder           | Supply cores (pair)      | Pilot cores (pair)       | Cable Ø     | Bending radius 1 (min.) | Bending radius 2 (min.) |
|-------------------|--------------------------|--------------------------|-------------|-------------------------|-------------------------|
| Incremental (HTL) | 2 × 0.25 mm <sup>2</sup> | 2 × 0.14 mm <sup>2</sup> | Max. 8.5 mm | 85 mm                   | 42.5 mm                 |
| SSI               | 2 × 0.25 mm <sup>2</sup> | 2 × 0.14 mm <sup>2</sup> | Max. 8.5 mm | 85 mm                   | 42.5 mm                 |

Bending radius: 1 = free to move, 2 = fixed installation

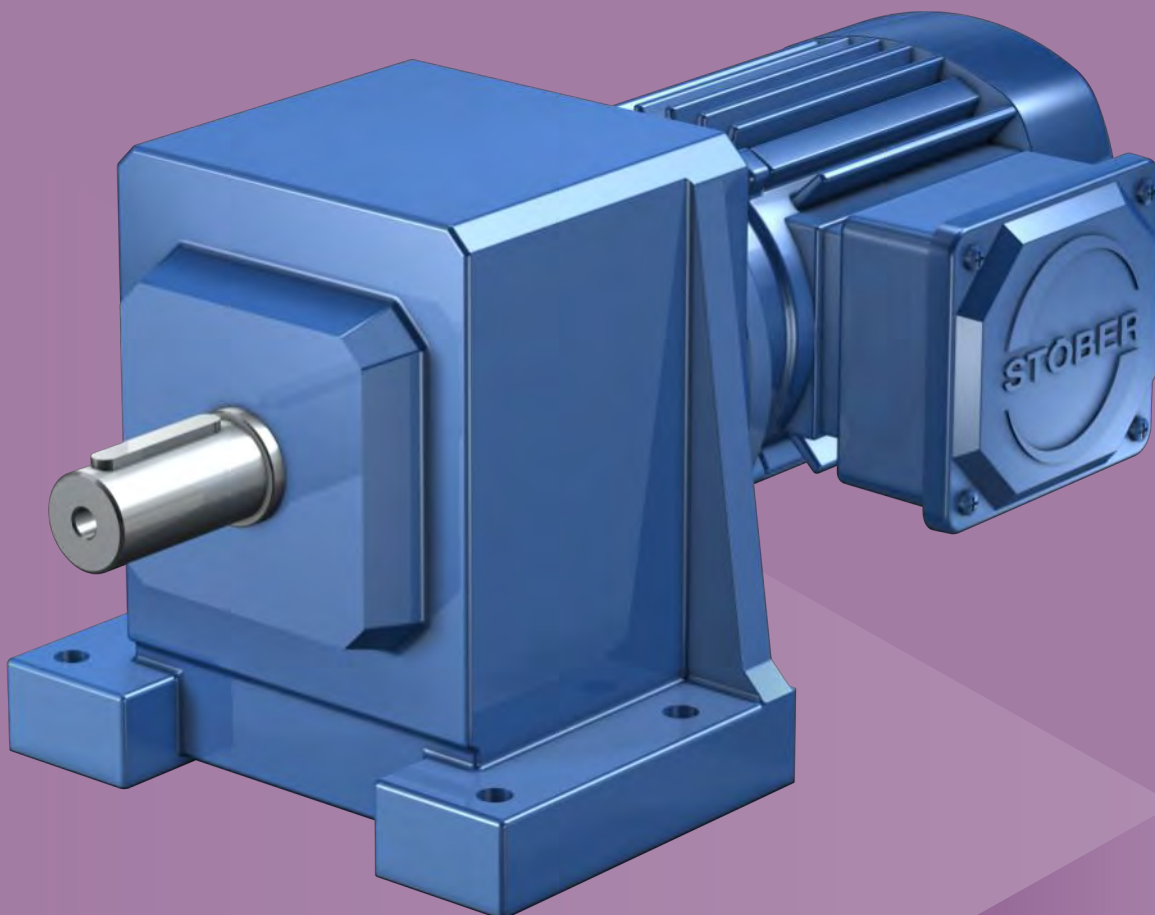
| Other                          |         |
|--------------------------------|---------|
| Torsional stress               | ± 30°/m |
| Bending resistance             | ✓       |
| Resistant to oil and chemicals | ✓       |

## 2 C helical geared motors

### Table of contents

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## 2 Helical geared motors

C

### 2.1 Overview

Compact helical geared motors

#### Features

|                                                              |                |
|--------------------------------------------------------------|----------------|
| Power density                                                | ★☆☆☆☆          |
| Backlash                                                     | ★★★★☆          |
| Price category                                               | €              |
| Shaft load                                                   | ★★★★☆          |
| Smooth operation                                             | ★★★★☆          |
| Torsional stiffness                                          | ★★★★☆          |
| Mass moment of inertia                                       | ★★★★★          |
| Helical gearing                                              | ✓              |
| Maintenance-free (C0 – C5)                                   | ✓              |
| FKM seal ring at the input                                   | ✓              |
| Reinforced output bearing                                    | ✓ (on request) |
| Energy efficiency class IE3 in accordance with EN 60034-30-1 | ✓              |

Key: ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

#### Technical data

|                     |               |
|---------------------|---------------|
| $P_N$               | 0.12 – 45 kW  |
| $i$                 | 2 – 274       |
| $M_{2N}$            | 2.3 – 8677 Nm |
| $\eta_{\text{get}}$ | 96 – 97 %     |

## 2.2 Selection tables

The technical data specified in the selection tables applies to:

- Installation altitudes up to 1000 m above sea level
- Surrounding temperatures from 0 °C to 40 °C
- Drives with self-ventilated motors
- Weight specification for mounting position EL1, housing design N

You can receive asynchronous geared motors with low output speed on request.

Asynchronous geared motors are ideal for operation on a drive controller (87 Hz). More information can be found in chapter [▶ 5.6.2](#)

For all other technical data, refer to <http://configurator.stoeber.de>.

An explanation of the formula symbols can be found in the chapter [▶ 13.1](#).

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 0,12 kW, <math>P_N</math> (87 Hz) = 0,21 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 7.6                                                                           | 0.83       | 13                      | 0.83       | 144              | C103_1840 IE3D063K04 | 20.1      | 183.7 | 2021/11            | 4.0                           |
| 10                                                                            | 1.1        | 18                      | 1.1        | 108              | C103_1370 IE3D063K04 | 20.1      | 137.3 | 10575/77           | 4.1                           |
| 13                                                                            | 1.4        | 22                      | 1.4        | 87               | C103_1110 IE3D063K04 | 20.1      | 111.1 | 1222/11            | 4.1                           |
| 15                                                                            | 1.7        | 26                      | 1.7        | 72               | C103_0920 IE3D063K04 | 20.1      | 92.13 | 16215/176          | 4.1                           |
| 17                                                                            | 1.9        | 30                      | 1.9        | 64               | C103_0820 IE3D063K04 | 20.1      | 81.64 | 31349/384          | 4.1                           |
| 20                                                                            | 1.1        | 35                      | 1.1        | 56               | C002_0700 IE3D063K04 | 12.3      | 69.88 | 559/8              | 4.0                           |
| 20                                                                            | 2.1        | 34                      | 2.1        | 56               | C102_0700 IE3D063K04 | 17.2      | 70.46 | 775/11             | 4.0                           |
| 22                                                                            | 1.2        | 39                      | 1.2        | 50               | C002_0620 IE3D063K04 | 12.3      | 62.35 | 1247/20            | 4.0                           |
| 22                                                                            | 2.4        | 39                      | 2.4        | 50               | C102_0620 IE3D063K04 | 17.2      | 62.43 | 4495/72            | 4.0                           |
| 25                                                                            | 1.3        | 43                      | 1.3        | 45               | C002_0560 IE3D063K04 | 12.3      | 55.97 | 2015/36            | 4.0                           |
| 25                                                                            | 2.7        | 43                      | 2.7        | 45               | C102_0560 IE3D063K04 | 17.2      | 56.36 | 620/11             | 4.0                           |
| 28                                                                            | 1.5        | 49                      | 1.5        | 40               | C002_0500 IE3D063K04 | 12.3      | 49.94 | 899/18             | 4.0                           |
| 28                                                                            | 3.0        | 49                      | 3.0        | 40               | C102_0500 IE3D063K04 | 17.2      | 49.94 | 899/18             | 4.0                           |
| 30                                                                            | 1.6        | 52                      | 1.6        | 37               | C002_0470 IE3D063K04 | 12.3      | 46.82 | 7865/168           | 4.0                           |
| 30                                                                            | 3.2        | 52                      | 3.2        | 37               | C102_0470 IE3D063K04 | 17.2      | 46.91 | 516/11             | 4.1                           |
| 34                                                                            | 1.8        | 58                      | 1.8        | 33               | C002_0420 IE3D063K04 | 12.3      | 41.77 | 3509/84            | 4.0                           |
| 34                                                                            | 3.6        | 58                      | 3.6        | 33               | C102_0420 IE3D063K04 | 17.2      | 41.57 | 1247/30            | 4.1                           |
| 40                                                                            | 2.2        | 69                      | 2.2        | 28               | C002_0350 IE3D063K04 | 12.3      | 35.03 | 1261/36            | 4.0                           |
| 45                                                                            | 2.4        | 78                      | 2.4        | 25               | C002_0310 IE3D063K04 | 12.3      | 31.26 | 2813/90            | 4.0                           |
| 50                                                                            | 2.7        | 87                      | 2.7        | 22               | C002_0280 IE3D063K04 | 12.3      | 27.99 | 2015/72            | 4.1                           |
| 56                                                                            | 3.0        | 97                      | 3.0        | 20               | C002_0250 IE3D063K04 | 12.3      | 24.97 | 899/36             | 4.1                           |
| 60                                                                            | 3.3        | 104                     | 3.3        | 18               | C002_0230 IE3D063K04 | 12.3      | 23.21 | 325/14             | 4.1                           |
| 68                                                                            | 3.6        | 117                     | 3.6        | 16               | C002_0210 IE3D063K04 | 12.3      | 20.71 | 145/7              | 4.1                           |
| 80                                                                            | 4.3        | 138                     | 4.3        | 14               | C002_0175 IE3D063K04 | 12.3      | 17.53 | 3575/204           | 4.1                           |
| 90                                                                            | 4.8        | 155                     | 4.8        | 12               | C002_0155 IE3D063K04 | 12.3      | 15.64 | 1595/102           | 4.1                           |
| 99                                                                            | 5.4        | 172                     | 5.4        | 11               | C002_0140 IE3D063K04 | 12.3      | 14.08 | 169/12             | 4.2                           |
| 111                                                                           | 6.0        | 193                     | 6.0        | 10               | C002_0125 IE3D063K04 | 12.3      | 12.57 | 377/30             | 4.2                           |
| 121                                                                           | 6.5        | 210                     | 6.5        | 9.2              | C002_0115 IE3D063K04 | 12.3      | 11.54 | 3185/276           | 4.2                           |
| 136                                                                           | 7.3        | 235                     | 7.3        | 8.2              | C002_0105 IE3D063K04 | 12.3      | 10.30 | 1421/138           | 4.2                           |
| 152                                                                           | 7.3        | 263                     | 7.3        | 7.3              | C002_0092 IE3D063K04 | 12.3      | 9.228 | 1495/162           | 4.3                           |
| 170                                                                           | 7.3        | 294                     | 7.3        | 6.6              | C002_0082 IE3D063K04 | 12.3      | 8.235 | 667/81             | 4.3                           |
| 181                                                                           | 6.9        | 314                     | 6.9        | 6.1              | C002_0077 IE3D063K04 | 12.3      | 7.714 | 54/7               | 4.1                           |
| 222                                                                           | 7.3        | 385                     | 7.3        | 5.0              | C002_0063 IE3D063K04 | 12.3      | 6.300 | 2035/323           | 4.1                           |
| 240                                                                           | 7.3        | 416                     | 7.3        | 4.6              | C002_0058 IE3D063K04 | 12.3      | 5.824 | 99/17              | 4.1                           |
| 277                                                                           | 7.3        | 479                     | 7.3        | 4.0              | C002_0051 IE3D063K04 | 12.3      | 5.063 | 481/95             | 4.2                           |
| 299                                                                           | 7.3        | 518                     | 7.3        | 3.7              | C002_0047 IE3D063K04 | 12.3      | 4.680 | 117/25             | 4.2                           |
| 337                                                                           | 7.3        | 584                     | 7.3        | 3.3              | C002_0041 IE3D063K04 | 12.3      | 4.149 | 1813/437           | 4.3                           |
| 365                                                                           | 7.3        | 632                     | 7.3        | 3.1              | C002_0038 IE3D063K04 | 12.3      | 3.835 | 441/115            | 4.3                           |
| 422                                                                           | 7.3        | 731                     | 7.3        | 2.6              | C002_0033 IE3D063K04 | 12.3      | 3.318 | 1702/513           | 4.4                           |
| 456                                                                           | 7.3        | 791                     | 7.3        | 2.4              | C002_0031 IE3D063K04 | 12.3      | 3.067 | 46/15              | 4.4                           |
| <b><math>P_N</math> (50 Hz) = 0,18 kW, <math>P_N</math> (87 Hz) = 0,31 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 7.7                                                                           | 0.94       | 13                      | 0.94       | 212              | C203_1830 IE3D063M04 | 26.9      | 183.4 | 99029/540          | 5.1                           |
| 10                                                                            | 1.3        | 18                      | 1.3        | 159              | C203_1380 IE3D063M04 | 26.9      | 137.8 | 16121/117          | 5.1                           |
| 13                                                                            | 0.93       | 22                      | 0.93       | 129              | C103_1110 IE3D063M04 | 20.9      | 111.1 | 1222/11            | 5.1                           |
| 13                                                                            | 1.6        | 22                      | 1.6        | 128              | C203_1110 IE3D063M04 | 26.9      | 110.6 | 191149/1728        | 5.1                           |
| 15                                                                            | 1.1        | 27                      | 1.1        | 107              | C103_0920 IE3D063M04 | 20.9      | 92.13 | 16215/176          | 5.1                           |
| 15                                                                            | 1.9        | 27                      | 1.9        | 107              | C203_0920 IE3D063M04 | 26.9      | 92.40 | 29939/324          | 5.1                           |
| 17                                                                            | 1.3        | 30                      | 1.3        | 94               | C103_0820 IE3D063M04 | 20.9      | 81.64 | 31349/384          | 5.1                           |
| 18                                                                            | 2.1        | 30                      | 2.1        | 93               | C203_0810 IE3D063M04 | 26.9      | 80.62 | 11609/144          | 5.1                           |

## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                          | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 0,18 kW, $P_N$ (87 Hz) = 0,31 kW |            |                         |            |                  |                      |           |       |                    |                               |
| 20                                               | 1.5        | 35                      | 1.5        | 83               | C102_0700 IE3D063M04 | 18.0      | 70.46 | 775/11             | 5.0                           |
| 20                                               | 2.4        | 35                      | 2.4        | 83               | C202_0700 IE3D063M04 | 22.0      | 70.32 | 7595/108           | 5.1                           |
| 23                                               | 0.82       | 39                      | 0.82       | 73               | C002_0620 IE3D063M04 | 13.1      | 62.35 | 1247/20            | 5.0                           |
| 23                                               | 1.6        | 39                      | 1.6        | 73               | C102_0620 IE3D063M04 | 18.0      | 62.43 | 4495/72            | 5.0                           |
| 23                                               | 2.6        | 40                      | 2.6        | 72               | C202_0610 IE3D063M04 | 22.0      | 61.35 | 2945/48            | 5.1                           |
| 25                                               | 0.91       | 44                      | 0.91       | 66               | C002_0560 IE3D063M04 | 13.1      | 55.97 | 2015/36            | 5.0                           |
| 25                                               | 1.8        | 43                      | 1.8        | 66               | C102_0560 IE3D063M04 | 18.0      | 56.36 | 620/11             | 5.0                           |
| 28                                               | 1.0        | 49                      | 1.0        | 59               | C002_0500 IE3D063M04 | 13.1      | 49.94 | 899/18             | 5.0                           |
| 28                                               | 2.0        | 49                      | 2.0        | 59               | C102_0500 IE3D063M04 | 18.0      | 49.94 | 899/18             | 5.0                           |
| 30                                               | 1.1        | 52                      | 1.1        | 55               | C002_0470 IE3D063M04 | 13.1      | 46.82 | 7865/168           | 5.0                           |
| 30                                               | 2.2        | 52                      | 2.2        | 55               | C102_0470 IE3D063M04 | 18.0      | 46.91 | 516/11             | 5.1                           |
| 34                                               | 1.2        | 59                      | 1.2        | 49               | C002_0420 IE3D063M04 | 13.1      | 41.77 | 3509/84            | 5.0                           |
| 34                                               | 2.5        | 59                      | 2.5        | 49               | C102_0420 IE3D063M04 | 18.0      | 41.57 | 1247/30            | 5.1                           |
| 40                                               | 1.5        | 70                      | 1.5        | 41               | C002_0350 IE3D063M04 | 13.1      | 35.03 | 1261/36            | 5.0                           |
| 40                                               | 2.9        | 70                      | 2.9        | 41               | C102_0350 IE3D063M04 | 18.0      | 35.07 | 2700/77            | 5.1                           |
| 45                                               | 1.6        | 78                      | 1.6        | 37               | C002_0310 IE3D063M04 | 13.1      | 31.26 | 2813/90            | 5.0                           |
| 46                                               | 3.3        | 79                      | 3.3        | 36               | C102_0310 IE3D063M04 | 18.0      | 31.07 | 435/14             | 5.1                           |
| 51                                               | 1.8        | 88                      | 1.8        | 33               | C002_0280 IE3D063M04 | 13.1      | 27.99 | 2015/72            | 5.1                           |
| 57                                               | 2.0        | 98                      | 2.0        | 29               | C002_0250 IE3D063M04 | 13.1      | 24.97 | 899/36             | 5.1                           |
| 60                                               | 4.3        | 104                     | 4.3        | 28               | C102_0240 IE3D063M04 | 18.0      | 23.52 | 1035/44            | 5.2                           |
| 61                                               | 2.2        | 106                     | 2.2        | 27               | C002_0230 IE3D063M04 | 13.1      | 23.21 | 325/14             | 5.1                           |
| 68                                               | 2.5        | 118                     | 2.5        | 24               | C002_0210 IE3D063M04 | 13.1      | 20.71 | 145/7              | 5.1                           |
| 81                                               | 2.9        | 140                     | 2.9        | 21               | C002_0175 IE3D063M04 | 13.1      | 17.53 | 3575/204           | 5.1                           |
| 90                                               | 3.3        | 157                     | 3.3        | 18               | C002_0155 IE3D063M04 | 13.1      | 15.64 | 1595/102           | 5.1                           |
| 100                                              | 3.6        | 174                     | 3.6        | 17               | C002_0140 IE3D063M04 | 13.1      | 14.08 | 169/12             | 5.2                           |
| 113                                              | 4.1        | 195                     | 4.1        | 15               | C002_0125 IE3D063M04 | 13.1      | 12.57 | 377/30             | 5.2                           |
| 123                                              | 4.4        | 212                     | 4.4        | 14               | C002_0115 IE3D063M04 | 13.1      | 11.54 | 3185/276           | 5.2                           |
| 137                                              | 5.0        | 238                     | 5.0        | 12               | C002_0105 IE3D063M04 | 13.1      | 10.30 | 1421/138           | 5.2                           |
| 153                                              | 5.0        | 266                     | 5.0        | 11               | C002_0092 IE3D063M04 | 13.1      | 9.228 | 1495/162           | 5.3                           |
| 172                                              | 5.0        | 298                     | 5.0        | 9.7              | C002_0082 IE3D063M04 | 13.1      | 8.235 | 667/81             | 5.3                           |
| 182                                              | 5.0        | 314                     | 5.0        | 9.2              | C102_0078 IE3D063M04 | 18.0      | 7.796 | 3243/416           | 5.2                           |
| 183                                              | 4.7        | 318                     | 4.7        | 9.1              | C002_0077 IE3D063M04 | 13.1      | 7.714 | 54/7               | 5.1                           |
| 225                                              | 5.0        | 389                     | 5.0        | 7.4              | C002_0063 IE3D063M04 | 13.1      | 6.300 | 2035/323           | 5.1                           |
| 241                                              | 5.0        | 417                     | 5.0        | 6.9              | C102_0059 IE3D063M04 | 18.0      | 5.875 | 47/8               | 5.4                           |
| 243                                              | 5.0        | 421                     | 5.0        | 6.8              | C002_0058 IE3D063M04 | 13.1      | 5.824 | 99/17              | 5.1                           |
| 279                                              | 5.0        | 484                     | 5.0        | 5.9              | C002_0051 IE3D063M04 | 13.1      | 5.063 | 481/95             | 5.2                           |
| 302                                              | 5.0        | 524                     | 5.0        | 5.5              | C002_0047 IE3D063M04 | 13.1      | 4.680 | 117/25             | 5.2                           |
| 338                                              | 5.0        | 585                     | 5.0        | 4.9              | C102_0042 IE3D063M04 | 18.0      | 4.189 | 377/90             | 5.7                           |
| 341                                              | 5.0        | 591                     | 5.0        | 4.9              | C002_0041 IE3D063M04 | 13.1      | 4.149 | 1813/437           | 5.3                           |
| 364                                              | 5.0        | 631                     | 5.0        | 4.6              | C102_0039 IE3D063M04 | 18.0      | 3.883 | 1363/351           | 5.7                           |
| 369                                              | 5.0        | 639                     | 5.0        | 4.5              | C002_0038 IE3D063M04 | 13.1      | 3.835 | 441/115            | 5.3                           |
| 426                                              | 5.0        | 739                     | 5.0        | 3.9              | C002_0033 IE3D063M04 | 13.1      | 3.318 | 1702/513           | 5.4                           |
| 461                                              | 5.0        | 799                     | 5.0        | 3.6              | C002_0031 IE3D063M04 | 13.1      | 3.067 | 46/15              | 5.4                           |
| 709                                              | 5.0        | 1227                    | 5.0        | 2.3              | C002_0020 IE3D063M04 | 13.1      | 1.997 | 1480/741           | 5.7                           |
| $P_N$ (50 Hz) = 0,25 kW, $P_N$ (87 Hz) = 0,43 kW |            |                         |            |                  |                      |           |       |                    |                               |
| 5.2                                              | 0.80       | 9.1                     | 0.80       | 437              | C303_2740 IE3D071K04 | 34.1      | 273.7 | 26273/96           | 8.8                           |
| 6.5                                              | 1.0        | 11                      | 1.0        | 351              | C303_2200 IE3D071K04 | 34.1      | 219.9 | 58045/264          | 8.8                           |
| 7.8                                              | 1.2        | 14                      | 1.2        | 292              | C303_1830 IE3D071K04 | 34.1      | 182.8 | 1645/9             | 8.8                           |
| 10                                               | 0.91       | 18                      | 0.91       | 220              | C203_1380 IE3D071K04 | 29.7      | 137.8 | 16121/117          | 8.8                           |
| 10                                               | 1.6        | 18                      | 1.6        | 219              | C303_1370 IE3D071K04 | 34.1      | 137.2 | 59267/432          | 8.8                           |
| 13                                               | 1.1        | 22                      | 1.1        | 177              | C203_1110 IE3D071K04 | 29.7      | 110.6 | 191149/1728        | 8.8                           |
| 13                                               | 2.0        | 23                      | 2.0        | 175              | C303_1100 IE3D071K04 | 34.1      | 109.6 | 94705/864          | 8.8                           |
| 16                                               | 0.82       | 27                      | 0.82       | 147              | C103_0920 IE3D071K04 | 23.7      | 92.13 | 16215/176          | 8.8                           |
| 15                                               | 1.4        | 27                      | 1.4        | 148              | C203_0920 IE3D071K04 | 29.7      | 92.40 | 29939/324          | 8.8                           |
| 16                                               | 2.4        | 27                      | 2.4        | 147              | C303_0920 IE3D071K04 | 34.1      | 91.93 | 39715/432          | 8.8                           |
| 18                                               | 0.92       | 30                      | 0.92       | 130              | C103_0820 IE3D071K04 | 23.7      | 81.64 | 31349/384          | 8.8                           |
| 18                                               | 1.6        | 31                      | 1.6        | 129              | C203_0810 IE3D071K04 | 29.7      | 80.62 | 11609/144          | 8.8                           |
| 18                                               | 2.7        | 30                      | 2.7        | 130              | C303_0810 IE3D071K04 | 34.1      | 81.47 | 1222/15            | 8.8                           |
| 20                                               | 1.1        | 35                      | 1.1        | 114              | C102_0700 IE3D071K04 | 20.8      | 70.46 | 775/11             | 8.7                           |
| 20                                               | 1.8        | 35                      | 1.8        | 114              | C202_0700 IE3D071K04 | 24.8      | 70.32 | 7595/108           | 8.8                           |
| 23                                               | 1.2        | 40                      | 1.2        | 101              | C102_0620 IE3D071K04 | 20.8      | 62.43 | 4495/72            | 8.7                           |
| 23                                               | 1.9        | 40                      | 1.9        | 99               | C202_0610 IE3D071K04 | 24.8      | 61.35 | 2945/48            | 8.8                           |
| 25                                               | 1.3        | 44                      | 1.3        | 91               | C102_0560 IE3D071K04 | 20.8      | 56.36 | 620/11             | 8.7                           |
| 29                                               | 1.5        | 50                      | 1.5        | 81               | C102_0500 IE3D071K04 | 20.8      | 49.94 | 899/18             | 8.7                           |
| 30                                               | 1.6        | 53                      | 1.6        | 76               | C102_0470 IE3D071K04 | 20.8      | 46.91 | 516/11             | 8.8                           |

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 0,25 kW, <math>P_N</math> (87 Hz) = 0,43 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 34                                                                            | 0.89       | 59                      | 0.89       | 68               | C002_0420 IE3D071K04 | 15.9      | 41.77 | 3509/84            | 8.7                           |
| 34                                                                            | 1.8        | 60                      | 1.8        | 67               | C102_0420 IE3D071K04 | 20.8      | 41.57 | 1247/30            | 8.8                           |
| 41                                                                            | 1.1        | 71                      | 1.1        | 57               | C002_0350 IE3D071K04 | 15.9      | 35.03 | 1261/36            | 8.7                           |
| 41                                                                            | 2.1        | 71                      | 2.1        | 57               | C102_0350 IE3D071K04 | 20.8      | 35.07 | 2700/77            | 8.8                           |
| 46                                                                            | 1.2        | 79                      | 1.2        | 51               | C002_0310 IE3D071K04 | 15.9      | 31.26 | 2813/90            | 8.7                           |
| 46                                                                            | 2.4        | 80                      | 2.4        | 50               | C102_0310 IE3D071K04 | 20.8      | 31.07 | 435/14             | 8.8                           |
| 51                                                                            | 1.3        | 89                      | 1.3        | 45               | C002_0280 IE3D071K04 | 15.9      | 27.99 | 2015/72            | 8.8                           |
| 57                                                                            | 1.5        | 99                      | 1.5        | 40               | C002_0250 IE3D071K04 | 15.9      | 24.97 | 899/36             | 8.8                           |
| 61                                                                            | 3.1        | 105                     | 3.1        | 38               | C102_0240 IE3D071K04 | 20.8      | 23.52 | 1035/44            | 8.9                           |
| 62                                                                            | 1.6        | 107                     | 1.6        | 38               | C002_0230 IE3D071K04 | 15.9      | 23.21 | 325/14             | 8.8                           |
| 69                                                                            | 1.8        | 120                     | 1.8        | 34               | C002_0210 IE3D071K04 | 15.9      | 20.71 | 145/7              | 8.8                           |
| 69                                                                            | 3.6        | 119                     | 3.6        | 34               | C102_0210 IE3D071K04 | 20.8      | 20.84 | 667/32             | 8.9                           |
| 82                                                                            | 2.1        | 141                     | 2.1        | 28               | C002_0175 IE3D071K04 | 15.9      | 17.53 | 3575/204           | 8.8                           |
| 91                                                                            | 2.4        | 158                     | 2.4        | 25               | C002_0155 IE3D071K04 | 15.9      | 15.64 | 1595/102           | 8.8                           |
| 102                                                                           | 2.6        | 176                     | 2.6        | 23               | C002_0140 IE3D071K04 | 15.9      | 14.08 | 169/12             | 8.9                           |
| 114                                                                           | 2.9        | 197                     | 2.9        | 20               | C002_0125 IE3D071K04 | 15.9      | 12.57 | 377/30             | 8.9                           |
| 124                                                                           | 3.2        | 215                     | 3.2        | 19               | C002_0115 IE3D071K04 | 15.9      | 11.54 | 3185/276           | 8.9                           |
| 139                                                                           | 3.6        | 241                     | 3.6        | 17               | C002_0105 IE3D071K04 | 15.9      | 10.30 | 1421/138           | 8.9                           |
| 155                                                                           | 3.6        | 268                     | 3.6        | 15               | C002_0092 IE3D071K04 | 15.9      | 9.228 | 1495/162           | 9.0                           |
| 174                                                                           | 3.6        | 301                     | 3.6        | 13               | C002_0082 IE3D071K04 | 15.9      | 8.235 | 667/81             | 9.0                           |
| 183                                                                           | 3.6        | 318                     | 3.6        | 13               | C102_0078 IE3D071K04 | 20.8      | 7.796 | 3243/416           | 8.9                           |
| 185                                                                           | 3.4        | 321                     | 3.4        | 12               | C002_0077 IE3D071K04 | 15.9      | 7.714 | 54/7               | 8.8                           |
| 227                                                                           | 3.6        | 393                     | 3.6        | 10               | C002_0063 IE3D071K04 | 15.9      | 6.300 | 2035/323           | 8.8                           |
| 243                                                                           | 3.6        | 422                     | 3.6        | 9.5              | C102_0059 IE3D071K04 | 20.8      | 5.875 | 47/8               | 9.1                           |
| 246                                                                           | 3.6        | 425                     | 3.6        | 9.4              | C002_0058 IE3D071K04 | 15.9      | 5.824 | 99/17              | 8.8                           |
| 282                                                                           | 3.6        | 489                     | 3.6        | 8.2              | C002_0051 IE3D071K04 | 15.9      | 5.063 | 481/95             | 8.9                           |
| 306                                                                           | 3.6        | 529                     | 3.6        | 7.6              | C002_0047 IE3D071K04 | 15.9      | 4.680 | 117/25             | 8.9                           |
| 341                                                                           | 3.6        | 591                     | 3.6        | 6.8              | C102_0042 IE3D071K04 | 20.8      | 4.189 | 377/90             | 9.4                           |
| 345                                                                           | 3.6        | 597                     | 3.6        | 6.7              | C002_0041 IE3D071K04 | 15.9      | 4.149 | 1813/437           | 9.0                           |
| 368                                                                           | 3.6        | 638                     | 3.6        | 6.3              | C102_0039 IE3D071K04 | 20.8      | 3.883 | 1363/351           | 9.4                           |
| 373                                                                           | 3.6        | 646                     | 3.6        | 6.2              | C002_0038 IE3D071K04 | 15.9      | 3.835 | 441/115            | 9.0                           |
| 431                                                                           | 3.6        | 746                     | 3.6        | 5.4              | C002_0033 IE3D071K04 | 15.9      | 3.318 | 1702/513           | 9.1                           |
| 466                                                                           | 3.6        | 808                     | 3.6        | 5.0              | C002_0031 IE3D071K04 | 15.9      | 3.067 | 46/15              | 9.1                           |
| 716                                                                           | 3.6        | 1240                    | 3.6        | 3.2              | C002_0020 IE3D071K04 | 15.9      | 1.997 | 1480/741           | 9.4                           |
| <b><math>P_N</math> (50 Hz) = 0,37 kW, <math>P_N</math> (87 Hz) = 0,64 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 7.8                                                                           | 0.80       | 14                      | 0.80       | 437              | C303_1830 IE3D071L04 | 35.2      | 182.8 | 1645/9             | 11                            |
| 10                                                                            | 1.1        | 18                      | 1.1        | 328              | C303_1370 IE3D071L04 | 35.2      | 137.2 | 59267/432          | 11                            |
| 13                                                                            | 1.3        | 23                      | 1.3        | 262              | C303_1100 IE3D071L04 | 35.2      | 109.6 | 94705/864          | 11                            |
| 15                                                                            | 0.91       | 27                      | 0.91       | 221              | C203_0920 IE3D071L04 | 30.8      | 92.40 | 29939/324          | 11                            |
| 16                                                                            | 1.6        | 27                      | 1.6        | 220              | C303_0920 IE3D071L04 | 35.2      | 91.93 | 39715/432          | 11                            |
| 18                                                                            | 1.0        | 31                      | 1.0        | 193              | C203_0810 IE3D071L04 | 30.8      | 80.62 | 11609/144          | 11                            |
| 18                                                                            | 1.8        | 30                      | 1.8        | 195              | C303_0810 IE3D071L04 | 35.2      | 81.47 | 1222/15            | 11                            |
| 20                                                                            | 1.2        | 35                      | 1.2        | 171              | C202_0700 IE3D071L04 | 25.9      | 70.32 | 7595/108           | 11                            |
| 23                                                                            | 1.3        | 40                      | 1.3        | 149              | C202_0610 IE3D071L04 | 25.9      | 61.35 | 2945/48            | 11                            |
| 25                                                                            | 0.88       | 44                      | 0.88       | 137              | C102_0560 IE3D071L04 | 21.9      | 56.36 | 620/11             | 11                            |
| 29                                                                            | 0.99       | 50                      | 0.99       | 121              | C102_0500 IE3D071L04 | 21.9      | 49.94 | 899/18             | 11                            |
| 30                                                                            | 1.1        | 53                      | 1.1        | 114              | C102_0470 IE3D071L04 | 21.9      | 46.91 | 516/11             | 11                            |
| 34                                                                            | 1.2        | 60                      | 1.2        | 101              | C102_0420 IE3D071L04 | 21.9      | 41.57 | 1247/30            | 11                            |
| 41                                                                            | 1.4        | 71                      | 1.4        | 85               | C102_0350 IE3D071L04 | 21.9      | 35.07 | 2700/77            | 11                            |
| 46                                                                            | 1.6        | 80                      | 1.6        | 75               | C102_0310 IE3D071L04 | 21.9      | 31.07 | 435/14             | 11                            |
| 51                                                                            | 0.88       | 89                      | 0.88       | 68               | C002_0280 IE3D071L04 | 17.0      | 27.99 | 2015/72            | 11                            |
| 57                                                                            | 0.99       | 99                      | 0.99       | 61               | C002_0250 IE3D071L04 | 17.0      | 24.97 | 899/36             | 11                            |
| 61                                                                            | 2.1        | 105                     | 2.1        | 57               | C102_0240 IE3D071L04 | 21.9      | 23.52 | 1035/44            | 11                            |
| 62                                                                            | 1.1        | 107                     | 1.1        | 56               | C002_0230 IE3D071L04 | 17.0      | 23.21 | 325/14             | 11                            |
| 69                                                                            | 1.2        | 120                     | 1.2        | 50               | C002_0210 IE3D071L04 | 17.0      | 20.71 | 145/7              | 11                            |
| 69                                                                            | 2.4        | 119                     | 2.4        | 51               | C102_0210 IE3D071L04 | 21.9      | 20.84 | 667/32             | 11                            |
| 82                                                                            | 1.4        | 141                     | 1.4        | 42               | C002_0175 IE3D071L04 | 17.0      | 17.53 | 3575/204           | 11                            |
| 81                                                                            | 2.4        | 140                     | 2.4        | 43               | C102_0175 IE3D071L04 | 21.9      | 17.73 | 195/11             | 11                            |
| 91                                                                            | 1.6        | 158                     | 1.6        | 38               | C002_0155 IE3D071L04 | 17.0      | 15.64 | 1595/102           | 11                            |
| 91                                                                            | 2.4        | 158                     | 2.4        | 38               | C102_0155 IE3D071L04 | 21.9      | 15.71 | 377/24             | 11                            |
| 102                                                                           | 1.8        | 176                     | 1.8        | 34               | C002_0140 IE3D071L04 | 17.0      | 14.08 | 169/12             | 11                            |
| 114                                                                           | 2.0        | 197                     | 2.0        | 30               | C002_0125 IE3D071L04 | 17.0      | 12.57 | 377/30             | 11                            |
| 124                                                                           | 2.1        | 215                     | 2.1        | 28               | C002_0115 IE3D071L04 | 17.0      | 11.54 | 3185/276           | 11                            |
| 139                                                                           | 2.4        | 241                     | 2.4        | 25               | C002_0105 IE3D071L04 | 17.0      | 10.30 | 1421/138           | 11                            |
| 155                                                                           | 2.4        | 268                     | 2.4        | 22               | C002_0092 IE3D071L04 | 17.0      | 9.228 | 1495/162           | 11                            |



## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 0,37 kW, <math>P_N</math> (87 Hz) = 0,64 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 174                                                                           | 2.4        | 301                     | 2.4        | 20               | C002_0082 IE3D071L04 | 17.0      | 8.235 | 667/81             | 11                            |
| 183                                                                           | 2.4        | 318                     | 2.4        | 19               | C102_0078 IE3D071L04 | 21.9      | 7.796 | 3243/416           | 11                            |
| 185                                                                           | 2.3        | 321                     | 2.3        | 19               | C002_0077 IE3D071L04 | 17.0      | 7.714 | 54/7               | 11                            |
| 227                                                                           | 2.4        | 393                     | 2.4        | 15               | C002_0063 IE3D071L04 | 17.0      | 6.300 | 2035/323           | 11                            |
| 243                                                                           | 2.4        | 422                     | 2.4        | 14               | C102_0059 IE3D071L04 | 21.9      | 5.875 | 47/8               | 11                            |
| 246                                                                           | 2.4        | 425                     | 2.4        | 14               | C002_0058 IE3D071L04 | 17.0      | 5.824 | 99/17              | 11                            |
| 282                                                                           | 2.4        | 489                     | 2.4        | 12               | C002_0051 IE3D071L04 | 17.0      | 5.063 | 481/95             | 11                            |
| 306                                                                           | 2.4        | 529                     | 2.4        | 11               | C002_0047 IE3D071L04 | 17.0      | 4.680 | 117/25             | 11                            |
| 341                                                                           | 2.4        | 591                     | 2.4        | 10               | C102_0042 IE3D071L04 | 21.9      | 4.189 | 377/90             | 11                            |
| 345                                                                           | 2.4        | 597                     | 2.4        | 10               | C002_0041 IE3D071L04 | 17.0      | 4.149 | 1813/437           | 11                            |
| 368                                                                           | 2.4        | 638                     | 2.4        | 9.4              | C102_0039 IE3D071L04 | 21.9      | 3.883 | 1363/351           | 11                            |
| 373                                                                           | 2.4        | 646                     | 2.4        | 9.3              | C002_0038 IE3D071L04 | 17.0      | 3.835 | 441/115            | 11                            |
| 431                                                                           | 2.4        | 746                     | 2.4        | 8.0              | C002_0033 IE3D071L04 | 17.0      | 3.318 | 1702/513           | 11                            |
| 466                                                                           | 2.4        | 808                     | 2.4        | 7.4              | C002_0031 IE3D071L04 | 17.0      | 3.067 | 46/15              | 11                            |
| 716                                                                           | 2.4        | 1240                    | 2.4        | 4.8              | C002_0020 IE3D071L04 | 17.0      | 1.997 | 1480/741           | 11                            |
| <b><math>P_N</math> (50 Hz) = 0,55 kW, <math>P_N</math> (87 Hz) = 0,95 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 5.3                                                                           | 0.85       | 9.2                     | 0.85       | 944              | C503_2710 IE3D080K04 | 60.2      | 270.5 | 58435/216          | 21                            |
| 5.4                                                                           | 1.4        | 9.4                     | 1.4        | 929              | C613_2660 IE3D080K04 | 80.0      | 266.4 | 7192/27            | 21                            |
| 6.7                                                                           | 1.1        | 12                      | 1.1        | 753              | C503_2160 IE3D080K04 | 60.2      | 215.9 | 1943/9             | 21                            |
| 6.8                                                                           | 1.7        | 12                      | 1.7        | 744              | C613_2130 IE3D080K04 | 80.0      | 213.1 | 28768/135          | 21                            |
| 8.0                                                                           | 1.3        | 14                      | 1.3        | 630              | C503_1810 IE3D080K04 | 60.2      | 180.6 | 8671/48            | 21                            |
| 8.0                                                                           | 0.87       | 14                      | 0.87       | 630              | C403_1800 IE3D080K04 | 49.2      | 180.4 | 1624/9             | 21                            |
| 8.2                                                                           | 2.1        | 14                      | 2.1        | 612              | C613_1750 IE3D080K04 | 80.0      | 175.3 | 7888/45            | 21                            |
| 11                                                                            | 1.2        | 19                      | 1.2        | 470              | C403_1350 IE3D080K04 | 49.2      | 134.6 | 1885/14            | 21                            |
| 11                                                                            | 1.7        | 18                      | 1.7        | 472              | C503_1350 IE3D080K04 | 60.2      | 135.3 | 406/3              | 21                            |
| 11                                                                            | 2.8        | 18                      | 2.8        | 471              | C613_1350 IE3D080K04 | 80.0      | 134.8 | 15776/117          | 21                            |
| 13                                                                            | 2.1        | 23                      | 2.1        | 379              | C503_1090 IE3D080K04 | 60.2      | 108.6 | 31291/288          | 21                            |
| 13                                                                            | 0.93       | 23                      | 0.93       | 378              | C303_1080 IE3D080K04 | 38.7      | 108.2 | 11687/108          | 21                            |
| 13                                                                            | 1.5        | 23                      | 1.5        | 376              | C403_1080 IE3D080K04 | 49.2      | 107.7 | 754/7              | 21                            |
| 14                                                                            | 3.5        | 24                      | 3.5        | 370              | C613_1060 IE3D080K04 | 80.0      | 106.1 | 3712/35            | 21                            |
| 16                                                                            | 1.1        | 27                      | 1.1        | 317              | C303_0910 IE3D080K04 | 38.7      | 90.76 | 4901/54            | 21                            |
| 16                                                                            | 1.7        | 28                      | 1.7        | 315              | C403_0900 IE3D080K04 | 49.2      | 90.32 | 8671/96            | 21                            |
| 16                                                                            | 2.5        | 28                      | 2.5        | 315              | C503_0900 IE3D080K04 | 60.2      | 90.32 | 8671/96            | 21                            |
| 18                                                                            | 2.0        | 31                      | 2.0        | 282              | C403_0810 IE3D080K04 | 49.2      | 80.81 | 42021/520          | 21                            |
| 18                                                                            | 2.8        | 31                      | 2.8        | 281              | C503_0810 IE3D080K04 | 60.2      | 80.60 | 19343/240          | 21                            |
| 18                                                                            | 1.2        | 31                      | 1.2        | 281              | C303_0800 IE3D080K04 | 38.7      | 80.43 | 6032/75            | 21                            |
| 19                                                                            | 3.5        | 33                      | 3.5        | 265              | C613_0760 IE3D080K04 | 80.0      | 75.81 | 5307/70            | 21                            |
| 21                                                                            | 1.4        | 36                      | 1.4        | 247              | C302_0700 IE3D080K04 | 34.5      | 69.88 | 559/8              | 21                            |
| 21                                                                            | 2.2        | 36                      | 2.2        | 247              | C402_0700 IE3D080K04 | 44.7      | 69.88 | 559/8              | 21                            |
| 23                                                                            | 2.3        | 40                      | 2.3        | 221              | C402_0630 IE3D080K04 | 44.7      | 62.52 | 8127/130           | 21                            |
| 23                                                                            | 1.5        | 40                      | 1.5        | 219              | C302_0620 IE3D080K04 | 34.5      | 61.92 | 1548/25            | 21                            |
| 23                                                                            | 3.2        | 40                      | 3.2        | 221              | C502_0620 IE3D080K04 | 56.3      | 62.43 | 4495/72            | 21                            |
| 26                                                                            | 1.0        | 44                      | 1.0        | 200              | C202_0560 IE3D080K04 | 29.4      | 56.42 | 1862/33            | 21                            |
| 26                                                                            | 1.8        | 44                      | 1.8        | 199              | C302_0560 IE3D080K04 | 34.5      | 56.14 | 1235/22            | 21                            |
| 26                                                                            | 2.8        | 44                      | 2.8        | 199              | C402_0560 IE3D080K04 | 44.7      | 56.10 | 9425/168           | 21                            |
| 29                                                                            | 2.0        | 50                      | 2.0        | 176              | C302_0500 IE3D080K04 | 34.5      | 49.75 | 2736/55            | 21                            |
| 29                                                                            | 3.1        | 50                      | 3.1        | 178              | C402_0500 IE3D080K04 | 44.7      | 50.19 | 1305/26            | 21                            |
| 29                                                                            | 1.1        | 51                      | 1.1        | 174              | C202_0490 IE3D080K04 | 29.4      | 49.23 | 1083/22            | 21                            |
| 31                                                                            | 1.2        | 53                      | 1.2        | 166              | C202_0470 IE3D080K04 | 29.4      | 46.82 | 2107/45            | 21                            |
| 31                                                                            | 2.1        | 53                      | 2.1        | 165              | C302_0470 IE3D080K04 | 34.5      | 46.67 | 140/3              | 21                            |
| 35                                                                            | 0.82       | 60                      | 0.82       | 147              | C102_0420 IE3D080K04 | 25.4      | 41.57 | 1247/30            | 21                            |
| 34                                                                            | 3.7        | 60                      | 3.7        | 148              | C402_0420 IE3D080K04 | 44.7      | 41.75 | 7056/169           | 21                            |
| 35                                                                            | 1.4        | 61                      | 1.4        | 145              | C202_0410 IE3D080K04 | 29.4      | 40.85 | 817/20             | 21                            |
| 35                                                                            | 2.4        | 60                      | 2.4        | 146              | C302_0410 IE3D080K04 | 34.5      | 41.35 | 2688/65            | 21                            |
| 41                                                                            | 0.97       | 71                      | 0.97       | 124              | C102_0350 IE3D080K04 | 25.4      | 35.07 | 2700/77            | 21                            |
| 41                                                                            | 1.6        | 71                      | 1.6        | 125              | C202_0350 IE3D080K04 | 29.4      | 35.18 | 1372/39            | 21                            |
| 41                                                                            | 2.8        | 71                      | 2.8        | 124              | C302_0350 IE3D080K04 | 34.5      | 35.03 | 1261/36            | 21                            |
| 46                                                                            | 1.1        | 80                      | 1.1        | 110              | C102_0310 IE3D080K04 | 25.4      | 31.07 | 435/14             | 21                            |
| 47                                                                            | 1.8        | 81                      | 1.8        | 109              | C202_0310 IE3D080K04 | 29.4      | 30.69 | 399/13             | 21                            |
| 46                                                                            | 3.2        | 80                      | 3.2        | 110              | C302_0310 IE3D080K04 | 34.5      | 31.04 | 776/25             | 21                            |
| 51                                                                            | 1.2        | 88                      | 1.2        | 100              | C102_0280 IE3D080K04 | 25.4      | 28.36 | 312/11             | 21                            |
| 51                                                                            | 2.0        | 88                      | 2.0        | 100              | C202_0280 IE3D080K04 | 29.4      | 28.24 | 4067/144           | 21                            |
| 57                                                                            | 1.3        | 99                      | 1.3        | 89               | C102_0250 IE3D080K04 | 25.4      | 25.13 | 377/15             | 21                            |
| 58                                                                            | 2.3        | 101                     | 2.3        | 87               | C202_0250 IE3D080K04 | 29.4      | 24.64 | 1577/64            | 21                            |
| 61                                                                            | 1.4        | 106                     | 1.4        | 83               | C102_0240 IE3D080K04 | 25.4      | 23.52 | 1035/44            | 21                            |

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 0,55 kW, <math>P_N</math> (87 Hz) = 0,95 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 61                                                                            | 2.4        | 106                     | 2.4        | 84               | C202_0240 IE3D080K04 | 29.4      | 23.59 | 637/27             | 21                            |
| 61                                                                            | 4.2        | 106                     | 4.2        | 83               | C302_0230 IE3D080K04 | 34.5      | 23.47 | 845/36             | 21                            |
| 70                                                                            | 0.82       | 120                     | 0.82       | 73               | C002_0210 IE3D080K04 | 20.5      | 20.71 | 145/7              | 21                            |
| 69                                                                            | 1.6        | 120                     | 1.6        | 74               | C102_0210 IE3D080K04 | 25.4      | 20.84 | 667/32             | 21                            |
| 70                                                                            | 2.7        | 121                     | 2.7        | 73               | C202_0210 IE3D080K04 | 29.4      | 20.58 | 247/12             | 21                            |
| 82                                                                            | 0.97       | 142                     | 0.97       | 62               | C002_0175 IE3D080K04 | 20.5      | 17.53 | 3575/204           | 21                            |
| 81                                                                            | 1.9        | 141                     | 1.9        | 63               | C102_0175 IE3D080K04 | 25.4      | 17.73 | 195/11             | 21                            |
| 82                                                                            | 3.2        | 142                     | 3.2        | 62               | C202_0175 IE3D080K04 | 29.4      | 17.52 | 3626/207           | 21                            |
| 92                                                                            | 1.1        | 160                     | 1.1        | 55               | C002_0155 IE3D080K04 | 20.5      | 15.64 | 1595/102           | 21                            |
| 92                                                                            | 2.2        | 159                     | 2.2        | 56               | C102_0155 IE3D080K04 | 25.4      | 15.71 | 377/24             | 21                            |
| 102                                                                           | 1.2        | 177                     | 1.2        | 50               | C002_0140 IE3D080K04 | 20.5      | 14.08 | 169/12             | 21                            |
| 102                                                                           | 2.4        | 177                     | 2.4        | 50               | C102_0140 IE3D080K04 | 25.4      | 14.06 | 2010/143           | 21                            |
| 115                                                                           | 1.3        | 198                     | 1.3        | 44               | C002_0125 IE3D080K04 | 20.5      | 12.57 | 377/30             | 21                            |
| 116                                                                           | 2.7        | 200                     | 2.7        | 44               | C102_0125 IE3D080K04 | 25.4      | 12.46 | 1943/156           | 21                            |
| 122                                                                           | 4.8        | 212                     | 4.8        | 42               | C202_0120 IE3D080K04 | 29.4      | 11.76 | 294/25             | 22                            |
| 125                                                                           | 1.5        | 216                     | 1.5        | 41               | C002_0115 IE3D080K04 | 20.5      | 11.54 | 3185/276           | 21                            |
| 123                                                                           | 2.9        | 213                     | 2.9        | 41               | C102_0115 IE3D080K04 | 25.4      | 11.72 | 1160/99            | 21                            |
| 140                                                                           | 1.6        | 242                     | 1.6        | 36               | C002_0105 IE3D080K04 | 20.5      | 10.30 | 1421/138           | 21                            |
| 139                                                                           | 3.3        | 240                     | 3.3        | 37               | C102_0105 IE3D080K04 | 25.4      | 10.38 | 841/81             | 21                            |
| 154                                                                           | 3.6        | 267                     | 3.5        | 33               | C102_0093 IE3D080K04 | 25.4      | 9.326 | 3180/341           | 21                            |
| 156                                                                           | 1.8        | 270                     | 1.8        | 33               | C002_0092 IE3D080K04 | 20.5      | 9.228 | 1495/162           | 21                            |
| 174                                                                           | 4.1        | 302                     | 3.8        | 29               | C102_0083 IE3D080K04 | 25.4      | 8.263 | 1537/186           | 21                            |
| 175                                                                           | 2.1        | 303                     | 1.9        | 29               | C002_0082 IE3D080K04 | 20.5      | 8.235 | 667/81             | 21                            |
| 185                                                                           | 4.0        | 320                     | 3.3        | 28               | C102_0078 IE3D080K04 | 25.4      | 7.796 | 3243/416           | 21                            |
| 187                                                                           | 2.0        | 323                     | 1.7        | 27               | C002_0077 IE3D080K04 | 20.5      | 7.714 | 54/7               | 21                            |
| 229                                                                           | 2.3        | 396                     | 1.9        | 22               | C002_0063 IE3D080K04 | 20.5      | 6.300 | 2035/323           | 21                            |
| 245                                                                           | 4.8        | 425                     | 4.0        | 21               | C102_0059 IE3D080K04 | 25.4      | 5.875 | 47/8               | 21                            |
| 247                                                                           | 2.4        | 428                     | 2.0        | 21               | C002_0058 IE3D080K04 | 20.5      | 5.824 | 99/17              | 21                            |
| 284                                                                           | 2.6        | 493                     | 2.2        | 18               | C002_0051 IE3D080K04 | 20.5      | 5.063 | 481/95             | 21                            |
| 287                                                                           | 5.3        | 496                     | 4.5        | 18               | C102_0050 IE3D080K04 | 25.4      | 5.025 | 201/40             | 21                            |
| 308                                                                           | 2.8        | 533                     | 2.3        | 17               | C002_0047 IE3D080K04 | 20.5      | 4.680 | 117/25             | 21                            |
| 344                                                                           | 6.0        | 595                     | 5.0        | 15               | C102_0042 IE3D080K04 | 25.4      | 4.189 | 377/90             | 21                            |
| 347                                                                           | 3.0        | 601                     | 2.5        | 15               | C002_0041 IE3D080K04 | 20.5      | 4.149 | 1813/437           | 21                            |
| 371                                                                           | 6.3        | 642                     | 5.3        | 14               | C102_0039 IE3D080K04 | 25.4      | 3.883 | 1363/351           | 21                            |
| 375                                                                           | 3.2        | 650                     | 2.7        | 14               | C002_0038 IE3D080K04 | 20.5      | 3.835 | 441/115            | 21                            |
| 434                                                                           | 3.5        | 752                     | 2.9        | 12               | C002_0033 IE3D080K04 | 20.5      | 3.318 | 1702/513           | 21                            |
| 470                                                                           | 3.7        | 813                     | 3.1        | 11               | C002_0031 IE3D080K04 | 20.5      | 3.067 | 46/15              | 21                            |
| 520                                                                           | 3.9        | 901                     | 3.3        | 9.8              | C002_0028 IE3D080K04 | 20.5      | 2.769 | 36/13              | 21                            |
| 661                                                                           | 6.6        | 1146                    | 6.6        | 7.7              | C102_0022 IE3D080K04 | 25.4      | 2.177 | 468/215            | 23                            |
| 721                                                                           | 4.9        | 1249                    | 4.1        | 7.1              | C002_0020 IE3D080K04 | 20.5      | 1.997 | 1480/741           | 21                            |
| <b><math>P_N</math> (50 Hz) = 0,75 kW, <math>P_N</math> (87 Hz) = 1,30 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 5.4                                                                           | 1.0        | 9.4                     | 1.0        | 1273             | C613_2660 IE3D080L04 | 82.5      | 266.4 | 7192/27            | 26                            |
| 6.8                                                                           | 1.3        | 12                      | 1.3        | 1019             | C613_2130 IE3D080L04 | 82.5      | 213.1 | 28768/135          | 26                            |
| 8.0                                                                           | 0.93       | 14                      | 0.93       | 863              | C503_1810 IE3D080L04 | 62.7      | 180.6 | 8671/48            | 26                            |
| 8.2                                                                           | 1.6        | 14                      | 1.6        | 838              | C613_1750 IE3D080L04 | 82.5      | 175.3 | 7888/45            | 26                            |
| 11                                                                            | 0.86       | 19                      | 0.86       | 644              | C403_1350 IE3D080L04 | 51.7      | 134.6 | 1885/14            | 26                            |
| 11                                                                            | 1.2        | 18                      | 1.2        | 647              | C503_1350 IE3D080L04 | 62.7      | 135.3 | 406/3              | 26                            |
| 11                                                                            | 2.0        | 19                      | 2.0        | 645              | C613_1350 IE3D080L04 | 82.5      | 134.8 | 15776/117          | 26                            |
| 13                                                                            | 1.5        | 23                      | 1.5        | 519              | C503_1090 IE3D080L04 | 62.7      | 108.6 | 31291/288          | 26                            |
| 13                                                                            | 1.1        | 23                      | 1.1        | 515              | C403_1080 IE3D080L04 | 51.7      | 107.7 | 754/7              | 26                            |
| 14                                                                            | 2.5        | 24                      | 2.5        | 507              | C613_1060 IE3D080L04 | 82.5      | 106.1 | 3712/35            | 27                            |
| 16                                                                            | 0.81       | 28                      | 0.81       | 434              | C303_0910 IE3D080L04 | 41.2      | 90.76 | 4901/54            | 26                            |
| 16                                                                            | 1.3        | 28                      | 1.3        | 432              | C403_0900 IE3D080L04 | 51.7      | 90.32 | 8671/96            | 26                            |
| 16                                                                            | 1.9        | 28                      | 1.9        | 432              | C503_0900 IE3D080L04 | 62.7      | 90.32 | 8671/96            | 26                            |
| 18                                                                            | 1.4        | 31                      | 1.4        | 386              | C403_0810 IE3D080L04 | 51.7      | 80.81 | 42021/520          | 26                            |
| 18                                                                            | 2.1        | 31                      | 2.1        | 385              | C503_0810 IE3D080L04 | 62.7      | 80.60 | 19343/240          | 26                            |
| 18                                                                            | 0.91       | 31                      | 0.91       | 384              | C303_0800 IE3D080L04 | 41.2      | 80.43 | 6032/75            | 26                            |
| 19                                                                            | 2.5        | 33                      | 2.5        | 362              | C613_0760 IE3D080L04 | 82.5      | 75.81 | 5307/70            | 27                            |
| 21                                                                            | 1.0        | 36                      | 1.0        | 339              | C302_0700 IE3D080L04 | 37.0      | 69.88 | 559/8              | 26                            |
| 21                                                                            | 1.6        | 36                      | 1.6        | 339              | C402_0700 IE3D080L04 | 47.2      | 69.88 | 559/8              | 26                            |
| 21                                                                            | 2.4        | 36                      | 2.4        | 339              | C502_0700 IE3D080L04 | 58.8      | 69.97 | 10075/144          | 26                            |
| 23                                                                            | 1.7        | 40                      | 1.7        | 303              | C402_0630 IE3D080L04 | 47.2      | 62.52 | 8127/130           | 26                            |
| 23                                                                            | 1.1        | 40                      | 1.1        | 300              | C302_0620 IE3D080L04 | 37.0      | 61.92 | 1548/25            | 26                            |
| 23                                                                            | 2.4        | 40                      | 2.4        | 303              | C502_0620 IE3D080L04 | 58.8      | 62.43 | 4495/72            | 26                            |
| 26                                                                            | 1.3        | 45                      | 1.3        | 272              | C302_0560 IE3D080L04 | 37.0      | 56.14 | 1235/22            | 26                            |

## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                          | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 0,75 kW, $P_N$ (87 Hz) = 1,30 kW |            |                         |            |                  |                      |           |       |                    |                               |
| 26                                               | 2.0        | 45                      | 2.0        | 272              | C402_0560 IE3D080L04 | 47.2      | 56.10 | 9425/168           | 26                            |
| 29                                               | 1.5        | 50                      | 1.5        | 241              | C302_0500 IE3D080L04 | 37.0      | 49.75 | 2736/55            | 26                            |
| 29                                               | 2.3        | 50                      | 2.3        | 243              | C402_0500 IE3D080L04 | 47.2      | 50.19 | 1305/26            | 26                            |
| 29                                               | 0.84       | 51                      | 0.84       | 239              | C202_0490 IE3D080L04 | 31.9      | 49.23 | 1083/22            | 26                            |
| 31                                               | 0.88       | 53                      | 0.88       | 227              | C202_0470 IE3D080L04 | 31.9      | 46.82 | 2107/45            | 26                            |
| 31                                               | 1.5        | 54                      | 1.5        | 226              | C302_0470 IE3D080L04 | 37.0      | 46.67 | 140/3              | 26                            |
| 31                                               | 2.4        | 54                      | 2.4        | 226              | C402_0470 IE3D080L04 | 47.2      | 46.67 | 140/3              | 27                            |
| 35                                               | 2.7        | 60                      | 2.7        | 202              | C402_0420 IE3D080L04 | 47.2      | 41.75 | 7056/169           | 27                            |
| 35                                               | 1.0        | 61                      | 1.0        | 198              | C202_0410 IE3D080L04 | 31.9      | 40.85 | 817/20             | 26                            |
| 35                                               | 1.7        | 61                      | 1.7        | 201              | C302_0410 IE3D080L04 | 37.0      | 41.35 | 2688/65            | 26                            |
| 41                                               | 1.2        | 71                      | 1.2        | 171              | C202_0350 IE3D080L04 | 31.9      | 35.18 | 1372/39            | 26                            |
| 41                                               | 2.1        | 71                      | 2.1        | 170              | C302_0350 IE3D080L04 | 37.0      | 35.03 | 1261/36            | 26                            |
| 47                                               | 1.3        | 82                      | 1.3        | 149              | C202_0310 IE3D080L04 | 31.9      | 30.69 | 399/13             | 26                            |
| 47                                               | 2.3        | 81                      | 2.3        | 151              | C302_0310 IE3D080L04 | 37.0      | 31.04 | 776/25             | 26                            |
| 51                                               | 0.87       | 88                      | 0.87       | 138              | C102_0280 IE3D080L04 | 27.9      | 28.36 | 312/11             | 26                            |
| 51                                               | 1.5        | 89                      | 1.5        | 137              | C202_0280 IE3D080L04 | 31.9      | 28.24 | 4067/144           | 26                            |
| 52                                               | 2.6        | 89                      | 2.6        | 136              | C302_0280 IE3D080L04 | 37.0      | 27.99 | 2015/72            | 27                            |
| 57                                               | 0.98       | 100                     | 0.98       | 122              | C102_0250 IE3D080L04 | 27.9      | 25.13 | 377/15             | 26                            |
| 59                                               | 1.7        | 102                     | 1.7        | 120              | C202_0250 IE3D080L04 | 31.9      | 24.64 | 1577/64            | 26                            |
| 58                                               | 2.9        | 101                     | 2.9        | 120              | C302_0250 IE3D080L04 | 37.0      | 24.80 | 124/5              | 27                            |
| 61                                               | 1.1        | 106                     | 1.1        | 114              | C102_0240 IE3D080L04 | 27.9      | 23.52 | 1035/44            | 26                            |
| 61                                               | 1.7        | 106                     | 1.7        | 114              | C202_0240 IE3D080L04 | 31.9      | 23.59 | 637/27             | 26                            |
| 62                                               | 3.1        | 107                     | 3.1        | 114              | C302_0230 IE3D080L04 | 37.0      | 23.47 | 845/36             | 27                            |
| 69                                               | 1.2        | 120                     | 1.2        | 101              | C102_0210 IE3D080L04 | 27.9      | 20.84 | 667/32             | 26                            |
| 70                                               | 2.0        | 122                     | 2.0        | 100              | C202_0210 IE3D080L04 | 31.9      | 20.58 | 247/12             | 26                            |
| 82                                               | 1.4        | 141                     | 1.4        | 86               | C102_0175 IE3D080L04 | 27.9      | 17.73 | 195/11             | 26                            |
| 82                                               | 2.4        | 143                     | 2.4        | 85               | C202_0175 IE3D080L04 | 31.9      | 17.52 | 3626/207           | 27                            |
| 92                                               | 1.6        | 159                     | 1.6        | 76               | C102_0155 IE3D080L04 | 27.9      | 15.71 | 377/24             | 26                            |
| 95                                               | 2.7        | 164                     | 2.7        | 74               | C202_0155 IE3D080L04 | 31.9      | 15.28 | 703/46             | 27                            |
| 103                                              | 0.88       | 178                     | 0.88       | 68               | C002_0140 IE3D080L04 | 23.0      | 14.08 | 169/12             | 26                            |
| 103                                              | 1.8        | 178                     | 1.8        | 68               | C102_0140 IE3D080L04 | 27.9      | 14.06 | 2010/143           | 26                            |
| 102                                              | 2.9        | 177                     | 2.9        | 68               | C202_0140 IE3D080L04 | 31.9      | 14.12 | 3430/243           | 27                            |
| 115                                              | 0.98       | 199                     | 0.98       | 61               | C002_0125 IE3D080L04 | 23.0      | 12.57 | 377/30             | 26                            |
| 116                                              | 2.0        | 201                     | 2.0        | 60               | C102_0125 IE3D080L04 | 27.9      | 12.46 | 1943/156           | 26                            |
| 117                                              | 3.3        | 203                     | 3.3        | 60               | C202_0125 IE3D080L04 | 31.9      | 12.32 | 665/54             | 27                            |
| 123                                              | 3.5        | 213                     | 3.5        | 57               | C202_0120 IE3D080L04 | 31.9      | 11.76 | 294/25             | 27                            |
| 125                                              | 1.1        | 217                     | 1.1        | 56               | C002_0115 IE3D080L04 | 23.0      | 11.54 | 3185/276           | 26                            |
| 123                                              | 2.1        | 214                     | 2.1        | 57               | C102_0115 IE3D080L04 | 27.9      | 11.72 | 1160/99            | 27                            |
| 140                                              | 1.2        | 243                     | 1.2        | 50               | C002_0105 IE3D080L04 | 23.0      | 10.30 | 1421/138           | 26                            |
| 139                                              | 2.4        | 241                     | 2.4        | 50               | C102_0105 IE3D080L04 | 27.9      | 10.38 | 841/81             | 27                            |
| 155                                              | 2.7        | 268                     | 2.6        | 45               | C102_0093 IE3D080L04 | 27.9      | 9.326 | 3180/341           | 27                            |
| 157                                              | 1.3        | 271                     | 1.3        | 45               | C002_0092 IE3D080L04 | 23.0      | 9.228 | 1495/162           | 26                            |
| 175                                              | 3.0        | 303                     | 2.8        | 40               | C102_0083 IE3D080L04 | 27.9      | 8.263 | 1537/186           | 27                            |
| 175                                              | 1.5        | 304                     | 1.4        | 40               | C002_0082 IE3D080L04 | 23.0      | 8.235 | 667/81             | 26                            |
| 185                                              | 2.9        | 321                     | 2.4        | 38               | C102_0078 IE3D080L04 | 27.9      | 7.796 | 3243/416           | 26                            |
| 187                                              | 1.5        | 324                     | 1.2        | 37               | C002_0077 IE3D080L04 | 23.0      | 7.714 | 54/7               | 26                            |
| 229                                              | 1.7        | 397                     | 1.4        | 31               | C002_0063 IE3D080L04 | 23.0      | 6.300 | 2035/323           | 26                            |
| 228                                              | 3.3        | 395                     | 2.8        | 31               | C102_0063 IE3D080L04 | 27.9      | 6.338 | 507/80             | 26                            |
| 246                                              | 3.5        | 426                     | 2.9        | 28               | C102_0059 IE3D080L04 | 27.9      | 5.875 | 47/8               | 26                            |
| 248                                              | 1.8        | 430                     | 1.5        | 28               | C002_0058 IE3D080L04 | 23.0      | 5.824 | 99/17              | 26                            |
| 250                                              | 4.8        | 432                     | 4.5        | 28               | C202_0058 IE3D080L04 | 31.9      | 5.791 | 666/115            | 27                            |
| 285                                              | 1.9        | 494                     | 1.6        | 25               | C002_0051 IE3D080L04 | 23.0      | 5.063 | 481/95             | 26                            |
| 285                                              | 4.8        | 493                     | 4.8        | 25               | C202_0051 IE3D080L04 | 31.9      | 5.072 | 350/69             | 27                            |
| 288                                              | 3.9        | 498                     | 3.3        | 24               | C102_0050 IE3D080L04 | 27.9      | 5.025 | 201/40             | 27                            |
| 309                                              | 2.0        | 535                     | 1.7        | 23               | C002_0047 IE3D080L04 | 23.0      | 4.680 | 117/25             | 26                            |
| 345                                              | 4.4        | 597                     | 3.7        | 20               | C102_0042 IE3D080L04 | 27.9      | 4.189 | 377/90             | 27                            |
| 348                                              | 2.2        | 603                     | 1.9        | 20               | C002_0041 IE3D080L04 | 23.0      | 4.149 | 1813/437           | 26                            |
| 372                                              | 4.6        | 645                     | 3.9        | 19               | C102_0039 IE3D080L04 | 27.9      | 3.883 | 1363/351           | 27                            |
| 377                                              | 2.3        | 653                     | 2.0        | 19               | C002_0038 IE3D080L04 | 23.0      | 3.835 | 441/115            | 26                            |
| 436                                              | 2.5        | 754                     | 2.1        | 16               | C002_0033 IE3D080L04 | 23.0      | 3.318 | 1702/513           | 26                            |
| 471                                              | 2.7        | 816                     | 2.3        | 15               | C002_0031 IE3D080L04 | 23.0      | 3.067 | 46/15              | 26                            |
| 522                                              | 2.9        | 904                     | 2.4        | 13               | C002_0028 IE3D080L04 | 23.0      | 2.769 | 36/13              | 26                            |
| 664                                              | 4.8        | 1150                    | 4.8        | 11               | C102_0022 IE3D080L04 | 27.9      | 2.177 | 468/215            | 28                            |
| 724                                              | 3.6        | 1253                    | 3.0        | 9.7              | C002_0020 IE3D080L04 | 23.0      | 1.997 | 1480/741           | 27                            |

| $n_2$<br>50 Hz<br>[rpm]                          | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 1,10 kW, $P_N$ (87 Hz) = 1,91 kW |            |                         |            |                  |                      |           |       |                    |                               |
| 6.8                                              | 0.87       | 12                      | 0.87       | 1487             | C613_2130 IE3D090S04 | 88.0      | 213.1 | 28768/135          | 40                            |
| 8.2                                              | 1.1        | 14                      | 1.1        | 1223             | C613_1750 IE3D090S04 | 88.0      | 175.3 | 7888/45            | 40                            |
| 11                                               | 0.85       | 18                      | 0.85       | 944              | C503_1350 IE3D090S04 | 68.2      | 135.3 | 406/3              | 40                            |
| 11                                               | 1.4        | 18                      | 1.4        | 941              | C613_1350 IE3D090S04 | 88.0      | 134.8 | 15776/117          | 40                            |
| 13                                               | 1.1        | 23                      | 1.1        | 758              | C503_1090 IE3D090S04 | 68.2      | 108.6 | 31291/288          | 40                            |
| 14                                               | 1.7        | 24                      | 1.7        | 740              | C613_1060 IE3D090S04 | 88.0      | 106.1 | 3712/35            | 41                            |
| 16                                               | 0.87       | 28                      | 0.87       | 630              | C403_0900 IE3D090S04 | 57.2      | 90.32 | 8671/96            | 40                            |
| 16                                               | 1.3        | 28                      | 1.3        | 630              | C503_0900 IE3D090S04 | 68.2      | 90.32 | 8671/96            | 40                            |
| 18                                               | 0.98       | 31                      | 0.98       | 564              | C403_0810 IE3D090S04 | 57.2      | 80.81 | 42021/520          | 40                            |
| 18                                               | 1.4        | 31                      | 1.4        | 562              | C503_0810 IE3D090S04 | 68.2      | 80.60 | 19343/240          | 40                            |
| 19                                               | 1.7        | 33                      | 1.7        | 529              | C613_0760 IE3D090S04 | 88.0      | 75.81 | 5307/70            | 41                            |
| 21                                               | 1.1        | 36                      | 1.1        | 495              | C402_0700 IE3D090S04 | 52.7      | 69.88 | 559/8              | 40                            |
| 21                                               | 1.6        | 36                      | 1.6        | 495              | C502_0700 IE3D090S04 | 64.3      | 69.97 | 10075/144          | 40                            |
| 23                                               | 1.1        | 40                      | 1.1        | 443              | C402_0630 IE3D090S04 | 52.7      | 62.52 | 8127/130           | 40                            |
| 23                                               | 1.6        | 40                      | 1.6        | 442              | C502_0620 IE3D090S04 | 64.3      | 62.43 | 4495/72            | 40                            |
| 26                                               | 0.88       | 44                      | 0.88       | 397              | C302_0560 IE3D090S04 | 42.5      | 56.14 | 1235/22            | 40                            |
| 26                                               | 1.4        | 44                      | 1.4        | 397              | C402_0560 IE3D090S04 | 52.7      | 56.10 | 9425/168           | 40                            |
| 26                                               | 2.0        | 45                      | 2.0        | 395              | C502_0560 IE3D090S04 | 64.3      | 55.83 | 335/6              | 41                            |
| 29                                               | 0.99       | 50                      | 0.99       | 352              | C302_0500 IE3D090S04 | 42.5      | 49.75 | 2736/55            | 40                            |
| 29                                               | 1.5        | 50                      | 1.5        | 355              | C402_0500 IE3D090S04 | 52.7      | 50.19 | 1305/26            | 40                            |
| 29                                               | 2.3        | 50                      | 2.3        | 353              | C502_0500 IE3D090S04 | 64.3      | 49.82 | 1943/39            | 41                            |
| 31                                               | 1.1        | 53                      | 1.1        | 330              | C302_0470 IE3D090S04 | 42.5      | 46.67 | 140/3              | 40                            |
| 31                                               | 1.7        | 53                      | 1.7        | 330              | C402_0470 IE3D090S04 | 52.7      | 46.67 | 140/3              | 41                            |
| 34                                               | 1.9        | 60                      | 1.9        | 296              | C402_0420 IE3D090S04 | 52.7      | 41.75 | 7056/169           | 41                            |
| 35                                               | 1.2        | 60                      | 1.2        | 293              | C302_0410 IE3D090S04 | 42.5      | 41.35 | 2688/65            | 40                            |
| 41                                               | 0.80       | 71                      | 0.80       | 249              | C202_0350 IE3D090S04 | 37.4      | 35.18 | 1372/39            | 40                            |
| 41                                               | 1.4        | 71                      | 1.4        | 248              | C302_0350 IE3D090S04 | 42.5      | 35.03 | 1261/36            | 40                            |
| 41                                               | 2.2        | 72                      | 2.2        | 247              | C402_0350 IE3D090S04 | 52.7      | 34.82 | 975/28             | 41                            |
| 47                                               | 0.92       | 81                      | 0.92       | 217              | C202_0310 IE3D090S04 | 37.4      | 30.69 | 399/13             | 40                            |
| 46                                               | 1.6        | 80                      | 1.6        | 220              | C302_0310 IE3D090S04 | 42.5      | 31.04 | 776/25             | 40                            |
| 46                                               | 2.5        | 80                      | 2.5        | 221              | C402_0310 IE3D090S04 | 52.7      | 31.15 | 405/13             | 41                            |
| 51                                               | 1.0        | 88                      | 1.0        | 200              | C202_0280 IE3D090S04 | 37.4      | 28.24 | 4067/144           | 40                            |
| 51                                               | 1.8        | 89                      | 1.8        | 198              | C302_0280 IE3D090S04 | 42.5      | 27.99 | 2015/72            | 41                            |
| 58                                               | 1.1        | 101                     | 1.1        | 174              | C202_0250 IE3D090S04 | 37.4      | 24.64 | 1577/64            | 40                            |
| 58                                               | 2.0        | 101                     | 2.0        | 176              | C302_0250 IE3D090S04 | 42.5      | 24.80 | 124/5              | 41                            |
| 61                                               | 1.2        | 106                     | 1.2        | 167              | C202_0240 IE3D090S04 | 37.4      | 23.59 | 637/27             | 40                            |
| 61                                               | 2.1        | 106                     | 2.1        | 166              | C302_0230 IE3D090S04 | 42.5      | 23.47 | 845/36             | 41                            |
| 69                                               | 0.81       | 120                     | 0.81       | 148              | C102_0210 IE3D090S04 | 33.4      | 20.84 | 667/32             | 40                            |
| 70                                               | 1.4        | 121                     | 1.4        | 146              | C202_0210 IE3D090S04 | 37.4      | 20.58 | 247/12             | 40                            |
| 69                                               | 2.4        | 120                     | 2.4        | 147              | C302_0210 IE3D090S04 | 42.5      | 20.80 | 104/5              | 41                            |
| 81                                               | 0.96       | 141                     | 0.96       | 126              | C102_0175 IE3D090S04 | 33.4      | 17.73 | 195/11             | 40                            |
| 82                                               | 1.6        | 142                     | 1.6        | 124              | C202_0175 IE3D090S04 | 37.4      | 17.52 | 3626/207           | 41                            |
| 92                                               | 1.1        | 159                     | 1.1        | 111              | C102_0155 IE3D090S04 | 33.4      | 15.71 | 377/24             | 40                            |
| 94                                               | 1.8        | 163                     | 1.8        | 108              | C202_0155 IE3D090S04 | 37.4      | 15.28 | 703/46             | 41                            |
| 102                                              | 1.2        | 177                     | 1.2        | 100              | C102_0140 IE3D090S04 | 33.4      | 14.06 | 2010/143           | 40                            |
| 102                                              | 2.0        | 177                     | 2.0        | 100              | C202_0140 IE3D090S04 | 37.4      | 14.12 | 3430/243           | 41                            |
| 116                                              | 1.4        | 200                     | 1.4        | 88               | C102_0125 IE3D090S04 | 33.4      | 12.46 | 1943/156           | 40                            |
| 117                                              | 2.3        | 203                     | 2.3        | 87               | C202_0125 IE3D090S04 | 37.4      | 12.32 | 665/54             | 41                            |
| 122                                              | 2.4        | 212                     | 2.4        | 83               | C202_0120 IE3D090S04 | 37.4      | 11.76 | 294/25             | 41                            |
| 123                                              | 1.4        | 213                     | 1.4        | 83               | C102_0115 IE3D090S04 | 33.4      | 11.72 | 1160/99            | 41                            |
| 140                                              | 0.82       | 242                     | 0.82       | 73               | C002_0105 IE3D090S04 | 28.5      | 10.30 | 1421/138           | 40                            |
| 139                                              | 1.6        | 240                     | 1.6        | 74               | C102_0105 IE3D090S04 | 33.4      | 10.38 | 841/81             | 41                            |
| 140                                              | 2.8        | 243                     | 2.7        | 73               | C202_0105 IE3D090S04 | 37.4      | 10.26 | 513/50             | 41                            |
| 154                                              | 1.8        | 267                     | 1.7        | 66               | C102_0093 IE3D090S04 | 33.4      | 9.326 | 3180/341           | 41                            |
| 156                                              | 0.92       | 270                     | 0.88       | 65               | C002_0092 IE3D090S04 | 28.5      | 9.228 | 1495/162           | 40                            |
| 174                                              | 2.1        | 302                     | 1.9        | 59               | C102_0083 IE3D090S04 | 33.4      | 8.263 | 1537/186           | 41                            |
| 175                                              | 1.0        | 303                     | 0.95       | 58               | C002_0082 IE3D090S04 | 28.5      | 8.235 | 667/81             | 40                            |
| 185                                              | 2.0        | 320                     | 1.7        | 55               | C102_0078 IE3D090S04 | 33.4      | 7.796 | 3243/416           | 40                            |
| 185                                              | 3.0        | 320                     | 2.5        | 55               | C202_0078 IE3D090S04 | 37.4      | 7.800 | 39/5               | 41                            |
| 187                                              | 1.0        | 323                     | 0.84       | 55               | C002_0077 IE3D090S04 | 28.5      | 7.714 | 54/7               | 40                            |
| 229                                              | 1.1        | 396                     | 0.96       | 45               | C002_0063 IE3D090S04 | 28.5      | 6.300 | 2035/323           | 40                            |
| 227                                              | 2.3        | 394                     | 1.9        | 45               | C102_0063 IE3D090S04 | 33.4      | 6.338 | 507/80             | 40                            |
| 245                                              | 2.4        | 425                     | 2.0        | 42               | C102_0059 IE3D090S04 | 33.4      | 5.875 | 47/8               | 40                            |
| 247                                              | 1.2        | 428                     | 1.0        | 41               | C002_0058 IE3D090S04 | 28.5      | 5.824 | 99/17              | 40                            |
| 249                                              | 3.3        | 431                     | 3.1        | 41               | C202_0058 IE3D090S04 | 37.4      | 5.791 | 666/115            | 41                            |

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 1,10 kW, <math>P_N</math> (87 Hz) = 1,91 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 284                                                                           | 1.3        | 493                     | 1.1        | 36               | C002_0051 IE3D090S04  | 28.5      | 5.063 | 481/95             | 40                            |
| 284                                                                           | 3.3        | 492                     | 3.3        | 36               | C202_0051 IE3D090S04  | 37.4      | 5.072 | 350/69             | 41                            |
| 287                                                                           | 2.6        | 496                     | 2.2        | 36               | C102_0050 IE3D090S04  | 33.4      | 5.025 | 201/40             | 41                            |
| 308                                                                           | 1.4        | 533                     | 1.2        | 33               | C002_0047 IE3D090S04  | 28.5      | 4.680 | 117/25             | 40                            |
| 309                                                                           | 2.8        | 535                     | 2.4        | 33               | C102_0047 IE3D090S04  | 33.4      | 4.658 | 3149/676           | 41                            |
| 344                                                                           | 3.0        | 595                     | 2.5        | 30               | C102_0042 IE3D090S04  | 33.4      | 4.189 | 377/90             | 41                            |
| 347                                                                           | 1.5        | 601                     | 1.3        | 29               | C002_0041 IE3D090S04  | 28.5      | 4.149 | 1813/437           | 40                            |
| 371                                                                           | 3.1        | 642                     | 2.7        | 27               | C102_0039 IE3D090S04  | 33.4      | 3.883 | 1363/351           | 41                            |
| 375                                                                           | 1.6        | 650                     | 1.3        | 27               | C002_0038 IE3D090S04  | 28.5      | 3.835 | 441/115            | 40                            |
| 434                                                                           | 1.7        | 752                     | 1.5        | 23               | C002_0033 IE3D090S04  | 28.5      | 3.318 | 1702/513           | 40                            |
| 432                                                                           | 3.3        | 748                     | 2.9        | 24               | C102_0033 IE3D090S04  | 33.4      | 3.334 | 2067/620           | 41                            |
| 470                                                                           | 1.8        | 813                     | 1.6        | 22               | C002_0031 IE3D090S04  | 28.5      | 3.067 | 46/15              | 40                            |
| 466                                                                           | 3.3        | 807                     | 3.1        | 22               | C102_0031 IE3D090S04  | 33.4      | 3.091 | 2491/806           | 41                            |
| 520                                                                           | 2.0        | 901                     | 1.7        | 20               | C002_0028 IE3D090S04  | 28.5      | 2.769 | 36/13              | 40                            |
| 661                                                                           | 3.3        | 1146                    | 3.3        | 15               | C102_0022 IE3D090S04  | 33.4      | 2.177 | 468/215            | 42                            |
| 721                                                                           | 2.4        | 1249                    | 2.1        | 14               | C002_0020 IE3D090S04  | 28.5      | 1.997 | 1480/741           | 41                            |
| <b><math>P_N</math> (50 Hz) = 1,50 kW, <math>P_N</math> (87 Hz) = 2,60 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 11                                                                            | 1.0        | 19                      | 1.0        | 1263             | C613_1350 IE3D090LX04 | 96.5      | 134.8 | 15776/117          | 58                            |
| 14                                                                            | 1.3        | 24                      | 1.3        | 994              | C613_1060 IE3D090LX04 | 96.5      | 106.1 | 3712/35            | 59                            |
| 16                                                                            | 0.95       | 28                      | 0.95       | 846              | C503_0900 IE3D090LX04 | 76.7      | 90.32 | 8671/96            | 58                            |
| 18                                                                            | 1.1        | 31                      | 1.1        | 755              | C503_0810 IE3D090LX04 | 76.7      | 80.60 | 19343/240          | 58                            |
| 19                                                                            | 1.3        | 33                      | 1.3        | 710              | C613_0760 IE3D090LX04 | 96.5      | 75.81 | 5307/70            | 59                            |
| 21                                                                            | 0.83       | 36                      | 0.83       | 664              | C402_0700 IE3D090LX04 | 61.2      | 69.88 | 559/8              | 58                            |
| 21                                                                            | 1.2        | 36                      | 1.2        | 665              | C502_0700 IE3D090LX04 | 72.8      | 69.97 | 10075/144          | 58                            |
| 23                                                                            | 0.84       | 40                      | 0.84       | 594              | C402_0630 IE3D090LX04 | 61.2      | 62.52 | 8127/130           | 58                            |
| 23                                                                            | 1.2        | 40                      | 1.2        | 593              | C502_0620 IE3D090LX04 | 72.8      | 62.43 | 4495/72            | 58                            |
| 26                                                                            | 1.0        | 45                      | 1.0        | 533              | C402_0560 IE3D090LX04 | 61.2      | 56.10 | 9425/168           | 58                            |
| 26                                                                            | 1.5        | 45                      | 1.5        | 531              | C502_0560 IE3D090LX04 | 72.8      | 55.83 | 335/6              | 59                            |
| 29                                                                            | 1.2        | 50                      | 1.2        | 477              | C402_0500 IE3D090LX04 | 61.2      | 50.19 | 1305/26            | 58                            |
| 29                                                                            | 1.7        | 51                      | 1.7        | 474              | C502_0500 IE3D090LX04 | 72.8      | 49.82 | 1943/39            | 59                            |
| 31                                                                            | 1.2        | 54                      | 1.2        | 444              | C402_0470 IE3D090LX04 | 61.2      | 46.67 | 140/3              | 59                            |
| 35                                                                            | 1.4        | 60                      | 1.4        | 397              | C402_0420 IE3D090LX04 | 61.2      | 41.75 | 7056/169           | 59                            |
| 35                                                                            | 0.89       | 61                      | 0.89       | 393              | C302_0410 IE3D090LX04 | 51.0      | 41.35 | 2688/65            | 58                            |
| 42                                                                            | 1.1        | 72                      | 1.1        | 333              | C302_0350 IE3D090LX04 | 51.0      | 35.03 | 1261/36            | 58                            |
| 42                                                                            | 1.7        | 72                      | 1.7        | 331              | C402_0350 IE3D090LX04 | 61.2      | 34.82 | 975/28             | 59                            |
| 47                                                                            | 1.2        | 81                      | 1.2        | 295              | C302_0310 IE3D090LX04 | 51.0      | 31.04 | 776/25             | 58                            |
| 47                                                                            | 1.9        | 81                      | 1.9        | 296              | C402_0310 IE3D090LX04 | 61.2      | 31.15 | 405/13             | 59                            |
| 52                                                                            | 1.3        | 90                      | 1.3        | 266              | C302_0280 IE3D090LX04 | 51.0      | 27.99 | 2015/72            | 59                            |
| 59                                                                            | 0.85       | 102                     | 0.85       | 234              | C202_0250 IE3D090LX04 | 45.9      | 24.64 | 1577/64            | 58                            |
| 59                                                                            | 1.5        | 102                     | 1.5        | 236              | C302_0250 IE3D090LX04 | 51.0      | 24.80 | 124/5              | 59                            |
| 62                                                                            | 0.89       | 107                     | 0.89       | 224              | C202_0240 IE3D090LX04 | 45.9      | 23.59 | 637/27             | 58                            |
| 62                                                                            | 1.6        | 107                     | 1.6        | 223              | C302_0230 IE3D090LX04 | 51.0      | 23.47 | 845/36             | 59                            |
| 71                                                                            | 1.0        | 122                     | 1.0        | 196              | C202_0210 IE3D090LX04 | 45.9      | 20.58 | 247/12             | 58                            |
| 70                                                                            | 1.8        | 121                     | 1.8        | 198              | C302_0210 IE3D090LX04 | 51.0      | 20.80 | 104/5              | 59                            |
| 83                                                                            | 1.2        | 144                     | 1.2        | 167              | C202_0175 IE3D090LX04 | 45.9      | 17.52 | 3626/207           | 59                            |
| 93                                                                            | 0.80       | 160                     | 0.80       | 149              | C102_0155 IE3D090LX04 | 41.9      | 15.71 | 377/24             | 58                            |
| 95                                                                            | 1.4        | 165                     | 1.4        | 145              | C202_0155 IE3D090LX04 | 45.9      | 15.28 | 703/46             | 59                            |
| 104                                                                           | 0.90       | 179                     | 0.90       | 134              | C102_0140 IE3D090LX04 | 41.9      | 14.06 | 2010/143           | 58                            |
| 103                                                                           | 1.5        | 179                     | 1.5        | 134              | C202_0140 IE3D090LX04 | 45.9      | 14.12 | 3430/243           | 59                            |
| 117                                                                           | 1.0        | 202                     | 1.0        | 118              | C102_0125 IE3D090LX04 | 41.9      | 12.46 | 1943/156           | 58                            |
| 118                                                                           | 1.7        | 205                     | 1.7        | 117              | C202_0125 IE3D090LX04 | 45.9      | 12.32 | 665/54             | 59                            |
| 124                                                                           | 1.8        | 214                     | 1.8        | 112              | C202_0120 IE3D090LX04 | 45.9      | 11.76 | 294/25             | 59                            |
| 124                                                                           | 1.1        | 215                     | 1.1        | 111              | C102_0115 IE3D090LX04 | 41.9      | 11.72 | 1160/99            | 59                            |
| 140                                                                           | 1.2        | 243                     | 1.2        | 99               | C102_0105 IE3D090LX04 | 41.9      | 10.38 | 841/81             | 59                            |
| 142                                                                           | 2.1        | 246                     | 2.0        | 98               | C202_0105 IE3D090LX04 | 45.9      | 10.26 | 513/50             | 59                            |
| 156                                                                           | 1.4        | 270                     | 1.3        | 89               | C102_0093 IE3D090LX04 | 41.9      | 9.326 | 3180/341           | 59                            |
| 176                                                                           | 1.5        | 305                     | 1.4        | 79               | C102_0083 IE3D090LX04 | 41.9      | 8.263 | 1537/186           | 59                            |
| 187                                                                           | 1.5        | 323                     | 1.2        | 74               | C102_0078 IE3D090LX04 | 41.9      | 7.796 | 3243/416           | 58                            |
| 187                                                                           | 2.2        | 323                     | 1.9        | 74               | C202_0078 IE3D090LX04 | 45.9      | 7.800 | 39/5               | 59                            |
| 231                                                                           | 0.85       | –                       | –          | 60               | C002_0063 IE3D090LX04 | 37.0      | 6.300 | 2035/323           | 58                            |
| 230                                                                           | 1.7        | 398                     | 1.4        | 60               | C102_0063 IE3D090LX04 | 41.9      | 6.338 | 507/80             | 58                            |
| 231                                                                           | 2.4        | 400                     | 2.2        | 60               | C202_0063 IE3D090LX04 | 45.9      | 6.295 | 3330/529           | 59                            |
| 248                                                                           | 1.8        | 429                     | 1.5        | 56               | C102_0059 IE3D090LX04 | 41.9      | 5.875 | 47/8               | 58                            |
| 250                                                                           | 0.89       | –                       | –          | 55               | C002_0058 IE3D090LX04 | 37.0      | 5.824 | 99/17              | 58                            |
| 251                                                                           | 2.4        | 435                     | 2.3        | 55               | C202_0058 IE3D090LX04 | 45.9      | 5.791 | 666/115            | 59                            |



| $n_2$<br>50 Hz<br>[rpm]                          | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 1,50 kW, $P_N$ (87 Hz) = 2,60 kW |            |                         |            |                  |                       |           |       |                    |                               |
| 287                                              | 0.98       | 498                     | 0.83       | 48               | C002_0051 IE3D090LX04 | 37.0      | 5.063 | 481/95             | 58                            |
| 287                                              | 2.4        | 497                     | 2.4        | 48               | C202_0051 IE3D090LX04 | 45.9      | 5.072 | 350/69             | 59                            |
| 290                                              | 2.0        | 502                     | 1.7        | 48               | C102_0050 IE3D090LX04 | 41.9      | 5.025 | 201/40             | 59                            |
| 311                                              | 1.0        | 538                     | 0.87       | 44               | C002_0047 IE3D090LX04 | 37.0      | 4.680 | 117/25             | 58                            |
| 312                                              | 2.1        | 541                     | 1.7        | 44               | C102_0047 IE3D090LX04 | 41.9      | 4.658 | 3149/676           | 59                            |
| 347                                              | 2.2        | 602                     | 1.9        | 40               | C102_0042 IE3D090LX04 | 41.9      | 4.189 | 377/90             | 59                            |
| 351                                              | 1.1        | 607                     | 0.94       | 39               | C002_0041 IE3D090LX04 | 37.0      | 4.149 | 1813/437           | 58                            |
| 375                                              | 2.3        | 649                     | 2.0        | 37               | C102_0039 IE3D090LX04 | 41.9      | 3.883 | 1363/351           | 59                            |
| 379                                              | 1.2        | 657                     | 0.99       | 36               | C002_0038 IE3D090LX04 | 37.0      | 3.835 | 441/115            | 58                            |
| 439                                              | 1.3        | 760                     | 1.1        | 32               | C002_0033 IE3D090LX04 | 37.0      | 3.318 | 1702/513           | 58                            |
| 436                                              | 2.4        | 756                     | 2.2        | 32               | C102_0033 IE3D090LX04 | 41.9      | 3.334 | 2067/620           | 59                            |
| 474                                              | 1.4        | 822                     | 1.2        | 29               | C002_0031 IE3D090LX04 | 37.0      | 3.067 | 46/15              | 58                            |
| 471                                              | 2.4        | 815                     | 2.3        | 29               | C102_0031 IE3D090LX04 | 41.9      | 3.091 | 2491/806           | 59                            |
| 525                                              | 1.5        | 910                     | 1.2        | 26               | C002_0028 IE3D090LX04 | 37.0      | 2.769 | 36/13              | 58                            |
| 668                                              | 2.4        | 1158                    | 2.4        | 21               | C102_0022 IE3D090LX04 | 41.9      | 2.177 | 468/215            | 60                            |
| 729                                              | 1.8        | 1262                    | 1.5        | 19               | C002_0020 IE3D090LX04 | 37.0      | 1.997 | 1480/741           | 59                            |
| 721                                              | 2.4        | 1249                    | 2.4        | 19               | C102_0020 IE3D090LX04 | 41.9      | 2.018 | 1128/559           | 60                            |
| $P_N$ (50 Hz) = 2,20 kW, $P_N$ (87 Hz) = 3,81 kW |            |                         |            |                  |                       |           |       |                    |                               |
| 5.4                                              | 0.96       | 9.3                     | 0.96       | 3740             | C813_2700 IE3D100KX04 | 209.5     | 269.8 | 7285/27            | 111                           |
| 6.8                                              | 1.2        | 12                      | 1.2        | 2940             | C813_2120 IE3D100KX04 | 209.5     | 212.1 | 8272/39            | 111                           |
| 8.1                                              | 1.5        | 14                      | 1.4        | 2472             | C813_1780 IE3D100KX04 | 209.5     | 178.4 | 6956/39            | 111                           |
| 10                                               | 1.9        | 18                      | 1.7        | 1918             | C813_1380 IE3D100KX04 | 209.5     | 138.4 | 2491/18            | 112                           |
| 11                                               | 1.1        | 18                      | 1.1        | 1904             | C713_1370 IE3D100KX04 | 150.5     | 137.3 | 10575/77           | 111                           |
| 11                                               | 1.3        | 19                      | 1.1        | 1835             | C713_1320 IE3D100KX04 | 150.5     | 132.4 | 33887/256          | 111                           |
| 11                                               | 0.82       | 20                      | 0.82       | 1759             | C613_1270 IE3D100KX04 | 110.5     | 126.9 | 48739/384          | 111                           |
| 13                                               | 2.2        | 23                      | 2.0        | 1491             | C813_1080 IE3D100KX04 | 209.5     | 107.6 | 4841/45            | 112                           |
| 13                                               | 0.87       | 23                      | 0.87       | 1489             | C613_1070 IE3D100KX04 | 110.5     | 107.4 | 752/7              | 111                           |
| 15                                               | 1.7        | 25                      | 1.4        | 1374             | C713_0990 IE3D100KX04 | 150.5     | 99.14 | 6345/64            | 111                           |
| 15                                               | 1.1        | 26                      | 1.1        | 1353             | C613_0980 IE3D100KX04 | 110.5     | 97.63 | 243695/2496        | 111                           |
| 16                                               | 2.2        | 28                      | 2.2        | 1259             | C813_0910 IE3D100KX04 | 209.5     | 90.82 | 18800/207          | 113                           |
| 16                                               | 1.1        | 28                      | 1.1        | 1231             | C613_0890 IE3D100KX04 | 110.5     | 88.78 | 799/9              | 111                           |
| 18                                               | 2.0        | 31                      | 1.7        | 1122             | C713_0810 IE3D100KX04 | 150.5     | 80.97 | 20727/256          | 111                           |
| 18                                               | 2.2        | 32                      | 2.0        | 1100             | C813_0790 IE3D100KX04 | 209.5     | 79.34 | 285619/3600        | 112                           |
| 19                                               | 1.4        | 33                      | 1.4        | 1065             | C613_0770 IE3D100KX04 | 110.5     | 76.80 | 8601/112           | 111                           |
| 21                                               | 2.0        | 36                      | 2.0        | 978              | C712_0700 IE3D100KX04 | 137.4     | 69.55 | 765/11             | 112                           |
| 21                                               | 1.3        | 36                      | 1.3        | 969              | C612_0690 IE3D100KX04 | 102.1     | 68.89 | 620/9              | 111                           |
| 23                                               | 1.6        | 40                      | 1.6        | 880              | C613_0630 IE3D100KX04 | 110.5     | 63.46 | 48739/768          | 111                           |
| 26                                               | 2.4        | 44                      | 2.4        | 799              | C712_0570 IE3D100KX04 | 137.4     | 56.82 | 625/11             | 113                           |
| 26                                               | 1.0        | 45                      | 1.0        | 785              | C502_0560 IE3D100KX04 | 86.8      | 55.83 | 335/6              | 111                           |
| 26                                               | 1.7        | 46                      | 1.7        | 775              | C612_0550 IE3D100KX04 | 102.1     | 55.11 | 496/9              | 112                           |
| 29                                               | 1.1        | 50                      | 1.1        | 701              | C502_0500 IE3D100KX04 | 86.8      | 49.82 | 1943/39            | 111                           |
| 29                                               | 2.1        | 51                      | 2.0        | 683              | C613_0490 IE3D100KX04 | 110.5     | 49.28 | 31537/640          | 111                           |
| 31                                               | 0.84       | 54                      | 0.84       | 656              | C402_0470 IE3D100KX04 | 75.2      | 46.67 | 140/3              | 111                           |
| 31                                               | 1.2        | 54                      | 1.2        | 657              | C502_0470 IE3D100KX04 | 86.8      | 46.72 | 1495/32            | 111                           |
| 32                                               | 2.0        | 55                      | 2.0        | 638              | C612_0450 IE3D100KX04 | 102.1     | 45.33 | 136/3              | 112                           |
| 35                                               | 0.94       | 60                      | 0.94       | 587              | C402_0420 IE3D100KX04 | 75.2      | 41.75 | 7056/169           | 111                           |
| 35                                               | 1.4        | 60                      | 1.4        | 586              | C502_0420 IE3D100KX04 | 86.8      | 41.69 | 667/16             | 111                           |
| 35                                               | 2.4        | 61                      | 2.4        | 577              | C712_0410 IE3D100KX04 | 137.4     | 41.02 | 2625/64            | 113                           |
| 37                                               | 2.2        | 64                      | 2.2        | 554              | C612_0390 IE3D100KX04 | 102.1     | 39.40 | 1891/48            | 112                           |
| 42                                               | 1.1        | 72                      | 1.1        | 490              | C402_0350 IE3D100KX04 | 75.2      | 34.82 | 975/28             | 111                           |
| 41                                               | 1.6        | 72                      | 1.6        | 492              | C502_0350 IE3D100KX04 | 86.8      | 35.00 | 35/1               | 112                           |
| 42                                               | 2.7        | 72                      | 2.7        | 490              | C612_0350 IE3D100KX04 | 102.1     | 34.87 | 1360/39            | 114                           |
| 45                                               | 2.5        | 78                      | 2.5        | 456              | C612_0320 IE3D100KX04 | 102.1     | 32.41 | 1037/32            | 112                           |
| 47                                               | 0.80       | 81                      | 0.80       | 437              | C302_0310 IE3D100KX04 | 65.0      | 31.04 | 776/25             | 110                           |
| 47                                               | 1.3        | 81                      | 1.3        | 438              | C402_0310 IE3D100KX04 | 75.2      | 31.15 | 405/13             | 111                           |
| 46                                               | 1.8        | 80                      | 1.8        | 439              | C502_0310 IE3D100KX04 | 86.8      | 31.23 | 406/13             | 112                           |
| 52                                               | 0.89       | 90                      | 0.89       | 394              | C302_0280 IE3D100KX04 | 65.0      | 27.99 | 2015/72            | 111                           |
| 52                                               | 1.4        | 90                      | 1.4        | 392              | C402_0280 IE3D100KX04 | 75.2      | 27.86 | 195/7              | 111                           |
| 52                                               | 2.0        | 89                      | 2.0        | 395              | C502_0280 IE3D100KX04 | 86.8      | 28.10 | 5395/192           | 112                           |
| 53                                               | 3.3        | 92                      | 3.3        | 386              | C612_0270 IE3D100KX04 | 102.1     | 27.43 | 192/7              | 115                           |
| 58                                               | 1.0        | 101                     | 1.0        | 349              | C302_0250 IE3D100KX04 | 65.0      | 24.80 | 124/5              | 111                           |
| 58                                               | 1.6        | 101                     | 1.6        | 351              | C402_0250 IE3D100KX04 | 75.2      | 24.92 | 324/13             | 111                           |
| 58                                               | 2.3        | 100                     | 2.3        | 353              | C502_0250 IE3D100KX04 | 86.8      | 25.07 | 2407/96            | 112                           |
| 62                                               | 1.1        | 107                     | 1.1        | 330              | C302_0230 IE3D100KX04 | 65.0      | 23.47 | 845/36             | 111                           |
| 62                                               | 1.7        | 108                     | 1.7        | 329              | C402_0230 IE3D100KX04 | 75.2      | 23.36 | 1495/64            | 112                           |

## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 2,20 kW, <math>P_N</math> (87 Hz) = 3,81 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 62                                                                            | 2.4        | 108                     | 2.4        | 329              | C502_0230 IE3D100KX04 | 86.8      | 23.36 | 1495/64            | 113                           |
| 70                                                                            | 1.2        | 121                     | 1.2        | 293              | C302_0210 IE3D100KX04 | 65.0      | 20.80 | 104/5              | 111                           |
| 69                                                                            | 1.9        | 120                     | 1.9        | 294              | C402_0210 IE3D100KX04 | 75.2      | 20.90 | 4347/208           | 112                           |
| 70                                                                            | 2.7        | 120                     | 2.7        | 293              | C502_0210 IE3D100KX04 | 86.8      | 20.84 | 667/32             | 113                           |
| 74                                                                            | 3.3        | 128                     | 3.3        | 276              | C612_0195 IE3D100KX04 | 102.1     | 19.61 | 549/28             | 115                           |
| 83                                                                            | 0.81       | 143                     | 0.81       | 246              | C202_0175 IE3D100KX04 | 59.9      | 17.52 | 3626/207           | 111                           |
| 83                                                                            | 1.4        | 143                     | 1.4        | 247              | C302_0175 IE3D100KX04 | 65.0      | 17.54 | 1105/63            | 111                           |
| 82                                                                            | 2.2        | 143                     | 2.2        | 248              | C402_0175 IE3D100KX04 | 75.2      | 17.60 | 845/48             | 112                           |
| 92                                                                            | 2.5        | 159                     | 2.5        | 222              | C402_0160 IE3D100KX04 | 75.2      | 15.75 | 63/4               | 113                           |
| 95                                                                            | 0.93       | 164                     | 0.93       | 215              | C202_0155 IE3D100KX04 | 59.9      | 15.28 | 703/46             | 111                           |
| 93                                                                            | 1.6        | 162                     | 1.6        | 219              | C302_0155 IE3D100KX04 | 65.0      | 15.54 | 544/35             | 111                           |
| 103                                                                           | 1.0        | 178                     | 1.0        | 199              | C202_0140 IE3D100KX04 | 59.9      | 14.12 | 3430/243           | 111                           |
| 104                                                                           | 1.8        | 179                     | 1.7        | 197              | C302_0140 IE3D100KX04 | 65.0      | 13.99 | 2015/144           | 111                           |
| 104                                                                           | 2.8        | 179                     | 2.8        | 197              | C402_0140 IE3D100KX04 | 75.2      | 13.99 | 2015/144           | 113                           |
| 118                                                                           | 1.2        | 204                     | 1.2        | 173              | C202_0125 IE3D100KX04 | 59.9      | 12.32 | 665/54             | 111                           |
| 117                                                                           | 2.0        | 203                     | 1.9        | 174              | C302_0125 IE3D100KX04 | 65.0      | 12.40 | 62/5               | 112                           |
| 123                                                                           | 1.2        | 214                     | 1.2        | 165              | C202_0120 IE3D100KX04 | 59.9      | 11.76 | 294/25             | 111                           |
| 125                                                                           | 2.1        | 216                     | 1.9        | 163              | C302_0115 IE3D100KX04 | 65.0      | 11.61 | 325/28             | 112                           |
| 140                                                                           | 0.82       | 242                     | 0.82       | 146              | C102_0105 IE3D100KX04 | 55.9      | 10.38 | 841/81             | 111                           |
| 141                                                                           | 1.4        | 245                     | 1.4        | 144              | C202_0105 IE3D100KX04 | 59.9      | 10.26 | 513/50             | 111                           |
| 141                                                                           | 2.4        | 244                     | 2.1        | 145              | C302_0105 IE3D100KX04 | 65.0      | 10.29 | 72/7               | 112                           |
| 154                                                                           | 1.5        | 268                     | 1.4        | 132              | C202_0094 IE3D100KX04 | 59.9      | 9.387 | 2450/261           | 111                           |
| 155                                                                           | 0.92       | 269                     | 0.88       | 131              | C102_0093 IE3D100KX04 | 55.9      | 9.326 | 3180/341           | 111                           |
| 156                                                                           | 2.7        | 270                     | 2.2        | 131              | C302_0093 IE3D100KX04 | 65.0      | 9.310 | 3575/384           | 113                           |
| 175                                                                           | 1.0        | 304                     | 0.95       | 116              | C102_0083 IE3D100KX04 | 55.9      | 8.263 | 1537/186           | 111                           |
| 176                                                                           | 2.9        | 304                     | 2.4        | 116              | C302_0083 IE3D100KX04 | 65.0      | 8.250 | 33/4               | 113                           |
| 177                                                                           | 1.7        | 307                     | 1.6        | 115              | C202_0082 IE3D100KX04 | 59.9      | 8.190 | 475/58             | 112                           |
| 186                                                                           | 1.0        | 322                     | 0.84       | 110              | C102_0078 IE3D100KX04 | 55.9      | 7.796 | 3243/416           | 110                           |
| 186                                                                           | 1.5        | 322                     | 1.3        | 110              | C202_0078 IE3D100KX04 | 59.9      | 7.800 | 39/5               | 111                           |
| 185                                                                           | 2.5        | 320                     | 2.1        | 110              | C302_0078 IE3D100KX04 | 65.0      | 7.841 | 494/63             | 111                           |
| 229                                                                           | 1.1        | 396                     | 0.96       | 89               | C102_0063 IE3D100KX04 | 55.9      | 6.338 | 507/80             | 110                           |
| 230                                                                           | 1.8        | 399                     | 1.5        | 89               | C202_0063 IE3D100KX04 | 59.9      | 6.295 | 3330/529           | 111                           |
| 230                                                                           | 2.9        | 398                     | 2.4        | 89               | C302_0063 IE3D100KX04 | 65.0      | 6.314 | 221/35             | 111                           |
| 247                                                                           | 1.2        | 427                     | 1.0        | 83               | C102_0059 IE3D100KX04 | 55.9      | 5.875 | 47/8               | 110                           |
| 247                                                                           | 3.0        | 429                     | 2.5        | 82               | C302_0059 IE3D100KX04 | 65.0      | 5.859 | 2584/441           | 111                           |
| 250                                                                           | 1.9        | 434                     | 1.6        | 81               | C202_0058 IE3D100KX04 | 59.9      | 5.791 | 666/115            | 111                           |
| 286                                                                           | 2.0        | 495                     | 1.7        | 71               | C202_0051 IE3D100KX04 | 59.9      | 5.072 | 350/69             | 111                           |
| 289                                                                           | 1.3        | 500                     | 1.1        | 71               | C102_0050 IE3D100KX04 | 55.9      | 5.025 | 201/40             | 111                           |
| 288                                                                           | 3.3        | 499                     | 2.8        | 71               | C302_0050 IE3D100KX04 | 65.0      | 5.038 | 403/80             | 112                           |
| 311                                                                           | 1.4        | 539                     | 1.2        | 66               | C102_0047 IE3D100KX04 | 55.9      | 4.658 | 3149/676           | 111                           |
| 311                                                                           | 2.1        | 538                     | 1.8        | 66               | C202_0047 IE3D100KX04 | 59.9      | 4.667 | 14/3               | 111                           |
| 313                                                                           | 4.1        | 543                     | 4.1        | 65               | C502_0046 IE3D100KX04 | 86.8      | 4.629 | 162/35             | 118                           |
| 346                                                                           | 1.5        | 600                     | 1.3        | 59               | C102_0042 IE3D100KX04 | 55.9      | 4.189 | 377/90             | 111                           |
| 343                                                                           | 2.3        | 594                     | 1.9        | 59               | C202_0042 IE3D100KX04 | 59.9      | 4.226 | 486/115            | 111                           |
| 373                                                                           | 1.6        | 647                     | 1.3        | 55               | C102_0039 IE3D100KX04 | 55.9      | 3.883 | 1363/351           | 111                           |
| 373                                                                           | 2.4        | 646                     | 2.0        | 55               | C202_0039 IE3D100KX04 | 59.9      | 3.888 | 486/125            | 111                           |
| 430                                                                           | 2.7        | 745                     | 2.2        | 47               | C202_0034 IE3D100KX04 | 59.9      | 3.373 | 2250/667           | 112                           |
| 435                                                                           | 1.8        | 753                     | 1.5        | 47               | C102_0033 IE3D100KX04 | 55.9      | 3.334 | 2067/620           | 111                           |
| 469                                                                           | 1.8        | 813                     | 1.6        | 43               | C102_0031 IE3D100KX04 | 55.9      | 3.091 | 2491/806           | 111                           |
| 467                                                                           | 2.8        | 809                     | 2.4        | 44               | C202_0031 IE3D100KX04 | 59.9      | 3.103 | 90/29              | 112                           |
| 539                                                                           | 3.1        | 934                     | 2.6        | 38               | C202_0027 IE3D100KX04 | 59.9      | 2.690 | 495/184            | 113                           |
| 562                                                                           | 2.1        | 973                     | 1.8        | 36               | C102_0026 IE3D100KX04 | 55.9      | 2.582 | 1911/740           | 111                           |
| 586                                                                           | 3.3        | 1015                    | 2.7        | 35               | C202_0025 IE3D100KX04 | 59.9      | 2.475 | 99/40              | 113                           |
| 606                                                                           | 2.2        | 1049                    | 1.8        | 34               | C102_0024 IE3D100KX04 | 55.9      | 2.394 | 2303/962           | 111                           |
| 666                                                                           | 2.3        | 1154                    | 2.0        | 31               | C102_0022 IE3D100KX04 | 55.9      | 2.177 | 468/215            | 112                           |
| 719                                                                           | 2.4        | 1245                    | 2.1        | 28               | C102_0020 IE3D100KX04 | 55.9      | 2.018 | 1128/559           | 112                           |
| <b><math>P_N</math> (50 Hz) = 3,00 kW, <math>P_N</math> (87 Hz) = 5,20 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 6.8                                                                           | 0.90       | 12                      | 0.88       | 4015             | C813_2120 IE3D100LX04 | 214.5     | 212.1 | 8272/39            | 131                           |
| 8.1                                                                           | 1.1        | 14                      | 1.0        | 3376             | C813_1780 IE3D100LX04 | 214.5     | 178.4 | 6956/39            | 131                           |
| 10                                                                            | 1.4        | 18                      | 1.2        | 2620             | C813_1380 IE3D100LX04 | 214.5     | 138.4 | 2491/18            | 132                           |
| 11                                                                            | 0.96       | 19                      | 0.84       | 2506             | C713_1320 IE3D100LX04 | 155.5     | 132.4 | 33887/256          | 131                           |
| 13                                                                            | 1.6        | 23                      | 1.5        | 2036             | C813_1080 IE3D100LX04 | 214.5     | 107.6 | 4841/45            | 132                           |
| 15                                                                            | 1.3        | 25                      | 1.1        | 1877             | C713_0990 IE3D100LX04 | 155.5     | 99.14 | 6345/64            | 131                           |
| 16                                                                            | 1.6        | 28                      | 1.6        | 1719             | C813_0910 IE3D100LX04 | 214.5     | 90.82 | 18800/207          | 133                           |
| 18                                                                            | 1.5        | 31                      | 1.2        | 1533             | C713_0810 IE3D100LX04 | 155.5     | 80.97 | 20727/256          | 131                           |

| $n_2$<br>50 Hz<br>[rpm]                          | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 3,00 kW, $P_N$ (87 Hz) = 5,20 kW |            |                         |            |                  |                       |           |       |                    |                               |
| 18                                               | 1.6        | 32                      | 1.5        | 1502             | C813_0790 IE3D100LX04 | 214.5     | 79.34 | 285619/3600        | 132                           |
| 19                                               | 1.0        | 33                      | 1.0        | 1454             | C613_0770 IE3D100LX04 | 115.5     | 76.80 | 8601/112           | 131                           |
| 21                                               | 1.5        | 36                      | 1.5        | 1336             | C712_0700 IE3D100LX04 | 142.4     | 69.55 | 765/11             | 132                           |
| 21                                               | 0.98       | 36                      | 0.98       | 1323             | C612_0690 IE3D100LX04 | 107.1     | 68.89 | 620/9              | 131                           |
| 23                                               | 1.2        | 40                      | 1.2        | 1201             | C613_0630 IE3D100LX04 | 115.5     | 63.46 | 48739/768          | 131                           |
| 26                                               | 1.8        | 44                      | 1.8        | 1091             | C712_0570 IE3D100LX04 | 142.4     | 56.82 | 625/11             | 133                           |
| 26                                               | 1.2        | 46                      | 1.2        | 1058             | C612_0550 IE3D100LX04 | 107.1     | 55.11 | 496/9              | 132                           |
| 29                                               | 0.84       | 50                      | 0.84       | 957              | C502_0500 IE3D100LX04 | 91.8      | 49.82 | 1943/39            | 131                           |
| 29                                               | 1.6        | 51                      | 1.5        | 933              | C613_0490 IE3D100LX04 | 115.5     | 49.28 | 31537/640          | 131                           |
| 31                                               | 0.89       | 54                      | 0.89       | 897              | C502_0470 IE3D100LX04 | 91.8      | 46.72 | 1495/32            | 131                           |
| 32                                               | 1.5        | 55                      | 1.5        | 871              | C612_0450 IE3D100LX04 | 107.1     | 45.33 | 136/3              | 132                           |
| 35                                               | 1.0        | 60                      | 1.0        | 801              | C502_0420 IE3D100LX04 | 91.8      | 41.69 | 667/16             | 131                           |
| 35                                               | 1.8        | 61                      | 1.8        | 788              | C712_0410 IE3D100LX04 | 142.4     | 41.02 | 2625/64            | 133                           |
| 37                                               | 1.6        | 64                      | 1.6        | 757              | C612_0390 IE3D100LX04 | 107.1     | 39.40 | 1891/48            | 132                           |
| 42                                               | 0.82       | 72                      | 0.82       | 669              | C402_0350 IE3D100LX04 | 80.2      | 34.82 | 975/28             | 131                           |
| 41                                               | 1.2        | 72                      | 1.2        | 672              | C502_0350 IE3D100LX04 | 91.8      | 35.00 | 35/1               | 132                           |
| 42                                               | 1.9        | 72                      | 1.9        | 670              | C612_0350 IE3D100LX04 | 107.1     | 34.87 | 1360/39            | 134                           |
| 41                                               | 2.3        | 72                      | 2.3        | 673              | C712_0350 IE3D100LX04 | 142.4     | 35.07 | 2700/77            | 138                           |
| 45                                               | 1.8        | 78                      | 1.8        | 622              | C612_0320 IE3D100LX04 | 107.1     | 32.41 | 1037/32            | 132                           |
| 47                                               | 0.92       | 81                      | 0.92       | 598              | C402_0310 IE3D100LX04 | 80.2      | 31.15 | 405/13             | 131                           |
| 46                                               | 1.3        | 80                      | 1.3        | 600              | C502_0310 IE3D100LX04 | 91.8      | 31.23 | 406/13             | 132                           |
| 52                                               | 1.0        | 90                      | 1.0        | 535              | C402_0280 IE3D100LX04 | 80.2      | 27.86 | 195/7              | 131                           |
| 52                                               | 1.5        | 89                      | 1.5        | 540              | C502_0280 IE3D100LX04 | 91.8      | 28.10 | 5395/192           | 132                           |
| 53                                               | 2.4        | 92                      | 2.4        | 527              | C612_0270 IE3D100LX04 | 107.1     | 27.43 | 192/7              | 135                           |
| 58                                               | 1.1        | 101                     | 1.1        | 479              | C402_0250 IE3D100LX04 | 80.2      | 24.92 | 324/13             | 131                           |
| 58                                               | 1.7        | 100                     | 1.7        | 482              | C502_0250 IE3D100LX04 | 91.8      | 25.07 | 2407/96            | 132                           |
| 58                                               | 2.1        | 101                     | 2.1        | 479              | C612_0250 IE3D100LX04 | 107.1     | 24.93 | 5185/208           | 134                           |
| 62                                               | 1.2        | 108                     | 1.2        | 449              | C402_0230 IE3D100LX04 | 80.2      | 23.36 | 1495/64            | 132                           |
| 62                                               | 1.8        | 108                     | 1.8        | 449              | C502_0230 IE3D100LX04 | 91.8      | 23.36 | 1495/64            | 133                           |
| 70                                               | 0.88       | 121                     | 0.88       | 399              | C302_0210 IE3D100LX04 | 70.0      | 20.80 | 104/5              | 131                           |
| 69                                               | 1.4        | 120                     | 1.4        | 401              | C402_0210 IE3D100LX04 | 80.2      | 20.90 | 4347/208           | 132                           |
| 70                                               | 2.0        | 120                     | 2.0        | 400              | C502_0210 IE3D100LX04 | 91.8      | 20.84 | 667/32             | 133                           |
| 74                                               | 2.4        | 128                     | 2.4        | 377              | C612_0195 IE3D100LX04 | 107.1     | 19.61 | 549/28             | 135                           |
| 83                                               | 1.0        | 143                     | 1.0        | 337              | C302_0175 IE3D100LX04 | 70.0      | 17.54 | 1105/63            | 131                           |
| 82                                               | 1.6        | 143                     | 1.6        | 338              | C402_0175 IE3D100LX04 | 80.2      | 17.60 | 845/48             | 132                           |
| 92                                               | 1.8        | 159                     | 1.8        | 302              | C402_0160 IE3D100LX04 | 80.2      | 15.75 | 63/4               | 133                           |
| 93                                               | 1.2        | 162                     | 1.2        | 299              | C302_0155 IE3D100LX04 | 70.0      | 15.54 | 544/35             | 131                           |
| 104                                              | 1.3        | 179                     | 1.3        | 269              | C302_0140 IE3D100LX04 | 70.0      | 13.99 | 2015/144           | 131                           |
| 104                                              | 2.0        | 179                     | 2.0        | 269              | C402_0140 IE3D100LX04 | 80.2      | 13.99 | 2015/144           | 133                           |
| 118                                              | 0.85       | 204                     | 0.85       | 237              | C202_0125 IE3D100LX04 | 64.9      | 12.32 | 665/54             | 131                           |
| 117                                              | 1.5        | 203                     | 1.4        | 238              | C302_0125 IE3D100LX04 | 70.0      | 12.40 | 62/5               | 132                           |
| 116                                              | 2.3        | 201                     | 2.3        | 240              | C402_0125 IE3D100LX04 | 80.2      | 12.52 | 651/52             | 133                           |
| 123                                              | 0.89       | 214                     | 0.89       | 226              | C202_0120 IE3D100LX04 | 64.9      | 11.76 | 294/25             | 131                           |
| 125                                              | 1.6        | 216                     | 1.4        | 223              | C302_0115 IE3D100LX04 | 70.0      | 11.61 | 325/28             | 132                           |
| 125                                              | 2.5        | 216                     | 2.4        | 223              | C402_0115 IE3D100LX04 | 80.2      | 11.64 | 1885/162           | 134                           |
| 141                                              | 1.0        | 245                     | 0.99       | 197              | C202_0105 IE3D100LX04 | 64.9      | 10.26 | 513/50             | 131                           |
| 141                                              | 1.8        | 244                     | 1.5        | 198              | C302_0105 IE3D100LX04 | 70.0      | 10.29 | 72/7               | 132                           |
| 139                                              | 2.8        | 241                     | 2.6        | 200              | C402_0105 IE3D100LX04 | 80.2      | 10.41 | 406/39             | 134                           |
| 154                                              | 1.1        | 268                     | 1.1        | 180              | C202_0094 IE3D100LX04 | 64.9      | 9.387 | 2450/261           | 131                           |
| 156                                              | 2.0        | 270                     | 1.6        | 179              | C302_0093 IE3D100LX04 | 70.0      | 9.310 | 3575/384           | 133                           |
| 176                                              | 2.1        | 304                     | 1.8        | 158              | C302_0083 IE3D100LX04 | 70.0      | 8.250 | 33/4               | 133                           |
| 177                                              | 1.3        | 307                     | 1.2        | 157              | C202_0082 IE3D100LX04 | 64.9      | 8.190 | 475/58             | 132                           |
| 186                                              | 1.1        | 322                     | 0.94       | 150              | C202_0078 IE3D100LX04 | 64.9      | 7.800 | 39/5               | 131                           |
| 185                                              | 1.8        | 320                     | 1.5        | 151              | C302_0078 IE3D100LX04 | 70.0      | 7.841 | 494/63             | 131                           |
| 186                                              | 2.4        | 321                     | 2.2        | 150              | C402_0078 IE3D100LX04 | 80.2      | 7.816 | 2001/256           | 132                           |
| 229                                              | 0.84       | –                       | –          | 122              | C102_0063 IE3D100LX04 | 60.9      | 6.338 | 507/80             | 130                           |
| 230                                              | 1.3        | 399                     | 1.1        | 121              | C202_0063 IE3D100LX04 | 64.9      | 6.295 | 3330/529           | 131                           |
| 230                                              | 2.1        | 398                     | 1.8        | 121              | C302_0063 IE3D100LX04 | 70.0      | 6.314 | 221/35             | 131                           |
| 247                                              | 0.88       | –                       | –          | 113              | C102_0059 IE3D100LX04 | 60.9      | 5.875 | 47/8               | 130                           |
| 247                                              | 2.2        | 429                     | 1.9        | 113              | C302_0059 IE3D100LX04 | 70.0      | 5.859 | 2584/441           | 131                           |
| 250                                              | 1.4        | 434                     | 1.1        | 111              | C202_0058 IE3D100LX04 | 64.9      | 5.791 | 666/115            | 131                           |
| 286                                              | 1.5        | 495                     | 1.2        | 97               | C202_0051 IE3D100LX04 | 64.9      | 5.072 | 350/69             | 131                           |
| 289                                              | 0.98       | 500                     | 0.82       | 97               | C102_0050 IE3D100LX04 | 60.9      | 5.025 | 201/40             | 131                           |
| 288                                              | 2.4        | 499                     | 2.1        | 97               | C302_0050 IE3D100LX04 | 70.0      | 5.038 | 403/80             | 132                           |
| 311                                              | 1.0        | 539                     | 0.87       | 89               | C102_0047 IE3D100LX04 | 60.9      | 4.658 | 3149/676           | 131                           |

## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 3,00 kW, <math>P_N</math> (87 Hz) = 5,20 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 311                                                                           | 1.6        | 538                     | 1.3        | 90               | C202_0047 IE3D100LX04 | 64.9      | 4.667 | 14/3               | 131                           |
| 310                                                                           | 2.6        | 537                     | 2.2        | 90               | C302_0047 IE3D100LX04 | 70.0      | 4.675 | 589/126            | 132                           |
| 313                                                                           | 3.0        | 543                     | 3.0        | 89               | C502_0046 IE3D100LX04 | 91.8      | 4.629 | 162/35             | 138                           |
| 346                                                                           | 1.1        | 600                     | 0.93       | 80               | C102_0042 IE3D100LX04 | 60.9      | 4.189 | 377/90             | 131                           |
| 343                                                                           | 1.7        | 594                     | 1.4        | 81               | C202_0042 IE3D100LX04 | 64.9      | 4.226 | 486/115            | 131                           |
| 347                                                                           | 2.8        | 601                     | 2.3        | 80               | C302_0042 IE3D100LX04 | 70.0      | 4.179 | 117/28             | 133                           |
| 373                                                                           | 1.2        | 647                     | 0.98       | 75               | C102_0039 IE3D100LX04 | 60.9      | 3.883 | 1363/351           | 131                           |
| 373                                                                           | 1.8        | 646                     | 1.5        | 75               | C202_0039 IE3D100LX04 | 64.9      | 3.888 | 486/125            | 131                           |
| 374                                                                           | 2.9        | 648                     | 2.4        | 74               | C302_0039 IE3D100LX04 | 70.0      | 3.878 | 190/49             | 133                           |
| 430                                                                           | 1.9        | 745                     | 1.6        | 65               | C202_0034 IE3D100LX04 | 64.9      | 3.373 | 2250/667           | 132                           |
| 433                                                                           | 3.0        | 749                     | 2.7        | 64               | C302_0034 IE3D100LX04 | 70.0      | 3.352 | 429/128            | 133                           |
| 435                                                                           | 1.3        | 753                     | 1.1        | 64               | C102_0033 IE3D100LX04 | 60.9      | 3.334 | 2067/620           | 131                           |
| 469                                                                           | 1.4        | 813                     | 1.1        | 59               | C102_0031 IE3D100LX04 | 60.9      | 3.091 | 2491/806           | 131                           |
| 467                                                                           | 2.1        | 809                     | 1.7        | 60               | C202_0031 IE3D100LX04 | 64.9      | 3.103 | 90/29              | 132                           |
| 539                                                                           | 2.3        | 934                     | 1.9        | 52               | C202_0027 IE3D100LX04 | 64.9      | 2.690 | 495/184            | 133                           |
| 562                                                                           | 1.5        | 973                     | 1.3        | 50               | C102_0026 IE3D100LX04 | 60.9      | 2.582 | 1911/740           | 131                           |
| 586                                                                           | 2.4        | 1015                    | 2.0        | 48               | C202_0025 IE3D100LX04 | 64.9      | 2.475 | 99/40              | 133                           |
| 606                                                                           | 1.6        | 1049                    | 1.3        | 46               | C102_0024 IE3D100LX04 | 60.9      | 2.394 | 2303/962           | 131                           |
| 666                                                                           | 1.7        | 1154                    | 1.4        | 42               | C102_0022 IE3D100LX04 | 60.9      | 2.177 | 468/215            | 132                           |
| 664                                                                           | 2.6        | 1150                    | 2.2        | 42               | C202_0022 IE3D100LX04 | 64.9      | 2.184 | 2160/989           | 134                           |
| 719                                                                           | 1.8        | 1245                    | 1.5        | 39               | C102_0020 IE3D100LX04 | 60.9      | 2.018 | 1128/559           | 132                           |
| 722                                                                           | 2.7        | 1250                    | 2.3        | 39               | C202_0020 IE3D100LX04 | 64.9      | 2.009 | 432/215            | 134                           |
| <b><math>P_N</math> (50 Hz) = 4,00 kW, <math>P_N</math> (87 Hz) = 6,93 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 8.2                                                                           | 0.81       | —                       | —          | 4450             | C813_1780 IE3D112M04  | 220.5     | 178.4 | 6956/39            | 171                           |
| 11                                                                            | 1.0        | 18                      | 0.92       | 3453             | C813_1380 IE3D112M04  | 220.5     | 138.4 | 2491/18            | 172                           |
| 14                                                                            | 1.2        | 24                      | 1.1        | 2684             | C813_1080 IE3D112M04  | 220.5     | 107.6 | 4841/45            | 172                           |
| 15                                                                            | 0.95       | —                       | —          | 2474             | C713_0990 IE3D112M04  | 161.5     | 99.14 | 6345/64            | 171                           |
| 16                                                                            | 1.2        | 28                      | 1.2        | 2266             | C813_0910 IE3D112M04  | 220.5     | 90.82 | 18800/207          | 173                           |
| 18                                                                            | 1.1        | 31                      | 0.92       | 2020             | C713_0810 IE3D112M04  | 161.5     | 80.97 | 20727/256          | 171                           |
| 18                                                                            | 1.2        | 32                      | 1.1        | 1980             | C813_0790 IE3D112M04  | 220.5     | 79.34 | 285619/3600        | 172                           |
| 21                                                                            | 1.1        | 36                      | 1.1        | 1761             | C712_0700 IE3D112M04  | 148.4     | 69.55 | 765/11             | 172                           |
| 23                                                                            | 0.92       | 40                      | 0.92       | 1583             | C613_0630 IE3D112M04  | 121.5     | 63.46 | 48739/768          | 171                           |
| 26                                                                            | 1.3        | 45                      | 1.3        | 1438             | C712_0570 IE3D112M04  | 148.4     | 56.82 | 625/11             | 173                           |
| 27                                                                            | 0.93       | 46                      | 0.93       | 1395             | C612_0550 IE3D112M04  | 113.1     | 55.11 | 496/9              | 172                           |
| 30                                                                            | 1.2        | 51                      | 1.1        | 1230             | C613_0490 IE3D112M04  | 121.5     | 49.28 | 31537/640          | 171                           |
| 32                                                                            | 1.1        | 56                      | 1.1        | 1148             | C612_0450 IE3D112M04  | 113.1     | 45.33 | 136/3              | 172                           |
| 36                                                                            | 1.3        | 62                      | 1.3        | 1038             | C712_0410 IE3D112M04  | 148.4     | 41.02 | 2625/64            | 173                           |
| 37                                                                            | 1.2        | 64                      | 1.2        | 997              | C612_0390 IE3D112M04  | 113.1     | 39.40 | 1891/48            | 172                           |
| 42                                                                            | 0.90       | 72                      | 0.90       | 886              | C502_0350 IE3D112M04  | 97.8      | 35.00 | 35/1               | 172                           |
| 42                                                                            | 1.5        | 73                      | 1.5        | 883              | C612_0350 IE3D112M04  | 113.1     | 34.87 | 1360/39            | 174                           |
| 42                                                                            | 1.8        | 72                      | 1.8        | 888              | C712_0350 IE3D112M04  | 148.4     | 35.07 | 2700/77            | 178                           |
| 45                                                                            | 1.4        | 78                      | 1.4        | 820              | C612_0320 IE3D112M04  | 113.1     | 32.41 | 1037/32            | 172                           |
| 47                                                                            | 1.0        | 81                      | 1.0        | 791              | C502_0310 IE3D112M04  | 97.8      | 31.23 | 406/13             | 172                           |
| 52                                                                            | 1.1        | 90                      | 1.1        | 711              | C502_0280 IE3D112M04  | 97.8      | 28.10 | 5395/192           | 172                           |
| 53                                                                            | 1.8        | 93                      | 1.8        | 694              | C612_0270 IE3D112M04  | 113.1     | 27.43 | 192/7              | 175                           |
| 59                                                                            | 0.87       | 102                     | 0.87       | 631              | C402_0250 IE3D112M04  | 86.2      | 24.92 | 324/13             | 171                           |
| 58                                                                            | 1.3        | 101                     | 1.3        | 635              | C502_0250 IE3D112M04  | 97.8      | 25.07 | 2407/96            | 172                           |
| 59                                                                            | 1.6        | 102                     | 1.6        | 631              | C612_0250 IE3D112M04  | 113.1     | 24.93 | 5185/208           | 174                           |
| 58                                                                            | 1.8        | 100                     | 1.8        | 641              | C712_0250 IE3D112M04  | 148.4     | 25.31 | 405/16             | 178                           |
| 63                                                                            | 0.93       | 109                     | 0.93       | 591              | C402_0230 IE3D112M04  | 86.2      | 23.36 | 1495/64            | 172                           |
| 63                                                                            | 1.4        | 109                     | 1.4        | 591              | C502_0230 IE3D112M04  | 97.8      | 23.36 | 1495/64            | 173                           |
| 70                                                                            | 1.0        | 121                     | 1.0        | 529              | C402_0210 IE3D112M04  | 86.2      | 20.90 | 4347/208           | 172                           |
| 70                                                                            | 1.5        | 122                     | 1.5        | 528              | C502_0210 IE3D112M04  | 97.8      | 20.84 | 667/32             | 173                           |
| 75                                                                            | 1.8        | 129                     | 1.8        | 496              | C612_0195 IE3D112M04  | 113.1     | 19.61 | 549/28             | 175                           |
| 83                                                                            | 1.2        | 144                     | 1.2        | 446              | C402_0175 IE3D112M04  | 86.2      | 17.60 | 845/48             | 172                           |
| 93                                                                            | 1.4        | 161                     | 1.4        | 399              | C402_0160 IE3D112M04  | 86.2      | 15.75 | 63/4               | 173                           |
| 94                                                                            | 0.89       | 163                     | 0.88       | 394              | C302_0155 IE3D112M04  | 76.0      | 15.54 | 544/35             | 171                           |
| 105                                                                           | 0.99       | 181                     | 0.95       | 354              | C302_0140 IE3D112M04  | 76.0      | 13.99 | 2015/144           | 171                           |
| 105                                                                           | 1.6        | 181                     | 1.6        | 354              | C402_0140 IE3D112M04  | 86.2      | 13.99 | 2015/144           | 173                           |
| 105                                                                           | 2.3        | 182                     | 2.3        | 353              | C502_0140 IE3D112M04  | 97.8      | 13.93 | 195/14             | 176                           |
| 118                                                                           | 1.1        | 205                     | 1.0        | 314              | C302_0125 IE3D112M04  | 76.0      | 12.40 | 62/5               | 172                           |
| 117                                                                           | 1.7        | 203                     | 1.7        | 317              | C402_0125 IE3D112M04  | 86.2      | 12.52 | 651/52             | 173                           |
| 118                                                                           | 2.3        | 204                     | 2.3        | 315              | C502_0125 IE3D112M04  | 97.8      | 12.43 | 87/7               | 176                           |
| 126                                                                           | 1.2        | 219                     | 1.1        | 294              | C302_0115 IE3D112M04  | 76.0      | 11.61 | 325/28             | 172                           |
| 126                                                                           | 1.9        | 218                     | 1.8        | 295              | C402_0115 IE3D112M04  | 86.2      | 11.64 | 1885/162           | 174                           |

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                  | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>1</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|-----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 4,00 kW, P <sub>N</sub> (87 Hz) = 6,93 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 142                                                                | 1.3        | 247                              | 1.2        | 260                     | C302_0105 IE3D112M04  | 76.0      | 10.29 | 72/7               | 172                                    |
| 141                                                                | 2.1        | 244                              | 1.9        | 264                     | C402_0105 IE3D112M04  | 86.2      | 10.41 | 406/39             | 174                                    |
| 156                                                                | 0.84       | —                                | —          | 238                     | C202_0094 IE3D112M04  | 70.9      | 9.387 | 2450/261           | 171                                    |
| 157                                                                | 1.5        | 273                              | 1.2        | 236                     | C302_0093 IE3D112M04  | 76.0      | 9.310 | 3575/384           | 173                                    |
| 178                                                                | 1.6        | 308                              | 1.3        | 209                     | C302_0083 IE3D112M04  | 76.0      | 8.250 | 33/4               | 173                                    |
| 179                                                                | 0.97       | 310                              | 0.87       | 207                     | C202_0082 IE3D112M04  | 70.9      | 8.190 | 475/58             | 172                                    |
| 188                                                                | 0.84       | —                                | —          | 197                     | C202_0078 IE3D112M04  | 70.9      | 7.800 | 39/5               | 171                                    |
| 187                                                                | 1.4        | 324                              | 1.2        | 199                     | C302_0078 IE3D112M04  | 76.0      | 7.841 | 494/63             | 171                                    |
| 187                                                                | 1.8        | 325                              | 1.7        | 198                     | C402_0078 IE3D112M04  | 86.2      | 7.816 | 2001/256           | 172                                    |
| 189                                                                | 2.0        | 327                              | 2.0        | 197                     | C502_0078 IE3D112M04  | 97.8      | 7.763 | 621/80             | 174                                    |
| 233                                                                | 0.97       | 403                              | 0.82       | 159                     | C202_0063 IE3D112M04  | 70.9      | 6.295 | 3330/529           | 171                                    |
| 232                                                                | 1.6        | 402                              | 1.3        | 160                     | C302_0063 IE3D112M04  | 76.0      | 6.314 | 221/35             | 171                                    |
| 250                                                                | 1.7        | 433                              | 1.4        | 148                     | C302_0059 IE3D112M04  | 76.0      | 5.859 | 2584/441           | 171                                    |
| 249                                                                | 2.1        | 431                              | 2.0        | 149                     | C402_0059 IE3D112M04  | 86.2      | 5.891 | 377/64             | 173                                    |
| 253                                                                | 1.0        | 438                              | 0.86       | 147                     | C202_0058 IE3D112M04  | 70.9      | 5.791 | 666/115            | 171                                    |
| 289                                                                | 1.1        | 500                              | 0.94       | 128                     | C202_0051 IE3D112M04  | 70.9      | 5.072 | 350/69             | 171                                    |
| 291                                                                | 1.8        | 504                              | 1.6        | 128                     | C302_0050 IE3D112M04  | 76.0      | 5.038 | 403/80             | 172                                    |
| 314                                                                | 1.2        | 544                              | 1.0        | 118                     | C202_0047 IE3D112M04  | 70.9      | 4.667 | 14/3               | 171                                    |
| 313                                                                | 1.9        | 543                              | 1.6        | 118                     | C302_0047 IE3D112M04  | 76.0      | 4.675 | 589/126            | 172                                    |
| 313                                                                | 2.3        | 542                              | 2.3        | 119                     | C402_0047 IE3D112M04  | 86.2      | 4.682 | 899/192            | 175                                    |
| 316                                                                | 2.3        | 548                              | 2.3        | 117                     | C502_0046 IE3D112M04  | 97.8      | 4.629 | 162/35             | 178                                    |
| 350                                                                | 0.84       | —                                | —          | 106                     | C102_0042 IE3D112M04  | 66.9      | 4.189 | 377/90             | 171                                    |
| 347                                                                | 1.3        | 600                              | 1.1        | 107                     | C202_0042 IE3D112M04  | 70.9      | 4.226 | 486/115            | 171                                    |
| 351                                                                | 2.1        | 607                              | 1.8        | 106                     | C302_0042 IE3D112M04  | 76.0      | 4.179 | 117/28             | 173                                    |
| 377                                                                | 0.88       | —                                | —          | 98                      | C102_0039 IE3D112M04  | 66.9      | 3.883 | 1363/351           | 171                                    |
| 377                                                                | 1.3        | 653                              | 1.1        | 98                      | C202_0039 IE3D112M04  | 70.9      | 3.888 | 486/125            | 171                                    |
| 378                                                                | 2.2        | 654                              | 1.8        | 98                      | C302_0039 IE3D112M04  | 76.0      | 3.878 | 190/49             | 173                                    |
| 434                                                                | 1.5        | 752                              | 1.2        | 85                      | C202_0034 IE3D112M04  | 70.9      | 3.373 | 2250/667           | 172                                    |
| 437                                                                | 2.3        | 757                              | 2.0        | 85                      | C302_0034 IE3D112M04  | 76.0      | 3.352 | 429/128            | 173                                    |
| 439                                                                | 0.97       | 761                              | 0.82       | 84                      | C102_0033 IE3D112M04  | 66.9      | 3.334 | 2067/620           | 171                                    |
| 474                                                                | 1.0        | 821                              | 0.86       | 78                      | C102_0031 IE3D112M04  | 66.9      | 3.091 | 2491/806           | 171                                    |
| 472                                                                | 1.6        | 818                              | 1.3        | 79                      | C202_0031 IE3D112M04  | 70.9      | 3.103 | 90/29              | 172                                    |
| 471                                                                | 2.3        | 816                              | 2.1        | 79                      | C302_0031 IE3D112M04  | 76.0      | 3.110 | 1045/336           | 174                                    |
| 545                                                                | 1.7        | 943                              | 1.4        | 68                      | C202_0027 IE3D112M04  | 70.9      | 2.690 | 495/184            | 173                                    |
| 567                                                                | 1.2        | 983                              | 0.97       | 65                      | C102_0026 IE3D112M04  | 66.9      | 2.582 | 1911/740           | 171                                    |
| 592                                                                | 1.8        | 1025                             | 1.5        | 63                      | C202_0025 IE3D112M04  | 70.9      | 2.475 | 99/40              | 173                                    |
| 612                                                                | 1.2        | 1060                             | 1.0        | 61                      | C102_0024 IE3D112M04  | 66.9      | 2.394 | 2303/962           | 171                                    |
| 673                                                                | 1.3        | 1166                             | 1.1        | 55                      | C102_0022 IE3D112M04  | 66.9      | 2.177 | 468/215            | 172                                    |
| 671                                                                | 2.0        | 1162                             | 1.7        | 55                      | C202_0022 IE3D112M04  | 70.9      | 2.184 | 2160/989           | 174                                    |
| 726                                                                | 1.4        | 1257                             | 1.1        | 51                      | C102_0020 IE3D112M04  | 66.9      | 2.018 | 1128/559           | 172                                    |
| 729                                                                | 2.1        | 1263                             | 1.7        | 51                      | C202_0020 IE3D112M04  | 70.9      | 2.009 | 432/215            | 174                                    |
| P <sub>N</sub> (50 Hz) = 5,50 kW, P <sub>N</sub> (87 Hz) = 9,53 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 6.8                                                                | 0.81       | 12                               | 0.81       | 7412                    | C913_2150 IE3D132SX04 | 361.3     | 215.4 | 3015/14            | 353                                    |
| 8.3                                                                | 0.99       | 14                               | 0.99       | 6061                    | C913_1760 IE3D132SX04 | 361.3     | 176.1 | 34515/196          | 354                                    |
| 11                                                                 | 0.94       | 20                               | 0.91       | 4458                    | C813_1300 IE3D132SX04 | 254.5     | 129.5 | 58941/455          | 352                                    |
| 13                                                                 | 1.6        | 23                               | 1.6        | 3801                    | C913_1100 IE3D132SX04 | 361.3     | 110.4 | 21645/196          | 356                                    |
| 14                                                                 | 0.99       | 24                               | 0.99       | 3646                    | C813_1060 IE3D132SX04 | 254.5     | 105.9 | 3708/35            | 353                                    |
| 15                                                                 | 1.2        | 25                               | 1.1        | 3459                    | C813_1010 IE3D132SX04 | 254.5     | 100.5 | 28143/280          | 353                                    |
| 16                                                                 | 1.2        | 28                               | 1.2        | 3078                    | C813_0890 IE3D132SX04 | 254.5     | 89.44 | 14400/161          | 354                                    |
| 18                                                                 | 0.88       | 32                               | 0.88       | 2744                    | C713_0800 IE3D132SX04 | 195.5     | 79.73 | 5103/64            | 352                                    |
| 19                                                                 | 1.6        | 32                               | 1.4        | 2689                    | C813_0780 IE3D132SX04 | 254.5     | 78.13 | 54693/700          | 353                                    |
| 19                                                                 | 1.9        | 33                               | 1.6        | 2675                    | C913_0780 IE3D132SX04 | 361.3     | 77.73 | 60939/784          | 356                                    |
| 21                                                                 | 1.5        | 37                               | 1.5        | 2406                    | C812_0690 IE3D132SX04 | 242.0     | 68.89 | 620/9              | 356                                    |
| 22                                                                 | 1.8        | 38                               | 1.5        | 2270                    | C813_0660 IE3D132SX04 | 254.5     | 65.96 | 10620/161          | 354                                    |
| 23                                                                 | 1.1        | 39                               | 1.1        | 2221                    | C713_0650 IE3D132SX04 | 195.5     | 64.55 | 4131/64            | 353                                    |
| 26                                                                 | 1.0        | 45                               | 1.0        | 1984                    | C712_0570 IE3D132SX04 | 182.4     | 56.82 | 625/11             | 353                                    |
| 27                                                                 | 1.9        | 47                               | 1.9        | 1891                    | C812_0540 IE3D132SX04 | 242.0     | 54.15 | 704/13             | 359                                    |
| 29                                                                 | 1.4        | 50                               | 1.4        | 1750                    | C713_0510 IE3D132SX04 | 195.5     | 50.85 | 18711/368          | 353                                    |
| 30                                                                 | 2.2        | 52                               | 1.9        | 1692                    | C813_0490 IE3D132SX04 | 254.5     | 49.18 | 49914/1015         | 355                                    |
| 31                                                                 | 1.2        | 54                               | 1.2        | 1635                    | C712_0470 IE3D132SX04 | 182.4     | 46.82 | 515/11             | 355                                    |
| 32                                                                 | 2.3        | 56                               | 2.3        | 1590                    | C812_0460 IE3D132SX04 | 242.0     | 45.54 | 592/13             | 362                                    |
| 32                                                                 | 0.82       | 56                               | 0.82       | 1583                    | C612_0450 IE3D132SX04 | 147.1     | 45.33 | 136/3              | 352                                    |
| 36                                                                 | 1.5        | 62                               | 1.5        | 1432                    | C712_0410 IE3D132SX04 | 182.4     | 41.02 | 2625/64            | 353                                    |
| 37                                                                 | 2.6        | 64                               | 2.6        | 1395                    | C812_0400 IE3D132SX04 | 242.0     | 39.94 | 2596/65            | 359                                    |
| 42                                                                 | 1.1        | 73                               | 1.1        | 1218                    | C612_0350 IE3D132SX04 | 147.1     | 34.87 | 1360/39            | 354                                    |



## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                          | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 5,50 kW, $P_N$ (87 Hz) = 9,53 kW |            |                         |            |                  |                       |           |       |                    |                               |
| 42                                               | 1.6        | 72                      | 1.6        | 1224             | C712_0350 IE3D132SX04 | 182.4     | 35.07 | 2700/77            | 358                           |
| 41                                               | 2.9        | 72                      | 2.9        | 1234             | C812_0350 IE3D132SX04 | 242.0     | 35.33 | 106/3              | 368                           |
| 43                                               | 2.0        | 75                      | 2.0        | 1180             | C712_0340 IE3D132SX04 | 182.4     | 33.80 | 2163/64            | 355                           |
| 45                                               | 1.3        | 78                      | 1.3        | 1132             | C612_0320 IE3D132SX04 | 147.1     | 32.41 | 1037/32            | 352                           |
| 51                                               | 2.0        | 89                      | 2.0        | 1000             | C712_0290 IE3D132SX04 | 182.4     | 28.64 | 315/11             | 360                           |
| 52                                               | 0.82       | 90                      | 0.82       | 981              | C502_0280 IE3D132SX04 | 131.8     | 28.10 | 5395/192           | 352                           |
| 53                                               | 1.4        | 93                      | 1.4        | 958              | C612_0270 IE3D132SX04 | 147.1     | 27.43 | 192/7              | 355                           |
| 53                                               | 3.5        | 92                      | 3.5        | 959              | C812_0270 IE3D132SX04 | 242.0     | 27.47 | 412/15             | 376                           |
| 56                                               | 3.0        | 97                      | 3.0        | 910              | C812_0260 IE3D132SX04 | 242.0     | 26.06 | 3127/120           | 368                           |
| 58                                               | 0.91       | 101                     | 0.91       | 876              | C502_0250 IE3D132SX04 | 131.8     | 25.07 | 2407/96            | 352                           |
| 59                                               | 1.7        | 102                     | 1.6        | 870              | C612_0250 IE3D132SX04 | 147.1     | 24.93 | 5185/208           | 354                           |
| 58                                               | 2.7        | 100                     | 2.7        | 884              | C712_0250 IE3D132SX04 | 182.4     | 25.31 | 405/16             | 358                           |
| 63                                               | 0.98       | 109                     | 0.98       | 816              | C502_0230 IE3D132SX04 | 131.8     | 23.36 | 1495/64            | 353                           |
| 65                                               | 1.6        | 112                     | 1.6        | 792              | C612_0230 IE3D132SX04 | 147.1     | 22.67 | 68/3               | 357                           |
| 63                                               | 2.5        | 109                     | 2.5        | 810              | C712_0230 IE3D132SX04 | 182.4     | 23.18 | 255/11             | 364                           |
| 70                                               | 1.1        | 122                     | 1.1        | 728              | C502_0210 IE3D132SX04 | 131.8     | 20.84 | 667/32             | 353                           |
| 71                                               | 3.1        | 123                     | 3.0        | 722              | C712_0210 IE3D132SX04 | 182.4     | 20.67 | 1323/64            | 361                           |
| 72                                               | 3.5        | 125                     | 3.5        | 707              | C812_0200 IE3D132SX04 | 242.0     | 20.26 | 6077/300           | 377                           |
| 75                                               | 2.1        | 129                     | 1.9        | 685              | C612_0195 IE3D132SX04 | 147.1     | 19.61 | 549/28             | 355                           |
| 80                                               | 3.1        | 139                     | 3.1        | 638              | C712_0185 IE3D132SX04 | 182.4     | 18.26 | 420/23             | 371                           |
| 83                                               | 0.90       | 144                     | 0.90       | 615              | C402_0175 IE3D132SX04 | 120.2     | 17.60 | 845/48             | 352                           |
| 83                                               | 1.3        | 144                     | 1.3        | 615              | C502_0175 IE3D132SX04 | 131.8     | 17.60 | 845/48             | 355                           |
| 83                                               | 2.1        | 144                     | 2.0        | 615              | C612_0175 IE3D132SX04 | 147.1     | 17.60 | 88/5               | 360                           |
| 86                                               | 3.8        | 148                     | 3.8        | 597              | C812_0170 IE3D132SX04 | 242.0     | 17.10 | 1180/69            | 385                           |
| 88                                               | 3.7        | 152                     | 3.5        | 584              | C712_0165 IE3D132SX04 | 182.4     | 16.73 | 1071/64            | 365                           |
| 93                                               | 1.0        | 161                     | 1.0        | 550              | C402_0160 IE3D132SX04 | 120.2     | 15.75 | 63/4               | 353                           |
| 90                                               | 2.6        | 157                     | 2.2        | 566              | C612_0160 IE3D132SX04 | 147.1     | 16.20 | 1037/64            | 357                           |
| 93                                               | 1.5        | 162                     | 1.5        | 549              | C502_0155 IE3D132SX04 | 131.8     | 15.71 | 377/24             | 355                           |
| 105                                              | 1.1        | 181                     | 1.1        | 489              | C402_0140 IE3D132SX04 | 120.2     | 13.99 | 2015/144           | 353                           |
| 105                                              | 1.6        | 182                     | 1.6        | 486              | C502_0140 IE3D132SX04 | 131.8     | 13.93 | 195/14             | 356                           |
| 104                                              | 2.6        | 179                     | 2.4        | 494              | C612_0140 IE3D132SX04 | 147.1     | 14.15 | 976/69             | 364                           |
| 107                                              | 4.2        | 185                     | 4.0        | 479              | C712_0135 IE3D132SX04 | 182.4     | 13.73 | 4380/319           | 380                           |
| 111                                              | 4.0        | 192                     | 4.0        | 460              | C712_0130 IE3D132SX04 | 182.4     | 13.18 | 4851/368           | 372                           |
| 118                                              | 0.81       | –                       | –          | 433              | C302_0125 IE3D132SX04 | 110.0     | 12.40 | 62/5               | 352                           |
| 117                                              | 1.3        | 203                     | 1.2        | 437              | C402_0125 IE3D132SX04 | 120.2     | 12.52 | 651/52             | 353                           |
| 118                                              | 1.8        | 204                     | 1.8        | 434              | C502_0125 IE3D132SX04 | 131.8     | 12.43 | 87/7               | 356                           |
| 116                                              | 3.0        | 202                     | 2.6        | 439              | C612_0125 IE3D132SX04 | 147.1     | 12.58 | 2013/160           | 361                           |
| 126                                              | 0.86       | –                       | –          | 405              | C302_0115 IE3D132SX04 | 110.0     | 11.61 | 325/28             | 352                           |
| 126                                              | 1.4        | 218                     | 1.3        | 406              | C402_0115 IE3D132SX04 | 120.2     | 11.64 | 1885/162           | 354                           |
| 126                                              | 2.0        | 218                     | 2.0        | 406              | C502_0115 IE3D132SX04 | 131.8     | 11.64 | 1885/162           | 358                           |
| 128                                              | 3.2        | 221                     | 2.7        | 400              | C612_0115 IE3D132SX04 | 147.1     | 11.46 | 928/81             | 368                           |
| 142                                              | 0.97       | 247                     | 0.84       | 359              | C302_0105 IE3D132SX04 | 110.0     | 10.29 | 72/7               | 352                           |
| 141                                              | 1.5        | 244                     | 1.4        | 364              | C402_0105 IE3D132SX04 | 120.2     | 10.41 | 406/39             | 354                           |
| 141                                              | 2.2        | 244                     | 2.1        | 363              | C502_0105 IE3D132SX04 | 131.8     | 10.38 | 841/81             | 358                           |
| 145                                              | 3.5        | 251                     | 3.0        | 353              | C612_0100 IE3D132SX04 | 147.1     | 10.11 | 3721/368           | 365                           |
| 148                                              | 4.4        | 256                     | 4.4        | 346              | C712_0099 IE3D132SX04 | 182.4     | 9.912 | 4599/464           | 381                           |
| 157                                              | 1.1        | 273                     | 0.90       | 325              | C302_0093 IE3D132SX04 | 110.0     | 9.310 | 3575/384           | 353                           |
| 158                                              | 1.7        | 274                     | 1.5        | 323              | C402_0093 IE3D132SX04 | 120.2     | 9.261 | 3445/372           | 356                           |
| 158                                              | 2.5        | 274                     | 2.3        | 323              | C502_0093 IE3D132SX04 | 131.8     | 9.261 | 3445/372           | 361                           |
| 161                                              | 3.8        | 278                     | 3.2        | 318              | C612_0091 IE3D132SX04 | 147.1     | 9.118 | 848/93             | 373                           |
| 178                                              | 1.2        | 308                     | 0.98       | 288              | C302_0083 IE3D132SX04 | 110.0     | 8.250 | 33/4               | 353                           |
| 177                                              | 1.9        | 306                     | 1.6        | 289              | C402_0083 IE3D132SX04 | 120.2     | 8.285 | 3339/403           | 356                           |
| 177                                              | 2.8        | 307                     | 2.5        | 289              | C502_0083 IE3D132SX04 | 131.8     | 8.263 | 1537/186           | 361                           |
| 179                                              | 4.1        | 310                     | 3.4        | 286              | C612_0082 IE3D132SX04 | 147.1     | 8.190 | 1769/216           | 369                           |
| 187                                              | 1.0        | 324                     | 0.84       | 274              | C302_0078 IE3D132SX04 | 110.0     | 7.841 | 494/63             | 351                           |
| 187                                              | 1.5        | 325                     | 1.2        | 273              | C402_0078 IE3D132SX04 | 120.2     | 7.816 | 2001/256           | 352                           |
| 189                                              | 2.3        | 327                     | 1.9        | 271              | C502_0078 IE3D132SX04 | 131.8     | 7.763 | 621/80             | 354                           |
| 225                                              | 4.4        | 389                     | 4.0        | 228              | C612_0065 IE3D132SX04 | 147.1     | 6.518 | 3233/496           | 376                           |
| 232                                              | 1.2        | 402                     | 0.97       | 220              | C302_0063 IE3D132SX04 | 110.0     | 6.314 | 221/35             | 351                           |
| 250                                              | 1.2        | 433                     | 1.0        | 205              | C302_0059 IE3D132SX04 | 110.0     | 5.859 | 2584/441           | 351                           |
| 249                                              | 1.8        | 431                     | 1.5        | 206              | C402_0059 IE3D132SX04 | 120.2     | 5.891 | 377/64             | 353                           |
| 250                                              | 2.7        | 434                     | 2.3        | 204              | C502_0059 IE3D132SX04 | 131.8     | 5.850 | 117/20             | 356                           |
| 291                                              | 1.3        | 504                     | 1.1        | 176              | C302_0050 IE3D132SX04 | 110.0     | 5.038 | 403/80             | 352                           |
| 313                                              | 1.4        | 543                     | 1.2        | 163              | C302_0047 IE3D132SX04 | 110.0     | 4.675 | 589/126            | 352                           |
| 313                                              | 2.0        | 542                     | 1.7        | 163              | C402_0047 IE3D132SX04 | 120.2     | 4.682 | 899/192            | 355                           |

| $n_2$<br>50 Hz<br>[rpm]                                                        | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 5,50 kW, <math>P_N</math> (87 Hz) = 9,53 kW</b>  |            |                         |            |                  |                       |           |       |                    |                               |
| 316                                                                            | 3.2        | 548                     | 2.7        | 162              | C502_0046 IE3D132SX04 | 131.8     | 4.629 | 162/35             | 358                           |
| 351                                                                            | 1.5        | 607                     | 1.3        | 146              | C302_0042 IE3D132SX04 | 110.0     | 4.179 | 117/28             | 353                           |
| 378                                                                            | 1.6        | 654                     | 1.3        | 135              | C302_0039 IE3D132SX04 | 110.0     | 3.878 | 190/49             | 353                           |
| 376                                                                            | 2.3        | 652                     | 1.9        | 136              | C402_0039 IE3D132SX04 | 120.2     | 3.894 | 841/216            | 356                           |
| 437                                                                            | 1.8        | 757                     | 1.5        | 117              | C302_0034 IE3D132SX04 | 110.0     | 3.352 | 429/128            | 353                           |
| 471                                                                            | 1.8        | 816                     | 1.6        | 109              | C302_0031 IE3D132SX04 | 110.0     | 3.110 | 1045/336           | 354                           |
| 473                                                                            | 2.7        | 819                     | 2.3        | 108              | C402_0031 IE3D132SX04 | 120.2     | 3.099 | 1537/496           | 358                           |
| 542                                                                            | 2.0        | 938                     | 1.7        | 94               | C302_0027 IE3D132SX04 | 110.0     | 2.705 | 1677/620           | 355                           |
| 584                                                                            | 2.1        | 1011                    | 1.8        | 88               | C302_0025 IE3D132SX04 | 110.0     | 2.510 | 1634/651           | 355                           |
| 673                                                                            | 2.3        | 1166                    | 2.0        | 76               | C302_0022 IE3D132SX04 | 110.0     | 2.177 | 468/215            | 357                           |
| 725                                                                            | 2.5        | 1256                    | 2.1        | 71               | C302_0020 IE3D132SX04 | 110.0     | 2.020 | 608/301            | 357                           |
| <b><math>P_N</math> (50 Hz) = 7,50 kW, <math>P_N</math> (87 Hz) = 12,99 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 13                                                                             | 1.2        | 23                      | 1.1        | 5173             | C913_1100 IE3D132MX04 | 359.3     | 110.4 | 21645/196          | 356                           |
| 15                                                                             | 0.89       | 25                      | 0.82       | 4708             | C813_1010 IE3D132MX04 | 252.5     | 100.5 | 28143/280          | 353                           |
| 16                                                                             | 0.86       | 28                      | 0.86       | 4190             | C813_0890 IE3D132MX04 | 252.5     | 89.44 | 14400/161          | 354                           |
| 19                                                                             | 1.1        | 33                      | 1.0        | 3660             | C813_0780 IE3D132MX04 | 252.5     | 78.13 | 54693/700          | 353                           |
| 19                                                                             | 1.4        | 33                      | 1.1        | 3641             | C913_0780 IE3D132MX04 | 359.3     | 77.73 | 60939/784          | 356                           |
| 21                                                                             | 1.1        | 37                      | 1.1        | 3274             | C812_0690 IE3D132MX04 | 240.0     | 68.89 | 620/9              | 356                           |
| 22                                                                             | 1.4        | 39                      | 1.1        | 3090             | C813_0660 IE3D132MX04 | 252.5     | 65.96 | 10620/161          | 354                           |
| 27                                                                             | 1.4        | 47                      | 1.4        | 2574             | C812_0540 IE3D132MX04 | 240.0     | 54.15 | 704/13             | 359                           |
| 29                                                                             | 1.0        | 50                      | 1.0        | 2382             | C713_0510 IE3D132MX04 | 193.5     | 50.85 | 18711/368          | 353                           |
| 30                                                                             | 1.6        | 52                      | 1.4        | 2304             | C813_0490 IE3D132MX04 | 252.5     | 49.18 | 49914/1015         | 355                           |
| 31                                                                             | 0.90       | 54                      | 0.90       | 2225             | C712_0470 IE3D132MX04 | 180.4     | 46.82 | 515/11             | 355                           |
| 32                                                                             | 1.7        | 56                      | 1.7        | 2164             | C812_0460 IE3D132MX04 | 240.0     | 45.54 | 592/13             | 362                           |
| 36                                                                             | 1.1        | 62                      | 1.1        | 1949             | C712_0410 IE3D132MX04 | 180.4     | 41.02 | 2625/64            | 353                           |
| 37                                                                             | 1.9        | 64                      | 1.9        | 1898             | C812_0400 IE3D132MX04 | 240.0     | 39.94 | 2596/65            | 359                           |
| 42                                                                             | 1.2        | 73                      | 1.2        | 1667             | C712_0350 IE3D132MX04 | 180.4     | 35.07 | 2700/77            | 358                           |
| 42                                                                             | 2.1        | 72                      | 2.1        | 1679             | C812_0350 IE3D132MX04 | 240.0     | 35.33 | 106/3              | 368                           |
| 43                                                                             | 1.5        | 75                      | 1.5        | 1606             | C712_0340 IE3D132MX04 | 180.4     | 33.80 | 2163/64            | 355                           |
| 44                                                                             | 1.9        | 76                      | 1.9        | 1596             | C812_0340 IE3D132MX04 | 240.0     | 33.59 | 2183/65            | 362                           |
| 45                                                                             | 0.94       | 79                      | 0.94       | 1540             | C612_0320 IE3D132MX04 | 145.1     | 32.41 | 1037/32            | 352                           |
| 51                                                                             | 1.5        | 89                      | 1.5        | 1361             | C712_0290 IE3D132MX04 | 180.4     | 28.64 | 315/11             | 360                           |
| 54                                                                             | 1.0        | 93                      | 1.0        | 1304             | C612_0270 IE3D132MX04 | 145.1     | 27.43 | 192/7              | 355                           |
| 54                                                                             | 2.6        | 93                      | 2.6        | 1306             | C812_0270 IE3D132MX04 | 240.0     | 27.47 | 412/15             | 376                           |
| 56                                                                             | 2.2        | 98                      | 2.2        | 1239             | C812_0260 IE3D132MX04 | 240.0     | 26.06 | 3127/120           | 368                           |
| 59                                                                             | 1.2        | 102                     | 1.2        | 1185             | C612_0250 IE3D132MX04 | 145.1     | 24.93 | 5185/208           | 354                           |
| 58                                                                             | 2.0        | 101                     | 1.9        | 1203             | C712_0250 IE3D132MX04 | 180.4     | 25.31 | 405/16             | 358                           |
| 65                                                                             | 1.2        | 112                     | 1.2        | 1077             | C612_0230 IE3D132MX04 | 145.1     | 22.67 | 68/3               | 357                           |
| 63                                                                             | 1.8        | 110                     | 1.8        | 1102             | C712_0230 IE3D132MX04 | 180.4     | 23.18 | 255/11             | 364                           |
| 63                                                                             | 2.8        | 110                     | 2.8        | 1102             | C812_0230 IE3D132MX04 | 240.0     | 23.19 | 1600/69            | 384                           |
| 71                                                                             | 0.81       | 122                     | 0.81       | 991              | C502_0210 IE3D132MX04 | 129.8     | 20.84 | 667/32             | 353                           |
| 71                                                                             | 2.3        | 123                     | 2.2        | 983              | C712_0210 IE3D132MX04 | 180.4     | 20.67 | 1323/64            | 361                           |
| 73                                                                             | 2.6        | 126                     | 2.6        | 963              | C812_0200 IE3D132MX04 | 240.0     | 20.26 | 6077/300           | 377                           |
| 75                                                                             | 1.6        | 130                     | 1.4        | 932              | C612_0195 IE3D132MX04 | 145.1     | 19.61 | 549/28             | 355                           |
| 80                                                                             | 2.3        | 139                     | 2.3        | 868              | C712_0185 IE3D132MX04 | 180.4     | 18.26 | 420/23             | 371                           |
| 84                                                                             | 0.96       | 145                     | 0.96       | 837              | C502_0175 IE3D132MX04 | 129.8     | 17.60 | 845/48             | 355                           |
| 84                                                                             | 1.6        | 145                     | 1.5        | 837              | C612_0175 IE3D132MX04 | 145.1     | 17.60 | 88/5               | 360                           |
| 85                                                                             | 3.2        | 147                     | 3.2        | 822              | C812_0175 IE3D132MX04 | 240.0     | 17.29 | 1504/87            | 401                           |
| 86                                                                             | 2.8        | 149                     | 2.8        | 813              | C812_0170 IE3D132MX04 | 240.0     | 17.10 | 1180/69            | 385                           |
| 88                                                                             | 2.7        | 152                     | 2.6        | 795              | C712_0165 IE3D132MX04 | 180.4     | 16.73 | 1071/64            | 365                           |
| 91                                                                             | 1.9        | 157                     | 1.6        | 770              | C612_0160 IE3D132MX04 | 145.1     | 16.20 | 1037/64            | 357                           |
| 94                                                                             | 1.1        | 162                     | 1.1        | 747              | C502_0155 IE3D132MX04 | 129.8     | 15.71 | 377/24             | 355                           |
| 105                                                                            | 0.83       | 182                     | 0.83       | 665              | C402_0140 IE3D132MX04 | 118.2     | 13.99 | 2015/144           | 353                           |
| 106                                                                            | 1.2        | 183                     | 1.2        | 662              | C502_0140 IE3D132MX04 | 129.8     | 13.93 | 195/14             | 356                           |
| 104                                                                            | 1.9        | 180                     | 1.7        | 672              | C612_0140 IE3D132MX04 | 145.1     | 14.15 | 976/69             | 364                           |
| 107                                                                            | 3.1        | 185                     | 2.9        | 653              | C712_0135 IE3D132MX04 | 180.4     | 13.73 | 4380/319           | 380                           |
| 112                                                                            | 2.9        | 193                     | 2.9        | 627              | C712_0130 IE3D132MX04 | 180.4     | 13.18 | 4851/368           | 372                           |
| 117                                                                            | 0.92       | 203                     | 0.91       | 595              | C402_0125 IE3D132MX04 | 118.2     | 12.52 | 651/52             | 353                           |
| 118                                                                            | 1.4        | 205                     | 1.4        | 591              | C502_0125 IE3D132MX04 | 129.8     | 12.43 | 87/7               | 356                           |
| 117                                                                            | 2.2        | 202                     | 1.9        | 598              | C612_0125 IE3D132MX04 | 145.1     | 12.58 | 2013/160           | 361                           |
| 126                                                                            | 0.99       | 219                     | 0.96       | 553              | C402_0115 IE3D132MX04 | 118.2     | 11.64 | 1885/162           | 354                           |
| 126                                                                            | 1.4        | 219                     | 1.4        | 553              | C502_0115 IE3D132MX04 | 129.8     | 11.64 | 1885/162           | 358                           |
| 128                                                                            | 2.4        | 222                     | 2.0        | 545              | C612_0115 IE3D132MX04 | 145.1     | 11.46 | 928/81             | 368                           |
| 141                                                                            | 1.1        | 245                     | 1.0        | 495              | C402_0105 IE3D132MX04 | 118.2     | 10.41 | 406/39             | 354                           |
| 142                                                                            | 1.6        | 245                     | 1.5        | 494              | C502_0105 IE3D132MX04 | 129.8     | 10.38 | 841/81             | 358                           |

## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                         | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|---------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 7,50 kW, <math>P_N</math> (87 Hz) = 12,99 kW</b>  |            |                         |            |                  |                       |           |       |                    |                               |
| 145                                                                             | 2.6        | 252                     | 2.2        | 481              | C612_0100 IE3D132MX04 | 145.1     | 10.11 | 3721/368           | 365                           |
| 148                                                                             | 3.3        | 257                     | 3.3        | 471              | C712_0099 IE3D132MX04 | 180.4     | 9.912 | 4599/464           | 381                           |
| 159                                                                             | 1.3        | 275                     | 1.1        | 440              | C402_0093 IE3D132MX04 | 118.2     | 9.261 | 3445/372           | 356                           |
| 159                                                                             | 1.8        | 275                     | 1.7        | 440              | C502_0093 IE3D132MX04 | 129.8     | 9.261 | 3445/372           | 361                           |
| 161                                                                             | 2.8        | 279                     | 2.3        | 433              | C612_0091 IE3D132MX04 | 145.1     | 9.118 | 848/93             | 373                           |
| 178                                                                             | 0.86       | –                       | –          | 392              | C302_0083 IE3D132MX04 | 108.0     | 8.250 | 33/4               | 353                           |
| 177                                                                             | 1.4        | 307                     | 1.2        | 394              | C402_0083 IE3D132MX04 | 118.2     | 8.285 | 3339/403           | 356                           |
| 178                                                                             | 2.0        | 308                     | 1.8        | 393              | C502_0083 IE3D132MX04 | 129.8     | 8.263 | 1537/186           | 361                           |
| 179                                                                             | 3.0        | 311                     | 2.5        | 389              | C612_0082 IE3D132MX04 | 145.1     | 8.190 | 1769/216           | 369                           |
| 188                                                                             | 1.1        | 326                     | 0.90       | 371              | C402_0078 IE3D132MX04 | 118.2     | 7.816 | 2001/256           | 352                           |
| 189                                                                             | 1.7        | 328                     | 1.4        | 369              | C502_0078 IE3D132MX04 | 129.8     | 7.763 | 621/80             | 354                           |
| 226                                                                             | 3.3        | 391                     | 2.9        | 310              | C612_0065 IE3D132MX04 | 145.1     | 6.518 | 3233/496           | 376                           |
| 233                                                                             | 0.85       | –                       | –          | 300              | C302_0063 IE3D132MX04 | 108.0     | 6.314 | 221/35             | 351                           |
| 251                                                                             | 0.89       | –                       | –          | 278              | C302_0059 IE3D132MX04 | 108.0     | 5.859 | 2584/441           | 351                           |
| 250                                                                             | 1.3        | 432                     | 1.1        | 280              | C402_0059 IE3D132MX04 | 118.2     | 5.891 | 377/64             | 353                           |
| 251                                                                             | 2.0        | 435                     | 1.7        | 278              | C502_0059 IE3D132MX04 | 129.8     | 5.850 | 117/20             | 356                           |
| 292                                                                             | 0.98       | 505                     | 0.83       | 239              | C302_0050 IE3D132MX04 | 108.0     | 5.038 | 403/80             | 352                           |
| 314                                                                             | 1.0        | 545                     | 0.87       | 222              | C302_0047 IE3D132MX04 | 108.0     | 4.675 | 589/126            | 352                           |
| 314                                                                             | 1.5        | 544                     | 1.3        | 223              | C402_0047 IE3D132MX04 | 118.2     | 4.682 | 899/192            | 355                           |
| 318                                                                             | 2.3        | 550                     | 2.0        | 220              | C502_0046 IE3D132MX04 | 129.8     | 4.629 | 162/35             | 358                           |
| 352                                                                             | 1.1        | 609                     | 0.94       | 199              | C302_0042 IE3D132MX04 | 108.0     | 4.179 | 117/28             | 353                           |
| 379                                                                             | 1.2        | 657                     | 0.98       | 184              | C302_0039 IE3D132MX04 | 108.0     | 3.878 | 190/49             | 353                           |
| 378                                                                             | 1.7        | 654                     | 1.4        | 185              | C402_0039 IE3D132MX04 | 118.2     | 3.894 | 841/216            | 356                           |
| 380                                                                             | 2.6        | 658                     | 2.2        | 184              | C502_0039 IE3D132MX04 | 129.8     | 3.867 | 58/15              | 361                           |
| 439                                                                             | 1.3        | 760                     | 1.1        | 159              | C302_0034 IE3D132MX04 | 108.0     | 3.352 | 429/128            | 353                           |
| 473                                                                             | 1.4        | 819                     | 1.1        | 148              | C302_0031 IE3D132MX04 | 108.0     | 3.110 | 1045/336           | 354                           |
| 474                                                                             | 2.0        | 822                     | 1.7        | 147              | C402_0031 IE3D132MX04 | 118.2     | 3.099 | 1537/496           | 358                           |
| 478                                                                             | 3.1        | 827                     | 2.6        | 146              | C502_0031 IE3D132MX04 | 129.8     | 3.077 | 477/155            | 365                           |
| 543                                                                             | 1.5        | 941                     | 1.2        | 129              | C302_0027 IE3D132MX04 | 108.0     | 2.705 | 1677/620           | 355                           |
| 586                                                                             | 1.6        | 1014                    | 1.3        | 119              | C302_0025 IE3D132MX04 | 108.0     | 2.510 | 1634/651           | 355                           |
| 599                                                                             | 2.3        | –                       | –          | 117              | C402_0025 IE3D132MX04 | 118.2     | 2.456 | 609/248            | 362                           |
| 675                                                                             | 1.7        | 1170                    | 1.4        | 103              | C302_0022 IE3D132MX04 | 108.0     | 2.177 | 468/215            | 357                           |
| 728                                                                             | 1.8        | 1260                    | 1.5        | 96               | C302_0020 IE3D132MX04 | 108.0     | 2.020 | 608/301            | 357                           |
| 747                                                                             | 2.7        | –                       | –          | 94               | C402_0020 IE3D132MX04 | 118.2     | 1.968 | 551/280            | 367                           |
| <b><math>P_N</math> (50 Hz) = 11,00 kW, <math>P_N</math> (87 Hz) = 19,05 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 12                                                                              | 0.81       | 20                      | 0.81       | 8677             | C913_1260 IE3D160MX04 | 376.3     | 126.1 | 183549/1456        | 435                           |
| 15                                                                              | 1.0        | 26                      | 1.0        | 6843             | C913_0990 IE3D160MX04 | 376.3     | 99.42 | 20679/208          | 436                           |
| 16                                                                              | 0.95       | 28                      | 0.95       | 6316             | C913_0920 IE3D160MX04 | 376.3     | 91.76 | 8075/88            | 438                           |
| 19                                                                              | 1.3        | 32                      | 1.2        | 5442             | C913_0790 IE3D160MX04 | 376.3     | 79.06 | 115107/1456        | 437                           |
| 21                                                                              | 1.1        | 36                      | 1.1        | 4886             | C912_0700 IE3D160MX04 | 347.4     | 69.97 | 10075/144          | 443                           |
| 23                                                                              | 1.6        | 39                      | 1.4        | 4446             | C913_0650 IE3D160MX04 | 376.3     | 64.59 | 295545/4576        | 438                           |
| 26                                                                              | 1.2        | 45                      | 1.2        | 3899             | C912_0560 IE3D160MX04 | 347.4     | 55.83 | 335/6              | 449                           |
| 27                                                                              | 0.95       | 47                      | 0.95       | 3782             | C812_0540 IE3D160MX04 | 257.0     | 54.15 | 704/13             | 439                           |
| 32                                                                              | 1.1        | 56                      | 1.1        | 3180             | C812_0460 IE3D160MX04 | 257.0     | 45.54 | 592/13             | 442                           |
| 37                                                                              | 1.3        | 64                      | 1.3        | 2789             | C812_0400 IE3D160MX04 | 257.0     | 39.94 | 2596/65            | 439                           |
| 37                                                                              | 1.2        | 65                      | 1.2        | 2745             | C912_0390 IE3D160MX04 | 347.4     | 39.30 | 4087/104           | 450                           |
| 42                                                                              | 0.82       | 72                      | 0.82       | 2449             | C712_0350 IE3D160MX04 | 197.4     | 35.07 | 2700/77            | 438                           |
| 41                                                                              | 1.5        | 72                      | 1.5        | 2468             | C812_0350 IE3D160MX04 | 257.0     | 35.33 | 106/3              | 448                           |
| 43                                                                              | 1.0        | 75                      | 1.0        | 2360             | C712_0340 IE3D160MX04 | 197.4     | 33.80 | 2163/64            | 435                           |
| 44                                                                              | 1.3        | 76                      | 1.3        | 2346             | C812_0340 IE3D160MX04 | 257.0     | 33.59 | 2183/65            | 442                           |
| 51                                                                              | 1.0        | 89                      | 1.0        | 2000             | C712_0290 IE3D160MX04 | 197.4     | 28.64 | 315/11             | 440                           |
| 53                                                                              | 1.8        | 92                      | 1.8        | 1918             | C812_0270 IE3D160MX04 | 257.0     | 27.47 | 412/15             | 456                           |
| 56                                                                              | 1.5        | 97                      | 1.5        | 1820             | C812_0260 IE3D160MX04 | 257.0     | 26.06 | 3127/120           | 448                           |
| 59                                                                              | 0.83       | 102                     | 0.81       | 1741             | C612_0250 IE3D160MX04 | 162.1     | 24.93 | 5185/208           | 434                           |
| 58                                                                              | 1.4        | 100                     | 1.3        | 1768             | C712_0250 IE3D160MX04 | 197.4     | 25.31 | 405/16             | 438                           |
| 65                                                                              | 0.82       | 112                     | 0.82       | 1583             | C612_0230 IE3D160MX04 | 162.1     | 22.67 | 68/3               | 437                           |
| 63                                                                              | 1.2        | 109                     | 1.2        | 1619             | C712_0230 IE3D160MX04 | 197.4     | 23.18 | 255/11             | 444                           |
| 63                                                                              | 1.9        | 109                     | 1.9        | 1619             | C812_0230 IE3D160MX04 | 257.0     | 23.19 | 1600/69            | 464                           |
| 71                                                                              | 1.6        | 123                     | 1.5        | 1444             | C712_0210 IE3D160MX04 | 197.4     | 20.67 | 1323/64            | 441                           |
| 72                                                                              | 1.8        | 125                     | 1.8        | 1415             | C812_0200 IE3D160MX04 | 257.0     | 20.26 | 6077/300           | 457                           |
| 75                                                                              | 1.1        | 129                     | 0.95       | 1369             | C612_0195 IE3D160MX04 | 162.1     | 19.61 | 549/28             | 435                           |
| 80                                                                              | 1.6        | 139                     | 1.6        | 1275             | C712_0185 IE3D160MX04 | 197.4     | 18.26 | 420/23             | 451                           |
| 83                                                                              | 1.1        | 144                     | 1.0        | 1229             | C612_0175 IE3D160MX04 | 162.1     | 17.60 | 88/5               | 440                           |
| 85                                                                              | 2.2        | 147                     | 2.2        | 1207             | C812_0175 IE3D160MX04 | 257.0     | 17.29 | 1504/87            | 481                           |
| 86                                                                              | 1.9        | 148                     | 1.9        | 1194             | C812_0170 IE3D160MX04 | 257.0     | 17.10 | 1180/69            | 465                           |

| $n_2$<br>50 Hz<br>[rpm]                                                         | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|---------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 11,00 kW, <math>P_N</math> (87 Hz) = 19,05 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 88                                                                              | 1.9        | 152                     | 1.7        | 1169             | C712_0165 IE3D160MX04 | 197.4     | 16.73 | 1071/64            | 445                           |
| 90                                                                              | 1.3        | 157                     | 1.1        | 1132             | C612_0160 IE3D160MX04 | 162.1     | 16.20 | 1037/64            | 437                           |
| 105                                                                             | 0.82       | 182                     | 0.82       | 973              | C502_0140 IE3D160MX04 | 146.8     | 13.93 | 195/14             | 436                           |
| 104                                                                             | 1.3        | 179                     | 1.2        | 988              | C612_0140 IE3D160MX04 | 162.1     | 14.15 | 976/69             | 444                           |
| 107                                                                             | 2.1        | 185                     | 2.0        | 959              | C712_0135 IE3D160MX04 | 197.4     | 13.73 | 4380/319           | 460                           |
| 111                                                                             | 2.0        | 192                     | 2.0        | 921              | C712_0130 IE3D160MX04 | 197.4     | 13.18 | 4851/368           | 452                           |
| 118                                                                             | 0.92       | 204                     | 0.92       | 868              | C502_0125 IE3D160MX04 | 146.8     | 12.43 | 87/7               | 436                           |
| 116                                                                             | 1.5        | 202                     | 1.3        | 879              | C612_0125 IE3D160MX04 | 162.1     | 12.58 | 2013/160           | 441                           |
| 115                                                                             | 2.2        | 199                     | 2.2        | 890              | C812_0125 IE3D160MX04 | 257.0     | 12.75 | 5546/435           | 484                           |
| 126                                                                             | 0.98       | 218                     | 0.98       | 813              | C502_0115 IE3D160MX04 | 146.8     | 11.64 | 1885/162           | 438                           |
| 128                                                                             | 1.6        | 221                     | 1.4        | 800              | C612_0115 IE3D160MX04 | 162.1     | 11.46 | 928/81             | 448                           |
| 141                                                                             | 1.1        | 244                     | 1.1        | 725              | C502_0105 IE3D160MX04 | 146.8     | 10.38 | 841/81             | 438                           |
| 145                                                                             | 1.8        | 251                     | 1.5        | 706              | C612_0100 IE3D160MX04 | 162.1     | 10.11 | 3721/368           | 445                           |
| 148                                                                             | 2.2        | 256                     | 2.2        | 692              | C712_0099 IE3D160MX04 | 197.4     | 9.912 | 4599/464           | 461                           |
| 158                                                                             | 1.2        | 274                     | 1.1        | 647              | C502_0093 IE3D160MX04 | 146.8     | 9.261 | 3445/372           | 441                           |
| 161                                                                             | 1.9        | 278                     | 1.6        | 637              | C612_0091 IE3D160MX04 | 162.1     | 9.118 | 848/93             | 453                           |
| 177                                                                             | 1.4        | 307                     | 1.2        | 577              | C502_0083 IE3D160MX04 | 146.8     | 8.263 | 1537/186           | 441                           |
| 179                                                                             | 2.0        | 310                     | 1.7        | 572              | C612_0082 IE3D160MX04 | 162.1     | 8.190 | 1769/216           | 449                           |
| 189                                                                             | 1.1        | 327                     | 0.95       | 542              | C502_0078 IE3D160MX04 | 146.8     | 7.763 | 621/80             | 434                           |
| 225                                                                             | 2.2        | 389                     | 2.0        | 455              | C612_0065 IE3D160MX04 | 162.1     | 6.518 | 3233/496           | 456                           |
| 250                                                                             | 1.4        | 434                     | 1.1        | 409              | C502_0059 IE3D160MX04 | 146.8     | 5.850 | 117/20             | 436                           |
| 316                                                                             | 1.6        | 548                     | 1.3        | 323              | C502_0046 IE3D160MX04 | 146.8     | 4.629 | 162/35             | 438                           |
| 379                                                                             | 1.8        | 656                     | 1.5        | 270              | C502_0039 IE3D160MX04 | 146.8     | 3.867 | 58/15              | 441                           |
| 476                                                                             | 2.1        | 825                     | 1.8        | 215              | C502_0031 IE3D160MX04 | 146.8     | 3.077 | 477/155            | 445                           |
| 741                                                                             | 2.2        | –                       | –          | 138              | C502_0020 IE3D160MX04 | 146.8     | 1.976 | 81/41              | 460                           |
| <b><math>P_N</math> (50 Hz) = 15,00 kW, <math>P_N</math> (87 Hz) = 25,98 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 19                                                                              | 0.96       | 32                      | 0.90       | 7331             | C913_0790 IE3D160LX04 | 436.3     | 79.06 | 115107/1456        | 1157                          |
| 21                                                                              | 0.84       | 37                      | 0.84       | 6583             | C912_0700 IE3D160LX04 | 407.4     | 69.97 | 10075/144          | 1163                          |
| 23                                                                              | 1.2        | 40                      | 1.0        | 5989             | C913_0650 IE3D160LX04 | 436.3     | 64.59 | 295545/4576        | 1158                          |
| 26                                                                              | 0.89       | 46                      | 0.89       | 5253             | C912_0560 IE3D160LX04 | 407.4     | 55.83 | 335/6              | 1169                          |
| 32                                                                              | 0.84       | 56                      | 0.84       | 4285             | C812_0460 IE3D160LX04 | 317.0     | 45.54 | 592/13             | 1162                          |
| 37                                                                              | 0.98       | 64                      | 0.98       | 3758             | C812_0400 IE3D160LX04 | 317.0     | 39.94 | 2596/65            | 1159                          |
| 38                                                                              | 0.89       | 65                      | 0.89       | 3698             | C912_0390 IE3D160LX04 | 407.4     | 39.30 | 4087/104           | 1170                          |
| 42                                                                              | 1.1        | 72                      | 1.1        | 3324             | C812_0350 IE3D160LX04 | 317.0     | 35.33 | 106/3              | 1168                          |
| 44                                                                              | 0.98       | 76                      | 0.98       | 3160             | C812_0340 IE3D160LX04 | 317.0     | 33.59 | 2183/65            | 1162                          |
| 54                                                                              | 1.3        | 93                      | 1.3        | 2584             | C812_0270 IE3D160LX04 | 317.0     | 27.47 | 412/15             | 1176                          |
| 57                                                                              | 1.1        | 98                      | 1.1        | 2452             | C812_0260 IE3D160LX04 | 317.0     | 26.06 | 3127/120           | 1168                          |
| 58                                                                              | 1.0        | 101                     | 0.98       | 2382             | C712_0250 IE3D160LX04 | 257.4     | 25.31 | 405/16             | 1158                          |
| 64                                                                              | 0.92       | 110                     | 0.92       | 2181             | C712_0230 IE3D160LX04 | 257.4     | 23.18 | 255/11             | 1164                          |
| 64                                                                              | 1.4        | 110                     | 1.4        | 2182             | C812_0230 IE3D160LX04 | 317.0     | 23.19 | 1600/69            | 1184                          |
| 71                                                                              | 1.2        | 124                     | 1.1        | 1945             | C712_0210 IE3D160LX04 | 257.4     | 20.67 | 1323/64            | 1161                          |
| 73                                                                              | 1.3        | 126                     | 1.3        | 1906             | C812_0200 IE3D160LX04 | 317.0     | 20.26 | 6077/300           | 1177                          |
| 81                                                                              | 1.2        | 140                     | 1.2        | 1718             | C712_0185 IE3D160LX04 | 257.4     | 18.26 | 420/23             | 1171                          |
| 85                                                                              | 1.6        | 148                     | 1.6        | 1627             | C812_0175 IE3D160LX04 | 317.0     | 17.29 | 1504/87            | 1201                          |
| 86                                                                              | 1.4        | 149                     | 1.4        | 1609             | C812_0170 IE3D160LX04 | 317.0     | 17.10 | 1180/69            | 1185                          |
| 88                                                                              | 1.4        | 153                     | 1.3        | 1575             | C712_0165 IE3D160LX04 | 257.4     | 16.73 | 1071/64            | 1165                          |
| 91                                                                              | 0.95       | 158                     | 0.80       | 1525             | C612_0160 IE3D160LX04 | 222.1     | 16.20 | 1037/64            | 1157                          |
| 104                                                                             | 0.98       | 181                     | 0.88       | 1331             | C612_0140 IE3D160LX04 | 222.1     | 14.15 | 976/69             | 1164                          |
| 107                                                                             | 1.5        | 186                     | 1.5        | 1292             | C712_0135 IE3D160LX04 | 257.4     | 13.73 | 4380/319           | 1180                          |
| 112                                                                             | 1.5        | 194                     | 1.5        | 1240             | C712_0130 IE3D160LX04 | 257.4     | 13.18 | 4851/368           | 1172                          |
| 117                                                                             | 1.1        | 203                     | 0.95       | 1184             | C612_0125 IE3D160LX04 | 222.1     | 12.58 | 2013/160           | 1161                          |
| 116                                                                             | 1.6        | 200                     | 1.6        | 1200             | C812_0125 IE3D160LX04 | 317.0     | 12.75 | 5546/435           | 1204                          |
| 129                                                                             | 1.2        | 223                     | 1.0        | 1078             | C612_0115 IE3D160LX04 | 222.1     | 11.46 | 928/81             | 1168                          |
| 142                                                                             | 0.82       | –                       | –          | 977              | C502_0105 IE3D160LX04 | 206.8     | 10.38 | 841/81             | 1158                          |
| 146                                                                             | 1.3        | 253                     | 1.1        | 951              | C612_0100 IE3D160LX04 | 222.1     | 10.11 | 3721/368           | 1165                          |
| 149                                                                             | 1.6        | 258                     | 1.6        | 933              | C712_0099 IE3D160LX04 | 257.4     | 9.912 | 4599/464           | 1181                          |
| 159                                                                             | 0.92       | 276                     | 0.84       | 871              | C502_0093 IE3D160LX04 | 206.8     | 9.261 | 3445/372           | 1161                          |
| 162                                                                             | 1.4        | 280                     | 1.2        | 858              | C612_0091 IE3D160LX04 | 222.1     | 9.118 | 848/93             | 1173                          |
| 179                                                                             | 1.0        | 309                     | 0.91       | 777              | C502_0083 IE3D160LX04 | 206.8     | 8.263 | 1537/186           | 1161                          |
| 180                                                                             | 1.5        | 312                     | 1.3        | 771              | C612_0082 IE3D160LX04 | 222.1     | 8.190 | 1769/216           | 1169                          |
| 190                                                                             | 0.84       | –                       | –          | 730              | C502_0078 IE3D160LX04 | 206.8     | 7.763 | 621/80             | 1154                          |
| 226                                                                             | 1.6        | 392                     | 1.5        | 613              | C612_0065 IE3D160LX04 | 222.1     | 6.518 | 3233/496           | 1176                          |
| 252                                                                             | 1.0        | 437                     | 0.85       | 550              | C502_0059 IE3D160LX04 | 206.8     | 5.850 | 117/20             | 1156                          |
| 319                                                                             | 1.2        | 552                     | 0.99       | 436              | C502_0046 IE3D160LX04 | 206.8     | 4.629 | 162/35             | 1158                          |
| 381                                                                             | 1.3        | 661                     | 1.1        | 364              | C502_0039 IE3D160LX04 | 206.8     | 3.867 | 58/15              | 1161                          |

## 2.2 Selection tables 2 C helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                         | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|---------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 15,00 kW, <math>P_N</math> (87 Hz) = 25,98 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 479                                                                             | 1.6        | 830                     | 1.3        | 290              | C502_0031 IE3D160LX04 | 206.8     | 3.077 | 477/155            | 1165                          |
| 746                                                                             | 1.6        | –                       | –          | 186              | C502_0020 IE3D160LX04 | 206.8     | 1.976 | 81/41              | 1180                          |
| <b><math>P_N</math> (50 Hz) = 18,50 kW, <math>P_N</math> (87 Hz) = 32,04 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 23                                                                              | 0.95       | 40                      | 0.85       | 7409             | C913_0650 IE3D180MX04 | 431.3     | 64.59 | 295545/4576        | 1158                          |
| 26                                                                              | 0.92       | 46                      | 0.92       | 6499             | C912_0560 IE3D180MX04 | 402.4     | 55.83 | 335/6              | 1169                          |
| 32                                                                              | 1.1        | 56                      | 1.1        | 5314             | C912_0460 IE3D180MX04 | 402.4     | 45.66 | 3835/84            | 1177                          |
| 38                                                                              | 1.3        | 65                      | 1.3        | 4574             | C912_0390 IE3D180MX04 | 402.4     | 39.30 | 4087/104           | 1170                          |
| 42                                                                              | 0.88       | 72                      | 0.88       | 4113             | C812_0350 IE3D180MX04 | 312.0     | 35.33 | 106/3              | 1168                          |
| 44                                                                              | 1.1        | 76                      | 1.1        | 3909             | C812_0340 IE3D180MX04 | 312.0     | 33.59 | 2183/65            | 1162                          |
| 46                                                                              | 1.8        | 80                      | 1.8        | 3740             | C912_0320 IE3D180MX04 | 402.4     | 32.13 | 3599/112           | 1178                          |
| 52                                                                              | 1.8        | 89                      | 1.8        | 3333             | C912_0290 IE3D180MX04 | 402.4     | 28.63 | 2405/84            | 1206                          |
| 54                                                                              | 1.1        | 93                      | 1.1        | 3197             | C812_0270 IE3D180MX04 | 312.0     | 27.47 | 412/15             | 1176                          |
| 57                                                                              | 1.4        | 98                      | 1.3        | 3033             | C812_0260 IE3D180MX04 | 312.0     | 26.06 | 3127/120           | 1168                          |
| 64                                                                              | 1.3        | 110                     | 1.3        | 2699             | C812_0230 IE3D180MX04 | 312.0     | 23.19 | 1600/69            | 1184                          |
| 71                                                                              | 1.0        | 124                     | 0.91       | 2406             | C712_0210 IE3D180MX04 | 252.4     | 20.67 | 1323/64            | 1161                          |
| 73                                                                              | 1.8        | 126                     | 1.5        | 2358             | C812_0200 IE3D180MX04 | 312.0     | 20.26 | 6077/300           | 1177                          |
| 73                                                                              | 2.4        | 127                     | 2.4        | 2346             | C912_0200 IE3D180MX04 | 402.4     | 20.15 | 2257/112           | 1210                          |
| 81                                                                              | 0.94       | 140                     | 0.94       | 2126             | C712_0185 IE3D180MX04 | 252.4     | 18.26 | 420/23             | 1171                          |
| 85                                                                              | 1.8        | 148                     | 1.7        | 2012             | C812_0175 IE3D180MX04 | 312.0     | 17.29 | 1504/87            | 1201                          |
| 86                                                                              | 2.0        | 149                     | 1.7        | 1991             | C812_0170 IE3D180MX04 | 312.0     | 17.10 | 1180/69            | 1185                          |
| 88                                                                              | 1.2        | 153                     | 1.0        | 1948             | C712_0165 IE3D180MX04 | 252.4     | 16.73 | 1071/64            | 1165                          |
| 107                                                                             | 2.2        | 186                     | 1.9        | 1602             | C812_0140 IE3D180MX04 | 312.0     | 13.76 | 1280/93            | 1219                          |
| 107                                                                             | 1.3        | 186                     | 1.2        | 1598             | C712_0135 IE3D180MX04 | 252.4     | 13.73 | 4380/319           | 1180                          |
| 112                                                                             | 1.5        | 194                     | 1.2        | 1534             | C712_0130 IE3D180MX04 | 252.4     | 13.18 | 4851/368           | 1172                          |
| 117                                                                             | 0.91       | –                       | –          | 1464             | C612_0125 IE3D180MX04 | 217.1     | 12.58 | 2013/160           | 1161                          |
| 116                                                                             | 2.4        | 200                     | 2.0        | 1484             | C812_0125 IE3D180MX04 | 312.0     | 12.75 | 5546/435           | 1204                          |
| 125                                                                             | 1.5        | 217                     | 1.3        | 1369             | C712_0120 IE3D180MX04 | 252.4     | 11.76 | 1035/88            | 1186                          |
| 129                                                                             | 0.97       | 223                     | 0.82       | 1334             | C612_0115 IE3D180MX04 | 217.1     | 11.46 | 928/81             | 1168                          |
| 146                                                                             | 1.1        | 253                     | 0.89       | 1177             | C612_0100 IE3D180MX04 | 217.1     | 10.11 | 3721/368           | 1165                          |
| 145                                                                             | 2.5        | 252                     | 2.4        | 1182             | C812_0100 IE3D180MX04 | 312.0     | 10.15 | 944/93             | 1224                          |
| 149                                                                             | 1.8        | 258                     | 1.5        | 1154             | C712_0099 IE3D180MX04 | 252.4     | 9.912 | 4599/464           | 1181                          |
| 162                                                                             | 1.1        | 280                     | 0.95       | 1061             | C612_0091 IE3D180MX04 | 217.1     | 9.118 | 848/93             | 1173                          |
| 163                                                                             | 2.5        | –                       | –          | 1053             | C812_0090 IE3D180MX04 | 312.0     | 9.043 | 208/23             | 1271                          |
| 174                                                                             | 2.0        | 301                     | 1.6        | 988              | C712_0085 IE3D180MX04 | 252.4     | 8.490 | 4347/512           | 1188                          |
| 180                                                                             | 1.2        | 312                     | 1.0        | 953              | C612_0082 IE3D180MX04 | 217.1     | 8.190 | 1769/216           | 1169                          |
| 200                                                                             | 2.2        | –                       | –          | 856              | C712_0074 IE3D180MX04 | 252.4     | 7.357 | 3480/473           | 1215                          |
| 207                                                                             | 1.3        | –                       | –          | 828              | C612_0071 IE3D180MX04 | 217.1     | 7.111 | 64/9               | 1182                          |
| 221                                                                             | 2.5        | –                       | –          | 776              | C812_0067 IE3D180MX04 | 312.0     | 6.670 | 767/115            | 1282                          |
| 226                                                                             | 1.4        | 392                     | 1.2        | 759              | C612_0065 IE3D180MX04 | 217.1     | 6.518 | 3233/496           | 1176                          |
| 252                                                                             | 1.5        | –                       | –          | 681              | C612_0059 IE3D180MX04 | 217.1     | 5.854 | 240/41             | 1191                          |
| 278                                                                             | 2.5        | –                       | –          | 618              | C712_0053 IE3D180MX04 | 252.4     | 5.311 | 1827/344           | 1221                          |
| 290                                                                             | 1.7        | –                       | –          | 592              | C612_0051 IE3D180MX04 | 217.1     | 5.083 | 61/12              | 1186                          |
| 346                                                                             | 2.5        | –                       | –          | 496              | C712_0043 IE3D180MX04 | 252.4     | 4.259 | 477/112            | 1246                          |
| 353                                                                             | 1.9        | –                       | –          | 487              | C612_0042 IE3D180MX04 | 217.1     | 4.184 | 2745/656           | 1197                          |
| 746                                                                             | 1.7        | –                       | –          | 230              | C502_0020 IE3D180MX04 | 201.8     | 1.976 | 81/41              | 1180                          |
| <b><math>P_N</math> (50 Hz) = 22,00 kW, <math>P_N</math> (87 Hz) = 38,11 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 32                                                                              | 0.95       | 56                      | 0.95       | 6289             | C912_0460 IE3D180LX04 | 448.4     | 45.66 | 3835/84            | 1707                          |
| 38                                                                              | 1.1        | 65                      | 1.1        | 5413             | C912_0390 IE3D180LX04 | 448.4     | 39.30 | 4087/104           | 1700                          |
| 44                                                                              | 0.91       | 76                      | 0.90       | 4626             | C812_0340 IE3D180LX04 | 358.0     | 33.59 | 2183/65            | 1692                          |
| 46                                                                              | 1.5        | 80                      | 1.5        | 4426             | C912_0320 IE3D180LX04 | 448.4     | 32.13 | 3599/112           | 1708                          |
| 52                                                                              | 1.5        | 89                      | 1.5        | 3944             | C912_0290 IE3D180LX04 | 448.4     | 28.63 | 2405/84            | 1736                          |
| 54                                                                              | 0.95       | 93                      | 0.95       | 3783             | C812_0270 IE3D180LX04 | 358.0     | 27.47 | 412/15             | 1706                          |
| 57                                                                              | 1.2        | 98                      | 1.1        | 3589             | C812_0260 IE3D180LX04 | 358.0     | 26.06 | 3127/120           | 1698                          |
| 64                                                                              | 1.1        | 110                     | 1.1        | 3194             | C812_0230 IE3D180LX04 | 358.0     | 23.19 | 1600/69            | 1714                          |
| 71                                                                              | 0.84       | –                       | –          | 2847             | C712_0210 IE3D180LX04 | 298.4     | 20.67 | 1323/64            | 1691                          |
| 73                                                                              | 1.5        | 126                     | 1.3        | 2790             | C812_0200 IE3D180LX04 | 358.0     | 20.26 | 6077/300           | 1707                          |
| 73                                                                              | 2.0        | 127                     | 2.0        | 2776             | C912_0200 IE3D180LX04 | 448.4     | 20.15 | 2257/112           | 1740                          |
| 85                                                                              | 1.5        | 148                     | 1.4        | 2381             | C812_0175 IE3D180LX04 | 358.0     | 17.29 | 1504/87            | 1731                          |
| 86                                                                              | 1.7        | 149                     | 1.4        | 2355             | C812_0170 IE3D180LX04 | 358.0     | 17.10 | 1180/69            | 1715                          |
| 88                                                                              | 1.0        | 153                     | 0.89       | 2305             | C712_0165 IE3D180LX04 | 298.4     | 16.73 | 1071/64            | 1695                          |
| 107                                                                             | 1.9        | 186                     | 1.6        | 1896             | C812_0140 IE3D180LX04 | 358.0     | 13.76 | 1280/93            | 1749                          |
| 107                                                                             | 1.1        | 186                     | 1.0        | 1891             | C712_0135 IE3D180LX04 | 298.4     | 13.73 | 4380/319           | 1710                          |
| 112                                                                             | 1.2        | 194                     | 1.0        | 1816             | C712_0130 IE3D180LX04 | 298.4     | 13.18 | 4851/368           | 1702                          |
| 116                                                                             | 2.1        | 200                     | 1.7        | 1756             | C812_0125 IE3D180LX04 | 358.0     | 12.75 | 5546/435           | 1734                          |
| 125                                                                             | 1.2        | 217                     | 1.1        | 1620             | C712_0120 IE3D180LX04 | 298.4     | 11.76 | 1035/88            | 1716                          |



| $n_2$<br>50 Hz<br>[rpm]                                                         | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|---------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 22,00 kW, <math>P_N</math> (87 Hz) = 38,11 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 129                                                                             | 0.82       | –                       | –          | 1578             | C612_0115 IE3D180LX04 | 263.1     | 11.46 | 928/81             | 1698                          |
| 146                                                                             | 0.89       | –                       | –          | 1393             | C612_0100 IE3D180LX04 | 263.1     | 10.11 | 3721/368           | 1695                          |
| 145                                                                             | 2.1        | 252                     | 2.0        | 1398             | C812_0100 IE3D180LX04 | 358.0     | 10.15 | 944/93             | 1754                          |
| 149                                                                             | 1.5        | 258                     | 1.3        | 1365             | C712_0099 IE3D180LX04 | 298.4     | 9.912 | 4599/464           | 1711                          |
| 162                                                                             | 0.96       | 280                     | 0.80       | 1256             | C612_0091 IE3D180LX04 | 263.1     | 9.118 | 848/93             | 1703                          |
| 163                                                                             | 2.1        | –                       | –          | 1246             | C812_0090 IE3D180LX04 | 358.0     | 9.043 | 208/23             | 1801                          |
| 174                                                                             | 1.7        | 301                     | 1.4        | 1169             | C712_0085 IE3D180LX04 | 298.4     | 8.490 | 4347/512           | 1718                          |
| 180                                                                             | 1.0        | 312                     | 0.86       | 1128             | C612_0082 IE3D180LX04 | 263.1     | 8.190 | 1769/216           | 1699                          |
| 200                                                                             | 1.8        | –                       | –          | 1013             | C712_0074 IE3D180LX04 | 298.4     | 7.357 | 3480/473           | 1745                          |
| 207                                                                             | 1.1        | –                       | –          | 979              | C612_0071 IE3D180LX04 | 263.1     | 7.111 | 64/9               | 1712                          |
| 221                                                                             | 2.1        | –                       | –          | 919              | C812_0067 IE3D180LX04 | 358.0     | 6.670 | 767/115            | 1812                          |
| 226                                                                             | 1.2        | 392                     | 1.0        | 898              | C612_0065 IE3D180LX04 | 263.1     | 6.518 | 3233/496           | 1706                          |
| 252                                                                             | 1.3        | –                       | –          | 806              | C612_0059 IE3D180LX04 | 263.1     | 5.854 | 240/41             | 1721                          |
| 278                                                                             | 2.1        | –                       | –          | 732              | C712_0053 IE3D180LX04 | 298.4     | 5.311 | 1827/344           | 1751                          |
| 290                                                                             | 1.4        | –                       | –          | 700              | C612_0051 IE3D180LX04 | 263.1     | 5.083 | 61/12              | 1716                          |
| 346                                                                             | 2.1        | –                       | –          | 587              | C712_0043 IE3D180LX04 | 298.4     | 4.259 | 477/112            | 1776                          |
| 353                                                                             | 1.6        | –                       | –          | 576              | C612_0042 IE3D180LX04 | 263.1     | 4.184 | 2745/656           | 1727                          |
| 746                                                                             | 1.4        | –                       | –          | 272              | C502_0020 IE3D180LX04 | 247.8     | 1.976 | 81/41              | 1710                          |
| <b><math>P_N</math> (50 Hz) = 30,00 kW, <math>P_N</math> (87 Hz) = 51,96 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 41                                                                              | 0.89       | –                       | –          | 6775             | C912_0360 IE3D200LX04 | 546.4     | 36.01 | 7345/204           | 3170                          |
| 46                                                                              | 1.2        | –                       | –          | 6047             | C912_0320 IE3D200LX04 | 546.4     | 32.13 | 3599/112           | 3158                          |
| 52                                                                              | 1.1        | –                       | –          | 5388             | C912_0290 IE3D200LX04 | 546.4     | 28.63 | 2405/84            | 3186                          |
| 58                                                                              | 1.5        | –                       | –          | 4769             | C912_0250 IE3D200LX04 | 546.4     | 25.34 | 6893/272           | 3172                          |
| 63                                                                              | 1.4        | –                       | –          | 4402             | C912_0230 IE3D200LX04 | 546.4     | 23.39 | 6175/264           | 3207                          |
| 73                                                                              | 1.8        | –                       | –          | 3792             | C912_0200 IE3D200LX04 | 546.4     | 20.15 | 2257/112           | 3190                          |
| 84                                                                              | 1.8        | –                       | –          | 3321             | C912_0175 IE3D200LX04 | 546.4     | 17.65 | 6565/372           | 3243                          |
| 90                                                                              | 2.3        | –                       | –          | 3098             | C912_0165 IE3D200LX04 | 546.4     | 16.46 | 5795/352           | 3212                          |
| 108                                                                             | 1.4        | –                       | –          | 2590             | C812_0140 IE3D200LX04 | 456.0     | 13.76 | 1280/93            | 3199                          |
| 119                                                                             | 3.0        | –                       | –          | 2337             | C912_0125 IE3D200LX04 | 546.4     | 12.42 | 6161/496           | 3251                          |
| 126                                                                             | 2.7        | –                       | –          | 2216             | C912_0120 IE3D200LX04 | 546.4     | 11.78 | 1625/138           | 3322                          |
| 146                                                                             | 1.8        | –                       | –          | 1910             | C812_0100 IE3D200LX04 | 456.0     | 10.15 | 944/93             | 3204                          |
| 164                                                                             | 1.9        | –                       | –          | 1702             | C812_0090 IE3D200LX04 | 456.0     | 9.043 | 208/23             | 3251                          |
| 179                                                                             | 3.3        | –                       | –          | 1560             | C912_0083 IE3D200LX04 | 546.4     | 8.288 | 1525/184           | 3341                          |
| 222                                                                             | 2.3        | –                       | –          | 1255             | C812_0067 IE3D200LX04 | 456.0     | 6.670 | 767/115            | 3262                          |
| 350                                                                             | 3.1        | –                       | –          | 795              | C812_0042 IE3D200LX04 | 456.0     | 4.225 | 1711/405           | 3374                          |
| <b><math>P_N</math> (50 Hz) = 37,00 kW, <math>P_N</math> (87 Hz) = 64,09 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 46                                                                              | 0.94       | –                       | –          | 7481             | C912_0320 IE3D225SX04 | 583.4     | 32.13 | 3599/112           | 3588                          |
| 52                                                                              | 0.90       | –                       | –          | 6665             | C912_0290 IE3D225SX04 | 583.4     | 28.63 | 2405/84            | 3616                          |
| 58                                                                              | 1.2        | –                       | –          | 5900             | C912_0250 IE3D225SX04 | 583.4     | 25.34 | 6893/272           | 3602                          |
| 63                                                                              | 1.1        | –                       | –          | 5445             | C912_0230 IE3D225SX04 | 583.4     | 23.39 | 6175/264           | 3637                          |
| 73                                                                              | 1.5        | –                       | –          | 4691             | C912_0200 IE3D225SX04 | 583.4     | 20.15 | 2257/112           | 3620                          |
| 84                                                                              | 1.5        | –                       | –          | 4108             | C912_0175 IE3D225SX04 | 583.4     | 17.65 | 6565/372           | 3673                          |
| 90                                                                              | 1.8        | –                       | –          | 3833             | C912_0165 IE3D225SX04 | 583.4     | 16.46 | 5795/352           | 3642                          |
| 119                                                                             | 2.4        | –                       | –          | 2892             | C912_0125 IE3D225SX04 | 583.4     | 12.42 | 6161/496           | 3681                          |
| 125                                                                             | 2.2        | –                       | –          | 2741             | C912_0120 IE3D225SX04 | 583.4     | 11.78 | 1625/138           | 3752                          |
| 178                                                                             | 2.7        | –                       | –          | 1929             | C912_0083 IE3D225SX04 | 583.4     | 8.288 | 1525/184           | 3771                          |
| <b><math>P_N</math> (50 Hz) = 45,00 kW, <math>P_N</math> (87 Hz) = 77,94 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 58                                                                              | 0.98       | –                       | –          | 7153             | C912_0250 IE3D225MX04 | 619.4     | 25.34 | 6893/272           | 5292                          |
| 63                                                                              | 0.91       | –                       | –          | 6602             | C912_0230 IE3D225MX04 | 619.4     | 23.39 | 6175/264           | 5327                          |
| 73                                                                              | 1.2        | –                       | –          | 5688             | C912_0200 IE3D225MX04 | 619.4     | 20.15 | 2257/112           | 5310                          |
| 84                                                                              | 1.2        | –                       | –          | 4982             | C912_0175 IE3D225MX04 | 619.4     | 17.65 | 6565/372           | 5363                          |
| 90                                                                              | 1.5        | –                       | –          | 4647             | C912_0165 IE3D225MX04 | 619.4     | 16.46 | 5795/352           | 5332                          |
| 119                                                                             | 2.0        | –                       | –          | 3506             | C912_0125 IE3D225MX04 | 619.4     | 12.42 | 6161/496           | 5371                          |
| 125                                                                             | 1.8        | –                       | –          | 3324             | C912_0120 IE3D225MX04 | 619.4     | 11.78 | 1625/138           | 5442                          |
| 178                                                                             | 2.2        | –                       | –          | 2339             | C912_0083 IE3D225MX04 | 619.4     | 8.288 | 1525/184           | 5461                          |



## 2.3 Dimensional drawings

In this chapter you can find the dimensions of the geared motors.

There is a dimensional drawing for every possible shaft/housing design, each with the tables for gear unit dimensions, motor dimensions and geared motor dimensions.

Dimensions can exceed the specifications of ISO 2768-mK due to casting tolerances or accumulation of individual tolerances.

We reserve the right to make dimensional changes due to ongoing technical development.

You can download 3D models of our standard drives at <http://configurator.stoeber.de>.

### Tolerances

| Axis height in accordance with DIN 747 | Tolerance |
|----------------------------------------|-----------|
| Up to 50 mm                            | -0.4 mm   |
| Up to 250 mm                           | -0.5 mm   |
| Up to 630 mm                           | -0.6 mm   |

| Solid shaft                          | Tolerance               |
|--------------------------------------|-------------------------|
| Shaft $\varnothing$ fit $\leq 50$ mm | DIN 748-1, ISO k6       |
| Shaft $\varnothing$ fit $> 50$ mm    | DIN 748-1, ISO m6       |
| Feather keys                         | DIN 6885-1, high form A |

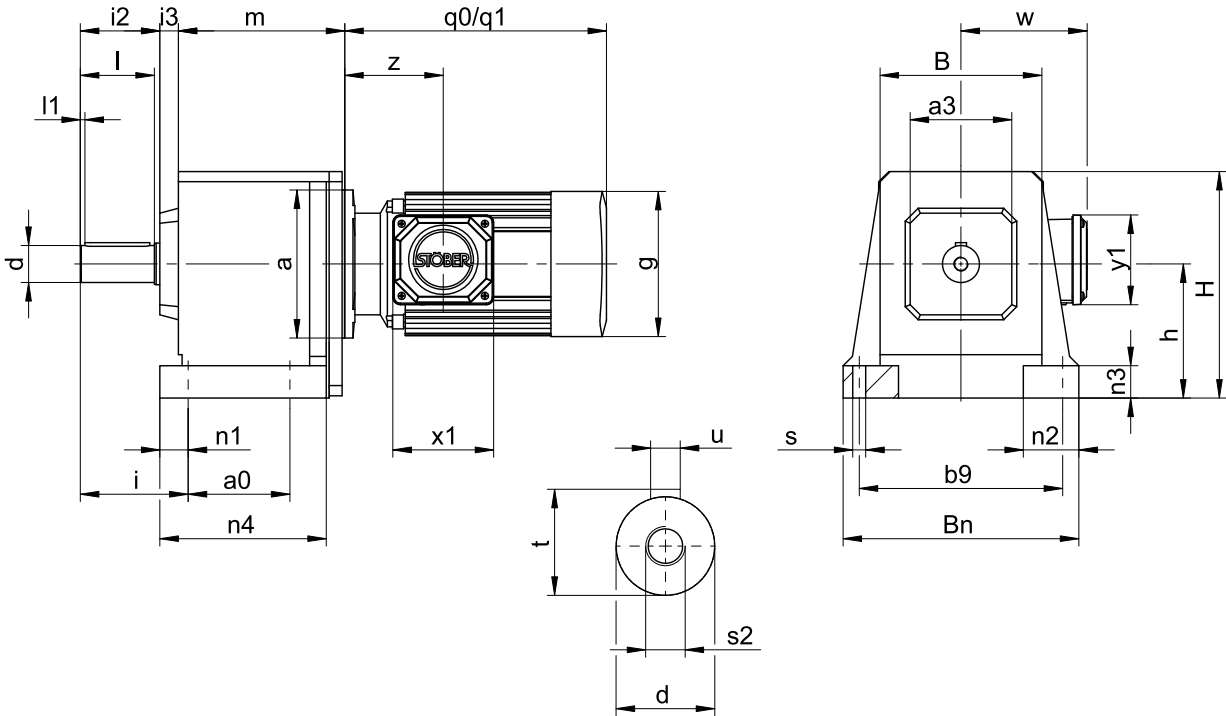
  

| Flange             | Pilot tolerance |
|--------------------|-----------------|
| Up to 300 mm       | ISO j6          |
| Starting at 350 mm | ISO h6          |

### Centering holes in solid shafts in accordance with DIN 332-2, DR shape

| Thread size       | M4 | M5   | M6 | M8 | M10 | M12 | M16 | M20 | M24 |
|-------------------|----|------|----|----|-----|-----|-----|-----|-----|
| Thread depth [mm] | 10 | 12.5 | 16 | 19 | 22  | 28  | 36  | 42  | 50  |

2.3.1 Solid shaft design with feather key, N housing design (base)



q0 Applies to motors without brake.
q1 Applies to motors with brake.

C203, C303, C612, C613: Motor adapter and gear unit are sometimes non-coaxial.

Options: C0 – C5 also available with solid shaft without feather key; on request starting at C6.

Dimensions of gear units

| Type | a0  | a3  | b9  | B   | Bn  | Ød               | h   | H   | i   | i2  | i3 | l   | l1 | n1 | n2  | n3 | n4    | Øs | s2  | t    | u          |
|------|-----|-----|-----|-----|-----|------------------|-----|-----|-----|-----|----|-----|----|----|-----|----|-------|----|-----|------|------------|
| C0   | 62  | 60  | 110 | 92  | 132 | 20 <sub>k6</sub> | 82  | 144 | 55  | 44  | 13 | 40  | 3  | 11 | 35  | 20 | 95.0  | 7  | M6  | 22.5 | A6×6×32    |
| C1   | 70  | 80  | 150 | 124 | 176 | 25 <sub>k6</sub> | 102 | 177 | 67  | 54  | 15 | 50  | 5  | 13 | 42  | 25 | 117.5 | 9  | M10 | 28.0 | A8×7×40    |
| C2   | 85  | 95  | 170 | 138 | 200 | 30 <sub>k6</sub> | 115 | 195 | 79  | 65  | 21 | 60  | 5  | 14 | 50  | 30 | 134.5 | 11 | M10 | 33.0 | A8×7×50    |
| C3   | 105 | 95  | 185 | 150 | 215 | 30 <sub>k6</sub> | 130 | 215 | 79  | 65  | 20 | 60  | 5  | 14 | 50  | 30 | 153.5 | 11 | M10 | 33.0 | A8×7×50    |
| C4   | 110 | 110 | 220 | 175 | 255 | 40 <sub>k6</sub> | 145 | 245 | 105 | 86  | 20 | 80  | 5  | 19 | 60  | 35 | 180.0 | 14 | M16 | 43.0 | A12×8×70   |
| C5   | 130 | 130 | 245 | 192 | 290 | 40 <sub>k6</sub> | 170 | 290 | 108 | 86  | 21 | 80  | 5  | 22 | 70  | 40 | 197.0 | 18 | M16 | 43.0 | A12×8×70   |
| C6   | 215 | 177 | 245 | 225 | 300 | 50 <sub>k6</sub> | 200 | 315 | 130 | 106 | 47 | 100 | 5  | 25 | 75  | 40 | 265.0 | 18 | M16 | 53.5 | A14×9×90   |
| C7   | 235 | 192 | 300 | 265 | 365 | 60 <sub>m6</sub> | 235 | 375 | 163 | 127 | 58 | 120 | 5  | 25 | 90  | 50 | 285.0 | 18 | M20 | 64.0 | A18×11×100 |
| C8   | 300 | 223 | 340 | 310 | 435 | 70 <sub>m6</sub> | 290 | 450 | 190 | 148 | 70 | 140 | 5  | 29 | 95  | 55 | 360.0 | 22 | M20 | 74.5 | A20×12×125 |
| C9   | 340 | 277 | 400 | 365 | 510 | 90 <sub>m6</sub> | 340 | 530 | 222 | 178 | 78 | 170 | 5  | 34 | 110 | 60 | 410.0 | 26 | M24 | 95.0 | A25×14×140 |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

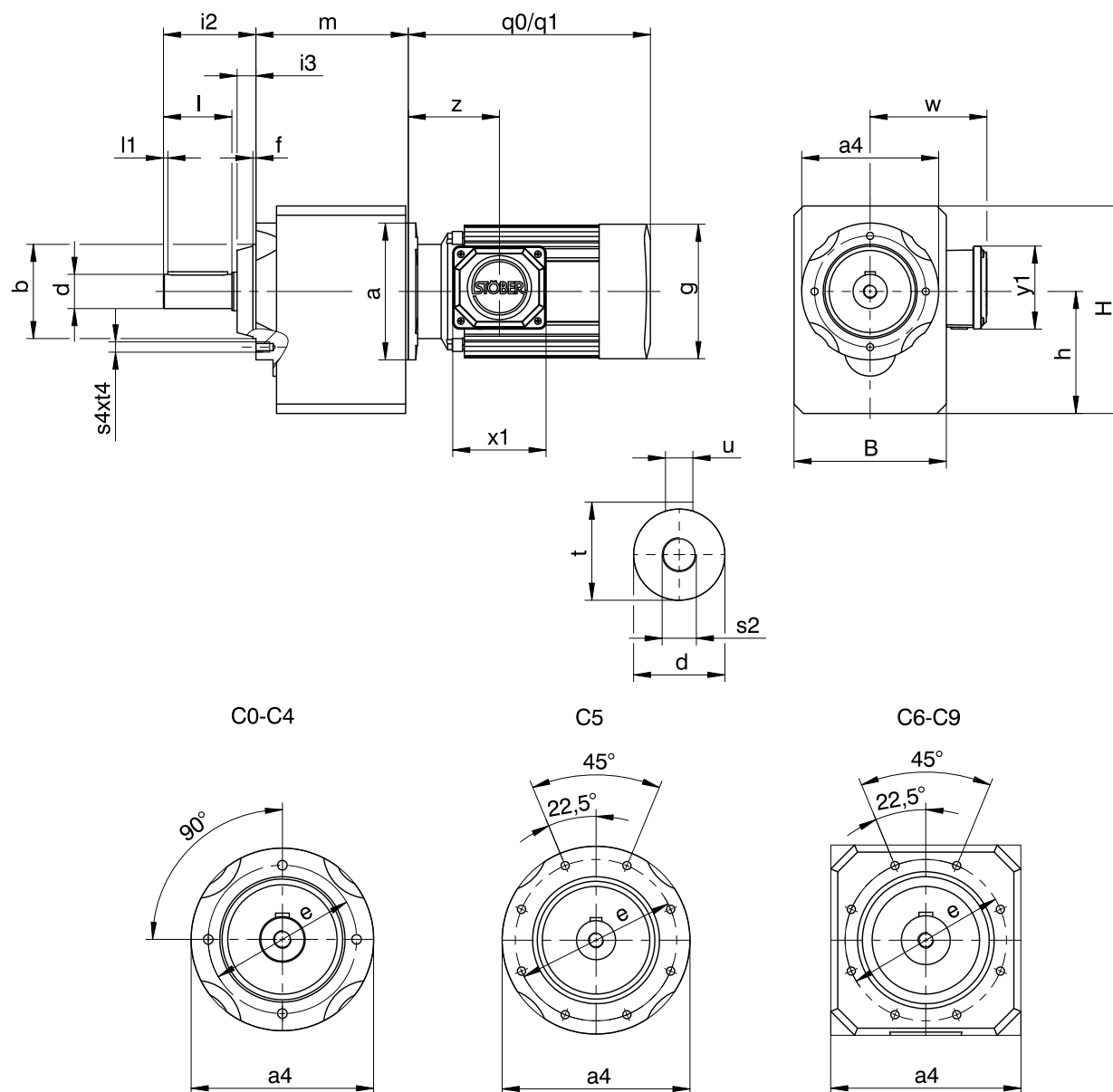
## Dimensions of geared motors

| Type | IE3D063 |       | IE3D071 |       | IE3D080 |       | IE3D090 |       | IE3D100 |       |
|------|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
|      | a       | m     | a       | m     | a       | m     | a       | m     | a       | m     |
| C002 | Ø140    | 97.5  | Ø140    | 97.5  | Ø160    | 101.5 | Ø160    | 101.5 | –       | –     |
| C102 | Ø140    | 118.0 | Ø140    | 118.0 | Ø160    | 122.0 | Ø160    | 122.0 | Ø200    | 124.0 |
| C103 | Ø140    | 155.0 | Ø140    | 155.0 | –       | –     | –       | –     | –       | –     |
| C202 | Ø140    | 129.0 | Ø140    | 129.0 | Ø160    | 133.0 | Ø160    | 133.0 | Ø200    | 135.0 |
| C203 | Ø140    | 166.0 | Ø140    | 166.0 | –       | –     | –       | –     | –       | –     |
| C302 | –       | –     | –       | –     | Ø160    | 152.5 | Ø160    | 152.5 | Ø200    | 154.5 |
| C303 | –       | –     | Ø140    | 185.5 | Ø160    | 195.5 | –       | –     | –       | –     |
| C402 | –       | –     | –       | –     | Ø160    | 180.0 | Ø160    | 180.0 | Ø200    | 182.0 |
| C403 | –       | –     | –       | –     | Ø160    | 223.0 | Ø160    | 223.0 | –       | –     |
| C502 | –       | –     | –       | –     | Ø160    | 200.0 | Ø160    | 200.0 | Ø200    | 202.0 |
| C503 | –       | –     | –       | –     | Ø160    | 243.0 | Ø160    | 243.0 | –       | –     |
| C612 | –       | –     | –       | –     | –       | –     | –       | –     | Ø200    | 180.0 |
| C613 | –       | –     | –       | –     | Ø160    | 222.0 | Ø160    | 222.0 | Ø200    | 242.0 |
| C712 | –       | –     | –       | –     | –       | –     | –       | –     | Ø200    | 201.0 |
| C713 | –       | –     | –       | –     | –       | –     | –       | –     | Ø200    | 262.0 |
| C813 | –       | –     | –       | –     | –       | –     | –       | –     | Ø200    | 296.0 |

| Type | IE3D112 |       | IE3D132 |       | IE3D160 |       | IE3D180 |       | IE3D200 |       | IE3D225 |       |
|------|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
|      | a       | m     | a       | m     | a       | m     | a       | m     | a       | m     | a       | m     |
| C102 | Ø200    | 124.0 | –       | –     | –       | –     | –       | –     | –       | –     | –       | –     |
| C202 | Ø200    | 135.0 | –       | –     | –       | –     | –       | –     | –       | –     | –       | –     |
| C302 | Ø200    | 154.5 | Ø250    | 157.5 | –       | –     | –       | –     | –       | –     | –       | –     |
| C402 | Ø200    | 182.0 | Ø250    | 185.0 | –       | –     | –       | –     | –       | –     | –       | –     |
| C502 | Ø200    | 202.0 | Ø250    | 205.0 | Ø300    | 219.0 | Ø300    | 219.0 | –       | –     | –       | –     |
| C612 | Ø200    | 180.0 | Ø250    | 183.0 | Ø300    | 196.0 | Ø300    | 196.0 | –       | –     | –       | –     |
| C613 | Ø200    | 242.0 | –       | –     | –       | –     | –       | –     | –       | –     | –       | –     |
| C712 | Ø200    | 201.0 | Ø250    | 203.0 | Ø300    | 216.0 | Ø300    | 216.0 | –       | –     | –       | –     |
| C713 | Ø200    | 262.0 | Ø250    | 274.0 | –       | –     | –       | –     | –       | –     | –       | –     |
| C812 | –       | –     | Ø250    | 237.0 | Ø300    | 250.0 | Ø300    | 250.0 | Ø350    | 273.0 | –       | –     |
| C813 | Ø200    | 296.0 | Ø250    | 308.0 | –       | –     | –       | –     | –       | –     | –       | –     |
| C912 | –       | –     | –       | –     | Ø300    | 279.0 | Ø300    | 279.0 | Ø350    | 302.0 | Ø400    | 302.0 |
| C913 | –       | –     | Ø250    | 337.0 | Ø300    | 362.0 | Ø300    | 362.0 | –       | –     | –       | –     |



### 2.3.2 Solid shaft design with feather key, G housing design (pitch circle diameter)



q0 Applies to motors without brake.

q1 Applies to motors with brake.

C203, C303, C612, C613: Motor adapter and gear unit are sometimes non-coaxial.

**Options:** C0 – C5 also available with solid shaft without feather key; on request starting at C6.

#### Dimensions of gear units

| Type | a4   | Øb                | B   | Ød               | Øe  | f   | h     | H     | i2  | i3 | l   | l1 | s2  | s4  | t    | t4 | u          |
|------|------|-------------------|-----|------------------|-----|-----|-------|-------|-----|----|-----|----|-----|-----|------|----|------------|
| C0   | Ø87  | 55 <sub>j6</sub>  | 97  | 20 <sub>k6</sub> | 75  | 3.0 | 79.0  | 141.0 | 58  | 14 | 40  | 3  | M6  | M6  | 22.5 | 10 | A6×6×32    |
| C1   | Ø120 | 80 <sub>j6</sub>  | 130 | 25 <sub>k6</sub> | 100 | 3.0 | 100.0 | 175.0 | 71  | 17 | 50  | 5  | M10 | M6  | 28.0 | 13 | A8×7×40    |
| C2   | Ø140 | 95 <sub>j6</sub>  | 142 | 30 <sub>k6</sub> | 115 | 3.0 | 112.0 | 192.0 | 87  | 22 | 60  | 5  | M10 | M8  | 33.0 | 13 | A8×7×50    |
| C3   | Ø140 | 95 <sub>j6</sub>  | 154 | 30 <sub>k6</sub> | 115 | 3.0 | 127.0 | 212.0 | 87  | 22 | 60  | 5  | M10 | M8  | 33.0 | 13 | A8×7×50    |
| C4   | Ø160 | 110 <sub>j6</sub> | 178 | 40 <sub>k6</sub> | 130 | 3.5 | 142.5 | 242.5 | 108 | 22 | 80  | 5  | M16 | M10 | 43.0 | 16 | A12×8×70   |
| C5   | Ø192 | 130 <sub>j6</sub> | 195 | 40 <sub>k6</sub> | 165 | 3.5 | 166.0 | 286.0 | 109 | 23 | 80  | 5  | M16 | M10 | 43.0 | 16 | A12×8×70   |
| C6   | □180 | 140 <sub>j6</sub> | 225 | 50 <sub>k6</sub> | 165 | 5.0 | 195.0 | 310.0 | 136 | 30 | 100 | 5  | M16 | M10 | 53.5 | 16 | A14×9×90   |
| C7   | □195 | 155 <sub>j6</sub> | 265 | 60 <sub>m6</sub> | 185 | 8.0 | 231.0 | 371.0 | 164 | 37 | 120 | 5  | M20 | M12 | 64.0 | 19 | A18×11×100 |
| C8   | □226 | 185 <sub>j6</sub> | 310 | 70 <sub>m6</sub> | 215 | 5.0 | 285.0 | 445.0 | 185 | 37 | 140 | 5  | M20 | M12 | 74.5 | 19 | A20×12×125 |
| C9   | □280 | 230 <sub>j6</sub> | 365 | 90 <sub>m6</sub> | 265 | 5.0 | 334.0 | 524.0 | 220 | 42 | 170 | 5  | M24 | M16 | 95.0 | 26 | A25×14×140 |

## Dimensions of motors

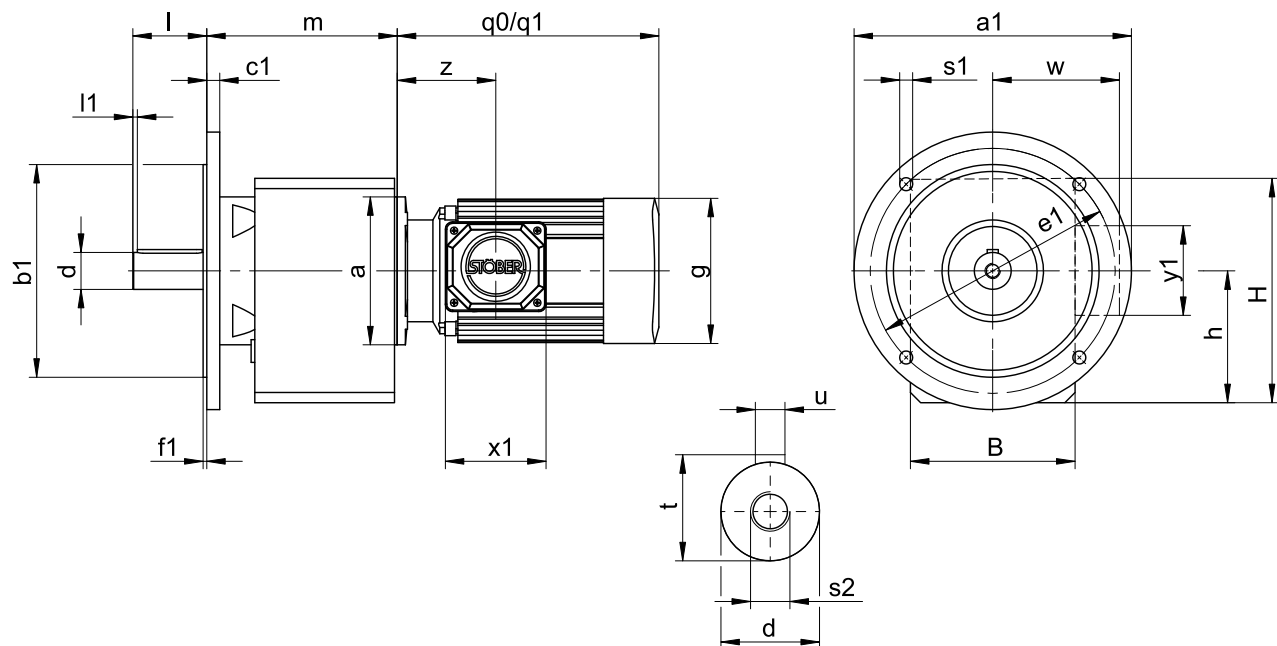
| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

## Dimensions of geared motors

| Type | IE3D063 |     | IE3D071 |     | IE3D080 |     | IE3D090 |     | IE3D100 |     |
|------|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
|      | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   |
| C002 | Ø140    | 96  | Ø140    | 96  | Ø160    | 100 | Ø160    | 100 | –       | –   |
| C102 | Ø140    | 116 | Ø140    | 116 | Ø160    | 120 | Ø160    | 120 | Ø200    | 122 |
| C103 | Ø140    | 153 | Ø140    | 153 | –       | –   | –       | –   | –       | –   |
| C202 | Ø140    | 128 | Ø140    | 128 | Ø160    | 132 | Ø160    | 132 | Ø200    | 134 |
| C203 | Ø140    | 165 | Ø140    | 165 | –       | –   | –       | –   | –       | –   |
| C302 | –       | –   | –       | –   | Ø160    | 151 | Ø160    | 151 | Ø200    | 153 |
| C303 | –       | –   | Ø140    | 184 | Ø160    | 194 | –       | –   | –       | –   |
| C402 | –       | –   | –       | –   | Ø160    | 178 | Ø160    | 178 | Ø200    | 180 |
| C403 | –       | –   | –       | –   | Ø160    | 221 | Ø160    | 221 | –       | –   |
| C502 | –       | –   | –       | –   | Ø160    | 198 | Ø160    | 198 | Ø200    | 200 |
| C503 | –       | –   | –       | –   | Ø160    | 241 | Ø160    | 241 | –       | –   |
| C612 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 197 |
| C613 | –       | –   | –       | –   | Ø160    | 239 | Ø160    | 239 | Ø200    | 259 |
| C712 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 222 |
| C713 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 283 |
| C813 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 329 |

| Type | IE3D112 |     | IE3D132 |     | IE3D160 |     | IE3D180 |     | IE3D200 |     | IE3D225 |     |
|------|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
|      | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   |
| C102 | Ø200    | 122 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C202 | Ø200    | 134 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C302 | Ø200    | 153 | Ø250    | 156 | –       | –   | –       | –   | –       | –   | –       | –   |
| C402 | Ø200    | 180 | Ø250    | 183 | –       | –   | –       | –   | –       | –   | –       | –   |
| C502 | Ø200    | 200 | Ø250    | 203 | Ø300    | 217 | Ø300    | 217 | –       | –   | –       | –   |
| C612 | Ø200    | 197 | Ø250    | 200 | Ø300    | 213 | Ø300    | 213 | –       | –   | –       | –   |
| C613 | Ø200    | 259 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C712 | Ø200    | 222 | Ø250    | 224 | Ø300    | 237 | Ø300    | 237 | –       | –   | –       | –   |
| C713 | Ø200    | 283 | Ø250    | 295 | –       | –   | –       | –   | –       | –   | –       | –   |
| C812 | –       | –   | Ø250    | 270 | Ø300    | 283 | Ø300    | 283 | Ø350    | 306 | –       | –   |
| C813 | Ø200    | 329 | Ø250    | 341 | –       | –   | –       | –   | –       | –   | –       | –   |
| C912 | –       | –   | –       | –   | Ø300    | 315 | Ø300    | 315 | Ø350    | 338 | Ø400    | 338 |
| C913 | –       | –   | Ø250    | 373 | Ø300    | 398 | Ø300    | 398 | –       | –   | –       | –   |

### 2.3.3 Solid shaft design with feather key, F housing design (round flange)



q0 Applies to motors without brake.

q1 Applies to motors with brake.

C203, C303, C612, C613: Motor adapter and gear unit are sometimes non-coaxial.

**Options:** C0 – C5 also available with solid shaft without feather key; on request starting at C6.

#### Dimensions of gear units

| Type | Øa1 | Øb1               | B   | c1 | Ød               | Øe1 | f1  | h     | H     | l   | l1 | Øs1 | s2  | t    | u          |
|------|-----|-------------------|-----|----|------------------|-----|-----|-------|-------|-----|----|-----|-----|------|------------|
| C0   | 160 | 110 <sub>j6</sub> | 97  | 10 | 20 <sub>k6</sub> | 130 | 3.0 | 79.0  | 141.0 | 40  | 3  | 9   | M6  | 22.5 | A6×6×32    |
| C1   | 200 | 130 <sub>j6</sub> | 130 | 12 | 25 <sub>k6</sub> | 165 | 3.5 | 100.0 | 175.0 | 50  | 5  | 11  | M10 | 28.0 | A8×7×40    |
| C2   | 200 | 130 <sub>j6</sub> | 142 | 12 | 30 <sub>k6</sub> | 165 | 3.5 | 112.0 | 192.0 | 60  | 5  | 11  | M10 | 33.0 | A8×7×50    |
| C3   | 250 | 180 <sub>j6</sub> | 154 | 12 | 30 <sub>k6</sub> | 215 | 4.0 | 127.0 | 212.0 | 60  | 5  | 14  | M10 | 33.0 | A8×7×50    |
| C4   | 250 | 180 <sub>j6</sub> | 178 | 14 | 40 <sub>k6</sub> | 215 | 4.0 | 142.5 | 242.5 | 80  | 5  | 14  | M16 | 43.0 | A12×8×70   |
| C5   | 300 | 230 <sub>j6</sub> | 195 | 16 | 40 <sub>k6</sub> | 265 | 4.0 | 166.0 | 286.0 | 80  | 5  | 14  | M16 | 43.0 | A12×8×70   |
| C6   | 300 | 230 <sub>j6</sub> | 225 | 17 | 50 <sub>k6</sub> | 265 | 4.0 | 195.0 | 310.0 | 100 | 5  | 14  | M16 | 53.5 | A14×9×90   |
| C7   | 350 | 250 <sub>h6</sub> | 265 | 18 | 60 <sub>m6</sub> | 300 | 5.0 | 231.0 | 371.0 | 120 | 5  | 18  | M20 | 64.0 | A18×11×100 |
| C8   | 400 | 300 <sub>h6</sub> | 310 | 20 | 70 <sub>m6</sub> | 350 | 5.0 | 285.0 | 445.0 | 140 | 5  | 18  | M20 | 74.5 | A20×12×125 |
| C9   | 450 | 350 <sub>h6</sub> | 365 | 23 | 90 <sub>m6</sub> | 400 | 5.0 | 334.0 | 524.0 | 170 | 5  | 18  | M24 | 95.0 | A25×14×140 |

#### Dimensions of additional round flanges

| Type | Øa1 | Øb1               | c1 | Øe1 | f1  | Øs1 |
|------|-----|-------------------|----|-----|-----|-----|
| C0   | 120 | 80 <sub>j6</sub>  | 10 | 100 | 3.0 | 7   |
| C0   | 140 | 95 <sub>j6</sub>  | 10 | 115 | 3.0 | 9   |
| C1   | 140 | 95 <sub>j6</sub>  | 8  | 115 | 3.5 | 9   |
| C1   | 160 | 110 <sub>j6</sub> | 10 | 130 | 3.5 | 9   |
| C2   | 160 | 110 <sub>j6</sub> | 10 | 130 | 3.5 | 9   |
| C2   | 250 | 180 <sub>j6</sub> | 12 | 215 | 4.0 | 14  |
| C3   | 160 | 110 <sub>j6</sub> | 10 | 130 | 3.5 | 9   |
| C3   | 200 | 130 <sub>j6</sub> | 12 | 165 | 3.5 | 11  |
| C4   | 200 | 130 <sub>j6</sub> | 14 | 165 | 3.5 | 11  |
| C4   | 300 | 230 <sub>j6</sub> | 14 | 265 | 4.0 | 14  |
| C5   | 250 | 180 <sub>j6</sub> | 14 | 215 | 4.0 | 14  |
| C8   | 350 | 250 <sub>h6</sub> | 18 | 300 | 5.0 | 18  |
| C8   | 450 | 350 <sub>h6</sub> | 20 | 400 | 5.0 | 18  |

## Dimensions of motors

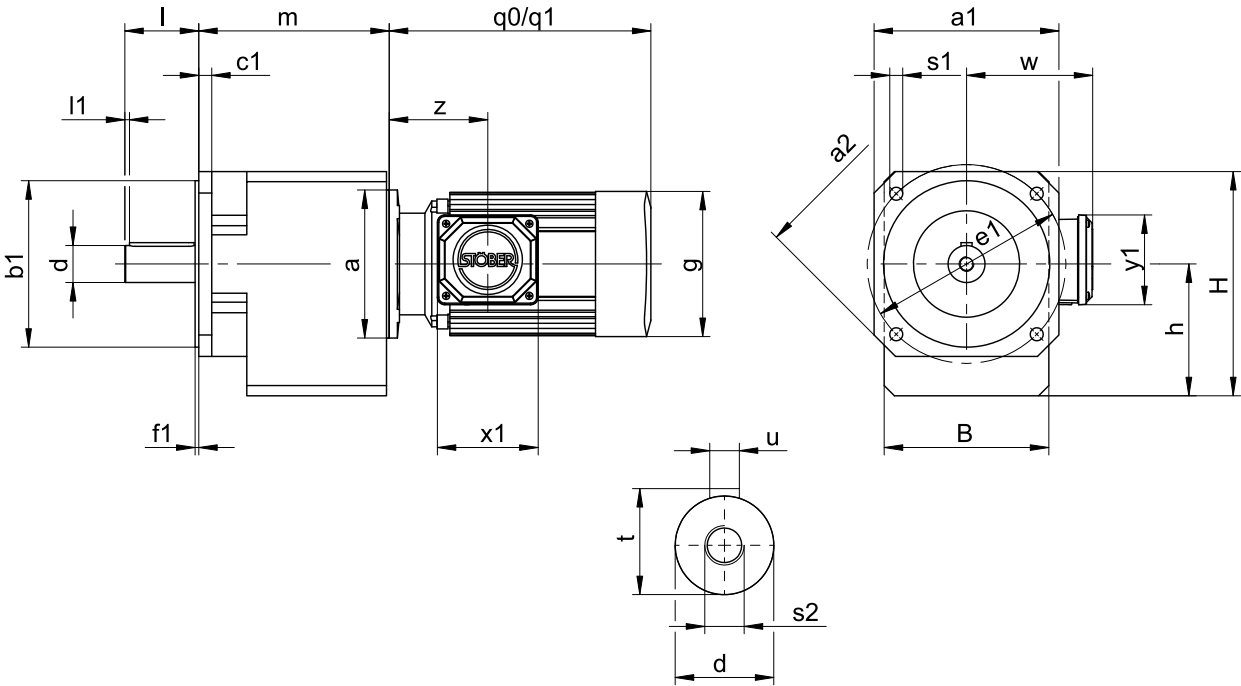
| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

## Dimensions of geared motors

| Type | IE3D063 |     | IE3D071 |     | IE3D080 |     | IE3D090 |     | IE3D100 |     |
|------|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
|      | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   |
| C002 | Ø140    | 114 | Ø140    | 114 | Ø160    | 118 | Ø160    | 118 | –       | –   |
| C102 | Ø140    | 137 | Ø140    | 137 | Ø160    | 141 | Ø160    | 141 | Ø200    | 143 |
| C103 | Ø140    | 174 | Ø140    | 174 | –       | –   | –       | –   | –       | –   |
| C202 | Ø140    | 155 | Ø140    | 155 | Ø160    | 159 | Ø160    | 159 | Ø200    | 161 |
| C203 | Ø140    | 192 | Ø140    | 192 | –       | –   | –       | –   | –       | –   |
| C302 | –       | –   | –       | –   | Ø160    | 178 | Ø160    | 178 | Ø200    | 180 |
| C303 | –       | –   | Ø140    | 211 | Ø160    | 221 | –       | –   | –       | –   |
| C402 | –       | –   | –       | –   | Ø160    | 206 | Ø160    | 206 | Ø200    | 208 |
| C403 | –       | –   | –       | –   | Ø160    | 249 | Ø160    | 249 | –       | –   |
| C502 | –       | –   | –       | –   | Ø160    | 227 | Ø160    | 227 | Ø200    | 229 |
| C503 | –       | –   | –       | –   | Ø160    | 270 | Ø160    | 270 | –       | –   |
| C612 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 233 |
| C613 | –       | –   | –       | –   | Ø160    | 275 | Ø160    | 275 | Ø200    | 295 |
| C712 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 266 |
| C713 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 327 |
| C813 | –       | –   | –       | –   | –       | –   | –       | –   | Ø200    | 374 |

| Type | IE3D112 |     | IE3D132 |     | IE3D160 |     | IE3D180 |     | IE3D200 |     | IE3D225 |     |
|------|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
|      | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   |
| C102 | Ø200    | 143 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C202 | Ø200    | 161 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C302 | Ø200    | 180 | Ø250    | 183 | –       | –   | –       | –   | –       | –   | –       | –   |
| C402 | Ø200    | 208 | Ø250    | 211 | –       | –   | –       | –   | –       | –   | –       | –   |
| C502 | Ø200    | 229 | Ø250    | 232 | Ø300    | 246 | Ø300    | 246 | –       | –   | –       | –   |
| C612 | Ø200    | 233 | Ø250    | 236 | Ø300    | 249 | Ø300    | 249 | –       | –   | –       | –   |
| C613 | Ø200    | 295 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C712 | Ø200    | 266 | Ø250    | 268 | Ø300    | 281 | Ø300    | 281 | –       | –   | –       | –   |
| C713 | Ø200    | 327 | Ø250    | 339 | –       | –   | –       | –   | –       | –   | –       | –   |
| C812 | –       | –   | Ø250    | 315 | Ø300    | 328 | Ø300    | 328 | Ø350    | 351 | –       | –   |
| C813 | Ø200    | 374 | Ø250    | 386 | –       | –   | –       | –   | –       | –   | –       | –   |
| C912 | –       | –   | –       | –   | Ø300    | 365 | Ø300    | 365 | Ø350    | 388 | Ø400    | 388 |
| C913 | –       | –   | Ø250    | 423 | Ø300    | 448 | Ø300    | 448 | –       | –   | –       | –   |

2.3.4 Solid shaft design with feather key, Q housing design (square flange)



q0 Applies to motors without brake.
q1 Applies to motors with brake.

C203, C303, C612, C613: Motor adapter and gear unit are sometimes non-coaxial.

Options: C0 – C5 also available with solid shaft without feather key; on request starting at C6.

Dimensions of gear units

| Type | □a1 | □a2 | Øb1               | B   | c1 | Ød               | Øe1 | f1  | h     | H     | l  | l1 | Øs1 | s2  | t    | u        |
|------|-----|-----|-------------------|-----|----|------------------|-----|-----|-------|-------|----|----|-----|-----|------|----------|
| C0   | 124 | 160 | 110 <sub>js</sub> | 97  | 9  | 20 <sub>k6</sub> | 130 | 3.0 | 79.0  | 141.0 | 40 | 3  | 9   | M6  | 22.5 | A6×6×32  |
| C1   | 145 | 192 | 130 <sub>js</sub> | 130 | 11 | 25 <sub>k6</sub> | 165 | 3.5 | 100.0 | 175.0 | 50 | 5  | 11  | M10 | 28.0 | A8×7×40  |
| C2   | 145 | 192 | 130 <sub>js</sub> | 142 | 11 | 30 <sub>k6</sub> | 165 | 3.5 | 112.0 | 192.0 | 60 | 5  | 11  | M10 | 33.0 | A8×7×50  |
| C3   | 200 | 250 | 180 <sub>js</sub> | 154 | 14 | 30 <sub>k6</sub> | 215 | 4.0 | 127.0 | 212.0 | 60 | 5  | 14  | M10 | 33.0 | A8×7×50  |
| C4   | 200 | 250 | 180 <sub>js</sub> | 178 | 14 | 40 <sub>k6</sub> | 215 | 4.0 | 142.5 | 242.5 | 80 | 5  | 14  | M16 | 43.0 | A12×8×70 |

Dimensions of motors

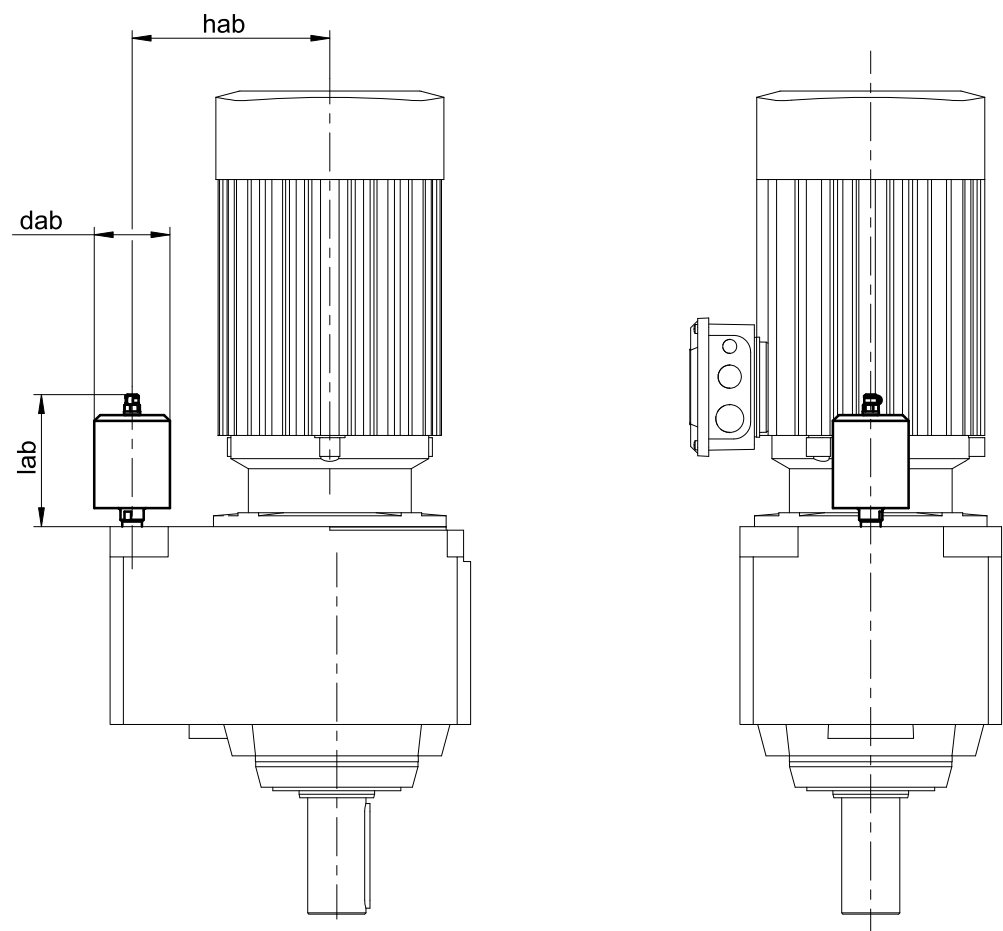
| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |



## Dimensions of geared motors

| Type | IE3D063 |     | IE3D071 |     | IE3D080 |     | IE3D090 |     | IE3D100 |     | IE3D112 |     | IE3D132 |     |
|------|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
|      | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   | a       | m   |
| C002 | Ø140    | 114 | Ø140    | 114 | Ø160    | 118 | Ø160    | 118 | –       | –   | –       | –   | –       | –   |
| C102 | Ø140    | 137 | Ø140    | 137 | Ø160    | 141 | Ø160    | 141 | Ø200    | 143 | Ø200    | 143 | –       | –   |
| C103 | Ø140    | 174 | Ø140    | 174 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C202 | Ø140    | 155 | Ø140    | 155 | Ø160    | 159 | Ø160    | 159 | Ø200    | 161 | Ø200    | 161 | –       | –   |
| C203 | Ø140    | 192 | Ø140    | 192 | –       | –   | –       | –   | –       | –   | –       | –   | –       | –   |
| C302 | –       | –   | –       | –   | Ø160    | 178 | Ø160    | 178 | Ø200    | 180 | Ø200    | 180 | Ø250    | 183 |
| C303 | –       | –   | Ø140    | 211 | Ø160    | 221 | –       | –   | –       | –   | –       | –   | –       | –   |
| C402 | –       | –   | –       | –   | Ø160    | 206 | Ø160    | 206 | Ø200    | 208 | Ø200    | 208 | Ø250    | 211 |
| C403 | –       | –   | –       | –   | Ø160    | 249 | Ø160    | 249 | –       | –   | –       | –   | –       | –   |

2.3.5 Oil expansion tank



Dimensions

| Type | IE3D100 |     |       | IE3D112 |     |       | IE3D132 |     |       | IE3D160 |     |       | IE3D180 |     |       | IE3D200 |     |       |
|------|---------|-----|-------|---------|-----|-------|---------|-----|-------|---------|-----|-------|---------|-----|-------|---------|-----|-------|
|      | dab     | hab | lab   | dab     | hab | lab   | dab     | hab | lab   | dab     | hab | lab   | dab     | hab | lab   | dab     | hab | lab   |
| C612 | 65      | 170 | 114.5 | 65      | 170 | 114.5 | 65      | 170 | 115.5 | 65      | 214 | 191.5 | 65      | 214 | 191.5 | –       | –   | –     |
| C712 | 73      | 205 | 129.5 | 73      | 205 | 129.5 | 73      | 205 | 129.5 | 73      | 205 | 129.5 | 73      | 205 | 129.5 | –       | –   | –     |
| C812 | –       | –   | –     | –       | –   | –     | 73      | 255 | 129.5 | 73      | 255 | 129.5 | 73      | 255 | 129.5 | 73      | 255 | 129.5 |
| C912 | –       | –   | –     | –       | –   | –     | –       | –   | –     | 73      | 305 | 126.0 | 73      | 305 | 126.0 | 73      | 305 | 112.0 |

More information can be found in the chapter
[▶ 2.6.3](#)

## 2.4 Type designation

In this chapter, you can find an explanation of the type designation with the associated options.  
Additional ordering information not included in the type designation can be found at the end of the chapter.

Sample code

|   |   |   |   |   |      |            |
|---|---|---|---|---|------|------------|
| C | 2 | 0 | 2 | N | 0280 | IE3D080L04 |
|---|---|---|---|---|------|------------|

Explanation

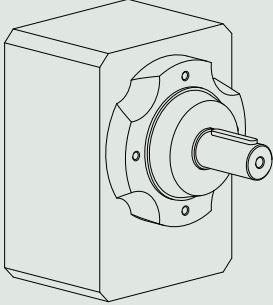
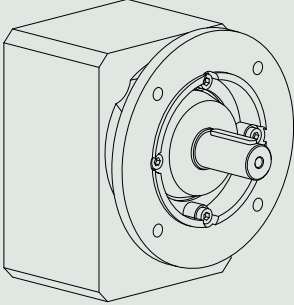
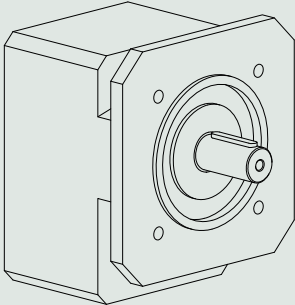
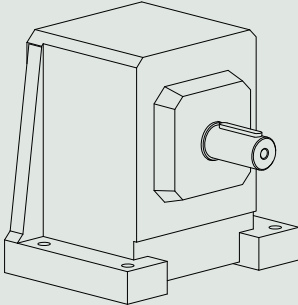
| Code       | Designation                         | Design                  |
|------------|-------------------------------------|-------------------------|
| C          | Type                                | Helical gear unit       |
| 2          | Size                                | 2 (example)             |
| 0          | Generation                          | Generation 0            |
| 1          |                                     | Generation 1            |
| 2          | Stages                              | Two-stage               |
| 3          |                                     | Three-stage             |
| G          | Housing                             | Pitch circle diameter   |
| F          |                                     | Round flange            |
| Q          |                                     | Square flange           |
| N          |                                     | Foot                    |
| 0280       | Transmission ratio (i x 10 rounded) | i = 28.24 (example)     |
| IE3D080L04 | Motor                               | IE3D asynchronous motor |

In order to complete the type designation, also specify:

- A detailed type designation of the motor, see the chapter [▶ 5.4](#)
- The mounting position, see the chapter [▶ 2.5.4](#)
- The position of the terminal box, see the chapter [▶ 2.5.6](#)
- Oil expansion tank (recommended for gear units in mounting position EL5), see the chapter [▶ 2.6.3](#)
- Standard or reinforced output bearing

2.5
Product description

2.5.1
Housing design

| Pitch circle diameter G                                                            |   | Round flange F                                                                       |   |   |
|------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------|---|---|
|   |   |   |   |   |
| Square flange Q                                                                    |   | Foot N                                                                               |   |   |
|  |   |  |   |   |
|                                                                                    | G | F                                                                                    | Q | N |
| C0                                                                                 | ✓ | ✓                                                                                    | ✓ | ✓ |
| C1                                                                                 | ✓ | ✓                                                                                    | ✓ | ✓ |
| C2                                                                                 | ✓ | ✓                                                                                    | ✓ | ✓ |
| C3                                                                                 | ✓ | ✓                                                                                    | ✓ | ✓ |
| C4                                                                                 | ✓ | ✓                                                                                    | ✓ | ✓ |
| C5                                                                                 | ✓ | ✓                                                                                    | – | ✓ |
| C6                                                                                 | ✓ | ✓                                                                                    | – | ✓ |
| C7                                                                                 | ✓ | ✓                                                                                    | – | ✓ |
| C8                                                                                 | ✓ | ✓                                                                                    | – | ✓ |
| C9                                                                                 | ✓ | ✓                                                                                    | – | ✓ |

2.5.2
Shaft design

Gear units in sizes C0 – C9 come standard with a solid shaft with feather key.

Gear units in sizes C0 – C5 can be ordered with the option of a solid shaft without feather key. Only upon request starting at size C6.

2.5.3
Installation conditions

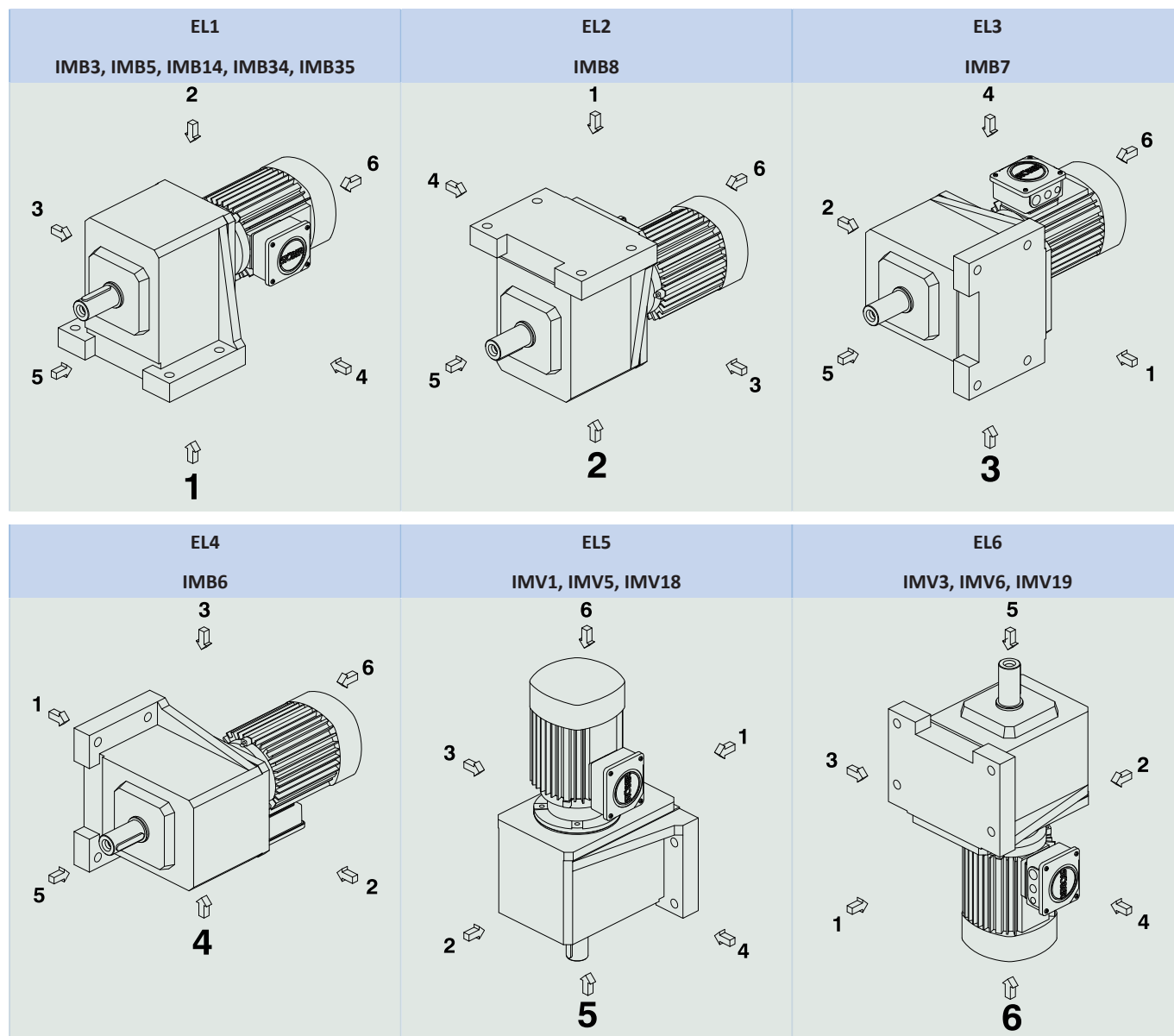
**Fastening the gear units on the machine side using the pitch circle diameter**

The specified torques and forces only apply when gear units are fastened on the machine side using screws of strength class 10.9. In addition, the gear housings must be adjusted at the pilot. The machine-side fit must be H7.

## 2.5.4 Mounting positions

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.



Since the lubricant filling volume of the gear unit depends on the mounting position, the mounting position must be specified when ordering.

## 2.5.5 Lubricants

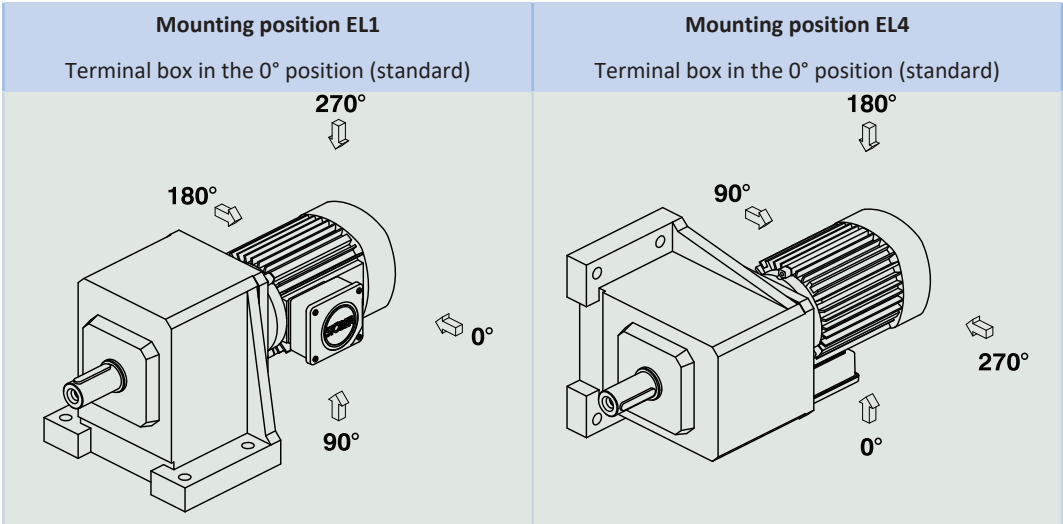
STOBER fills the gear units with the amount and type of lubricant specified on the nameplate. The filling volume and the structure of the gear units depend on the mounting position.

Only install the gear units in the intended mounting position! Reposition the gear units only after consulting STOBER. Otherwise, STOBER assumes no liability for the gear units.

You will receive lubricants for use in the food industry upon request.



2.5.6
Position of the terminal box



Indicate variations for your geared motor in the purchase order.  
 Note that the terminal box position rotates along with the geared motor if the geared motor rotates to another mounting position.

2.5.7
Other product features

| Feature                                                                | Value                                                                                    |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Max. permitted gear unit temperature (on the surface of the gear unit) | ≤ 80 °C                                                                                  |
| Paint                                                                  | RAL 7001 Silver gray<br>Optional selection of various RAL colors.                        |
| (ATEX) Directive 2014/34/EU                                            | You can get asynchronous motors for use in potentially explosive atmospheres on request. |
| Efficiency:                                                            |                                                                                          |
| η <sub>get</sub> two-stage                                             | 97%                                                                                      |
| η <sub>get</sub> three-stage                                           | 96%                                                                                      |
| Protection class                                                       | IP56                                                                                     |

2.5.8
Losses due to splashing

Increased losses due to splashing can occur in individual cases under certain operating conditions. These can lead to oil leakage or unacceptably high operating temperatures.

Please coordinate with STOBER to determine a suitable course of action if:

- The surrounding temperature is under −10 °C or over +40 °C
- The gear unit type meets the following conditions:

| Type   | Mounting position | n <sub>1N</sub><br>[rpm] | ED              | i    |
|--------|-------------------|--------------------------|-----------------|------|
| C6, C7 | EL5, EL6          | > 2500                   | > 60%, > 20 min | < 10 |
| C8, C9 | EL5, EL6          | > 2000                   | > 60%, > 20 min | < 10 |

2.5.9
Maintenance

The instructions for maintenance can be found in the operating manual, ID 443027\_en, at <http://www.stoeb.de/en/downloads/>. Enter the ID of the documentation in the Search... field.

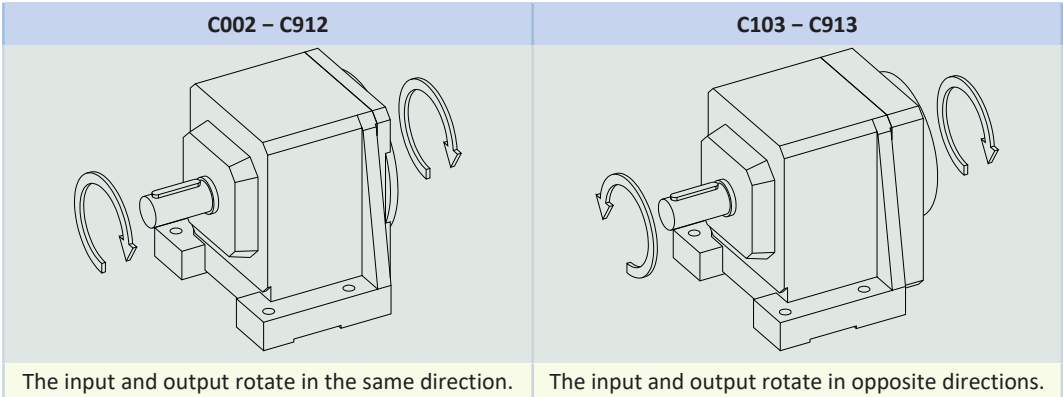
Ventilation

Air release valves are fitted as a standard feature and independently of installation position for gear unit sizes C6 to C9.

For the position and dimensions of the air release valve, refer to the 3D model.

Download the 3D model at <http://configurator.stoerber.de>.

2.5.10 Direction of rotation



The pictures show mounting position EL1.

2.6 Project configuration

Project your drives using the information in this chapter. In doing so, observe the limit conditions in this chapter to ensure a safe design.

An explanation of the formula symbols can be found in Chapter [13.1](#)

Determine the following for your application:

- The actual torque  $M_{2N^*}$
- The actual speed  $n_{2^*}$
- The operating mode operating factor  $fB_{op}$
- The runtime operating factor  $fB_t$
- The motor operating factor  $fB_{mot}$
- The duty cycle ED in %

$$ED = \frac{t_{op}}{T} \cdot 100\%$$

For the S4 and S8 operating mode:

- The mass moment of inertia  $J_{2^*}$

$$J_{1^*} = \frac{J_{2^*}}{i^2}$$

Calculate the motor rating necessary for your application:

$$P_{N^*} = \frac{M_{2N^*} \cdot n_{2^*} \cdot fB_{mot}}{9550}$$

Using the determined values and the calculated motor rating, select a suitable drive from the selection table.

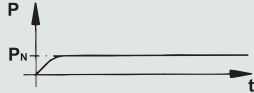
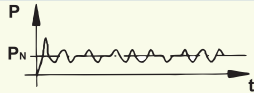
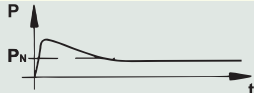
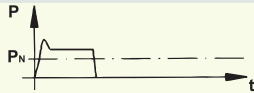
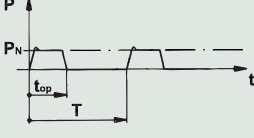
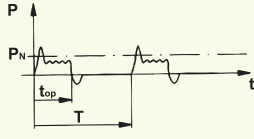
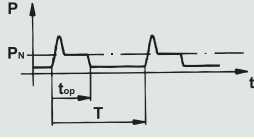
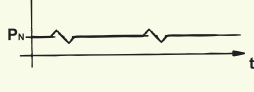
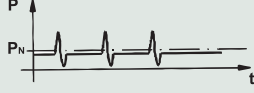
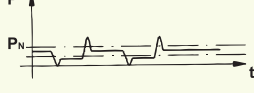
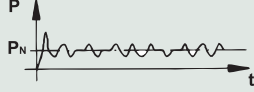
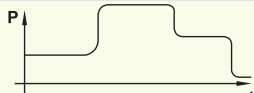
Then check the following conditions:

$$M_{2N^*} \cdot fB_{op} \cdot fB_t < M_{2N} \cdot S$$

$$P_N^* < P_N$$

Operating factors

| Run time             | $fB_t$ |
|----------------------|--------|
| Daily runtime ≤ 8 h  | 1.00   |
| Daily runtime ≤ 16 h | 1.15   |
| Daily runtime ≤ 24 h | 1.20   |

| Operating mode                                                                                                                                                                                                                                                   | Characteristic output curve                                                          | ED          | $fb_{op}$                                                  | $fb_{mot}$                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------|------------------------------------------------------------|------------------------------------------------------------|
| <b>S1</b> Continuous operation with soft start <ul style="list-style-type: none"> <li>Start time up to 30 s</li> </ul>                                                                                                                                           |    | 100 %       | 1.00                                                       | 1.00                                                       |
| <b>S1</b> Continuous operation with normal start <ul style="list-style-type: none"> <li>Asynchronous motors with direct switch-on or dynamic loading</li> <li>Start time up to 30 s</li> </ul>                                                                   |    | 100 %       | 1.25                                                       | 1.00                                                       |
| <b>S1</b> Continuous operation with high-load start <ul style="list-style-type: none"> <li>Start time up to 30 s</li> </ul>                                                                                                                                      |    | 100 %       | 1.25                                                       | 1.25                                                       |
| <b>S2</b> brief operation <ul style="list-style-type: none"> <li>Operating time <math>t_{op} \leq 3</math> minutes</li> </ul>                                                                                                                                    |    | $\leq 30$ % | 0.75                                                       | 0.75                                                       |
| <b>S3</b> Periodic cyclic operation <ul style="list-style-type: none"> <li>Cycle time <math>T \leq 10</math> minutes</li> <li>Cyclic operation with braking motor</li> <li>Low additional flywheel weights<br/><math>J_{1*} &lt; 0,5 \cdot J_1</math></li> </ul> |    | $\leq 25$ % | 0.70                                                       | 0.70                                                       |
|                                                                                                                                                                                                                                                                  |                                                                                      | $\leq 40$ % | 1.00                                                       | 1.00                                                       |
|                                                                                                                                                                                                                                                                  |                                                                                      | $\leq 60$ % | 1.25                                                       | 1.25                                                       |
| <b>S4</b> Periodic cyclic operation with the effect of the start-up process <ul style="list-style-type: none"> <li>Cycle time <math>T \leq 10</math> minutes</li> <li>Cyclic operation with braking motor</li> <li>Larger additional flywheel weights</li> </ul> |   | 40 %        | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | 1.40                                                       |
| <b>S6</b> Uninterrupted periodic operation                                                                                                                                                                                                                       |  | 100 %       | 1.25                                                       | 1.00                                                       |
| <b>S6</b> Uninterrupted periodic operation with short-term loading <ul style="list-style-type: none"> <li>Low speeds</li> <li>Low additional flywheel weights<br/><math>J_{1*} &lt; 0,5 \cdot J_1</math></li> </ul>                                              |  | 100 %       | 1.40                                                       | 1.00                                                       |
| <b>S6</b> Uninterrupted periodic operation with impact loading <ul style="list-style-type: none"> <li>High speeds</li> <li>Large additional flywheel weights</li> </ul>                                                                                          |  | 100 %       | 1.60                                                       | 1.25                                                       |
| <b>S8</b> Uninterrupted periodic operation <ul style="list-style-type: none"> <li>With load changes</li> <li>With speed changes</li> </ul>                                                                                                                       |  | 100 %       | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | $J_{1*} \leq J_1: 1.25$<br>$J_{1*} \sim 3 \cdot J_1: 1.40$ |
| <b>S9</b> Non-periodic operation <ul style="list-style-type: none"> <li>With load changes</li> <li>With speed changes</li> </ul>                                                                                                                                 |  | 100 %       | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | $J_{1*} \leq J_1: 1.25$<br>$J_{1*} \sim 3 \cdot J_1: 1.40$ |
| <b>S10</b> Operation with individual constant loads                                                                                                                                                                                                              |  | 100 %       | 1.00                                                       | 1.00                                                       |

Tab. 1: Operating factors for operating modes S1 to S10

## 2.6.1 Permitted shaft loads for the output shaft

The values specified in the tables apply to the permitted shaft loads:

- For shaft dimensions in accordance with the catalog
- For output speeds  $n_{2m^*} \leq 20$  rpm ( $F_{2axN} = F_{2ax20}$ ;  $F_{2radN} = F_{2rad20}$ ;  $M_{2kN} = M_{2k20}$ )
- Only if radial forces on the gear unit are stabilized by its pilots for the pitch circle diameter and flange housing design

### Permitted shaft loads

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| C0   | 20.0          | 500                | 1900                | 1900                  | 80                 | 80                   |
| C1   | 30.0          | 850                | 3400                | 3400                  | 190                | 190                  |
| C2   | 30.0          | 1050               | 4200                | 4200                  | 260                | 260                  |
| C3   | 30.0          | 1400               | 5650                | 5650                  | 350                | 350                  |
| C4   | 35.0          | 2400               | 9700                | 9700                  | 750                | 750                  |
| C5   | 42.0          | 3000               | 11000               | 11000                 | 900                | 900                  |
| C6   | 40.0          | 4000               | 16000               | 16000                 | 1500               | 1500                 |
| C7   | 45.0          | 5500               | 22000               | 22000                 | 2400               | 2400                 |
| C8   | 50.0          | 7500               | 30000               | 30000                 | 3700               | 3700                 |
| C9   | 55.0          | 9500               | 37000               | 37000                 | 5200               | 5200                 |

For other output speeds, download diagrams at <http://configurator.stoeber.de>.

The following applies to output speeds  $n_{2m^*} > 20$  rpm:

$$F_{2axN} = \frac{F_{2ax20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad F_{2radN} = \frac{F_{2rad20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad M_{2kN} = \frac{M_{2k20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}}$$

The values for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  can be found in the table "Permitted shaft loads" in this chapter.

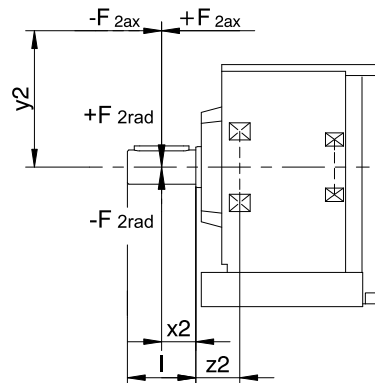


Fig. 1: Force application points

The specified values for  $F_{2rad20}$  are based on application of force at the middle of the output shaft:  $x_2 = l/2$ .

Shaft dimensions can be found in the "Dimensional drawings" chapter.

The following applies to other force application points:

$$M_{2k^*} = \frac{2 \cdot F_{2ax^*} \cdot y_2 + F_{2rad^*} \cdot (x_2 + z_2)}{1000} \leq M_{2kN}$$

$$F_{2rad^*} \leq F_{2radN}$$

$$F_{2ax^*} \leq F_{2axN}$$

For applications with multiple axial and/or radial forces, you must add the forces as vectors.

In the event of EMERGENCY OFF operation (max. 1000 load changes), you can multiply the permitted forces and torques for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  by a factor of two.

### 2.6.2 Radial shaft seal rings

**Leak-proofness**

Our gear units are equipped with high-quality radial shaft seal rings and checked for leaks. However, a leak cannot be fully ruled out over the length of use of a gear unit. If you use a gear unit with goods incompatible with the lubricant, you must take measures to prevent direct contact with the gear unit lubricant in case of a leak.

### 2.6.3 Oil expansion tank

The gear units have a higher fill level in mounting position EL5. The oil expansion tank prevents oil from escaping out of the gear unit.

**Notes**

- We recommend using an oil expansion tank in mounting position EL5 (additional cost) for fast running gear units with an input speed  $n_1 > 1750$  rpm and gear ratios  $i < 20$ .
- It is not possible to use an oil expansion tank if the terminal box is at 90°!
- The oil expansion tank can only be used with certain sizes; see the chapter [\[► 2.3.5\]](#)

## 2.7 Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

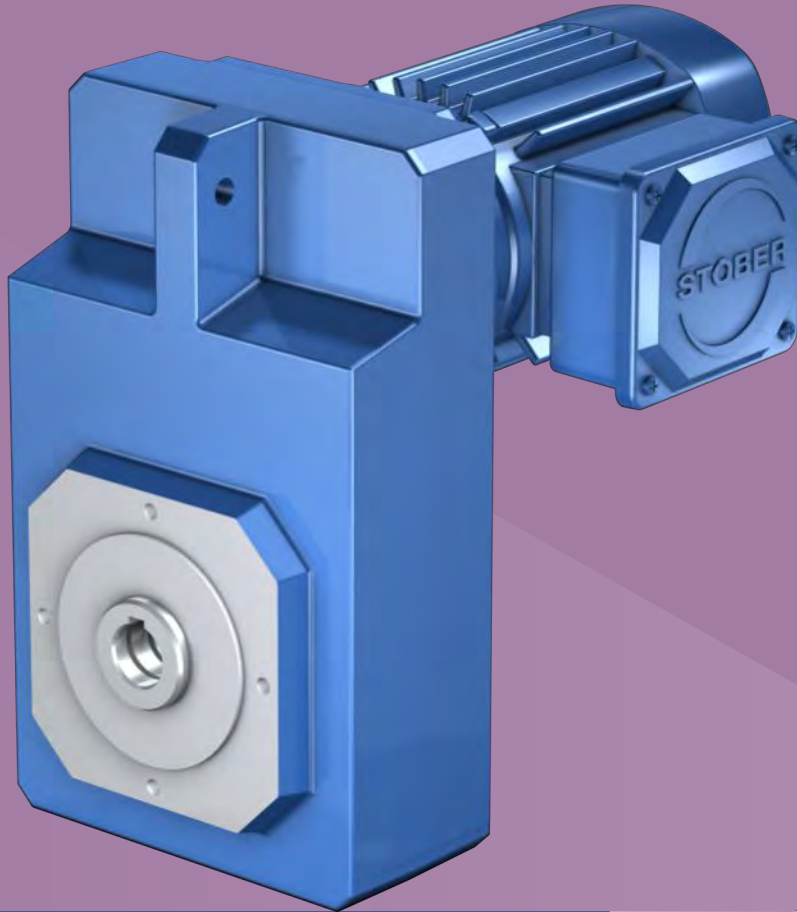
| Documentation                                           | ID        |
|---------------------------------------------------------|-----------|
| Operating manual for C/F/K/S gear units and gear motors | 443027_en |

## 3 F offset helical geared motors

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3

## Offset helical geared motors

F

### 3.1 Overview

Offset helical geared motors with large axial distances

#### Features

|                                                              |       |
|--------------------------------------------------------------|-------|
| Power density                                                | ★☆☆☆☆ |
| Backlash                                                     | ★★★★☆ |
| Price category                                               | €     |
| Shaft load                                                   | ★★★★☆ |
| Smooth operation                                             | ★★★★☆ |
| Torsional stiffness                                          | ★★☆☆☆ |
| Mass moment of inertia                                       | ★★★★★ |
| Helical gearing                                              | ✓     |
| Maintenance-free                                             | ✓     |
| FKM seal ring at the input                                   | ✓     |
| Large axial distances, suitable for confined situations      | ✓     |
| Energy efficiency class IE3 in accordance with EN 60034-30-1 | ✓     |

Key: ★☆☆☆☆ good | ★★★★★ excellent  
€ Economy | €€€€€ Premium

#### Technical data

|                     |               |
|---------------------|---------------|
| $P_N$               | 0.12 – 7.5 kW |
| $i$                 | 4.3 – 547     |
| $M_{2N}$            | 5.1 – 1338 Nm |
| $\eta_{\text{get}}$ | 96 – 97 %     |

## 3.2 Selection tables

The technical data specified in the selection tables applies to:

- Installation altitudes up to 1000 m above sea level
- Surrounding temperatures from 0 °C to 40 °C
- Drives with self-ventilated motors
- Weight specification for mounting position EL1, housing design G

You can receive asynchronous geared motors with low output speed on request.

Asynchronous geared motors are ideal for operation on a drive controller (87 Hz). More information can be found in chapter [▶ 5.6.2](#)

For all other technical data, refer to <http://configurator.stoeber.de>.

An explanation of the formula symbols can be found in the chapter [▶ 13.1](#).

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 0,12 kW, <math>P_N</math> (87 Hz) = 0,21 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 10                                                                            | 1.1        | 17                      | 1.1        | 111              | F102_1400 IE3D063K04 | 17.5      | 139.8 | 559/4              | 4.0                           |
| 13                                                                            | 1.3        | 22                      | 1.3        | 89               | F102_1120 IE3D063K04 | 17.5      | 111.9 | 2015/18            | 4.0                           |
| 15                                                                            | 1.6        | 26                      | 1.6        | 74               | F102_0940 IE3D063K04 | 17.5      | 93.63 | 7865/84            | 4.0                           |
| 20                                                                            | 2.2        | 35                      | 2.2        | 56               | F102_0700 IE3D063K04 | 17.5      | 70.06 | 1261/18            | 4.0                           |
| 25                                                                            | 2.7        | 43                      | 2.7        | 45               | F102_0560 IE3D063K04 | 17.5      | 55.97 | 2015/36            | 4.1                           |
| 30                                                                            | 3.2        | 52                      | 3.2        | 37               | F102_0460 IE3D063K04 | 17.5      | 46.43 | 325/7              | 4.1                           |
| 40                                                                            | 4.3        | 69                      | 4.2        | 28               | F102_0350 IE3D063K04 | 17.5      | 35.05 | 3575/102           | 4.1                           |
| 50                                                                            | 5.4        | 86                      | 4.9        | 22               | F102_0280 IE3D063K04 | 17.5      | 28.17 | 169/6              | 4.2                           |
| 61                                                                            | 6.5        | 105                     | 5.6        | 18               | F102_0230 IE3D063K04 | 17.5      | 23.08 | 3185/138           | 4.2                           |
| 76                                                                            | 7.3        | 131                     | 6.5        | 15               | F102_0185 IE3D063K04 | 17.5      | 18.46 | 1495/81            | 4.3                           |
| 103                                                                           | 7.3        | 178                     | 7.3        | 11               | F102_0135 IE3D063K04 | 17.5      | 13.59 | 231/17             | 4.2                           |
| 128                                                                           | 7.3        | 222                     | 7.3        | 8.7              | F102_0110 IE3D063K04 | 17.5      | 10.92 | 273/25             | 4.3                           |
| 156                                                                           | 7.3        | 271                     | 7.3        | 7.1              | F102_0089 IE3D063K04 | 17.5      | 8.948 | 1029/115           | 4.4                           |
| <b><math>P_N</math> (50 Hz) = 0,18 kW, <math>P_N</math> (87 Hz) = 0,31 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 3.9                                                                           | 0.94       | 6.7                     | 0.94       | 424              | F303_3670 IE3D063M04 | 39.0      | 366.8 | 99029/270          | 5.1                           |
| 5.1                                                                           | 1.3        | 8.9                     | 1.3        | 319              | F303_2760 IE3D063M04 | 39.0      | 275.6 | 32242/117          | 5.1                           |
| 6.4                                                                           | 0.93       | 11                      | 0.93       | 257              | F203_2220 IE3D063M04 | 29.4      | 222.2 | 2444/11            | 5.1                           |
| 6.4                                                                           | 1.6        | 11                      | 1.6        | 256              | F303_2210 IE3D063M04 | 39.0      | 221.2 | 191149/864         | 5.1                           |
| 7.7                                                                           | 1.9        | 13                      | 1.9        | 214              | F303_1850 IE3D063M04 | 39.0      | 184.8 | 29939/162          | 5.1                           |
| 7.7                                                                           | 1.1        | 13                      | 1.1        | 213              | F203_1840 IE3D063M04 | 29.4      | 184.3 | 16215/88           | 5.1                           |
| 10                                                                            | 1.5        | 17                      | 1.5        | 165              | F202_1410 IE3D063M04 | 26.5      | 140.9 | 1550/11            | 5.0                           |
| 10                                                                            | 2.4        | 17                      | 2.4        | 165              | F302_1410 IE3D063M04 | 34.1      | 140.6 | 7595/54            | 5.1                           |
| 13                                                                            | 1.8        | 22                      | 1.8        | 132              | F202_1130 IE3D063M04 | 26.5      | 112.7 | 1240/11            | 5.1                           |
| 13                                                                            | 0.91       | 22                      | 0.91       | 131              | F102_1120 IE3D063M04 | 18.3      | 111.9 | 2015/18            | 5.0                           |
| 15                                                                            | 1.1        | 26                      | 1.1        | 110              | F102_0940 IE3D063M04 | 18.3      | 93.63 | 7865/84            | 5.0                           |
| 15                                                                            | 2.2        | 26                      | 2.2        | 110              | F202_0940 IE3D063M04 | 26.5      | 93.82 | 1032/11            | 5.1                           |
| 20                                                                            | 1.5        | 35                      | 1.5        | 82               | F102_0700 IE3D063M04 | 18.3      | 70.06 | 1261/18            | 5.0                           |
| 20                                                                            | 2.9        | 35                      | 2.9        | 82               | F202_0700 IE3D063M04 | 26.5      | 70.13 | 5400/77            | 5.1                           |
| 25                                                                            | 1.8        | 44                      | 1.8        | 66               | F102_0560 IE3D063M04 | 18.3      | 55.97 | 2015/36            | 5.1                           |
| 30                                                                            | 4.3        | 52                      | 4.3        | 55               | F202_0470 IE3D063M04 | 26.5      | 47.05 | 1035/22            | 5.2                           |
| 30                                                                            | 2.2        | 53                      | 2.2        | 54               | F102_0460 IE3D063M04 | 18.3      | 46.43 | 325/7              | 5.1                           |
| 40                                                                            | 2.9        | 70                      | 2.8        | 41               | F102_0350 IE3D063M04 | 18.3      | 35.05 | 3575/102           | 5.1                           |
| 50                                                                            | 3.6        | 87                      | 3.3        | 33               | F102_0280 IE3D063M04 | 18.3      | 28.17 | 169/6              | 5.2                           |
| 61                                                                            | 4.4        | 106                     | 3.8        | 27               | F102_0230 IE3D063M04 | 18.3      | 23.08 | 3185/138           | 5.2                           |
| 77                                                                            | 5.0        | 133                     | 4.4        | 22               | F102_0185 IE3D063M04 | 18.3      | 18.46 | 1495/81            | 5.3                           |
| 104                                                                           | 5.0        | 180                     | 5.0        | 16               | F102_0135 IE3D063M04 | 18.3      | 13.59 | 231/17             | 5.2                           |
| 130                                                                           | 5.0        | 224                     | 5.0        | 13               | F102_0110 IE3D063M04 | 18.3      | 10.92 | 273/25             | 5.3                           |
| 158                                                                           | 5.0        | 274                     | 5.0        | 11               | F102_0089 IE3D063M04 | 18.3      | 8.948 | 1029/115           | 5.4                           |
| 198                                                                           | 5.0        | 342                     | 5.0        | 8.4              | F102_0072 IE3D063M04 | 18.3      | 7.156 | 322/45             | 5.6                           |
| 328                                                                           | 5.0        | 569                     | 5.0        | 5.1              | F102_0043 IE3D063M04 | 18.3      | 4.308 | 56/13              | 6.5                           |
| <b><math>P_N</math> (50 Hz) = 0,25 kW, <math>P_N</math> (87 Hz) = 0,43 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 2.6                                                                           | 0.80       | 4.5                     | 0.80       | 874              | F403_5470 IE3D071K04 | 49.4      | 547.4 | 26273/48           | 8.8                           |
| 3.3                                                                           | 1.0        | 5.6                     | 1.0        | 702              | F403_4400 IE3D071K04 | 49.4      | 439.7 | 58045/132          | 8.8                           |
| 3.9                                                                           | 1.2        | 6.8                     | 1.2        | 584              | F403_3660 IE3D071K04 | 49.4      | 365.6 | 3290/9             | 8.8                           |
| 5.2                                                                           | 0.91       | 9.0                     | 0.91       | 440              | F303_2760 IE3D071K04 | 41.8      | 275.6 | 32242/117          | 8.8                           |
| 5.2                                                                           | 1.6        | 9.0                     | 1.6        | 438              | F403_2740 IE3D071K04 | 49.4      | 274.4 | 59267/216          | 8.8                           |
| 6.5                                                                           | 1.1        | 11                      | 1.1        | 353              | F303_2210 IE3D071K04 | 41.8      | 221.2 | 191149/864         | 8.8                           |
| 6.5                                                                           | 2.0        | 11                      | 2.0        | 350              | F403_2190 IE3D071K04 | 49.4      | 219.2 | 94705/432          | 8.8                           |
| 7.7                                                                           | 1.4        | 13                      | 1.4        | 295              | F303_1850 IE3D071K04 | 41.8      | 184.8 | 29939/162          | 8.8                           |

### 3.2 Selection tables 3 F offset helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 0,25 kW, <math>P_N</math> (87 Hz) = 0,43 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 7.8                                                                           | 0.82       | 13                      | 0.82       | 294              | F203_1840 IE3D071K04 | 32.2      | 184.3 | 16215/88           | 8.8                           |
| 7.8                                                                           | 2.4        | 13                      | 2.4        | 294              | F403_1840 IE3D071K04 | 49.4      | 183.9 | 39715/216          | 8.8                           |
| 10                                                                            | 1.1        | 18                      | 1.1        | 228              | F202_1410 IE3D071K04 | 29.3      | 140.9 | 1550/11            | 8.7                           |
| 10                                                                            | 1.8        | 18                      | 1.8        | 228              | F302_1410 IE3D071K04 | 36.9      | 140.6 | 7595/54            | 8.8                           |
| 13                                                                            | 1.3        | 22                      | 1.3        | 183              | F202_1130 IE3D071K04 | 29.3      | 112.7 | 1240/11            | 8.8                           |
| 15                                                                            | 1.6        | 26                      | 1.6        | 152              | F202_0940 IE3D071K04 | 29.3      | 93.82 | 1032/11            | 8.8                           |
| 20                                                                            | 1.1        | 35                      | 1.1        | 113              | F102_0700 IE3D071K04 | 21.1      | 70.06 | 1261/18            | 8.7                           |
| 20                                                                            | 2.1        | 35                      | 2.1        | 114              | F202_0700 IE3D071K04 | 29.3      | 70.13 | 5400/77            | 8.8                           |
| 26                                                                            | 1.3        | 44                      | 1.3        | 91               | F102_0560 IE3D071K04 | 21.1      | 55.97 | 2015/36            | 8.8                           |
| 30                                                                            | 3.1        | 53                      | 3.1        | 76               | F202_0470 IE3D071K04 | 29.3      | 47.05 | 1035/22            | 8.9                           |
| 31                                                                            | 1.6        | 53                      | 1.6        | 75               | F102_0460 IE3D071K04 | 21.1      | 46.43 | 325/7              | 8.8                           |
| 41                                                                            | 2.1        | 71                      | 2.1        | 57               | F102_0350 IE3D071K04 | 21.1      | 35.05 | 3575/102           | 8.8                           |
| 51                                                                            | 2.6        | 88                      | 2.4        | 46               | F102_0280 IE3D071K04 | 21.1      | 28.17 | 169/6              | 8.9                           |
| 62                                                                            | 3.2        | 107                     | 2.7        | 37               | F102_0230 IE3D071K04 | 21.1      | 23.08 | 3185/138           | 8.9                           |
| 77                                                                            | 3.6        | 134                     | 3.2        | 30               | F102_0185 IE3D071K04 | 21.1      | 18.46 | 1495/81            | 9.0                           |
| 105                                                                           | 3.6        | 182                     | 3.6        | 22               | F102_0135 IE3D071K04 | 21.1      | 13.59 | 231/17             | 8.9                           |
| 131                                                                           | 3.6        | 227                     | 3.6        | 18               | F102_0110 IE3D071K04 | 21.1      | 10.92 | 273/25             | 9.0                           |
| 159                                                                           | 3.6        | 275                     | 3.6        | 15               | F202_0090 IE3D071K04 | 29.3      | 9.006 | 3161/351           | 10                            |
| 160                                                                           | 3.6        | 277                     | 3.6        | 14               | F102_0089 IE3D071K04 | 21.1      | 8.948 | 1029/115           | 9.1                           |
| 200                                                                           | 3.6        | 346                     | 3.6        | 12               | F102_0072 IE3D071K04 | 21.1      | 7.156 | 322/45             | 9.3                           |
| 332                                                                           | 3.6        | 575                     | 3.6        | 7.0              | F102_0043 IE3D071K04 | 21.1      | 4.308 | 56/13              | 10                            |
| <b><math>P_N</math> (50 Hz) = 0,37 kW, <math>P_N</math> (87 Hz) = 0,64 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 3.9                                                                           | 0.80       | 6.8                     | 0.80       | 874              | F403_3660 IE3D071L04 | 50.5      | 365.6 | 3290/9             | 11                            |
| 5.2                                                                           | 1.1        | 9.0                     | 1.1        | 656              | F403_2740 IE3D071L04 | 50.5      | 274.4 | 59267/216          | 11                            |
| 6.5                                                                           | 1.3        | 11                      | 1.3        | 524              | F403_2190 IE3D071L04 | 50.5      | 219.2 | 94705/432          | 11                            |
| 7.7                                                                           | 0.91       | 13                      | 0.91       | 442              | F303_1850 IE3D071L04 | 42.9      | 184.8 | 29939/162          | 11                            |
| 7.8                                                                           | 1.6        | 13                      | 1.6        | 439              | F403_1840 IE3D071L04 | 50.5      | 183.9 | 39715/216          | 11                            |
| 10                                                                            | 1.2        | 18                      | 1.2        | 341              | F302_1410 IE3D071L04 | 38.0      | 140.6 | 7595/54            | 11                            |
| 13                                                                            | 0.88       | 22                      | 0.88       | 273              | F202_1130 IE3D071L04 | 30.4      | 112.7 | 1240/11            | 11                            |
| 15                                                                            | 1.1        | 26                      | 1.1        | 228              | F202_0940 IE3D071L04 | 30.4      | 93.82 | 1032/11            | 11                            |
| 20                                                                            | 1.4        | 35                      | 1.4        | 170              | F202_0700 IE3D071L04 | 30.4      | 70.13 | 5400/77            | 11                            |
| 26                                                                            | 0.88       | 44                      | 0.88       | 136              | F102_0560 IE3D071L04 | 22.2      | 55.97 | 2015/36            | 11                            |
| 30                                                                            | 2.1        | 53                      | 2.1        | 114              | F202_0470 IE3D071L04 | 30.4      | 47.05 | 1035/22            | 11                            |
| 31                                                                            | 1.1        | 53                      | 1.1        | 113              | F102_0460 IE3D071L04 | 22.2      | 46.43 | 325/7              | 11                            |
| 41                                                                            | 1.4        | 71                      | 1.4        | 85               | F102_0350 IE3D071L04 | 22.2      | 35.05 | 3575/102           | 11                            |
| 40                                                                            | 2.4        | 70                      | 2.4        | 86               | F202_0350 IE3D071L04 | 30.4      | 35.46 | 390/11             | 11                            |
| 51                                                                            | 1.8        | 88                      | 1.6        | 68               | F102_0280 IE3D071L04 | 22.2      | 28.17 | 169/6              | 11                            |
| 62                                                                            | 2.1        | 107                     | 1.8        | 56               | F102_0230 IE3D071L04 | 22.2      | 23.08 | 3185/138           | 11                            |
| 77                                                                            | 2.4        | 134                     | 2.1        | 45               | F102_0185 IE3D071L04 | 22.2      | 18.46 | 1495/81            | 11                            |
| 105                                                                           | 2.4        | 182                     | 2.4        | 33               | F102_0135 IE3D071L04 | 22.2      | 13.59 | 231/17             | 11                            |
| 131                                                                           | 2.4        | 227                     | 2.4        | 26               | F102_0110 IE3D071L04 | 22.2      | 10.92 | 273/25             | 11                            |
| 159                                                                           | 2.4        | 275                     | 2.4        | 22               | F202_0090 IE3D071L04 | 30.4      | 9.006 | 3161/351           | 12                            |
| 160                                                                           | 2.4        | 277                     | 2.4        | 22               | F102_0089 IE3D071L04 | 22.2      | 8.948 | 1029/115           | 11                            |
| 200                                                                           | 2.4        | 346                     | 2.4        | 17               | F102_0072 IE3D071L04 | 22.2      | 7.156 | 322/45             | 11                            |
| 332                                                                           | 2.4        | 575                     | 2.4        | 10               | F102_0043 IE3D071L04 | 22.2      | 4.308 | 56/13              | 12                            |
| <b><math>P_N</math> (50 Hz) = 0,55 kW, <math>P_N</math> (87 Hz) = 0,95 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 4.0                                                                           | 0.87       | 6.9                     | 0.87       | 1259             | F603_3610 IE3D080K04 | 81.3      | 360.9 | 3248/9             | 21                            |
| 5.3                                                                           | 1.2        | 9.3                     | 1.2        | 940              | F603_2690 IE3D080K04 | 81.3      | 269.3 | 1885/7             | 21                            |
| 6.7                                                                           | 0.93       | 12                      | 0.93       | 755              | F403_2160 IE3D080K04 | 54.0      | 216.4 | 11687/54           | 21                            |
| 6.7                                                                           | 1.5        | 12                      | 1.5        | 752              | F603_2150 IE3D080K04 | 81.3      | 215.4 | 1508/7             | 21                            |
| 7.9                                                                           | 1.1        | 14                      | 1.1        | 633              | F403_1820 IE3D080K04 | 54.0      | 181.5 | 4901/27            | 21                            |
| 8.0                                                                           | 1.7        | 14                      | 1.7        | 630              | F603_1810 IE3D080K04 | 81.3      | 180.6 | 8671/48            | 21                            |
| 10                                                                            | 1.4        | 18                      | 1.4        | 495              | F402_1400 IE3D080K04 | 49.8      | 139.8 | 559/4              | 21                            |
| 10                                                                            | 2.2        | 18                      | 2.2        | 495              | F602_1400 IE3D080K04 | 76.8      | 139.8 | 559/4              | 21                            |
| 13                                                                            | 1.0        | 22                      | 1.0        | 400              | F302_1130 IE3D080K04 | 41.5      | 112.8 | 3724/33            | 21                            |
| 13                                                                            | 1.8        | 22                      | 1.8        | 398              | F402_1120 IE3D080K04 | 49.8      | 112.3 | 1235/11            | 21                            |
| 13                                                                            | 2.8        | 22                      | 2.8        | 397              | F602_1120 IE3D080K04 | 76.8      | 112.2 | 9425/84            | 21                            |
| 15                                                                            | 1.2        | 27                      | 1.2        | 332              | F302_0940 IE3D080K04 | 41.5      | 93.64 | 4214/45            | 21                            |
| 15                                                                            | 2.1        | 27                      | 2.1        | 330              | F402_0930 IE3D080K04 | 49.8      | 93.33 | 280/3              | 21                            |
| 21                                                                            | 0.97       | 36                      | 0.97       | 248              | F202_0700 IE3D080K04 | 33.9      | 70.13 | 5400/77            | 21                            |
| 20                                                                            | 1.6        | 35                      | 1.6        | 249              | F302_0700 IE3D080K04 | 41.5      | 70.36 | 2744/39            | 21                            |
| 21                                                                            | 2.8        | 36                      | 2.8        | 248              | F402_0700 IE3D080K04 | 49.8      | 70.06 | 1261/18            | 21                            |
| 25                                                                            | 1.2        | 44                      | 1.2        | 201              | F202_0570 IE3D080K04 | 33.9      | 56.73 | 624/11             | 21                            |
| 25                                                                            | 2.0        | 44                      | 2.0        | 200              | F302_0560 IE3D080K04 | 41.5      | 56.49 | 4067/72            | 21                            |
| 31                                                                            | 1.4        | 53                      | 1.4        | 167              | F202_0470 IE3D080K04 | 33.9      | 47.05 | 1035/22            | 21                            |

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                 | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 0,55 kW, <math>P_N</math> (87 Hz) = 0,95 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 31                                                                            | 2.4        | 53                      | 2.4        | 167              | F302_0470 IE3D080K04 | 41.5      | 47.19 | 1274/27            | 21                            |
| 41                                                                            | 0.97       | 71                      | 0.94       | 124              | F102_0350 IE3D080K04 | 25.7      | 35.05 | 3575/102           | 21                            |
| 41                                                                            | 1.9        | 70                      | 1.9        | 126              | F202_0350 IE3D080K04 | 33.9      | 35.46 | 390/11             | 21                            |
| 41                                                                            | 3.2        | 71                      | 3.1        | 124              | F302_0350 IE3D080K04 | 41.5      | 35.03 | 7252/207           | 21                            |
| 51                                                                            | 1.2        | 89                      | 1.1        | 100              | F102_0280 IE3D080K04 | 25.7      | 28.17 | 169/6              | 21                            |
| 51                                                                            | 2.4        | 89                      | 2.2        | 100              | F202_0280 IE3D080K04 | 33.9      | 28.11 | 4020/143           | 21                            |
| 61                                                                            | 4.8        | 106                     | 4.1        | 83               | F302_0240 IE3D080K04 | 41.5      | 23.52 | 588/25             | 22                            |
| 62                                                                            | 1.5        | 108                     | 1.2        | 82               | F102_0230 IE3D080K04 | 25.7      | 23.08 | 3185/138           | 21                            |
| 61                                                                            | 2.9        | 106                     | 2.4        | 83               | F202_0230 IE3D080K04 | 33.9      | 23.43 | 2320/99            | 21                            |
| 78                                                                            | 1.7        | 135                     | 1.4        | 65               | F102_0185 IE3D080K04 | 25.7      | 18.46 | 1495/81            | 21                            |
| 77                                                                            | 3.4        | 134                     | 2.8        | 66               | F202_0185 IE3D080K04 | 33.9      | 18.65 | 6360/341           | 22                            |
| 106                                                                           | 2.1        | 184                     | 1.8        | 48               | F102_0135 IE3D080K04 | 25.7      | 13.59 | 231/17             | 21                            |
| 132                                                                           | 2.4        | 228                     | 2.0        | 39               | F102_0110 IE3D080K04 | 25.7      | 10.92 | 273/25             | 21                            |
| 160                                                                           | 5.5        | 277                     | 4.6        | 32               | F202_0090 IE3D080K04 | 33.9      | 9.006 | 3161/351           | 22                            |
| 161                                                                           | 2.8        | 279                     | 2.3        | 32               | F102_0089 IE3D080K04 | 25.7      | 8.948 | 1029/115           | 21                            |
| 201                                                                           | 3.2        | 349                     | 2.7        | 25               | F102_0072 IE3D080K04 | 25.7      | 7.156 | 322/45             | 21                            |
| 223                                                                           | 3.4        | 386                     | 2.9        | 23               | F102_0065 IE3D080K04 | 25.7      | 6.462 | 84/13              | 21                            |
| 308                                                                           | 6.6        | 533                     | 6.6        | 17               | F202_0047 IE3D080K04 | 33.9      | 4.680 | 2616/559           | 25                            |
| 334                                                                           | 4.5        | 579                     | 3.8        | 15               | F102_0043 IE3D080K04 | 25.7      | 4.308 | 56/13              | 22                            |
| <b><math>P_N</math> (50 Hz) = 0,75 kW, <math>P_N</math> (87 Hz) = 1,30 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 5.4                                                                           | 0.86       | 9.3                     | 0.86       | 1287             | F603_2690 IE3D080L04 | 83.8      | 269.3 | 1885/7             | 26                            |
| 6.7                                                                           | 1.1        | 12                      | 1.1        | 1030             | F603_2150 IE3D080L04 | 83.8      | 215.4 | 1508/7             | 26                            |
| 8.0                                                                           | 0.81       | 14                      | 0.81       | 868              | F403_1820 IE3D080L04 | 56.5      | 181.5 | 4901/27            | 26                            |
| 8.0                                                                           | 1.3        | 14                      | 1.3        | 863              | F603_1810 IE3D080L04 | 83.8      | 180.6 | 8671/48            | 26                            |
| 10                                                                            | 1.0        | 18                      | 1.0        | 678              | F402_1400 IE3D080L04 | 52.3      | 139.8 | 559/4              | 26                            |
| 10                                                                            | 1.6        | 18                      | 1.6        | 678              | F602_1400 IE3D080L04 | 79.3      | 139.8 | 559/4              | 26                            |
| 13                                                                            | 1.3        | 22                      | 1.3        | 545              | F402_1120 IE3D080L04 | 52.3      | 112.3 | 1235/11            | 26                            |
| 13                                                                            | 2.0        | 22                      | 2.0        | 544              | F602_1120 IE3D080L04 | 79.3      | 112.2 | 9425/84            | 26                            |
| 15                                                                            | 0.88       | 27                      | 0.88       | 454              | F302_0940 IE3D080L04 | 44.0      | 93.64 | 4214/45            | 26                            |
| 15                                                                            | 1.5        | 27                      | 1.5        | 453              | F402_0930 IE3D080L04 | 52.3      | 93.33 | 280/3              | 26                            |
| 15                                                                            | 2.4        | 27                      | 2.4        | 453              | F602_0930 IE3D080L04 | 79.3      | 93.33 | 280/3              | 27                            |
| 21                                                                            | 1.2        | 36                      | 1.2        | 341              | F302_0700 IE3D080L04 | 44.0      | 70.36 | 2744/39            | 26                            |
| 21                                                                            | 2.1        | 36                      | 2.1        | 340              | F402_0700 IE3D080L04 | 52.3      | 70.06 | 1261/18            | 26                            |
| 25                                                                            | 0.87       | 44                      | 0.87       | 275              | F202_0570 IE3D080L04 | 36.4      | 56.73 | 624/11             | 26                            |
| 26                                                                            | 1.5        | 44                      | 1.5        | 274              | F302_0560 IE3D080L04 | 44.0      | 56.49 | 4067/72            | 26                            |
| 26                                                                            | 2.6        | 45                      | 2.6        | 271              | F402_0560 IE3D080L04 | 52.3      | 55.97 | 2015/36            | 27                            |
| 31                                                                            | 1.1        | 53                      | 1.1        | 228              | F202_0470 IE3D080L04 | 36.4      | 47.05 | 1035/22            | 26                            |
| 31                                                                            | 1.7        | 53                      | 1.7        | 229              | F302_0470 IE3D080L04 | 44.0      | 47.19 | 1274/27            | 26                            |
| 31                                                                            | 3.1        | 53                      | 3.1        | 228              | F402_0470 IE3D080L04 | 52.3      | 46.94 | 845/18             | 27                            |
| 41                                                                            | 1.4        | 71                      | 1.4        | 172              | F202_0350 IE3D080L04 | 36.4      | 35.46 | 390/11             | 26                            |
| 41                                                                            | 2.4        | 71                      | 2.3        | 170              | F302_0350 IE3D080L04 | 44.0      | 35.03 | 7252/207           | 27                            |
| 51                                                                            | 0.88       | –                       | –          | 137              | F102_0280 IE3D080L04 | 28.2      | 28.17 | 169/6              | 26                            |
| 51                                                                            | 1.8        | 89                      | 1.6        | 136              | F202_0280 IE3D080L04 | 36.4      | 28.11 | 4020/143           | 27                            |
| 51                                                                            | 2.9        | 89                      | 2.6        | 137              | F302_0280 IE3D080L04 | 44.0      | 28.23 | 6860/243           | 27                            |
| 61                                                                            | 3.5        | 106                     | 3.0        | 114              | F302_0240 IE3D080L04 | 44.0      | 23.52 | 588/25             | 27                            |
| 63                                                                            | 1.1        | 108                     | 0.90       | 112              | F102_0230 IE3D080L04 | 28.2      | 23.08 | 3185/138           | 26                            |
| 62                                                                            | 2.1        | 107                     | 1.8        | 114              | F202_0230 IE3D080L04 | 36.4      | 23.43 | 2320/99            | 27                            |
| 78                                                                            | 1.2        | 136                     | 1.0        | 90               | F102_0185 IE3D080L04 | 28.2      | 18.46 | 1495/81            | 26                            |
| 77                                                                            | 2.5        | 134                     | 2.1        | 90               | F202_0185 IE3D080L04 | 36.4      | 18.65 | 6360/341           | 27                            |
| 106                                                                           | 1.5        | 184                     | 1.3        | 66               | F102_0135 IE3D080L04 | 28.2      | 13.59 | 231/17             | 26                            |
| 106                                                                           | 3.0        | 184                     | 2.6        | 66               | F202_0135 IE3D080L04 | 36.4      | 13.63 | 109/8              | 27                            |
| 132                                                                           | 1.8        | 229                     | 1.5        | 53               | F102_0110 IE3D080L04 | 28.2      | 10.92 | 273/25             | 26                            |
| 134                                                                           | 3.5        | 232                     | 3.0        | 52               | F202_0110 IE3D080L04 | 36.4      | 10.80 | 7303/676           | 27                            |
| 160                                                                           | 4.0        | 278                     | 3.4        | 44               | F202_0090 IE3D080L04 | 36.4      | 9.006 | 3161/351           | 27                            |
| 161                                                                           | 2.0        | 280                     | 1.7        | 43               | F102_0089 IE3D080L04 | 28.2      | 8.948 | 1029/115           | 26                            |
| 202                                                                           | 2.3        | 350                     | 2.0        | 35               | F102_0072 IE3D080L04 | 28.2      | 7.156 | 322/45             | 27                            |
| 224                                                                           | 2.5        | 387                     | 2.1        | 31               | F102_0065 IE3D080L04 | 28.2      | 6.462 | 84/13              | 27                            |
| 309                                                                           | 4.8        | 535                     | 4.8        | 23               | F202_0047 IE3D080L04 | 36.4      | 4.680 | 2616/559           | 30                            |
| 335                                                                           | 3.3        | 581                     | 2.8        | 21               | F102_0043 IE3D080L04 | 28.2      | 4.308 | 56/13              | 28                            |
| <b><math>P_N</math> (50 Hz) = 1,10 kW, <math>P_N</math> (87 Hz) = 1,91 kW</b> |            |                         |            |                  |                      |           |       |                    |                               |
| 8.0                                                                           | 0.87       | 14                      | 0.87       | 1261             | F603_1810 IE3D090S04 | 89.3      | 180.6 | 8671/48            | 40                            |
| 10                                                                            | 1.1        | 18                      | 1.1        | 990              | F602_1400 IE3D090S04 | 84.8      | 139.8 | 559/4              | 40                            |
| 13                                                                            | 0.88       | 22                      | 0.88       | 795              | F402_1120 IE3D090S04 | 57.8      | 112.3 | 1235/11            | 40                            |
| 13                                                                            | 1.4        | 22                      | 1.4        | 795              | F602_1120 IE3D090S04 | 84.8      | 112.2 | 9425/84            | 40                            |
| 15                                                                            | 1.1        | 27                      | 1.1        | 661              | F402_0930 IE3D090S04 | 57.8      | 93.33 | 280/3              | 40                            |

### 3.2 Selection tables 3 F offset helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 1,10 kW, <math>P_N</math> (87 Hz) = 1,91 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 15                                                                            | 1.7        | 27                      | 1.7        | 661              | F602_0930 IE3D090S04  | 84.8      | 93.33 | 280/3              | 41                            |
| 20                                                                            | 0.80       | 35                      | 0.80       | 498              | F302_0700 IE3D090S04  | 49.5      | 70.36 | 2744/39            | 40                            |
| 21                                                                            | 1.4        | 36                      | 1.4        | 496              | F402_0700 IE3D090S04  | 57.8      | 70.06 | 1261/18            | 40                            |
| 21                                                                            | 2.2        | 36                      | 2.2        | 493              | F602_0700 IE3D090S04  | 84.8      | 69.64 | 975/14             | 41                            |
| 25                                                                            | 1.0        | 44                      | 1.0        | 400              | F302_0560 IE3D090S04  | 49.5      | 56.49 | 4067/72            | 40                            |
| 26                                                                            | 1.8        | 45                      | 1.8        | 396              | F402_0560 IE3D090S04  | 57.8      | 55.97 | 2015/36            | 41                            |
| 31                                                                            | 1.2        | 53                      | 1.2        | 334              | F302_0470 IE3D090S04  | 49.5      | 47.19 | 1274/27            | 40                            |
| 31                                                                            | 2.1        | 53                      | 2.1        | 332              | F202_0470 IE3D090S04  | 57.8      | 46.94 | 845/18             | 41                            |
| 41                                                                            | 0.96       | 70                      | 0.93       | 251              | F202_0350 IE3D090S04  | 41.9      | 35.46 | 390/11             | 40                            |
| 41                                                                            | 1.6        | 71                      | 1.6        | 248              | F302_0350 IE3D090S04  | 49.5      | 35.03 | 7252/207           | 41                            |
| 51                                                                            | 1.2        | 89                      | 1.1        | 199              | F202_0280 IE3D090S04  | 41.9      | 28.11 | 4020/143           | 41                            |
| 51                                                                            | 2.0        | 88                      | 1.8        | 200              | F302_0280 IE3D090S04  | 49.5      | 28.23 | 6860/243           | 41                            |
| 61                                                                            | 2.4        | 106                     | 2.0        | 167              | F302_0240 IE3D090S04  | 49.5      | 23.52 | 588/25             | 41                            |
| 61                                                                            | 1.4        | 106                     | 1.2        | 166              | F202_0230 IE3D090S04  | 41.9      | 23.43 | 2320/99            | 41                            |
| 78                                                                            | 0.85       | –                       | –          | 131              | F102_0185 IE3D090S04  | 33.7      | 18.46 | 1495/81            | 40                            |
| 77                                                                            | 1.7        | 134                     | 1.4        | 132              | F202_0185 IE3D090S04  | 41.9      | 18.65 | 6360/341           | 41                            |
| 106                                                                           | 1.0        | 184                     | 0.88       | 96               | F102_0135 IE3D090S04  | 33.7      | 13.59 | 231/17             | 40                            |
| 106                                                                           | 2.1        | 183                     | 1.8        | 96               | F202_0135 IE3D090S04  | 41.9      | 13.63 | 109/8              | 41                            |
| 132                                                                           | 1.2        | 228                     | 1.0        | 77               | F102_0110 IE3D090S04  | 33.7      | 10.92 | 273/25             | 40                            |
| 133                                                                           | 2.4        | 231                     | 2.0        | 76               | F202_0110 IE3D090S04  | 41.9      | 10.80 | 7303/676           | 41                            |
| 160                                                                           | 2.7        | 277                     | 2.3        | 64               | F202_0090 IE3D090S04  | 41.9      | 9.006 | 3161/351           | 41                            |
| 161                                                                           | 1.4        | 279                     | 1.2        | 63               | F102_0089 IE3D090S04  | 33.7      | 8.948 | 1029/115           | 40                            |
| 201                                                                           | 1.6        | 349                     | 1.4        | 51               | F102_0072 IE3D090S04  | 33.7      | 7.156 | 322/45             | 41                            |
| 201                                                                           | 3.2        | 348                     | 2.7        | 51               | F202_0072 IE3D090S04  | 41.9      | 7.167 | 5777/806           | 42                            |
| 223                                                                           | 1.7        | 386                     | 1.4        | 46               | F102_0065 IE3D090S04  | 33.7      | 6.462 | 84/13              | 41                            |
| 308                                                                           | 3.3        | 533                     | 3.3        | 33               | F202_0047 IE3D090S04  | 41.9      | 4.680 | 2616/559           | 44                            |
| 334                                                                           | 2.2        | 579                     | 1.9        | 31               | F102_0043 IE3D090S04  | 33.7      | 4.308 | 56/13              | 42                            |
| <b><math>P_N</math> (50 Hz) = 1,50 kW, <math>P_N</math> (87 Hz) = 2,60 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 10                                                                            | 0.83       | 18                      | 0.83       | 1328             | F602_1400 IE3D090LX04 | 93.3      | 139.8 | 559/4              | 58                            |
| 13                                                                            | 1.0        | 22                      | 1.0        | 1067             | F602_1120 IE3D090LX04 | 93.3      | 112.2 | 9425/84            | 58                            |
| 16                                                                            | 1.2        | 27                      | 1.2        | 887              | F602_0930 IE3D090LX04 | 93.3      | 93.33 | 280/3              | 59                            |
| 21                                                                            | 1.1        | 36                      | 1.1        | 666              | F402_0700 IE3D090LX04 | 66.3      | 70.06 | 1261/18            | 58                            |
| 21                                                                            | 1.7        | 36                      | 1.7        | 662              | F602_0700 IE3D090LX04 | 93.3      | 69.64 | 975/14             | 59                            |
| 26                                                                            | 1.3        | 45                      | 1.3        | 532              | F402_0560 IE3D090LX04 | 66.3      | 55.97 | 2015/36            | 59                            |
| 31                                                                            | 0.89       | 53                      | 0.89       | 449              | F302_0470 IE3D090LX04 | 58.0      | 47.19 | 1274/27            | 58                            |
| 31                                                                            | 1.6        | 54                      | 1.6        | 446              | F402_0470 IE3D090LX04 | 66.3      | 46.94 | 845/18             | 59                            |
| 42                                                                            | 1.2        | 72                      | 1.2        | 333              | F302_0350 IE3D090LX04 | 58.0      | 35.03 | 7252/207           | 59                            |
| 52                                                                            | 0.90       | 90                      | 0.80       | 267              | F202_0280 IE3D090LX04 | 50.4      | 28.11 | 4020/143           | 59                            |
| 52                                                                            | 1.5        | 89                      | 1.3        | 268              | F302_0280 IE3D090LX04 | 58.0      | 28.23 | 6860/243           | 59                            |
| 62                                                                            | 1.8        | 107                     | 1.5        | 224              | F302_0240 IE3D090LX04 | 58.0      | 23.52 | 588/25             | 59                            |
| 62                                                                            | 1.1        | 108                     | 0.91       | 223              | F202_0230 IE3D090LX04 | 50.4      | 23.43 | 2320/99            | 59                            |
| 78                                                                            | 1.3        | 135                     | 1.1        | 177              | F202_0185 IE3D090LX04 | 50.4      | 18.65 | 6360/341           | 59                            |
| 107                                                                           | 1.5        | 185                     | 1.3        | 130              | F202_0135 IE3D090LX04 | 50.4      | 13.63 | 109/8              | 59                            |
| 109                                                                           | 2.4        | 188                     | 2.2        | 127              | F302_0135 IE3D090LX04 | 58.0      | 13.38 | 7696/575           | 59                            |
| 133                                                                           | 0.90       | –                       | –          | 104              | F102_0110 IE3D090LX04 | 42.2      | 10.92 | 273/25             | 58                            |
| 135                                                                           | 1.8        | 233                     | 1.5        | 103              | F202_0110 IE3D090LX04 | 50.4      | 10.80 | 7303/676           | 59                            |
| 135                                                                           | 2.4        | 234                     | 2.4        | 103              | F302_0110 IE3D090LX04 | 58.0      | 10.79 | 1456/135           | 60                            |
| 162                                                                           | 2.0        | 280                     | 1.7        | 86               | F202_0090 IE3D090LX04 | 50.4      | 9.006 | 3161/351           | 59                            |
| 163                                                                           | 1.0        | 282                     | 0.87       | 85               | F102_0089 IE3D090LX04 | 42.2      | 8.948 | 1029/115           | 58                            |
| 203                                                                           | 1.2        | 352                     | 1.0        | 68               | F102_0072 IE3D090LX04 | 42.2      | 7.156 | 322/45             | 59                            |
| 203                                                                           | 2.4        | 352                     | 2.0        | 68               | F202_0072 IE3D090LX04 | 50.4      | 7.167 | 5777/806           | 60                            |
| 225                                                                           | 1.3        | 390                     | 1.1        | 61               | F102_0065 IE3D090LX04 | 42.2      | 6.462 | 84/13              | 59                            |
| 311                                                                           | 2.4        | 538                     | 2.4        | 44               | F202_0047 IE3D090LX04 | 50.4      | 4.680 | 2616/559           | 62                            |
| 338                                                                           | 1.7        | 585                     | 1.4        | 41               | F102_0043 IE3D090LX04 | 42.2      | 4.308 | 56/13              | 60                            |
| <b><math>P_N</math> (50 Hz) = 2,20 kW, <math>P_N</math> (87 Hz) = 3,81 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 16                                                                            | 0.84       | 27                      | 0.84       | 1313             | F602_0930 IE3D100KX04 | 107.3     | 93.33 | 280/3              | 111                           |
| 21                                                                            | 1.1        | 36                      | 1.1        | 980              | F602_0700 IE3D100KX04 | 107.3     | 69.64 | 975/14             | 111                           |
| 26                                                                            | 0.89       | 45                      | 0.89       | 787              | F402_0560 IE3D100KX04 | 80.3      | 55.97 | 2015/36            | 111                           |
| 26                                                                            | 1.4        | 45                      | 1.4        | 784              | F602_0560 IE3D100KX04 | 107.3     | 55.71 | 390/7              | 111                           |
| 31                                                                            | 1.1        | 53                      | 1.1        | 660              | F402_0470 IE3D100KX04 | 80.3      | 46.94 | 845/18             | 111                           |
| 31                                                                            | 1.7        | 54                      | 1.7        | 657              | F602_0470 IE3D100KX04 | 107.3     | 46.72 | 1495/32            | 112                           |
| 41                                                                            | 0.81       | –                       | –          | 493              | F302_0350 IE3D100KX04 | 72.0      | 35.03 | 7252/207           | 111                           |
| 41                                                                            | 1.4        | 72                      | 1.3        | 493              | F402_0350 IE3D100KX04 | 80.3      | 35.08 | 2210/63            | 111                           |
| 41                                                                            | 2.2        | 71                      | 2.1        | 495              | F602_0350 IE3D100KX04 | 107.3     | 35.21 | 845/24             | 113                           |
| 51                                                                            | 1.0        | 89                      | 0.90       | 397              | F302_0280 IE3D100KX04 | 72.0      | 28.23 | 6860/243           | 111                           |

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                  | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>1</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|-----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 2,20 kW, P <sub>N</sub> (87 Hz) = 3,81 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 52                                                                 | 1.8        | 90                               | 1.5        | 394                     | F402_0280 IE3D100KX04 | 80.3      | 27.99 | 2015/72            | 112                                    |
| 52                                                                 | 2.8        | 90                               | 2.5        | 394                     | F602_0280 IE3D100KX04 | 107.3     | 27.99 | 2015/72            | 114                                    |
| 62                                                                 | 1.2        | 107                              | 1.0        | 331                     | F302_0240 IE3D100KX04 | 72.0      | 23.52 | 588/25             | 111                                    |
| 62                                                                 | 2.0        | 108                              | 1.7        | 327                     | F402_0230 IE3D100KX04 | 80.3      | 23.21 | 325/14             | 112                                    |
| 77                                                                 | 1.4        | 134                              | 1.2        | 264                     | F302_0190 IE3D100KX04 | 72.0      | 18.77 | 4900/261           | 112                                    |
| 78                                                                 | 0.85       | –                                | –          | 262                     | F202_0185 IE3D100KX04 | 64.4      | 18.65 | 6360/341           | 111                                    |
| 78                                                                 | 2.3        | 135                              | 2.0        | 262                     | F402_0185 IE3D100KX04 | 80.3      | 18.62 | 3575/192           | 113                                    |
| 106                                                                | 1.0        | 184                              | 0.88       | 192                     | F202_0135 IE3D100KX04 | 64.4      | 13.63 | 109/8              | 111                                    |
| 108                                                                | 1.8        | 188                              | 1.5        | 188                     | F302_0135 IE3D100KX04 | 72.0      | 13.38 | 7696/575           | 111                                    |
| 107                                                                | 2.9        | 185                              | 2.4        | 191                     | F402_0135 IE3D100KX04 | 80.3      | 13.57 | 5984/441           | 112                                    |
| 134                                                                | 1.2        | 232                              | 1.0        | 152                     | F202_0110 IE3D100KX04 | 64.4      | 10.80 | 7303/676           | 111                                    |
| 134                                                                | 2.0        | 233                              | 1.7        | 152                     | F302_0110 IE3D100KX04 | 72.0      | 10.79 | 1456/135           | 112                                    |
| 161                                                                | 1.4        | 279                              | 1.2        | 127                     | F202_0090 IE3D100KX04 | 64.4      | 9.006 | 3161/351           | 111                                    |
| 161                                                                | 2.3        | 279                              | 1.9        | 126                     | F302_0090 IE3D100KX04 | 72.0      | 8.986 | 5616/625           | 113                                    |
| 202                                                                | 1.6        | 350                              | 1.4        | 101                     | F202_0072 IE3D100KX04 | 64.4      | 7.167 | 5777/806           | 112                                    |
| 202                                                                | 2.7        | 350                              | 2.2        | 101                     | F302_0072 IE3D100KX04 | 72.0      | 7.172 | 208/29             | 114                                    |
| 253                                                                | 3.1        | 439                              | 2.6        | 80                      | F302_0057 IE3D100KX04 | 72.0      | 5.720 | 143/25             | 116                                    |
| 261                                                                | 1.9        | 452                              | 1.6        | 78                      | F202_0056 IE3D100KX04 | 64.4      | 5.552 | 5341/962           | 113                                    |
| 310                                                                | 2.1        | 537                              | 1.8        | 66                      | F202_0047 IE3D100KX04 | 64.4      | 4.680 | 2616/559           | 114                                    |
| 312                                                                | 3.6        | 541                              | 3.0        | 65                      | F302_0046 IE3D100KX04 | 72.0      | 4.644 | 4992/1075          | 118                                    |
| P <sub>N</sub> (50 Hz) = 3,00 kW, P <sub>N</sub> (87 Hz) = 5,20 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 21                                                                 | 0.82       | 36                               | 0.82       | 1338                    | F602_0700 IE3D100LX04 | 112.3     | 69.64 | 975/14             | 131                                    |
| 26                                                                 | 1.0        | 45                               | 1.0        | 1070                    | F602_0560 IE3D100LX04 | 112.3     | 55.71 | 390/7              | 131                                    |
| 31                                                                 | 1.2        | 54                               | 1.2        | 897                     | F602_0470 IE3D100LX04 | 112.3     | 46.72 | 1495/32            | 132                                    |
| 41                                                                 | 1.0        | 72                               | 0.94       | 674                     | F402_0350 IE3D100LX04 | 85.3      | 35.08 | 2210/63            | 131                                    |
| 41                                                                 | 1.6        | 71                               | 1.6        | 676                     | F602_0350 IE3D100LX04 | 112.3     | 35.21 | 845/24             | 133                                    |
| 52                                                                 | 1.3        | 90                               | 1.1        | 537                     | F402_0280 IE3D100LX04 | 85.3      | 27.99 | 2015/72            | 132                                    |
| 52                                                                 | 2.0        | 90                               | 1.8        | 537                     | F602_0280 IE3D100LX04 | 112.3     | 27.99 | 2015/72            | 134                                    |
| 62                                                                 | 0.89       | –                                | –          | 452                     | F302_0240 IE3D100LX04 | 77.0      | 23.52 | 588/25             | 131                                    |
| 62                                                                 | 1.5        | 108                              | 1.2        | 446                     | F402_0230 IE3D100LX04 | 85.3      | 23.21 | 325/14             | 132                                    |
| 62                                                                 | 2.5        | 108                              | 2.1        | 447                     | F602_0230 IE3D100LX04 | 112.3     | 23.27 | 1885/81            | 135                                    |
| 77                                                                 | 1.0        | 134                              | 0.87       | 361                     | F302_0190 IE3D100LX04 | 77.0      | 18.77 | 4900/261           | 132                                    |
| 78                                                                 | 1.7        | 135                              | 1.4        | 358                     | F402_0185 IE3D100LX04 | 85.3      | 18.62 | 3575/192           | 133                                    |
| 108                                                                | 1.3        | 188                              | 1.1        | 257                     | F302_0135 IE3D100LX04 | 77.0      | 13.38 | 7696/575           | 131                                    |
| 107                                                                | 2.1        | 185                              | 1.8        | 261                     | F402_0135 IE3D100LX04 | 85.3      | 13.57 | 5984/441           | 132                                    |
| 134                                                                | 0.89       | –                                | –          | 207                     | F202_0110 IE3D100LX04 | 69.4      | 10.80 | 7303/676           | 131                                    |
| 134                                                                | 1.5        | 233                              | 1.3        | 207                     | F302_0110 IE3D100LX04 | 77.0      | 10.79 | 1456/135           | 132                                    |
| 134                                                                | 2.5        | 232                              | 2.1        | 208                     | F402_0110 IE3D100LX04 | 85.3      | 10.83 | 682/63             | 133                                    |
| 161                                                                | 1.0        | 279                              | 0.85       | 173                     | F202_0090 IE3D100LX04 | 69.4      | 9.006 | 3161/351           | 131                                    |
| 161                                                                | 1.7        | 279                              | 1.4        | 173                     | F302_0090 IE3D100LX04 | 77.0      | 8.986 | 5616/625           | 133                                    |
| 161                                                                | 2.8        | 280                              | 2.3        | 172                     | F402_0090 IE3D100LX04 | 85.3      | 8.980 | 440/49             | 135                                    |
| 202                                                                | 1.2        | 350                              | 0.99       | 138                     | F202_0072 IE3D100LX04 | 69.4      | 7.167 | 5777/806           | 132                                    |
| 202                                                                | 2.0        | 350                              | 1.6        | 138                     | F302_0072 IE3D100LX04 | 77.0      | 7.172 | 208/29             | 134                                    |
| 201                                                                | 3.0        | 349                              | 2.7        | 138                     | F402_0072 IE3D100LX04 | 85.3      | 7.202 | 605/84             | 137                                    |
| 253                                                                | 2.3        | 439                              | 1.9        | 110                     | F302_0057 IE3D100LX04 | 77.0      | 5.720 | 143/25             | 136                                    |
| 261                                                                | 1.4        | 452                              | 1.2        | 107                     | F202_0056 IE3D100LX04 | 69.4      | 5.552 | 5341/962           | 133                                    |
| 310                                                                | 1.6        | 537                              | 1.3        | 90                      | F202_0047 IE3D100LX04 | 69.4      | 4.680 | 2616/559           | 134                                    |
| 312                                                                | 2.6        | 541                              | 2.2        | 89                      | F302_0046 IE3D100LX04 | 77.0      | 4.644 | 4992/1075          | 138                                    |
| P <sub>N</sub> (50 Hz) = 4,00 kW, P <sub>N</sub> (87 Hz) = 6,93 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 31                                                                 | 0.93       | 54                               | 0.93       | 1183                    | F602_0470 IE3D112M04  | 118.3     | 46.72 | 1495/32            | 172                                    |
| 42                                                                 | 1.2        | 72                               | 1.2        | 891                     | F602_0350 IE3D112M04  | 118.3     | 35.21 | 845/24             | 173                                    |
| 52                                                                 | 0.99       | 91                               | 0.83       | 709                     | F402_0280 IE3D112M04  | 91.3      | 27.99 | 2015/72            | 172                                    |
| 52                                                                 | 1.6        | 91                               | 1.4        | 709                     | F602_0280 IE3D112M04  | 118.3     | 27.99 | 2015/72            | 174                                    |
| 63                                                                 | 1.1        | 109                              | 0.94       | 588                     | F402_0230 IE3D112M04  | 91.3      | 23.21 | 325/14             | 172                                    |
| 63                                                                 | 1.9        | 109                              | 1.6        | 589                     | F602_0230 IE3D112M04  | 118.3     | 23.27 | 1885/81            | 175                                    |
| 79                                                                 | 1.3        | 136                              | 1.1        | 471                     | F402_0185 IE3D112M04  | 91.3      | 18.62 | 3575/192           | 173                                    |
| 109                                                                | 0.98       | 190                              | 0.82       | 339                     | F302_0135 IE3D112M04  | 83.0      | 13.38 | 7696/575           | 171                                    |
| 108                                                                | 1.6        | 187                              | 1.3        | 344                     | F402_0135 IE3D112M04  | 91.3      | 13.57 | 5984/441           | 172                                    |
| 108                                                                | 2.1        | 186                              | 2.1        | 345                     | F602_0135 IE3D112M04  | 118.3     | 13.61 | 871/64             | 175                                    |
| 136                                                                | 1.1        | 235                              | 0.95       | 273                     | F302_0110 IE3D112M04  | 83.0      | 10.79 | 1456/135           | 172                                    |
| 135                                                                | 1.9        | 234                              | 1.6        | 274                     | F402_0110 IE3D112M04  | 91.3      | 10.83 | 682/63             | 173                                    |
| 135                                                                | 2.3        | 235                              | 2.3        | 274                     | F602_0110 IE3D112M04  | 118.3     | 10.82 | 2077/192           | 178                                    |
| 163                                                                | 1.3        | 282                              | 1.1        | 227                     | F302_0090 IE3D112M04  | 83.0      | 8.986 | 5616/625           | 173                                    |
| 163                                                                | 2.1        | 283                              | 1.8        | 227                     | F402_0090 IE3D112M04  | 91.3      | 8.980 | 440/49             | 175                                    |
| 204                                                                | 0.89       | –                                | –          | 181                     | F202_0072 IE3D112M04  | 75.4      | 7.167 | 5777/806           | 172                                    |



### 3.2 Selection tables 3 F offset helical geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                        | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 4,00 kW, <math>P_N</math> (87 Hz) = 6,93 kW</b>  |            |                         |            |                  |                       |           |       |                    |                               |
| 204                                                                            | 1.5        | 354                     | 1.2        | 182              | F302_0072 IE3D112M04  | 83.0      | 7.172 | 208/29             | 174                           |
| 203                                                                            | 2.3        | 352                     | 2.0        | 182              | F402_0072 IE3D112M04  | 91.3      | 7.202 | 605/84             | 177                           |
| 256                                                                            | 1.7        | 444                     | 1.4        | 145              | F302_0057 IE3D112M04  | 83.0      | 5.720 | 143/25             | 176                           |
| 264                                                                            | 1.1        | 457                     | 0.89       | 141              | F202_0056 IE3D112M04  | 75.4      | 5.552 | 5341/962           | 173                           |
| 313                                                                            | 1.2        | 542                     | 0.99       | 118              | F202_0047 IE3D112M04  | 75.4      | 4.680 | 2616/559           | 174                           |
| 315                                                                            | 2.0        | 546                     | 1.7        | 118              | F302_0046 IE3D112M04  | 83.0      | 4.644 | 4992/1075          | 178                           |
| <b><math>P_N</math> (50 Hz) = 5,50 kW, <math>P_N</math> (87 Hz) = 9,53 kW</b>  |            |                         |            |                  |                       |           |       |                    |                               |
| 42                                                                             | 0.90       | 72                      | 0.86       | 1229             | F602_0350 IE3D132SX04 | 152.3     | 35.21 | 845/24             | 353                           |
| 52                                                                             | 1.1        | 91                      | 1.0        | 977              | F602_0280 IE3D132SX04 | 152.3     | 27.99 | 2015/72            | 354                           |
| 63                                                                             | 0.81       | –                       | –          | 811              | F402_0230 IE3D132SX04 | 125.3     | 23.21 | 325/14             | 352                           |
| 63                                                                             | 1.4        | 109                     | 1.1        | 813              | F602_0230 IE3D132SX04 | 152.3     | 23.27 | 1885/81            | 355                           |
| 79                                                                             | 0.94       | –                       | –          | 650              | F402_0185 IE3D132SX04 | 125.3     | 18.62 | 3575/192           | 353                           |
| 79                                                                             | 1.6        | 137                     | 1.3        | 647              | F602_0185 IE3D132SX04 | 152.3     | 18.52 | 3445/186           | 358                           |
| 108                                                                            | 1.2        | 187                     | 0.97       | 474              | F402_0135 IE3D132SX04 | 125.3     | 13.57 | 5984/441           | 352                           |
| 108                                                                            | 1.9        | 186                     | 1.6        | 475              | F602_0135 IE3D132SX04 | 152.3     | 13.61 | 871/64             | 355                           |
| 135                                                                            | 1.3        | 234                     | 1.1        | 378              | F402_0110 IE3D132SX04 | 125.3     | 10.83 | 682/63             | 353                           |
| 135                                                                            | 2.3        | 235                     | 1.9        | 378              | F602_0110 IE3D132SX04 | 152.3     | 10.82 | 2077/192           | 358                           |
| 163                                                                            | 1.5        | 283                     | 1.3        | 314              | F402_0090 IE3D132SX04 | 125.3     | 8.980 | 440/49             | 355                           |
| 163                                                                            | 2.6        | 282                     | 2.1        | 314              | F602_0090 IE3D132SX04 | 152.3     | 8.995 | 1943/216           | 361                           |
| 203                                                                            | 1.8        | 352                     | 1.5        | 251              | F402_0072 IE3D132SX04 | 125.3     | 7.202 | 605/84             | 357                           |
| 205                                                                            | 3.0        | 354                     | 2.5        | 250              | F602_0072 IE3D132SX04 | 152.3     | 7.159 | 3551/496           | 366                           |
| 252                                                                            | 2.0        | 437                     | 1.7        | 203              | F402_0058 IE3D132SX04 | 125.3     | 5.813 | 3784/651           | 360                           |
| 258                                                                            | 3.5        | –                       | –          | 198              | F602_0057 IE3D132SX04 | 152.3     | 5.673 | 1407/248           | 374                           |
| 313                                                                            | 2.4        | 542                     | 2.0        | 163              | F402_0047 IE3D132SX04 | 125.3     | 4.678 | 1408/301           | 365                           |
| 322                                                                            | 4.0        | –                       | –          | 159              | F602_0045 IE3D132SX04 | 152.3     | 4.546 | 1273/280           | 386                           |
| <b><math>P_N</math> (50 Hz) = 7,50 kW, <math>P_N</math> (87 Hz) = 12,99 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 53                                                                             | 0.83       | –                       | –          | 1330             | F602_0280 IE3D132MX04 | 150.3     | 27.99 | 2015/72            | 354                           |
| 63                                                                             | 0.99       | 109                     | 0.83       | 1106             | F602_0230 IE3D132MX04 | 150.3     | 23.27 | 1885/81            | 355                           |
| 79                                                                             | 1.2        | 137                     | 0.97       | 880              | F602_0185 IE3D132MX04 | 150.3     | 18.52 | 3445/186           | 358                           |
| 108                                                                            | 0.85       | –                       | –          | 645              | F402_0135 IE3D132MX04 | 123.3     | 13.57 | 5984/441           | 352                           |
| 108                                                                            | 1.4        | 187                     | 1.2        | 647              | F602_0135 IE3D132MX04 | 150.3     | 13.61 | 871/64             | 355                           |
| 136                                                                            | 0.99       | 235                     | 0.83       | 515              | F402_0110 IE3D132MX04 | 123.3     | 10.83 | 682/63             | 353                           |
| 136                                                                            | 1.7        | 235                     | 1.4        | 514              | F602_0110 IE3D132MX04 | 150.3     | 10.82 | 2077/192           | 358                           |
| 164                                                                            | 1.1        | 284                     | 0.94       | 427              | F402_0090 IE3D132MX04 | 123.3     | 8.980 | 440/49             | 355                           |
| 163                                                                            | 1.9        | 283                     | 1.6        | 428              | F602_0090 IE3D132MX04 | 150.3     | 8.995 | 1943/216           | 361                           |
| 204                                                                            | 1.3        | 354                     | 1.1        | 342              | F402_0072 IE3D132MX04 | 123.3     | 7.202 | 605/84             | 357                           |
| 205                                                                            | 2.2        | 356                     | 1.8        | 340              | F602_0072 IE3D132MX04 | 150.3     | 7.159 | 3551/496           | 366                           |
| 253                                                                            | 1.5        | 438                     | 1.3        | 276              | F402_0058 IE3D132MX04 | 123.3     | 5.813 | 3784/651           | 360                           |
| 259                                                                            | 2.5        | –                       | –          | 270              | F602_0057 IE3D132MX04 | 150.3     | 5.673 | 1407/248           | 374                           |
| 314                                                                            | 1.7        | 544                     | 1.5        | 222              | F402_0047 IE3D132MX04 | 123.3     | 4.678 | 1408/301           | 365                           |
| 323                                                                            | 3.0        | –                       | –          | 216              | F602_0045 IE3D132MX04 | 150.3     | 4.546 | 1273/280           | 386                           |

## 3.3 Dimensional drawings

In this chapter you can find the dimensions of the geared motors.

There is a dimensional drawing for every possible shaft/housing design, each with the tables for gear unit dimensions, motor dimensions and geared motor dimensions.

Dimensions can exceed the specifications of ISO 2768-mK due to casting tolerances or accumulation of individual tolerances.

We reserve the right to make dimensional changes due to ongoing technical development.

You can download 3D models of our standard drives at <http://configurator.stoeber.de>.

### Tolerances

| Axis height in accordance with DIN 747 | Tolerance |
|----------------------------------------|-----------|
| Up to 50 mm                            | -0.4 mm   |
| Up to 250 mm                           | -0.5 mm   |
| Up to 630 mm                           | -0.6 mm   |

| Solid shaft                          | Tolerance               |
|--------------------------------------|-------------------------|
| Shaft $\varnothing$ fit $\leq 50$ mm | DIN 748-1, ISO k6       |
| Shaft $\varnothing$ fit $> 50$ mm    | DIN 748-1, ISO m6       |
| Feather keys                         | DIN 6885-1, high form A |

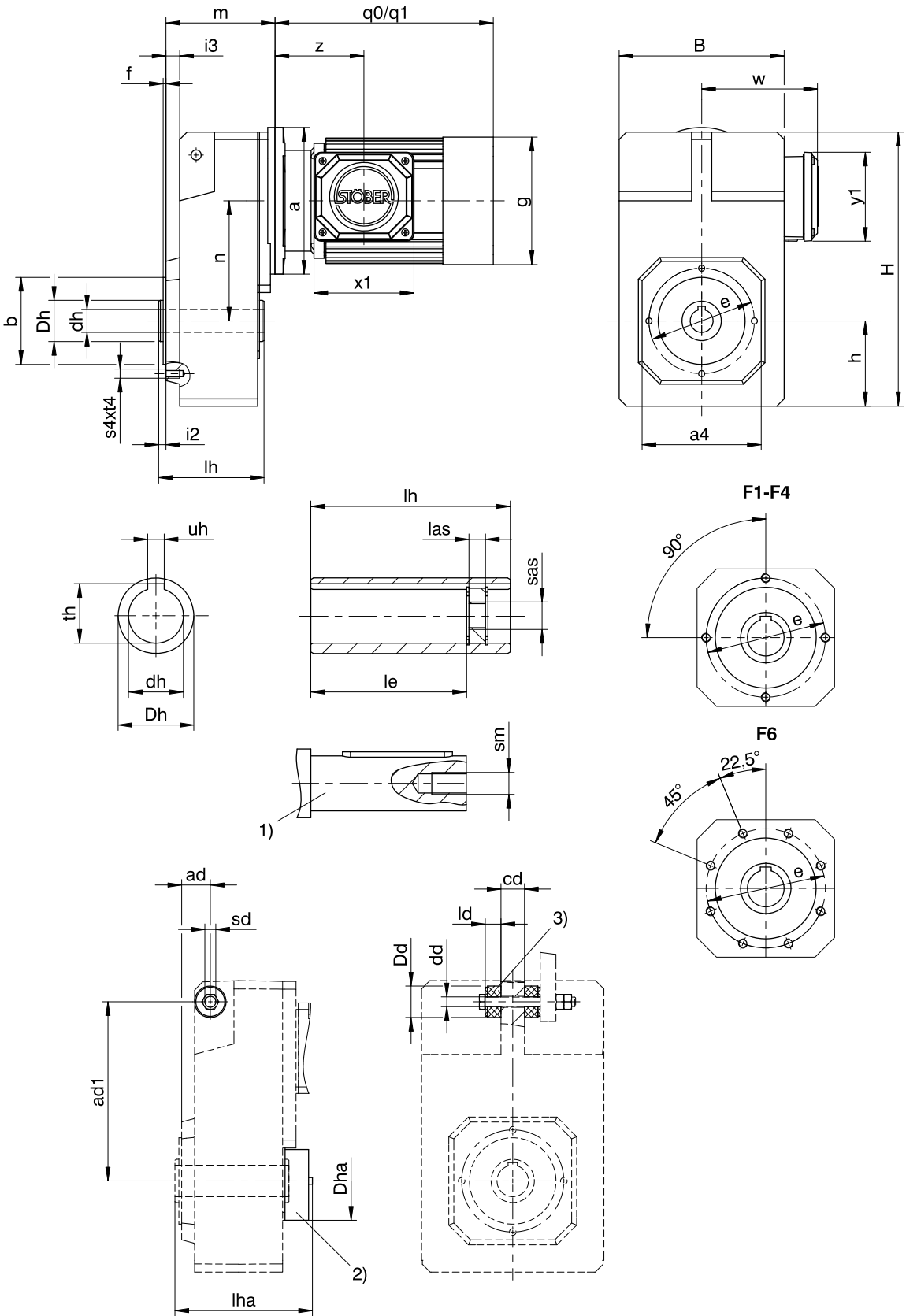
| Hollow shaft          | Tolerance             |
|-----------------------|-----------------------|
| Hollow shaft hole fit | ISO H7                |
| Feather keys          | DIN 6885-1, high form |

| Flange             | Pilot tolerance |
|--------------------|-----------------|
| Up to 300 mm       | ISO j6          |
| Starting at 350 mm | ISO h6          |

### Centering holes in solid shafts in accordance with DIN 332-2, DR shape

| Thread size       | M4 | M5   | M6 | M8 | M10 | M12 | M16 | M20 | M24 |
|-------------------|----|------|----|----|-----|-----|-----|-----|-----|
| Thread depth [mm] | 10 | 12.5 | 16 | 19 | 22  | 28  | 36  | 42  | 50  |

3.3.1 A shaft design (hollow shaft), G housing design (pitch circle diameter)



- |    |                                                                                                                                                   |    |                               |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------------------------|
| q0 | Applies to motors without brake.                                                                                                                  | q1 | Applies to motors with brake. |
| 1) | The length of the machine shaft must be at least 2.2 x $\varnothing dh$ and the length of the feather key must be at least 2 x $\varnothing dh$ . | 2) | Cover (optional)              |
| 3) | Rubber buffer for torque arm bracket (optional). Dimension $\varnothing Dd$ = outer $\varnothing$ of the rubber buffer when not tensioned.        |    |                               |

## Dimensions of gear units

| Type | □a4 | ad   | ad1 | Øb                | B   | cd | Ødd                | Ødh              | ØDd | ØDh | ØDha | Øe  | f   | h   | H     | i2   | i3   | ld | le  | lh  | las | lha   | s4  | sd  | sm  | sas | t4 | th   | uh                |
|------|-----|------|-----|-------------------|-----|----|--------------------|------------------|-----|-----|------|-----|-----|-----|-------|------|------|----|-----|-----|-----|-------|-----|-----|-----|-----|----|------|-------------------|
| F1   | 100 | 29.5 | 150 | 70 <sub>js</sub>  | 145 | 20 | 11 <sup>+0.5</sup> | 20 <sup>H7</sup> | 30  | 35  | 70   | 85  | 2.5 | 74  | 238.0 | 6.5  | 12.5 | 15 | 73  | 95  | 12  | 112   | M8  | M10 | M6  | M8  | 13 | 22.8 | 6 <sup>JS9</sup>  |
| F2   | 130 | 33.0 | 181 | 95 <sub>js</sub>  | 180 | 22 | 11 <sup>+0.5</sup> | 25 <sup>H7</sup> | 30  | 45  | 82   | 115 | 3.0 | 93  | 299.0 | 8.0  | 15.0 | 15 | 92  | 115 | 12  | 130.5 | M8  | M10 | M10 | M12 | 13 | 28.3 | 8 <sup>JS9</sup>  |
| F3   | 150 | 38.5 | 205 | 110 <sub>js</sub> | 206 | 30 | 14 <sup>+0.5</sup> | 30 <sup>H7</sup> | 37  | 50  | 88   | 130 | 3.5 | 106 | 335.5 | 8.5  | 16.5 | 20 | 103 | 130 | 12  | 155.5 | M10 | M12 | M10 | M12 | 16 | 33.3 | 8 <sup>JS9</sup>  |
| F4   | 150 | 38.5 | 228 | 110 <sub>js</sub> | 230 | 30 | 14 <sup>+0.5</sup> | 40 <sup>H7</sup> | 37  | 55  | 100  | 130 | 3.5 | 116 | 370.0 | 8.5  | 16.5 | 20 | 114 | 145 | 12  | 174.5 | M10 | M12 | M16 | M20 | 16 | 43.3 | 12 <sup>JS9</sup> |
| F6   | 180 | 44.5 | 270 | 130 <sub>js</sub> | 265 | 35 | 22 <sup>+0.5</sup> | 50 <sup>H7</sup> | 60  | 70  | 115  | 165 | 3.5 | 137 | 433.0 | 10.5 | 20.5 | 30 | 143 | 180 | 12  | 192.5 | M10 | M20 | M16 | M20 | 16 | 53.8 | 14 <sup>JS9</sup> |

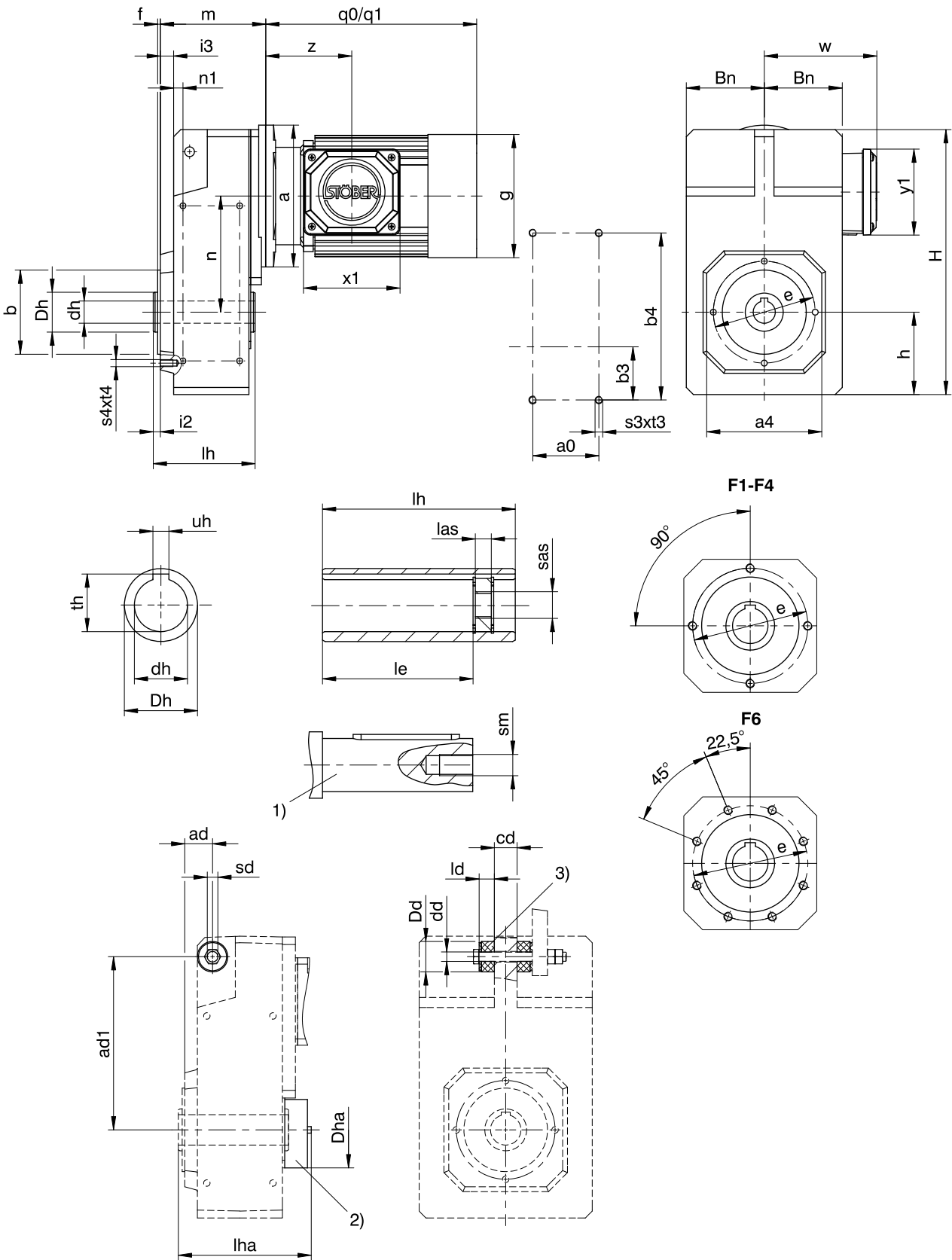
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 97.5  | 102.0 | Ø140    | 97.5  | 102.0 | Ø160    | 101.5 | 102.0 | Ø160    | 101.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 115.0 | 131.0 | Ø140    | 115.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø200    | 121.0 | 131.0 | Ø200    | 121.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 152.0 | 131.0 | Ø140    | 152.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 129.5 | 149.5 | Ø140    | 129.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø200    | 135.5 | 149.5 | Ø200    | 135.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 166.5 | 149.5 | Ø140    | 166.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 148.5 | 169.0 | Ø160    | 148.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø250    | 153.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 181.5 | 169.0 | Ø160    | 191.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 179.5 | 196.0 | Ø160    | 179.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø250    | 184.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 222.5 | 196.0 | Ø160    | 222.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

3.3.2 A shaft design (hollow shaft), GN housing design (pitch circle diameter + side fastening)



- |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| <p><math>q_0</math> Applies to motors without brake.</p> <p>1) The length of the machine shaft must be at least 2.2 x <math>\varnothing d_h</math> and the length of the feather key must be at least 2 x <math>\varnothing d_h</math>.</p> <p>3) Rubber buffer for torque arm bracket (optional). Dimension <math>\varnothing D_d</math> = outer <math>\varnothing</math> of the rubber buffer when not tensioned.</p> | <p><math>q_1</math> Applies to motors with brake.</p> <p>2) Cover (optional)</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|

## Dimensions of gear units

| Type | a0  | □a4 | ad   | ad1 | Øb                | b3 | b4  | Bn  | cd | Ødd                | Ødh              | ØDd | ØDh | ØDha | Øe  | f   | h   | H     |
|------|-----|-----|------|-----|-------------------|----|-----|-----|----|--------------------|------------------|-----|-----|------|-----|-----|-----|-------|
| F1   | 50  | 100 | 29.5 | 150 | 70 <sub>j6</sub>  | 40 | 140 | 71  | 20 | 11 <sup>+0.5</sup> | 20 <sup>H7</sup> | 30  | 35  | 70   | 85  | 2.5 | 74  | 238.0 |
| F2   | 64  | 130 | 33.0 | 181 | 95 <sub>j6</sub>  | 55 | 175 | 88  | 22 | 11 <sup>+0.5</sup> | 25 <sup>H7</sup> | 30  | 45  | 82   | 115 | 3.0 | 93  | 299.0 |
| F3   | 72  | 150 | 38.5 | 205 | 110 <sub>j6</sub> | 60 | 200 | 102 | 30 | 14 <sup>+0.5</sup> | 30 <sup>H7</sup> | 37  | 50  | 88   | 130 | 3.5 | 106 | 335.5 |
| F4   | 87  | 150 | 38.5 | 228 | 110 <sub>j6</sub> | 70 | 220 | 114 | 30 | 14 <sup>+0.5</sup> | 40 <sup>H7</sup> | 37  | 55  | 100  | 130 | 3.5 | 116 | 370.0 |
| F6   | 108 | 180 | 44.5 | 270 | 130 <sub>j6</sub> | 85 | 270 | 131 | 35 | 22 <sup>+0.5</sup> | 50 <sup>H7</sup> | 60  | 70  | 115  | 165 | 3.5 | 137 | 433.0 |

| Type | i2   | i3   | ld | le  | lh  | las | lha   | n1   | s3  | s4  | sd  | sm  | sas | t3 | t4 | th   | uh                |
|------|------|------|----|-----|-----|-----|-------|------|-----|-----|-----|-----|-----|----|----|------|-------------------|
| F1   | 6.5  | 12.5 | 15 | 73  | 95  | 12  | 112   | 10.0 | M6  | M8  | M10 | M6  | M8  | 11 | 13 | 22.8 | 6 <sup>JS9</sup>  |
| F2   | 8.0  | 15.0 | 15 | 92  | 115 | 12  | 130.5 | 10.5 | M8  | M8  | M10 | M10 | M12 | 13 | 13 | 28.3 | 8 <sup>JS9</sup>  |
| F3   | 8.5  | 16.5 | 20 | 103 | 130 | 12  | 155.5 | 12.5 | M10 | M10 | M12 | M10 | M12 | 16 | 16 | 33.3 | 8 <sup>JS9</sup>  |
| F4   | 8.5  | 16.5 | 20 | 114 | 145 | 12  | 174.5 | 12.5 | M10 | M10 | M12 | M16 | M20 | 16 | 16 | 43.3 | 12 <sup>JS9</sup> |
| F6   | 10.5 | 20.5 | 30 | 143 | 180 | 12  | 192.5 | 15.5 | M12 | M10 | M20 | M16 | M20 | 19 | 16 | 53.8 | 14 <sup>JS9</sup> |

## Dimensions of motors

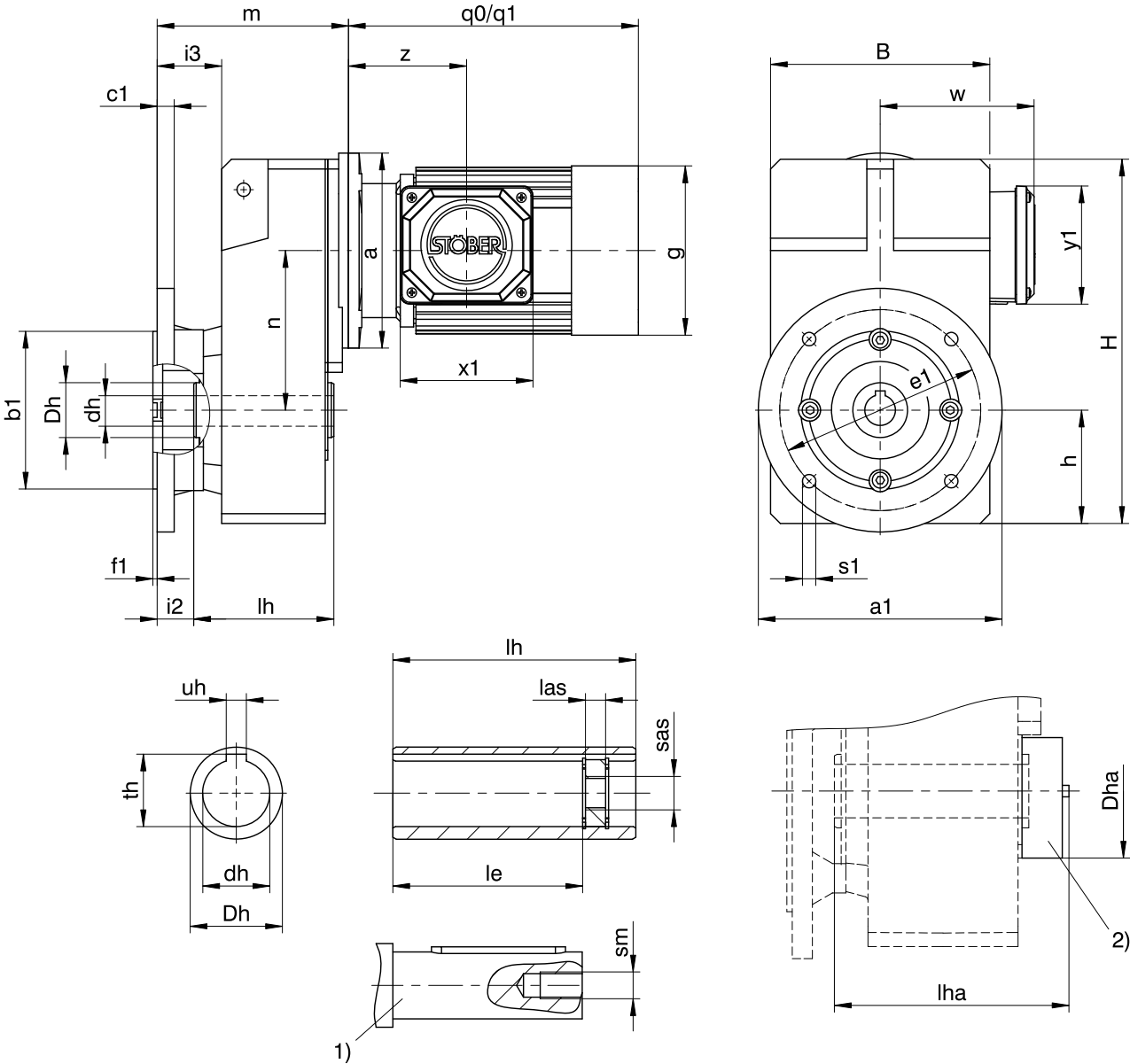
| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 97.5  | 102.0 | Ø140    | 97.5  | 102.0 | Ø160    | 101.5 | 102.0 | Ø160    | 101.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 115.0 | 131.0 | Ø140    | 115.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø200    | 121.0 | 131.0 | Ø200    | 121.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 152.0 | 131.0 | Ø140    | 152.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 129.5 | 149.5 | Ø140    | 129.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø200    | 135.5 | 149.5 | Ø200    | 135.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 166.5 | 149.5 | Ø140    | 166.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 148.5 | 169.0 | Ø160    | 148.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø250    | 153.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 181.5 | 169.0 | Ø160    | 191.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 179.5 | 196.0 | Ø160    | 179.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø250    | 184.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 222.5 | 196.0 | Ø160    | 222.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |



3.3.3 A shaft design (hollow shaft), F housing design (round flange)



- q0 Applies to motors without brake.

1) The length of the machine shaft must be at least 2.2 x  $\varnothing dh$  and the length of the feather key must be at least 2 x  $\varnothing dh$ .
- q1 Applies to motors with brake.

2) Cover (optional)

Dimensions of gear units

| Type | Øa1 | Øb1              | B   | c1 | Ødh              | ØDh | ØDha | Øe1 | f1  | h   | H     | i2   | i3   | le  | lh  | las | lha   | Øs1 | sm  | sas | th   | uh                |
|------|-----|------------------|-----|----|------------------|-----|------|-----|-----|-----|-------|------|------|-----|-----|-----|-------|-----|-----|-----|------|-------------------|
| F1   | 160 | 110 <sub>6</sub> | 145 | 10 | 20 <sup>H7</sup> | 35  | 70   | 130 | 3.5 | 74  | 238.0 | 25.5 | 44.5 | 73  | 95  | 12  | 112.0 | 9   | M6  | M8  | 22.8 | 6 <sup>JS9</sup>  |
| F2   | 200 | 130 <sub>6</sub> | 180 | 14 | 25 <sup>H7</sup> | 45  | 82   | 165 | 3.5 | 93  | 299.0 | 30.0 | 53.0 | 92  | 115 | 12  | 130.5 | 11  | M10 | M12 | 28.3 | 8 <sup>JS9</sup>  |
| F3   | 250 | 180 <sub>6</sub> | 206 | 15 | 30 <sup>H7</sup> | 50  | 88   | 215 | 4.0 | 106 | 335.5 | 31.5 | 56.5 | 103 | 130 | 12  | 155.5 | 14  | M10 | M12 | 33.3 | 8 <sup>JS9</sup>  |
| F4   | 250 | 180 <sub>6</sub> | 230 | 15 | 40 <sup>H7</sup> | 55  | 100  | 215 | 4.0 | 116 | 370.0 | 31.5 | 56.5 | 114 | 145 | 12  | 174.5 | 14  | M16 | M20 | 43.3 | 12 <sup>JS9</sup> |
| F6   | 300 | 230 <sub>6</sub> | 265 | 17 | 50 <sup>H7</sup> | 70  | 115  | 265 | 4.0 | 137 | 433.0 | 29.5 | 60.5 | 143 | 180 | 12  | 192.5 | 14  | M16 | M20 | 53.8 | 14 <sup>JS9</sup> |

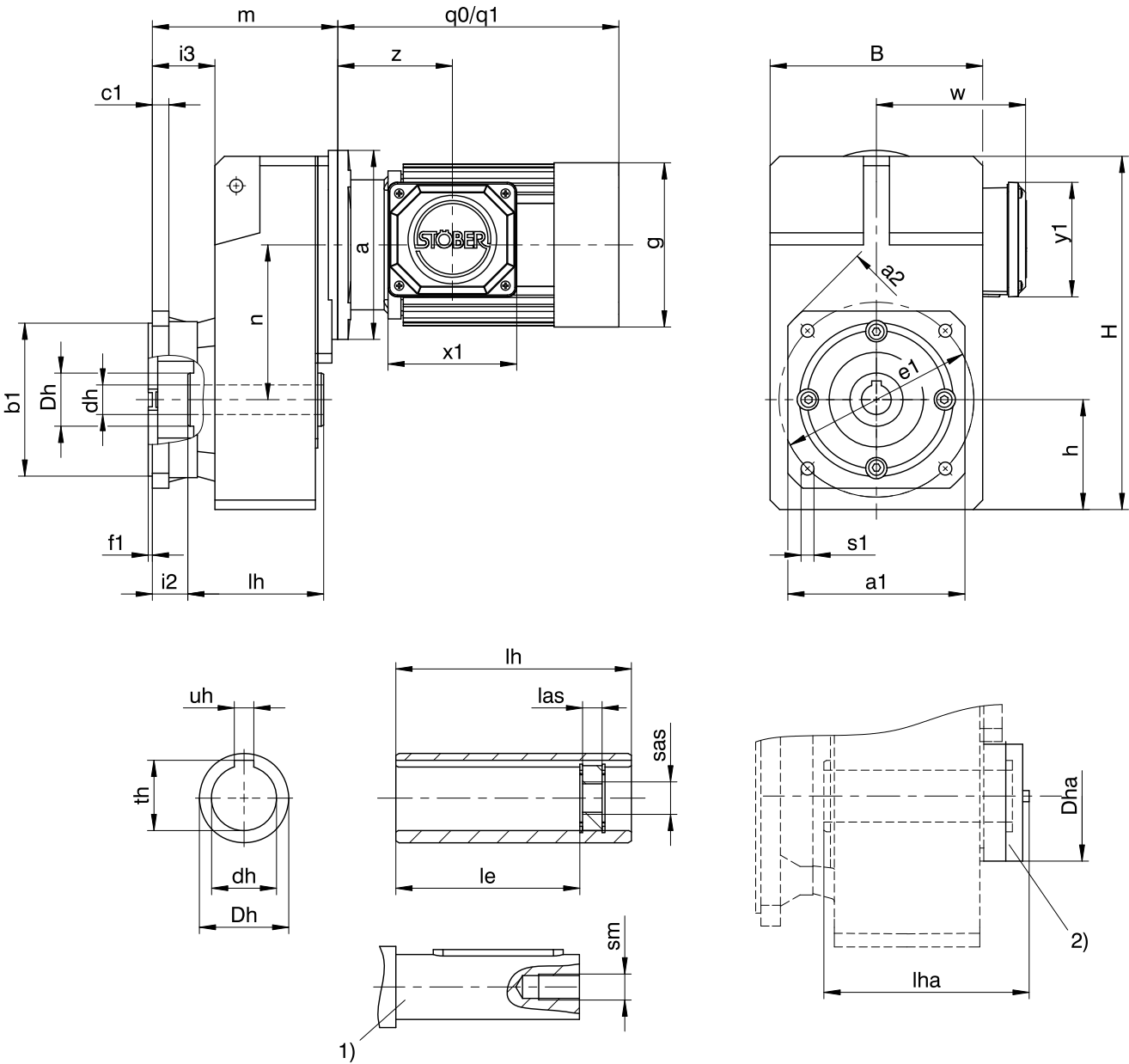
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 129.5 | 102.0 | Ø140    | 129.5 | 102.0 | Ø160    | 133.5 | 102.0 | Ø160    | 133.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 153.0 | 131.0 | Ø140    | 153.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø200    | 159.0 | 131.0 | Ø200    | 159.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 190.0 | 131.0 | Ø140    | 190.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 169.5 | 149.5 | Ø140    | 169.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø200    | 175.5 | 149.5 | Ø200    | 175.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 206.5 | 149.5 | Ø140    | 206.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 188.5 | 169.0 | Ø160    | 188.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø250    | 193.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 221.5 | 169.0 | Ø160    | 231.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 219.5 | 196.0 | Ø160    | 219.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø250    | 224.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 262.5 | 196.0 | Ø160    | 262.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

3.3.4 A shaft design (hollow shaft), Q housing design (square flange)



- q0 Applies to motors without brake. q1 Applies to motors with brake.
- 1) The length of the machine shaft must be at least 2.2 x Ødh and the length of the feather key must be at least 2 x Ødh. 2) Cover (optional)

Dimensions of gear units

| Type | □a1 | □a2 | Øb1              | B   | c1 | Ødh              | ØDh | ØDha | Øe1 | f1  | h   | H     | i2   | i3   | le  | lh  | las | lha   | Øs1 | sm  | sas | th   | uh                |
|------|-----|-----|------------------|-----|----|------------------|-----|------|-----|-----|-----|-------|------|------|-----|-----|-----|-------|-----|-----|-----|------|-------------------|
| F1   | 125 | 160 | 110 <sub>f</sub> | 145 | 10 | 20 <sup>H7</sup> | 35  | 70   | 130 | 3.5 | 74  | 238.0 | 25.5 | 44.5 | 73  | 95  | 12  | 112.0 | 9   | M6  | M8  | 22.8 | 6 <sup>JS9</sup>  |
| F2   | 150 | 195 | 130 <sub>f</sub> | 180 | 14 | 25 <sup>H7</sup> | 45  | 82   | 165 | 3.5 | 93  | 299.0 | 30.0 | 53.0 | 92  | 115 | 12  | 130.5 | 11  | M10 | M12 | 28.3 | 8 <sup>JS9</sup>  |
| F3   | 200 | 260 | 180 <sub>f</sub> | 206 | 15 | 30 <sup>H7</sup> | 50  | 88   | 215 | 4.0 | 106 | 335.5 | 31.5 | 56.5 | 103 | 130 | 12  | 155.5 | 14  | M10 | M12 | 33.3 | 8 <sup>JS9</sup>  |
| F4   | 200 | 260 | 180 <sub>f</sub> | 230 | 15 | 40 <sup>H7</sup> | 55  | 100  | 215 | 4.0 | 116 | 370.0 | 31.5 | 56.5 | 114 | 145 | 12  | 174.5 | 14  | M16 | M20 | 43.3 | 12 <sup>JS9</sup> |
| F6   | 250 | 325 | 230 <sub>f</sub> | 265 | 17 | 50 <sup>H7</sup> | 70  | 115  | 265 | 4.0 | 137 | 433.0 | 29.5 | 60.5 | 143 | 180 | 12  | 192.5 | 14  | M16 | M20 | 53.8 | 14 <sup>JS9</sup> |

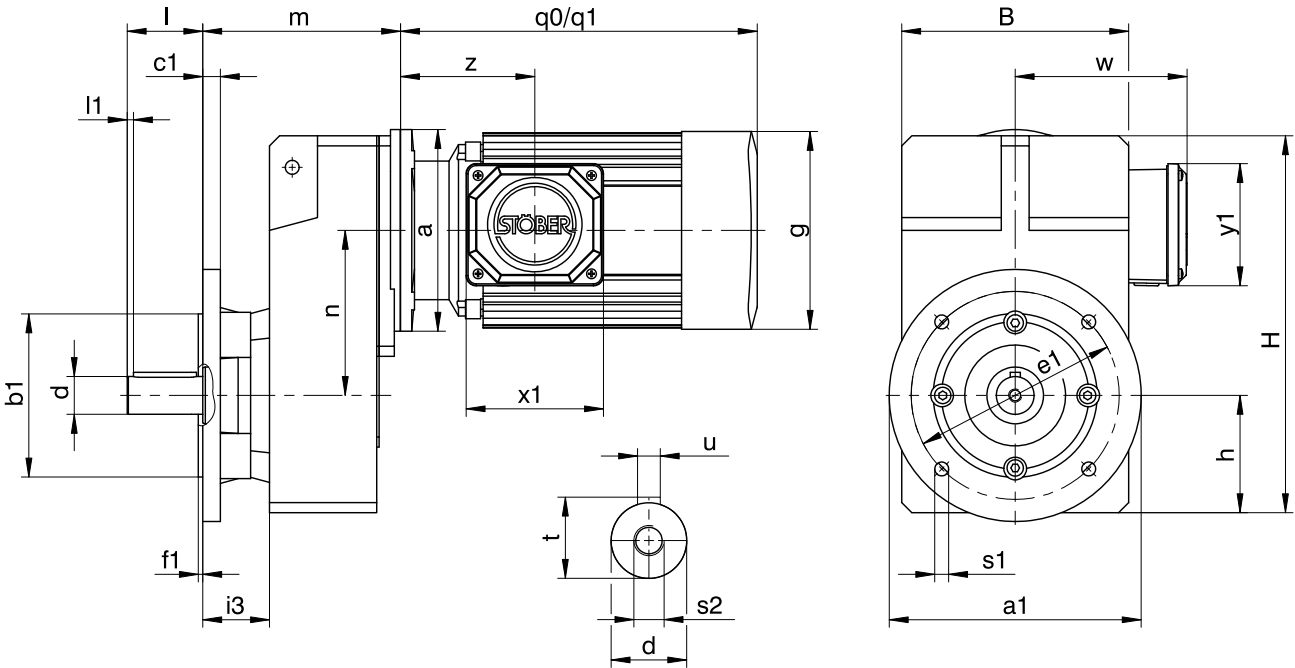
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 129.5 | 102.0 | Ø140    | 129.5 | 102.0 | Ø160    | 133.5 | 102.0 | Ø160    | 133.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 153.0 | 131.0 | Ø140    | 153.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø200    | 159.0 | 131.0 | Ø200    | 159.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 190.0 | 131.0 | Ø140    | 190.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 169.5 | 149.5 | Ø140    | 169.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø200    | 175.5 | 149.5 | Ø200    | 175.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 206.5 | 149.5 | Ø140    | 206.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 188.5 | 169.0 | Ø160    | 188.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø250    | 193.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 221.5 | 169.0 | Ø160    | 231.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 219.5 | 196.0 | Ø160    | 219.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø250    | 224.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 262.5 | 196.0 | Ø160    | 262.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

3.3.5
V shaft design (solid shaft), F housing design (round flange)



q0 Applies to motors without brake.
q1 Applies to motors with brake.

Dimensions of gear units

| Type | Øa1 | Øb1              | B   | c1 | Ød               | Øe1 | f1  | h   | H     | i3   | l   | l1 | Øs1 | s2  | t    | u        |
|------|-----|------------------|-----|----|------------------|-----|-----|-----|-------|------|-----|----|-----|-----|------|----------|
| F1   | 160 | 110 <sub>⌀</sub> | 145 | 10 | 25 <sub>k6</sub> | 130 | 3.5 | 74  | 238.0 | 44.5 | 50  | 5  | 9   | M10 | 28.0 | A8×7×40  |
| F2   | 200 | 130 <sub>⌀</sub> | 180 | 14 | 30 <sub>k6</sub> | 165 | 3.5 | 93  | 299.0 | 53.0 | 60  | 5  | 11  | M10 | 33.0 | A8×7×50  |
| F3   | 250 | 180 <sub>⌀</sub> | 206 | 15 | 35 <sub>k6</sub> | 215 | 4.0 | 106 | 335.5 | 56.5 | 70  | 5  | 14  | M12 | 38.0 | A10×8×60 |
| F4   | 250 | 180 <sub>⌀</sub> | 230 | 15 | 40 <sub>k6</sub> | 215 | 4.0 | 116 | 370.0 | 56.5 | 80  | 5  | 14  | M16 | 43.0 | A12×8×70 |
| F6   | 300 | 230 <sub>⌀</sub> | 265 | 17 | 50 <sub>k6</sub> | 265 | 4.0 | 137 | 433.0 | 60.5 | 100 | 5  | 14  | M16 | 53.5 | A14×9×90 |

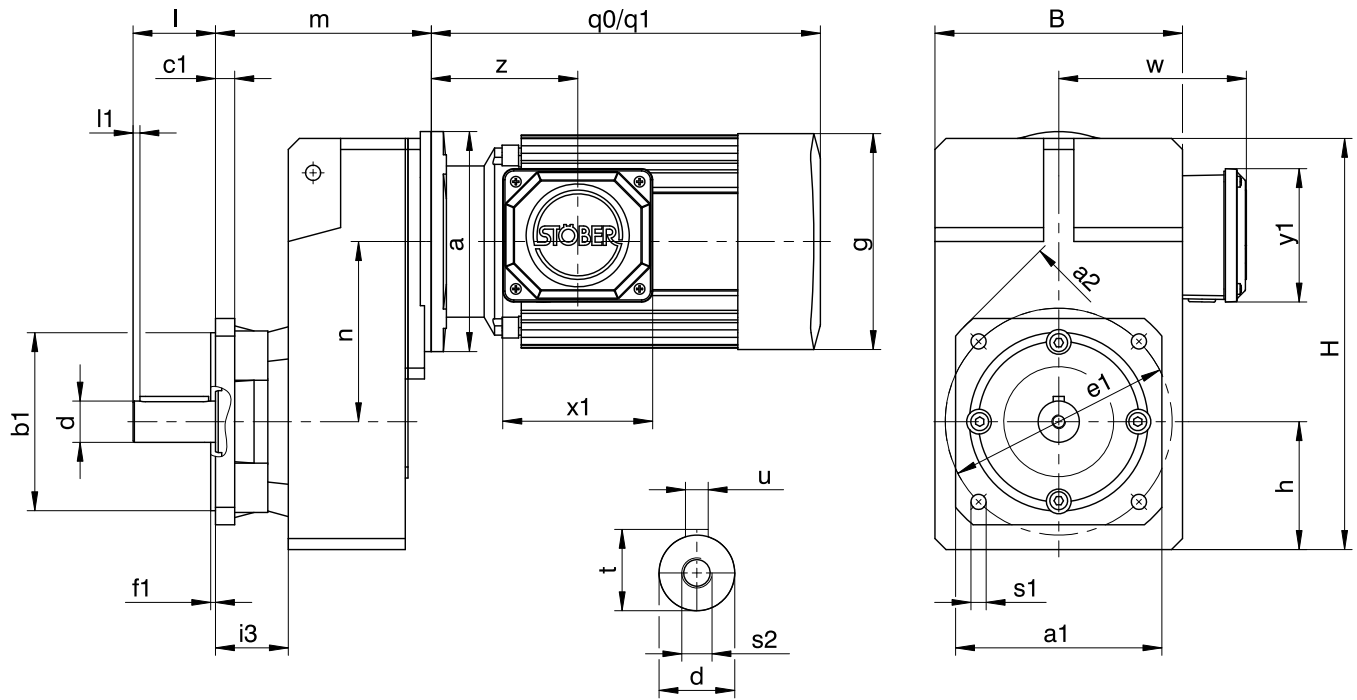
Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 129.5 | 102.0 | Ø140    | 129.5 | 102.0 | Ø160    | 133.5 | 102.0 | Ø160    | 133.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 153.0 | 131.0 | Ø140    | 153.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø200    | 159.0 | 131.0 | Ø200    | 159.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 190.0 | 131.0 | Ø140    | 190.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 169.5 | 149.5 | Ø140    | 169.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø200    | 175.5 | 149.5 | Ø200    | 175.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 206.5 | 149.5 | Ø140    | 206.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 188.5 | 169.0 | Ø160    | 188.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø250    | 193.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 221.5 | 169.0 | Ø160    | 231.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 219.5 | 196.0 | Ø160    | 219.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø250    | 224.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 262.5 | 196.0 | Ø160    | 262.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

### 3.3.6 V shaft design (solid shaft), Q housing design (square flange)



$q0$  Applies to motors without brake.

$q1$  Applies to motors with brake.

#### Dimensions of gear units

| Type | $\square a1$ | $\square a2$ | $\varnothing b1$  | $c1$ | $B$ | $\varnothing d$  | $\varnothing e1$ | $f1$ | $h$ | $H$   | $i3$ | $l$ | $l1$ | $\varnothing s1$ | $s2$ | $t$  | $u$      |
|------|--------------|--------------|-------------------|------|-----|------------------|------------------|------|-----|-------|------|-----|------|------------------|------|------|----------|
| F1   | 125          | 160          | 110 <sub>j6</sub> | 10   | 145 | 25 <sub>k6</sub> | 130              | 3.5  | 74  | 238.0 | 44.5 | 50  | 5    | 9                | M10  | 28.0 | A8×7×40  |
| F2   | 150          | 195          | 130 <sub>j6</sub> | 14   | 180 | 30 <sub>k6</sub> | 165              | 3.5  | 93  | 299.0 | 53.0 | 60  | 5    | 11               | M10  | 33.0 | A8×7×50  |
| F3   | 200          | 260          | 180 <sub>j6</sub> | 15   | 206 | 35 <sub>k6</sub> | 215              | 4.0  | 106 | 335.5 | 56.5 | 70  | 5    | 14               | M12  | 38.0 | A10×8×60 |
| F4   | 200          | 260          | 180 <sub>j6</sub> | 15   | 230 | 40 <sub>k6</sub> | 215              | 4.0  | 116 | 370.0 | 56.5 | 80  | 5    | 14               | M16  | 43.0 | A12×8×70 |
| F6   | 250          | 325          | 230 <sub>j6</sub> | 17   | 265 | 50 <sub>k6</sub> | 265              | 4.0  | 137 | 433.0 | 60.5 | 100 | 5    | 14               | M16  | 53.5 | A14×9×90 |

#### Dimensions of motors

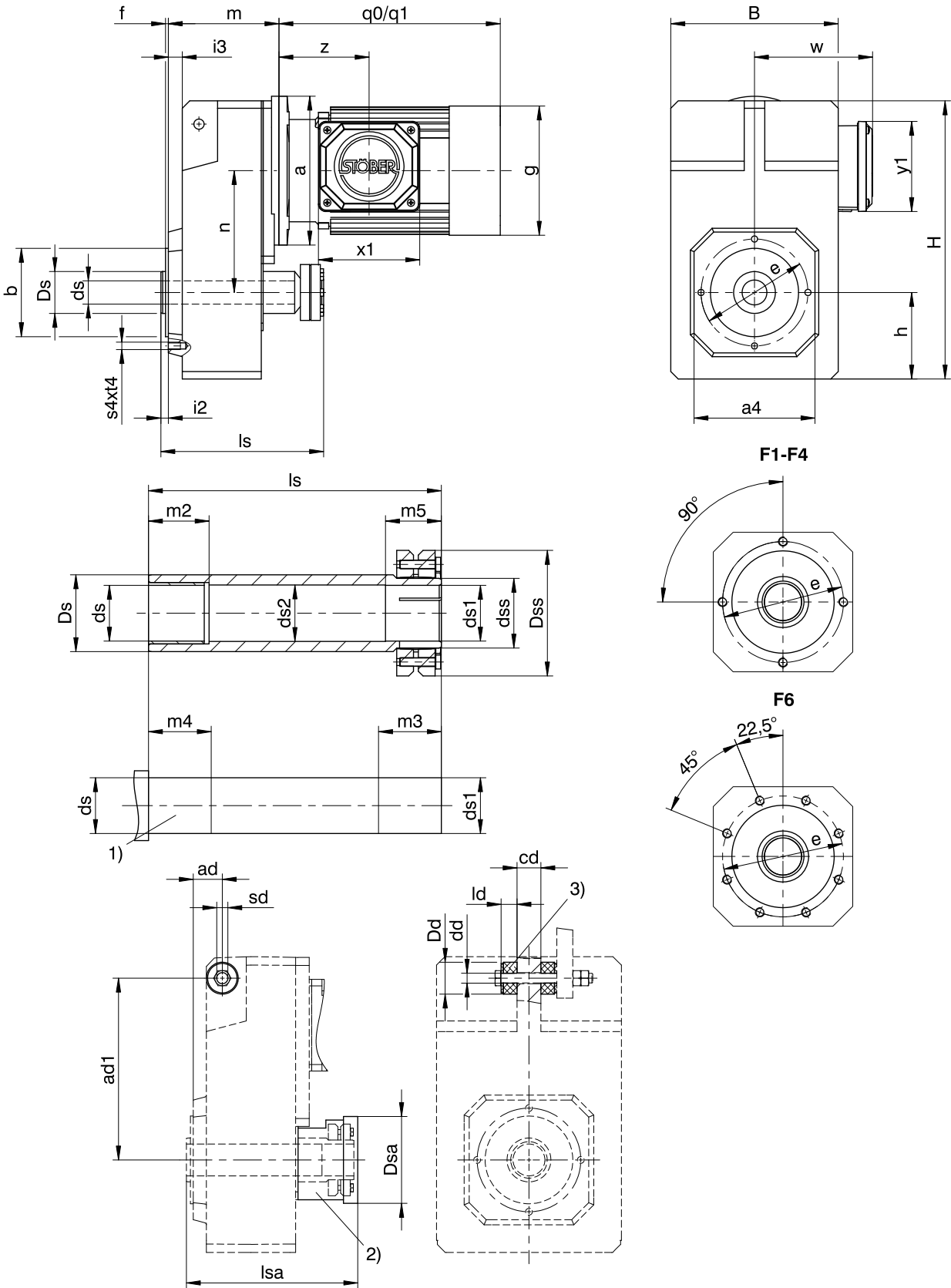
| Type        | $g$ | $q0$ | $q1$ | $w$ | $x1$  | $y1$  | $z$   |
|-------------|-----|------|------|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208  | 261  | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208  | 261  | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238  | 295  | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238  | 295  | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261  | 329  | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283  | 351  | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310  | 380  | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365  | 435  | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404  | 491  | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444  | 531  | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424  | 521  | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476  | 591  | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476  | 591  | 199 | 146.5 | 156.5 | 141.5 |

#### Dimensions of geared motors

| Type | IE3D063           |       |       | IE3D071           |       |       | IE3D080           |       |       | IE3D090           |       |       | IE3D100           |       |       | IE3D112           |       |       | IE3D132           |       |       |
|------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|-------------------|-------|-------|
|      | $a$               | $m$   | $n$   | $a$               | $m$   | $n$   | $a$               | $m$   | $n$   | $a$               | $m$   | $n$   | $a$               | $m$   | $n$   | $a$               | $m$   | $n$   | $a$               | $m$   | $n$   |
| F102 | $\varnothing 140$ | 129.5 | 102.0 | $\varnothing 140$ | 129.5 | 102.0 | $\varnothing 160$ | 133.5 | 102.0 | $\varnothing 160$ | 133.5 | 102.0 | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     |
| F202 | $\varnothing 140$ | 153.0 | 131.0 | $\varnothing 140$ | 153.0 | 131.0 | $\varnothing 160$ | 157.0 | 131.0 | $\varnothing 160$ | 157.0 | 131.0 | $\varnothing 200$ | 159.0 | 131.0 | $\varnothing 200$ | 159.0 | 131.0 | —                 | —     | —     |
| F203 | $\varnothing 140$ | 190.0 | 131.0 | $\varnothing 140$ | 190.0 | 131.0 | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     |
| F302 | $\varnothing 140$ | 169.5 | 149.5 | $\varnothing 140$ | 169.5 | 149.5 | $\varnothing 160$ | 173.5 | 149.5 | $\varnothing 160$ | 173.5 | 149.5 | $\varnothing 200$ | 175.5 | 149.5 | $\varnothing 200$ | 175.5 | 149.5 | —                 | —     | —     |
| F303 | $\varnothing 140$ | 206.5 | 149.5 | $\varnothing 140$ | 206.5 | 149.5 | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     |
| F402 | —                 | —     | —     | —                 | —     | —     | $\varnothing 160$ | 188.5 | 169.0 | $\varnothing 160$ | 188.5 | 169.0 | $\varnothing 200$ | 190.5 | 169.0 | $\varnothing 200$ | 190.5 | 169.0 | $\varnothing 250$ | 193.5 | 169.0 |
| F403 | —                 | —     | —     | $\varnothing 140$ | 221.5 | 169.0 | $\varnothing 160$ | 231.5 | 132.0 | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     |
| F602 | —                 | —     | —     | —                 | —     | —     | $\varnothing 160$ | 219.5 | 196.0 | $\varnothing 160$ | 219.5 | 196.0 | $\varnothing 200$ | 221.5 | 196.0 | $\varnothing 200$ | 221.5 | 196.0 | $\varnothing 250$ | 224.5 | 196.0 |
| F603 | —                 | —     | —     | —                 | —     | —     | $\varnothing 160$ | 262.5 | 196.0 | $\varnothing 160$ | 262.5 | 196.0 | —                 | —     | —     | —                 | —     | —     | —                 | —     | —     |



3.3.7 S shaft design (hollow shaft with shrink disk), G housing design (pitch circle diameter)



- |    |                                                                                                                                            |    |                               |
|----|--------------------------------------------------------------------------------------------------------------------------------------------|----|-------------------------------|
| q0 | Applies to motors without brake.                                                                                                           | q1 | Applies to motors with brake. |
| 1) | Machine shaft: The dimension $ls$ must meet or exceed the specified value.                                                                 | 2) | Cover (optional)              |
| 3) | Rubber buffer for torque arm bracket (optional). Dimension $\varnothing Dd$ = outer $\varnothing$ of the rubber buffer when not tensioned. |    |                               |

## Dimensions of gear units

| Type | □a4 | ad   | ad1 | Øb                | B   | cd | Ødd                | Øds              | Øds1                           | Øds2 | Ødss | ØDd | ØDs | ØDsa | ØDss | Øe  | f   | h   | H     | i2   | i3   | ld | ls  | lsa | m2 | m3 | m4 | m5 | s4  | sd  | t4 |
|------|-----|------|-----|-------------------|-----|----|--------------------|------------------|--------------------------------|------|------|-----|-----|------|------|-----|-----|-----|-------|------|------|----|-----|-----|----|----|----|----|-----|-----|----|
| F1   | 100 | 29.5 | 150 | 70 <sub>j6</sub>  | 145 | 20 | 11 <sup>+0.5</sup> | 20 <sub>h9</sub> | 20 <sub>h9</sub> <sup>H7</sup> | 20.5 | 24   | 30  | 35  | 63   | 50   | 85  | 2.5 | 74  | 238.0 | 6.5  | 12.5 | 15 | 146 | 150 | 20 | 31 | 25 | 26 | M8  | M10 | 13 |
| F2   | 130 | 33.0 | 181 | 95 <sub>j6</sub>  | 180 | 22 | 11 <sup>+0.5</sup> | 25 <sub>h9</sub> | 25 <sub>h9</sub> <sup>H7</sup> | 25.5 | 30   | 30  | 45  | 73   | 60   | 115 | 3.0 | 93  | 299.0 | 8.0  | 15.0 | 15 | 175 | 180 | 20 | 37 | 25 | 32 | M8  | M10 | 13 |
| F3   | 150 | 38.5 | 205 | 110 <sub>j6</sub> | 206 | 30 | 14 <sup>+0.5</sup> | 30 <sub>h9</sub> | 30 <sub>h9</sub> <sup>H7</sup> | 30.5 | 36   | 37  | 50  | 83   | 72   | 130 | 3.5 | 106 | 335.5 | 8.5  | 16.5 | 20 | 192 | 196 | 25 | 37 | 30 | 32 | M10 | M12 | 16 |
| F4   | 150 | 38.5 | 228 | 110 <sub>j6</sub> | 230 | 30 | 14 <sup>+0.5</sup> | 40 <sub>h9</sub> | 40 <sub>h9</sub> <sup>H7</sup> | 40.5 | 50   | 37  | 55  | 108  | 90   | 130 | 3.5 | 116 | 370.0 | 8.5  | 16.5 | 20 | 210 | 215 | 40 | 45 | 45 | 40 | M10 | M12 | 16 |
| F6   | 180 | 44.5 | 270 | 130 <sub>j6</sub> | 265 | 35 | 22 <sup>+0.5</sup> | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 60  | 70  | 128  | 106  | 165 | 3.5 | 137 | 433.0 | 10.5 | 20.5 | 30 | 248 | 251 | 40 | 47 | 45 | 42 | M10 | M20 | 16 |

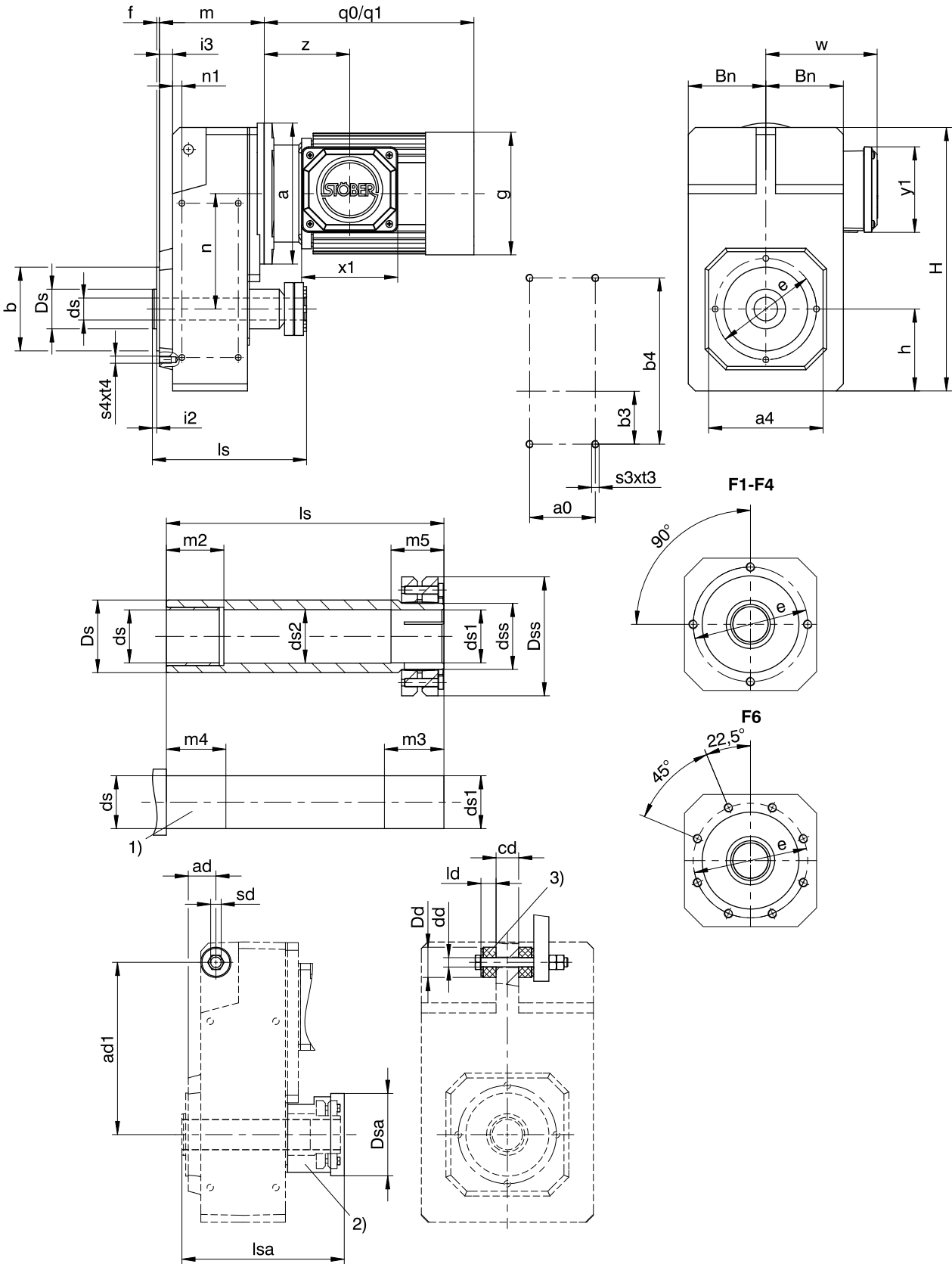
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 97.5  | 102.0 | Ø140    | 97.5  | 102.0 | Ø160    | 101.5 | 102.0 | Ø160    | 101.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 115.0 | 131.0 | Ø140    | 115.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø200    | 121.0 | 131.0 | Ø200    | 121.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 152.0 | 131.0 | Ø140    | 152.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 129.5 | 149.5 | Ø140    | 129.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø200    | 135.5 | 149.5 | Ø200    | 135.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 166.5 | 149.5 | Ø140    | 166.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 148.5 | 169.0 | Ø160    | 148.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø250    | 153.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 181.5 | 169.0 | Ø160    | 191.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 179.5 | 196.0 | Ø160    | 179.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø250    | 184.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 222.5 | 196.0 | Ø160    | 222.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

3.3.8 S shaft design (hollow shaft with shrink disk), GN housing design (pitch circle diameter + side fastening)



- $q_0$  Applies to motors without brake.  $q_1$  Applies to motors with brake.
- 1) Machine shaft: The dimension  $l_s$  must meet or exceed the specified value. 2) Cover (optional)
- 3) Rubber buffer for torque arm bracket (optional). Dimension  $\varnothing Dd$  = outer  $\varnothing$  of the rubber buffer when not tensioned.

## Dimensions of gear units

| Type | a0  | □a4 | ad   | ad1 | Øb                | b3 | b4  | Bn  | cd | Ødd                | Øds              | Øds1                           | Øds2 | Ødss | ØDd | ØDs | ØDsa | ØDss |
|------|-----|-----|------|-----|-------------------|----|-----|-----|----|--------------------|------------------|--------------------------------|------|------|-----|-----|------|------|
| F1   | 50  | 100 | 29.5 | 150 | 70 <sub>j6</sub>  | 40 | 140 | 71  | 20 | 11 <sup>+0.5</sup> | 20 <sub>h9</sub> | 20 <sub>h9</sub> <sup>H7</sup> | 20.5 | 24   | 30  | 63  | 63   | 50   |
| F2   | 64  | 130 | 33.0 | 181 | 95 <sub>j6</sub>  | 55 | 175 | 88  | 22 | 11 <sup>+0.5</sup> | 25 <sub>h9</sub> | 25 <sub>h9</sub> <sup>H7</sup> | 25.5 | 30   | 30  | 73  | 73   | 60   |
| F3   | 72  | 150 | 38.5 | 205 | 110 <sub>j6</sub> | 60 | 200 | 102 | 30 | 14 <sup>+0.5</sup> | 30 <sub>h9</sub> | 30 <sub>h9</sub> <sup>H7</sup> | 30.5 | 36   | 37  | 83  | 83   | 72   |
| F4   | 87  | 150 | 38.5 | 228 | 110 <sub>j6</sub> | 70 | 220 | 114 | 30 | 14 <sup>+0.5</sup> | 40 <sub>h9</sub> | 40 <sub>h9</sub> <sup>H7</sup> | 40.5 | 50   | 37  | 108 | 108  | 90   |
| F6   | 108 | 180 | 44.5 | 270 | 130 <sub>j6</sub> | 85 | 270 | 131 | 35 | 22 <sup>+0.5</sup> | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 60  | 128 | 128  | 106  |

| Type | Øe  | f   | h   | H     | i2   | i3   | ld | ls  | lsa | n1   | m2 | m3 | m4 | m5 | s3  | s4  | sd  | t3 | t4 |
|------|-----|-----|-----|-------|------|------|----|-----|-----|------|----|----|----|----|-----|-----|-----|----|----|
| F1   | 85  | 2.5 | 74  | 238.0 | 6.5  | 12.5 | 15 | 146 | 150 | 10   | 20 | 31 | 25 | 26 | M6  | M8  | M10 | 11 | 13 |
| F2   | 115 | 3.0 | 93  | 299.0 | 8.0  | 15.0 | 15 | 175 | 180 | 10.5 | 20 | 37 | 25 | 32 | M8  | M8  | M10 | 13 | 13 |
| F3   | 130 | 3.5 | 106 | 335.5 | 8.5  | 16.5 | 20 | 192 | 196 | 12.5 | 25 | 37 | 30 | 32 | M10 | M10 | M12 | 16 | 16 |
| F4   | 130 | 3.5 | 116 | 370.0 | 8.5  | 16.5 | 20 | 210 | 215 | 12.5 | 40 | 45 | 45 | 40 | M10 | M10 | M12 | 16 | 16 |
| F6   | 165 | 3.5 | 137 | 433.0 | 10.5 | 20.5 | 30 | 248 | 251 | 15.5 | 40 | 47 | 45 | 42 | M12 | M10 | M20 | 19 | 16 |

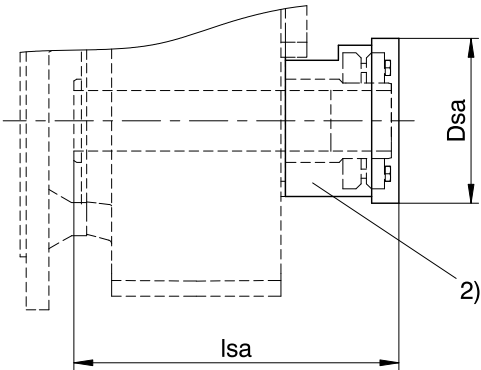
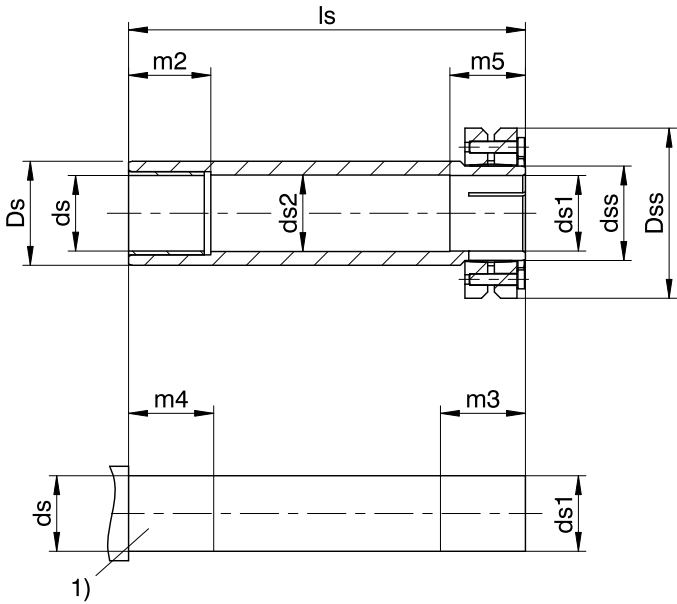
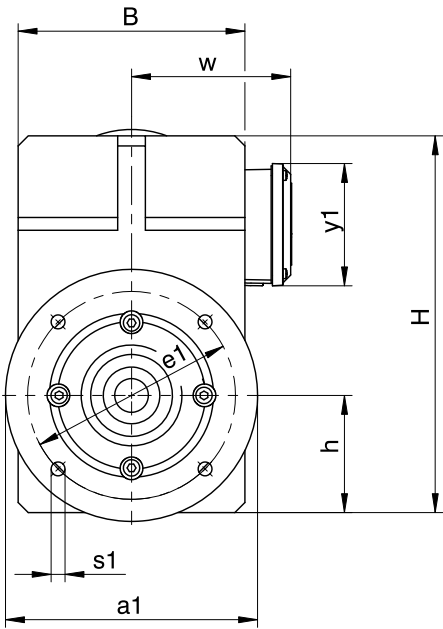
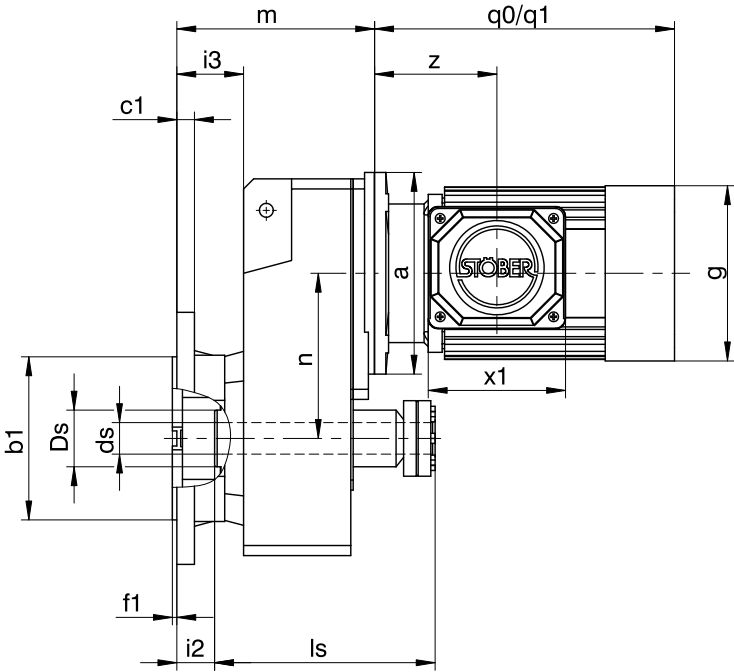
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 97.5  | 102.0 | Ø140    | 97.5  | 102.0 | Ø160    | 101.5 | 102.0 | Ø160    | 101.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 115.0 | 131.0 | Ø140    | 115.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø160    | 119.0 | 131.0 | Ø200    | 121.0 | 131.0 | Ø200    | 121.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 152.0 | 131.0 | Ø140    | 152.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 129.5 | 149.5 | Ø140    | 129.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø160    | 133.5 | 149.5 | Ø200    | 135.5 | 149.5 | Ø200    | 135.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 166.5 | 149.5 | Ø140    | 166.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 148.5 | 169.0 | Ø160    | 148.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø200    | 150.5 | 169.0 | Ø250    | 153.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 181.5 | 169.0 | Ø160    | 191.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 179.5 | 196.0 | Ø160    | 179.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø200    | 181.5 | 196.0 | Ø250    | 184.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 222.5 | 196.0 | Ø160    | 222.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

3.3.9 S shaft design (hollow shaft with shrink disk), F housing design (round flange)



- |    |                                                                          |    |                               |
|----|--------------------------------------------------------------------------|----|-------------------------------|
| q0 | Applies to motors without brake.                                         | q1 | Applies to motors with brake. |
| 1) | Machine shaft: The dimension ls must meet or exceed the specified value. | 2) | Cover (optional)              |

## Dimensions of gear units

| Type | Øa1 | Øb1               | B   | c1 | Øds              | Øds1                           | Øds2 | Ødss | ØDs | ØDsa | ØDss | Øe1 | f1  | h   | H     | i2   | i3   | ls  | lsa | m2 | m3 | m4 | m5 | Øs1 |
|------|-----|-------------------|-----|----|------------------|--------------------------------|------|------|-----|------|------|-----|-----|-----|-------|------|------|-----|-----|----|----|----|----|-----|
| F1   | 160 | 110 <sub>js</sub> | 145 | 10 | 20 <sub>h9</sub> | 20 <sub>h9</sub> <sup>H7</sup> | 20.5 | 24   | 35  | 63   | 50   | 130 | 3.5 | 74  | 238.0 | 25.5 | 44.5 | 146 | 150 | 20 | 31 | 25 | 26 | 9   |
| F2   | 200 | 130 <sub>js</sub> | 180 | 14 | 25 <sub>h9</sub> | 25 <sub>h9</sub> <sup>H7</sup> | 25.5 | 30   | 45  | 73   | 60   | 165 | 3.5 | 93  | 299.0 | 30.0 | 53.0 | 175 | 180 | 20 | 37 | 25 | 32 | 11  |
| F3   | 250 | 180 <sub>js</sub> | 206 | 15 | 30 <sub>h9</sub> | 30 <sub>h9</sub> <sup>H7</sup> | 30.5 | 36   | 50  | 83   | 72   | 215 | 4.0 | 106 | 335.5 | 31.5 | 56.5 | 192 | 196 | 25 | 37 | 30 | 32 | 14  |
| F4   | 250 | 180 <sub>js</sub> | 230 | 15 | 40 <sub>h9</sub> | 40 <sub>h9</sub> <sup>H7</sup> | 40.5 | 50   | 55  | 108  | 90   | 215 | 4.0 | 116 | 370.0 | 31.5 | 56.5 | 210 | 215 | 40 | 45 | 45 | 40 | 14  |
| F6   | 300 | 230 <sub>js</sub> | 265 | 17 | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 70  | 128  | 106  | 265 | 4.0 | 137 | 433.0 | 29.5 | 60.5 | 248 | 251 | 40 | 47 | 45 | 42 | 14  |

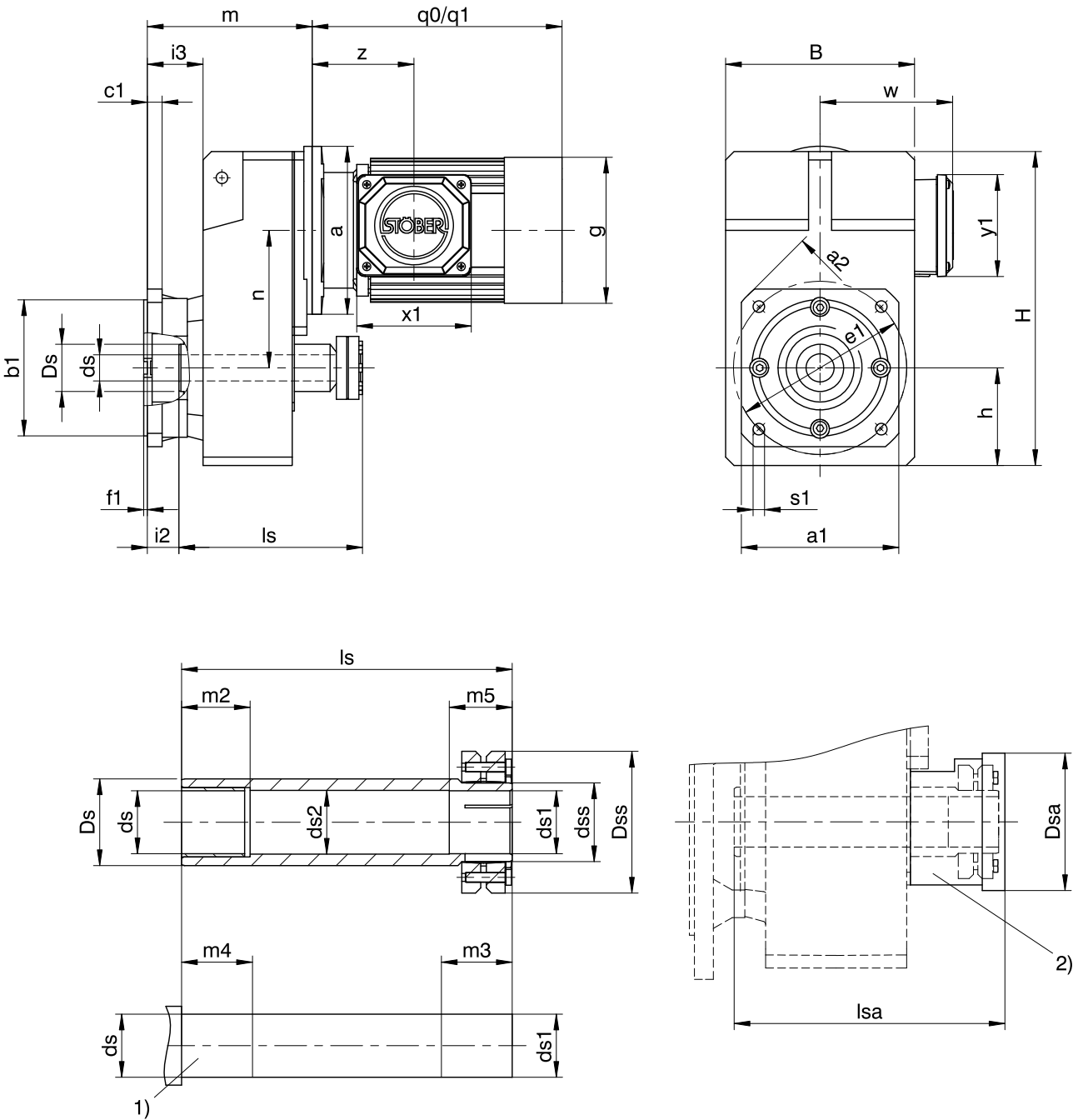
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 129.5 | 102.0 | Ø140    | 129.5 | 102.0 | Ø160    | 133.5 | 102.0 | Ø160    | 133.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 153.0 | 131.0 | Ø140    | 153.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø200    | 159.0 | 131.0 | Ø200    | 159.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 190.0 | 131.0 | Ø140    | 190.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 169.5 | 149.5 | Ø140    | 169.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø200    | 175.5 | 149.5 | Ø200    | 175.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 206.5 | 149.5 | Ø140    | 206.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 188.5 | 169.0 | Ø160    | 188.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø250    | 193.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 221.5 | 169.0 | Ø160    | 231.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 219.5 | 196.0 | Ø160    | 219.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø250    | 224.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 262.5 | 196.0 | Ø160    | 262.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

3.3.10 S shaft design (hollow shaft with shrink disk), Q housing design (square flange)



- q0

Applies to motors without brake.
- q1

Applies to motors with brake.
- 1)

Machine shaft: The dimension  $l_s$  must meet or exceed the specified value.
- 2)

Cover (optional)

Dimensions of gear units

| Type | □a1 | □a2 | Øb1               | B   | c1 | Øds              | Øds1                           | Øds2 | Ødss | ØDs | ØDsa | ØDss | Øe1 | f1  | h   | H     | i2   | i3   | ls  | lsa | m2 | m3 | m4 | m5 | Øs1 |
|------|-----|-----|-------------------|-----|----|------------------|--------------------------------|------|------|-----|------|------|-----|-----|-----|-------|------|------|-----|-----|----|----|----|----|-----|
| F1   | 125 | 160 | 110 <sub>js</sub> | 145 | 10 | 20 <sub>h9</sub> | 20 <sub>h9</sub> <sup>H7</sup> | 20.5 | 24   | 35  | 63   | 50   | 130 | 3.5 | 74  | 238.0 | 25.5 | 44.5 | 146 | 150 | 20 | 31 | 25 | 26 | 9   |
| F2   | 150 | 195 | 130 <sub>js</sub> | 180 | 14 | 25 <sub>h9</sub> | 25 <sub>h9</sub> <sup>H7</sup> | 25.5 | 30   | 45  | 73   | 60   | 165 | 3.5 | 93  | 299.0 | 30.0 | 53.0 | 175 | 180 | 20 | 37 | 25 | 32 | 11  |
| F3   | 200 | 260 | 180 <sub>js</sub> | 206 | 15 | 30 <sub>h9</sub> | 30 <sub>h9</sub> <sup>H7</sup> | 30.5 | 36   | 50  | 83   | 72   | 215 | 4.0 | 106 | 335.5 | 31.5 | 56.5 | 192 | 196 | 25 | 37 | 30 | 32 | 14  |
| F4   | 200 | 260 | 180 <sub>js</sub> | 230 | 15 | 40 <sub>h9</sub> | 40 <sub>h9</sub> <sup>H7</sup> | 40.5 | 50   | 55  | 108  | 90   | 215 | 4.0 | 116 | 370.0 | 31.5 | 56.5 | 210 | 215 | 40 | 45 | 45 | 40 | 14  |
| F6   | 250 | 325 | 230 <sub>js</sub> | 265 | 17 | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 70  | 128  | 106  | 265 | 4.0 | 137 | 433.0 | 29.5 | 60.5 | 248 | 251 | 40 | 47 | 45 | 42 | 14  |



## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |

## Dimensions of geared motors

| Type | IE3D063 |       |       | IE3D071 |       |       | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       |
|------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|      | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     | a       | m     | n     |
| F102 | Ø140    | 129.5 | 102.0 | Ø140    | 129.5 | 102.0 | Ø160    | 133.5 | 102.0 | Ø160    | 133.5 | 102.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F202 | Ø140    | 153.0 | 131.0 | Ø140    | 153.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø160    | 157.0 | 131.0 | Ø200    | 159.0 | 131.0 | Ø200    | 159.0 | 131.0 | –       | –     | –     |
| F203 | Ø140    | 190.0 | 131.0 | Ø140    | 190.0 | 131.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F302 | Ø140    | 169.5 | 149.5 | Ø140    | 169.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø160    | 173.5 | 149.5 | Ø200    | 175.5 | 149.5 | Ø200    | 175.5 | 149.5 | –       | –     | –     |
| F303 | Ø140    | 206.5 | 149.5 | Ø140    | 206.5 | 149.5 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F402 | –       | –     | –     | –       | –     | –     | Ø160    | 188.5 | 169.0 | Ø160    | 188.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø200    | 190.5 | 169.0 | Ø250    | 193.5 | 169.0 |
| F403 | –       | –     | –     | Ø140    | 221.5 | 169.0 | Ø160    | 231.5 | 132.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| F602 | –       | –     | –     | –       | –     | –     | Ø160    | 219.5 | 196.0 | Ø160    | 219.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø200    | 221.5 | 196.0 | Ø250    | 224.5 | 196.0 |
| F603 | –       | –     | –     | –       | –     | –     | Ø160    | 262.5 | 196.0 | Ø160    | 262.5 | 196.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |

### 3.4 Type designation

In this chapter, you can find an explanation of the type designation with the associated options.  
 Additional ordering information not included in the type designation can be found at the end of the chapter.

**Sample code**

|   |   |   |   |   |   |      |            |
|---|---|---|---|---|---|------|------------|
| F | 2 | 0 | 2 | A | G | 0280 | IE3D080L04 |
|---|---|---|---|---|---|------|------------|

**Explanation**

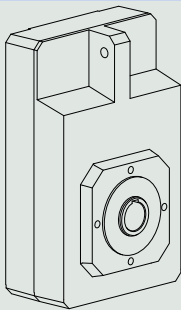
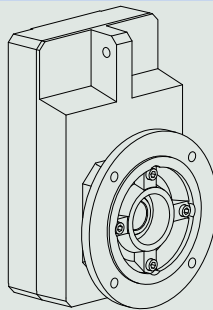
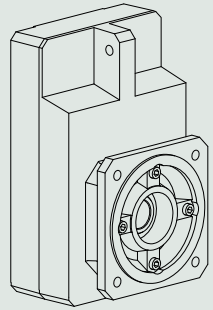
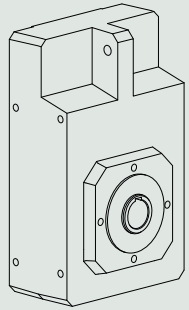
| Code    | Designation                         | Design                                 |
|---------|-------------------------------------|----------------------------------------|
| F       | Type                                | Offset helical gear unit               |
| 2       | Size                                | 2 (example)                            |
| 0       | Generation                          | Generation 0                           |
| 2       | Stages                              | Two-stage                              |
| 3       |                                     | Three-stage                            |
| A       | Shaft                               | Hollow shaft with keyway               |
| S       |                                     | Hollow shaft with shrink ring          |
| V       |                                     | Solid shaft                            |
| G       | Housing                             | Pitch circle diameter                  |
| F       |                                     | Round flange                           |
| Q       |                                     | Square flange                          |
| GN      |                                     | Pitch circle diameter + side fastening |
| 0280    | Transmission ratio (i x 10 rounded) | i = 28.11 (example)                    |
| IE3D080 | Motor                               | IE3D asynchronous motor                |
| L04     |                                     |                                        |

In order to complete the type designation, also specify:

- A detailed type designation of the motor, see the chapter [\[► 5.4\]](#)
- The mounting position, see the chapter [\[► 3.5.4\]](#)
- The position of the terminal box, see the chapter [\[► 3.5.6\]](#)

## 3.5 Product description

### 3.5.1 Housing design

| Pitch circle diameter G                                                            | Round flange F                                                                       |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|   |   |
| Square flange Q                                                                    | Pitch circle diameter + side fastening GN                                            |
|  |  |

|    | G | F | Q | GN |
|----|---|---|---|----|
| F1 | ✓ | ✓ | ✓ | ✓  |
| F2 | ✓ | ✓ | ✓ | ✓  |
| F3 | ✓ | ✓ | ✓ | ✓  |
| F4 | ✓ | ✓ | ✓ | ✓  |
| F6 | ✓ | ✓ | ✓ | ✓  |

### 3.5.2 Combinatorial shaft/housing design

|                               | Housing design |    |    |    |     |
|-------------------------------|----------------|----|----|----|-----|
| Shaft design                  | Code           | G  | F  | Q  | GN  |
| Hollow shaft with keyway      | A              | AG | AF | AQ | AGN |
| Hollow shaft with shrink ring | S              | SG | SF | SQ | SGN |
| Solid shaft                   | V              | –  | VF | VQ | –   |

### 3.5.3 Installation conditions

#### Hollow shaft

The hollow shaft hole tolerance is ISO H7. The tolerance of the machine shaft must be ISO k6.

Take care to align the machine shaft with the gear unit hollow shaft when attaching the gear unit.

Maximum deviation  $\leq 0.03$  mm.

For simpler assembly and disassembly of the machine shaft, the hollow shafts are equipped with a spiral groove (as a grease deposit).

A hardened, threaded keeper plate is included in the scope of delivery. You also have the option to order the hollow shaft without a keeper plate.

#### Hollow shaft with shrink ring

The tolerance of the hollow shaft hole is ISO H7.

The machine shaft must be ISO h9.

Select a material for the machine shaft with a permitted surface pressure of  $p \geq 325$  N/mm<sup>2</sup>.

Possible materials:

- C45E +QT
- 42CrMo4

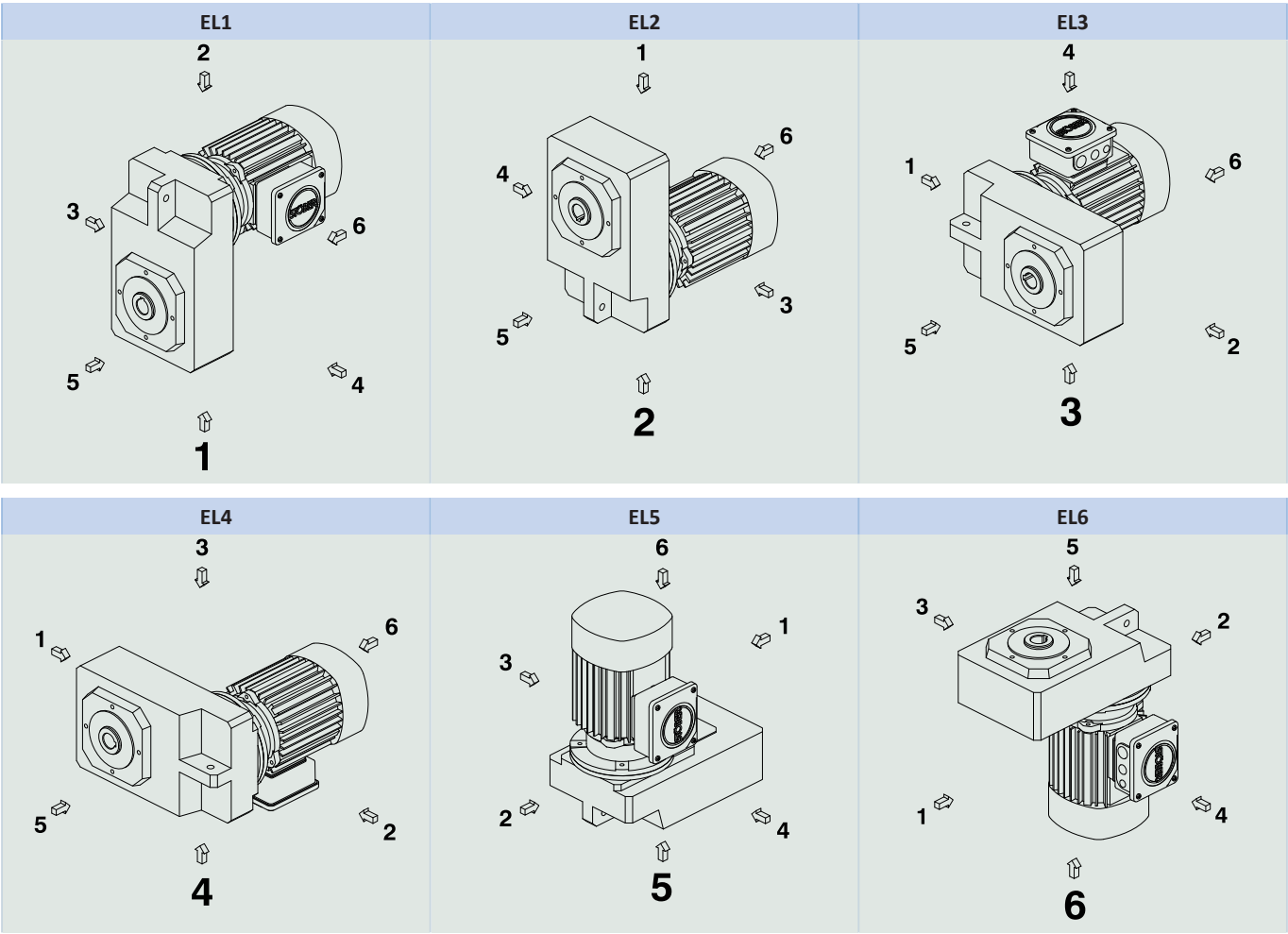
**Fastening the gear units on the machine side using the pitch circle diameter**

The specified torques and forces only apply when gear units are fastened on the machine side using screws of strength class 10.9. In addition, the gear housings must be adjusted at the pilot. The machine-side fit must be H7.

**3.5.4 Mounting positions**

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.



Since the lubricant filling volume of the gear unit depends on the mounting position, the mounting position must be specified when ordering.

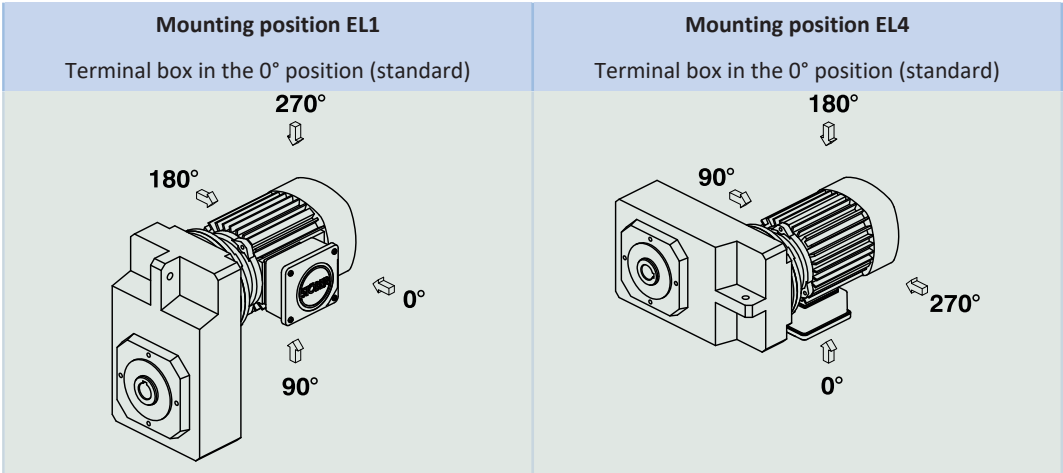
**3.5.5 Lubricants**

STOBER fills the gear units with the amount and type of lubricant specified on the nameplate. The filling volume and the structure of the gear units depend on the mounting position.

Only install the gear units in the intended mounting position! Reposition the gear units only after consulting STOBER. Otherwise, STOBER assumes no liability for the gear units.

You will receive lubricants for use in the food industry upon request.

3.5.6 Position of the terminal box



Indicate variations for your geared motor in the purchase order.

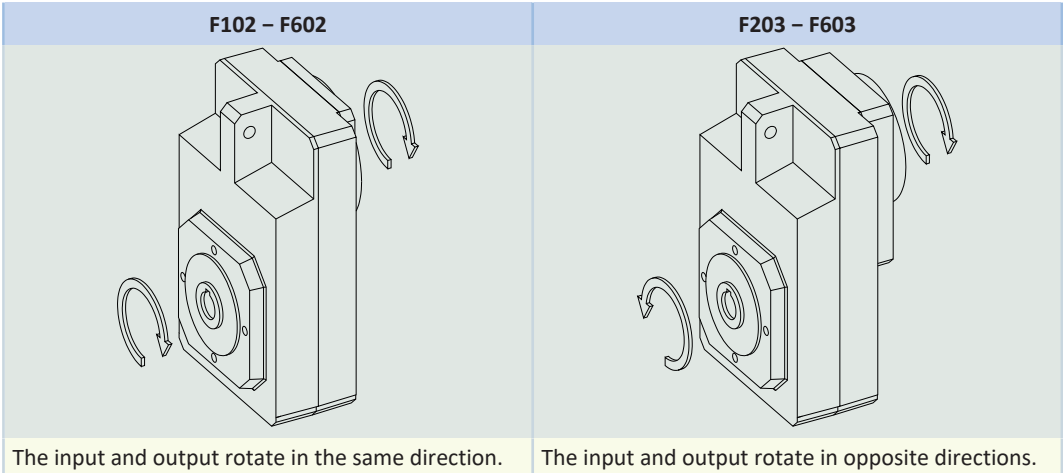
Note that the terminal box position rotates along with the geared motor if the geared motor rotates to another mounting position.

3.5.7 Other product features

| Feature                                                                | Value                                                                                    |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Max. permitted gear unit temperature (on the surface of the gear unit) | ≤ 80 °C                                                                                  |
| Paint                                                                  | RAL 7001 Silver gray<br>Optional selection of various RAL colors.                        |
| (ATEX) Directive 2014/34/EU                                            | You can get asynchronous motors for use in potentially explosive atmospheres on request. |
| Efficiency:                                                            |                                                                                          |
| η <sub>get</sub> two-stage                                             | 97%                                                                                      |
| η <sub>get</sub> three-stage                                           | 96%                                                                                      |
| Protection class                                                       | IP56                                                                                     |

3.5.8 Direction of rotation

Solid shaft (V), hollow shaft with keyway (A), hollow shaft with shrink ring (S)



The pictures show mounting position EL1.

## 3.6 Project configuration

Project your drives using the information in this chapter. In doing so, observe the limit conditions in this chapter to ensure a safe design.

An explanation of the formula symbols can be found in Chapter [13.1](#)

Determine the following for your application:

- The actual torque  $M_{2N^*}$
- The actual speed  $n_{2^*}$
- The operating mode operating factor  $fB_{op}$
- The runtime operating factor  $fB_t$
- The motor operating factor  $fB_{mot}$
- The duty cycle ED in %

$$ED = \frac{t_{op}}{T} \cdot 100\%$$

For the S4 and S8 operating mode:

- The mass moment of inertia  $J_{2^*}$

$$J_{1^*} = \frac{J_{2^*}}{i^2}$$

Calculate the motor rating necessary for your application:

$$P_{N^*} = \frac{M_{2N^*} \cdot n_{2^*} \cdot fB_{mot}}{9550}$$

Using the determined values and the calculated motor rating, select a suitable drive from the selection table.

Then check the following conditions:

$$M_{2N^*} \cdot fB_{op} \cdot fB_t < M_{2N} \cdot S$$

$$P_N^* < P_N$$

Operating factors

| Run time             | $fB_t$ |
|----------------------|--------|
| Daily runtime ≤ 8 h  | 1.00   |
| Daily runtime ≤ 16 h | 1.15   |
| Daily runtime ≤ 24 h | 1.20   |

| Operating mode                                                                                                                                                                                                                                                   | Characteristic output curve | ED          | $fB_{op}$                                                  | $fB_{mot}$                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------|------------------------------------------------------------|------------------------------------------------------------|
| <b>S1</b> Continuous operation with soft start <ul style="list-style-type: none"> <li>Start time up to 30 s</li> </ul>                                                                                                                                           |                             | 100 %       | 1.00                                                       | 1.00                                                       |
| <b>S1</b> Continuous operation with normal start <ul style="list-style-type: none"> <li>Asynchronous motors with direct switch-on or dynamic loading</li> <li>Start time up to 30 s</li> </ul>                                                                   |                             | 100 %       | 1.25                                                       | 1.00                                                       |
| <b>S1</b> Continuous operation with high-load start <ul style="list-style-type: none"> <li>Start time up to 30 s</li> </ul>                                                                                                                                      |                             | 100 %       | 1.25                                                       | 1.25                                                       |
| <b>S2</b> brief operation <ul style="list-style-type: none"> <li>Operating time <math>t_{op} \leq 3</math> minutes</li> </ul>                                                                                                                                    |                             | $\leq 30$ % | 0.75                                                       | 0.75                                                       |
| <b>S3</b> Periodic cyclic operation <ul style="list-style-type: none"> <li>Cycle time <math>T \leq 10</math> minutes</li> <li>Cyclic operation with braking motor</li> <li>Low additional flywheel weights<br/><math>J_{1*} &lt; 0,5 \cdot J_1</math></li> </ul> |                             | $\leq 25$ % | 0.70                                                       | 0.70                                                       |
|                                                                                                                                                                                                                                                                  |                             | $\leq 40$ % | 1.00                                                       | 1.00                                                       |
|                                                                                                                                                                                                                                                                  |                             | $\leq 60$ % | 1.25                                                       | 1.25                                                       |
| <b>S4</b> Periodic cyclic operation with the effect of the start-up process <ul style="list-style-type: none"> <li>Cycle time <math>T \leq 10</math> minutes</li> <li>Cyclic operation with braking motor</li> <li>Larger additional flywheel weights</li> </ul> |                             | 40 %        | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | 1.40                                                       |
| <b>S6</b> Uninterrupted periodic operation                                                                                                                                                                                                                       |                             | 100 %       | 1.25                                                       | 1.00                                                       |
| <b>S6</b> Uninterrupted periodic operation with short-term loading <ul style="list-style-type: none"> <li>Low speeds</li> <li>Low additional flywheel weights<br/><math>J_{1*} &lt; 0,5 \cdot J_1</math></li> </ul>                                              |                             | 100 %       | 1.40                                                       | 1.00                                                       |
| <b>S6</b> Uninterrupted periodic operation with impact loading <ul style="list-style-type: none"> <li>High speeds</li> <li>Large additional flywheel weights</li> </ul>                                                                                          |                             | 100 %       | 1.60                                                       | 1.25                                                       |
| <b>S8</b> Uninterrupted periodic operation <ul style="list-style-type: none"> <li>With load changes</li> <li>With speed changes</li> </ul>                                                                                                                       |                             | 100 %       | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | $J_{1*} \leq J_1: 1.25$<br>$J_{1*} \sim 3 \cdot J_1: 1.40$ |
| <b>S9</b> Non-periodic operation <ul style="list-style-type: none"> <li>With load changes</li> <li>With speed changes</li> </ul>                                                                                                                                 |                             | 100 %       | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | $J_{1*} \leq J_1: 1.25$<br>$J_{1*} \sim 3 \cdot J_1: 1.40$ |
| <b>S10</b> Operation with individual constant loads                                                                                                                                                                                                              |                             | 100 %       | 1.00                                                       | 1.00                                                       |

Tab. 1: Operating factors for operating modes S1 to S10



### 3.6.1 Permitted shaft loads for the output shaft

The values specified in the tables apply to the permitted shaft loads:

- For shaft dimensions in accordance with the catalog
- For output speeds  $n_{2m^*} \leq 20$  rpm ( $F_{2axN} = F_{2ax20}$ ;  $F_{2radN} = F_{2rad20}$ ;  $M_{2kN} = M_{2k20}$ )
- Only if radial forces on the gear unit are stabilized by its pilots for the pitch circle diameter and flange housing design

#### 3.6.1.1 V shaft design

Permitted shaft loads for V shaft design (solid shaft)

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| F1   | 35.0          | 1100               | 4200                | 4200                  | 260                | 260                  |
| F2   | 41.0          | 1400               | 5400                | 5400                  | 400                | 400                  |
| F3   | 43.0          | 1900               | 7500                | 7500                  | 600                | 600                  |
| F4   | 44.0          | 2350               | 9250                | 9250                  | 800                | 800                  |
| F6   | 44.0          | 3100               | 12500               | 12500                 | 1200               | 1200                 |

For other output speeds, download diagrams at <http://configurator.stoeber.de>.

The following applies to output speeds  $n_{2m^*} > 20$  rpm:

$$F_{2axN} = \frac{F_{2ax20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad F_{2radN} = \frac{F_{2rad20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad M_{2kN} = \frac{M_{2k20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}}$$

The values for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  can be found in the table "Permitted shaft loads" in this chapter.

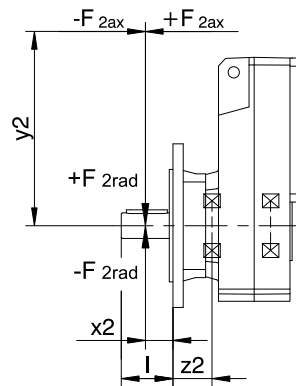


Fig. 1: Force application points for solid shaft

The specified values for  $F_{2rad20}$  are based on application of force at the middle of the output shaft:  $x_2 = l/2$ .

Shaft dimensions can be found in the "Dimensional drawings" chapter.

The following applies to other force application points:

$$M_{2k^*} = \frac{2 \cdot F_{2ax^*} \cdot y_2 + F_{2rad^*} \cdot (x_2 + z_2)}{1000} \leq M_{2kN}$$

$$F_{2rad^*} \leq F_{2radN}$$

$$F_{2ax^*} \leq F_{2axN}$$

For applications with multiple axial and/or radial forces, you must add the forces as vectors.

In the event of EMERGENCY OFF operation (max. 1000 load changes), you can multiply the permitted forces and torques for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  by a factor of two.

### 3.6.1.2 A and S shaft design

Permitted shaft loads for A shaft design (hollow shaft with keyway)

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| F1   | 30.0          | 900                | 4200                | 4200                  | 175                | 175                  |
| F2   | 33.0          | 1200               | 5400                | 5400                  | 250                | 250                  |
| F3   | 33.0          | 1350               | 7500                | 7500                  | 375                | 375                  |
| F4   | 39.0          | 1900               | 9250                | 9250                  | 550                | 550                  |
| F6   | 45.0          | 2200               | 12500               | 12500                 | 800                | 800                  |

Permitted shaft loads for S shaft design (hollow shaft with shrink ring)

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| F1   | 30.0          | 900                | 4200                | 4200                  | 175                | 175                  |
| F2   | 33.0          | 1200               | 5400                | 5400                  | 250                | 250                  |
| F3   | 33.0          | 1350               | 7500                | 7500                  | 375                | 375                  |
| F4   | 39.0          | 1900               | 9250                | 9250                  | 550                | 550                  |
| F6   | 45.0          | 2200               | 12500               | 12500                 | 800                | 800                  |

For other output speeds, download diagrams at <http://configurator.stoeber.de>.

The following applies to output speeds  $n_{2m^*} > 20$  rpm:

$$F_{2axN} = \frac{F_{2ax20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad F_{2radN} = \frac{F_{2rad20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad M_{2kN} = \frac{M_{2k20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}}$$

The values for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  can be found in the table "Permitted shaft loads" in this chapter.

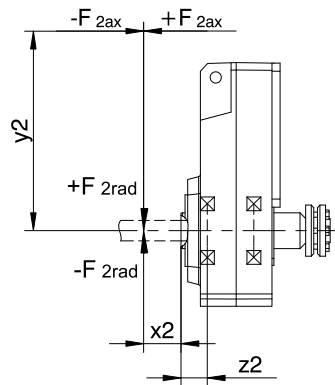


Fig. 2: Force application points for hollow shaft

You can determine the permitted radial forces from the permitted breakdown torque  $M_{2kN}$ . The actual radial forces may not exceed the permitted radial forces. The permitted radial forces pertain to the shaft end ( $x_2 = 0$ ).

$$M_{2k^*} = \frac{2 \cdot F_{2ax^*} \cdot y_2 + F_{2rad^*} \cdot (x_2 + z_2)}{1000} \leq M_{2kN}$$

$$F_{2ax^*} \leq F_{2axN}$$

For applications with multiple axial and/or radial forces, you must add the forces as vectors.

In the event of EMERGENCY OFF operation (max. 1000 load changes), you can multiply the permitted forces and torques for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  by a factor of two.

3.6.2 Radial shaft seal rings

Leak-proofness

Our gear units are equipped with high-quality radial shaft seal rings and checked for leaks. However, a leak cannot be fully ruled out over the length of use of a gear unit. If you use a gear unit with goods incompatible with the lubricant, you must take measures to prevent direct contact with the gear unit lubricant in case of a leak.

3.7 Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/downloads/>

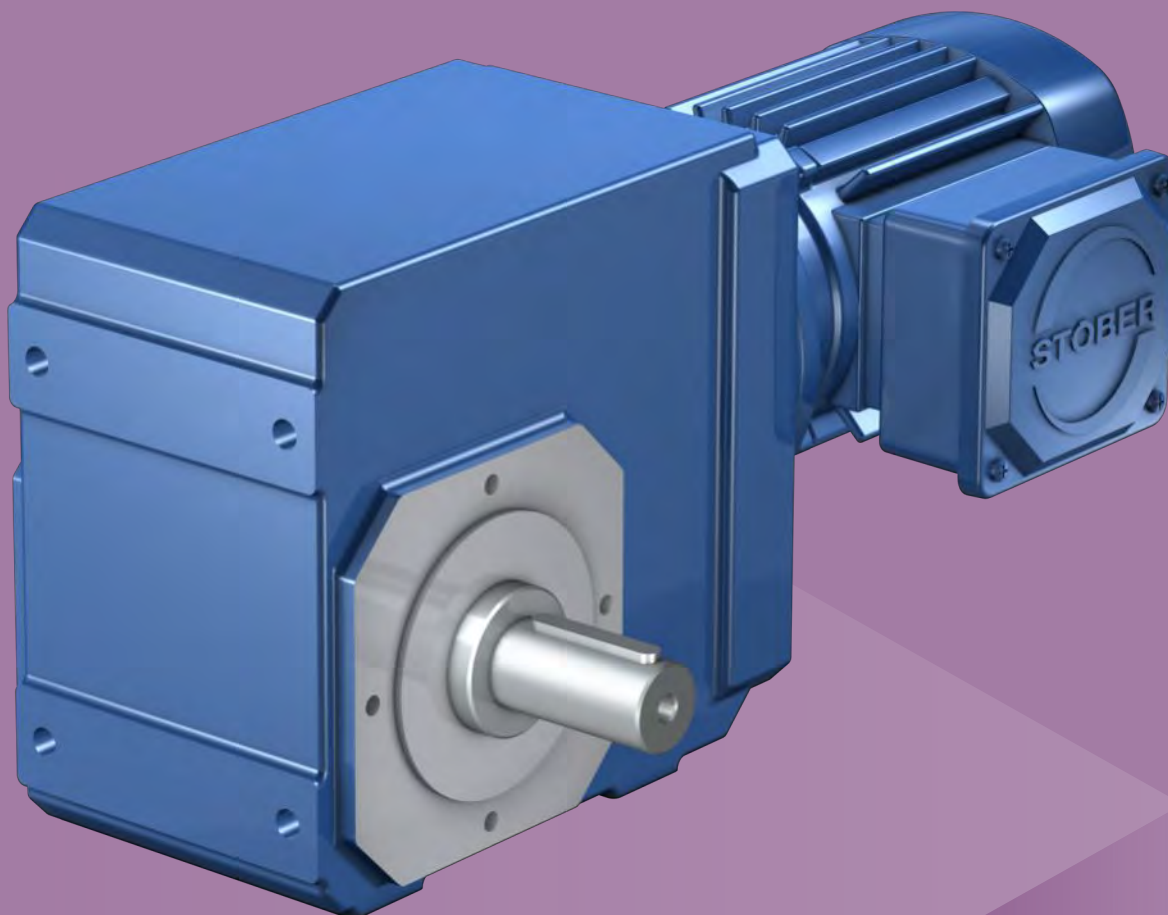
Enter the ID of the documentation in the Search... field.

| Documentation                                           | ID        |
|---------------------------------------------------------|-----------|
| Operating manual for C/F/K/S gear units and gear motors | 443027_en |

## 4 K helical bevel geared motors

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4

## Helical bevel geared motors

K

### 4.1 Overview

Highly rigid helical-geared right-angle geared motor

#### Features

|                                                              |                |
|--------------------------------------------------------------|----------------|
| Power density                                                | ★★★★☆          |
| Backlash                                                     | ★★★★☆          |
| Price category                                               | €€             |
| Shaft load                                                   | ★★★★☆          |
| Smooth operation                                             | ★★★★☆          |
| Torsional stiffness                                          | ★★★★☆          |
| Mass moment of inertia                                       | ★★★★★          |
| Helical gearing                                              | ✓              |
| Maintenance-free (K1 – K4)                                   | ✓              |
| FKM seal ring at the input                                   | ✓              |
| Reinforced output bearing (K5 – K8)                          | ✓ (on request) |
| Energy efficiency class IE3 in accordance with EN 60034-30-1 | ✓              |

Key: ★☆☆☆☆ good | ★★★★★ excellent

€ Economy | €€€€€ Premium

#### Technical data

|                     |                |
|---------------------|----------------|
| $P_N$               | 0.12 – 45 kW   |
| $i$                 | 4 – 381        |
| $M_{2N}$            | 6.5 – 14123 Nm |
| $\eta_{\text{get}}$ | 94 – 97 %      |

## 4.2 Selection tables

The technical data specified in the selection tables applies to:

- Installation altitudes up to 1000 m above sea level
- Surrounding temperatures from 0 °C to 40 °C
- Drives with self-ventilated motors
- Weight specification for mounting position EL1, housing design G

You can receive asynchronous geared motors with low output speed on request.

Asynchronous geared motors are ideal for operation on a drive controller (87 Hz). More information can be found in chapter [▶ 5.6.2](#)

For all other technical data, refer to <http://configurator.stoeber.de>.

An explanation of the formula symbols can be found in the chapter [▶ 13.1](#).

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>1</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 0,12 kW, P <sub>N</sub> (87 Hz) = 0,21 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 20                                                                 | 1.2        | 35                               | 1.2        | 56                      | K102_0700 IE3D063K04 | 16.0      | 70.03 | 2451/35            | 4.0                                    |
| 25                                                                 | 1.9        | 43                               | 1.9        | 45                      | K102_0560 IE3D063K04 | 16.0      | 56.10 | 1178/21            | 4.0                                    |
| 28                                                                 | 1.2        | 48                               | 1.2        | 40                      | K102_0500 IE3D063K04 | 16.0      | 50.31 | 5031/100           | 4.0                                    |
| 30                                                                 | 2.7        | 52                               | 2.7        | 37                      | K102_0470 IE3D063K04 | 16.0      | 46.92 | 2299/49            | 4.0                                    |
| 35                                                                 | 1.9        | 60                               | 1.9        | 32                      | K102_0400 IE3D063K04 | 16.0      | 40.30 | 403/10             | 4.0                                    |
| 40                                                                 | 4.3        | 69                               | 4.1        | 28                      | K102_0350 IE3D063K04 | 16.0      | 35.11 | 3686/105           | 4.0                                    |
| 42                                                                 | 2.7        | 72                               | 2.7        | 27                      | K102_0340 IE3D063K04 | 16.0      | 33.71 | 4719/140           | 4.0                                    |
| 50                                                                 | 5.4        | 86                               | 4.8        | 22                      | K102_0280 IE3D063K04 | 16.0      | 28.05 | 589/21             | 4.1                                    |
| 56                                                                 | 4.8        | 96                               | 4.8        | 20                      | K102_0250 IE3D063K04 | 16.0      | 25.22 | 1261/50            | 4.0                                    |
| 60                                                                 | 6.3        | 104                              | 5.4        | 19                      | K102_0230 IE3D063K04 | 16.0      | 23.27 | 1140/49            | 4.1                                    |
| 69                                                                 | 6.0        | 120                              | 5.9        | 16                      | K102_0200 IE3D063K04 | 16.0      | 20.15 | 403/20             | 4.1                                    |
| 80                                                                 | 7.3        | 138                              | 6.5        | 14                      | K102_0175 IE3D063K04 | 16.0      | 17.56 | 2090/119           | 4.1                                    |
| 84                                                                 | 6.9        | 145                              | 6.7        | 13                      | K102_0165 IE3D063K04 | 16.0      | 16.71 | 117/7              | 4.1                                    |
| P <sub>N</sub> (50 Hz) = 0,18 kW, P <sub>N</sub> (87 Hz) = 0,31 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 6.5                                                                | 1.0        | 11                               | 1.0        | 252                     | K303_2180 IE3D063M04 | 34.2      | 218.2 | 38399/176          | 5.1                                    |
| 7.8                                                                | 0.96       | 14                               | 0.96       | 209                     | K203_1810 IE3D063M04 | 27.2      | 181.0 | 86903/480          | 5.1                                    |
| 7.8                                                                | 1.6        | 14                               | 1.6        | 209                     | K303_1810 IE3D063M04 | 34.2      | 181.0 | 86903/480          | 5.1                                    |
| 10                                                                 | 2.2        | 18                               | 2.2        | 157                     | K303_1360 IE3D063M04 | 34.2      | 136.0 | 14147/104          | 5.1                                    |
| 10                                                                 | 1.3        | 18                               | 1.3        | 157                     | K203_1350 IE3D063M04 | 27.2      | 135.3 | 30315/224          | 5.1                                    |
| 13                                                                 | 1.6        | 22                               | 1.6        | 127                     | K203_1090 IE3D063M04 | 27.2      | 109.5 | 26273/240          | 5.1                                    |
| 13                                                                 | 2.8        | 22                               | 2.8        | 126                     | K303_1090 IE3D063M04 | 34.2      | 109.2 | 167743/1536        | 5.1                                    |
| 16                                                                 | 1.9        | 27                               | 1.9        | 105                     | K203_0910 IE3D063M04 | 27.2      | 90.79 | 46483/512          | 5.1                                    |
| 16                                                                 | 3.3        | 27                               | 3.3        | 106                     | K303_0910 IE3D063M04 | 34.2      | 91.23 | 26273/288          | 5.1                                    |
| 18                                                                 | 2.2        | 31                               | 2.2        | 92                      | K203_0800 IE3D063M04 | 27.2      | 79.62 | 26273/330          | 5.1                                    |
| 18                                                                 | 3.8        | 31                               | 3.3        | 92                      | K303_0790 IE3D063M04 | 34.2      | 79.42 | 167743/2112        | 5.1                                    |
| 20                                                                 | 0.85       | 35                               | 0.85       | 82                      | K102_0700 IE3D063M04 | 16.8      | 70.03 | 2451/35            | 5.0                                    |
| 20                                                                 | 1.6        | 35                               | 1.6        | 81                      | K202_0690 IE3D063M04 | 24.3      | 69.43 | 6665/96            | 5.0                                    |
| 20                                                                 | 2.6        | 35                               | 2.6        | 81                      | K302_0690 IE3D063M04 | 29.3      | 69.43 | 6665/96            | 5.1                                    |
| 21                                                                 | 2.5        | 36                               | 2.5        | 79                      | K203_0680 IE3D063M04 | 27.2      | 68.42 | 26273/384          | 5.1                                    |
| 21                                                                 | 2.6        | 37                               | 2.6        | 76                      | K203_0660 IE3D063M04 | 27.2      | 66.03 | 46483/704          | 5.1                                    |
| 25                                                                 | 1.3        | 44                               | 1.3        | 66                      | K102_0560 IE3D063M04 | 16.8      | 56.10 | 1178/21            | 5.0                                    |
| 25                                                                 | 2.4        | 44                               | 2.4        | 65                      | K202_0560 IE3D063M04 | 24.3      | 55.54 | 1333/24            | 5.1                                    |
| 26                                                                 | 3.2        | 45                               | 3.2        | 63                      | K203_0540 IE3D063M04 | 27.2      | 54.25 | 135407/2496        | 5.1                                    |
| 28                                                                 | 0.85       | 49                               | 0.85       | 59                      | K102_0500 IE3D063M04 | 16.8      | 50.31 | 5031/100           | 5.0                                    |
| 28                                                                 | 1.6        | 49                               | 1.6        | 59                      | K202_0500 IE3D063M04 | 24.3      | 50.49 | 6665/132           | 5.0                                    |
| 28                                                                 | 3.5        | 49                               | 3.5        | 58                      | K203_0500 IE3D063M04 | 27.2      | 49.76 | 26273/528          | 5.1                                    |
| 30                                                                 | 1.8        | 52                               | 1.8        | 55                      | K102_0470 IE3D063M04 | 16.8      | 46.92 | 2299/49            | 5.0                                    |
| 31                                                                 | 3.7        | 53                               | 3.7        | 54                      | K202_0460 IE3D063M04 | 24.3      | 46.23 | 1849/40            | 5.1                                    |
| 31                                                                 | 3.8        | 54                               | 3.8        | 52                      | K203_0450 IE3D063M04 | 27.2      | 45.22 | 58609/1296         | 5.1                                    |
| 35                                                                 | 1.3        | 61                               | 1.3        | 47                      | K102_0400 IE3D063M04 | 16.8      | 40.30 | 403/10             | 5.0                                    |
| 35                                                                 | 2.4        | 61                               | 2.4        | 47                      | K202_0400 IE3D063M04 | 24.3      | 40.39 | 1333/33            | 5.1                                    |
| 36                                                                 | 4.4        | 62                               | 4.4        | 46                      | K203_0390 IE3D063M04 | 27.2      | 39.45 | 135407/3432        | 5.1                                    |
| 40                                                                 | 2.9        | 70                               | 2.8        | 41                      | K102_0350 IE3D063M04 | 16.8      | 35.11 | 3686/105           | 5.0                                    |
| 42                                                                 | 1.8        | 73                               | 1.8        | 40                      | K102_0340 IE3D063M04 | 16.8      | 33.71 | 4719/140           | 5.0                                    |
| 42                                                                 | 3.8        | 73                               | 3.8        | 39                      | K202_0340 IE3D063M04 | 24.3      | 33.62 | 1849/55            | 5.1                                    |
| 50                                                                 | 3.6        | 87                               | 3.2        | 33                      | K102_0280 IE3D063M04 | 16.8      | 28.05 | 589/21             | 5.1                                    |
| 56                                                                 | 3.2        | 97                               | 3.2        | 30                      | K102_0250 IE3D063M04 | 16.8      | 25.22 | 1261/50            | 5.0                                    |
| 61                                                                 | 4.3        | 105                              | 3.6        | 27                      | K102_0230 IE3D063M04 | 16.8      | 23.27 | 1140/49            | 5.1                                    |
| 70                                                                 | 4.1        | 122                              | 4.0        | 24                      | K102_0200 IE3D063M04 | 16.8      | 20.15 | 403/20             | 5.1                                    |

#### 4.2 Selection tables 4 K helical bevel geared motors

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 0,18 kW, P <sub>N</sub> (87 Hz) = 0,31 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 81                                                                 | 5.0        | 140                              | 4.4        | 21                      | K102_0175 IE3D063M04 | 16.8      | 17.56 | 2090/119           | 5.1                                    |
| 85                                                                 | 4.7        | 147                              | 4.5        | 20                      | K102_0165 IE3D063M04 | 16.8      | 16.71 | 117/7              | 5.1                                    |
| 100                                                                | 5.0        | 174                              | 5.0        | 17                      | K102_0140 IE3D063M04 | 16.8      | 14.11 | 494/35             | 5.2                                    |
| 112                                                                | 5.0        | 194                              | 5.0        | 15                      | K102_0125 IE3D063M04 | 16.8      | 12.62 | 429/34             | 5.2                                    |
| 122                                                                | 5.0        | 212                              | 5.0        | 14                      | K102_0115 IE3D063M04 | 16.8      | 11.57 | 266/23             | 5.2                                    |
| 140                                                                | 5.0        | 242                              | 5.0        | 12                      | K102_0100 IE3D063M04 | 16.8      | 10.14 | 507/50             | 5.2                                    |
| 153                                                                | 5.0        | 265                              | 5.0        | 11                      | K102_0092 IE3D063M04 | 16.8      | 9.249 | 1748/189           | 5.3                                    |
| 170                                                                | 5.0        | 295                              | 5.0        | 9.8                     | K102_0083 IE3D063M04 | 16.8      | 8.309 | 1911/230           | 5.3                                    |
| 213                                                                | 5.0        | 369                              | 5.0        | 7.8                     | K102_0066 IE3D063M04 | 16.8      | 6.644 | 299/45             | 5.4                                    |
| P <sub>N</sub> (50 Hz) = 0,25 kW, P <sub>N</sub> (87 Hz) = 0,43 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 5.3                                                                | 0.86       | 9.1                              | 0.86       | 434                     | K403_2720 IE3D071K04 | 49.8      | 271.6 | 86903/320          | 8.8                                    |
| 6.6                                                                | 1.2        | 11                               | 1.2        | 348                     | K403_2180 IE3D071K04 | 49.8      | 218.2 | 38399/176          | 8.8                                    |
| 7.9                                                                | 1.2        | 14                               | 1.2        | 289                     | K303_1810 IE3D071K04 | 37.0      | 181.0 | 86903/480          | 8.8                                    |
| 7.9                                                                | 1.8        | 14                               | 1.8        | 290                     | K403_1810 IE3D071K04 | 49.8      | 181.4 | 14147/78           | 8.8                                    |
| 11                                                                 | 1.6        | 18                               | 1.6        | 217                     | K303_1360 IE3D071K04 | 37.0      | 136.0 | 14147/104          | 8.8                                    |
| 11                                                                 | 2.5        | 18                               | 2.3        | 217                     | K403_1360 IE3D071K04 | 49.8      | 136.1 | 196037/1440        | 8.8                                    |
| 11                                                                 | 0.93       | 18                               | 0.93       | 216                     | K203_1350 IE3D071K04 | 30.0      | 135.3 | 30315/224          | 8.8                                    |
| 13                                                                 | 1.1        | 23                               | 1.1        | 175                     | K203_1090 IE3D071K04 | 30.0      | 109.5 | 26273/240          | 8.8                                    |
| 13                                                                 | 2.0        | 23                               | 2.0        | 174                     | K303_1090 IE3D071K04 | 37.0      | 109.2 | 167743/1536        | 8.8                                    |
| 16                                                                 | 1.4        | 27                               | 1.4        | 145                     | K203_0910 IE3D071K04 | 30.0      | 90.79 | 46483/512          | 8.8                                    |
| 16                                                                 | 2.4        | 27                               | 2.4        | 146                     | K303_0910 IE3D071K04 | 37.0      | 91.23 | 26273/288          | 8.8                                    |
| 18                                                                 | 1.6        | 31                               | 1.6        | 127                     | K203_0800 IE3D071K04 | 30.0      | 79.62 | 26273/330          | 8.8                                    |
| 18                                                                 | 2.8        | 31                               | 2.4        | 127                     | K303_0790 IE3D071K04 | 37.0      | 79.42 | 167743/2112        | 8.8                                    |
| 21                                                                 | 1.2        | 36                               | 1.2        | 112                     | K202_0690 IE3D071K04 | 27.1      | 69.43 | 6665/96            | 8.7                                    |
| 21                                                                 | 1.9        | 36                               | 1.9        | 112                     | K302_0690 IE3D071K04 | 32.1      | 69.43 | 6665/96            | 8.8                                    |
| 21                                                                 | 1.8        | 36                               | 1.8        | 109                     | K203_0680 IE3D071K04 | 30.0      | 68.42 | 26273/384          | 8.8                                    |
| 21                                                                 | 3.2        | 37                               | 3.2        | 108                     | K303_0680 IE3D071K04 | 37.0      | 67.73 | 74777/1104         | 8.8                                    |
| 22                                                                 | 1.9        | 38                               | 1.9        | 105                     | K203_0660 IE3D071K04 | 30.0      | 66.03 | 46483/704          | 8.8                                    |
| 22                                                                 | 3.2        | 37                               | 2.7        | 106                     | K303_0660 IE3D071K04 | 37.0      | 66.35 | 26273/396          | 8.8                                    |
| 25                                                                 | 0.94       | 44                               | 0.94       | 91                      | K102_0560 IE3D071K04 | 19.6      | 56.10 | 1178/21            | 8.7                                    |
| 26                                                                 | 1.8        | 45                               | 1.8        | 90                      | K202_0560 IE3D071K04 | 27.1      | 55.54 | 1333/24            | 8.8                                    |
| 26                                                                 | 3.2        | 45                               | 3.2        | 87                      | K303_0550 IE3D071K04 | 37.0      | 54.58 | 70735/1296         | 8.8                                    |
| 26                                                                 | 2.3        | 46                               | 2.3        | 87                      | K203_0540 IE3D071K04 | 30.0      | 54.25 | 135407/2496        | 8.8                                    |
| 28                                                                 | 1.2        | 49                               | 1.2        | 82                      | K202_0500 IE3D071K04 | 27.1      | 50.49 | 6665/132           | 8.7                                    |
| 29                                                                 | 2.5        | 50                               | 2.5        | 79                      | K203_0500 IE3D071K04 | 30.0      | 49.76 | 26273/528          | 8.8                                    |
| 29                                                                 | 3.2        | 50                               | 3.2        | 79                      | K303_0490 IE3D071K04 | 37.0      | 49.26 | 74777/1518         | 8.8                                    |
| 30                                                                 | 1.3        | 53                               | 1.3        | 76                      | K102_0470 IE3D071K04 | 19.6      | 46.92 | 2299/49            | 8.7                                    |
| 31                                                                 | 2.7        | 54                               | 2.7        | 75                      | K202_0460 IE3D071K04 | 27.1      | 46.23 | 1849/40            | 8.8                                    |
| 32                                                                 | 2.8        | 55                               | 2.8        | 72                      | K203_0450 IE3D071K04 | 30.0      | 45.22 | 58609/1296         | 8.8                                    |
| 35                                                                 | 0.94       | 61                               | 0.94       | 65                      | K102_0400 IE3D071K04 | 19.6      | 40.30 | 403/10             | 8.7                                    |
| 35                                                                 | 1.8        | 61                               | 1.8        | 65                      | K202_0400 IE3D071K04 | 27.1      | 40.39 | 1333/33            | 8.8                                    |
| 36                                                                 | 3.2        | 63                               | 3.2        | 63                      | K203_0390 IE3D071K04 | 30.0      | 39.45 | 135407/3432        | 8.8                                    |
| 41                                                                 | 2.1        | 71                               | 2.0        | 57                      | K102_0350 IE3D071K04 | 19.6      | 35.11 | 3686/105           | 8.7                                    |
| 42                                                                 | 1.3        | 73                               | 1.3        | 55                      | K102_0340 IE3D071K04 | 19.6      | 33.71 | 4719/140           | 8.7                                    |
| 43                                                                 | 2.7        | 74                               | 2.7        | 54                      | K202_0340 IE3D071K04 | 27.1      | 33.62 | 1849/55            | 8.8                                    |
| 51                                                                 | 2.6        | 88                               | 2.3        | 45                      | K102_0280 IE3D071K04 | 19.6      | 28.05 | 589/21             | 8.8                                    |
| 57                                                                 | 2.4        | 98                               | 2.4        | 41                      | K102_0250 IE3D071K04 | 19.6      | 25.22 | 1261/50            | 8.7                                    |
| 61                                                                 | 3.1        | 106                              | 2.6        | 38                      | K102_0230 IE3D071K04 | 19.6      | 23.27 | 1140/49            | 8.8                                    |
| 71                                                                 | 3.0        | 123                              | 2.9        | 33                      | K102_0200 IE3D071K04 | 19.6      | 20.15 | 403/20             | 8.8                                    |
| 81                                                                 | 3.6        | 141                              | 3.2        | 28                      | K102_0175 IE3D071K04 | 19.6      | 17.56 | 2090/119           | 8.8                                    |
| 85                                                                 | 3.6        | 147                              | 3.6        | 27                      | K202_0170 IE3D071K04 | 27.1      | 16.86 | 2967/176           | 9.0                                    |
| 86                                                                 | 3.4        | 148                              | 3.3        | 27                      | K102_0165 IE3D071K04 | 19.6      | 16.71 | 117/7              | 8.8                                    |
| 101                                                                | 3.6        | 175                              | 3.6        | 23                      | K102_0140 IE3D071K04 | 19.6      | 14.11 | 494/35             | 8.9                                    |
| 113                                                                | 3.6        | 196                              | 3.6        | 20                      | K102_0125 IE3D071K04 | 19.6      | 12.62 | 429/34             | 8.9                                    |
| 124                                                                | 3.6        | 214                              | 3.6        | 19                      | K102_0115 IE3D071K04 | 19.6      | 11.57 | 266/23             | 8.9                                    |
| 141                                                                | 3.6        | 244                              | 3.6        | 16                      | K102_0100 IE3D071K04 | 19.6      | 10.14 | 507/50             | 8.9                                    |
| 155                                                                | 3.6        | 268                              | 3.6        | 15                      | K102_0092 IE3D071K04 | 19.6      | 9.249 | 1748/189           | 9.0                                    |
| 172                                                                | 3.6        | 298                              | 3.6        | 13                      | K102_0083 IE3D071K04 | 19.6      | 8.309 | 1911/230           | 9.0                                    |
| 215                                                                | 3.6        | 373                              | 3.6        | 11                      | K102_0066 IE3D071K04 | 19.6      | 6.644 | 299/45             | 9.1                                    |
| 257                                                                | 3.6        | 445                              | 3.6        | 9.0                     | K102_0056 IE3D071K04 | 19.6      | 5.568 | 1520/273           | 9.4                                    |
| 358                                                                | 3.6        | 619                              | 3.6        | 6.5                     | K102_0040 IE3D071K04 | 19.6      | 4.000 | 4/1                | 9.6                                    |
| P <sub>N</sub> (50 Hz) = 0,37 kW, P <sub>N</sub> (87 Hz) = 0,64 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 6.6                                                                | 0.81       | 11                               | 0.81       | 521                     | K403_2180 IE3D071L04 | 50.9      | 218.2 | 38399/176          | 11                                     |
| 7.9                                                                | 1.2        | 14                               | 1.2        | 433                     | K403_1810 IE3D071L04 | 50.9      | 181.4 | 14147/78           | 11                                     |
| 11                                                                 | 1.1        | 18                               | 1.1        | 325                     | K303_1360 IE3D071L04 | 38.1      | 136.0 | 14147/104          | 11                                     |



| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 0,37 kW, P <sub>N</sub> (87 Hz) = 0,64 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 11                                                                 | 1.7        | 18                               | 1.5        | 325                     | K403_1360 IE3D071L04 | 50.9      | 136.1 | 196037/1440        | 11                                     |
| 13                                                                 | 1.3        | 23                               | 1.3        | 261                     | K303_1090 IE3D071L04 | 38.1      | 109.2 | 167743/1536        | 11                                     |
| 13                                                                 | 2.1        | 23                               | 1.8        | 260                     | K403_1090 IE3D071L04 | 50.9      | 108.8 | 62651/576          | 11                                     |
| 16                                                                 | 0.92       | 27                               | 0.92       | 217                     | K203_0910 IE3D071L04 | 31.1      | 90.79 | 46483/512          | 11                                     |
| 16                                                                 | 1.6        | 27                               | 1.6        | 218                     | K303_0910 IE3D071L04 | 38.1      | 91.23 | 26273/288          | 11                                     |
| 16                                                                 | 2.1        | 27                               | 2.1        | 218                     | K403_0910 IE3D071L04 | 50.9      | 91.23 | 26273/288          | 11                                     |
| 18                                                                 | 1.1        | 31                               | 1.1        | 190                     | K203_0800 IE3D071L04 | 31.1      | 79.62 | 26273/330          | 11                                     |
| 18                                                                 | 1.8        | 31                               | 1.6        | 190                     | K303_0790 IE3D071L04 | 38.1      | 79.42 | 167743/2112        | 11                                     |
| 18                                                                 | 2.1        | 31                               | 1.8        | 189                     | K403_0790 IE3D071L04 | 50.9      | 79.11 | 62651/792          | 11                                     |
| 21                                                                 | 1.3        | 36                               | 1.3        | 168                     | K302_0690 IE3D071L04 | 33.2      | 69.43 | 6665/96            | 11                                     |
| 21                                                                 | 1.2        | 36                               | 1.2        | 164                     | K203_0680 IE3D071L04 | 31.1      | 68.42 | 26273/384          | 11                                     |
| 21                                                                 | 2.1        | 37                               | 2.1        | 162                     | K303_0680 IE3D071L04 | 38.1      | 67.73 | 74777/1104         | 11                                     |
| 22                                                                 | 1.3        | 38                               | 1.3        | 158                     | K203_0660 IE3D071L04 | 31.1      | 66.03 | 46483/704          | 11                                     |
| 22                                                                 | 2.1        | 37                               | 1.8        | 159                     | K303_0660 IE3D071L04 | 38.1      | 66.35 | 26273/396          | 11                                     |
| 26                                                                 | 1.2        | 45                               | 1.2        | 135                     | K202_0560 IE3D071L04 | 28.2      | 55.54 | 1333/24            | 11                                     |
| 26                                                                 | 2.1        | 45                               | 2.1        | 130                     | K303_0550 IE3D071L04 | 38.1      | 54.58 | 70735/1296         | 11                                     |
| 26                                                                 | 1.5        | 46                               | 1.5        | 130                     | K203_0540 IE3D071L04 | 31.1      | 54.25 | 135407/2496        | 11                                     |
| 29                                                                 | 1.7        | 50                               | 1.7        | 119                     | K203_0500 IE3D071L04 | 31.1      | 49.76 | 26273/528          | 11                                     |
| 29                                                                 | 2.1        | 50                               | 2.1        | 118                     | K303_0490 IE3D071L04 | 38.1      | 49.26 | 74777/1518         | 11                                     |
| 30                                                                 | 0.89       | 53                               | 0.89       | 114                     | K102_0470 IE3D071L04 | 20.7      | 46.92 | 2299/49            | 11                                     |
| 31                                                                 | 1.8        | 54                               | 1.8        | 112                     | K202_0460 IE3D071L04 | 28.2      | 46.23 | 1849/40            | 11                                     |
| 32                                                                 | 1.9        | 55                               | 1.9        | 108                     | K203_0450 IE3D071L04 | 31.1      | 45.22 | 58609/1296         | 11                                     |
| 35                                                                 | 1.2        | 61                               | 1.2        | 98                      | K202_0400 IE3D071L04 | 28.2      | 40.39 | 1333/33            | 11                                     |
| 36                                                                 | 2.1        | 63                               | 2.1        | 94                      | K203_0390 IE3D071L04 | 31.1      | 39.45 | 135407/3432        | 11                                     |
| 41                                                                 | 1.4        | 71                               | 1.3        | 85                      | K102_0350 IE3D071L04 | 20.7      | 35.11 | 3686/105           | 11                                     |
| 41                                                                 | 2.0        | 72                               | 2.0        | 84                      | K202_0350 IE3D071L04 | 28.2      | 34.55 | 1935/56            | 11                                     |
| 42                                                                 | 0.89       | 73                               | 0.89       | 82                      | K102_0340 IE3D071L04 | 20.7      | 33.71 | 4719/140           | 11                                     |
| 43                                                                 | 1.8        | 74                               | 1.8        | 82                      | K202_0340 IE3D071L04 | 28.2      | 33.62 | 1849/55            | 11                                     |
| 51                                                                 | 1.8        | 88                               | 1.6        | 68                      | K102_0280 IE3D071L04 | 20.7      | 28.05 | 589/21             | 11                                     |
| 57                                                                 | 1.6        | 98                               | 1.6        | 61                      | K102_0250 IE3D071L04 | 20.7      | 25.22 | 1261/50            | 11                                     |
| 57                                                                 | 2.0        | 99                               | 2.0        | 61                      | K202_0250 IE3D071L04 | 28.2      | 25.13 | 1935/77            | 11                                     |
| 61                                                                 | 2.1        | 106                              | 1.8        | 56                      | K102_0230 IE3D071L04 | 20.7      | 23.27 | 1140/49            | 11                                     |
| 71                                                                 | 2.0        | 123                              | 1.9        | 49                      | K102_0200 IE3D071L04 | 20.7      | 20.15 | 403/20             | 11                                     |
| 81                                                                 | 2.4        | 141                              | 2.1        | 43                      | K102_0175 IE3D071L04 | 20.7      | 17.56 | 2090/119           | 11                                     |
| 85                                                                 | 2.4        | 147                              | 2.4        | 41                      | K202_0170 IE3D071L04 | 28.2      | 16.86 | 2967/176           | 11                                     |
| 86                                                                 | 2.3        | 148                              | 2.2        | 41                      | K102_0165 IE3D071L04 | 20.7      | 16.71 | 117/7              | 11                                     |
| 101                                                                | 2.4        | 175                              | 2.4        | 34                      | K102_0140 IE3D071L04 | 20.7      | 14.11 | 494/35             | 11                                     |
| 113                                                                | 2.4        | 196                              | 2.4        | 31                      | K102_0125 IE3D071L04 | 20.7      | 12.62 | 429/34             | 11                                     |
| 124                                                                | 2.4        | 214                              | 2.4        | 28                      | K102_0115 IE3D071L04 | 20.7      | 11.57 | 266/23             | 11                                     |
| 141                                                                | 2.4        | 244                              | 2.4        | 25                      | K102_0100 IE3D071L04 | 20.7      | 10.14 | 507/50             | 11                                     |
| 155                                                                | 2.4        | 268                              | 2.4        | 22                      | K102_0092 IE3D071L04 | 20.7      | 9.249 | 1748/189           | 11                                     |
| 170                                                                | 2.4        | 295                              | 2.4        | 20                      | K202_0084 IE3D071L04 | 28.2      | 8.397 | 2494/297           | 11                                     |
| 172                                                                | 2.4        | 298                              | 2.4        | 20                      | K102_0083 IE3D071L04 | 20.7      | 8.309 | 1911/230           | 11                                     |
| 215                                                                | 2.4        | 373                              | 2.4        | 16                      | K102_0066 IE3D071L04 | 20.7      | 6.644 | 299/45             | 11                                     |
| 257                                                                | 2.4        | 445                              | 2.4        | 14                      | K102_0056 IE3D071L04 | 20.7      | 5.568 | 1520/273           | 11                                     |
| 358                                                                | 2.4        | 619                              | 2.4        | 9.7                     | K102_0040 IE3D071L04 | 20.7      | 4.000 | 4/1                | 12                                     |
| P <sub>N</sub> (50 Hz) = 0,55 kW, P <sub>N</sub> (87 Hz) = 0,95 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 3.8                                                                | 1.4        | 6.5                              | 1.4        | 1309                    | K714_3810 IE3D080K04 | 114.2     | 381.0 | 195083/512         | 21                                     |
| 3.9                                                                | 0.85       | 6.8                              | 0.85       | 1267                    | K614_3690 IE3D080K04 | 81.4      | 368.9 | 1700009/4608       | 21                                     |
| 4.2                                                                | 1.4        | 7.2                              | 1.4        | 1182                    | K714_3440 IE3D080K04 | 114.2     | 344.1 | 44051/128          | 21                                     |
| 4.3                                                                | 0.85       | 7.5                              | 0.85       | 1145                    | K614_3330 IE3D080K04 | 81.4      | 333.2 | 383873/1152        | 21                                     |
| 4.7                                                                | 2.3        | 8.2                              | 2.1        | 1047                    | K714_3050 IE3D080K04 | 114.2     | 304.8 | 195083/640         | 21                                     |
| 4.8                                                                | 0.87       | 8.3                              | 0.87       | 1030                    | K514_3000 IE3D080K04 | 60.5      | 300.0 | 756059/2520        | 21                                     |
| 4.9                                                                | 1.4        | 8.5                              | 1.4        | 1011                    | K614_2940 IE3D080K04 | 81.4      | 294.4 | 3674213/12480      | 21                                     |
| 5.2                                                                | 2.3        | 9.1                              | 2.1        | 946                     | K714_2750 IE3D080K04 | 114.2     | 275.3 | 44051/160          | 21                                     |
| 5.3                                                                | 0.88       | 9.2                              | 0.88       | 931                     | K514_2710 IE3D080K04 | 60.5      | 271.0 | 24389/90           | 21                                     |
| 5.4                                                                | 1.4        | 9.4                              | 1.4        | 913                     | K614_2660 IE3D080K04 | 81.4      | 265.9 | 829661/3120        | 21                                     |
| 5.7                                                                | 2.6        | 9.9                              | 2.5        | 861                     | K714_2510 IE3D080K04 | 114.2     | 250.7 | 320943/1280        | 21                                     |
| 5.8                                                                | 1.1        | 10                               | 1.1        | 857                     | K514_2500 IE3D080K04 | 60.5      | 249.6 | 729988/2925        | 21                                     |
| 5.8                                                                | 1.7        | 10                               | 1.7        | 846                     | K614_2460 IE3D080K04 | 81.4      | 246.3 | 1261297/5120       | 21                                     |
| 6.4                                                                | 2.6        | 11                               | 2.5        | 778                     | K714_2260 IE3D080K04 | 114.2     | 226.5 | 72471/320          | 21                                     |
| 6.4                                                                | 1.2        | 11                               | 1.2        | 774                     | K514_2250 IE3D080K04 | 60.5      | 225.4 | 659344/2925        | 21                                     |
| 6.5                                                                | 1.9        | 11                               | 1.9        | 764                     | K614_2230 IE3D080K04 | 81.4      | 222.5 | 284809/1280        | 21                                     |
| 7.5                                                                | 2.9        | 13                               | 2.9        | 662                     | K714_1930 IE3D080K04 | 114.2     | 192.9 | 320943/1664        | 21                                     |
| 7.7                                                                | 1.4        | 13                               | 1.4        | 640                     | K514_1860 IE3D080K04 | 60.5      | 186.2 | 26071/140          | 21                                     |

#### 4.2 Selection tables 4 K helical bevel geared motors

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 0,55 kW, P <sub>N</sub> (87 Hz) = 0,95 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 7.8                                                                | 2.3        | 14                               | 2.3        | 634                     | K614_1850 IE3D080K04 | 81.4      | 184.6 | 383873/2080        | 21                                     |
| 8.0                                                                | 0.86       | 14                               | 0.86       | 625                     | K403_1790 IE3D080K04 | 54.4      | 179.1 | 34916/195          | 21                                     |
| 8.3                                                                | 2.9        | 14                               | 2.9        | 598                     | K714_1740 IE3D080K04 | 114.2     | 174.2 | 72471/416          | 21                                     |
| 8.6                                                                | 1.6        | 15                               | 1.6        | 578                     | K514_1680 IE3D080K04 | 60.5      | 168.2 | 841/5              | 21                                     |
| 8.6                                                                | 2.5        | 15                               | 2.5        | 573                     | K614_1670 IE3D080K04 | 81.4      | 166.7 | 86681/520          | 21                                     |
| 9.5                                                                | 3.5        | 16                               | 3.5        | 521                     | K714_1520 IE3D080K04 | 114.2     | 151.7 | 24273/160          | 21                                     |
| 9.7                                                                | 1.8        | 17                               | 1.8        | 512                     | K514_1490 IE3D080K04 | 60.5      | 149.0 | 26071/175          | 21                                     |
| 9.7                                                                | 2.8        | 17                               | 2.8        | 509                     | K614_1480 IE3D080K04 | 81.4      | 148.2 | 4551637/30720      | 21                                     |
| 11                                                                 | 3.5        | 18                               | 3.5        | 471                     | K714_1370 IE3D080K04 | 114.2     | 137.0 | 5481/40            | 21                                     |
| 11                                                                 | 1.9        | 19                               | 1.9        | 462                     | K514_1350 IE3D080K04 | 60.5      | 134.6 | 3364/25            | 21                                     |
| 11                                                                 | 1.2        | 19                               | 1.2        | 469                     | K403_1340 IE3D080K04 | 54.4      | 134.4 | 120959/900         | 21                                     |
| 11                                                                 | 3.2        | 19                               | 3.2        | 460                     | K614_1340 IE3D080K04 | 81.4      | 133.8 | 1027789/7680       | 21                                     |
| 12                                                                 | 2.1        | 20                               | 2.1        | 429                     | K514_1250 IE3D080K04 | 60.5      | 124.9 | 599633/4800        | 21                                     |
| 12                                                                 | 3.4        | 20                               | 3.4        | 423                     | K614_1230 IE3D080K04 | 81.4      | 123.2 | 1261297/10240      | 21                                     |
| 13                                                                 | 2.3        | 22                               | 2.3        | 388                     | K514_1130 IE3D080K04 | 60.5      | 112.8 | 135401/1200        | 21                                     |
| 13                                                                 | 3.8        | 22                               | 3.7        | 382                     | K614_1110 IE3D080K04 | 81.4      | 111.3 | 284809/2560        | 21                                     |
| 13                                                                 | 0.93       | 23                               | 0.93       | 376                     | K303_1080 IE3D080K04 | 41.6      | 107.8 | 103501/960         | 21                                     |
| 13                                                                 | 1.5        | 23                               | 1.5        | 375                     | K403_1070 IE3D080K04 | 54.4      | 107.4 | 38657/360          | 21                                     |
| 15                                                                 | 2.3        | 26                               | 2.3        | 337                     | K513_0970 IE3D080K04 | 56.0      | 96.64 | 38657/400          | 21                                     |
| 15                                                                 | 3.2        | 26                               | 3.2        | 333                     | K613_0950 IE3D080K04 | 77.5      | 95.41 | 293105/3072        | 21                                     |
| 15                                                                 | 2.8        | 26                               | 2.8        | 323                     | K514_0940 IE3D080K04 | 60.5      | 94.15 | 338923/3600        | 21                                     |
| 16                                                                 | 1.1        | 28                               | 1.1        | 314                     | K303_0900 IE3D080K04 | 41.6      | 90.06 | 16211/180          | 21                                     |
| 16                                                                 | 1.8        | 28                               | 1.8        | 314                     | K403_0900 IE3D080K04 | 54.4      | 90.06 | 16211/180          | 21                                     |
| 16                                                                 | 2.3        | 29                               | 2.3        | 305                     | K513_0870 IE3D080K04 | 56.0      | 87.29 | 8729/100           | 21                                     |
| 17                                                                 | 3.2        | 29                               | 3.2        | 301                     | K613_0860 IE3D080K04 | 77.5      | 86.18 | 66185/768          | 21                                     |
| 17                                                                 | 3.1        | 29                               | 3.1        | 292                     | K514_0850 IE3D080K04 | 60.5      | 85.03 | 76531/900          | 21                                     |
| 18                                                                 | 1.3        | 32                               | 1.3        | 274                     | K303_0780 IE3D080K04 | 41.6      | 78.41 | 103501/1320        | 21                                     |
| 18                                                                 | 2.0        | 32                               | 2.0        | 273                     | K403_0780 IE3D080K04 | 54.4      | 78.10 | 38657/495          | 21                                     |
| 19                                                                 | 4.5        | 33                               | 4.5        | 266                     | K613_0760 IE3D080K04 | 77.5      | 76.14 | 126697/1664        | 22                                     |
| 21                                                                 | 3.4        | 36                               | 3.4        | 245                     | K513_0700 IE3D080K04 | 56.0      | 70.08 | 841/12             | 21                                     |
| 21                                                                 | 1.5        | 36                               | 1.5        | 245                     | K402_0690 IE3D080K04 | 50.2      | 69.34 | 5547/80            | 21                                     |
| 21                                                                 | 4.5        | 36                               | 4.5        | 240                     | K613_0690 IE3D080K04 | 77.5      | 68.77 | 28609/416          | 22                                     |
| 22                                                                 | 1.5        | 37                               | 1.5        | 233                     | K303_0670 IE3D080K04 | 41.6      | 66.87 | 46139/690          | 21                                     |
| 21                                                                 | 2.3        | 37                               | 2.3        | 235                     | K403_0670 IE3D080K04 | 54.4      | 67.30 | 21199/315          | 21                                     |
| 22                                                                 | 1.5        | 38                               | 1.5        | 229                     | K303_0650 IE3D080K04 | 41.6      | 65.50 | 32422/495          | 21                                     |
| 22                                                                 | 2.4        | 38                               | 2.4        | 229                     | K403_0650 IE3D080K04 | 54.4      | 65.50 | 32422/495          | 21                                     |
| 25                                                                 | 4.4        | 43                               | 4.4        | 203                     | K513_0580 IE3D080K04 | 56.0      | 58.30 | 11368/195          | 21                                     |
| 26                                                                 | 1.3        | 45                               | 1.3        | 197                     | K302_0560 IE3D080K04 | 36.7      | 55.71 | 2451/44            | 21                                     |
| 26                                                                 | 2.1        | 45                               | 2.1        | 197                     | K402_0560 IE3D080K04 | 50.2      | 55.71 | 2451/44            | 21                                     |
| 27                                                                 | 1.9        | 46                               | 1.9        | 188                     | K303_0540 IE3D080K04 | 41.6      | 53.88 | 8729/162           | 21                                     |
| 27                                                                 | 2.9        | 46                               | 2.9        | 187                     | K403_0540 IE3D080K04 | 54.4      | 53.69 | 38657/720          | 21                                     |
| 29                                                                 | 1.5        | 49                               | 1.5        | 179                     | K402_0500 IE3D080K04 | 50.2      | 50.43 | 5547/110           | 21                                     |
| 30                                                                 | 2.1        | 51                               | 2.1        | 170                     | K303_0490 IE3D080K04 | 41.6      | 48.63 | 184556/3795        | 21                                     |
| 30                                                                 | 5.2        | 52                               | 5.2        | 168                     | K513_0480 IE3D080K04 | 56.0      | 48.16 | 2697/56            | 22                                     |
| 31                                                                 | 1.2        | 54                               | 1.2        | 164                     | K202_0460 IE3D080K04 | 31.7      | 46.23 | 1849/40            | 21                                     |
| 31                                                                 | 2.1        | 54                               | 2.1        | 164                     | K302_0460 IE3D080K04 | 36.7      | 46.23 | 1849/40            | 21                                     |
| 32                                                                 | 2.2        | 56                               | 2.2        | 157                     | K303_0450 IE3D080K04 | 41.6      | 44.89 | 11223/250          | 21                                     |
| 33                                                                 | 5.2        | 57                               | 5.2        | 152                     | K513_0440 IE3D080K04 | 56.0      | 43.50 | 87/2               | 22                                     |
| 36                                                                 | 1.3        | 62                               | 1.3        | 143                     | K302_0410 IE3D080K04 | 36.7      | 40.51 | 4902/121           | 21                                     |
| 36                                                                 | 2.1        | 62                               | 2.1        | 143                     | K402_0410 IE3D080K04 | 50.2      | 40.51 | 4902/121           | 21                                     |
| 37                                                                 | 2.6        | 64                               | 2.6        | 137                     | K303_0390 IE3D080K04 | 41.6      | 39.19 | 34916/891          | 21                                     |
| 40                                                                 | 2.8        | 70                               | 2.8        | 125                     | K303_0360 IE3D080K04 | 41.6      | 35.83 | 215/6              | 21                                     |
| 41                                                                 | 0.97       | 71                               | 0.91       | 124                     | K102_0350 IE3D080K04 | 24.2      | 35.11 | 3686/105           | 21                                     |
| 42                                                                 | 1.6        | 72                               | 1.6        | 122                     | K202_0350 IE3D080K04 | 31.7      | 34.55 | 1935/56            | 21                                     |
| 41                                                                 | 2.8        | 72                               | 2.8        | 123                     | K302_0350 IE3D080K04 | 36.7      | 34.73 | 903/26             | 21                                     |
| 43                                                                 | 1.3        | 74                               | 1.3        | 119                     | K202_0340 IE3D080K04 | 31.7      | 33.62 | 1849/55            | 21                                     |
| 43                                                                 | 2.1        | 74                               | 2.1        | 119                     | K302_0340 IE3D080K04 | 36.7      | 33.62 | 1849/55            | 21                                     |
| 44                                                                 | 3.1        | 76                               | 3.0        | 114                     | K303_0330 IE3D080K04 | 41.6      | 32.65 | 44892/1375         | 21                                     |
| 44                                                                 | 4.1        | 77                               | 4.1        | 113                     | K403_0320 IE3D080K04 | 54.4      | 32.39 | 2494/77            | 21                                     |
| 51                                                                 | 1.2        | 89                               | 1.1        | 99                      | K102_0280 IE3D080K04 | 24.2      | 28.05 | 589/21             | 21                                     |
| 52                                                                 | 2.0        | 89                               | 1.9        | 99                      | K202_0280 IE3D080K04 | 31.7      | 27.95 | 559/20             | 21                                     |
| 57                                                                 | 1.1        | 99                               | 1.1        | 89                      | K102_0250 IE3D080K04 | 24.2      | 25.22 | 1261/50            | 21                                     |
| 57                                                                 | 2.2        | 99                               | 2.0        | 89                      | K202_0250 IE3D080K04 | 31.7      | 25.13 | 1935/77            | 21                                     |
| 62                                                                 | 1.4        | 107                              | 1.2        | 82                      | K102_0230 IE3D080K04 | 24.2      | 23.27 | 1140/49            | 21                                     |
| 62                                                                 | 2.4        | 108                              | 2.1        | 82                      | K202_0230 IE3D080K04 | 31.7      | 23.18 | 2967/128           | 21                                     |

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 0,55 kW, P <sub>N</sub> (87 Hz) = 0,95 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 71                                                                 | 1.5        | 124                              | 1.3        | 71                      | K102_0200 IE3D080K04 | 24.2      | 20.15 | 403/20             | 21                                     |
| 71                                                                 | 2.8        | 123                              | 2.3        | 72                      | K202_0200 IE3D080K04 | 31.7      | 20.33 | 1118/55            | 21                                     |
| 82                                                                 | 1.7        | 142                              | 1.4        | 62                      | K102_0175 IE3D080K04 | 24.2      | 17.56 | 2090/119           | 21                                     |
| 82                                                                 | 3.1        | 143                              | 2.6        | 62                      | K202_0175 IE3D080K04 | 31.7      | 17.47 | 559/32             | 21                                     |
| 85                                                                 | 3.1        | 148                              | 2.7        | 60                      | K202_0170 IE3D080K04 | 31.7      | 16.86 | 2967/176           | 21                                     |
| 86                                                                 | 1.8        | 149                              | 1.5        | 59                      | K102_0165 IE3D080K04 | 24.2      | 16.71 | 117/7              | 21                                     |
| 102                                                                | 2.0        | 177                              | 1.7        | 50                      | K102_0140 IE3D080K04 | 24.2      | 14.11 | 494/35             | 21                                     |
| 104                                                                | 3.6        | 180                              | 3.0        | 49                      | K202_0140 IE3D080K04 | 31.7      | 13.85 | 2881/208           | 21                                     |
| 114                                                                | 2.1        | 198                              | 1.8        | 45                      | K102_0125 IE3D080K04 | 24.2      | 12.62 | 429/34             | 21                                     |
| 125                                                                | 2.3        | 216                              | 1.9        | 41                      | K102_0115 IE3D080K04 | 24.2      | 11.57 | 266/23             | 21                                     |
| 142                                                                | 2.5        | 246                              | 2.1        | 36                      | K102_0100 IE3D080K04 | 24.2      | 10.14 | 507/50             | 21                                     |
| 156                                                                | 2.6        | 270                              | 2.2        | 33                      | K102_0092 IE3D080K04 | 24.2      | 9.249 | 1748/189           | 21                                     |
| 171                                                                | 5.0        | 297                              | 4.2        | 30                      | K202_0084 IE3D080K04 | 31.7      | 8.397 | 2494/297           | 21                                     |
| 173                                                                | 2.8        | 300                              | 2.4        | 29                      | K102_0083 IE3D080K04 | 24.2      | 8.309 | 1911/230           | 21                                     |
| 215                                                                | 5.8        | 373                              | 4.9        | 24                      | K202_0067 IE3D080K04 | 31.7      | 6.683 | 2279/341           | 22                                     |
| 217                                                                | 3.3        | 375                              | 2.8        | 24                      | K102_0066 IE3D080K04 | 24.2      | 6.644 | 299/45             | 21                                     |
| 240                                                                | 3.5        | 416                              | 3.0        | 21                      | K102_0060 IE3D080K04 | 24.2      | 6.000 | 6/1                | 21                                     |
| 259                                                                | 3.7        | 448                              | 3.1        | 20                      | K102_0056 IE3D080K04 | 24.2      | 5.568 | 1520/273           | 21                                     |
| 330                                                                | 6.6        | 572                              | 6.5        | 15                      | K202_0044 IE3D080K04 | 31.7      | 4.364 | 48/11              | 23                                     |
| 360                                                                | 4.6        | 624                              | 3.9        | 14                      | K102_0040 IE3D080K04 | 24.2      | 4.000 | 4/1                | 22                                     |
| P <sub>N</sub> (50 Hz) = 0,75 kW, P <sub>N</sub> (87 Hz) = 1,30 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 3.8                                                                | 1.0        | 6.6                              | 1.0        | 1793                    | K714_3810 IE3D080L04 | 116.7     | 381.0 | 195083/512         | 26                                     |
| 4.2                                                                | 1.0        | 7.3                              | 1.0        | 1619                    | K714_3440 IE3D080L04 | 116.7     | 344.1 | 44051/128          | 26                                     |
| 4.7                                                                | 1.7        | 8.2                              | 1.5        | 1434                    | K714_3050 IE3D080L04 | 116.7     | 304.8 | 195083/640         | 26                                     |
| 4.9                                                                | 1.0        | 8.5                              | 1.0        | 1385                    | K614_2940 IE3D080L04 | 83.9      | 294.4 | 3674213/12480      | 26                                     |
| 5.2                                                                | 1.7        | 9.1                              | 1.5        | 1295                    | K714_2750 IE3D080L04 | 116.7     | 275.3 | 44051/160          | 26                                     |
| 5.4                                                                | 1.1        | 9.4                              | 1.1        | 1251                    | K614_2660 IE3D080L04 | 83.9      | 265.9 | 829661/3120        | 26                                     |
| 5.8                                                                | 1.9        | 10                               | 1.8        | 1180                    | K714_2510 IE3D080L04 | 116.7     | 250.7 | 320943/1280        | 26                                     |
| 5.9                                                                | 1.3        | 10                               | 1.3        | 1159                    | K614_2460 IE3D080L04 | 83.9      | 246.3 | 1261297/5120       | 26                                     |
| 6.4                                                                | 1.9        | 11                               | 1.8        | 1066                    | K714_2260 IE3D080L04 | 116.7     | 226.5 | 72471/320          | 26                                     |
| 6.4                                                                | 0.85       | 11                               | 0.85       | 1061                    | K514_2250 IE3D080L04 | 63.0      | 225.4 | 659344/2925        | 26                                     |
| 6.5                                                                | 1.4        | 11                               | 1.4        | 1047                    | K614_2230 IE3D080L04 | 83.9      | 222.5 | 284809/1280        | 26                                     |
| 7.5                                                                | 2.1        | 13                               | 2.1        | 907                     | K714_1930 IE3D080L04 | 116.7     | 192.9 | 320943/1664        | 26                                     |
| 7.8                                                                | 1.0        | 13                               | 1.0        | 876                     | K514_1860 IE3D080L04 | 63.0      | 186.2 | 26071/140          | 26                                     |
| 7.8                                                                | 1.7        | 14                               | 1.7        | 868                     | K614_1850 IE3D080L04 | 83.9      | 184.6 | 383873/2080        | 26                                     |
| 8.3                                                                | 2.1        | 14                               | 2.1        | 820                     | K714_1740 IE3D080L04 | 116.7     | 174.2 | 72471/416          | 26                                     |
| 8.6                                                                | 1.1        | 15                               | 1.1        | 791                     | K514_1680 IE3D080L04 | 63.0      | 168.2 | 841/5              | 26                                     |
| 8.7                                                                | 1.8        | 15                               | 1.8        | 784                     | K614_1670 IE3D080L04 | 83.9      | 166.7 | 86681/520          | 26                                     |
| 9.5                                                                | 2.5        | 16                               | 2.5        | 714                     | K714_1520 IE3D080L04 | 116.7     | 151.7 | 24273/160          | 27                                     |
| 9.7                                                                | 1.3        | 17                               | 1.3        | 701                     | K514_1490 IE3D080L04 | 63.0      | 149.0 | 26071/175          | 26                                     |
| 9.8                                                                | 2.1        | 17                               | 2.1        | 697                     | K614_1480 IE3D080L04 | 83.9      | 148.2 | 4551637/30720      | 26                                     |
| 11                                                                 | 2.5        | 18                               | 2.5        | 645                     | K714_1370 IE3D080L04 | 116.7     | 137.0 | 5481/40            | 27                                     |
| 11                                                                 | 1.4        | 19                               | 1.4        | 633                     | K514_1350 IE3D080L04 | 63.0      | 134.6 | 3364/25            | 26                                     |
| 11                                                                 | 0.86       | 19                               | 0.86       | 642                     | K403_1340 IE3D080L04 | 56.9      | 134.4 | 120959/900         | 26                                     |
| 11                                                                 | 2.3        | 19                               | 2.3        | 630                     | K614_1340 IE3D080L04 | 83.9      | 133.8 | 1027789/7680       | 26                                     |
| 12                                                                 | 1.5        | 20                               | 1.5        | 588                     | K514_1250 IE3D080L04 | 63.0      | 124.9 | 599633/4800        | 26                                     |
| 12                                                                 | 2.5        | 20                               | 2.5        | 580                     | K614_1230 IE3D080L04 | 83.9      | 123.2 | 1261297/10240      | 26                                     |
| 13                                                                 | 1.7        | 22                               | 1.7        | 531                     | K514_1130 IE3D080L04 | 63.0      | 112.8 | 135401/1200        | 26                                     |
| 13                                                                 | 2.8        | 22                               | 2.7        | 523                     | K614_1110 IE3D080L04 | 83.9      | 111.3 | 284809/2560        | 26                                     |
| 13                                                                 | 1.1        | 23                               | 1.1        | 513                     | K403_1070 IE3D080L04 | 56.9      | 107.4 | 38657/360          | 26                                     |
| 15                                                                 | 1.7        | 26                               | 1.7        | 462                     | K513_0970 IE3D080L04 | 58.5      | 96.64 | 38657/400          | 26                                     |
| 15                                                                 | 2.4        | 26                               | 2.4        | 456                     | K613_0950 IE3D080L04 | 80.0      | 95.41 | 293105/3072        | 27                                     |
| 15                                                                 | 2.0        | 27                               | 2.0        | 443                     | K514_0940 IE3D080L04 | 63.0      | 94.15 | 338923/3600        | 26                                     |
| 16                                                                 | 0.81       | 28                               | 0.81       | 430                     | K303_0900 IE3D080L04 | 44.1      | 90.06 | 16211/180          | 26                                     |
| 16                                                                 | 1.3        | 28                               | 1.3        | 430                     | K403_0900 IE3D080L04 | 56.9      | 90.06 | 16211/180          | 26                                     |
| 17                                                                 | 1.7        | 29                               | 1.7        | 417                     | K513_0870 IE3D080L04 | 58.5      | 87.29 | 8729/100           | 26                                     |
| 17                                                                 | 2.4        | 29                               | 2.4        | 412                     | K613_0860 IE3D080L04 | 80.0      | 86.18 | 66185/768          | 27                                     |
| 17                                                                 | 2.3        | 29                               | 2.3        | 400                     | K514_0850 IE3D080L04 | 63.0      | 85.03 | 76531/900          | 26                                     |
| 18                                                                 | 0.93       | 32                               | 0.93       | 375                     | K303_0780 IE3D080L04 | 44.1      | 78.41 | 103501/1320        | 26                                     |
| 19                                                                 | 1.5        | 32                               | 1.5        | 373                     | K403_0780 IE3D080L04 | 56.9      | 78.10 | 38657/495          | 26                                     |
| 19                                                                 | 2.4        | 32                               | 2.4        | 371                     | K513_0780 IE3D080L04 | 58.5      | 77.59 | 26071/336          | 26                                     |
| 19                                                                 | 3.3        | 33                               | 3.3        | 364                     | K613_0760 IE3D080L04 | 80.0      | 76.14 | 126697/1664        | 27                                     |
| 21                                                                 | 2.4        | 36                               | 2.4        | 335                     | K513_0700 IE3D080L04 | 58.5      | 70.08 | 841/12             | 26                                     |
| 21                                                                 | 1.1        | 36                               | 1.1        | 336                     | K402_0690 IE3D080L04 | 52.7      | 69.34 | 5547/80            | 26                                     |
| 21                                                                 | 3.3        | 36                               | 3.3        | 329                     | K613_0690 IE3D080L04 | 80.0      | 68.77 | 28609/416          | 27                                     |

#### 4.2 Selection tables 4 K helical bevel geared motors

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>1</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 0,75 kW, P <sub>N</sub> (87 Hz) = 1,30 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 22                                                                 | 1.1        | 37                               | 1.1        | 320                     | K303_0670 IE3D080L04 | 44.1      | 66.87 | 46139/690          | 26                                     |
| 21                                                                 | 1.7        | 37                               | 1.7        | 322                     | K403_0670 IE3D080L04 | 56.9      | 67.30 | 21199/315          | 26                                     |
| 22                                                                 | 1.1        | 38                               | 1.1        | 313                     | K303_0650 IE3D080L04 | 44.1      | 65.50 | 32422/495          | 26                                     |
| 22                                                                 | 1.8        | 38                               | 1.8        | 313                     | K403_0650 IE3D080L04 | 56.9      | 65.50 | 32422/495          | 26                                     |
| 22                                                                 | 2.9        | 39                               | 2.9        | 309                     | K513_0650 IE3D080L04 | 58.5      | 64.54 | 12586/195          | 27                                     |
| 25                                                                 | 3.2        | 43                               | 3.2        | 279                     | K513_0580 IE3D080L04 | 58.5      | 58.30 | 11368/195          | 27                                     |
| 26                                                                 | 0.98       | 45                               | 0.98       | 270                     | K302_0560 IE3D080L04 | 39.2      | 55.71 | 2451/44            | 26                                     |
| 26                                                                 | 1.6        | 45                               | 1.6        | 270                     | K402_0560 IE3D080L04 | 52.7      | 55.71 | 2451/44            | 26                                     |
| 27                                                                 | 1.4        | 46                               | 1.4        | 258                     | K303_0540 IE3D080L04 | 44.1      | 53.88 | 8729/162           | 26                                     |
| 27                                                                 | 2.1        | 47                               | 2.1        | 257                     | K403_0540 IE3D080L04 | 56.9      | 53.69 | 38657/720          | 26                                     |
| 29                                                                 | 1.1        | 50                               | 1.1        | 245                     | K402_0500 IE3D080L04 | 52.7      | 50.43 | 5547/110           | 26                                     |
| 30                                                                 | 1.5        | 51                               | 1.5        | 232                     | K303_0490 IE3D080L04 | 44.1      | 48.63 | 184556/3795        | 26                                     |
| 30                                                                 | 2.4        | 51                               | 2.4        | 234                     | K403_0490 IE3D080L04 | 56.9      | 48.94 | 169592/3465        | 26                                     |
| 30                                                                 | 3.8        | 52                               | 3.8        | 230                     | K513_0480 IE3D080L04 | 58.5      | 48.16 | 2697/56            | 27                                     |
| 31                                                                 | 0.89       | 54                               | 0.89       | 224                     | K202_0460 IE3D080L04 | 34.2      | 46.23 | 1849/40            | 26                                     |
| 31                                                                 | 1.5        | 54                               | 1.5        | 224                     | K302_0460 IE3D080L04 | 39.2      | 46.23 | 1849/40            | 26                                     |
| 31                                                                 | 2.4        | 54                               | 2.4        | 225                     | K402_0460 IE3D080L04 | 52.7      | 46.31 | 602/13             | 26                                     |
| 32                                                                 | 1.6        | 56                               | 1.6        | 215                     | K303_0450 IE3D080L04 | 44.1      | 44.89 | 11223/250          | 26                                     |
| 32                                                                 | 2.6        | 56                               | 2.6        | 213                     | K403_0450 IE3D080L04 | 56.9      | 44.54 | 1247/28            | 26                                     |
| 33                                                                 | 3.8        | 58                               | 3.8        | 208                     | K513_0440 IE3D080L04 | 58.5      | 43.50 | 87/2               | 27                                     |
| 36                                                                 | 0.98       | 62                               | 0.98       | 196                     | K302_0410 IE3D080L04 | 39.2      | 40.51 | 4902/121           | 26                                     |
| 36                                                                 | 1.6        | 62                               | 1.6        | 196                     | K402_0410 IE3D080L04 | 52.7      | 40.51 | 4902/121           | 26                                     |
| 37                                                                 | 1.9        | 64                               | 1.9        | 187                     | K303_0390 IE3D080L04 | 44.1      | 39.19 | 34916/891          | 26                                     |
| 37                                                                 | 2.9        | 64                               | 2.9        | 187                     | K403_0390 IE3D080L04 | 56.9      | 39.05 | 38657/990          | 26                                     |
| 40                                                                 | 2.0        | 70                               | 2.0        | 171                     | K303_0360 IE3D080L04 | 44.1      | 35.83 | 215/6              | 26                                     |
| 42                                                                 | 1.2        | 72                               | 1.2        | 168                     | K202_0350 IE3D080L04 | 34.2      | 34.55 | 1935/56            | 26                                     |
| 42                                                                 | 2.1        | 72                               | 2.1        | 168                     | K302_0350 IE3D080L04 | 39.2      | 34.73 | 903/26             | 26                                     |
| 43                                                                 | 0.95       | 74                               | 0.95       | 163                     | K202_0340 IE3D080L04 | 34.2      | 33.62 | 1849/55            | 26                                     |
| 43                                                                 | 1.5        | 74                               | 1.5        | 163                     | K302_0340 IE3D080L04 | 39.2      | 33.62 | 1849/55            | 26                                     |
| 43                                                                 | 2.4        | 74                               | 2.4        | 163                     | K402_0340 IE3D080L04 | 52.7      | 33.68 | 4816/143           | 26                                     |
| 44                                                                 | 2.2        | 77                               | 2.2        | 156                     | K303_0330 IE3D080L04 | 44.1      | 32.65 | 44892/1375         | 26                                     |
| 45                                                                 | 3.0        | 77                               | 3.0        | 155                     | K403_0320 IE3D080L04 | 56.9      | 32.39 | 2494/77            | 26                                     |
| 52                                                                 | 0.88       | –                                | –          | 136                     | K102_0280 IE3D080L04 | 26.7      | 28.05 | 589/21             | 26                                     |
| 52                                                                 | 1.5        | 90                               | 1.4        | 136                     | K202_0280 IE3D080L04 | 34.2      | 27.95 | 559/20             | 26                                     |
| 52                                                                 | 2.6        | 90                               | 2.4        | 135                     | K302_0280 IE3D080L04 | 39.2      | 27.88 | 3569/128           | 26                                     |
| 58                                                                 | 1.6        | 100                              | 1.5        | 122                     | K202_0250 IE3D080L04 | 34.2      | 25.13 | 1935/77            | 26                                     |
| 57                                                                 | 2.8        | 99                               | 2.6        | 123                     | K302_0250 IE3D080L04 | 39.2      | 25.26 | 3612/143           | 26                                     |
| 62                                                                 | 1.0        | 108                              | 0.88       | 113                     | K102_0230 IE3D080L04 | 26.7      | 23.27 | 1140/49            | 26                                     |
| 62                                                                 | 1.8        | 108                              | 1.6        | 112                     | K202_0230 IE3D080L04 | 34.2      | 23.18 | 2967/128           | 26                                     |
| 62                                                                 | 3.1        | 107                              | 2.7        | 113                     | K302_0230 IE3D080L04 | 39.2      | 23.29 | 559/24             | 26                                     |
| 72                                                                 | 1.1        | 124                              | 0.96       | 98                      | K102_0200 IE3D080L04 | 26.7      | 20.15 | 403/20             | 26                                     |
| 71                                                                 | 2.0        | 123                              | 1.7        | 99                      | K202_0200 IE3D080L04 | 34.2      | 20.33 | 1118/55            | 26                                     |
| 82                                                                 | 1.3        | 143                              | 1.1        | 85                      | K102_0175 IE3D080L04 | 26.7      | 17.56 | 2090/119           | 26                                     |
| 83                                                                 | 2.2        | 143                              | 1.9        | 85                      | K202_0175 IE3D080L04 | 34.2      | 17.47 | 559/32             | 26                                     |
| 86                                                                 | 2.3        | 148                              | 1.9        | 82                      | K202_0170 IE3D080L04 | 34.2      | 16.86 | 2967/176           | 26                                     |
| 86                                                                 | 1.3        | 150                              | 1.1        | 81                      | K102_0165 IE3D080L04 | 26.7      | 16.71 | 117/7              | 26                                     |
| 102                                                                | 1.4        | 177                              | 1.2        | 68                      | K102_0140 IE3D080L04 | 26.7      | 14.11 | 494/35             | 26                                     |
| 104                                                                | 2.6        | 181                              | 2.2        | 67                      | K202_0140 IE3D080L04 | 34.2      | 13.85 | 2881/208           | 27                                     |
| 115                                                                | 1.6        | 198                              | 1.3        | 61                      | K102_0125 IE3D080L04 | 26.7      | 12.62 | 429/34             | 26                                     |
| 114                                                                | 2.8        | 197                              | 2.3        | 62                      | K202_0125 IE3D080L04 | 34.2      | 12.71 | 559/44             | 26                                     |
| 125                                                                | 1.7        | 216                              | 1.4        | 56                      | K102_0115 IE3D080L04 | 26.7      | 11.57 | 266/23             | 26                                     |
| 125                                                                | 3.0        | 217                              | 2.5        | 56                      | K202_0115 IE3D080L04 | 34.2      | 11.55 | 1247/108           | 27                                     |
| 143                                                                | 1.8        | 247                              | 1.5        | 49                      | K102_0100 IE3D080L04 | 26.7      | 10.14 | 507/50             | 26                                     |
| 143                                                                | 3.2        | 248                              | 2.7        | 49                      | K202_0100 IE3D080L04 | 34.2      | 10.07 | 2881/286           | 27                                     |
| 156                                                                | 1.9        | 271                              | 1.6        | 45                      | K102_0092 IE3D080L04 | 26.7      | 9.249 | 1748/189           | 26                                     |
| 157                                                                | 3.4        | 272                              | 2.9        | 45                      | K202_0092 IE3D080L04 | 34.2      | 9.190 | 2279/248           | 27                                     |
| 172                                                                | 3.7        | 298                              | 3.1        | 41                      | K202_0084 IE3D080L04 | 34.2      | 8.397 | 2494/297           | 27                                     |
| 174                                                                | 2.1        | 301                              | 1.7        | 40                      | K102_0083 IE3D080L04 | 26.7      | 8.309 | 1911/230           | 26                                     |
| 216                                                                | 4.3        | 375                              | 3.6        | 32                      | K202_0067 IE3D080L04 | 34.2      | 6.683 | 2279/341           | 27                                     |
| 217                                                                | 2.4        | 377                              | 2.0        | 32                      | K102_0066 IE3D080L04 | 26.7      | 6.644 | 299/45             | 26                                     |
| 241                                                                | 2.6        | 417                              | 2.2        | 29                      | K102_0060 IE3D080L04 | 26.7      | 6.000 | 6/1                | 26                                     |
| 260                                                                | 2.7        | 450                              | 2.3        | 27                      | K102_0056 IE3D080L04 | 26.7      | 5.568 | 1520/273           | 27                                     |
| 331                                                                | 4.8        | 574                              | 4.8        | 21                      | K202_0044 IE3D080L04 | 34.2      | 4.364 | 48/11              | 28                                     |
| 361                                                                | 3.4        | 626                              | 2.8        | 19                      | K102_0040 IE3D080L04 | 26.7      | 4.000 | 4/1                | 27                                     |

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 1,10 kW, P <sub>N</sub> (87 Hz) = 1,91 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 4.7                                                                | 1.1        | 8.2                              | 1.0        | 2094                    | K714_3050 IE3D090S04 | 122.2     | 304.8 | 195083/640         | 40                                     |
| 5.2                                                                | 1.1        | 9.1                              | 1.0        | 1891                    | K714_2750 IE3D090S04 | 122.2     | 275.3 | 44051/160          | 40                                     |
| 5.7                                                                | 1.3        | 9.9                              | 1.2        | 1722                    | K714_2510 IE3D090S04 | 122.2     | 250.7 | 320943/1280        | 40                                     |
| 5.8                                                                | 0.86       | 10                               | 0.86       | 1692                    | K614_2460 IE3D090S04 | 89.4      | 246.3 | 1261297/5120       | 40                                     |
| 6.4                                                                | 1.3        | 11                               | 1.2        | 1556                    | K714_2260 IE3D090S04 | 122.2     | 226.5 | 72471/320          | 40                                     |
| 6.5                                                                | 0.95       | 11                               | 0.95       | 1528                    | K614_2230 IE3D090S04 | 89.4      | 222.5 | 284809/1280        | 40                                     |
| 7.5                                                                | 1.5        | 13                               | 1.5        | 1325                    | K714_1930 IE3D090S04 | 122.2     | 192.9 | 320943/1664        | 40                                     |
| 7.8                                                                | 1.1        | 14                               | 1.1        | 1268                    | K614_1850 IE3D090S04 | 89.4      | 184.6 | 383873/2080        | 40                                     |
| 8.3                                                                | 1.5        | 14                               | 1.5        | 1197                    | K714_1740 IE3D090S04 | 122.2     | 174.2 | 72471/416          | 40                                     |
| 8.6                                                                | 1.3        | 15                               | 1.3        | 1145                    | K614_1670 IE3D090S04 | 89.4      | 166.7 | 86681/520          | 40                                     |
| 9.5                                                                | 1.7        | 16                               | 1.7        | 1042                    | K714_1520 IE3D090S04 | 122.2     | 151.7 | 24273/160          | 41                                     |
| 9.7                                                                | 0.88       | 17                               | 0.88       | 1023                    | K514_1490 IE3D090S04 | 68.5      | 149.0 | 26071/175          | 40                                     |
| 9.7                                                                | 1.4        | 17                               | 1.4        | 1018                    | K614_1480 IE3D090S04 | 89.4      | 148.2 | 4551637/30720      | 40                                     |
| 11                                                                 | 1.7        | 18                               | 1.7        | 941                     | K714_1370 IE3D090S04 | 122.2     | 137.0 | 5481/40            | 41                                     |
| 11                                                                 | 0.97       | 19                               | 0.97       | 924                     | K514_1350 IE3D090S04 | 68.5      | 134.6 | 3364/25            | 40                                     |
| 11                                                                 | 1.6        | 19                               | 1.6        | 919                     | K614_1340 IE3D090S04 | 89.4      | 133.8 | 1027789/7680       | 40                                     |
| 12                                                                 | 1.0        | 20                               | 1.0        | 858                     | K514_1250 IE3D090S04 | 68.5      | 124.9 | 599633/4800        | 40                                     |
| 12                                                                 | 1.7        | 20                               | 1.7        | 846                     | K614_1230 IE3D090S04 | 89.4      | 123.2 | 1261297/10240      | 40                                     |
| 13                                                                 | 1.2        | 22                               | 1.2        | 775                     | K514_1130 IE3D090S04 | 68.5      | 112.8 | 135401/1200        | 40                                     |
| 13                                                                 | 1.9        | 22                               | 1.9        | 764                     | K614_1110 IE3D090S04 | 89.4      | 111.3 | 284809/2560        | 40                                     |
| 15                                                                 | 1.1        | 26                               | 1.1        | 674                     | K513_0970 IE3D090S04 | 64.0      | 96.64 | 38657/400          | 40                                     |
| 15                                                                 | 1.6        | 26                               | 1.6        | 666                     | K613_0950 IE3D090S04 | 85.5      | 95.41 | 293105/3072        | 41                                     |
| 15                                                                 | 1.4        | 26                               | 1.4        | 647                     | K514_0940 IE3D090S04 | 68.5      | 94.15 | 338923/3600        | 40                                     |
| 16                                                                 | 0.88       | 28                               | 0.88       | 629                     | K403_0900 IE3D090S04 | 62.4      | 90.06 | 16211/180          | 40                                     |
| 16                                                                 | 1.1        | 29                               | 1.1        | 609                     | K513_0870 IE3D090S04 | 64.0      | 87.29 | 8729/100           | 40                                     |
| 17                                                                 | 1.6        | 29                               | 1.6        | 601                     | K613_0860 IE3D090S04 | 85.5      | 86.18 | 66185/768          | 41                                     |
| 17                                                                 | 1.5        | 29                               | 1.5        | 584                     | K514_0850 IE3D090S04 | 68.5      | 85.03 | 76531/900          | 40                                     |
| 18                                                                 | 1.0        | 32                               | 1.0        | 545                     | K403_0780 IE3D090S04 | 62.4      | 78.10 | 38657/495          | 40                                     |
| 19                                                                 | 1.7        | 32                               | 1.7        | 541                     | K513_0780 IE3D090S04 | 64.0      | 77.59 | 26071/336          | 40                                     |
| 19                                                                 | 2.3        | 33                               | 2.3        | 531                     | K613_0760 IE3D090S04 | 85.5      | 76.14 | 126697/1664        | 41                                     |
| 21                                                                 | 1.7        | 36                               | 1.7        | 489                     | K513_0700 IE3D090S04 | 64.0      | 70.08 | 841/12             | 40                                     |
| 21                                                                 | 2.3        | 36                               | 2.3        | 480                     | K613_0690 IE3D090S04 | 85.5      | 68.77 | 28609/416          | 41                                     |
| 21                                                                 | 1.2        | 37                               | 1.2        | 470                     | K403_0670 IE3D090S04 | 62.4      | 67.30 | 21199/315          | 40                                     |
| 22                                                                 | 1.2        | 38                               | 1.2        | 457                     | K403_0650 IE3D090S04 | 62.4      | 65.50 | 32422/495          | 40                                     |
| 22                                                                 | 2.0        | 39                               | 2.0        | 450                     | K513_0650 IE3D090S04 | 64.0      | 64.54 | 12586/195          | 41                                     |
| 25                                                                 | 2.2        | 43                               | 2.2        | 407                     | K513_0580 IE3D090S04 | 64.0      | 58.30 | 11368/195          | 41                                     |
| 26                                                                 | 1.1        | 45                               | 1.1        | 394                     | K402_0560 IE3D090S04 | 58.2      | 55.71 | 2451/44            | 40                                     |
| 27                                                                 | 0.93       | 46                               | 0.93       | 376                     | K303_0540 IE3D090S04 | 49.6      | 53.88 | 8729/162           | 40                                     |
| 27                                                                 | 1.5        | 46                               | 1.5        | 375                     | K403_0540 IE3D090S04 | 62.4      | 53.69 | 38657/720          | 40                                     |
| 30                                                                 | 1.0        | 51                               | 1.0        | 339                     | K303_0490 IE3D090S04 | 49.6      | 48.63 | 184556/3795        | 40                                     |
| 29                                                                 | 1.6        | 51                               | 1.6        | 342                     | K403_0490 IE3D090S04 | 62.4      | 48.94 | 169592/3465        | 40                                     |
| 30                                                                 | 2.6        | 52                               | 2.6        | 336                     | K513_0480 IE3D090S04 | 64.0      | 48.16 | 2697/56            | 41                                     |
| 31                                                                 | 1.1        | 54                               | 1.1        | 327                     | K302_0460 IE3D090S04 | 44.7      | 46.23 | 1849/40            | 40                                     |
| 31                                                                 | 1.6        | 54                               | 1.6        | 328                     | K402_0460 IE3D090S04 | 58.2      | 46.31 | 602/13             | 40                                     |
| 32                                                                 | 1.1        | 56                               | 1.1        | 313                     | K303_0450 IE3D090S04 | 49.6      | 44.89 | 11223/250          | 40                                     |
| 32                                                                 | 1.8        | 56                               | 1.8        | 311                     | K403_0450 IE3D090S04 | 62.4      | 44.54 | 1247/28            | 40                                     |
| 33                                                                 | 2.6        | 57                               | 2.6        | 304                     | K513_0440 IE3D090S04 | 64.0      | 43.50 | 87/2               | 41                                     |
| 36                                                                 | 1.1        | 62                               | 1.1        | 287                     | K402_0410 IE3D090S04 | 58.2      | 40.51 | 4902/121           | 40                                     |
| 37                                                                 | 1.3        | 64                               | 1.3        | 273                     | K303_0390 IE3D090S04 | 49.6      | 39.19 | 34916/891          | 40                                     |
| 37                                                                 | 2.0        | 64                               | 2.0        | 273                     | K403_0390 IE3D090S04 | 62.4      | 39.05 | 38657/990          | 40                                     |
| 40                                                                 | 1.4        | 70                               | 1.4        | 250                     | K303_0360 IE3D090S04 | 49.6      | 35.83 | 215/6              | 40                                     |
| 40                                                                 | 2.0        | 70                               | 2.0        | 249                     | K403_0360 IE3D090S04 | 62.4      | 35.72 | 13717/384          | 40                                     |
| 42                                                                 | 0.82       | 72                               | 0.82       | 245                     | K202_0350 IE3D090S04 | 39.7      | 34.55 | 1935/56            | 40                                     |
| 41                                                                 | 1.4        | 72                               | 1.4        | 246                     | K302_0350 IE3D090S04 | 44.7      | 34.73 | 903/26             | 40                                     |
| 41                                                                 | 2.2        | 72                               | 2.2        | 246                     | K402_0350 IE3D090S04 | 58.2      | 34.76 | 4171/120           | 40                                     |
| 43                                                                 | 1.1        | 74                               | 1.1        | 238                     | K302_0340 IE3D090S04 | 44.7      | 33.62 | 1849/55            | 40                                     |
| 43                                                                 | 1.6        | 74                               | 1.6        | 238                     | K402_0340 IE3D090S04 | 58.2      | 33.68 | 4816/143           | 40                                     |
| 44                                                                 | 1.5        | 76                               | 1.5        | 228                     | K303_0330 IE3D090S04 | 49.6      | 32.65 | 44892/1375         | 40                                     |
| 44                                                                 | 2.0        | 77                               | 2.0        | 226                     | K403_0320 IE3D090S04 | 62.4      | 32.39 | 2494/77            | 40                                     |
| 52                                                                 | 1.0        | 89                               | 0.95       | 198                     | K202_0280 IE3D090S04 | 39.7      | 27.95 | 559/20             | 40                                     |
| 52                                                                 | 1.8        | 89                               | 1.7        | 197                     | K302_0280 IE3D090S04 | 44.7      | 27.88 | 3569/128           | 40                                     |
| 52                                                                 | 2.8        | 90                               | 2.5        | 197                     | K402_0280 IE3D090S04 | 58.2      | 27.77 | 1333/48            | 41                                     |
| 57                                                                 | 1.1        | 99                               | 1.0        | 178                     | K202_0250 IE3D090S04 | 39.7      | 25.13 | 1935/77            | 40                                     |
| 57                                                                 | 1.9        | 99                               | 1.8        | 179                     | K302_0250 IE3D090S04 | 44.7      | 25.26 | 3612/143           | 40                                     |
| 57                                                                 | 2.6        | 99                               | 2.6        | 179                     | K402_0250 IE3D090S04 | 58.2      | 25.28 | 4171/165           | 41                                     |



#### 4.2 Selection tables 4 K helical bevel geared motors

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                  | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|-----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 1,10 kW, P <sub>N</sub> (87 Hz) = 1,91 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 62                                                                 | 1.2        | 108                              | 1.1        | 164                     | K202_0230 IE3D090S04  | 39.7      | 23.18 | 2967/128           | 40                                     |
| 62                                                                 | 2.1        | 107                              | 1.9        | 165                     | K302_0230 IE3D090S04  | 44.7      | 23.29 | 559/24             | 40                                     |
| 71                                                                 | 1.4        | 123                              | 1.2        | 144                     | K202_0200 IE3D090S04  | 39.7      | 20.33 | 1118/55            | 40                                     |
| 71                                                                 | 2.4        | 123                              | 2.1        | 144                     | K302_0200 IE3D090S04  | 44.7      | 20.28 | 3569/176           | 40                                     |
| 82                                                                 | 0.86       | –                                | –          | 124                     | K102_0175 IE3D090S04  | 32.2      | 17.56 | 2090/119           | 40                                     |
| 82                                                                 | 1.5        | 143                              | 1.3        | 124                     | K202_0175 IE3D090S04  | 39.7      | 17.47 | 559/32             | 40                                     |
| 83                                                                 | 2.7        | 144                              | 2.3        | 122                     | K302_0175 IE3D090S04  | 44.7      | 17.29 | 1591/92            | 41                                     |
| 85                                                                 | 1.6        | 148                              | 1.3        | 119                     | K202_0170 IE3D090S04  | 39.7      | 16.86 | 2967/176           | 40                                     |
| 85                                                                 | 2.7        | 147                              | 2.3        | 120                     | K302_0170 IE3D090S04  | 44.7      | 16.94 | 559/33             | 41                                     |
| 86                                                                 | 0.89       | –                                | –          | 118                     | K102_0165 IE3D090S04  | 32.2      | 16.71 | 117/7              | 40                                     |
| 102                                                                | 0.99       | 177                              | 0.84       | 100                     | K102_0140 IE3D090S04  | 32.2      | 14.11 | 494/35             | 40                                     |
| 104                                                                | 1.8        | 180                              | 1.5        | 98                      | K202_0140 IE3D090S04  | 39.7      | 13.85 | 2881/208           | 41                                     |
| 103                                                                | 3.1        | 179                              | 2.6        | 99                      | K302_0140 IE3D090S04  | 44.7      | 13.94 | 1505/108           | 41                                     |
| 114                                                                | 1.1        | 198                              | 0.90       | 89                      | K102_0125 IE3D090S04  | 32.2      | 12.62 | 429/34             | 40                                     |
| 113                                                                | 1.9        | 196                              | 1.6        | 90                      | K202_0125 IE3D090S04  | 39.7      | 12.71 | 559/44             | 40                                     |
| 114                                                                | 3.3        | 198                              | 2.8        | 89                      | K302_0125 IE3D090S04  | 44.7      | 12.58 | 3182/253           | 41                                     |
| 125                                                                | 1.1        | 216                              | 0.96       | 82                      | K102_0115 IE3D090S04  | 32.2      | 11.57 | 266/23             | 40                                     |
| 125                                                                | 2.0        | 216                              | 1.7        | 82                      | K202_0115 IE3D090S04  | 39.7      | 11.55 | 1247/108           | 41                                     |
| 142                                                                | 1.2        | 246                              | 1.0        | 72                      | K102_0100 IE3D090S04  | 32.2      | 10.14 | 507/50             | 40                                     |
| 143                                                                | 2.2        | 248                              | 1.9        | 71                      | K202_0100 IE3D090S04  | 39.7      | 10.07 | 2881/286           | 41                                     |
| 156                                                                | 1.3        | 270                              | 1.1        | 65                      | K102_0092 IE3D090S04  | 32.2      | 9.249 | 1748/189           | 40                                     |
| 157                                                                | 2.4        | 271                              | 2.0        | 65                      | K202_0092 IE3D090S04  | 39.7      | 9.190 | 2279/248           | 41                                     |
| 171                                                                | 2.5        | 297                              | 2.1        | 59                      | K202_0084 IE3D090S04  | 39.7      | 8.397 | 2494/297           | 41                                     |
| 173                                                                | 1.4        | 300                              | 1.2        | 59                      | K102_0083 IE3D090S04  | 32.2      | 8.309 | 1911/230           | 40                                     |
| 215                                                                | 2.9        | 373                              | 2.5        | 47                      | K202_0067 IE3D090S04  | 39.7      | 6.683 | 2279/341           | 41                                     |
| 217                                                                | 1.6        | 375                              | 1.4        | 47                      | K102_0066 IE3D090S04  | 32.2      | 6.644 | 299/45             | 40                                     |
| 240                                                                | 1.8        | 416                              | 1.5        | 42                      | K102_0060 IE3D090S04  | 32.2      | 6.000 | 6/1                | 40                                     |
| 240                                                                | 3.1        | 416                              | 2.6        | 42                      | K202_0060 IE3D090S04  | 39.7      | 6.000 | 6/1                | 42                                     |
| 259                                                                | 1.8        | 448                              | 1.6        | 39                      | K102_0056 IE3D090S04  | 32.2      | 5.568 | 1520/273           | 41                                     |
| 330                                                                | 3.3        | 572                              | 3.3        | 31                      | K202_0044 IE3D090S04  | 39.7      | 4.364 | 48/11              | 42                                     |
| 360                                                                | 2.3        | 624                              | 1.9        | 28                      | K102_0040 IE3D090S04  | 32.2      | 4.000 | 4/1                | 41                                     |
| P <sub>N</sub> (50 Hz) = 1,50 kW, P <sub>N</sub> (87 Hz) = 2,60 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 4.8                                                                | 0.85       | –                                | –          | 2811                    | K714_3050 IE3D090LX04 | 130.7     | 304.8 | 195083/640         | 58                                     |
| 5.3                                                                | 0.86       | –                                | –          | 2539                    | K714_2750 IE3D090LX04 | 130.7     | 275.3 | 44051/160          | 58                                     |
| 5.8                                                                | 0.98       | 10                               | 0.91       | 2312                    | K714_2510 IE3D090LX04 | 130.7     | 250.7 | 320943/1280        | 58                                     |
| 6.4                                                                | 0.98       | 11                               | 0.91       | 2088                    | K714_2260 IE3D090LX04 | 130.7     | 226.5 | 72471/320          | 58                                     |
| 7.5                                                                | 1.1        | 13                               | 1.1        | 1779                    | K714_1930 IE3D090LX04 | 130.7     | 192.9 | 320943/1664        | 58                                     |
| 7.9                                                                | 0.85       | 14                               | 0.85       | 1702                    | K614_1850 IE3D090LX04 | 97.9      | 184.6 | 383873/2080        | 58                                     |
| 8.4                                                                | 1.1        | 14                               | 1.1        | 1607                    | K714_1740 IE3D090LX04 | 130.7     | 174.2 | 72471/416          | 58                                     |
| 8.7                                                                | 0.94       | 15                               | 0.94       | 1537                    | K614_1670 IE3D090LX04 | 97.9      | 166.7 | 86681/520          | 58                                     |
| 9.6                                                                | 1.3        | 17                               | 1.3        | 1399                    | K714_1520 IE3D090LX04 | 130.7     | 151.7 | 24273/160          | 59                                     |
| 9.8                                                                | 1.1        | 17                               | 1.1        | 1366                    | K614_1480 IE3D090LX04 | 97.9      | 148.2 | 4551637/30720      | 58                                     |
| 11                                                                 | 1.3        | 18                               | 1.3        | 1264                    | K714_1370 IE3D090LX04 | 130.7     | 137.0 | 5481/40            | 59                                     |
| 11                                                                 | 1.2        | 19                               | 1.2        | 1234                    | K614_1340 IE3D090LX04 | 97.9      | 133.8 | 1027789/7680       | 58                                     |
| 12                                                                 | 1.3        | 20                               | 1.3        | 1136                    | K614_1230 IE3D090LX04 | 97.9      | 123.2 | 1261297/10240      | 58                                     |
| 13                                                                 | 0.87       | 22                               | 0.87       | 1041                    | K514_1130 IE3D090LX04 | 77.0      | 112.8 | 135401/1200        | 58                                     |
| 13                                                                 | 1.4        | 23                               | 1.4        | 1026                    | K614_1110 IE3D090LX04 | 97.9      | 111.3 | 284809/2560        | 58                                     |
| 15                                                                 | 0.84       | 26                               | 0.84       | 905                     | K513_0970 IE3D090LX04 | 72.5      | 96.64 | 38657/400          | 58                                     |
| 15                                                                 | 1.2        | 26                               | 1.2        | 894                     | K613_0950 IE3D090LX04 | 94.0      | 95.41 | 293105/3072        | 59                                     |
| 15                                                                 | 1.0        | 27                               | 1.0        | 868                     | K514_0940 IE3D090LX04 | 77.0      | 94.15 | 338923/3600        | 58                                     |
| 17                                                                 | 0.84       | 29                               | 0.84       | 818                     | K513_0870 IE3D090LX04 | 72.5      | 87.29 | 8729/100           | 58                                     |
| 17                                                                 | 1.2        | 29                               | 1.2        | 807                     | K613_0860 IE3D090LX04 | 94.0      | 86.18 | 66185/768          | 59                                     |
| 17                                                                 | 1.1        | 30                               | 1.1        | 784                     | K514_0850 IE3D090LX04 | 77.0      | 85.03 | 76531/900          | 58                                     |
| 19                                                                 | 1.2        | 32                               | 1.2        | 727                     | K513_0780 IE3D090LX04 | 72.5      | 77.59 | 26071/336          | 58                                     |
| 19                                                                 | 1.7        | 33                               | 1.7        | 713                     | K613_0760 IE3D090LX04 | 94.0      | 76.14 | 126697/1664        | 59                                     |
| 21                                                                 | 1.3        | 36                               | 1.3        | 657                     | K513_0700 IE3D090LX04 | 72.5      | 70.08 | 841/12             | 58                                     |
| 21                                                                 | 1.7        | 37                               | 1.7        | 644                     | K613_0690 IE3D090LX04 | 94.0      | 68.77 | 28609/416          | 59                                     |
| 22                                                                 | 0.87       | 37                               | 0.87       | 631                     | K403_0670 IE3D090LX04 | 70.9      | 67.30 | 21199/315          | 58                                     |
| 22                                                                 | 0.90       | 38                               | 0.90       | 614                     | K403_0650 IE3D090LX04 | 70.9      | 65.50 | 32422/495          | 58                                     |
| 23                                                                 | 1.5        | 39                               | 1.5        | 605                     | K513_0650 IE3D090LX04 | 72.5      | 64.54 | 12586/195          | 59                                     |
| 25                                                                 | 1.6        | 43                               | 1.6        | 546                     | K513_0580 IE3D090LX04 | 72.5      | 58.30 | 11368/195          | 59                                     |
| 26                                                                 | 0.80       | 45                               | 0.80       | 530                     | K402_0560 IE3D090LX04 | 66.7      | 55.71 | 2451/44            | 58                                     |
| 27                                                                 | 1.1        | 47                               | 1.1        | 503                     | K403_0540 IE3D090LX04 | 70.9      | 53.69 | 38657/720          | 58                                     |
| 30                                                                 | 1.2        | 51                               | 1.2        | 459                     | K403_0490 IE3D090LX04 | 70.9      | 48.94 | 169592/3465        | 58                                     |
| 30                                                                 | 1.9        | 52                               | 1.9        | 451                     | K513_0480 IE3D090LX04 | 72.5      | 48.16 | 2697/56            | 59                                     |

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                  | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|-----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 1,50 kW, P <sub>N</sub> (87 Hz) = 2,60 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 31                                                                 | 1.2        | 54                               | 1.2        | 440                     | K402_0460 IE3D090LX04 | 66.7      | 46.31 | 602/13             | 58                                     |
| 32                                                                 | 0.83       | 56                               | 0.83       | 421                     | K303_0450 IE3D090LX04 | 58.1      | 44.89 | 11223/250          | 58                                     |
| 33                                                                 | 1.3        | 57                               | 1.3        | 417                     | K403_0450 IE3D090LX04 | 70.9      | 44.54 | 1247/28            | 58                                     |
| 33                                                                 | 1.9        | 58                               | 1.9        | 408                     | K513_0440 IE3D090LX04 | 72.5      | 43.50 | 87/2               | 59                                     |
| 36                                                                 | 0.80       | 62                               | 0.80       | 385                     | K402_0410 IE3D090LX04 | 66.7      | 40.51 | 4902/121           | 58                                     |
| 37                                                                 | 0.95       | 64                               | 0.95       | 367                     | K303_0390 IE3D090LX04 | 58.1      | 39.19 | 34916/891          | 58                                     |
| 37                                                                 | 1.5        | 65                               | 1.5        | 366                     | K403_0390 IE3D090LX04 | 70.9      | 39.05 | 38657/990          | 58                                     |
| 41                                                                 | 1.0        | 70                               | 1.0        | 336                     | K303_0360 IE3D090LX04 | 58.1      | 35.83 | 215/6              | 58                                     |
| 41                                                                 | 1.5        | 71                               | 1.5        | 335                     | K403_0360 IE3D090LX04 | 70.9      | 35.72 | 13717/384          | 58                                     |
| 42                                                                 | 1.1        | 73                               | 1.1        | 330                     | K302_0350 IE3D090LX04 | 53.2      | 34.73 | 903/26             | 58                                     |
| 42                                                                 | 1.7        | 73                               | 1.6        | 330                     | K402_0350 IE3D090LX04 | 66.7      | 34.76 | 4171/120           | 58                                     |
| 43                                                                 | 1.2        | 75                               | 1.2        | 320                     | K402_0340 IE3D090LX04 | 66.7      | 33.68 | 4816/143           | 58                                     |
| 45                                                                 | 1.1        | 77                               | 1.1        | 306                     | K303_0330 IE3D090LX04 | 58.1      | 32.65 | 44892/1375         | 58                                     |
| 45                                                                 | 1.5        | 78                               | 1.5        | 303                     | K403_0320 IE3D090LX04 | 70.9      | 32.39 | 2494/77            | 58                                     |
| 52                                                                 | 1.3        | 90                               | 1.2        | 265                     | K302_0280 IE3D090LX04 | 53.2      | 27.88 | 3569/128           | 58                                     |
| 52                                                                 | 2.1        | 91                               | 1.9        | 264                     | K402_0280 IE3D090LX04 | 66.7      | 27.77 | 1333/48            | 59                                     |
| 58                                                                 | 0.84       | –                                | –          | 239                     | K202_0250 IE3D090LX04 | 48.2      | 25.13 | 1935/77            | 58                                     |
| 58                                                                 | 1.4        | 100                              | 1.3        | 240                     | K302_0250 IE3D090LX04 | 53.2      | 25.26 | 3612/143           | 58                                     |
| 58                                                                 | 2.0        | 100                              | 2.0        | 240                     | K402_0250 IE3D090LX04 | 66.7      | 25.28 | 4171/165           | 59                                     |
| 63                                                                 | 0.91       | –                                | –          | 220                     | K202_0230 IE3D090LX04 | 48.2      | 23.18 | 2967/128           | 58                                     |
| 62                                                                 | 1.6        | 108                              | 1.4        | 221                     | K302_0230 IE3D090LX04 | 53.2      | 23.29 | 559/24             | 58                                     |
| 62                                                                 | 2.4        | 108                              | 2.1        | 221                     | K402_0230 IE3D090LX04 | 66.7      | 23.29 | 559/24             | 59                                     |
| 72                                                                 | 1.0        | 124                              | 0.87       | 193                     | K202_0200 IE3D090LX04 | 48.2      | 20.33 | 1118/55            | 58                                     |
| 72                                                                 | 1.8        | 124                              | 1.5        | 193                     | K302_0200 IE3D090LX04 | 53.2      | 20.28 | 3569/176           | 58                                     |
| 72                                                                 | 2.3        | 125                              | 2.3        | 192                     | K402_0200 IE3D090LX04 | 66.7      | 20.20 | 1333/66            | 59                                     |
| 83                                                                 | 1.1        | 144                              | 0.96       | 166                     | K202_0175 IE3D090LX04 | 48.2      | 17.47 | 559/32             | 58                                     |
| 84                                                                 | 2.0        | 146                              | 1.7        | 164                     | K302_0175 IE3D090LX04 | 53.2      | 17.29 | 1591/92            | 59                                     |
| 86                                                                 | 1.2        | 149                              | 0.99       | 160                     | K202_0170 IE3D090LX04 | 48.2      | 16.86 | 2967/176           | 58                                     |
| 86                                                                 | 2.0        | 149                              | 1.7        | 161                     | K302_0170 IE3D090LX04 | 53.2      | 16.94 | 559/33             | 59                                     |
| 105                                                                | 1.3        | 182                              | 1.1        | 132                     | K202_0140 IE3D090LX04 | 48.2      | 13.85 | 2881/208           | 59                                     |
| 104                                                                | 2.3        | 181                              | 2.0        | 132                     | K302_0140 IE3D090LX04 | 53.2      | 13.94 | 1505/108           | 59                                     |
| 115                                                                | 1.4        | 198                              | 1.2        | 121                     | K202_0125 IE3D090LX04 | 48.2      | 12.71 | 559/44             | 58                                     |
| 116                                                                | 2.4        | 200                              | 2.1        | 120                     | K302_0125 IE3D090LX04 | 53.2      | 12.58 | 3182/253           | 59                                     |
| 126                                                                | 0.84       | –                                | –          | 110                     | K102_0115 IE3D090LX04 | 40.7      | 11.57 | 266/23             | 58                                     |
| 126                                                                | 1.5        | 218                              | 1.3        | 110                     | K202_0115 IE3D090LX04 | 48.2      | 11.55 | 1247/108           | 59                                     |
| 125                                                                | 2.4        | 217                              | 2.2        | 110                     | K302_0115 IE3D090LX04 | 53.2      | 11.61 | 1161/100           | 59                                     |
| 143                                                                | 0.92       | –                                | –          | 96                      | K102_0100 IE3D090LX04 | 40.7      | 10.14 | 507/50             | 58                                     |
| 144                                                                | 1.7        | 250                              | 1.4        | 96                      | K202_0100 IE3D090LX04 | 48.2      | 10.07 | 2881/286           | 59                                     |
| 144                                                                | 2.4        | 249                              | 2.4        | 96                      | K302_0100 IE3D090LX04 | 53.2      | 10.14 | 3010/297           | 59                                     |
| 157                                                                | 0.98       | 272                              | 0.82       | 88                      | K102_0092 IE3D090LX04 | 40.7      | 9.249 | 1748/189           | 58                                     |
| 158                                                                | 1.8        | 274                              | 1.5        | 87                      | K202_0092 IE3D090LX04 | 48.2      | 9.190 | 2279/248           | 59                                     |
| 173                                                                | 1.9        | 300                              | 1.6        | 80                      | K202_0084 IE3D090LX04 | 48.2      | 8.397 | 2494/297           | 59                                     |
| 172                                                                | 2.4        | 298                              | 2.4        | 80                      | K302_0084 IE3D090LX04 | 53.2      | 8.444 | 2322/275           | 60                                     |
| 175                                                                | 1.1        | 303                              | 0.89       | 79                      | K102_0083 IE3D090LX04 | 40.7      | 8.309 | 1911/230           | 58                                     |
| 218                                                                | 2.2        | 377                              | 1.8        | 64                      | K202_0067 IE3D090LX04 | 48.2      | 6.683 | 2279/341           | 59                                     |
| 219                                                                | 1.2        | 379                              | 1.0        | 63                      | K102_0066 IE3D090LX04 | 40.7      | 6.644 | 299/45             | 58                                     |
| 243                                                                | 1.3        | 420                              | 1.1        | 57                      | K102_0060 IE3D090LX04 | 40.7      | 6.000 | 6/1                | 58                                     |
| 243                                                                | 2.3        | 420                              | 2.0        | 57                      | K202_0060 IE3D090LX04 | 48.2      | 6.000 | 6/1                | 60                                     |
| 261                                                                | 1.4        | 453                              | 1.2        | 53                      | K102_0056 IE3D090LX04 | 40.7      | 5.568 | 1520/273           | 59                                     |
| 333                                                                | 2.4        | 577                              | 2.4        | 41                      | K202_0044 IE3D090LX04 | 48.2      | 4.364 | 48/11              | 60                                     |
| 364                                                                | 1.7        | 630                              | 1.4        | 38                      | K102_0040 IE3D090LX04 | 40.7      | 4.000 | 4/1                | 59                                     |
| P <sub>N</sub> (50 Hz) = 2,20 kW, P <sub>N</sub> (87 Hz) = 3,81 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 3.9                                                                | 1.1        | 6.7                              | 0.98       | 5099                    | K914_3740 IE3D100KX04 | 317.0     | 373.7 | 13775935/36864     | 111                                    |
| 4.7                                                                | 0.94       | 8.1                              | 0.94       | 4242                    | K814_3110 IE3D100KX04 | 202.8     | 310.9 | 2149075/6912       | 111                                    |
| 4.9                                                                | 1.4        | 8.5                              | 1.2        | 4008                    | K914_2940 IE3D100KX04 | 317.0     | 293.8 | 977647/3328        | 111                                    |
| 5.2                                                                | 0.94       | 8.9                              | 0.94       | 3832                    | K814_2810 IE3D100KX04 | 202.8     | 280.8 | 485275/1728        | 111                                    |
| 5.7                                                                | 1.2        | 9.8                              | 1.1        | 3496                    | K814_2560 IE3D100KX04 | 202.8     | 256.2 | 8854189/34560      | 111                                    |
| 5.9                                                                | 1.6        | 10                               | 1.4        | 3371                    | K914_2470 IE3D100KX04 | 317.0     | 247.0 | 3288449/13312      | 111                                    |
| 6.3                                                                | 1.3        | 11                               | 1.1        | 3157                    | K814_2310 IE3D100KX04 | 202.8     | 231.4 | 1999333/8640       | 111                                    |
| 7.4                                                                | 0.90       | 13                               | 0.90       | 2666                    | K714_1950 IE3D100KX04 | 144.7     | 195.4 | 2600745/13312      | 111                                    |
| 7.6                                                                | 1.6        | 13                               | 1.4        | 2618                    | K814_1920 IE3D100KX04 | 202.8     | 191.9 | 85963/448          | 111                                    |
| 7.6                                                                | 1.9        | 13                               | 1.7        | 2615                    | K914_1920 IE3D100KX04 | 317.0     | 191.7 | 4710481/24576      | 112                                    |
| 8.2                                                                | 1.0        | 14                               | 1.0        | 2408                    | K714_1760 IE3D100KX04 | 144.7     | 176.5 | 587265/3328        | 111                                    |
| 8.4                                                                | 1.7        | 14                               | 1.4        | 2365                    | K814_1730 IE3D100KX04 | 202.8     | 173.3 | 2773/16            | 111                                    |
| 9.3                                                                | 2.0        | 16                               | 1.7        | 2138                    | K814_1570 IE3D100KX04 | 202.8     | 156.7 | 601741/3840        | 111                                    |



#### 4.2 Selection tables 4 K helical bevel geared motors

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                  | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|-----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 2,20 kW, P <sub>N</sub> (87 Hz) = 3,81 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 9.4                                                                | 1.1        | 16                               | 1.1        | 2097                    | K714_1540 IE3D100KX04 | 144.7     | 153.7 | 39339/256          | 111                                    |
| 9.7                                                                | 2.2        | 17                               | 2.0        | 2033                    | K914_1490 IE3D100KX04 | 317.0     | 149.0 | 9154331/61440      | 112                                    |
| 10                                                                 | 2.0        | 18                               | 1.7        | 1931                    | K814_1420 IE3D100KX04 | 202.8     | 141.5 | 135877/960         | 111                                    |
| 10                                                                 | 1.3        | 18                               | 1.3        | 1894                    | K714_1390 IE3D100KX04 | 144.7     | 138.8 | 8883/64            | 111                                    |
| 11                                                                 | 1.4        | 20                               | 1.4        | 1733                    | K714_1270 IE3D100KX04 | 144.7     | 127.0 | 520149/4096        | 111                                    |
| 11                                                                 | 2.2        | 20                               | 2.0        | 1731                    | K814_1270 IE3D100KX04 | 202.8     | 126.9 | 1461371/11520      | 112                                    |
| 12                                                                 | 2.2        | 20                               | 2.2        | 1716                    | K914_1260 IE3D100KX04 | 317.0     | 125.8 | 2221925/17664      | 113                                    |
| 13                                                                 | 1.5        | 22                               | 1.5        | 1565                    | K714_1150 IE3D100KX04 | 144.7     | 114.7 | 117453/1024        | 111                                    |
| 13                                                                 | 2.2        | 22                               | 2.0        | 1563                    | K814_1150 IE3D100KX04 | 202.8     | 114.6 | 329987/2880        | 112                                    |
| 15                                                                 | 1.4        | 25                               | 1.4        | 1366                    | K713_0990 IE3D100KX04 | 136.3     | 98.54 | 100905/1024        | 111                                    |
| 15                                                                 | 1.8        | 25                               | 1.8        | 1345                    | K714_0990 IE3D100KX04 | 144.7     | 98.60 | 1009701/10240      | 111                                    |
| 15                                                                 | 2.2        | 26                               | 2.2        | 1347                    | K813_0970 IE3D100KX04 | 189.7     | 97.17 | 31093/320          | 113                                    |
| 15                                                                 | 2.2        | 27                               | 2.2        | 1280                    | K914_0940 IE3D100KX04 | 317.0     | 93.78 | 4177219/44544      | 114                                    |
| 16                                                                 | 1.4        | 28                               | 1.4        | 1234                    | K713_0890 IE3D100KX04 | 136.3     | 89.00 | 22785/256          | 111                                    |
| 16                                                                 | 2.0        | 28                               | 2.0        | 1215                    | K714_0890 IE3D100KX04 | 144.7     | 89.06 | 227997/2560        | 111                                    |
| 17                                                                 | 2.2        | 29                               | 2.2        | 1217                    | K813_0880 IE3D100KX04 | 189.7     | 87.76 | 7021/80            | 113                                    |
| 18                                                                 | 2.2        | 32                               | 2.2        | 1093                    | K713_0790 IE3D100KX04 | 136.3     | 78.83 | 20181/256          | 112                                    |
| 19                                                                 | 1.4        | 33                               | 1.4        | 1055                    | K613_0760 IE3D100KX04 | 108.0     | 76.14 | 126697/1664        | 111                                    |
| 20                                                                 | 2.4        | 35                               | 2.4        | 994                     | K813_0720 IE3D100KX04 | 189.7     | 71.70 | 10325/144          | 114                                    |
| 20                                                                 | 2.2        | 35                               | 2.2        | 987                     | K713_0710 IE3D100KX04 | 136.3     | 71.20 | 4557/64            | 112                                    |
| 21                                                                 | 1.4        | 37                               | 1.4        | 953                     | K613_0690 IE3D100KX04 | 108.0     | 68.77 | 28609/416          | 111                                    |
| 22                                                                 | 1.0        | 39                               | 1.0        | 895                     | K513_0650 IE3D100KX04 | 86.5      | 64.54 | 12586/195          | 111                                    |
| 22                                                                 | 2.5        | 39                               | 2.5        | 899                     | K713_0650 IE3D100KX04 | 136.3     | 64.85 | 33201/512          | 112                                    |
| 23                                                                 | 1.6        | 39                               | 1.6        | 883                     | K613_0640 IE3D100KX04 | 108.0     | 63.71 | 130479/2048        | 111                                    |
| 25                                                                 | 2.5        | 43                               | 2.5        | 812                     | K713_0590 IE3D100KX04 | 136.3     | 58.57 | 7497/128           | 113                                    |
| 25                                                                 | 1.1        | 43                               | 1.1        | 808                     | K513_0580 IE3D100KX04 | 86.5      | 58.30 | 11368/195          | 111                                    |
| 25                                                                 | 1.8        | 44                               | 1.8        | 798                     | K613_0580 IE3D100KX04 | 108.0     | 57.55 | 29463/512          | 111                                    |
| 29                                                                 | 2.8        | 50                               | 2.8        | 691                     | K713_0500 IE3D100KX04 | 136.3     | 49.88 | 166005/3328        | 114                                    |
| 30                                                                 | 3.2        | 51                               | 3.2        | 679                     | K813_0490 IE3D100KX04 | 189.7     | 48.99 | 5487/112           | 119                                    |
| 30                                                                 | 1.3        | 52                               | 1.3        | 668                     | K513_0480 IE3D100KX04 | 86.5      | 48.16 | 2697/56            | 111                                    |
| 30                                                                 | 2.2        | 53                               | 2.2        | 662                     | K613_0480 IE3D100KX04 | 108.0     | 47.73 | 39711/832          | 112                                    |
| 32                                                                 | 2.8        | 56                               | 2.8        | 625                     | K713_0450 IE3D100KX04 | 136.3     | 45.05 | 37485/832          | 114                                    |
| 33                                                                 | 1.5        | 58                               | 1.5        | 603                     | K513_0440 IE3D100KX04 | 86.5      | 43.50 | 87/2               | 111                                    |
| 33                                                                 | 3.2        | 57                               | 3.2        | 613                     | K813_0440 IE3D100KX04 | 189.7     | 44.25 | 177/4              | 119                                    |
| 34                                                                 | 2.4        | 58                               | 2.3        | 598                     | K613_0430 IE3D100KX04 | 108.0     | 43.11 | 8967/208           | 112                                    |
| 38                                                                 | 1.7        | 65                               | 1.7        | 534                     | K513_0390 IE3D100KX04 | 86.5      | 38.53 | 2697/70            | 111                                    |
| 37                                                                 | 3.3        | 64                               | 3.3        | 544                     | K713_0390 IE3D100KX04 | 136.3     | 39.23 | 2511/64            | 116                                    |
| 38                                                                 | 2.7        | 66                               | 2.5        | 531                     | K613_0380 IE3D100KX04 | 108.0     | 38.32 | 156953/4096        | 113                                    |
| 42                                                                 | 1.1        | 72                               | 1.1        | 489                     | K402_0350 IE3D100KX04 | 80.7      | 34.76 | 4171/120           | 110                                    |
| 42                                                                 | 1.9        | 72                               | 1.9        | 482                     | K513_0350 IE3D100KX04 | 86.5      | 34.80 | 174/5              | 112                                    |
| 42                                                                 | 3.0        | 73                               | 2.7        | 480                     | K613_0350 IE3D100KX04 | 108.0     | 34.61 | 35441/1024         | 113                                    |
| 45                                                                 | 2.0        | 78                               | 2.0        | 448                     | K513_0320 IE3D100KX04 | 86.5      | 32.31 | 20677/640          | 112                                    |
| 50                                                                 | 2.2        | 86                               | 2.2        | 405                     | K513_0290 IE3D100KX04 | 86.5      | 29.18 | 4669/160           | 112                                    |
| 52                                                                 | 0.89       | 90                               | 0.84       | 392                     | K302_0280 IE3D100KX04 | 67.2      | 27.88 | 3569/128           | 110                                    |
| 52                                                                 | 1.4        | 90                               | 1.3        | 391                     | K402_0280 IE3D100KX04 | 80.7      | 27.77 | 1333/48            | 111                                    |
| 57                                                                 | 1.4        | 99                               | 1.3        | 356                     | K402_0250 IE3D100KX04 | 80.7      | 25.28 | 4171/165           | 111                                    |
| 60                                                                 | 2.7        | 103                              | 2.6        | 338                     | K513_0240 IE3D100KX04 | 86.5      | 24.35 | 11687/480          | 113                                    |
| 62                                                                 | 1.1        | 108                              | 0.94       | 328                     | K302_0230 IE3D100KX04 | 67.2      | 23.29 | 559/24             | 110                                    |
| 62                                                                 | 1.7        | 108                              | 1.4        | 328                     | K402_0230 IE3D100KX04 | 80.7      | 23.29 | 559/24             | 111                                    |
| 66                                                                 | 3.0        | 114                              | 2.8        | 305                     | K513_0220 IE3D100KX04 | 86.5      | 21.99 | 2639/120           | 113                                    |
| 72                                                                 | 1.2        | 124                              | 1.0        | 285                     | K302_0200 IE3D100KX04 | 67.2      | 20.28 | 3569/176           | 110                                    |
| 72                                                                 | 1.8        | 124                              | 1.6        | 284                     | K402_0200 IE3D100KX04 | 80.7      | 20.20 | 1333/66            | 111                                    |
| 75                                                                 | 3.4        | 130                              | 3.0        | 268                     | K513_0195 IE3D100KX04 | 86.5      | 19.35 | 27869/1440         | 114                                    |
| 76                                                                 | 4.1        | 132                              | 4.0        | 263                     | K613_0190 IE3D100KX04 | 108.0     | 18.99 | 17019/896          | 118                                    |
| 84                                                                 | 1.4        | 145                              | 1.1        | 243                     | K302_0175 IE3D100KX04 | 67.2      | 17.29 | 1591/92            | 111                                    |
| 83                                                                 | 2.0        | 144                              | 1.7        | 245                     | K402_0175 IE3D100KX04 | 80.7      | 17.41 | 731/42             | 111                                    |
| 86                                                                 | 1.4        | 148                              | 1.2        | 238                     | K302_0170 IE3D100KX04 | 67.2      | 16.94 | 559/33             | 111                                    |
| 86                                                                 | 2.1        | 148                              | 1.7        | 238                     | K402_0170 IE3D100KX04 | 80.7      | 16.94 | 559/33             | 111                                    |
| 90                                                                 | 4.0        | –                                | –          | 223                     | K513_0160 IE3D100KX04 | 86.5      | 16.09 | 26071/1620         | 115                                    |
| 100                                                                | 4.1        | –                                | –          | 201                     | K513_0145 IE3D100KX04 | 86.5      | 14.54 | 5887/405           | 116                                    |
| 105                                                                | 0.90       | –                                | –          | 195                     | K202_0140 IE3D100KX04 | 62.2      | 13.85 | 2881/208           | 111                                    |
| 104                                                                | 1.6        | 180                              | 1.3        | 196                     | K302_0140 IE3D100KX04 | 67.2      | 13.94 | 1505/108           | 111                                    |
| 104                                                                | 2.4        | 181                              | 2.0        | 195                     | K402_0140 IE3D100KX04 | 80.7      | 13.89 | 1333/96            | 112                                    |
| 114                                                                | 0.96       | 198                              | 0.81       | 179                     | K202_0125 IE3D100KX04 | 62.2      | 12.71 | 559/44             | 110                                    |
| 115                                                                | 1.7        | 200                              | 1.4        | 177                     | K302_0125 IE3D100KX04 | 67.2      | 12.58 | 3182/253           | 111                                    |

| $n_2$<br>50 Hz<br>[rpm]                                                       | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                  | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|-------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|-----------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 2,20 kW, <math>P_N</math> (87 Hz) = 3,81 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 115                                                                           | 2.5        | 198                     | 2.1        | 178              | K402_0125 IE3D100KX04 | 80.7      | 12.66 | 2924/231           | 112                           |
| 126                                                                           | 1.0        | 218                     | 0.86       | 162              | K202_0115 IE3D100KX04 | 62.2      | 11.55 | 1247/108           | 111                           |
| 125                                                                           | 1.8        | 216                     | 1.5        | 163              | K302_0115 IE3D100KX04 | 67.2      | 11.61 | 1161/100           | 111                           |
| 126                                                                           | 2.7        | 218                     | 2.3        | 162              | K402_0115 IE3D100KX04 | 80.7      | 11.52 | 645/56             | 113                           |
| 144                                                                           | 1.1        | 249                     | 0.94       | 142              | K202_0100 IE3D100KX04 | 62.2      | 10.07 | 2881/286           | 111                           |
| 143                                                                           | 1.9        | 248                     | 1.6        | 143              | K302_0100 IE3D100KX04 | 67.2      | 10.14 | 3010/297           | 111                           |
| 144                                                                           | 2.9        | 249                     | 2.5        | 142              | K402_0100 IE3D100KX04 | 80.7      | 10.10 | 1333/132           | 112                           |
| 156                                                                           | 2.1        | 271                     | 1.7        | 130              | K302_0093 IE3D100KX04 | 67.2      | 9.267 | 1075/116           | 112                           |
| 158                                                                           | 1.2        | 273                     | 1.0        | 129              | K202_0092 IE3D100KX04 | 62.2      | 9.190 | 2279/248           | 111                           |
| 157                                                                           | 3.1        | 272                     | 2.6        | 130              | K402_0092 IE3D100KX04 | 80.7      | 9.238 | 2365/256           | 114                           |
| 173                                                                           | 1.3        | 299                     | 1.1        | 118              | K202_0084 IE3D100KX04 | 62.2      | 8.397 | 2494/297           | 111                           |
| 172                                                                           | 2.2        | 297                     | 1.9        | 119              | K302_0084 IE3D100KX04 | 67.2      | 8.444 | 2322/275           | 112                           |
| 196                                                                           | 2.4        | 340                     | 2.0        | 104              | K302_0074 IE3D100KX04 | 67.2      | 7.391 | 473/64             | 113                           |
| 204                                                                           | 1.4        | 353                     | 1.2        | 100              | K202_0071 IE3D100KX04 | 62.2      | 7.118 | 2107/296           | 111                           |
| 217                                                                           | 1.5        | 376                     | 1.2        | 94               | K202_0067 IE3D100KX04 | 62.2      | 6.683 | 2279/341           | 111                           |
| 215                                                                           | 2.6        | 373                     | 2.2        | 95               | K302_0067 IE3D100KX04 | 67.2      | 6.740 | 2150/319           | 112                           |
| 242                                                                           | 1.6        | 419                     | 1.3        | 84               | K202_0060 IE3D100KX04 | 62.2      | 6.000 | 6/1                | 112                           |
| 242                                                                           | 2.8        | 419                     | 2.3        | 84               | K302_0060 IE3D100KX04 | 67.2      | 6.000 | 6/1                | 113                           |
| 270                                                                           | 3.0        | 467                     | 2.5        | 76               | K302_0054 IE3D100KX04 | 67.2      | 5.375 | 43/8               | 113                           |
| 280                                                                           | 1.7        | 485                     | 1.5        | 73               | K202_0052 IE3D100KX04 | 62.2      | 5.177 | 2107/407           | 112                           |
| 332                                                                           | 2.0        | 575                     | 1.6        | 61               | K202_0044 IE3D100KX04 | 62.2      | 4.364 | 48/11              | 112                           |
| 332                                                                           | 3.4        | 575                     | 2.9        | 61               | K302_0044 IE3D100KX04 | 67.2      | 4.364 | 48/11              | 114                           |
| 363                                                                           | 2.1        | 628                     | 1.7        | 56               | K202_0040 IE3D100KX04 | 62.2      | 4.000 | 4/1                | 112                           |
| <b><math>P_N</math> (50 Hz) = 3,00 kW, <math>P_N</math> (87 Hz) = 5,20 kW</b> |            |                         |            |                  |                       |           |       |                    |                               |
| 4.9                                                                           | 1.0        | 8.5                     | 0.88       | 5473             | K914_2940 IE3D100LX04 | 322.0     | 293.8 | 977647/3328        | 131                           |
| 5.7                                                                           | 0.88       | 9.8                     | 0.84       | 4773             | K814_2560 IE3D100LX04 | 207.8     | 256.2 | 8854189/34560      | 131                           |
| 5.9                                                                           | 1.2        | 10                      | 1.0        | 4603             | K914_2470 IE3D100LX04 | 322.0     | 247.0 | 3288449/13312      | 131                           |
| 6.3                                                                           | 0.97       | 11                      | 0.84       | 4311             | K814_2310 IE3D100LX04 | 207.8     | 231.4 | 1999333/8640       | 131                           |
| 7.6                                                                           | 1.2        | 13                      | 1.1        | 3575             | K814_1920 IE3D100LX04 | 207.8     | 191.9 | 85963/448          | 131                           |
| 7.6                                                                           | 1.4        | 13                      | 1.2        | 3571             | K914_1920 IE3D100LX04 | 322.0     | 191.7 | 4710481/24576      | 132                           |
| 8.4                                                                           | 1.3        | 14                      | 1.1        | 3229             | K814_1730 IE3D100LX04 | 207.8     | 173.3 | 2773/16            | 131                           |
| 9.3                                                                           | 1.4        | 16                      | 1.2        | 2920             | K814_1570 IE3D100LX04 | 207.8     | 156.7 | 601741/3840        | 131                           |
| 9.4                                                                           | 0.84       | 16                      | 0.84       | 2863             | K714_1540 IE3D100LX04 | 149.7     | 153.7 | 39339/256          | 131                           |
| 9.7                                                                           | 1.6        | 17                      | 1.5        | 2776             | K914_1490 IE3D100LX04 | 322.0     | 149.0 | 9154331/61440      | 132                           |
| 10                                                                            | 1.5        | 18                      | 1.2        | 2637             | K814_1420 IE3D100LX04 | 207.8     | 141.5 | 135877/960         | 131                           |
| 10                                                                            | 0.93       | 18                      | 0.93       | 2586             | K714_1390 IE3D100LX04 | 149.7     | 138.8 | 8883/64            | 131                           |
| 11                                                                            | 1.0        | 20                      | 1.0        | 2366             | K714_1270 IE3D100LX04 | 149.7     | 127.0 | 520149/4096        | 131                           |
| 11                                                                            | 1.6        | 20                      | 1.5        | 2364             | K814_1270 IE3D100LX04 | 207.8     | 126.9 | 1461371/11520      | 132                           |
| 12                                                                            | 1.6        | 20                      | 1.6        | 2344             | K914_1260 IE3D100LX04 | 322.0     | 125.8 | 2221925/17664      | 133                           |
| 13                                                                            | 1.1        | 22                      | 1.1        | 2137             | K714_1150 IE3D100LX04 | 149.7     | 114.7 | 117453/1024        | 131                           |
| 13                                                                            | 1.6        | 22                      | 1.5        | 2135             | K814_1150 IE3D100LX04 | 207.8     | 114.6 | 329987/2880        | 132                           |
| 15                                                                            | 0.99       | 25                      | 0.99       | 1865             | K713_0990 IE3D100LX04 | 141.3     | 98.54 | 100905/1024        | 131                           |
| 15                                                                            | 1.3        | 25                      | 1.3        | 1837             | K714_0990 IE3D100LX04 | 149.7     | 98.60 | 1009701/10240      | 131                           |
| 15                                                                            | 1.6        | 26                      | 1.6        | 1839             | K813_0970 IE3D100LX04 | 194.7     | 97.17 | 31093/320          | 133                           |
| 15                                                                            | 1.6        | 27                      | 1.6        | 1747             | K914_0940 IE3D100LX04 | 322.0     | 93.78 | 4177219/44544      | 134                           |
| 16                                                                            | 0.99       | 28                      | 0.99       | 1685             | K713_0890 IE3D100LX04 | 141.3     | 89.00 | 22785/256          | 131                           |
| 16                                                                            | 1.4        | 28                      | 1.4        | 1659             | K714_0890 IE3D100LX04 | 149.7     | 89.06 | 227997/2560        | 131                           |
| 17                                                                            | 1.6        | 29                      | 1.6        | 1661             | K813_0880 IE3D100LX04 | 194.7     | 87.76 | 7021/80            | 133                           |
| 18                                                                            | 1.6        | 32                      | 1.6        | 1492             | K713_0790 IE3D100LX04 | 141.3     | 78.83 | 20181/256          | 132                           |
| 18                                                                            | 1.8        | 32                      | 1.8        | 1503             | K813_0790 IE3D100LX04 | 194.7     | 79.38 | 45725/576          | 134                           |
| 19                                                                            | 1.0        | 33                      | 1.0        | 1441             | K613_0760 IE3D100LX04 | 113.0     | 76.14 | 126697/1664        | 131                           |
| 20                                                                            | 1.8        | 35                      | 1.8        | 1357             | K813_0720 IE3D100LX04 | 194.7     | 71.70 | 10325/144          | 134                           |
| 20                                                                            | 1.6        | 35                      | 1.6        | 1348             | K713_0710 IE3D100LX04 | 141.3     | 71.20 | 4557/64            | 132                           |
| 21                                                                            | 1.0        | 37                      | 1.0        | 1302             | K613_0690 IE3D100LX04 | 113.0     | 68.77 | 28609/416          | 131                           |
| 22                                                                            | 1.8        | 39                      | 1.8        | 1227             | K713_0650 IE3D100LX04 | 141.3     | 64.85 | 33201/512          | 132                           |
| 23                                                                            | 1.2        | 39                      | 1.2        | 1206             | K613_0640 IE3D100LX04 | 113.0     | 63.71 | 130479/2048        | 131                           |
| 25                                                                            | 1.8        | 43                      | 1.8        | 1109             | K713_0590 IE3D100LX04 | 141.3     | 58.57 | 7497/128           | 133                           |
| 25                                                                            | 0.82       | 43                      | 0.82       | 1103             | K513_0580 IE3D100LX04 | 91.5      | 58.30 | 11368/195          | 131                           |
| 25                                                                            | 1.3        | 44                      | 1.3        | 1089             | K613_0580 IE3D100LX04 | 113.0     | 57.55 | 29463/512          | 131                           |
| 29                                                                            | 2.1        | 50                      | 2.1        | 944              | K713_0500 IE3D100LX04 | 141.3     | 49.88 | 166005/3328        | 134                           |
| 30                                                                            | 2.3        | 51                      | 2.3        | 927              | K813_0490 IE3D100LX04 | 194.7     | 48.99 | 5487/112           | 139                           |
| 30                                                                            | 0.99       | 52                      | 0.99       | 912              | K513_0480 IE3D100LX04 | 91.5      | 48.16 | 2697/56            | 131                           |
| 30                                                                            | 1.6        | 53                      | 1.6        | 903              | K613_0480 IE3D100LX04 | 113.0     | 47.73 | 39711/832          | 132                           |
| 32                                                                            | 2.1        | 56                      | 2.1        | 853              | K713_0450 IE3D100LX04 | 141.3     | 45.05 | 37485/832          | 134                           |
| 33                                                                            | 1.1        | 58                      | 1.1        | 823              | K513_0440 IE3D100LX04 | 91.5      | 43.50 | 87/2               | 131                           |

#### 4.2 Selection tables 4 K helical bevel geared motors

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                  | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>1</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|-----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 3,00 kW, P <sub>N</sub> (87 Hz) = 5,20 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 33                                                                 | 2.3        | 57                               | 2.3        | 838                     | K813_0440 IE3D100LX04 | 194.7     | 44.25 | 177/4              | 139                                    |
| 34                                                                 | 1.8        | 58                               | 1.7        | 816                     | K613_0430 IE3D100LX04 | 113.0     | 43.11 | 8967/208           | 132                                    |
| 38                                                                 | 1.2        | 65                               | 1.2        | 729                     | K513_0390 IE3D100LX04 | 91.5      | 38.53 | 2697/70            | 131                                    |
| 37                                                                 | 2.4        | 64                               | 2.4        | 743                     | K713_0390 IE3D100LX04 | 141.3     | 39.23 | 2511/64            | 136                                    |
| 38                                                                 | 2.0        | 66                               | 1.8        | 725                     | K613_0380 IE3D100LX04 | 113.0     | 38.32 | 156953/4096        | 133                                    |
| 42                                                                 | 0.82       | –                                | –          | 668                     | K402_0350 IE3D100LX04 | 85.7      | 34.76 | 4171/120           | 130                                    |
| 42                                                                 | 1.4        | 72                               | 1.4        | 659                     | K513_0350 IE3D100LX04 | 91.5      | 34.80 | 174/5              | 132                                    |
| 42                                                                 | 2.2        | 73                               | 2.0        | 655                     | K613_0350 IE3D100LX04 | 113.0     | 34.61 | 35441/1024         | 133                                    |
| 45                                                                 | 1.5        | 78                               | 1.5        | 612                     | K513_0320 IE3D100LX04 | 91.5      | 32.31 | 20677/640          | 132                                    |
| 46                                                                 | 2.4        | 79                               | 2.1        | 603                     | K613_0320 IE3D100LX04 | 113.0     | 31.86 | 130479/4096        | 134                                    |
| 50                                                                 | 1.6        | 86                               | 1.6        | 552                     | K513_0290 IE3D100LX04 | 91.5      | 29.18 | 4669/160           | 132                                    |
| 50                                                                 | 2.7        | 87                               | 2.2        | 545                     | K613_0290 IE3D100LX04 | 113.0     | 28.77 | 29463/1024         | 134                                    |
| 52                                                                 | 1.0        | 90                               | 0.92       | 533                     | K402_0280 IE3D100LX04 | 85.7      | 27.77 | 1333/48            | 131                                    |
| 57                                                                 | 1.0        | 99                               | 0.98       | 486                     | K402_0250 IE3D100LX04 | 85.7      | 25.28 | 4171/165           | 131                                    |
| 60                                                                 | 2.0        | 103                              | 1.9        | 461                     | K513_0240 IE3D100LX04 | 91.5      | 24.35 | 11687/480          | 133                                    |
| 62                                                                 | 1.2        | 108                              | 1.0        | 447                     | K402_0230 IE3D100LX04 | 85.7      | 23.29 | 559/24             | 131                                    |
| 66                                                                 | 2.2        | 114                              | 2.0        | 416                     | K513_0220 IE3D100LX04 | 91.5      | 21.99 | 2639/120           | 133                                    |
| 72                                                                 | 0.90       | –                                | –          | 389                     | K302_0200 IE3D100LX04 | 72.2      | 20.28 | 3569/176           | 130                                    |
| 72                                                                 | 1.4        | 124                              | 1.1        | 388                     | K402_0200 IE3D100LX04 | 85.7      | 20.20 | 1333/66            | 131                                    |
| 75                                                                 | 2.5        | 130                              | 2.2        | 366                     | K513_0195 IE3D100LX04 | 91.5      | 19.35 | 27869/1440         | 134                                    |
| 76                                                                 | 3.0        | 132                              | 3.0        | 360                     | K613_0190 IE3D100LX04 | 113.0     | 18.99 | 17019/896          | 138                                    |
| 84                                                                 | 1.0        | 145                              | 0.84       | 332                     | K302_0175 IE3D100LX04 | 72.2      | 17.29 | 1591/92            | 131                                    |
| 83                                                                 | 1.5        | 144                              | 1.3        | 334                     | K402_0175 IE3D100LX04 | 85.7      | 17.41 | 731/42             | 131                                    |
| 83                                                                 | 2.7        | 144                              | 2.4        | 331                     | K513_0175 IE3D100LX04 | 91.5      | 17.48 | 6293/360           | 134                                    |
| 86                                                                 | 1.0        | 148                              | 0.85       | 325                     | K302_0170 IE3D100LX04 | 72.2      | 16.94 | 559/33             | 131                                    |
| 86                                                                 | 1.5        | 148                              | 1.3        | 325                     | K402_0170 IE3D100LX04 | 85.7      | 16.94 | 559/33             | 131                                    |
| 85                                                                 | 3.0        | 146                              | 3.0        | 325                     | K613_0170 IE3D100LX04 | 113.0     | 17.16 | 549/32             | 138                                    |
| 90                                                                 | 3.0        | –                                | –          | 305                     | K513_0160 IE3D100LX04 | 91.5      | 16.09 | 26071/1620         | 135                                    |
| 100                                                                | 3.0        | –                                | –          | 275                     | K513_0145 IE3D100LX04 | 91.5      | 14.54 | 5887/405           | 136                                    |
| 104                                                                | 1.2        | 180                              | 0.97       | 268                     | K302_0140 IE3D100LX04 | 72.2      | 13.94 | 1505/108           | 131                                    |
| 104                                                                | 1.7        | 181                              | 1.5        | 267                     | K402_0140 IE3D100LX04 | 85.7      | 13.89 | 1333/96            | 132                                    |
| 115                                                                | 1.2        | 200                              | 1.0        | 242                     | K302_0125 IE3D100LX04 | 72.2      | 12.58 | 3182/253           | 131                                    |
| 115                                                                | 1.8        | 198                              | 1.6        | 243                     | K402_0125 IE3D100LX04 | 85.7      | 12.66 | 2924/231           | 132                                    |
| 125                                                                | 1.3        | 216                              | 1.1        | 223                     | K302_0115 IE3D100LX04 | 72.2      | 11.61 | 1161/100           | 131                                    |
| 126                                                                | 2.0        | 218                              | 1.7        | 221                     | K402_0115 IE3D100LX04 | 85.7      | 11.52 | 645/56             | 133                                    |
| 144                                                                | 0.82       | –                                | –          | 193                     | K202_0100 IE3D100LX04 | 67.2      | 10.07 | 2881/286           | 131                                    |
| 143                                                                | 1.4        | 248                              | 1.2        | 195                     | K302_0100 IE3D100LX04 | 72.2      | 10.14 | 3010/297           | 131                                    |
| 144                                                                | 2.1        | 249                              | 1.8        | 194                     | K402_0100 IE3D100LX04 | 85.7      | 10.10 | 1333/132           | 132                                    |
| 156                                                                | 1.5        | 271                              | 1.3        | 178                     | K302_0093 IE3D100LX04 | 72.2      | 9.267 | 1075/116           | 132                                    |
| 158                                                                | 0.87       | –                                | –          | 177                     | K202_0092 IE3D100LX04 | 67.2      | 9.190 | 2279/248           | 131                                    |
| 157                                                                | 2.3        | 272                              | 1.9        | 177                     | K402_0092 IE3D100LX04 | 85.7      | 9.238 | 2365/256           | 134                                    |
| 173                                                                | 0.92       | –                                | –          | 161                     | K202_0084 IE3D100LX04 | 67.2      | 8.397 | 2494/297           | 131                                    |
| 172                                                                | 1.6        | 297                              | 1.4        | 162                     | K302_0084 IE3D100LX04 | 72.2      | 8.444 | 2322/275           | 132                                    |
| 173                                                                | 2.4        | 300                              | 2.0        | 161                     | K402_0084 IE3D100LX04 | 85.7      | 8.377 | 645/77             | 133                                    |
| 196                                                                | 1.8        | 340                              | 1.5        | 142                     | K302_0074 IE3D100LX04 | 72.2      | 7.391 | 473/64             | 133                                    |
| 204                                                                | 1.0        | 353                              | 0.87       | 137                     | K202_0071 IE3D100LX04 | 67.2      | 7.118 | 2107/296           | 131                                    |
| 217                                                                | 1.1        | 376                              | 0.91       | 128                     | K202_0067 IE3D100LX04 | 67.2      | 6.683 | 2279/341           | 131                                    |
| 215                                                                | 1.9        | 373                              | 1.6        | 129                     | K302_0067 IE3D100LX04 | 72.2      | 6.740 | 2150/319           | 132                                    |
| 216                                                                | 2.8        | 374                              | 2.4        | 129                     | K402_0067 IE3D100LX04 | 85.7      | 6.719 | 215/32             | 134                                    |
| 242                                                                | 1.2        | 419                              | 0.97       | 115                     | K202_0060 IE3D100LX04 | 67.2      | 6.000 | 6/1                | 132                                    |
| 242                                                                | 2.0        | 419                              | 1.7        | 115                     | K302_0060 IE3D100LX04 | 72.2      | 6.000 | 6/1                | 133                                    |
| 270                                                                | 2.2        | 467                              | 1.8        | 103                     | K302_0054 IE3D100LX04 | 72.2      | 5.375 | 43/8               | 133                                    |
| 280                                                                | 1.3        | 485                              | 1.1        | 99                      | K202_0052 IE3D100LX04 | 67.2      | 5.177 | 2107/407           | 132                                    |
| 332                                                                | 1.4        | 575                              | 1.2        | 84                      | K202_0044 IE3D100LX04 | 67.2      | 4.364 | 48/11              | 132                                    |
| 332                                                                | 2.5        | 575                              | 2.1        | 84                      | K302_0044 IE3D100LX04 | 72.2      | 4.364 | 48/11              | 134                                    |
| 363                                                                | 1.5        | 628                              | 1.3        | 77                      | K202_0040 IE3D100LX04 | 67.2      | 4.000 | 4/1                | 132                                    |
| 363                                                                | 2.7        | 628                              | 2.2        | 77                      | K302_0040 IE3D100LX04 | 72.2      | 4.000 | 4/1                | 135                                    |
| P <sub>N</sub> (50 Hz) = 4,00 kW, P <sub>N</sub> (87 Hz) = 6,93 kW |            |                                  |            |                         |                       |           |       |                    |                                        |
| 5.9                                                                | 0.90       | –                                | –          | 6067                    | K914_2470 IE3D112M04  | 328.0     | 247.0 | 3288449/13312      | 171                                    |
| 7.6                                                                | 0.89       | 13                               | 0.80       | 4713                    | K814_1920 IE3D112M04  | 213.8     | 191.9 | 85963/448          | 171                                    |
| 7.6                                                                | 1.1        | 13                               | 0.93       | 4707                    | K914_1920 IE3D112M04  | 328.0     | 191.7 | 4710481/24576      | 172                                    |
| 8.5                                                                | 0.95       | 15                               | 0.80       | 4257                    | K814_1730 IE3D112M04  | 213.8     | 173.3 | 2773/16            | 171                                    |
| 9.3                                                                | 1.1        | 16                               | 0.93       | 3849                    | K814_1570 IE3D112M04  | 213.8     | 156.7 | 601741/3840        | 171                                    |
| 9.8                                                                | 1.2        | 17                               | 1.1        | 3659                    | K914_1490 IE3D112M04  | 328.0     | 149.0 | 9154331/61440      | 172                                    |
| 10                                                                 | 1.1        | 18                               | 0.93       | 3476                    | K814_1420 IE3D112M04  | 213.8     | 141.5 | 135877/960         | 171                                    |

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                 | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>i</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|----------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 4,00 kW, P <sub>N</sub> (87 Hz) = 6,93 kW |            |                                  |            |                         |                      |           |       |                    |                                        |
| 12                                                                 | 1.2        | 20                               | 1.1        | 3116                    | K814_1270 IE3D112M04 | 213.8     | 126.9 | 1461371/11520      | 172                                    |
| 12                                                                 | 1.2        | 20                               | 1.2        | 3089                    | K914_1260 IE3D112M04 | 328.0     | 125.8 | 2221925/17664      | 173                                    |
| 13                                                                 | 0.85       | 22                               | 0.85       | 2817                    | K714_1150 IE3D112M04 | 155.7     | 114.7 | 117453/1024        | 171                                    |
| 13                                                                 | 1.2        | 22                               | 1.1        | 2814                    | K814_1150 IE3D112M04 | 213.8     | 114.6 | 329987/2880        | 172                                    |
| 15                                                                 | 0.99       | 26                               | 0.99       | 2422                    | K714_0990 IE3D112M04 | 155.7     | 98.60 | 1009701/10240      | 171                                    |
| 15                                                                 | 1.2        | 26                               | 1.2        | 2424                    | K813_0970 IE3D112M04 | 200.7     | 97.17 | 31093/320          | 173                                    |
| 16                                                                 | 1.2        | 27                               | 1.2        | 2303                    | K914_0940 IE3D112M04 | 328.0     | 93.78 | 4177219/44544      | 174                                    |
| 16                                                                 | 1.1        | 28                               | 1.1        | 2187                    | K714_0890 IE3D112M04 | 155.7     | 89.06 | 227997/2560        | 171                                    |
| 17                                                                 | 1.2        | 29                               | 1.2        | 2190                    | K813_0880 IE3D112M04 | 200.7     | 87.76 | 7021/80            | 173                                    |
| 19                                                                 | 1.2        | 32                               | 1.2        | 1967                    | K713_0790 IE3D112M04 | 147.3     | 78.83 | 20181/256          | 172                                    |
| 18                                                                 | 1.3        | 32                               | 1.3        | 1981                    | K813_0790 IE3D112M04 | 200.7     | 79.38 | 45725/576          | 174                                    |
| 20                                                                 | 1.3        | 35                               | 1.3        | 1789                    | K813_0720 IE3D112M04 | 200.7     | 71.70 | 10325/144          | 174                                    |
| 21                                                                 | 1.2        | 36                               | 1.2        | 1777                    | K713_0710 IE3D112M04 | 147.3     | 71.20 | 4557/64            | 172                                    |
| 23                                                                 | 1.4        | 39                               | 1.4        | 1618                    | K713_0650 IE3D112M04 | 147.3     | 64.85 | 33201/512          | 172                                    |
| 23                                                                 | 0.91       | 40                               | 0.91       | 1590                    | K613_0640 IE3D112M04 | 119.0     | 63.71 | 130479/2048        | 171                                    |
| 25                                                                 | 1.4        | 43                               | 1.4        | 1461                    | K713_0590 IE3D112M04 | 147.3     | 58.57 | 7497/128           | 173                                    |
| 25                                                                 | 1.0        | 44                               | 1.0        | 1436                    | K613_0580 IE3D112M04 | 119.0     | 57.55 | 29463/512          | 171                                    |
| 29                                                                 | 1.6        | 51                               | 1.6        | 1245                    | K713_0500 IE3D112M04 | 147.3     | 49.88 | 166005/3328        | 174                                    |
| 30                                                                 | 1.8        | 52                               | 1.8        | 1222                    | K813_0490 IE3D112M04 | 200.7     | 48.99 | 5487/112           | 179                                    |
| 31                                                                 | 1.2        | 53                               | 1.2        | 1191                    | K613_0480 IE3D112M04 | 119.0     | 47.73 | 39711/832          | 172                                    |
| 33                                                                 | 1.6        | 56                               | 1.6        | 1124                    | K713_0450 IE3D112M04 | 147.3     | 45.05 | 37485/832          | 174                                    |
| 34                                                                 | 0.83       | 58                               | 0.83       | 1085                    | K513_0440 IE3D112M04 | 97.5      | 43.50 | 87/2               | 171                                    |
| 33                                                                 | 1.8        | 57                               | 1.8        | 1104                    | K813_0440 IE3D112M04 | 200.7     | 44.25 | 177/4              | 179                                    |
| 34                                                                 | 1.3        | 59                               | 1.3        | 1076                    | K613_0430 IE3D112M04 | 119.0     | 43.11 | 8967/208           | 172                                    |
| 38                                                                 | 0.94       | 66                               | 0.94       | 961                     | K513_0390 IE3D112M04 | 97.5      | 38.53 | 2697/70            | 171                                    |
| 37                                                                 | 1.8        | 65                               | 1.8        | 979                     | K713_0390 IE3D112M04 | 147.3     | 39.23 | 2511/64            | 176                                    |
| 38                                                                 | 1.5        | 66                               | 1.4        | 956                     | K613_0380 IE3D112M04 | 119.0     | 38.32 | 156953/4096        | 173                                    |
| 42                                                                 | 1.0        | 73                               | 1.0        | 868                     | K513_0350 IE3D112M04 | 97.5      | 34.80 | 174/5              | 172                                    |
| 42                                                                 | 1.7        | 73                               | 1.5        | 864                     | K613_0350 IE3D112M04 | 119.0     | 34.61 | 35441/1024         | 173                                    |
| 41                                                                 | 1.8        | 72                               | 1.8        | 884                     | K713_0350 IE3D112M04 | 147.3     | 35.44 | 567/16             | 176                                    |
| 45                                                                 | 1.1        | 79                               | 1.1        | 806                     | K513_0320 IE3D112M04 | 97.5      | 32.31 | 20677/640          | 172                                    |
| 46                                                                 | 1.8        | 80                               | 1.6        | 795                     | K613_0320 IE3D112M04 | 119.0     | 31.86 | 130479/4096        | 174                                    |
| 50                                                                 | 1.2        | 87                               | 1.2        | 728                     | K513_0290 IE3D112M04 | 97.5      | 29.18 | 4669/160           | 172                                    |
| 51                                                                 | 2.0        | 88                               | 1.7        | 718                     | K613_0290 IE3D112M04 | 119.0     | 28.77 | 29463/1024         | 174                                    |
| 60                                                                 | 1.5        | 104                              | 1.4        | 608                     | K513_0240 IE3D112M04 | 97.5      | 24.35 | 11687/480          | 173                                    |
| 63                                                                 | 0.93       | –                                | –          | 590                     | K402_0230 IE3D112M04 | 91.7      | 23.29 | 559/24             | 171                                    |
| 67                                                                 | 1.6        | 115                              | 1.5        | 549                     | K513_0220 IE3D112M04 | 97.5      | 21.99 | 2639/120           | 173                                    |
| 73                                                                 | 1.0        | 126                              | 0.86       | 511                     | K402_0200 IE3D112M04 | 91.7      | 20.20 | 1333/66            | 171                                    |
| 76                                                                 | 1.9        | 131                              | 1.7        | 483                     | K513_0195 IE3D112M04 | 97.5      | 19.35 | 27869/1440         | 174                                    |
| 77                                                                 | 2.3        | 134                              | 2.2        | 474                     | K613_0190 IE3D112M04 | 119.0     | 18.99 | 17019/896          | 178                                    |
| 84                                                                 | 1.1        | 146                              | 0.95       | 441                     | K402_0175 IE3D112M04 | 91.7      | 17.41 | 731/42             | 171                                    |
| 84                                                                 | 2.1        | 145                              | 1.8        | 436                     | K513_0175 IE3D112M04 | 97.5      | 17.48 | 6293/360           | 174                                    |
| 86                                                                 | 1.2        | 150                              | 0.97       | 429                     | K402_0170 IE3D112M04 | 91.7      | 16.94 | 559/33             | 171                                    |
| 85                                                                 | 2.3        | 148                              | 2.3        | 428                     | K613_0170 IE3D112M04 | 119.0     | 17.16 | 549/32             | 178                                    |
| 91                                                                 | 2.2        | –                                | –          | 402                     | K513_0160 IE3D112M04 | 97.5      | 16.09 | 26071/1620         | 175                                    |
| 101                                                                | 2.3        | –                                | –          | 363                     | K513_0145 IE3D112M04 | 97.5      | 14.54 | 5887/405           | 176                                    |
| 105                                                                | 0.88       | –                                | –          | 353                     | K302_0140 IE3D112M04 | 78.2      | 13.94 | 1505/108           | 171                                    |
| 106                                                                | 1.3        | 183                              | 1.1        | 352                     | K402_0140 IE3D112M04 | 91.7      | 13.89 | 1333/96            | 172                                    |
| 116                                                                | 0.94       | –                                | –          | 318                     | K302_0125 IE3D112M04 | 78.2      | 12.58 | 3182/253           | 171                                    |
| 116                                                                | 1.4        | 200                              | 1.2        | 320                     | K402_0125 IE3D112M04 | 91.7      | 12.66 | 2924/231           | 172                                    |
| 126                                                                | 0.99       | 219                              | 0.83       | 294                     | K302_0115 IE3D112M04 | 78.2      | 11.61 | 1161/100           | 171                                    |
| 127                                                                | 1.5        | 220                              | 1.3        | 292                     | K402_0115 IE3D112M04 | 91.7      | 11.52 | 645/56             | 173                                    |
| 145                                                                | 1.1        | 250                              | 0.91       | 257                     | K302_0100 IE3D112M04 | 78.2      | 10.14 | 3010/297           | 171                                    |
| 145                                                                | 1.6        | 251                              | 1.4        | 256                     | K402_0100 IE3D112M04 | 91.7      | 10.10 | 1333/132           | 172                                    |
| 158                                                                | 1.1        | 274                              | 0.96       | 235                     | K302_0093 IE3D112M04 | 78.2      | 9.267 | 1075/116           | 172                                    |
| 159                                                                | 1.7        | 275                              | 1.5        | 234                     | K402_0092 IE3D112M04 | 91.7      | 9.238 | 2365/256           | 174                                    |
| 173                                                                | 1.2        | 301                              | 1.0        | 214                     | K302_0084 IE3D112M04 | 78.2      | 8.444 | 2322/275           | 172                                    |
| 175                                                                | 1.8        | 303                              | 1.5        | 212                     | K402_0084 IE3D112M04 | 91.7      | 8.377 | 645/77             | 173                                    |
| 198                                                                | 1.3        | 343                              | 1.1        | 187                     | K302_0074 IE3D112M04 | 78.2      | 7.391 | 473/64             | 173                                    |
| 219                                                                | 0.82       | –                                | –          | 169                     | K202_0067 IE3D112M04 | 73.2      | 6.683 | 2279/341           | 171                                    |
| 217                                                                | 1.4        | 376                              | 1.2        | 171                     | K302_0067 IE3D112M04 | 78.2      | 6.740 | 2150/319           | 172                                    |
| 218                                                                | 2.1        | 378                              | 1.8        | 170                     | K402_0067 IE3D112M04 | 91.7      | 6.719 | 215/32             | 174                                    |
| 244                                                                | 0.88       | –                                | –          | 152                     | K202_0060 IE3D112M04 | 73.2      | 6.000 | 6/1                | 172                                    |
| 244                                                                | 1.5        | 423                              | 1.3        | 152                     | K302_0060 IE3D112M04 | 78.2      | 6.000 | 6/1                | 173                                    |
| 273                                                                | 1.7        | 472                              | 1.4        | 136                     | K302_0054 IE3D112M04 | 78.2      | 5.375 | 43/8               | 173                                    |

#### 4.2 Selection tables 4 K helical bevel geared motors

| n <sub>2</sub><br>50 Hz<br>[rpm]                                   | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                   | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>1</sub><br>[kgcm <sup>2</sup> ] |
|--------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|------------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 4,00 kW, P <sub>N</sub> (87 Hz) = 6,93 kW |            |                                  |            |                         |                        |           |       |                    |                                        |
| 283                                                                | 0.97       | 490                              | 0.81       | 131                     | K202_0052 IE3D112M04   | 73.2      | 5.177 | 2107/407           | 172                                    |
| 336                                                                | 1.1        | 581                              | 0.91       | 110                     | K202_0044 IE3D112M04   | 73.2      | 4.364 | 48/11              | 172                                    |
| 336                                                                | 1.9        | 581                              | 1.6        | 110                     | K302_0044 IE3D112M04   | 78.2      | 4.364 | 48/11              | 174                                    |
| 366                                                                | 1.1        | 634                              | 0.96       | 101                     | K202_0040 IE3D112M04   | 73.2      | 4.000 | 4/1                | 172                                    |
| 366                                                                | 2.0        | 634                              | 1.7        | 101                     | K302_0040 IE3D112M04   | 78.2      | 4.000 | 4/1                | 175                                    |
| P <sub>N</sub> (50 Hz) = 5,50 kW, P <sub>N</sub> (87 Hz) = 9,93 kW |            |                                  |            |                         |                        |           |       |                    |                                        |
| 5.0                                                                | 1.1        | –                                | –          | 9836                    | K1014_2900 IE3D132SX04 | 571.0     | 290.4 | 392553/1352        | 353                                    |
| 6.0                                                                | 0.85       | 10                               | 0.85       | 8241                    | K914_2430 IE3D132SX04  | 362.0     | 243.3 | 5667327/23296      | 353                                    |
| 6.2                                                                | 1.3        | –                                | –          | 8043                    | K1014_2370 IE3D132SX04 | 571.0     | 237.4 | 49383/208          | 354                                    |
| 7.8                                                                | 1.1        | 13                               | 1.1        | 6394                    | K914_1890 IE3D132SX04  | 362.0     | 188.8 | 2706021/14336      | 353                                    |
| 9.5                                                                | 0.80       | 16                               | 0.80       | 5228                    | K814_1540 IE3D132SX04  | 247.8     | 154.3 | 49383/320          | 352                                    |
| 9.8                                                                | 1.9        | –                                | –          | 5044                    | K1014_1490 IE3D132SX04 | 571.0     | 148.9 | 30969/208          | 356                                    |
| 10                                                                 | 1.4        | 17                               | 1.4        | 4971                    | K914_1470 IE3D132SX04  | 362.0     | 146.7 | 5258871/35840      | 354                                    |
| 11                                                                 | 0.89       | 18                               | 0.89       | 4722                    | K814_1390 IE3D132SX04  | 247.8     | 139.4 | 11151/80           | 352                                    |
| 12                                                                 | 0.99       | 20                               | 0.99       | 4232                    | K814_1250 IE3D132SX04  | 247.8     | 124.9 | 279837/2240        | 353                                    |
| 12                                                                 | 1.7        | 20                               | 1.6        | 4196                    | K914_1240 IE3D132SX04  | 362.0     | 123.9 | 1276425/10304      | 354                                    |
| 13                                                                 | 1.1        | 22                               | 1.1        | 3823                    | K814_1130 IE3D132SX04  | 247.8     | 112.8 | 9027/80            | 353                                    |
| 15                                                                 | 1.3        | 26                               | 1.3        | 3334                    | K814_0980 IE3D132SX04  | 247.8     | 98.41 | 181071/1840        | 353                                    |
| 15                                                                 | 1.6        | 27                               | 1.6        | 3284                    | K913_0950 IE3D132SX04  | 349.5     | 95.41 | 293105/3072        | 356                                    |
| 16                                                                 | 2.2        | 27                               | 1.9        | 3129                    | K914_0920 IE3D132SX04  | 362.0     | 92.35 | 2399679/25984      | 356                                    |
| 16                                                                 | 1.4        | 29                               | 1.4        | 3011                    | K814_0890 IE3D132SX04  | 247.8     | 88.89 | 40887/460          | 353                                    |
| 18                                                                 | 1.5        | 32                               | 1.5        | 2732                    | K813_0790 IE3D132SX04  | 234.7     | 79.38 | 45725/576          | 354                                    |
| 20                                                                 | 2.6        | 34                               | 2.6        | 2581                    | K913_0750 IE3D132SX04  | 349.5     | 75.00 | 62403/832          | 360                                    |
| 20                                                                 | 1.7        | 34                               | 1.7        | 2507                    | K814_0740 IE3D132SX04  | 247.8     | 73.99 | 1201653/16240      | 354                                    |
| 20                                                                 | 1.5        | 35                               | 1.5        | 2468                    | K813_0720 IE3D132SX04  | 234.7     | 71.70 | 10325/144          | 354                                    |
| 22                                                                 | 1.9        | 38                               | 1.9        | 2264                    | K814_0670 IE3D132SX04  | 247.8     | 66.83 | 38763/580          | 354                                    |
| 23                                                                 | 1.1        | 39                               | 1.1        | 2232                    | K713_0650 IE3D132SX04  | 181.3     | 64.85 | 33201/512          | 352                                    |
| 22                                                                 | 1.9        | 39                               | 1.9        | 2251                    | K813_0650 IE3D132SX04  | 234.7     | 65.41 | 188387/2880        | 355                                    |
| 23                                                                 | 2.6        | 40                               | 2.6        | 2171                    | K913_0630 IE3D132SX04  | 349.5     | 63.07 | 209901/3328        | 363                                    |
| 25                                                                 | 1.2        | 43                               | 1.2        | 2016                    | K713_0590 IE3D132SX04  | 181.3     | 58.57 | 7497/128           | 353                                    |
| 25                                                                 | 2.1        | 43                               | 2.1        | 2033                    | K813_0590 IE3D132SX04  | 234.7     | 59.08 | 42539/720          | 356                                    |
| 29                                                                 | 1.4        | 51                               | 1.4        | 1717                    | K713_0500 IE3D132SX04  | 181.3     | 49.88 | 166005/3328        | 354                                    |
| 30                                                                 | 2.5        | 52                               | 2.4        | 1686                    | K813_0490 IE3D132SX04  | 234.7     | 48.99 | 5487/112           | 359                                    |
| 33                                                                 | 1.5        | 56                               | 1.5        | 1551                    | K713_0450 IE3D132SX04  | 181.3     | 45.05 | 37485/832          | 354                                    |
| 33                                                                 | 2.8        | 57                               | 2.6        | 1523                    | K813_0440 IE3D132SX04  | 234.7     | 44.25 | 177/4              | 359                                    |
| 37                                                                 | 3.1        | 63                               | 2.8        | 1377                    | K813_0400 IE3D132SX04  | 234.7     | 40.01 | 12803/320          | 362                                    |
| 37                                                                 | 1.8        | 65                               | 1.6        | 1350                    | K713_0390 IE3D132SX04  | 181.3     | 39.23 | 2511/64            | 356                                    |
| 38                                                                 | 1.1        | 66                               | 1.0        | 1319                    | K613_0380 IE3D132SX04  | 153.0     | 38.32 | 156953/4096        | 353                                    |
| 39                                                                 | 3.5        | 67                               | 3.5        | 1309                    | K913_0380 IE3D132SX04  | 349.5     | 38.04 | 194773/5120        | 380                                    |
| 41                                                                 | 3.1        | 70                               | 3.0        | 1244                    | K813_0360 IE3D132SX04  | 234.7     | 36.14 | 2891/80            | 363                                    |
| 42                                                                 | 1.2        | 73                               | 1.1        | 1191                    | K613_0350 IE3D132SX04  | 153.0     | 34.61 | 35441/1024         | 353                                    |
| 41                                                                 | 2.0        | 72                               | 1.7        | 1220                    | K713_0350 IE3D132SX04  | 181.3     | 35.44 | 567/16             | 356                                    |
| 45                                                                 | 0.81       | 79                               | 0.81       | 1112                    | K513_0320 IE3D132SX04  | 131.5     | 32.31 | 20677/640          | 352                                    |
| 46                                                                 | 1.3        | 80                               | 1.1        | 1096                    | K613_0320 IE3D132SX04  | 153.0     | 31.86 | 130479/4096        | 354                                    |
| 45                                                                 | 2.2        | 78                               | 1.9        | 1116                    | K713_0320 IE3D132SX04  | 181.3     | 32.42 | 33201/1024         | 358                                    |
| 50                                                                 | 0.90       | 87                               | 0.90       | 1004                    | K513_0290 IE3D132SX04  | 131.5     | 29.18 | 4669/160           | 352                                    |
| 51                                                                 | 1.5        | 88                               | 1.2        | 990                     | K613_0290 IE3D132SX04  | 153.0     | 28.77 | 29463/1024         | 354                                    |
| 50                                                                 | 2.4        | 87                               | 2.0        | 1008                    | K713_0290 IE3D132SX04  | 181.3     | 29.29 | 7497/256           | 358                                    |
| 57                                                                 | 4.0        | –                                | –          | 878                     | K813_0260 IE3D132SX04  | 234.7     | 25.51 | 140833/5520        | 375                                    |
| 58                                                                 | 2.6        | –                                | –          | 866                     | K713_0250 IE3D132SX04  | 181.3     | 25.18 | 64449/2560         | 362                                    |
| 60                                                                 | 1.1        | 104                              | 1.0        | 838                     | K513_0240 IE3D132SX04  | 131.5     | 24.35 | 11687/480          | 353                                    |
| 61                                                                 | 1.6        | 106                              | 1.4        | 826                     | K613_0240 IE3D132SX04  | 153.0     | 24.01 | 24583/1024         | 356                                    |
| 61                                                                 | 4.4        | –                                | –          | 824                     | K913_0240 IE3D132SX04  | 349.5     | 23.94 | 88877/3712         | 411                                    |
| 64                                                                 | 2.8        | –                                | –          | 783                     | K713_0230 IE3D132SX04  | 181.3     | 22.74 | 14553/640          | 362                                    |
| 67                                                                 | 1.2        | 115                              | 1.1        | 757                     | K513_0220 IE3D132SX04  | 131.5     | 21.99 | 2639/120           | 353                                    |
| 68                                                                 | 1.8        | 117                              | 1.5        | 746                     | K613_0220 IE3D132SX04  | 153.0     | 21.68 | 5551/256           | 356                                    |
| 72                                                                 | 3.0        | –                                | –          | 696                     | K713_0200 IE3D132SX04  | 181.3     | 20.23 | 119133/5888        | 366                                    |
| 76                                                                 | 1.4        | 131                              | 1.2        | 666                     | K513_0195 IE3D132SX04  | 131.5     | 19.35 | 27869/1440         | 354                                    |
| 77                                                                 | 1.9        | 134                              | 1.6        | 654                     | K613_0190 IE3D132SX04  | 153.0     | 18.99 | 17019/896          | 358                                    |
| 76                                                                 | 4.4        | –                                | –          | 660                     | K813_0190 IE3D132SX04  | 234.7     | 19.18 | 133517/6960        | 388                                    |
| 80                                                                 | 3.2        | –                                | –          | 629                     | K713_0185 IE3D132SX04  | 181.3     | 18.28 | 26901/1472         | 367                                    |
| 84                                                                 | 0.82       | –                                | –          | 608                     | K402_0175 IE3D132SX04  | 125.7     | 17.41 | 731/42             | 351                                    |
| 84                                                                 | 1.5        | 145                              | 1.3        | 602                     | K513_0175 IE3D132SX04  | 131.5     | 17.48 | 6293/360           | 354                                    |
| 85                                                                 | 4.4        | –                                | –          | 596                     | K813_0175 IE3D132SX04  | 234.7     | 17.33 | 30149/1740         | 390                                    |
| 86                                                                 | 0.84       | –                                | –          | 592                     | K402_0170 IE3D132SX04  | 125.7     | 16.94 | 559/33             | 351                                    |



| $n_2$<br>50 Hz<br>[rpm]                           | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                   | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|---------------------------------------------------|------------|-------------------------|------------|------------------|------------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 5,50 kW, $P_N$ (87 Hz) = 9,53 kW  |            |                         |            |                  |                        |           |       |                    |                               |
| 85                                                | 2.1        | 148                     | 1.7        | 590              | K613_0170 IE3D132SX04  | 153.0     | 17.16 | 549/32             | 358                           |
| 89                                                | 3.5        | –                       | –          | 564              | K713_0165 IE3D132SX04  | 181.3     | 16.39 | 6293/384           | 371                           |
| 91                                                | 1.6        | –                       | –          | 554              | K513_0160 IE3D132SX04  | 131.5     | 16.09 | 26071/1620         | 355                           |
| 92                                                | 2.2        | –                       | –          | 546              | K613_0160 IE3D132SX04  | 153.0     | 15.87 | 54839/3456         | 360                           |
| 99                                                | 3.7        | –                       | –          | 509              | K713_0150 IE3D132SX04  | 181.3     | 14.80 | 1421/96            | 372                           |
| 101                                               | 1.7        | –                       | –          | 500              | K513_0145 IE3D132SX04  | 131.5     | 14.54 | 5887/405           | 356                           |
| 102                                               | 2.3        | –                       | –          | 493              | K613_0145 IE3D132SX04  | 153.0     | 14.33 | 12383/864          | 361                           |
| 106                                               | 0.96       | 183                     | 0.80       | 485              | K402_0140 IE3D132SX04  | 125.7     | 13.89 | 1333/96            | 352                           |
| 114                                               | 1.9        | –                       | –          | 441              | K513_0130 IE3D132SX04  | 131.5     | 12.81 | 1537/120           | 357                           |
| 112                                               | 4.1        | –                       | –          | 449              | K713_0130 IE3D132SX04  | 181.3     | 13.04 | 3339/256           | 379                           |
| 116                                               | 1.0        | 200                     | 0.85       | 442              | K402_0125 IE3D132SX04  | 125.7     | 12.66 | 2924/231           | 352                           |
| 116                                               | 2.5        | –                       | –          | 435              | K613_0125 IE3D132SX04  | 153.0     | 12.63 | 3233/256           | 364                           |
| 124                                               | 4.3        | –                       | –          | 405              | K713_0120 IE3D132SX04  | 181.3     | 11.78 | 23373/1984         | 381                           |
| 127                                               | 1.1        | 220                     | 0.91       | 402              | K402_0115 IE3D132SX04  | 125.7     | 11.52 | 645/56             | 353                           |
| 127                                               | 2.0        | –                       | –          | 398              | K513_0115 IE3D132SX04  | 131.5     | 11.57 | 10759/930          | 358                           |
| 145                                               | 1.2        | 251                     | 0.99       | 353              | K402_0100 IE3D132SX04  | 125.7     | 10.10 | 1333/132           | 352                           |
| 144                                               | 2.2        | –                       | –          | 349              | K513_0100 IE3D132SX04  | 131.5     | 10.15 | 203/20             | 360                           |
| 159                                               | 1.3        | 275                     | 1.1        | 323              | K402_0092 IE3D132SX04  | 125.7     | 9.238 | 2365/256           | 354                           |
| 160                                               | 2.4        | –                       | –          | 316              | K513_0092 IE3D132SX04  | 131.5     | 9.168 | 1421/155           | 361                           |
| 175                                               | 1.3        | 303                     | 1.1        | 293              | K402_0084 IE3D132SX04  | 125.7     | 8.377 | 645/77             | 353                           |
| 180                                               | 2.6        | –                       | –          | 280              | K513_0081 IE3D132SX04  | 131.5     | 8.134 | 17081/2100         | 364                           |
| 196                                               | 1.4        | 340                     | 1.2        | 260              | K402_0075 IE3D132SX04  | 125.7     | 7.456 | 1849/248           | 355                           |
| 199                                               | 2.7        | –                       | –          | 253              | K513_0073 IE3D132SX04  | 131.5     | 7.347 | 551/75             | 366                           |
| 218                                               | 1.5        | 378                     | 1.3        | 235              | K402_0067 IE3D132SX04  | 125.7     | 6.719 | 215/32             | 354                           |
| 244                                               | 1.7        | 423                     | 1.4        | 210              | K402_0060 IE3D132SX04  | 125.7     | 6.000 | 6/1                | 357                           |
| 270                                               | 1.8        | 468                     | 1.5        | 189              | K402_0054 IE3D132SX04  | 125.7     | 5.422 | 1849/341           | 356                           |
| 336                                               | 2.1        | 581                     | 1.7        | 152              | K402_0044 IE3D132SX04  | 125.7     | 4.364 | 48/11              | 358                           |
| 366                                               | 2.2        | 634                     | 1.8        | 140              | K402_0040 IE3D132SX04  | 125.7     | 4.000 | 4/1                | 360                           |
| $P_N$ (50 Hz) = 7,50 kW, $P_N$ (87 Hz) = 12,99 kW |            |                         |            |                  |                        |           |       |                    |                               |
| 5.1                                               | 0.80       | –                       | –          | 13388            | K1014_2900 IE3D132MX04 | 569.0     | 290.4 | 392553/1352        | 353                           |
| 6.2                                               | 0.95       | –                       | –          | 10947            | K1014_2370 IE3D132MX04 | 569.0     | 237.4 | 49383/208          | 354                           |
| 7.8                                               | 0.80       | 13                      | 0.80       | 8703             | K914_1890 IE3D132MX04  | 360.0     | 188.8 | 2706021/14336      | 353                           |
| 9.9                                               | 1.4        | –                       | –          | 6865             | K1014_1490 IE3D132MX04 | 569.0     | 148.9 | 30969/208          | 356                           |
| 10                                                | 1.0        | 17                      | 1.0        | 6766             | K914_1470 IE3D132MX04  | 360.0     | 146.7 | 5258871/35840      | 354                           |
| 12                                                | 1.2        | 21                      | 1.1        | 5712             | K914_1240 IE3D132MX04  | 360.0     | 123.9 | 1276425/10304      | 354                           |
| 13                                                | 0.81       | 23                      | 0.81       | 5203             | K814_1130 IE3D132MX04  | 245.8     | 112.8 | 9027/80            | 353                           |
| 15                                                | 0.93       | 26                      | 0.93       | 4537             | K814_0980 IE3D132MX04  | 245.8     | 98.41 | 181071/1840        | 353                           |
| 15                                                | 1.2        | 27                      | 1.2        | 4469             | K913_0950 IE3D132MX04  | 347.5     | 95.41 | 293105/3072        | 356                           |
| 16                                                | 1.6        | 28                      | 1.4        | 4258             | K914_0920 IE3D132MX04  | 360.0     | 92.35 | 2399679/25984      | 356                           |
| 17                                                | 1.0        | 29                      | 1.0        | 4098             | K814_0890 IE3D132MX04  | 245.8     | 88.89 | 40887/460          | 353                           |
| 19                                                | 1.1        | 32                      | 1.1        | 3719             | K813_0790 IE3D132MX04  | 232.7     | 79.38 | 45725/576          | 354                           |
| 20                                                | 1.9        | 34                      | 1.9        | 3513             | K913_0750 IE3D132MX04  | 347.5     | 75.00 | 62403/832          | 360                           |
| 20                                                | 1.2        | 34                      | 1.2        | 3412             | K814_0740 IE3D132MX04  | 245.8     | 73.99 | 1201653/16240      | 354                           |
| 21                                                | 1.1        | 36                      | 1.1        | 3359             | K813_0720 IE3D132MX04  | 232.7     | 71.70 | 10325/144          | 354                           |
| 22                                                | 1.4        | 38                      | 1.4        | 3082             | K814_0670 IE3D132MX04  | 245.8     | 66.83 | 38763/580          | 354                           |
| 22                                                | 1.4        | 39                      | 1.4        | 3064             | K813_0650 IE3D132MX04  | 232.7     | 65.41 | 188387/2880        | 355                           |
| 23                                                | 1.9        | 40                      | 1.9        | 2954             | K913_0630 IE3D132MX04  | 347.5     | 63.07 | 209901/3328        | 363                           |
| 25                                                | 0.88       | 43                      | 0.88       | 2744             | K713_0590 IE3D132MX04  | 179.3     | 58.57 | 7497/128           | 353                           |
| 25                                                | 1.5        | 43                      | 1.5        | 2768             | K813_0590 IE3D132MX04  | 232.7     | 59.08 | 42539/720          | 356                           |
| 29                                                | 1.0        | 51                      | 1.0        | 2337             | K713_0500 IE3D132MX04  | 179.3     | 49.88 | 166005/3328        | 354                           |
| 30                                                | 1.8        | 52                      | 1.8        | 2295             | K813_0490 IE3D132MX04  | 232.7     | 48.99 | 5487/112           | 359                           |
| 30                                                | 2.2        | 52                      | 2.2        | 2292             | K913_0490 IE3D132MX04  | 347.5     | 48.94 | 100223/2048        | 370                           |
| 33                                                | 1.1        | 57                      | 1.1        | 2111             | K713_0450 IE3D132MX04  | 179.3     | 45.05 | 37485/832          | 354                           |
| 33                                                | 2.0        | 58                      | 1.9        | 2073             | K813_0440 IE3D132MX04  | 232.7     | 44.25 | 177/4              | 359                           |
| 37                                                | 2.2        | 64                      | 2.0        | 1874             | K813_0400 IE3D132MX04  | 232.7     | 40.01 | 12803/320          | 362                           |
| 37                                                | 1.3        | 65                      | 1.2        | 1838             | K713_0390 IE3D132MX04  | 179.3     | 39.23 | 2511/64            | 356                           |
| 38                                                | 0.81       | –                       | –          | 1795             | K613_0380 IE3D132MX04  | 151.0     | 38.32 | 156953/4096        | 353                           |
| 39                                                | 2.6        | 67                      | 2.6        | 1782             | K913_0380 IE3D132MX04  | 347.5     | 38.04 | 194773/5120        | 380                           |
| 41                                                | 2.3        | 70                      | 2.2        | 1693             | K813_0360 IE3D132MX04  | 232.7     | 36.14 | 2891/80            | 363                           |
| 42                                                | 0.89       | –                       | –          | 1621             | K613_0350 IE3D132MX04  | 151.0     | 34.61 | 35441/1024         | 353                           |
| 41                                                | 1.4        | 72                      | 1.3        | 1660             | K713_0350 IE3D132MX04  | 179.3     | 35.44 | 567/16             | 356                           |
| 46                                                | 0.97       | 80                      | 0.84       | 1492             | K613_0320 IE3D132MX04  | 151.0     | 31.86 | 130479/4096        | 354                           |
| 45                                                | 1.6        | 79                      | 1.4        | 1519             | K713_0320 IE3D132MX04  | 179.3     | 32.42 | 33201/1024         | 358                           |
| 45                                                | 2.7        | 79                      | 2.4        | 1517             | K813_0320 IE3D132MX04  | 232.7     | 32.39 | 31093/960          | 367                           |
| 51                                                | 1.1        | 88                      | 0.90       | 1348             | K613_0290 IE3D132MX04  | 151.0     | 28.77 | 29463/1024         | 354                           |

#### 4.2 Selection tables 4 K helical bevel geared motors

| $n_2$<br>50 Hz<br>[rpm]                                                         | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                   | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|---------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|------------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 7,50 kW, <math>P_N</math> (87 Hz) = 12,99 kW</b>  |            |                         |            |                  |                        |           |       |                    |                               |
| 50                                                                              | 1.7        | 87                      | 1.5        | 1372             | K713_0290 IE3D132MX04  | 179.3     | 29.29 | 7497/256           | 358                           |
| 50                                                                              | 2.7        | 87                      | 2.5        | 1370             | K813_0290 IE3D132MX04  | 232.7     | 29.25 | 7021/240           | 368                           |
| 58                                                                              | 2.9        | –                       | –          | 1195             | K813_0260 IE3D132MX04  | 232.7     | 25.51 | 140833/5520        | 375                           |
| 58                                                                              | 1.9        | –                       | –          | 1179             | K713_0250 IE3D132MX04  | 179.3     | 25.18 | 64449/2560         | 362                           |
| 61                                                                              | 1.2        | 106                     | 1.0        | 1125             | K613_0240 IE3D132MX04  | 151.0     | 24.01 | 24583/1024         | 356                           |
| 61                                                                              | 3.2        | –                       | –          | 1122             | K913_0240 IE3D132MX04  | 347.5     | 23.94 | 88877/3712         | 411                           |
| 65                                                                              | 2.1        | –                       | –          | 1065             | K713_0230 IE3D132MX04  | 179.3     | 22.74 | 14553/640          | 362                           |
| 67                                                                              | 0.87       | 116                     | 0.81       | 1030             | K513_0220 IE3D132MX04  | 129.5     | 21.99 | 2639/120           | 353                           |
| 68                                                                              | 1.3        | 117                     | 1.1        | 1016             | K613_0220 IE3D132MX04  | 151.0     | 21.68 | 5551/256           | 356                           |
| 73                                                                              | 2.2        | –                       | –          | 948              | K713_0200 IE3D132MX04  | 179.3     | 20.23 | 119133/5888        | 366                           |
| 76                                                                              | 0.99       | 132                     | 0.89       | 907              | K513_0195 IE3D132MX04  | 129.5     | 19.35 | 27869/1440         | 354                           |
| 77                                                                              | 1.4        | 134                     | 1.2        | 890              | K613_0190 IE3D132MX04  | 151.0     | 18.99 | 17019/896          | 358                           |
| 77                                                                              | 3.3        | –                       | –          | 899              | K813_0190 IE3D132MX04  | 232.7     | 19.18 | 133517/6960        | 388                           |
| 80                                                                              | 2.4        | –                       | –          | 856              | K713_0185 IE3D132MX04  | 179.3     | 18.28 | 26901/1472         | 367                           |
| 84                                                                              | 1.1        | 146                     | 0.95       | 819              | K513_0175 IE3D132MX04  | 129.5     | 17.48 | 6293/360           | 354                           |
| 85                                                                              | 3.3        | –                       | –          | 812              | K813_0175 IE3D132MX04  | 232.7     | 17.33 | 30149/1740         | 390                           |
| 86                                                                              | 1.5        | 148                     | 1.3        | 804              | K613_0170 IE3D132MX04  | 151.0     | 17.16 | 549/32             | 358                           |
| 90                                                                              | 2.6        | –                       | –          | 768              | K713_0165 IE3D132MX04  | 179.3     | 16.39 | 6293/384           | 371                           |
| 91                                                                              | 1.2        | –                       | –          | 754              | K513_0160 IE3D132MX04  | 129.5     | 16.09 | 26071/1620         | 355                           |
| 93                                                                              | 1.6        | –                       | –          | 743              | K613_0160 IE3D132MX04  | 151.0     | 15.87 | 54839/3456         | 360                           |
| 99                                                                              | 2.7        | –                       | –          | 693              | K713_0150 IE3D132MX04  | 179.3     | 14.80 | 1421/96            | 372                           |
| 101                                                                             | 1.3        | –                       | –          | 681              | K513_0145 IE3D132MX04  | 129.5     | 14.54 | 5887/405           | 356                           |
| 103                                                                             | 1.7        | –                       | –          | 671              | K613_0145 IE3D132MX04  | 151.0     | 14.33 | 12383/864          | 361                           |
| 115                                                                             | 1.4        | –                       | –          | 600              | K513_0130 IE3D132MX04  | 129.5     | 12.81 | 1537/120           | 357                           |
| 113                                                                             | 3.0        | –                       | –          | 611              | K713_0130 IE3D132MX04  | 179.3     | 13.04 | 3339/256           | 379                           |
| 116                                                                             | 1.9        | –                       | –          | 592              | K613_0125 IE3D132MX04  | 151.0     | 12.63 | 3233/256           | 364                           |
| 125                                                                             | 3.2        | –                       | –          | 552              | K713_0120 IE3D132MX04  | 179.3     | 11.78 | 23373/1984         | 381                           |
| 127                                                                             | 1.5        | –                       | –          | 542              | K513_0115 IE3D132MX04  | 129.5     | 11.57 | 10759/930          | 358                           |
| 129                                                                             | 2.0        | –                       | –          | 534              | K613_0115 IE3D132MX04  | 151.0     | 11.41 | 22631/1984         | 365                           |
| 146                                                                             | 0.87       | –                       | –          | 480              | K402_0100 IE3D132MX04  | 123.7     | 10.10 | 1333/132           | 352                           |
| 145                                                                             | 1.6        | –                       | –          | 475              | K513_0100 IE3D132MX04  | 129.5     | 10.15 | 203/20             | 360                           |
| 159                                                                             | 0.92       | –                       | –          | 439              | K402_0092 IE3D132MX04  | 123.7     | 9.238 | 2365/256           | 354                           |
| 160                                                                             | 1.7        | –                       | –          | 429              | K513_0092 IE3D132MX04  | 129.5     | 9.168 | 1421/155           | 361                           |
| 175                                                                             | 0.98       | 304                     | 0.82       | 398              | K402_0084 IE3D132MX04  | 123.7     | 8.377 | 645/77             | 353                           |
| 181                                                                             | 1.9        | –                       | –          | 381              | K513_0081 IE3D132MX04  | 129.5     | 8.134 | 17081/2100         | 364                           |
| 181                                                                             | 2.5        | –                       | –          | 380              | K613_0081 IE3D132MX04  | 151.0     | 8.107 | 85095/10496        | 377                           |
| 197                                                                             | 1.1        | 341                     | 0.89       | 354              | K402_0075 IE3D132MX04  | 123.7     | 7.456 | 1849/248           | 355                           |
| 200                                                                             | 2.0        | –                       | –          | 344              | K513_0073 IE3D132MX04  | 129.5     | 7.347 | 551/75             | 366                           |
| 219                                                                             | 1.1        | 379                     | 0.95       | 319              | K402_0067 IE3D132MX04  | 123.7     | 6.719 | 215/32             | 354                           |
| 245                                                                             | 1.2        | 424                     | 1.0        | 285              | K402_0060 IE3D132MX04  | 123.7     | 6.000 | 6/1                | 357                           |
| 271                                                                             | 1.3        | 470                     | 1.1        | 258              | K402_0054 IE3D132MX04  | 123.7     | 5.422 | 1849/341           | 356                           |
| 337                                                                             | 1.5        | 583                     | 1.3        | 207              | K402_0044 IE3D132MX04  | 123.7     | 4.364 | 48/11              | 358                           |
| 368                                                                             | 1.6        | 637                     | 1.3        | 190              | K402_0040 IE3D132MX04  | 123.7     | 4.000 | 4/1                | 360                           |
| <b><math>P_N</math> (50 Hz) = 11,00 kW, <math>P_N</math> (87 Hz) = 19,05 kW</b> |            |                         |            |                  |                        |           |       |                    |                               |
| 7.7                                                                             | 0.93       | –                       | –          | 12902            | K1014_1900 IE3D160MX04 | 586.0     | 190.4 | 514941/2704        | 436                           |
| 9.7                                                                             | 1.2        | –                       | –          | 10260            | K1014_1510 IE3D160MX04 | 586.0     | 151.4 | 409479/2704        | 437                           |
| 12                                                                              | 1.4        | –                       | –          | 8382             | K1014_1240 IE3D160MX04 | 586.0     | 123.7 | 735955/59488       | 439                           |
| 15                                                                              | 0.82       | 27                      | 0.82       | 6567             | K913_0950 IE3D160MX04  | 364.5     | 95.41 | 293105/3072        | 436                           |
| 16                                                                              | 1.1        | –                       | –          | 6493             | K1013_0940 IE3D160MX04 | 557.1     | 94.33 | 235445/2496        | 444                           |
| 16                                                                              | 1.7        | –                       | –          | 6324             | K1014_0930 IE3D160MX04 | 586.0     | 93.34 | 252399/2704        | 442                           |
| 20                                                                              | 1.3        | 34                      | 1.3        | 5163             | K913_0750 IE3D160MX04  | 364.5     | 75.00 | 62403/832          | 440                           |
| 22                                                                              | 0.93       | 39                      | 0.93       | 4502             | K813_0650 IE3D160MX04  | 249.7     | 65.41 | 188387/2880        | 435                           |
| 23                                                                              | 1.3        | 40                      | 1.3        | 4341             | K913_0630 IE3D160MX04  | 364.5     | 63.07 | 209901/3328        | 443                           |
| 25                                                                              | 1.0        | 43                      | 1.0        | 4067             | K813_0590 IE3D160MX04  | 249.7     | 59.08 | 42539/720          | 436                           |
| 30                                                                              | 1.2        | 52                      | 1.2        | 3372             | K813_0490 IE3D160MX04  | 249.7     | 48.99 | 5487/112           | 439                           |
| 30                                                                              | 1.5        | 52                      | 1.5        | 3368             | K913_0490 IE3D160MX04  | 364.5     | 48.94 | 100223/2048        | 450                           |
| 33                                                                              | 1.4        | 57                      | 1.3        | 3046             | K813_0440 IE3D160MX04  | 249.7     | 44.25 | 177/4              | 439                           |
| 37                                                                              | 1.5        | 63                      | 1.4        | 2754             | K813_0400 IE3D160MX04  | 249.7     | 40.01 | 12803/320          | 442                           |
| 37                                                                              | 0.89       | 65                      | 0.82       | 2701             | K713_0390 IE3D160MX04  | 196.3     | 39.23 | 2511/64            | 436                           |
| 39                                                                              | 1.8        | 67                      | 1.8        | 2619             | K913_0380 IE3D160MX04  | 364.5     | 38.04 | 194773/5120        | 460                           |
| 41                                                                              | 1.6        | 70                      | 1.5        | 2487             | K813_0360 IE3D160MX04  | 249.7     | 36.14 | 2891/80            | 443                           |
| 41                                                                              | 0.98       | 72                      | 0.87       | 2439             | K713_0350 IE3D160MX04  | 196.3     | 35.44 | 567/16             | 436                           |
| 45                                                                              | 1.1        | 78                      | 0.93       | 2232             | K713_0320 IE3D160MX04  | 196.3     | 32.42 | 33201/1024         | 438                           |
| 45                                                                              | 1.9        | 78                      | 1.6        | 2229             | K813_0320 IE3D160MX04  | 249.7     | 32.39 | 31093/960          | 447                           |
| 46                                                                              | 1.9        | 79                      | 1.9        | 2211             | K913_0320 IE3D160MX04  | 364.5     | 32.12 | 47275/1472         | 469                           |



| n <sub>2</sub><br>50 Hz<br>[rpm]                                     | S<br>50 Hz | n <sub>2</sub><br>87 Hz<br>[rpm] | S<br>87 Hz | M <sub>2N</sub><br>[Nm] | Type                   | m<br>[kg] | i     | i <sub>exakt</sub> | J <sub>1</sub><br>[kgcm <sup>2</sup> ] |
|----------------------------------------------------------------------|------------|----------------------------------|------------|-------------------------|------------------------|-----------|-------|--------------------|----------------------------------------|
| P <sub>N</sub> (50 Hz) = 11,00 kW, P <sub>N</sub> (87 Hz) = 19,05 kW |            |                                  |            |                         |                        |           |       |                    |                                        |
| 50                                                                   | 1.2        | 87                               | 0.99       | 2016                    | K713_0290 IE3D160MX04  | 196.3     | 29.29 | 7497/256           | 438                                    |
| 50                                                                   | 1.9        | 87                               | 1.7        | 2014                    | K813_0290 IE3D160MX04  | 249.7     | 29.25 | 7021/240           | 448                                    |
| 57                                                                   | 2.0        | –                                | –          | 1756                    | K813_0260 IE3D160MX04  | 249.7     | 25.51 | 140833/5520        | 455                                    |
| 58                                                                   | 1.3        | –                                | –          | 1733                    | K713_0250 IE3D160MX04  | 196.3     | 25.18 | 64449/2560         | 442                                    |
| 61                                                                   | 0.82       | –                                | –          | 1652                    | K613_0240 IE3D160MX04  | 168.0     | 24.01 | 24583/1024         | 436                                    |
| 61                                                                   | 2.2        | –                                | –          | 1648                    | K913_0240 IE3D160MX04  | 364.5     | 23.94 | 88877/3712         | 491                                    |
| 64                                                                   | 1.4        | –                                | –          | 1565                    | K713_0230 IE3D160MX04  | 196.3     | 22.74 | 14553/640          | 442                                    |
| 64                                                                   | 2.0        | –                                | –          | 1586                    | K813_0230 IE3D160MX04  | 249.7     | 23.04 | 31801/1380         | 456                                    |
| 68                                                                   | 0.88       | –                                | –          | 1493                    | K613_0220 IE3D160MX04  | 168.0     | 21.68 | 5551/256           | 436                                    |
| 72                                                                   | 1.5        | –                                | –          | 1393                    | K713_0200 IE3D160MX04  | 196.3     | 20.23 | 119133/5888        | 446                                    |
| 77                                                                   | 0.96       | 134                              | 0.81       | 1307                    | K613_0190 IE3D160MX04  | 168.0     | 18.99 | 17019/896          | 438                                    |
| 76                                                                   | 2.2        | –                                | –          | 1320                    | K813_0190 IE3D160MX04  | 249.7     | 19.18 | 133517/6960        | 468                                    |
| 80                                                                   | 1.6        | –                                | –          | 1258                    | K713_0185 IE3D160MX04  | 196.3     | 18.28 | 26901/1472         | 447                                    |
| 85                                                                   | 2.2        | –                                | –          | 1193                    | K813_0175 IE3D160MX04  | 249.7     | 17.33 | 30149/1740         | 470                                    |
| 85                                                                   | 1.0        | 148                              | 0.87       | 1181                    | K613_0170 IE3D160MX04  | 168.0     | 17.16 | 549/32             | 438                                    |
| 89                                                                   | 1.7        | –                                | –          | 1128                    | K713_0165 IE3D160MX04  | 196.3     | 16.39 | 6293/384           | 451                                    |
| 92                                                                   | 1.1        | –                                | –          | 1092                    | K613_0160 IE3D160MX04  | 168.0     | 15.87 | 54839/3456         | 440                                    |
| 99                                                                   | 1.9        | –                                | –          | 1019                    | K713_0150 IE3D160MX04  | 196.3     | 14.80 | 1421/96            | 452                                    |
| 102                                                                  | 1.2        | –                                | –          | 987                     | K613_0145 IE3D160MX04  | 168.0     | 14.33 | 12383/864          | 441                                    |
| 112                                                                  | 2.0        | –                                | –          | 898                     | K713_0130 IE3D160MX04  | 196.3     | 13.04 | 3339/256           | 459                                    |
| 116                                                                  | 1.3        | –                                | –          | 869                     | K613_0125 IE3D160MX04  | 168.0     | 12.63 | 3233/256           | 444                                    |
| 124                                                                  | 2.2        | –                                | –          | 811                     | K713_0120 IE3D160MX04  | 196.3     | 11.78 | 23373/1984         | 461                                    |
| 128                                                                  | 1.4        | –                                | –          | 785                     | K613_0115 IE3D160MX04  | 168.0     | 11.41 | 22631/1984         | 445                                    |
| 181                                                                  | 1.7        | –                                | –          | 558                     | K613_0081 IE3D160MX04  | 168.0     | 8.107 | 85095/10496        | 457                                    |
| 200                                                                  | 1.8        | –                                | –          | 504                     | K613_0073 IE3D160MX04  | 168.0     | 7.323 | 19215/2624         | 459                                    |
| P <sub>N</sub> (50 Hz) = 15,00 kW, P <sub>N</sub> (87 Hz) = 25,98 kW |            |                                  |            |                         |                        |           |       |                    |                                        |
| 9.7                                                                  | 0.87       | –                                | –          | 13823                   | K1014_1510 IE3D160LX04 | 646.0     | 151.4 | 409479/2704        | 1157                                   |
| 12                                                                   | 1.1        | –                                | –          | 11292                   | K1014_1240 IE3D160LX04 | 646.0     | 123.7 | 7359555/59488      | 1159                                   |
| 16                                                                   | 0.84       | –                                | –          | 8747                    | K1013_0940 IE3D160LX04 | 617.1     | 94.33 | 235445/2496        | 1164                                   |
| 16                                                                   | 1.3        | –                                | –          | 8520                    | K1014_0930 IE3D160LX04 | 646.0     | 93.34 | 252399/2704        | 1162                                   |
| 20                                                                   | 0.98       | 34                               | 0.98       | 6955                    | K913_0750 IE3D160LX04  | 424.5     | 75.00 | 62403/832          | 1160                                   |
| 23                                                                   | 0.98       | 41                               | 0.98       | 5849                    | K913_0630 IE3D160LX04  | 424.5     | 63.07 | 209901/3328        | 1163                                   |
| 30                                                                   | 0.92       | 52                               | 0.90       | 4543                    | K813_0490 IE3D160LX04  | 309.7     | 48.99 | 5487/112           | 1159                                   |
| 30                                                                   | 1.1        | 52                               | 1.1        | 4538                    | K913_0490 IE3D160LX04  | 424.5     | 48.94 | 100223/2048        | 1170                                   |
| 33                                                                   | 1.0        | 58                               | 0.97       | 4103                    | K813_0440 IE3D160LX04  | 309.7     | 44.25 | 177/4              | 1159                                   |
| 37                                                                   | 1.1        | 64                               | 1.0        | 3710                    | K813_0400 IE3D160LX04  | 309.7     | 40.01 | 12803/320          | 1162                                   |
| 39                                                                   | 1.3        | 67                               | 1.3        | 3528                    | K913_0380 IE3D160LX04  | 424.5     | 38.04 | 194773/5120        | 1180                                   |
| 41                                                                   | 1.2        | 71                               | 1.1        | 3351                    | K813_0360 IE3D160LX04  | 309.7     | 36.14 | 2891/80            | 1163                                   |
| 46                                                                   | 1.4        | 79                               | 1.2        | 3003                    | K813_0320 IE3D160LX04  | 309.7     | 32.39 | 31093/960          | 1167                                   |
| 46                                                                   | 1.4        | 80                               | 1.4        | 2978                    | K913_0320 IE3D160LX04  | 424.5     | 32.12 | 47275/1472         | 1189                                   |
| 50                                                                   | 0.88       | –                                | –          | 2716                    | K713_0290 IE3D160LX04  | 256.3     | 29.29 | 7497/256           | 1158                                   |
| 50                                                                   | 1.4        | 87                               | 1.3        | 2713                    | K813_0290 IE3D160LX04  | 309.7     | 29.25 | 7021/240           | 1168                                   |
| 58                                                                   | 1.5        | –                                | –          | 2366                    | K813_0260 IE3D160LX04  | 309.7     | 25.51 | 140833/5520        | 1175                                   |
| 59                                                                   | 0.97       | –                                | –          | 2335                    | K713_0250 IE3D160LX04  | 256.3     | 25.18 | 64449/2560         | 1162                                   |
| 62                                                                   | 1.6        | –                                | –          | 2220                    | K913_0240 IE3D160LX04  | 424.5     | 23.94 | 88877/3712         | 1211                                   |
| 65                                                                   | 1.0        | –                                | –          | 2109                    | K713_0230 IE3D160LX04  | 256.3     | 22.74 | 14553/640          | 1162                                   |
| 64                                                                   | 1.5        | –                                | –          | 2137                    | K813_0230 IE3D160LX04  | 309.7     | 23.04 | 31801/1380         | 1176                                   |
| 73                                                                   | 1.1        | –                                | –          | 1876                    | K713_0200 IE3D160LX04  | 256.3     | 20.23 | 119133/5888        | 1166                                   |
| 77                                                                   | 1.6        | –                                | –          | 1779                    | K813_0190 IE3D160LX04  | 309.7     | 19.18 | 133517/6960        | 1188                                   |
| 81                                                                   | 1.2        | –                                | –          | 1695                    | K713_0185 IE3D160LX04  | 256.3     | 18.28 | 26901/1472         | 1167                                   |
| 85                                                                   | 1.6        | –                                | –          | 1607                    | K813_0175 IE3D160LX04  | 309.7     | 17.33 | 30149/1740         | 1190                                   |
| 90                                                                   | 1.3        | –                                | –          | 1520                    | K713_0165 IE3D160LX04  | 256.3     | 16.39 | 6293/384           | 1171                                   |
| 93                                                                   | 0.81       | –                                | –          | 1471                    | K613_0160 IE3D160LX04  | 228.0     | 15.87 | 54839/3456         | 1160                                   |
| 100                                                                  | 1.4        | –                                | –          | 1373                    | K713_0150 IE3D160LX04  | 256.3     | 14.80 | 1421/96            | 1172                                   |
| 103                                                                  | 0.86       | –                                | –          | 1329                    | K613_0145 IE3D160LX04  | 228.0     | 14.33 | 12383/864          | 1161                                   |
| 113                                                                  | 1.5        | –                                | –          | 1210                    | K713_0130 IE3D160LX04  | 256.3     | 13.04 | 3339/256           | 1179                                   |
| 117                                                                  | 0.94       | –                                | –          | 1171                    | K613_0125 IE3D160LX04  | 228.0     | 12.63 | 3233/256           | 1164                                   |
| 125                                                                  | 1.6        | –                                | –          | 1092                    | K713_0120 IE3D160LX04  | 256.3     | 11.78 | 23373/1984         | 1181                                   |
| 129                                                                  | 1.0        | –                                | –          | 1058                    | K613_0115 IE3D160LX04  | 228.0     | 11.41 | 22631/1984         | 1165                                   |
| 182                                                                  | 1.3        | –                                | –          | 752                     | K613_0081 IE3D160LX04  | 228.0     | 8.107 | 85095/10496        | 1177                                   |
| 201                                                                  | 1.4        | –                                | –          | 679                     | K613_0073 IE3D160LX04  | 228.0     | 7.323 | 19215/2624         | 1179                                   |
| P <sub>N</sub> (50 Hz) = 18,50 kW, P <sub>N</sub> (87 Hz) = 32,04 kW |            |                                  |            |                         |                        |           |       |                    |                                        |
| 12                                                                   | 0.86       | –                                | –          | 13970                   | K1014_1240 IE3D180MX04 | 641.0     | 123.7 | 7359555/59488      | 1159                                   |
| 16                                                                   | 1.0        | –                                | –          | 10540                   | K1014_0930 IE3D180MX04 | 641.0     | 93.34 | 252399/2704        | 1162                                   |
| 20                                                                   | 1.3        | –                                | –          | 8636                    | K1013_0750 IE3D180MX04 | 612.1     | 75.28 | 101773/1352        | 1172                                   |

#### 4.2 Selection tables 4 K helical bevel geared motors

| $n_2$<br>50 Hz<br>[rpm]                            | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                   | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|----------------------------------------------------|------------|-------------------------|------------|------------------|------------------------|-----------|-------|--------------------|-------------------------------|
| $P_N$ (50 Hz) = 18,50 kW, $P_N$ (87 Hz) = 32,04 kW |            |                         |            |                  |                        |           |       |                    |                               |
| 23                                                 | 0.97       | 41                      | 0.97       | 7236             | K913_0630 IE3D180MX04  | 419.5     | 63.07 | 209901/3328        | 1163                          |
| 24                                                 | 1.7        | –                       | –          | 7061             | K1013_0620 IE3D180MX04 | 612.1     | 61.55 | 12803/208          | 1181                          |
| 30                                                 | 1.2        | 52                      | 1.2        | 5614             | K913_0490 IE3D180MX04  | 419.5     | 48.94 | 100223/2048        | 1170                          |
| 37                                                 | 0.92       | 64                      | 0.83       | 4590             | K813_0400 IE3D180MX04  | 304.7     | 40.01 | 12803/320          | 1162                          |
| 38                                                 | 2.4        | –                       | –          | 4428             | K1013_0390 IE3D180MX04 | 612.1     | 38.60 | 8029/208           | 1216                          |
| 39                                                 | 1.6        | 67                      | 1.6        | 4364             | K913_0380 IE3D180MX04  | 419.5     | 38.04 | 194773/5120        | 1180                          |
| 41                                                 | 1.0        | 71                      | 0.89       | 4146             | K813_0360 IE3D180MX04  | 304.7     | 36.14 | 2891/80            | 1163                          |
| 46                                                 | 1.1        | 79                      | 0.96       | 3716             | K813_0320 IE3D180MX04  | 304.7     | 32.39 | 31093/960          | 1167                          |
| 46                                                 | 1.9        | 80                      | 1.8        | 3684             | K913_0320 IE3D180MX04  | 419.5     | 32.12 | 47275/1472         | 1189                          |
| 50                                                 | 1.2        | 87                      | 1.0        | 3356             | K813_0290 IE3D180MX04  | 304.7     | 29.25 | 7021/240           | 1168                          |
| 58                                                 | 1.3        | –                       | –          | 2927             | K813_0260 IE3D180MX04  | 304.7     | 25.51 | 140833/5520        | 1175                          |
| 62                                                 | 2.5        | –                       | –          | 2747             | K913_0240 IE3D180MX04  | 419.5     | 23.94 | 88877/3712         | 1211                          |
| 65                                                 | 0.84       | –                       | –          | 2609             | K713_0230 IE3D180MX04  | 251.3     | 22.74 | 14553/640          | 1162                          |
| 64                                                 | 1.4        | –                       | –          | 2644             | K813_0230 IE3D180MX04  | 304.7     | 23.04 | 31801/1380         | 1176                          |
| 73                                                 | 0.91       | –                       | –          | 2321             | K713_0200 IE3D180MX04  | 251.3     | 20.23 | 119133/5888        | 1166                          |
| 77                                                 | 1.6        | –                       | –          | 2201             | K813_0190 IE3D180MX04  | 304.7     | 19.18 | 133517/6960        | 1188                          |
| 77                                                 | 2.5        | –                       | –          | 2187             | K913_0190 IE3D180MX04  | 419.5     | 19.06 | 305/16             | 1235                          |
| 81                                                 | 0.97       | –                       | –          | 2097             | K713_0185 IE3D180MX04  | 251.3     | 18.28 | 26901/1472         | 1167                          |
| 85                                                 | 1.7        | –                       | –          | 1988             | K813_0175 IE3D180MX04  | 304.7     | 17.33 | 30149/1740         | 1190                          |
| 90                                                 | 1.0        | –                       | –          | 1880             | K713_0165 IE3D180MX04  | 251.3     | 16.39 | 6293/384           | 1171                          |
| 90                                                 | 1.8        | –                       | –          | 1885             | K813_0165 IE3D180MX04  | 304.7     | 16.43 | 42067/2560         | 1196                          |
| 100                                                | 1.1        | –                       | –          | 1698             | K713_0150 IE3D180MX04  | 251.3     | 14.80 | 1421/96            | 1172                          |
| 99                                                 | 1.9        | –                       | –          | 1703             | K813_0150 IE3D180MX04  | 304.7     | 14.84 | 9499/640           | 1200                          |
| 113                                                | 1.2        | –                       | –          | 1496             | K713_0130 IE3D180MX04  | 251.3     | 13.04 | 3339/256           | 1179                          |
| 118                                                | 2.5        | –                       | –          | 1437             | K913_0125 IE3D180MX04  | 419.5     | 12.53 | 73749/5888         | 1308                          |
| 125                                                | 1.3        | –                       | –          | 1352             | K713_0120 IE3D180MX04  | 251.3     | 11.78 | 23373/1984         | 1181                          |
| 143                                                | 2.5        | –                       | –          | 1179             | K813_0105 IE3D180MX04  | 304.7     | 10.28 | 53041/5160         | 1242                          |
| 145                                                | 1.4        | –                       | –          | 1167             | K713_0100 IE3D180MX04  | 251.3     | 10.17 | 651/64             | 1192                          |
| 159                                                | 2.5        | –                       | –          | 1065             | K813_0093 IE3D180MX04  | 304.7     | 9.284 | 11977/1290         | 1251                          |
| 161                                                | 1.5        | –                       | –          | 1054             | K713_0092 IE3D180MX04  | 251.3     | 9.188 | 147/16             | 1194                          |
| 176                                                | 1.6        | –                       | –          | 961              | K713_0084 IE3D180MX04  | 251.3     | 8.373 | 87885/10496        | 1205                          |
| 179                                                | 2.5        | –                       | –          | 946              | K813_0082 IE3D180MX04  | 304.7     | 8.243 | 96937/11760        | 1279                          |
| 182                                                | 1.0        | –                       | –          | 930              | K613_0081 IE3D180MX04  | 223.0     | 8.107 | 85095/10496        | 1177                          |
| 195                                                | 1.7        | –                       | –          | 868              | K713_0076 IE3D180MX04  | 251.3     | 7.563 | 19845/2624         | 1209                          |
| 198                                                | 2.5        | –                       | –          | 854              | K813_0074 IE3D180MX04  | 304.7     | 7.445 | 3127/420           | 1292                          |
| 201                                                | 1.1        | –                       | –          | 840              | K613_0073 IE3D180MX04  | 223.0     | 7.323 | 19215/2624         | 1179                          |
| $P_N$ (50 Hz) = 22,00 kW, $P_N$ (87 Hz) = 38,11 kW |            |                         |            |                  |                        |           |       |                    |                               |
| 16                                                 | 0.87       | –                       | –          | 12473            | K1014_0930 IE3D180LX04 | 687.0     | 93.34 | 252399/2704        | 1692                          |
| 20                                                 | 1.1        | –                       | –          | 10219            | K1013_0750 IE3D180LX04 | 658.1     | 75.28 | 101773/1352        | 1702                          |
| 23                                                 | 0.82       | 41                      | 0.82       | 8562             | K913_0630 IE3D180LX04  | 465.5     | 63.07 | 209901/3328        | 1693                          |
| 24                                                 | 1.4        | –                       | –          | 8356             | K1013_0620 IE3D180LX04 | 658.1     | 61.55 | 12803/208          | 1711                          |
| 30                                                 | 1.1        | 52                      | 1.1        | 6643             | K913_0490 IE3D180LX04  | 465.5     | 48.94 | 100223/2048        | 1700                          |
| 38                                                 | 2.0        | –                       | –          | 5240             | K1013_0390 IE3D180LX04 | 658.1     | 38.60 | 8029/208           | 1746                          |
| 39                                                 | 1.4        | 67                      | 1.3        | 5164             | K913_0380 IE3D180LX04  | 465.5     | 38.04 | 194773/5120        | 1710                          |
| 41                                                 | 0.86       | –                       | –          | 4906             | K813_0360 IE3D180LX04  | 350.7     | 36.14 | 2891/80            | 1693                          |
| 46                                                 | 0.96       | 79                      | 0.81       | 4397             | K813_0320 IE3D180LX04  | 350.7     | 32.39 | 31093/960          | 1697                          |
| 46                                                 | 1.6        | 80                      | 1.5        | 4360             | K913_0320 IE3D180LX04  | 465.5     | 32.12 | 47275/1472         | 1719                          |
| 50                                                 | 1.0        | 87                      | 0.87       | 3971             | K813_0290 IE3D180LX04  | 350.7     | 29.25 | 7021/240           | 1698                          |
| 58                                                 | 1.1        | –                       | –          | 3463             | K813_0260 IE3D180LX04  | 350.7     | 25.51 | 140833/5520        | 1705                          |
| 62                                                 | 2.1        | –                       | –          | 3250             | K913_0240 IE3D180LX04  | 465.5     | 23.94 | 88877/3712         | 1741                          |
| 64                                                 | 1.2        | –                       | –          | 3128             | K813_0230 IE3D180LX04  | 350.7     | 23.04 | 31801/1380         | 1706                          |
| 77                                                 | 1.4        | –                       | –          | 2604             | K813_0190 IE3D180LX04  | 350.7     | 19.18 | 133517/6960        | 1718                          |
| 77                                                 | 2.1        | –                       | –          | 2588             | K913_0190 IE3D180LX04  | 465.5     | 19.06 | 305/16             | 1765                          |
| 81                                                 | 0.82       | –                       | –          | 2481             | K713_0185 IE3D180LX04  | 297.3     | 18.28 | 26901/1472         | 1697                          |
| 85                                                 | 1.5        | –                       | –          | 2352             | K813_0175 IE3D180LX04  | 350.7     | 17.33 | 30149/1740         | 1720                          |
| 90                                                 | 0.88       | –                       | –          | 2225             | K713_0165 IE3D180LX04  | 297.3     | 16.39 | 6293/384           | 1701                          |
| 90                                                 | 1.5        | –                       | –          | 2231             | K813_0165 IE3D180LX04  | 350.7     | 16.43 | 42067/2560         | 1726                          |
| 100                                                | 0.94       | –                       | –          | 2009             | K713_0150 IE3D180LX04  | 297.3     | 14.80 | 1421/96            | 1702                          |
| 99                                                 | 1.6        | –                       | –          | 2015             | K813_0150 IE3D180LX04  | 350.7     | 14.84 | 9499/640           | 1730                          |
| 113                                                | 1.0        | –                       | –          | 1771             | K713_0130 IE3D180LX04  | 297.3     | 13.04 | 3339/256           | 1709                          |
| 118                                                | 2.1        | –                       | –          | 1700             | K913_0125 IE3D180LX04  | 465.5     | 12.53 | 73749/5888         | 1838                          |
| 125                                                | 1.1        | –                       | –          | 1599             | K713_0120 IE3D180LX04  | 297.3     | 11.78 | 23373/1984         | 1711                          |
| 143                                                | 2.1        | –                       | –          | 1395             | K813_0105 IE3D180LX04  | 350.7     | 10.28 | 53041/5160         | 1772                          |
| 145                                                | 1.2        | –                       | –          | 1381             | K713_0100 IE3D180LX04  | 297.3     | 10.17 | 651/64             | 1722                          |
| 159                                                | 2.1        | –                       | –          | 1260             | K813_0093 IE3D180LX04  | 350.7     | 9.284 | 11977/1290         | 1781                          |

| $n_2$<br>50 Hz<br>[rpm]                                                         | S<br>50 Hz | $n_2$<br>87 Hz<br>[rpm] | S<br>87 Hz | $M_{2N}$<br>[Nm] | Type                   | m<br>[kg] | i     | $i_{\text{exakt}}$ | $J_1$<br>[kgcm <sup>2</sup> ] |
|---------------------------------------------------------------------------------|------------|-------------------------|------------|------------------|------------------------|-----------|-------|--------------------|-------------------------------|
| <b><math>P_N</math> (50 Hz) = 22,00 kW, <math>P_N</math> (87 Hz) = 38,11 kW</b> |            |                         |            |                  |                        |           |       |                    |                               |
| 161                                                                             | 1.3        | —                       | —          | 1247             | K713_0092 IE3D180LX04  | 297.3     | 9.188 | 147/16             | 1724                          |
| 176                                                                             | 1.4        | —                       | —          | 1137             | K713_0084 IE3D180LX04  | 297.3     | 8.373 | 87885/10496        | 1735                          |
| 179                                                                             | 2.1        | —                       | —          | 1119             | K813_0082 IE3D180LX04  | 350.7     | 8.243 | 96937/11760        | 1809                          |
| 182                                                                             | 0.86       | —                       | —          | 1101             | K613_0081 IE3D180LX04  | 269.0     | 8.107 | 85095/10496        | 1707                          |
| 195                                                                             | 1.5        | —                       | —          | 1027             | K713_0076 IE3D180LX04  | 297.3     | 7.563 | 19845/2624         | 1739                          |
| 198                                                                             | 2.1        | —                       | —          | 1011             | K813_0074 IE3D180LX04  | 350.7     | 7.445 | 3127/420           | 1822                          |
| 201                                                                             | 0.92       | —                       | —          | 994              | K613_0073 IE3D180LX04  | 269.0     | 7.323 | 19215/2624         | 1709                          |
| <b><math>P_N</math> (50 Hz) = 30,00 kW, <math>P_N</math> (87 Hz) = 51,96 kW</b> |            |                         |            |                  |                        |           |       |                    |                               |
| 24                                                                              | 1.1        | —                       | —          | 11416            | K1013_0620 IE3D200LX04 | 756.1     | 61.55 | 12803/208          | 3161                          |
| 30                                                                              | 1.3        | —                       | —          | 9003             | K1013_0490 IE3D200LX04 | 756.1     | 48.54 | 171647/3536        | 3176                          |
| 38                                                                              | 1.7        | —                       | —          | 7159             | K1013_0390 IE3D200LX04 | 756.1     | 38.60 | 8029/208           | 3196                          |
| 47                                                                              | 2.1        | —                       | —          | 5849             | K1013_0320 IE3D200LX04 | 756.1     | 31.54 | 144305/4576        | 3222                          |
| 62                                                                              | 2.7        | —                       | —          | 4413             | K1013_0240 IE3D200LX04 | 756.1     | 23.79 | 4949/208           | 3270                          |
| 78                                                                              | 1.8        | —                       | —          | 3536             | K913_0190 IE3D200LX04  | 563.5     | 19.06 | 305/16             | 3215                          |
| 93                                                                              | 3.3        | —                       | —          | 2944             | K1013_0160 IE3D200LX04 | 756.1     | 15.88 | 37975/2392         | 3382                          |
| 118                                                                             | 2.4        | —                       | —          | 2323             | K913_0125 IE3D200LX04  | 563.5     | 12.53 | 73749/5888         | 3288                          |
| 187                                                                             | 3.3        | —                       | —          | 1471             | K913_0079 IE3D200LX04  | 563.5     | 7.934 | 54839/6912         | 3439                          |
| <b><math>P_N</math> (50 Hz) = 37,00 kW, <math>P_N</math> (87 Hz) = 64,09 kW</b> |            |                         |            |                  |                        |           |       |                    |                               |
| 24                                                                              | 0.85       | —                       | —          | 14123            | K1013_0620 IE3D225SX04 | 793.1     | 61.55 | 12803/208          | 3591                          |
| 30                                                                              | 1.1        | —                       | —          | 11138            | K1013_0490 IE3D225SX04 | 793.1     | 48.54 | 171647/3536        | 3606                          |
| 38                                                                              | 1.4        | —                       | —          | 8857             | K1013_0390 IE3D225SX04 | 793.1     | 38.60 | 8029/208           | 3626                          |
| 47                                                                              | 1.7        | —                       | —          | 7235             | K1013_0320 IE3D225SX04 | 793.1     | 31.54 | 144305/4576        | 3652                          |
| 62                                                                              | 2.2        | —                       | —          | 5459             | K1013_0240 IE3D225SX04 | 793.1     | 23.79 | 4949/208           | 3700                          |
| 93                                                                              | 2.7        | —                       | —          | 3643             | K1013_0160 IE3D225SX04 | 793.1     | 15.88 | 37975/2392         | 3812                          |
| <b><math>P_N</math> (50 Hz) = 45,00 kW, <math>P_N</math> (87 Hz) = 77,94 kW</b> |            |                         |            |                  |                        |           |       |                    |                               |
| 30                                                                              | 0.89       | —                       | —          | 13504            | K1013_0490 IE3D225MX04 | 829.1     | 48.54 | 171647/3536        | 5296                          |
| 38                                                                              | 1.1        | —                       | —          | 10739            | K1013_0390 IE3D225MX04 | 829.1     | 38.60 | 8029/208           | 5316                          |
| 47                                                                              | 1.4        | —                       | —          | 8773             | K1013_0320 IE3D225MX04 | 829.1     | 31.54 | 144305/4576        | 5342                          |
| 62                                                                              | 1.8        | —                       | —          | 6619             | K1013_0240 IE3D225MX04 | 829.1     | 23.79 | 4949/208           | 5390                          |
| 93                                                                              | 2.2        | —                       | —          | 4417             | K1013_0160 IE3D225MX04 | 829.1     | 15.88 | 37975/2392         | 5502                          |



## 4.3 Dimensional drawings

In this chapter you can find the dimensions of the geared motors.

There is a dimensional drawing for every possible shaft/housing design, each with the tables for gear unit dimensions, motor dimensions and geared motor dimensions.

Dimensions can exceed the specifications of ISO 2768-mK due to casting tolerances or accumulation of individual tolerances.

We reserve the right to make dimensional changes due to ongoing technical development.

You can download 3D models of our standard drives at <http://configurator.stoeber.de>.

### Tolerances

| Axis height in accordance with DIN 747 | Tolerance |
|----------------------------------------|-----------|
| Up to 50 mm                            | -0.4 mm   |
| Up to 250 mm                           | -0.5 mm   |
| Up to 630 mm                           | -0.6 mm   |

| Solid shaft                          | Tolerance               |
|--------------------------------------|-------------------------|
| Shaft $\varnothing$ fit $\leq 50$ mm | DIN 748-1, ISO k6       |
| Shaft $\varnothing$ fit $> 50$ mm    | DIN 748-1, ISO m6       |
| Feather keys                         | DIN 6885-1, high form A |

| Hollow shaft          | Tolerance                                                          |
|-----------------------|--------------------------------------------------------------------|
| Hollow shaft hole fit | ISO H7                                                             |
| Feather keys          | DIN 6885-1, high form<br>K1 $\varnothing$ 30: DIN 6885-3, low form |

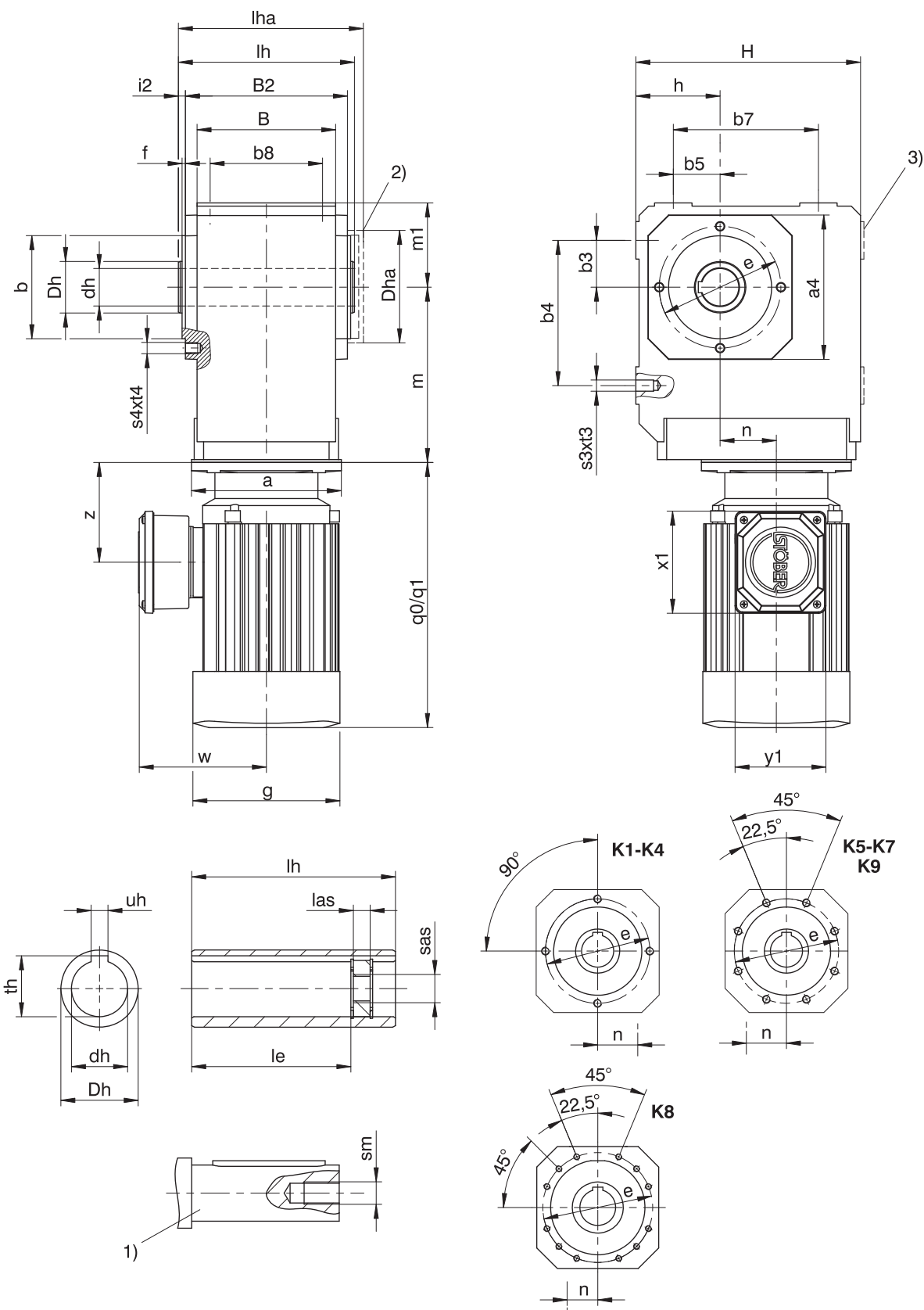
  

| Flange             | Pilot tolerance |
|--------------------|-----------------|
| Up to 300 mm       | ISO j6          |
| Starting at 350 mm | ISO h6          |

### Centering holes in solid shafts in accordance with DIN 332-2, DR shape

| Thread size       | M4 | M5   | M6 | M8 | M10 | M12 | M16 | M20 | M24 |
|-------------------|----|------|----|----|-----|-----|-----|-----|-----|
| Thread depth [mm] | 10 | 12.5 | 16 | 19 | 22  | 28  | 36  | 42  | 50  |

4.3.1 A shaft design (hollow shaft), G housing design (pitch circle diameter)



$q_0$  Applies to motors without brake.

1) The length of the machine shaft must be at least  $2.2 \times \varnothing d_h$  and the length of the feather key must be at least  $2 \times \varnothing d_h$ .

3) Only for K1 (other sizes on request)

$q_1$  Applies to motors with brake.

2) Cover (optional)

## Dimensions of gear units

| Type | □a4 | Øb                | b3 | b4  | b5  | b7  | b8  | B   | B2  | Ødh              | ØDh | Dha  | Øe  | f   | h   | H   | i2   | le    | lh  | las | lha   | m1  | s3  | s4  | sm  | sas | t3 | t4 | th   | uh                |
|------|-----|-------------------|----|-----|-----|-----|-----|-----|-----|------------------|-----|------|-----|-----|-----|-----|------|-------|-----|-----|-------|-----|-----|-----|-----|-----|----|----|------|-------------------|
| K1   | 105 | 75 <sub>j6</sub>  | 30 | 90  | 30  | 90  | 70  | 90  | 106 | 20 <sup>H7</sup> | 40  | □105 | 90  | 3.0 | 60  | 160 | 7.0  | 98.0  | 120 | 12  | 127.0 | 60  | M8  | M8  | M6  | M8  | 13 | 13 | 22.8 | 6 <sup>JS9</sup>  |
| K1   | 105 | 75 <sub>j6</sub>  | 30 | 90  | 30  | 90  | 70  | 90  | 106 | 25 <sup>H7</sup> | 40  | □105 | 90  | 3.0 | 60  | 160 | 7.0  | 98.0  | 120 | 12  | 127.0 | 60  | M8  | M8  | M10 | M12 | 13 | 13 | 28.3 | 8 <sup>JS9</sup>  |
| K1   | 105 | 75 <sub>j6</sub>  | 30 | 90  | 30  | 90  | 70  | 90  | 106 | 30 <sup>H7</sup> | 40  | □105 | 90  | 3.0 | 60  | 160 | 7.0  | 93.5  | 120 | 12  | 127.0 | 60  | M8  | M8  | M10 | M12 | 13 | 13 | 32.0 | 8 <sup>JS9</sup>  |
| K2   | 116 | 82 <sub>j6</sub>  | 35 | 115 | 35  | 115 | 90  | 115 | 134 | 30 <sup>H7</sup> | 45  | □116 | 100 | 3.0 | 65  | 190 | 7.0  | 121.5 | 148 | 12  | 156.0 | 65  | M10 | M8  | M10 | M12 | 16 | 13 | 33.3 | 8 <sup>JS9</sup>  |
| K3   | 132 | 95 <sub>j6</sub>  | 40 | 130 | 40  | 130 | 105 | 130 | 146 | 35 <sup>H7</sup> | 50  | □132 | 115 | 3.0 | 75  | 213 | 7.0  | 125.0 | 160 | 12  | 168.0 | 75  | M10 | M8  | M12 | M16 | 16 | 13 | 38.3 | 10 <sup>JS9</sup> |
| K4   | 152 | 110 <sub>j6</sub> | 50 | 155 | 50  | 155 | 120 | 148 | 173 | 40 <sup>H7</sup> | 55  | □152 | 130 | 3.5 | 90  | 240 | 7.5  | 157.0 | 188 | 12  | 197.5 | 90  | M12 | M10 | M16 | M20 | 19 | 16 | 43.3 | 12 <sup>JS9</sup> |
| K5   | 145 | 110 <sub>j6</sub> | 40 | 140 | 100 | 140 | 125 | 160 | 185 | 50 <sup>H7</sup> | 65  | □145 | 130 | 3.5 | 160 | 260 | 7.5  | 164.0 | 200 | 12  | 209.5 | 100 | M16 | M10 | M16 | M20 | 26 | 16 | 53.8 | 14 <sup>JS9</sup> |
| K6   | 180 | 140 <sub>j6</sub> | 50 | 160 | 110 | 160 | 130 | 168 | 200 | 50 <sup>H7</sup> | 70  | Ø183 | 165 | 3.5 | 190 | 310 | 7.5  | 179.0 | 215 | 12  | 224.5 | 120 | M16 | M10 | M16 | M20 | 26 | 16 | 53.8 | 14 <sup>JS9</sup> |
| K7   | 195 | 155 <sub>j6</sub> | 55 | 180 | 125 | 180 | 145 | 190 | 226 | 60 <sup>H7</sup> | 85  | Ø205 | 185 | 3.5 | 212 | 342 | 8.0  | 214.0 | 242 | 12  | 252.0 | 125 | M20 | M12 | M20 | M24 | 33 | 19 | 64.4 | 18 <sup>JS9</sup> |
| K8   | 226 | 185 <sub>j6</sub> | 75 | 240 | 165 | 240 | 185 | 235 | 282 | 70 <sup>H7</sup> | 100 | Ø184 | 215 | 4.0 | 265 | 410 | 9.0  | 263.0 | 300 | 20  | 311.0 | 145 | M24 | M12 | M20 | M24 | 38 | 19 | 74.9 | 20 <sup>JS9</sup> |
| K9   | 280 | 230 <sub>j6</sub> | 95 | 280 | 185 | 280 | 225 | 285 | 330 | 90 <sup>H7</sup> | 120 | Ø230 | 265 | 5.0 | 315 | 495 | 10.0 | 302.0 | 350 | 26  | 361.0 | 180 | M30 | M16 | M24 | M30 | 48 | 26 | 95.4 | 25 <sup>JS9</sup> |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.



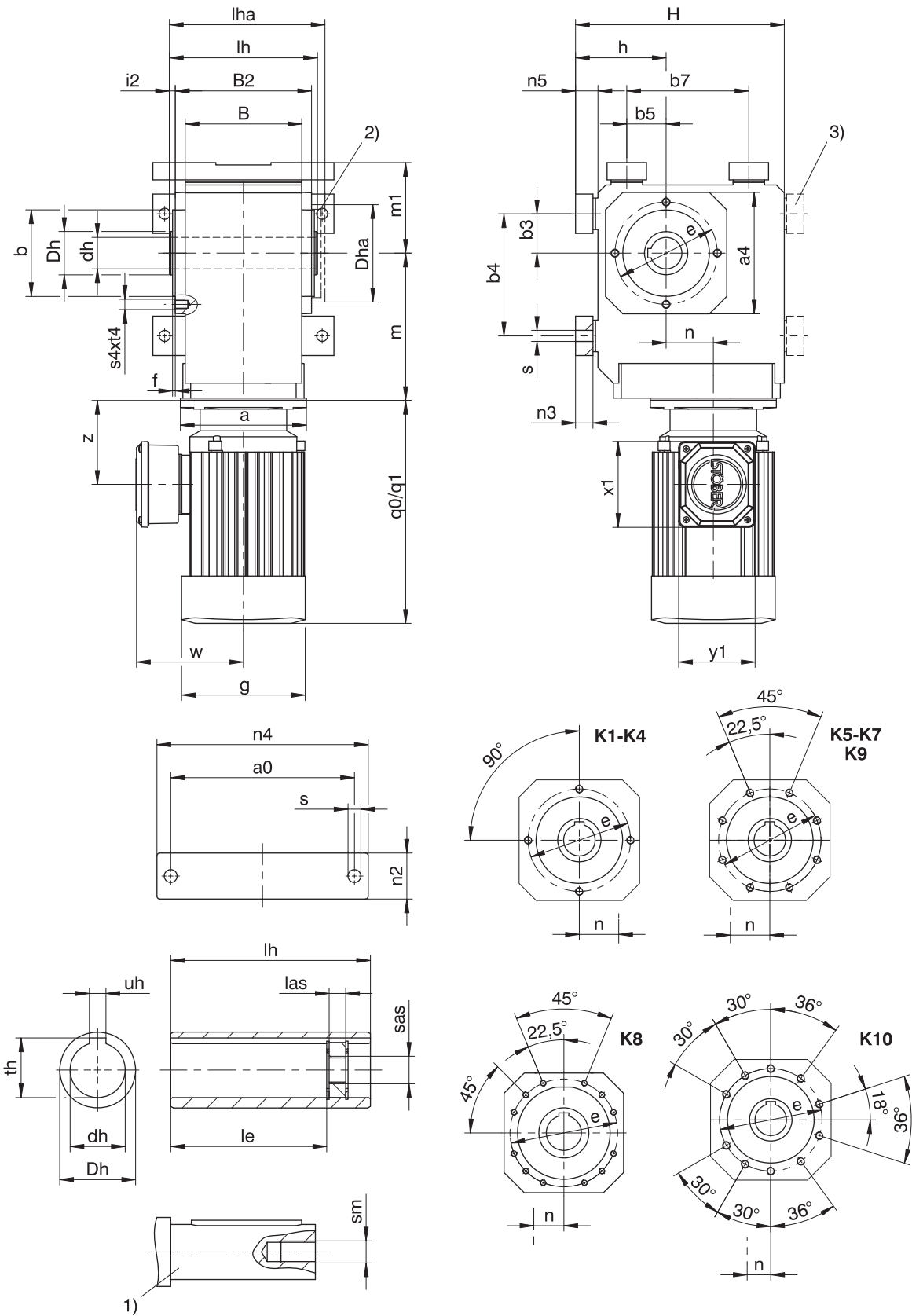
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |



4.3.2 A shaft design (hollow shaft), NG housing design (base + pitch circle diameter)



- |    |                                                                                                                                                     |    |                               |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------------------------|
| q0 | Applies to motors without brake.                                                                                                                    | q1 | Applies to motors with brake. |
| 1) | The length of the machine shaft must be at least 2.2 x $\varnothing d_h$ and the length of the feather key must be at least 2 x $\varnothing d_h$ . | 2) | Cover (optional)              |
| 3) | Only for K1 (other sizes on request)                                                                                                                |    |                               |

## Dimensions of gear units

| Type | a0  | □a4 | Øb                | b3  | b4  | b5  | b7  | B   | B2  | Ødh               | ØDh | Dha  | Øe  | f    | h   | H   |
|------|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|-------------------|-----|------|-----|------|-----|-----|
| K1   | 115 | 105 | 75 <sub>j6</sub>  | 30  | 90  | 30  | 90  | 90  | 106 | 20 <sup>H7</sup>  | 40  | □105 | 90  | 3.0  | 75  | 175 |
| K1   | 115 | 105 | 75 <sub>j6</sub>  | 30  | 90  | 30  | 90  | 90  | 106 | 25 <sup>H7</sup>  | 40  | □105 | 90  | 3.0  | 75  | 175 |
| K1   | 115 | 105 | 75 <sub>j6</sub>  | 30  | 90  | 30  | 90  | 90  | 106 | 30 <sup>H7</sup>  | 40  | □105 | 90  | 3.0  | 75  | 175 |
| K2   | 155 | 116 | 82 <sub>j6</sub>  | 35  | 115 | 35  | 115 | 115 | 134 | 30 <sup>H7</sup>  | 45  | □116 | 100 | 3.0  | 88  | 213 |
| K3   | 170 | 132 | 95 <sub>j6</sub>  | 40  | 130 | 40  | 130 | 130 | 146 | 35 <sup>H7</sup>  | 50  | □132 | 115 | 3.0  | 98  | 236 |
| K4   | 200 | 152 | 110 <sub>j6</sub> | 50  | 155 | 50  | 155 | 148 | 173 | 40 <sup>H7</sup>  | 55  | □152 | 130 | 3.5  | 115 | 265 |
| K5   | 200 | 145 | 110 <sub>j6</sub> | 40  | 140 | 100 | 140 | 160 | 185 | 50 <sup>H7</sup>  | 65  | □145 | 130 | 3.5  | 190 | 290 |
| K6   | 210 | 180 | 140 <sub>j6</sub> | 50  | 160 | 110 | 160 | 168 | 200 | 50 <sup>H7</sup>  | 70  | Ø183 | 165 | 3.5  | 220 | 340 |
| K7   | 241 | 195 | 155 <sub>j6</sub> | 55  | 180 | 125 | 180 | 190 | 226 | 60 <sup>H7</sup>  | 85  | Ø205 | 185 | 3.5  | 250 | 380 |
| K8   | 300 | 226 | 185 <sub>j6</sub> | 75  | 240 | 165 | 240 | 235 | 282 | 70 <sup>H7</sup>  | 100 | Ø184 | 215 | 4.0  | 310 | 455 |
| K9   | 360 | 280 | 230 <sub>j6</sub> | 95  | 280 | 185 | 280 | 285 | 330 | 90 <sup>H7</sup>  | 120 | Ø230 | 265 | 5.0  | 365 | 545 |
| K10  | 330 | 340 | 250 <sub>h6</sub> | 115 | 350 | 265 | 420 | 400 | 356 | 100 <sup>H7</sup> | 130 | Ø200 | 300 | 20.0 | 420 | 636 |

| Type | i2   | le    | lh  | las | lha   | m1  | n2  | n3 | n4  | n5 | Øs   | s4  | sm  | sas | t4 | th    | uh                |
|------|------|-------|-----|-----|-------|-----|-----|----|-----|----|------|-----|-----|-----|----|-------|-------------------|
| K1   | 7.0  | 98.0  | 120 | 12  | 127.0 | 75  | 30  | 13 | 140 | 15 | 9.0  | M8  | M10 | M12 | 13 | 28.3  | 8 <sup>JS9</sup>  |
| K1   | 7.0  | 98.0  | 120 | 12  | 127.0 | 75  | 30  | 13 | 140 | 15 | 9.0  | M8  | M6  | M8  | 13 | 22.8  | 6 <sup>JS9</sup>  |
| K1   | 7.0  | 93.5  | 120 | 12  | 127.0 | 75  | 30  | 13 | 140 | 15 | 9.0  | M8  | M10 | M12 | 13 | 32.0  | 8 <sup>JS9</sup>  |
| K2   | 7.0  | 121.5 | 148 | 12  | 156.0 | 88  | 40  | 20 | 185 | 23 | 11.0 | M8  | M10 | M12 | 13 | 33.3  | 8 <sup>JS9</sup>  |
| K3   | 7.0  | 125.0 | 160 | 12  | 168.0 | 98  | 45  | 20 | 200 | 23 | 11.0 | M8  | M12 | M16 | 13 | 38.3  | 10 <sup>JS9</sup> |
| K4   | 7.5  | 157.0 | 188 | 12  | 197.5 | 115 | 50  | 22 | 230 | 25 | 14.0 | M10 | M16 | M20 | 16 | 43.3  | 12 <sup>JS9</sup> |
| K5   | 7.5  | 164.0 | 200 | 12  | 209.5 | 130 | 60  | 27 | 240 | 30 | 18.0 | M10 | M16 | M20 | 16 | 53.8  | 14 <sup>JS9</sup> |
| K6   | 7.5  | 179.0 | 215 | 12  | 224.5 | 150 | 65  | 27 | 250 | 30 | 18.5 | M10 | M16 | M20 | 16 | 53.8  | 14 <sup>JS9</sup> |
| K7   | 8.0  | 214.0 | 242 | 12  | 252.0 | 163 | 70  | 35 | 290 | 38 | 23.0 | M12 | M20 | M24 | 19 | 64.4  | 18 <sup>JS9</sup> |
| K8   | 9.0  | 263.0 | 300 | 20  | 311.0 | 190 | 85  | 41 | 360 | 45 | 27.0 | M12 | M20 | M24 | 19 | 74.9  | 20 <sup>JS9</sup> |
| K9   | 10.0 | 302.0 | 350 | 26  | 361.0 | 230 | 95  | 46 | 430 | 50 | 31.0 | M16 | M24 | M30 | 26 | 95.4  | 25 <sup>JS9</sup> |
| K10  | 27.0 | 361.0 | 410 | 26  | 441.0 | 270 | 120 | –  | 400 | 45 | 39.0 | M20 | M24 | M30 | 33 | 106.4 | 28 <sup>JS9</sup> |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

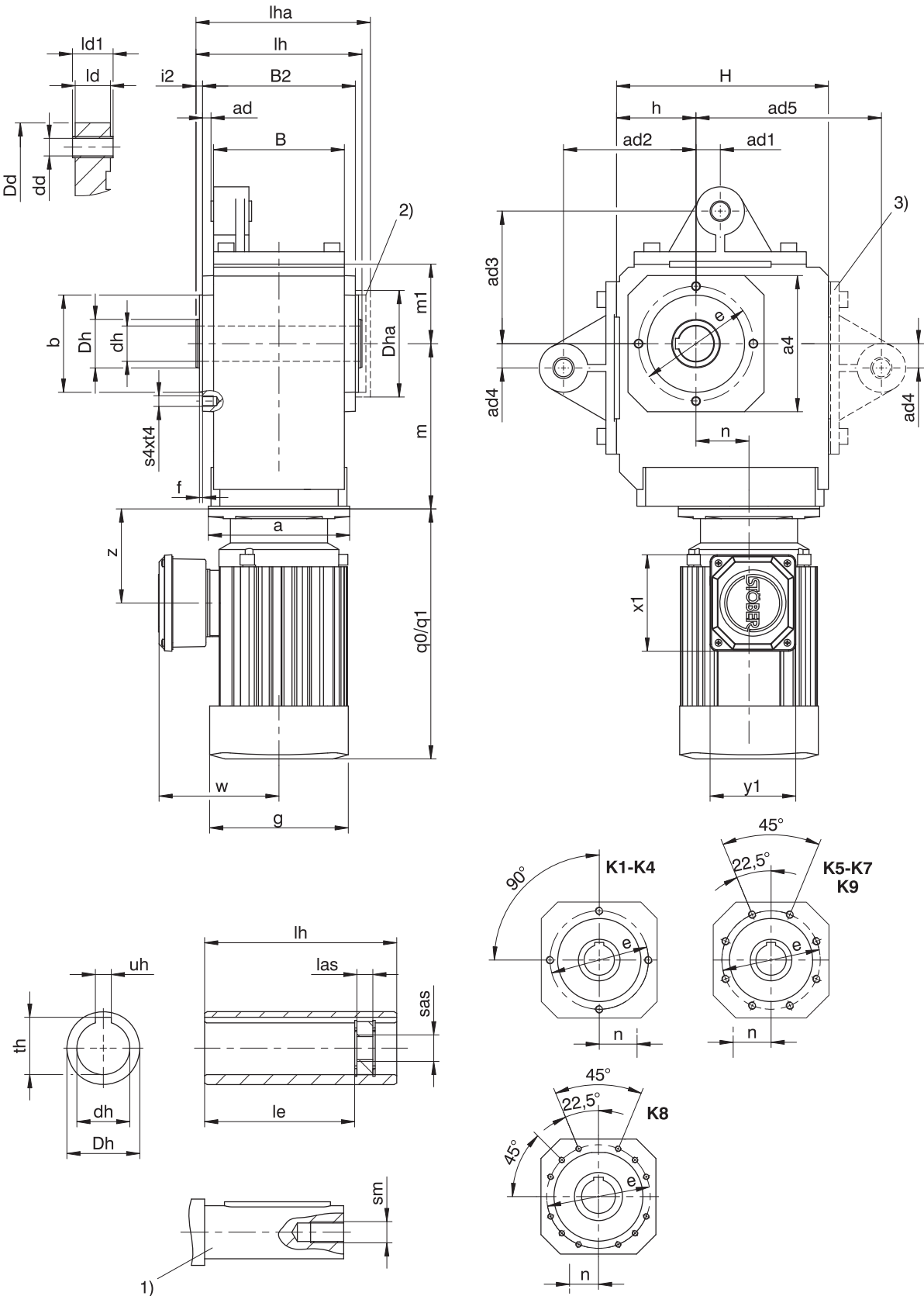
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | Ø140    | 124 | 36.0 | Ø140    | 124 | 36.0 | Ø160    | 128 | 36.0 | Ø160    | 128 | 36.0 | –       | –   | –    |
| K202 | Ø140    | 143 | 46.0 | Ø140    | 143 | 46.0 | Ø160    | 147 | 46.0 | Ø160    | 147 | 46.0 | Ø200    | 149 | 46.0 |
| K203 | Ø140    | 180 | 46.0 | Ø140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | Ø140    | 163 | 52.5 | Ø140    | 163 | 52.5 | Ø160    | 167 | 52.5 | Ø160    | 167 | 52.5 | Ø200    | 169 | 52.5 |
| K303 | Ø140    | 200 | 52.5 | Ø140    | 200 | 52.5 | Ø160    | 210 | 16.0 | Ø160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | Ø160    | 187 | 60.0 | Ø160    | 187 | 60.0 | Ø200    | 189 | 60.0 |
| K403 | –       | –   | –    | Ø140    | 220 | 60.0 | Ø160    | 230 | 23.0 | Ø160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | Ø160    | 172 | 15.0 | Ø160    | 172 | 15.0 | Ø200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | Ø160    | 215 | 15.0 | Ø160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | Ø160    | 191 | 18.0 | Ø160    | 191 | 18.0 | Ø200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | Ø160    | 234 | 18.0 | Ø160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | Ø160    | 263 | 20.0 | Ø160    | 263 | 20.0 | Ø200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 353 | 25.0 |

| Type  | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202  | Ø200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302  | Ø200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402  | Ø200    | 189 | 60.0 | Ø250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513  | Ø200    | 174 | 15.0 | Ø250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613  | Ø200    | 193 | 18.0 | Ø250    | 196 | 18.0 | Ø300    | 210 | 18.0 | Ø300    | 210 | 18.0 | –       | –   | –    | –       | –   | –    |
| K713  | Ø200    | 221 | 20.0 | Ø250    | 224 | 20.0 | Ø300    | 237 | 20.0 | Ø300    | 237 | 20.0 | –       | –   | –    | –       | –   | –    |
| K714  | Ø200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813  | Ø200    | 247 | 24.0 | Ø250    | 249 | 24.0 | Ø300    | 262 | 24.0 | Ø300    | 262 | 24.0 | –       | –   | –    | –       | –   | –    |
| K814  | Ø200    | 308 | 24.0 | Ø250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913  | –       | –   | –    | Ø250    | 294 | 25.0 | Ø300    | 307 | 25.0 | Ø300    | 307 | 25.0 | Ø350    | 330 | 25.0 | –       | –   | –    |
| K914  | Ø200    | 353 | 25.0 | Ø250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K1013 | –       | –   | –    | –       | –   | –    | Ø300    | 392 | 28.0 | Ø300    | 392 | 28.0 | Ø350    | 415 | 28.0 | Ø400    | 415 | 28.0 |
| K1014 | –       | –   | –    | Ø250    | 450 | 28.0 | Ø300    | 475 | 28.0 | Ø300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |



4.3.3 A shaft design (hollow shaft), GD housing design (pitch circle diameter + torque arm bracket)



q0 Applies to motors without brake.

1) The length of the machine shaft must be at least  $2.2 \times \varnothing dh$  and the length of the feather key must be at least  $2 \times \varnothing dh$ .

3) Only for K1 (other sizes on request)

q1 Applies to motors with brake.

2) Cover (optional)

- If you brace the gear units without the factory-adjusted torque arms provided for this purpose, the dimensions for  $ad2$  and  $ad3$  must meet the specified value.



## Dimensions of gear units

| Type | □a4 | ad   | ad1  | ad2 | ad3 | ad4  | ad5 | Øb                | B   | B2  | Ødd              | Ødh              | ØDd | ØDh | Dha  | Øe  | f   |
|------|-----|------|------|-----|-----|------|-----|-------------------|-----|-----|------------------|------------------|-----|-----|------|-----|-----|
| K1   | 105 | 6.0  | 15.0 | 90  | 90  | 15.0 | 130 | 75 <sub>j6</sub>  | 90  | 106 | 12 <sup>H9</sup> | 20 <sup>H7</sup> | 43  | 40  | □105 | 90  | 3.0 |
| K1   | 105 | 6.0  | 15.0 | 90  | 90  | 15.0 | 130 | 75 <sub>j6</sub>  | 90  | 106 | 12 <sup>H9</sup> | 25 <sup>H7</sup> | 43  | 40  | □105 | 90  | 3.0 |
| K1   | 105 | 6.0  | 15.0 | 90  | 90  | 15.0 | 130 | 75 <sub>j6</sub>  | 90  | 106 | 12 <sup>H9</sup> | 30 <sup>H7</sup> | 43  | 40  | □105 | 90  | 3.0 |
| K2   | 116 | 6.5  | 22.5 | 100 | 100 | 22.5 | –   | 82 <sub>j6</sub>  | 115 | 134 | 16 <sup>H9</sup> | 30 <sup>H7</sup> | 45  | 45  | □116 | 100 | 3.0 |
| K3   | 132 | 5.0  | 25.0 | 120 | 120 | 25.0 | –   | 95 <sub>j6</sub>  | 130 | 146 | 16 <sup>H9</sup> | 35 <sup>H7</sup> | 45  | 50  | □132 | 115 | 3.0 |
| K4   | 152 | 9.5  | 27.5 | 150 | 150 | 27.5 | –   | 110 <sub>j6</sub> | 148 | 173 | 20 <sup>H9</sup> | 40 <sup>H7</sup> | 55  | 55  | □152 | 130 | 3.5 |
| K5   | 145 | 9.5  | 30.0 | 250 | 190 | 30.0 | –   | 110 <sub>j6</sub> | 160 | 185 | 20 <sup>H9</sup> | 50 <sup>H7</sup> | 58  | 65  | □145 | 130 | 3.5 |
| K6   | 180 | 13.0 | 30.0 | 250 | 180 | 30.0 | –   | 140 <sub>j6</sub> | 168 | 200 | 20 <sup>H9</sup> | 50 <sup>H7</sup> | 58  | 70  | Ø183 | 165 | 3.5 |
| K7   | 195 | 15.0 | 35.0 | 300 | 213 | 35.0 | –   | 155 <sub>j6</sub> | 190 | 226 | 20 <sup>H9</sup> | 60 <sup>H7</sup> | 68  | 85  | Ø205 | 185 | 3.5 |
| K8   | 226 | 17.0 | 45.0 | 350 | 230 | 45.0 | –   | 185 <sub>j6</sub> | 235 | 282 | 24 <sup>H9</sup> | 70 <sup>H7</sup> | 72  | 100 | Ø184 | 215 | 4.0 |
| K9   | 280 | 16.0 | 45.0 | 450 | 315 | 45.0 | –   | 230 <sub>j6</sub> | 285 | 330 | 24 <sup>H9</sup> | 90 <sup>H7</sup> | 75  | 120 | Ø230 | 265 | 5.0 |

## Dimensions of gear units

| Type | h   | H   | i2   | ld  | ld1 | le    | lh  | las | lha   | m1  | s4  | sm  | sas | t4 | th   | uh                |
|------|-----|-----|------|-----|-----|-------|-----|-----|-------|-----|-----|-----|-----|----|------|-------------------|
| K1   | 60  | 160 | 7.0  | 24  | 28  | 98.0  | 120 | 12  | 127.0 | 60  | M8  | M6  | M8  | 13 | 22.8 | 6 <sup>JS9</sup>  |
| K1   | 60  | 160 | 7.0  | 24  | 28  | 98.0  | 120 | 12  | 127.0 | 60  | M8  | M10 | M12 | 13 | 28.3 | 8 <sup>JS9</sup>  |
| K1   | 60  | 160 | 7.0  | 24  | 28  | 93.5  | 120 | 12  | 127.0 | 60  | M8  | M10 | M12 | 13 | 32.0 | 8 <sup>JS9</sup>  |
| K2   | 65  | 190 | 7.0  | 32  | 38  | 121.5 | 148 | 12  | 156.0 | 65  | M8  | M10 | M12 | 13 | 33.3 | 8 <sup>JS9</sup>  |
| K3   | 75  | 213 | 7.0  | 32  | 38  | 125.0 | 160 | 12  | 168.0 | 75  | M8  | M12 | M16 | 13 | 38.3 | 10 <sup>JS9</sup> |
| K4   | 90  | 240 | 7.5  | 40  | 46  | 157.0 | 188 | 12  | 197.5 | 90  | M10 | M16 | M20 | 16 | 43.3 | 12 <sup>JS9</sup> |
| K5   | 160 | 260 | 7.5  | 40  | 46  | 164.0 | 200 | 12  | 209.5 | 100 | M10 | M16 | M20 | 16 | 53.8 | 14 <sup>JS9</sup> |
| K6   | 190 | 310 | 7.5  | 40  | 46  | 179.0 | 215 | 12  | 224.5 | 120 | M10 | M16 | M20 | 16 | 53.8 | 14 <sup>JS9</sup> |
| K7   | 212 | 342 | 8.0  | 64  | 70  | 214.0 | 242 | 12  | 252.0 | 125 | M12 | M20 | M24 | 19 | 64.4 | 18 <sup>JS9</sup> |
| K8   | 265 | 410 | 9.0  | 102 | 115 | 263.0 | 300 | 20  | 311.0 | 145 | M12 | M20 | M24 | 19 | 74.9 | 20 <sup>JS9</sup> |
| K9   | 315 | 495 | 10.0 | 102 | 115 | 302.0 | 350 | 26  | 361.0 | 180 | M16 | M24 | M30 | 26 | 95.4 | 25 <sup>JS9</sup> |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

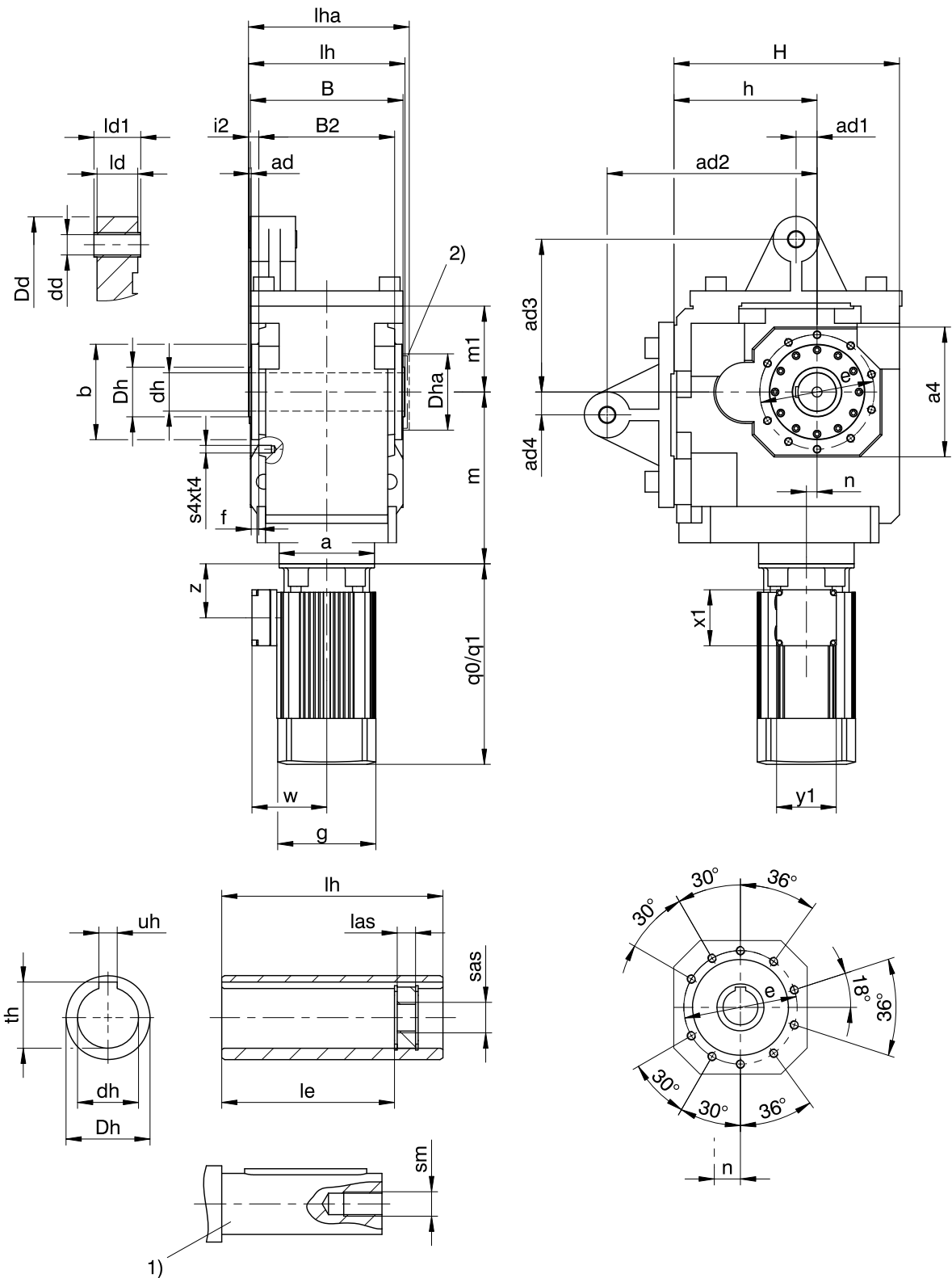
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |



4.3.4 A shaft design (hollow shaft), NGD housing design (foot + pitch circle diameter + torque arm bracket)



q0 Applies to motors without brake.

q1 Applies to motors with brake.

1) The length of the machine shaft must be at least 2.2 x  $\varnothing d_h$  and the length of the feather key must be at least 2 x  $\varnothing d_h$ .

2) Cover (optional)

- If you brace the gear units without the factory-adjusted torque arms provided for this purpose, the dimensions for  $ad_2$  and  $ad_3$  must meet the specified value.

## Dimensions of gear units

| Type | □a4 | ad | ad1 | ad2 | ad3 | ad4 | Øb                | B   | B2  | Ødd              | Ødh               | ØDd | ØDh | Dha  | Øe  | f  |
|------|-----|----|-----|-----|-----|-----|-------------------|-----|-----|------------------|-------------------|-----|-----|------|-----|----|
| K10  | 340 | 5  | 60  | 550 | 400 | 55  | 250 <sub>h6</sub> | 400 | 356 | 40 <sup>H9</sup> | 100 <sup>H7</sup> | 120 | 130 | Ø200 | 300 | 20 |

## Dimensions of gear units

| Type | h   | H   | i2 | ld  | ld1 | le  | lh  | las | lha | m1  | s4  | sm  | sas | t4 | th    | uh                |
|------|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-------|-------------------|
| K10  | 375 | 591 | 27 | 118 | 124 | 361 | 410 | 26  | 441 | 225 | M20 | M24 | M30 | 33 | 106.4 | 28 <sup>JS9</sup> |

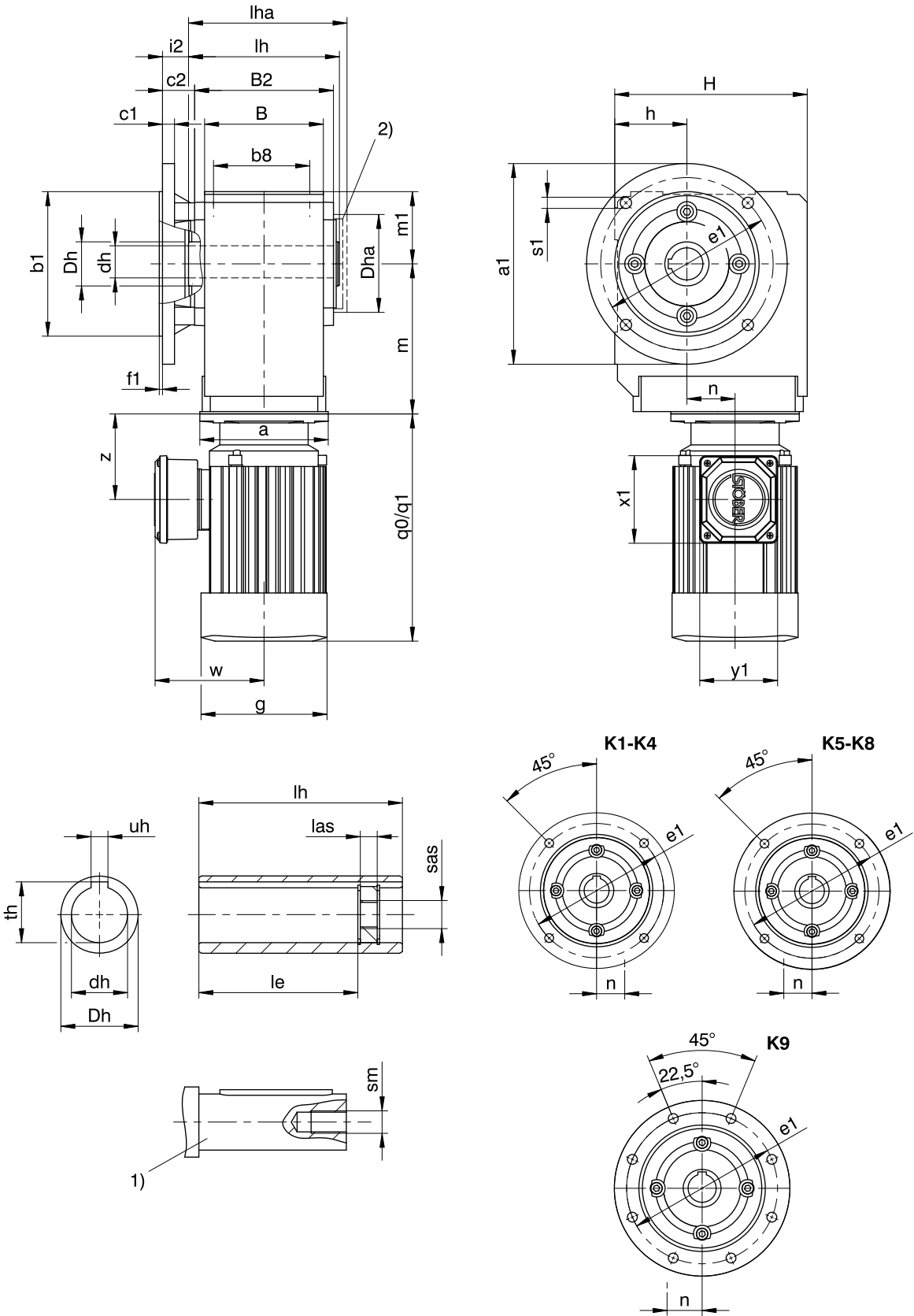
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

## Dimensions of geared motors

| Type  | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K1013 | –       | –   | –    | Ø300    | 392 | 28.0 | Ø300    | 392 | 28.0 | Ø350    | 415 | 28.0 | Ø400    | 415 | 28.0 |
| K1014 | Ø250    | 450 | 28.0 | Ø300    | 475 | 28.0 | Ø300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |

4.3.5 A shaft design (hollow shaft), F housing design (round flange)



- q0 Applies to motors without brake.

1) The length of the machine shaft must be at least 2.2 x Ødh and the length of the feather key must be at least 2 x Ødh.
- q1 Applies to motors with brake.

2) Cover (optional)

## Dimensions of gear units

| Type | Øa1 | Øb1               | b8  | B   | B2  | c1 | c2   | Ødh              | ØDh | Dha  | Øe1 | f1  | h   | H   | i2   | le    | lh  | las | lha   | m1  | Øs1 | sm  | sas | th   | uh                |
|------|-----|-------------------|-----|-----|-----|----|------|------------------|-----|------|-----|-----|-----|-----|------|-------|-----|-----|-------|-----|-----|-----|-----|------|-------------------|
| K1   | 160 | 110 <sub>js</sub> | 70  | 90  | 106 | 10 | 32.0 | 20 <sup>H7</sup> | 40  | □105 | 130 | 3.5 | 60  | 160 | 25.0 | 98.0  | 120 | 12  | 127.0 | 60  | 9   | M6  | M8  | 22.8 | 6 <sup>JS9</sup>  |
| K1   | 160 | 110 <sub>js</sub> | 70  | 90  | 106 | 10 | 32.0 | 25 <sup>H7</sup> | 40  | □105 | 130 | 3.5 | 60  | 160 | 25.0 | 98.0  | 120 | 12  | 127.0 | 60  | 9   | M10 | M12 | 28.3 | 8 <sup>JS9</sup>  |
| K1   | 160 | 110 <sub>js</sub> | 70  | 90  | 106 | 10 | 32.0 | 30 <sup>H7</sup> | 40  | □105 | 130 | 3.5 | 60  | 160 | 25.0 | 93.5  | 120 | 12  | 127.0 | 60  | 9   | M10 | M12 | 32.0 | 8 <sup>JS9</sup>  |
| K2   | 200 | 130 <sub>js</sub> | 90  | 115 | 134 | 12 | 32.0 | 30 <sup>H7</sup> | 45  | □116 | 165 | 3.5 | 65  | 190 | 25.0 | 121.5 | 148 | 12  | 156.0 | 65  | 11  | M10 | M12 | 33.3 | 8 <sup>JS9</sup>  |
| K3   | 200 | 130 <sub>js</sub> | 105 | 130 | 146 | 14 | 38.0 | 35 <sup>H7</sup> | 50  | □132 | 165 | 3.5 | 75  | 213 | 31.0 | 125.0 | 160 | 12  | 168.0 | 75  | 11  | M12 | M16 | 38.3 | 10 <sup>JS9</sup> |
| K4   | 250 | 180 <sub>js</sub> | 120 | 148 | 173 | 15 | 40.0 | 40 <sup>H7</sup> | 55  | □152 | 215 | 4.0 | 90  | 240 | 32.5 | 157.0 | 188 | 12  | 197.5 | 90  | 14  | M16 | M20 | 43.3 | 12 <sup>JS9</sup> |
| K5   | 250 | 180 <sub>js</sub> | 125 | 160 | 185 | 15 | 39.5 | 50 <sup>H7</sup> | 65  | □145 | 215 | 4.0 | 160 | 260 | 32.0 | 164.0 | 200 | 12  | 209.5 | 100 | 14  | M16 | M20 | 53.8 | 14 <sup>JS9</sup> |
| K6   | 300 | 230 <sub>js</sub> | 130 | 168 | 200 | 17 | 36.0 | 50 <sup>H7</sup> | 70  | Ø183 | 265 | 4.0 | 190 | 310 | 28.5 | 179.0 | 215 | 12  | 224.5 | 120 | 14  | M16 | M20 | 53.8 | 14 <sup>JS9</sup> |
| K7   | 350 | 250 <sub>h6</sub> | 145 | 190 | 226 | 18 | 44.0 | 60 <sup>H7</sup> | 85  | Ø205 | 300 | 5.0 | 212 | 342 | 36.0 | 214.0 | 242 | 12  | 252.0 | 125 | 18  | M20 | M24 | 64.4 | 18 <sup>JS9</sup> |
| K8   | 400 | 300 <sub>h6</sub> | 185 | 235 | 282 | 20 | 45.0 | 70 <sup>H7</sup> | 100 | Ø184 | 350 | 5.0 | 265 | 410 | 36.0 | 263.0 | 300 | 20  | 311.0 | 145 | 18  | M20 | M24 | 74.9 | 20 <sup>JS9</sup> |
| K9   | 450 | 350 <sub>h6</sub> | 225 | 285 | 330 | 23 | 50.0 | 90 <sup>H7</sup> | 120 | Ø230 | 400 | 5.0 | 315 | 495 | 40.0 | 302.0 | 350 | 26  | 361.0 | 180 | 18  | M24 | M30 | 95.4 | 25 <sup>JS9</sup> |

## Dimensions of additional round flanges

| Type | Øa1 | Øb1               | c1 | Øe1 | f1  | Øs1 |
|------|-----|-------------------|----|-----|-----|-----|
| K1   | 140 | 95 <sub>js</sub>  | 10 | 115 | 3.0 | 9   |
| K2   | 160 | 110 <sub>js</sub> | 12 | 130 | 3.5 | 9   |
| K3   | 160 | 110 <sub>js</sub> | 14 | 130 | 3.5 | 9   |
| K3   | 250 | 180 <sub>js</sub> | 14 | 215 | 4.0 | 14  |
| K8   | 350 | 250 <sub>h6</sub> | 18 | 300 | 5.0 | 18  |
| K8   | 450 | 350 <sub>h6</sub> | 20 | 400 | 5.0 | 18  |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.



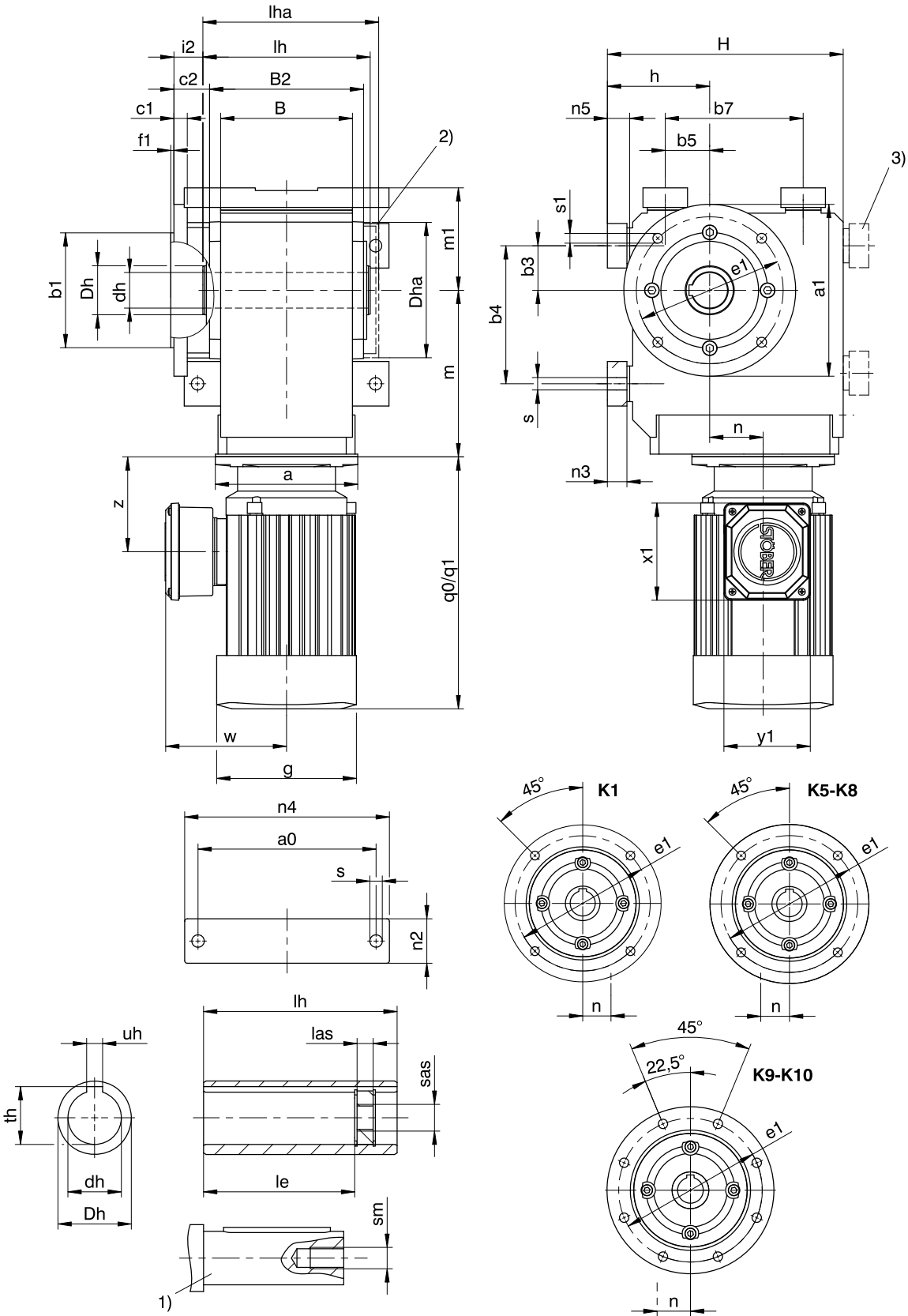
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |



4.3.6 A shaft design (hollow shaft), NF housing design (base + round flange)



- q0 Applies to motors without brake.

1) The length of the machine shaft must be at least 2.2 x  $\varnothing dh$  and the length of the feather key must be at least 2 x  $\varnothing dh$ .

3) Only for K1 (other sizes on request)
- q1 Applies to motors with brake.

2) Cover (optional)

## Dimensions of gear units

| Type | a0  | Øa1 | Øb1               | b3  | b4  | b5  | b7  | B   | B2  | c1 | c2   | Ødh               | ØDh | Dha  | Øe1 | f1  | h   |
|------|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|----|------|-------------------|-----|------|-----|-----|-----|
| K1   | 115 | 160 | 110 <sub>js</sub> | 30  | 90  | 30  | 90  | 90  | 106 | 10 | 32.0 | 20 <sup>H7</sup>  | 40  | □105 | 130 | 3.5 | 75  |
| K1   | 115 | 160 | 110 <sub>js</sub> | 30  | 90  | 30  | 90  | 90  | 106 | 10 | 32.0 | 25 <sup>H7</sup>  | 40  | □105 | 130 | 3.5 | 75  |
| K1   | 115 | 160 | 110 <sub>js</sub> | 30  | 90  | 30  | 90  | 90  | 106 | 10 | 32.0 | 30 <sup>H7</sup>  | 40  | □105 | 130 | 3.5 | 75  |
| K3   | 170 | 160 | 110 <sub>js</sub> | 40  | 130 | 40  | 130 | 130 | 146 | 14 | 38.0 | 35 <sup>H7</sup>  | 50  | □132 | 130 | 3.5 | 98  |
| K5   | 200 | 250 | 180 <sub>js</sub> | 40  | 140 | 100 | 140 | 160 | 185 | 15 | 39.5 | 50 <sup>H7</sup>  | 65  | □145 | 215 | 4.0 | 190 |
| K6   | 210 | 300 | 230 <sub>js</sub> | 50  | 160 | 110 | 160 | 168 | 200 | 17 | 36.0 | 50 <sup>H7</sup>  | 70  | Ø183 | 265 | 4.0 | 220 |
| K7   | 241 | 350 | 250 <sub>h6</sub> | 55  | 180 | 125 | 180 | 190 | 226 | 18 | 44.0 | 60 <sup>H7</sup>  | 85  | Ø205 | 300 | 5.0 | 250 |
| K8   | 300 | 400 | 300 <sub>h6</sub> | 75  | 240 | 165 | 240 | 235 | 282 | 20 | 45.0 | 70 <sup>H7</sup>  | 100 | Ø184 | 350 | 5.0 | 310 |
| K9   | 360 | 450 | 350 <sub>h6</sub> | 95  | 280 | 185 | 280 | 285 | 330 | 23 | 50.0 | 90 <sup>H7</sup>  | 120 | Ø230 | 400 | 5.0 | 365 |
| K10  | 330 | 550 | 450 <sub>h6</sub> | 115 | 350 | 265 | 420 | 400 | 356 | 25 | 78.0 | 100 <sup>H7</sup> | 130 | Ø200 | 500 | 5.0 | 420 |

## Dimensions of gear units

| Type | H   | i2   | las | le    | lh  | lha   | m1  | n2  | n3 | n4  | n5 | Øs   | Øs1 | sm  | sas | th    | uh                |
|------|-----|------|-----|-------|-----|-------|-----|-----|----|-----|----|------|-----|-----|-----|-------|-------------------|
| K1   | 175 | 25.0 | 12  | 98.0  | 120 | 127.0 | 75  | 30  | 13 | 140 | 15 | 9.0  | 9   | M10 | M12 | 28.3  | 8 <sup>JS9</sup>  |
| K1   | 175 | 25.0 | 12  | 98.0  | 120 | 127.0 | 75  | 30  | 13 | 140 | 15 | 9.0  | 9   | M6  | M8  | 22.8  | 6 <sup>JS9</sup>  |
| K1   | 175 | 25.0 | 12  | 93.5  | 120 | 127.0 | 75  | 30  | 13 | 140 | 15 | 9.0  | 9   | M10 | M12 | 32.0  | 8 <sup>JS9</sup>  |
| K3   | 236 | 31.0 | 12  | 125.0 | 160 | 168.0 | 98  | 45  | 20 | 200 | 23 | 11.0 | 9   | M12 | M16 | 38.3  | 10 <sup>JS9</sup> |
| K5   | 290 | 32.0 | 12  | 164.0 | 200 | 209.5 | 130 | 60  | 27 | 240 | 30 | 18.0 | 14  | M16 | M20 | 53.8  | 14 <sup>JS9</sup> |
| K6   | 340 | 28.5 | 12  | 179.0 | 215 | 224.5 | 150 | 65  | 27 | 250 | 30 | 18.5 | 14  | M16 | M20 | 53.8  | 14 <sup>JS9</sup> |
| K7   | 380 | 36.0 | 12  | 214.0 | 242 | 252.0 | 163 | 70  | 35 | 290 | 38 | 23.0 | 18  | M20 | M24 | 64.4  | 18 <sup>JS9</sup> |
| K8   | 455 | 36.0 | 20  | 263.0 | 300 | 311.0 | 190 | 85  | 41 | 360 | 45 | 27.0 | 18  | M20 | M24 | 74.9  | 20 <sup>JS9</sup> |
| K9   | 545 | 40.0 | 26  | 302.0 | 350 | 361.0 | 230 | 95  | 46 | 430 | 50 | 31.0 | 18  | M24 | M30 | 95.4  | 25 <sup>JS9</sup> |
| K10  | 636 | 51.0 | 26  | 361.0 | 410 | 441.0 | 270 | 120 | —  | 400 | 45 | 39.0 | 18  | M24 | M30 | 106.4 | 28 <sup>JS9</sup> |

## Dimensions of additional round flanges

| Type | Øa1 | Øb1               | c1 | Øe1 | f1 | Øs1 |
|------|-----|-------------------|----|-----|----|-----|
| K1   | 140 | 95 <sub>js</sub>  | 10 | 115 | 3  | 9   |
| K8   | 350 | 250 <sub>h6</sub> | 18 | 300 | 5  | 18  |
| K8   | 450 | 350 <sub>h6</sub> | 20 | 400 | 5  | 18  |

All other dimensions can be found on the next page.

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | Ø140    | 124 | 36.0 | Ø140    | 124 | 36.0 | Ø160    | 128 | 36.0 | Ø160    | 128 | 36.0 | –       | –   | –    |
| K302 | Ø140    | 163 | 52.5 | Ø140    | 163 | 52.5 | Ø160    | 167 | 52.5 | Ø160    | 167 | 52.5 | Ø200    | 169 | 52.5 |
| K303 | Ø140    | 200 | 52.5 | Ø140    | 200 | 52.5 | Ø160    | 210 | 16.0 | Ø160    | 210 | 16.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | Ø160    | 172 | 15.0 | Ø160    | 172 | 15.0 | Ø200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | Ø160    | 215 | 15.0 | Ø160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | Ø160    | 191 | 18.0 | Ø160    | 191 | 18.0 | Ø200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | Ø160    | 234 | 18.0 | Ø160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | Ø160    | 263 | 20.0 | Ø160    | 263 | 20.0 | Ø200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 353 | 25.0 |

| Type  | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K302  | Ø200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513  | Ø200    | 174 | 15.0 | Ø250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613  | Ø200    | 193 | 18.0 | Ø250    | 196 | 18.0 | Ø300    | 210 | 18.0 | Ø300    | 210 | 18.0 | –       | –   | –    | –       | –   | –    |
| K713  | Ø200    | 221 | 20.0 | Ø250    | 224 | 20.0 | Ø300    | 237 | 20.0 | Ø300    | 237 | 20.0 | –       | –   | –    | –       | –   | –    |
| K714  | Ø200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813  | Ø200    | 247 | 24.0 | Ø250    | 249 | 24.0 | Ø300    | 262 | 24.0 | Ø300    | 262 | 24.0 | –       | –   | –    | –       | –   | –    |
| K814  | Ø200    | 308 | 24.0 | Ø250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913  | –       | –   | –    | Ø250    | 294 | 25.0 | Ø300    | 307 | 25.0 | Ø300    | 307 | 25.0 | Ø350    | 330 | 25.0 | –       | –   | –    |
| K914  | Ø200    | 353 | 25.0 | Ø250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K1013 | –       | –   | –    | –       | –   | –    | Ø300    | 392 | 28.0 | Ø300    | 392 | 28.0 | Ø350    | 415 | 28.0 | Ø400    | 415 | 28.0 |
| K1014 | –       | –   | –    | Ø250    | 450 | 28.0 | Ø300    | 475 | 28.0 | Ø300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |





## Dimensions of gear units

| Type | a4  | Øb                | b3 | b4  | b5  | b7  | b8  | B   | B2  | Øds              | Øds1                           | Øds2 | Ødss | ØDs | ØDsa  | ØDss | Øe  | f   | h   | H   | i2   | ls  | lsa | m1  | m2 | m3 | m4 | m5 | s3  | s4  | t3 | t4 |
|------|-----|-------------------|----|-----|-----|-----|-----|-----|-----|------------------|--------------------------------|------|------|-----|-------|------|-----|-----|-----|-----|------|-----|-----|-----|----|----|----|----|-----|-----|----|----|
| K1   | 105 | 75 <sub>j6</sub>  | 30 | 90  | 30  | 90  | 70  | 90  | 106 | 25 <sub>h9</sub> | 25 <sub>h9</sub> <sup>H7</sup> | 25.5 | 30   | 40  | 80    | 60   | 90  | 3.0 | 60  | 160 | 7.0  | 149 | 163 | 60  | 20 | 34 | 25 | 29 | M8  | M8  | 13 | 13 |
| K2   | 116 | 82 <sub>j6</sub>  | 35 | 115 | 35  | 115 | 90  | 115 | 134 | 30 <sub>h9</sub> | 30 <sub>h9</sub> <sup>H7</sup> | 30.5 | 36   | 45  | 88    | 72   | 100 | 3.0 | 65  | 190 | 7.0  | 178 | 193 | 65  | 25 | 39 | 30 | 34 | M10 | M8  | 16 | 13 |
| K3   | 132 | 95 <sub>j6</sub>  | 40 | 130 | 40  | 130 | 105 | 130 | 146 | 35 <sub>h9</sub> | 35 <sub>h9</sub> <sup>H7</sup> | 35.5 | 44   | 50  | 101   | 80   | 115 | 3.0 | 75  | 213 | 7.0  | 190 | 206 | 75  | 30 | 39 | 35 | 34 | M10 | M8  | 16 | 13 |
| K4   | 152 | 110 <sub>j6</sub> | 50 | 155 | 50  | 155 | 120 | 148 | 173 | 40 <sub>h9</sub> | 40 <sub>h9</sub> <sup>H7</sup> | 40.5 | 50   | 55  | 114   | 88   | 130 | 3.5 | 90  | 240 | 7.5  | 220 | 243 | 90  | 40 | 39 | 45 | 34 | M12 | M10 | 19 | 16 |
| K5   | 145 | 110 <sub>j6</sub> | 40 | 140 | 100 | 140 | 125 | 160 | 185 | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 65  | 116   | 106  | 130 | 3.5 | 160 | 260 | 7.5  | 237 | 254 | 100 | 40 | 44 | 45 | 39 | M16 | M10 | 26 | 16 |
| K6   | 180 | 140 <sub>j6</sub> | 50 | 160 | 110 | 160 | 130 | 168 | 200 | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 70  | 128   | 106  | 165 | 3.5 | 190 | 310 | 7.5  | 254 | 276 | 120 | 40 | 45 | 45 | 40 | M16 | M10 | 26 | 16 |
| K7   | 195 | 155 <sub>h6</sub> | 55 | 180 | 125 | 180 | 145 | 190 | 226 | 60 <sub>h6</sub> | 60 <sub>h6</sub> <sup>H7</sup> | 62.0 | 75   | 85  | 161.5 | 138  | 185 | 3.5 | 212 | 342 | 8.0  | 278 | 314 | 125 | 40 | 45 | 45 | 40 | M20 | M12 | 33 | 19 |
| K8   | 226 | 185 <sub>h6</sub> | 75 | 240 | 165 | 240 | 185 | 235 | 282 | 70 <sub>h6</sub> | 70 <sub>h6</sub> <sup>H7</sup> | 72.0 | 90   | 100 | 193   | 155  | 215 | 4.0 | 265 | 410 | 9.0  | 352 | 378 | 145 | 50 | 60 | 60 | 50 | M24 | M12 | 38 | 19 |
| K9   | 280 | 230 <sub>h6</sub> | 95 | 280 | 185 | 280 | 225 | 285 | 330 | 90 <sub>h6</sub> | 90 <sub>h6</sub> <sup>H7</sup> | 92.0 | 120  | 120 | 244   | 200  | 265 | 5.0 | 315 | 495 | 10.0 | 418 | 428 | 180 | 60 | 70 | 70 | 60 | M30 | M16 | 48 | 26 |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.



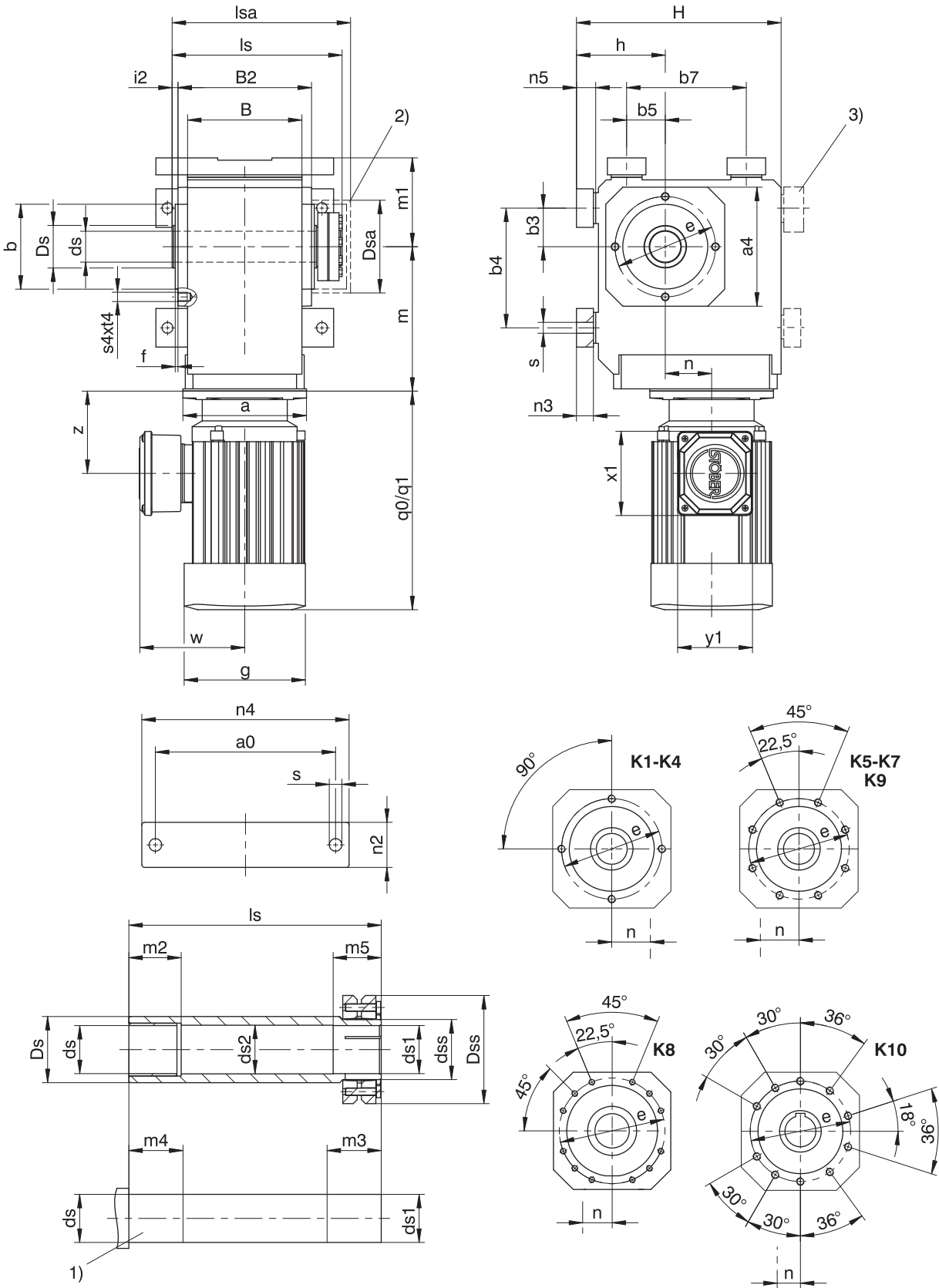
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |



4.3.8 S shaft design (hollow shaft with shrink disk), NG housing design (base + pitch circle diameter)



- |    |                                                                             |    |                               |
|----|-----------------------------------------------------------------------------|----|-------------------------------|
| q0 | Applies to motors without brake.                                            | q1 | Applies to motors with brake. |
| 1) | Machine shaft: The dimension $l_s$ must meet or exceed the specified value. | 2) | Cover (optional)              |
| 3) | Only for K1 (other sizes on request)                                        |    |                               |

## Dimensions of gear units

| Type | a0  | a4  | Øb                | b3  | b4  | b5  | b7  | B   | B2  | Øds               | Øds1                            | Øds2  | Ødss | ØDs | ØDsa  |
|------|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|-------------------|---------------------------------|-------|------|-----|-------|
| K1   | 115 | 105 | 75 <sub>j6</sub>  | 30  | 90  | 30  | 90  | 90  | 106 | 25 <sub>h9</sub>  | 25 <sub>h9</sub> <sup>H7</sup>  | 25.5  | 30   | 40  | 80    |
| K2   | 155 | 116 | 82 <sub>j6</sub>  | 35  | 115 | 35  | 115 | 115 | 134 | 30 <sub>h9</sub>  | 30 <sub>h9</sub> <sup>H7</sup>  | 30.5  | 36   | 45  | 88    |
| K3   | 170 | 132 | 95 <sub>j6</sub>  | 40  | 130 | 40  | 130 | 130 | 146 | 35 <sub>h9</sub>  | 35 <sub>h9</sub> <sup>H7</sup>  | 35.5  | 44   | 50  | 101   |
| K4   | 200 | 152 | 110 <sub>j6</sub> | 50  | 155 | 50  | 155 | 148 | 173 | 40 <sub>h9</sub>  | 40 <sub>h9</sub> <sup>H7</sup>  | 40.5  | 50   | 55  | 114   |
| K5   | 200 | 145 | 110 <sub>j6</sub> | 40  | 140 | 100 | 140 | 160 | 185 | 50 <sub>h9</sub>  | 50 <sub>h9</sub> <sup>H7</sup>  | 50.5  | 62   | 65  | 116   |
| K6   | 210 | 180 | 140 <sub>j6</sub> | 50  | 160 | 110 | 160 | 168 | 200 | 50 <sub>h9</sub>  | 50 <sub>h9</sub> <sup>H7</sup>  | 50.5  | 62   | 70  | 128   |
| K7   | 241 | 195 | 155 <sub>j6</sub> | 55  | 180 | 125 | 180 | 190 | 226 | 60 <sub>h6</sub>  | 60 <sub>h6</sub> <sup>H7</sup>  | 62.0  | 75   | 85  | 161.5 |
| K8   | 300 | 226 | 185 <sub>j6</sub> | 75  | 240 | 165 | 240 | 235 | 282 | 70 <sub>h6</sub>  | 70 <sub>h6</sub> <sup>H7</sup>  | 72.0  | 90   | 100 | 193   |
| K9   | 360 | 280 | 230 <sub>j6</sub> | 95  | 280 | 185 | 280 | 285 | 330 | 90 <sub>h6</sub>  | 90 <sub>h6</sub> <sup>H7</sup>  | 92.0  | 120  | 120 | 244   |
| K10  | 330 | 340 | 250 <sub>h6</sub> | 115 | 350 | 265 | 420 | 400 | 356 | 100 <sub>h6</sub> | 100 <sub>h6</sub> <sup>H7</sup> | 102.0 | 130  | 130 | 274   |

## Dimensions of gear units

| Type | ØDss | Øe  | f    | h   | H   | i2   | ls  | lsa | m1  | m2 | m3 | m4 | m5 | n2  | n3 | n4  | n5 | Øs   | s4  | t4 |
|------|------|-----|------|-----|-----|------|-----|-----|-----|----|----|----|----|-----|----|-----|----|------|-----|----|
| K1   | 60   | 90  | 3.0  | 75  | 175 | 7.0  | 149 | 163 | 75  | 20 | 34 | 25 | 29 | 30  | 13 | 140 | 15 | 9.0  | M8  | 13 |
| K2   | 72   | 100 | 3.0  | 88  | 213 | 7.0  | 178 | 193 | 88  | 25 | 39 | 30 | 34 | 40  | 20 | 185 | 23 | 11.0 | M8  | 13 |
| K3   | 80   | 115 | 3.0  | 98  | 236 | 7.0  | 190 | 206 | 98  | 30 | 39 | 35 | 34 | 45  | 20 | 200 | 23 | 11.0 | M8  | 13 |
| K4   | 88   | 130 | 3.5  | 115 | 265 | 7.5  | 220 | 243 | 115 | 40 | 39 | 45 | 34 | 50  | 22 | 230 | 25 | 14.0 | M10 | 16 |
| K5   | 106  | 130 | 3.5  | 190 | 290 | 7.5  | 237 | 254 | 130 | 40 | 44 | 45 | 39 | 60  | 27 | 240 | 30 | 18.0 | M10 | 16 |
| K6   | 106  | 165 | 3.5  | 220 | 340 | 7.5  | 254 | 276 | 150 | 40 | 45 | 45 | 40 | 65  | 27 | 250 | 30 | 18.5 | M10 | 16 |
| K7   | 138  | 185 | 3.5  | 250 | 380 | 8.0  | 278 | 314 | 163 | 40 | 45 | 45 | 40 | 70  | 35 | 290 | 38 | 23.0 | M12 | 19 |
| K8   | 155  | 215 | 4.0  | 310 | 455 | 9.0  | 352 | 378 | 190 | 50 | 60 | 60 | 50 | 85  | 41 | 360 | 45 | 27.0 | M12 | 19 |
| K9   | 200  | 265 | 5.0  | 365 | 545 | 10.0 | 418 | 428 | 230 | 60 | 70 | 70 | 60 | 95  | 46 | 430 | 50 | 31.0 | M16 | 26 |
| K10  | 215  | 300 | 20.0 | 420 | 636 | 27.0 | 483 | 497 | 270 | 60 | 80 | 70 | 70 | 120 | –  | 400 | 45 | 39.0 | M20 | 33 |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

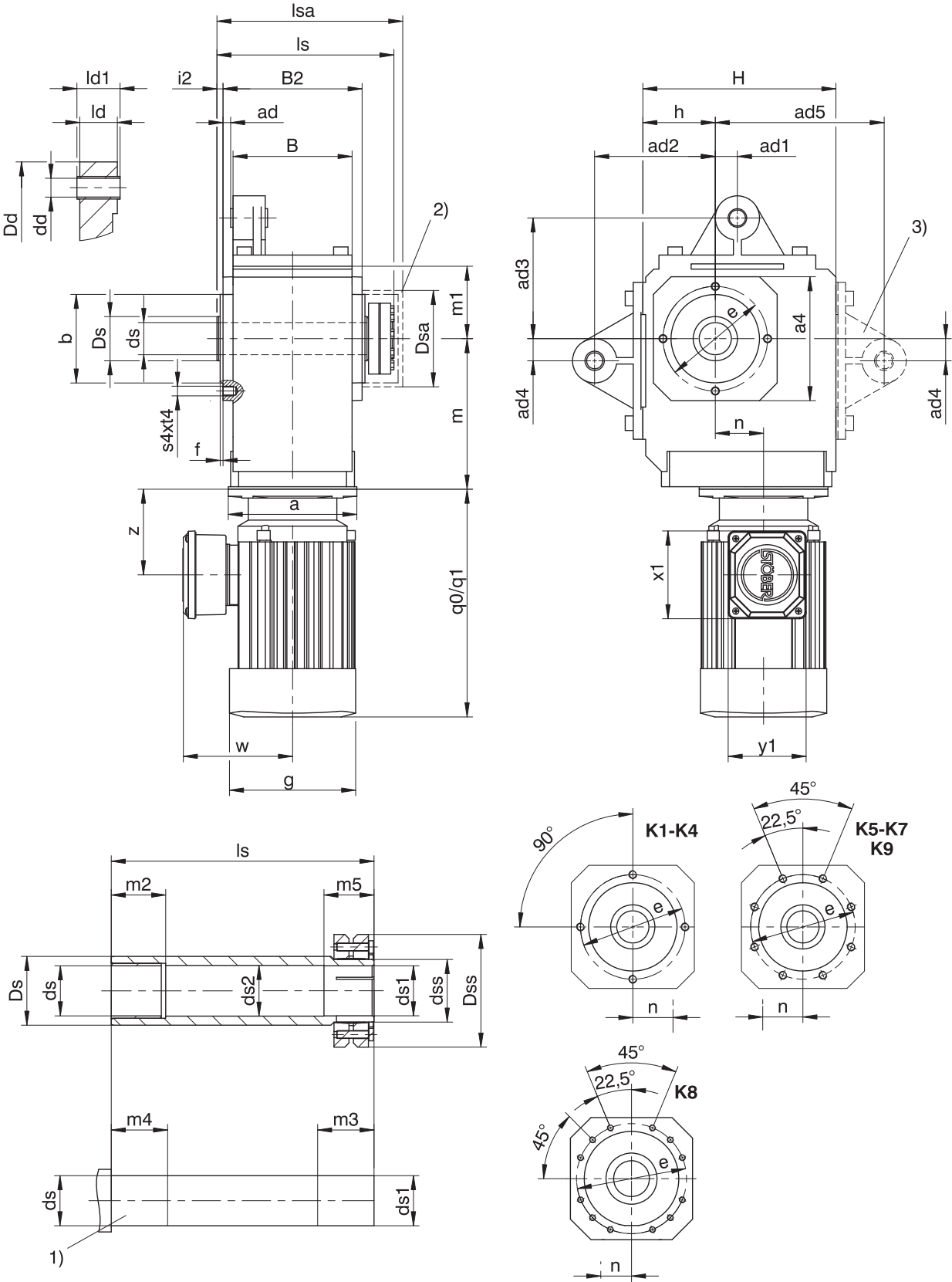
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type  | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202  | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302  | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402  | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513  | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613  | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    | –       | –   | –    |
| K713  | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    | –       | –   | –    |
| K714  | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813  | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    | –       | –   | –    |
| K814  | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913  | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 | –       | –   | –    |
| K914  | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K1013 | –       | –   | –    | –       | –   | –    | ∅300    | 392 | 28.0 | ∅300    | 392 | 28.0 | ∅350    | 415 | 28.0 | ∅400    | 415 | 28.0 |
| K1014 | –       | –   | –    | ∅250    | 450 | 28.0 | ∅300    | 475 | 28.0 | ∅300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |



4.3.9 S shaft design (hollow shaft with shrink disk), GD housing design (pitch circle diameter + torque arm bracket)



q0 Applies to motors without brake.

1) Machine shaft: The dimension  $l_s$  must meet or exceed the specified value.

3) Only for K1 (other sizes on request)

q1 Applies to motors with brake.

2) Cover (optional)

- If you brace the gear units without the factory-adjusted torque arms provided for this purpose, the dimensions for  $ad_2$  and  $ad_3$  must meet the specified value.

## Dimensions of gear units

| Type | □a4 | ad   | ad1  | ad2 | ad3 | ad4  | ad5 | Øb                | B   | B2  | Ødd                            | Øds              | Øds1                           | Øds2 | Ødss | ØDd | ØDs | ØDsa  |
|------|-----|------|------|-----|-----|------|-----|-------------------|-----|-----|--------------------------------|------------------|--------------------------------|------|------|-----|-----|-------|
| K1   | 105 | 6.0  | 15.0 | 90  | 90  | 15.0 | 130 | 75 <sub>j6</sub>  | 90  | 106 | 12 <sup>H9</sup> <sub>j9</sub> | 25 <sub>h9</sub> | 25 <sub>h9</sub> <sup>H7</sup> | 25.5 | 30   | 43  | 40  | 80    |
| K2   | 116 | 6.5  | 22.5 | 100 | 100 | 22.5 | —   | 82 <sub>j6</sub>  | 115 | 134 | 16 <sup>H9</sup> <sub>j9</sub> | 30 <sub>h9</sub> | 30 <sub>h9</sub> <sup>H7</sup> | 30.5 | 36   | 45  | 45  | 88    |
| K3   | 132 | 5.0  | 25.0 | 120 | 120 | 25.0 | —   | 95 <sub>j6</sub>  | 130 | 146 | 16 <sup>H9</sup> <sub>j9</sub> | 35 <sub>h9</sub> | 35 <sub>h9</sub> <sup>H7</sup> | 35.5 | 44   | 45  | 50  | 101   |
| K4   | 152 | 9.5  | 27.5 | 150 | 150 | 27.5 | —   | 110 <sub>j6</sub> | 148 | 173 | 20 <sup>H9</sup> <sub>j9</sub> | 40 <sub>h9</sub> | 40 <sub>h9</sub> <sup>H7</sup> | 40.5 | 50   | 55  | 55  | 114   |
| K5   | 145 | 9.5  | 30.0 | 250 | 190 | 30.0 | —   | 110 <sub>j6</sub> | 160 | 185 | 20 <sup>H9</sup> <sub>j9</sub> | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 58  | 65  | 116   |
| K6   | 180 | 13.0 | 30.0 | 250 | 180 | 30.0 | —   | 140 <sub>j6</sub> | 168 | 200 | 20 <sup>H9</sup> <sub>j9</sub> | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 58  | 70  | 128   |
| K7   | 195 | 15.0 | 35.0 | 300 | 213 | 35.0 | —   | 155 <sub>h6</sub> | 190 | 226 | 20 <sup>H9</sup> <sub>j9</sub> | 60 <sub>h6</sub> | 60 <sub>h6</sub> <sup>H7</sup> | 62.0 | 75   | 68  | 85  | 161.5 |
| K8   | 226 | 17.0 | 45.0 | 350 | 230 | 45.0 | —   | 185 <sub>h6</sub> | 235 | 282 | 24 <sup>H9</sup> <sub>j9</sub> | 70 <sub>h6</sub> | 70 <sub>h6</sub> <sup>H7</sup> | 72.0 | 90   | 72  | 100 | 193   |
| K9   | 280 | 16.0 | 45.0 | 450 | 315 | 45.0 | —   | 230 <sub>h6</sub> | 285 | 330 | 24 <sup>H9</sup> <sub>j9</sub> | 90 <sub>h6</sub> | 90 <sub>h6</sub> <sup>H7</sup> | 92.0 | 120  | 75  | 120 | 244   |

## Dimensions of gear units

| Type | ØDss | Øe  | f   | h   | H   | i2   | ld  | ld1 | ls  | lsa | m1  | m2 | m3 | m4 | m5 | s4  | t4 |
|------|------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|----|----|----|----|-----|----|
| K1   | 60   | 90  | 3.0 | 60  | 160 | 7.0  | 24  | 28  | 149 | 163 | 60  | 20 | 34 | 25 | 29 | M8  | 13 |
| K2   | 72   | 100 | 3.0 | 65  | 190 | 7.0  | 32  | 38  | 178 | 193 | 65  | 25 | 39 | 30 | 34 | M8  | 13 |
| K3   | 80   | 115 | 3.0 | 75  | 213 | 7.0  | 32  | 38  | 190 | 206 | 75  | 30 | 39 | 35 | 34 | M8  | 13 |
| K4   | 88   | 130 | 3.5 | 90  | 240 | 7.5  | 40  | 46  | 220 | 243 | 90  | 40 | 39 | 45 | 34 | M10 | 16 |
| K5   | 106  | 130 | 3.5 | 160 | 260 | 7.5  | 40  | 46  | 237 | 254 | 100 | 40 | 44 | 45 | 39 | M10 | 16 |
| K6   | 106  | 165 | 3.5 | 190 | 310 | 7.5  | 40  | 46  | 254 | 276 | 120 | 40 | 45 | 45 | 40 | M10 | 16 |
| K7   | 138  | 185 | 3.5 | 212 | 342 | 8.0  | 64  | 70  | 278 | 314 | 125 | 40 | 45 | 45 | 40 | M12 | 19 |
| K8   | 155  | 215 | 4.0 | 265 | 410 | 9.0  | 102 | 115 | 352 | 378 | 145 | 50 | 60 | 60 | 50 | M12 | 19 |
| K9   | 200  | 265 | 5.0 | 315 | 495 | 10.0 | 102 | 115 | 418 | 428 | 180 | 60 | 70 | 70 | 60 | M16 | 26 |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.



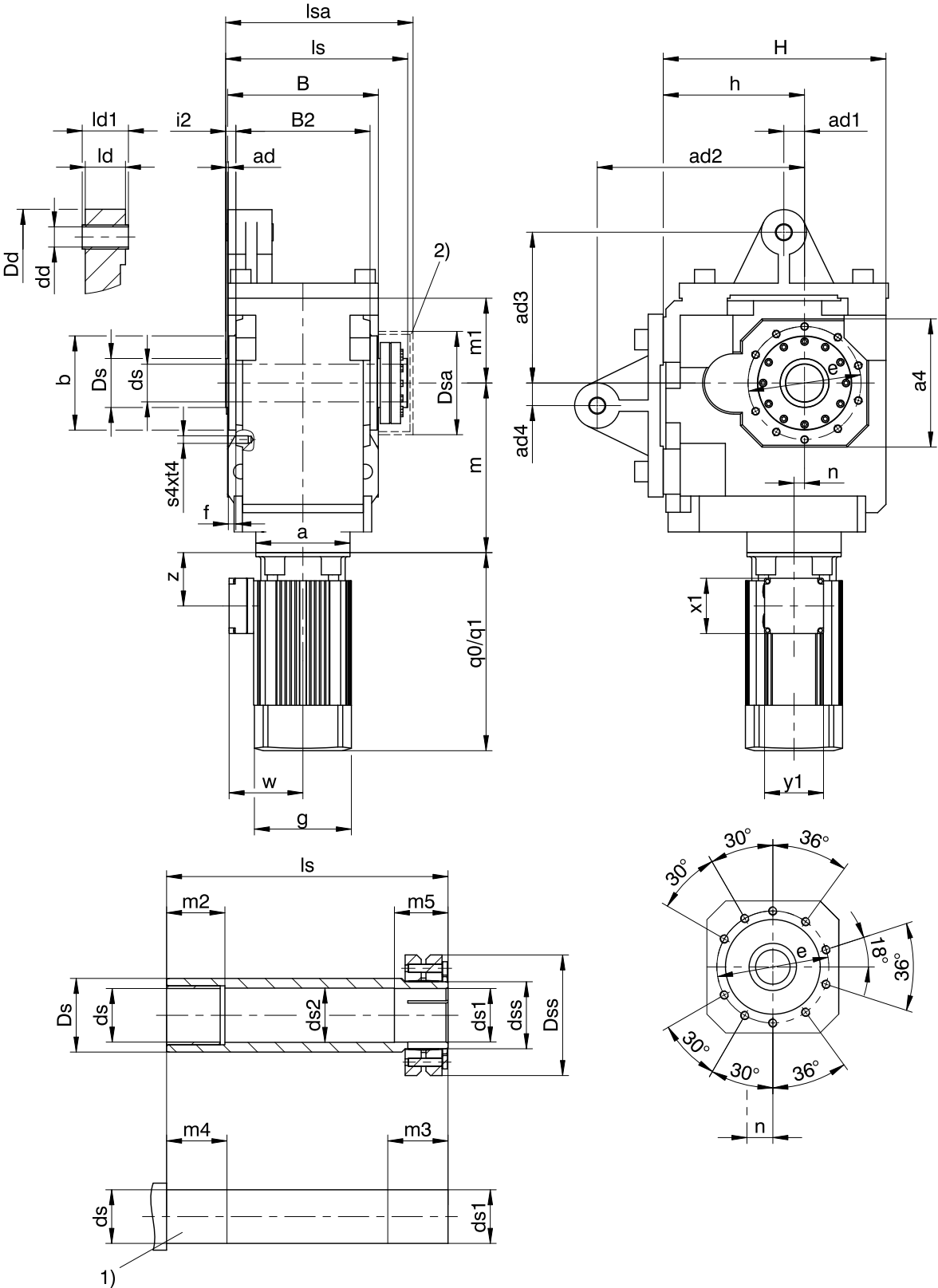
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |



4.3.10 S shaft design (hollow shaft with shrink disk), NGD housing design (foot + pitch circle diameter + torque arm bracket)



q0 Applies to motors without brake.

q1 Applies to motors with brake.

1) Machine shaft: The dimension  $l_s$  must meet or exceed the specified value.

2) Cover (optional)

- If you brace the gear units without the factory-adjusted torque arms provided for this purpose, the dimensions for  $ad_2$  and  $ad_3$  must meet the specified value.

## Dimensions of gear units

| Type | □a4 | ad | ad1 | ad2 | ad3 | ad4 | Øb                | B   | B2  | Ødd              | Øds               | Øds1                            | Øds2 | Ødss | ØDd | ØDs | ØDsa |
|------|-----|----|-----|-----|-----|-----|-------------------|-----|-----|------------------|-------------------|---------------------------------|------|------|-----|-----|------|
| K10  | 340 | 5  | 55  | 550 | 400 | 60  | 250 <sub>h6</sub> | 400 | 356 | 40 <sup>H9</sup> | 100 <sub>h6</sub> | 100 <sub>h6</sub> <sup>H7</sup> | 102  | 130  | 120 | 130 | 274  |

## Dimensions of gear units

| Type | ØDss | Øe  | f  | h   | H   | i2 | ld  | ld1 | ls  | lsa | m1  | m2 | m3 | m4 | m5 | s4  | t4 |
|------|------|-----|----|-----|-----|----|-----|-----|-----|-----|-----|----|----|----|----|-----|----|
| K10  | 215  | 300 | 20 | 375 | 591 | 27 | 118 | 124 | 483 | 497 | 225 | 60 | 80 | 70 | 70 | M20 | 33 |

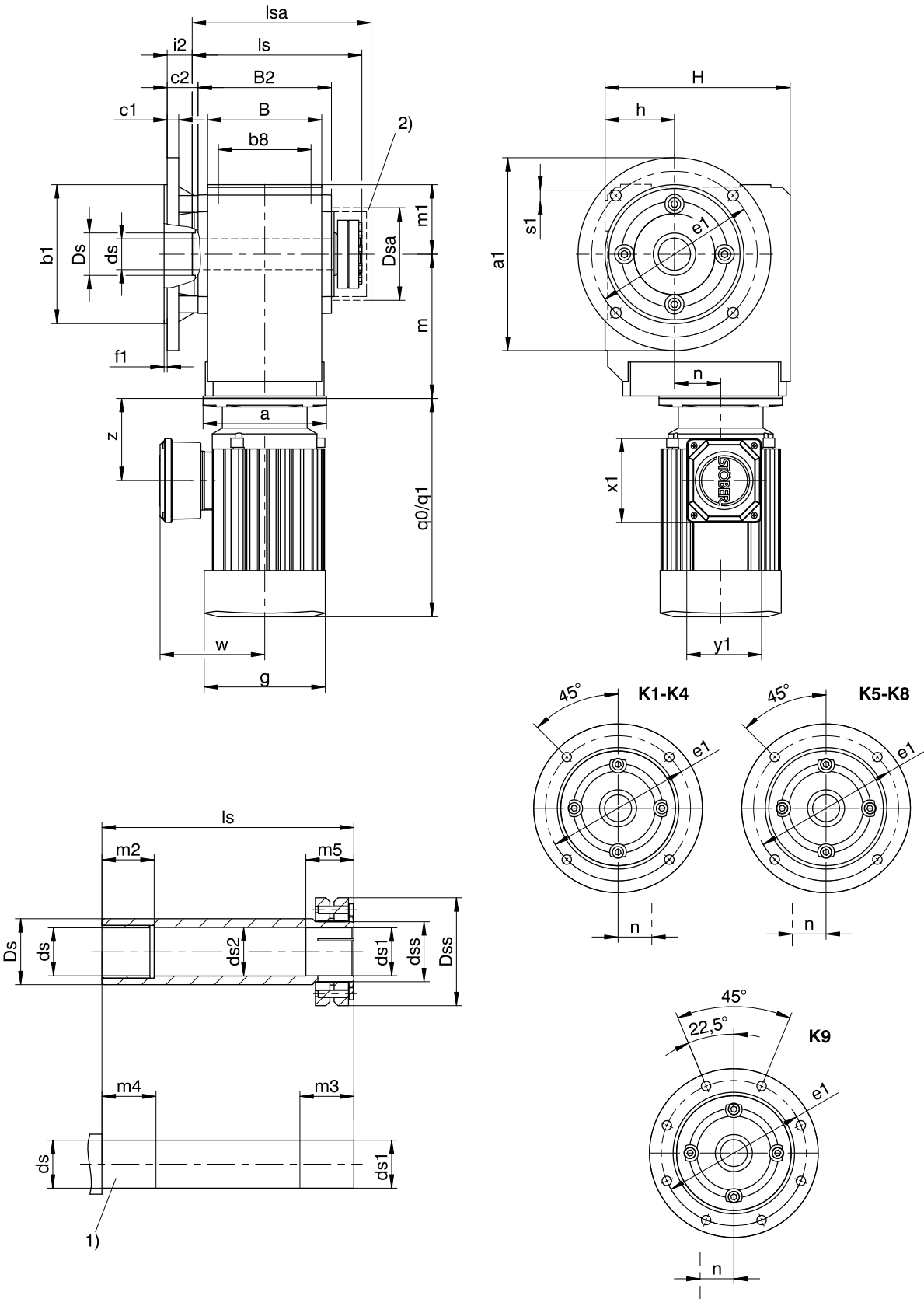
## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

## Dimensions of geared motors

| Type  | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K1013 | –       | –   | –    | Ø300    | 392 | 28.0 | Ø300    | 392 | 28.0 | Ø350    | 415 | 28.0 | Ø400    | 415 | 28.0 |
| K1014 | Ø250    | 450 | 28.0 | Ø300    | 475 | 28.0 | Ø300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |

4.3.11 S shaft design (hollow shaft with shrink disk), F housing design (round flange)



- q0 Applies to motors without brake.

1) Machine shaft: The dimension  $l_s$  must meet or exceed the specified value.
- q1 Applies to motors with brake.

2) Cover (optional)

## Dimensions of gear units

| Type | Øa1 | Øb1               | b8  | B   | B2  | c1 | c2   | Øds              | Øds1                           | Øds2 | Ødss | ØDs | ØDsa  | ØDss | Øe1 | f1  | h   | H   | i2   | ls  | lsa | m1  | m2 | m3 | m4 | m5 | Øs1 |
|------|-----|-------------------|-----|-----|-----|----|------|------------------|--------------------------------|------|------|-----|-------|------|-----|-----|-----|-----|------|-----|-----|-----|----|----|----|----|-----|
| K1   | 160 | 110 <sub>β</sub>  | 70  | 90  | 106 | 10 | 32.0 | 25 <sub>h9</sub> | 25 <sub>h9</sub> <sup>H7</sup> | 25.5 | 30   | 40  | 80    | 60   | 130 | 3.5 | 60  | 160 | 25.0 | 149 | 163 | 60  | 20 | 34 | 25 | 29 | 9   |
| K2   | 200 | 130 <sub>β</sub>  | 90  | 115 | 134 | 12 | 32.0 | 30 <sub>h9</sub> | 30 <sub>h9</sub> <sup>H7</sup> | 30.5 | 36   | 45  | 88    | 72   | 165 | 3.5 | 65  | 190 | 25.0 | 178 | 193 | 65  | 25 | 39 | 30 | 34 | 11  |
| K3   | 200 | 130 <sub>β</sub>  | 105 | 130 | 146 | 14 | 38.0 | 35 <sub>h9</sub> | 35 <sub>h9</sub> <sup>H7</sup> | 35.5 | 44   | 50  | 101   | 80   | 165 | 3.5 | 75  | 213 | 31.0 | 190 | 206 | 75  | 30 | 39 | 35 | 34 | 11  |
| K4   | 250 | 180 <sub>β</sub>  | 120 | 148 | 173 | 15 | 40.0 | 40 <sub>h9</sub> | 40 <sub>h9</sub> <sup>H7</sup> | 40.5 | 50   | 55  | 114   | 88   | 215 | 4.0 | 90  | 240 | 32.5 | 220 | 243 | 90  | 40 | 39 | 45 | 34 | 14  |
| K5   | 250 | 180 <sub>β</sub>  | 125 | 160 | 185 | 15 | 39.5 | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 65  | 116   | 106  | 215 | 4.0 | 160 | 260 | 32.0 | 237 | 254 | 100 | 40 | 44 | 45 | 39 | 14  |
| K6   | 300 | 230 <sub>β</sub>  | 130 | 168 | 200 | 17 | 36.0 | 50 <sub>h9</sub> | 50 <sub>h9</sub> <sup>H7</sup> | 50.5 | 62   | 70  | 128   | 106  | 265 | 4.0 | 190 | 310 | 28.5 | 254 | 276 | 120 | 40 | 45 | 45 | 40 | 14  |
| K7   | 350 | 250 <sub>h6</sub> | 145 | 190 | 226 | 18 | 44.0 | 60 <sub>h6</sub> | 60 <sub>h6</sub> <sup>H7</sup> | 62.0 | 75   | 85  | 161.5 | 138  | 300 | 5.0 | 212 | 342 | 36.0 | 278 | 314 | 125 | 40 | 45 | 45 | 40 | 18  |
| K8   | 400 | 300 <sub>h6</sub> | 185 | 235 | 282 | 20 | 45.0 | 70 <sub>h6</sub> | 70 <sub>h6</sub> <sup>H7</sup> | 72.0 | 90   | 100 | 193   | 155  | 350 | 5.0 | 265 | 410 | 36.0 | 352 | 378 | 145 | 50 | 60 | 60 | 50 | 18  |
| K9   | 450 | 350 <sub>h6</sub> | 225 | 285 | 330 | 23 | 50.0 | 90 <sub>h6</sub> | 90 <sub>h6</sub> <sup>H7</sup> | 92.0 | 120  | 120 | 244   | 200  | 400 | 5.0 | 315 | 495 | 40.0 | 418 | 428 | 180 | 60 | 70 | 70 | 60 | 18  |

## Dimensions of additional round flanges

| Type | Øa1 | Øb1               | c1 | Øe1 | f1  | Øs1 |
|------|-----|-------------------|----|-----|-----|-----|
| K1   | 140 | 95 <sub>β</sub>   | 10 | 115 | 3.0 | 9   |
| K2   | 160 | 110 <sub>β</sub>  | 12 | 130 | 3.5 | 9   |
| K3   | 160 | 110 <sub>β</sub>  | 14 | 130 | 3.5 | 9   |
| K3   | 250 | 180 <sub>β</sub>  | 14 | 215 | 4.0 | 14  |
| K8   | 350 | 250 <sub>h6</sub> | 18 | 300 | 5.0 | 18  |
| K8   | 450 | 350 <sub>h6</sub> | 20 | 400 | 5.0 | 18  |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

## Dimensions of geared motors

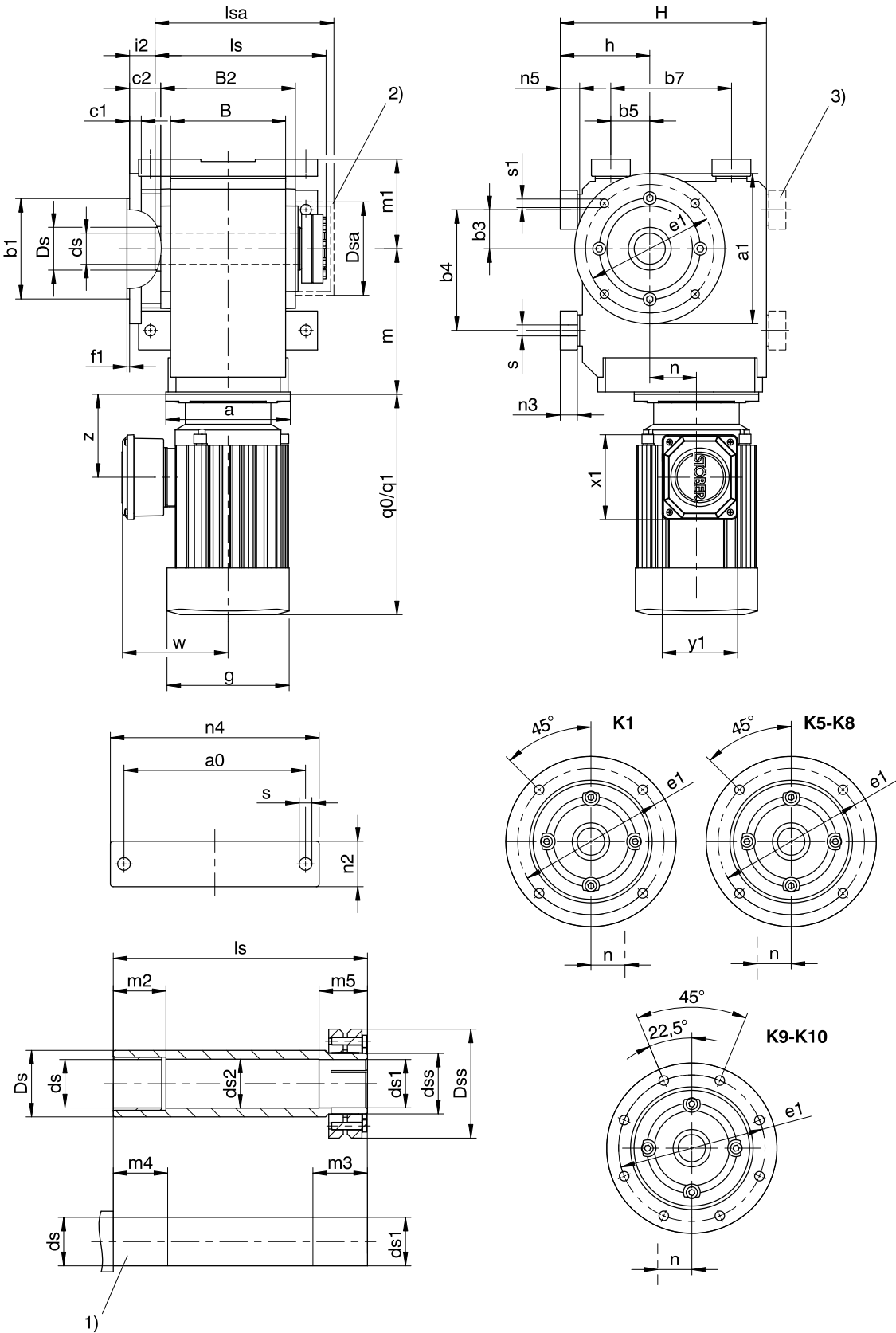
| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |





4.3.12 S shaft design (hollow shaft with shrink disk), NF housing design (base + round flange)



- q0 Applies to motors without brake.

1) Machine shaft: The dimension  $l_s$  must meet or exceed the specified value.

3) Only for K1 (other sizes on request)
- q1 Applies to motors with brake.

2) Cover (optional)

## Dimensions of gear units

| Type | a0  | Øa1 | Øb1               | b3  | b4  | b5  | b7  | B   | B2  | c1 | c2   | Øds               | Øds1                            | Øds2  | Ødss | ØDs | ØDsa  | ØDss |
|------|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|----|------|-------------------|---------------------------------|-------|------|-----|-------|------|
| K1   | 115 | 160 | 110 <sub>j6</sub> | 30  | 90  | 30  | 90  | 90  | 106 | 10 | 32.0 | 25 <sub>h9</sub>  | 25 <sub>h9</sub> <sup>H7</sup>  | 25.5  | 30   | 40  | 80.0  | 60   |
| K3   | 170 | 160 | 110 <sub>j6</sub> | 40  | 130 | 40  | 130 | 130 | 146 | 14 | 38.0 | 35 <sub>h9</sub>  | 35 <sub>h9</sub> <sup>H7</sup>  | 35.5  | 44   | 50  | 101.0 | 80   |
| K5   | 200 | 250 | 180 <sub>j6</sub> | 40  | 140 | 100 | 140 | 160 | 185 | 15 | 39.5 | 50 <sub>h9</sub>  | 50 <sub>h9</sub> <sup>H7</sup>  | 50.5  | 62   | 65  | 116.0 | 106  |
| K6   | 210 | 300 | 230 <sub>j6</sub> | 50  | 160 | 110 | 160 | 168 | 200 | 17 | 36.0 | 50 <sub>h9</sub>  | 50 <sub>h9</sub> <sup>H7</sup>  | 50.5  | 62   | 70  | 128.0 | 106  |
| K7   | 241 | 350 | 250 <sub>h6</sub> | 55  | 180 | 125 | 180 | 190 | 226 | 18 | 44.0 | 60 <sub>h6</sub>  | 60 <sub>h6</sub> <sup>H7</sup>  | 62.0  | 75   | 85  | 161.5 | 138  |
| K8   | 300 | 400 | 300 <sub>h6</sub> | 75  | 240 | 165 | 240 | 235 | 282 | 20 | 45.0 | 70 <sub>h6</sub>  | 70 <sub>h6</sub> <sup>H7</sup>  | 72.0  | 90   | 100 | 193.0 | 155  |
| K9   | 360 | 450 | 350 <sub>h6</sub> | 95  | 280 | 185 | 280 | 285 | 330 | 23 | 50.0 | 90 <sub>h6</sub>  | 90 <sub>h6</sub> <sup>H7</sup>  | 92.0  | 120  | 120 | 244.0 | 200  |
| K10  | 330 | 550 | 450 <sub>h6</sub> | 115 | 350 | 265 | 420 | 400 | 356 | 25 | 78.0 | 100 <sub>h6</sub> | 100 <sub>h6</sub> <sup>H7</sup> | 102.0 | 130  | 130 | 274.0 | 215  |

## Dimensions of gear units

| Type | Øe1 | f1  | h   | H   | i2   | ls  | lsa | m1  | m2 | m3 | m4 | m5 | n2  | n3 | n4  | n5 | Øs   | Øs1 |
|------|-----|-----|-----|-----|------|-----|-----|-----|----|----|----|----|-----|----|-----|----|------|-----|
| K1   | 130 | 3.5 | 75  | 175 | 25.0 | 149 | 163 | 75  | 20 | 34 | 25 | 29 | 30  | 13 | 140 | 15 | 9.0  | 9   |
| K3   | 130 | 3.5 | 98  | 236 | 31.0 | 190 | 206 | 98  | 30 | 39 | 35 | 34 | 45  | 20 | 200 | 23 | 11.0 | 9   |
| K5   | 215 | 4.0 | 190 | 290 | 32.0 | 237 | 254 | 130 | 40 | 44 | 45 | 39 | 60  | 27 | 240 | 30 | 18.0 | 14  |
| K6   | 265 | 4.0 | 220 | 340 | 28.5 | 254 | 276 | 150 | 40 | 45 | 45 | 40 | 65  | 27 | 250 | 30 | 18.5 | 14  |
| K7   | 300 | 5.0 | 250 | 380 | 36.0 | 278 | 314 | 163 | 40 | 45 | 45 | 40 | 70  | 35 | 290 | 38 | 23.0 | 18  |
| K8   | 350 | 5.0 | 310 | 455 | 36.0 | 352 | 378 | 190 | 50 | 60 | 60 | 50 | 85  | 41 | 360 | 45 | 27.0 | 18  |
| K9   | 400 | 5.0 | 365 | 545 | 40.0 | 418 | 428 | 230 | 60 | 70 | 70 | 60 | 95  | 46 | 430 | 50 | 31.0 | 18  |
| K10  | 500 | 5.0 | 420 | 636 | 51.0 | 483 | 497 | 270 | 60 | 80 | 70 | 70 | 120 | –  | 400 | 45 | 39.0 | 18  |

## Dimensions of additional round flanges

| Type | Øa1 | Øb1               | c1 | Øe1 | f1 | Øs1 |
|------|-----|-------------------|----|-----|----|-----|
| K1   | 140 | 95 <sub>j6</sub>  | 10 | 115 | 3  | 9   |
| K8   | 350 | 250 <sub>h6</sub> | 18 | 300 | 5  | 18  |
| K8   | 450 | 350 <sub>h6</sub> | 20 | 400 | 5  | 18  |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

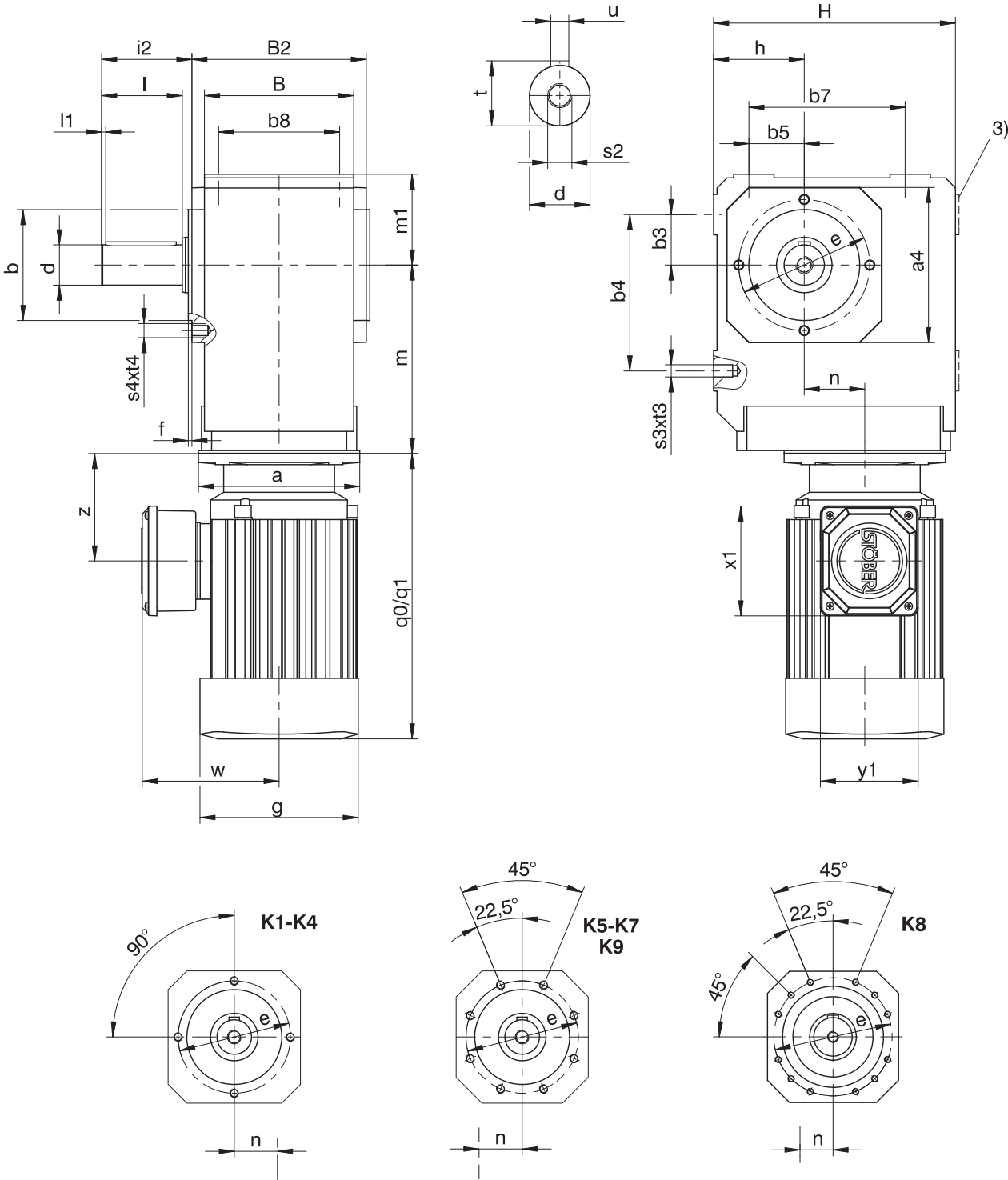
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | Ø140    | 124 | 36.0 | Ø140    | 124 | 36.0 | Ø160    | 128 | 36.0 | Ø160    | 128 | 36.0 | –       | –   | –    |
| K302 | Ø140    | 163 | 52.5 | Ø140    | 163 | 52.5 | Ø160    | 167 | 52.5 | Ø160    | 167 | 52.5 | Ø200    | 169 | 52.5 |
| K303 | Ø140    | 200 | 52.5 | Ø140    | 200 | 52.5 | Ø160    | 210 | 16.0 | Ø160    | 210 | 16.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | Ø160    | 172 | 15.0 | Ø160    | 172 | 15.0 | Ø200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | Ø160    | 215 | 15.0 | Ø160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | Ø160    | 191 | 18.0 | Ø160    | 191 | 18.0 | Ø200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | Ø160    | 234 | 18.0 | Ø160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | Ø160    | 263 | 20.0 | Ø160    | 263 | 20.0 | Ø200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 353 | 25.0 |

| Type  | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K302  | Ø200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513  | Ø200    | 174 | 15.0 | Ø250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613  | Ø200    | 193 | 18.0 | Ø250    | 196 | 18.0 | Ø300    | 210 | 18.0 | Ø300    | 210 | 18.0 | –       | –   | –    | –       | –   | –    |
| K713  | Ø200    | 221 | 20.0 | Ø250    | 224 | 20.0 | Ø300    | 237 | 20.0 | Ø300    | 237 | 20.0 | –       | –   | –    | –       | –   | –    |
| K714  | Ø200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813  | Ø200    | 247 | 24.0 | Ø250    | 249 | 24.0 | Ø300    | 262 | 24.0 | Ø300    | 262 | 24.0 | –       | –   | –    | –       | –   | –    |
| K814  | Ø200    | 308 | 24.0 | Ø250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913  | –       | –   | –    | Ø250    | 294 | 25.0 | Ø300    | 307 | 25.0 | Ø300    | 307 | 25.0 | Ø350    | 330 | 25.0 | –       | –   | –    |
| K914  | Ø200    | 353 | 25.0 | Ø250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K1013 | –       | –   | –    | –       | –   | –    | Ø300    | 392 | 28.0 | Ø300    | 392 | 28.0 | Ø350    | 415 | 28.0 | Ø400    | 415 | 28.0 |
| K1014 | –       | –   | –    | Ø250    | 450 | 28.0 | Ø300    | 475 | 28.0 | Ø300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |



4.3.13 A shaft design (solid shaft), G housing design (pitch circle diameter)



q0 Applies to motors without brake.

3) Only for K1 (other sizes on request)

– K1 – K9: Solid shaft on both sides available.

q1 Applies to motors with brake.

– K1 – K4: solid shaft without feather key available, on request starting at K5.

## Dimensions of gear units

| Type | □a4 | Øb                | b3 | b4  | b5  | b7  | b8  | B   | B2  | Ød               | Øe  | f   | h   | H   | i2    | l   | l1 | m1  | s2  | s3  | s4  | t    | t3 | t4 | u          |
|------|-----|-------------------|----|-----|-----|-----|-----|-----|-----|------------------|-----|-----|-----|-----|-------|-----|----|-----|-----|-----|-----|------|----|----|------------|
| K1   | 105 | 75 <sub>js</sub>  | 30 | 90  | 30  | 90  | 70  | 90  | 106 | 25 <sub>ks</sub> | 90  | 3.0 | 60  | 160 | 62.0  | 50  | 4  | 60  | M10 | M8  | M8  | 28.0 | 13 | 13 | A8×7×40    |
| K2   | 116 | 82 <sub>js</sub>  | 35 | 115 | 35  | 115 | 90  | 115 | 134 | 30 <sub>ks</sub> | 100 | 3.0 | 65  | 190 | 68.0  | 60  | 4  | 65  | M10 | M10 | M8  | 33.0 | 16 | 13 | A8×7×50    |
| K3   | 132 | 95 <sub>js</sub>  | 40 | 130 | 40  | 130 | 105 | 130 | 146 | 30 <sub>ks</sub> | 115 | 3.0 | 75  | 213 | 69.0  | 60  | 4  | 75  | M10 | M10 | M8  | 33.0 | 16 | 13 | A8×7×50    |
| K4   | 152 | 110 <sub>js</sub> | 50 | 155 | 50  | 155 | 120 | 148 | 173 | 40 <sub>ks</sub> | 130 | 3.5 | 90  | 240 | 89.5  | 80  | 4  | 90  | M16 | M12 | M10 | 43.0 | 19 | 16 | A12×8×70   |
| K5   | 145 | 110 <sub>js</sub> | 40 | 140 | 100 | 140 | 125 | 160 | 185 | 45 <sub>ks</sub> | 130 | 3.5 | 160 | 260 | 129.5 | 90  | 4  | 100 | M16 | M16 | M10 | 48.5 | 26 | 16 | A14×9×80   |
| K6   | 180 | 140 <sub>js</sub> | 50 | 160 | 110 | 160 | 130 | 168 | 200 | 50 <sub>ks</sub> | 165 | 3.5 | 190 | 310 | 136.0 | 100 | 4  | 120 | M16 | M16 | M10 | 53.5 | 26 | 16 | A14×9×90   |
| K7   | 195 | 155 <sub>js</sub> | 55 | 180 | 125 | 180 | 145 | 190 | 226 | 60 <sub>ms</sub> | 185 | 3.5 | 212 | 342 | 164.0 | 120 | 4  | 125 | M20 | M20 | M12 | 64.0 | 33 | 19 | A18×11×110 |
| K8   | 226 | 185 <sub>js</sub> | 75 | 240 | 165 | 240 | 185 | 235 | 282 | 70 <sub>ms</sub> | 215 | 4.0 | 265 | 410 | 185.0 | 140 | 5  | 145 | M20 | M24 | M12 | 74.5 | 38 | 19 | A20×12×125 |
| K9   | 280 | 230 <sub>js</sub> | 95 | 280 | 185 | 280 | 225 | 285 | 330 | 90 <sub>ms</sub> | 265 | 5.0 | 315 | 495 | 220.0 | 170 | 8  | 180 | M24 | M30 | M16 | 95.0 | 48 | 26 | A25×14×140 |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

## Dimensions of geared motors

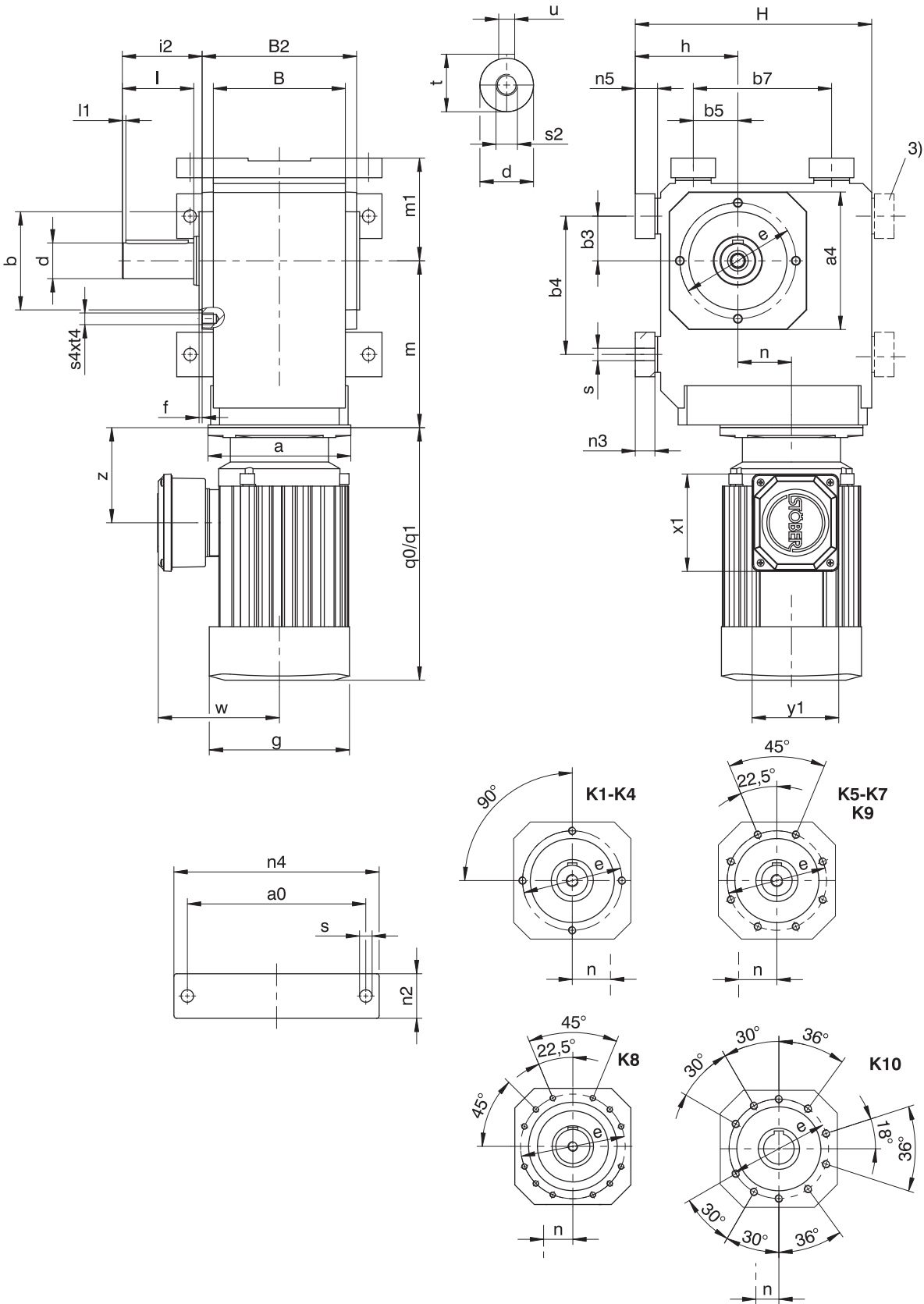
| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |





4.3.14 V shaft design (solid shaft), NG housing design (base + pitch circle diameter)



- q0

Applies to motors without brake.
- 3)

Only for K1 (other sizes on request)
- K1 – K9: Solid shaft on both sides available.
- q1

Applies to motors with brake.
- K1 – K4: solid shaft without feather key available, on request starting at K5.

## Dimensions of gear units

| Type | a0  | a4  | Øb                | b3  | b4  | b5  | b7  | B   | B2  | Ød                | Øe  | f    | h   | H   | i2    | l   | l1 | m1  | n2  | n3 | n4  | n5 | Øs   | s2  | s4  | t     | t4 | u          |
|------|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|-------------------|-----|------|-----|-----|-------|-----|----|-----|-----|----|-----|----|------|-----|-----|-------|----|------------|
| K1   | 115 | 105 | 75 <sub>j6</sub>  | 30  | 90  | 30  | 90  | 90  | 106 | 25 <sub>k6</sub>  | 90  | 3.0  | 75  | 175 | 62.0  | 50  | 4  | 75  | 30  | 13 | 140 | 15 | 9.0  | M10 | M8  | 28.0  | 13 | A8×7×40    |
| K2   | 155 | 116 | 82 <sub>j6</sub>  | 35  | 115 | 35  | 115 | 115 | 134 | 30 <sub>k6</sub>  | 100 | 3.0  | 88  | 213 | 68.0  | 60  | 4  | 88  | 40  | 20 | 185 | 23 | 11.0 | M10 | M8  | 33.0  | 13 | A8×7×50    |
| K3   | 170 | 132 | 95 <sub>j6</sub>  | 40  | 130 | 40  | 130 | 130 | 146 | 30 <sub>k6</sub>  | 115 | 3.0  | 98  | 236 | 69.0  | 60  | 4  | 98  | 45  | 20 | 200 | 23 | 11.0 | M10 | M8  | 33.0  | 13 | A8×7×50    |
| K4   | 200 | 152 | 110 <sub>j6</sub> | 50  | 155 | 50  | 155 | 148 | 173 | 40 <sub>k6</sub>  | 130 | 3.5  | 115 | 265 | 89.5  | 80  | 4  | 115 | 50  | 22 | 230 | 25 | 14.0 | M16 | M10 | 43.0  | 16 | A12×8×70   |
| K5   | 200 | 145 | 110 <sub>j6</sub> | 40  | 140 | 100 | 140 | 160 | 185 | 45 <sub>k6</sub>  | 130 | 3.5  | 190 | 290 | 129.5 | 90  | 4  | 130 | 60  | 27 | 240 | 30 | 18.0 | M16 | M10 | 48.5  | 16 | A14×9×80   |
| K6   | 210 | 180 | 140 <sub>j6</sub> | 50  | 160 | 110 | 160 | 168 | 200 | 50 <sub>k6</sub>  | 165 | 3.5  | 220 | 340 | 136.0 | 100 | 4  | 150 | 65  | 27 | 250 | 30 | 18.5 | M16 | M10 | 53.5  | 16 | A14×9×90   |
| K7   | 241 | 195 | 155 <sub>j6</sub> | 55  | 180 | 125 | 180 | 190 | 226 | 60 <sub>m6</sub>  | 185 | 3.5  | 250 | 380 | 164.0 | 120 | 4  | 163 | 70  | 35 | 290 | 38 | 23.0 | M20 | M12 | 64.0  | 19 | A18×11×110 |
| K8   | 300 | 226 | 185 <sub>j6</sub> | 75  | 240 | 165 | 240 | 235 | 282 | 70 <sub>m6</sub>  | 215 | 4.0  | 310 | 455 | 185.0 | 140 | 5  | 190 | 85  | 41 | 360 | 45 | 27.0 | M20 | M12 | 74.5  | 19 | A20×12×125 |
| K9   | 360 | 280 | 230 <sub>j6</sub> | 95  | 280 | 185 | 280 | 285 | 330 | 90 <sub>m6</sub>  | 265 | 5.0  | 365 | 545 | 220.0 | 170 | 8  | 230 | 95  | 46 | 430 | 50 | 31.0 | M24 | M16 | 95.0  | 26 | A25×14×140 |
| K10  | 330 | 340 | 250 <sub>m6</sub> | 115 | 350 | 265 | 420 | 400 | 356 | 110 <sub>m6</sub> | 300 | 20.0 | 420 | 636 | 240.0 | 210 | 15 | 270 | 120 | –  | 400 | 45 | 39.0 | M24 | M20 | 116.0 | 33 | A28×16×180 |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

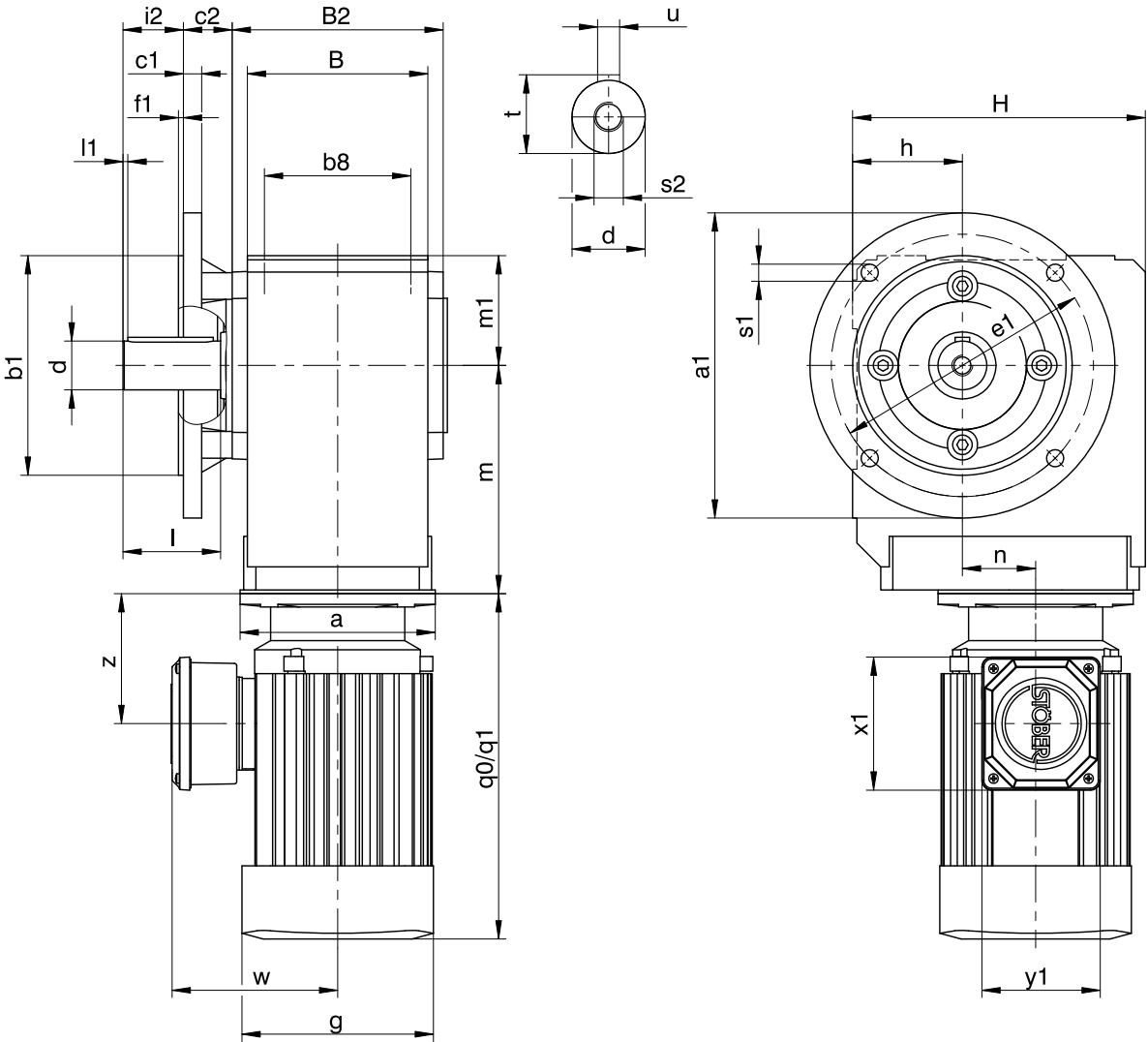
## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

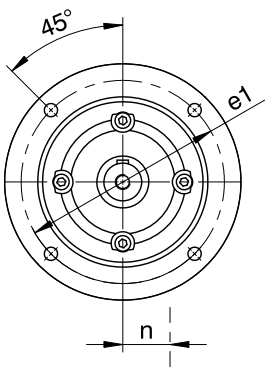
| Type  | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202  | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302  | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402  | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513  | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613  | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    | –       | –   | –    |
| K713  | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    | –       | –   | –    |
| K714  | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813  | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    | –       | –   | –    |
| K814  | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913  | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 | –       | –   | –    |
| K914  | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K1013 | –       | –   | –    | –       | –   | –    | ∅300    | 392 | 28.0 | ∅300    | 392 | 28.0 | ∅350    | 415 | 28.0 | ∅400    | 415 | 28.0 |
| K1014 | –       | –   | –    | ∅250    | 450 | 28.0 | ∅300    | 475 | 28.0 | ∅300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |



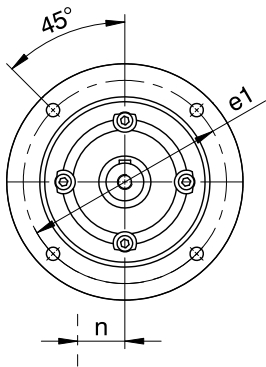
4.3.15 V shaft design (solid shaft), F housing design (round flange)



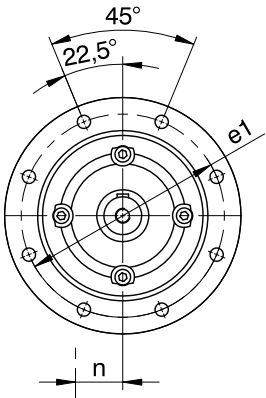
K1-K4



K5-K8



K9



- q0 Applies to motors without brake.

– K1 – K4: solid shaft without feather key available, on request starting at K5.
- q1 Applies to motors with brake.

– K1 – K9: Solid shaft on both sides available.

## Dimensions of gear units

| Type | Øa1 | Øb1               | b8  | B   | B2  | c1 | c2   | Ød               | Øe1 | f1  | h   | H   | i2    | l   | l1 | m1  | Øs1 | s2  | t    | u          |
|------|-----|-------------------|-----|-----|-----|----|------|------------------|-----|-----|-----|-----|-------|-----|----|-----|-----|-----|------|------------|
| K1   | 160 | 110 <sub>j6</sub> | 70  | 90  | 106 | 10 | 32.0 | 25 <sub>h6</sub> | 130 | 3.5 | 60  | 160 | 30.0  | 50  | 4  | 60  | 9   | M10 | 28.0 | A8×7×40    |
| K2   | 200 | 130 <sub>j6</sub> | 90  | 115 | 134 | 12 | 32.0 | 30 <sub>h6</sub> | 165 | 3.5 | 65  | 190 | 36.0  | 60  | 4  | 65  | 11  | M10 | 33.0 | A8×7×50    |
| K3   | 200 | 130 <sub>j6</sub> | 105 | 130 | 146 | 14 | 38.0 | 30 <sub>h6</sub> | 165 | 3.5 | 75  | 213 | 31.0  | 60  | 4  | 75  | 11  | M10 | 33.0 | A8×7×50    |
| K4   | 250 | 180 <sub>j6</sub> | 120 | 148 | 173 | 15 | 40.0 | 40 <sub>h6</sub> | 215 | 4.0 | 90  | 240 | 49.5  | 80  | 4  | 90  | 14  | M16 | 43.0 | A12×8×70   |
| K5   | 250 | 180 <sub>j6</sub> | 125 | 160 | 185 | 15 | 39.5 | 45 <sub>h6</sub> | 215 | 4.0 | 160 | 260 | 90.0  | 90  | 4  | 100 | 14  | M16 | 48.5 | A14×9×80   |
| K6   | 300 | 230 <sub>j6</sub> | 130 | 168 | 200 | 17 | 36.0 | 50 <sub>h6</sub> | 265 | 4.0 | 190 | 310 | 100.0 | 100 | 4  | 120 | 14  | M16 | 53.5 | A14×9×90   |
| K7   | 350 | 250 <sub>h6</sub> | 145 | 190 | 226 | 18 | 44.0 | 60 <sub>h6</sub> | 300 | 5.0 | 212 | 342 | 120.0 | 120 | 4  | 125 | 18  | M20 | 64.0 | A18×11×110 |
| K8   | 400 | 300 <sub>h6</sub> | 185 | 235 | 282 | 20 | 45.0 | 70 <sub>h6</sub> | 350 | 5.0 | 265 | 410 | 140.0 | 140 | 5  | 145 | 18  | M20 | 74.5 | A20×12×125 |
| K9   | 450 | 350 <sub>h6</sub> | 225 | 285 | 330 | 23 | 50.0 | 90 <sub>h6</sub> | 400 | 5.0 | 315 | 495 | 170.0 | 170 | 8  | 180 | 18  | M24 | 95.0 | A25×14×140 |

## Dimensions of additional round flanges

| Type | Øa1 | Øb1               | c1 | Øe1 | f1  | Øs1 |
|------|-----|-------------------|----|-----|-----|-----|
| K1   | 140 | 95 <sub>j6</sub>  | 10 | 115 | 3.0 | 9   |
| K2   | 160 | 110 <sub>j6</sub> | 12 | 130 | 3.5 | 9   |
| K3   | 160 | 110 <sub>j6</sub> | 14 | 130 | 3.5 | 9   |
| K3   | 250 | 180 <sub>j6</sub> | 14 | 215 | 4.0 | 14  |
| K8   | 350 | 250 <sub>h6</sub> | 18 | 300 | 5.0 | 18  |
| K8   | 450 | 350 <sub>h6</sub> | 20 | 400 | 5.0 | 18  |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |

The dimensions a, m and n can be found on the next page.

## Dimensions of geared motors

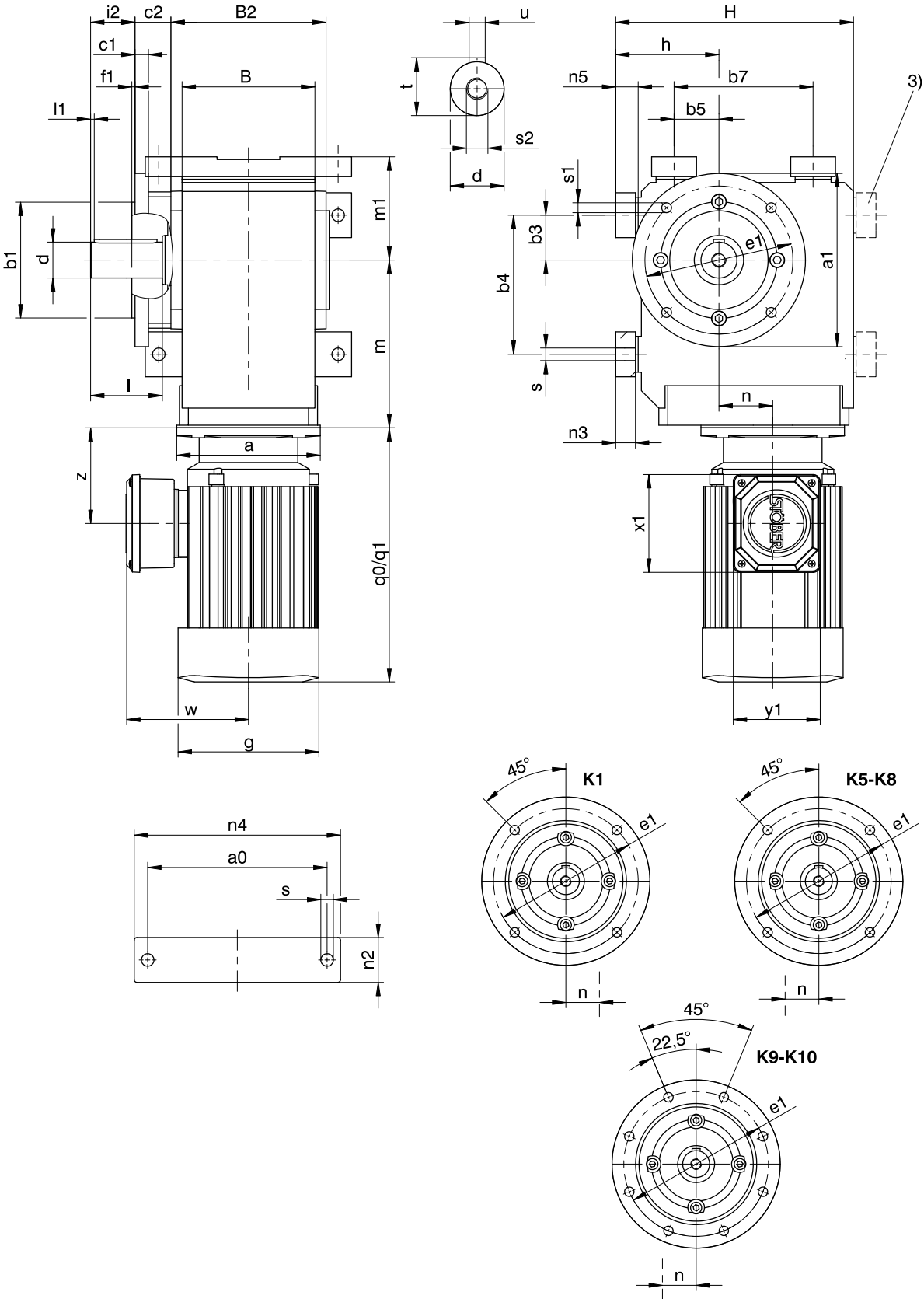
| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | ∅140    | 124 | 36.0 | ∅140    | 124 | 36.0 | ∅160    | 128 | 36.0 | ∅160    | 128 | 36.0 | –       | –   | –    |
| K202 | ∅140    | 143 | 46.0 | ∅140    | 143 | 46.0 | ∅160    | 147 | 46.0 | ∅160    | 147 | 46.0 | ∅200    | 149 | 46.0 |
| K203 | ∅140    | 180 | 46.0 | ∅140    | 180 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅140    | 163 | 52.5 | ∅140    | 163 | 52.5 | ∅160    | 167 | 52.5 | ∅160    | 167 | 52.5 | ∅200    | 169 | 52.5 |
| K303 | ∅140    | 200 | 52.5 | ∅140    | 200 | 52.5 | ∅160    | 210 | 16.0 | ∅160    | 210 | 16.0 | –       | –   | –    |
| K402 | –       | –   | –    | –       | –   | –    | ∅160    | 187 | 60.0 | ∅160    | 187 | 60.0 | ∅200    | 189 | 60.0 |
| K403 | –       | –   | –    | ∅140    | 220 | 60.0 | ∅160    | 230 | 23.0 | ∅160    | 230 | 23.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | ∅160    | 172 | 15.0 | ∅160    | 172 | 15.0 | ∅200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | ∅160    | 215 | 15.0 | ∅160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | ∅160    | 191 | 18.0 | ∅160    | 191 | 18.0 | ∅200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | ∅160    | 234 | 18.0 | ∅160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | ∅160    | 263 | 20.0 | ∅160    | 263 | 20.0 | ∅200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | ∅200    | 353 | 25.0 |

| Type | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K202 | ∅200    | 149 | 46.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K302 | ∅200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K402 | ∅200    | 189 | 60.0 | ∅250    | 192 | 60.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513 | ∅200    | 174 | 15.0 | ∅250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613 | ∅200    | 193 | 18.0 | ∅250    | 196 | 18.0 | ∅300    | 210 | 18.0 | ∅300    | 210 | 18.0 | –       | –   | –    |
| K713 | ∅200    | 221 | 20.0 | ∅250    | 224 | 20.0 | ∅300    | 237 | 20.0 | ∅300    | 237 | 20.0 | –       | –   | –    |
| K714 | ∅200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813 | ∅200    | 247 | 24.0 | ∅250    | 249 | 24.0 | ∅300    | 262 | 24.0 | ∅300    | 262 | 24.0 | –       | –   | –    |
| K814 | ∅200    | 308 | 24.0 | ∅250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913 | –       | –   | –    | ∅250    | 294 | 25.0 | ∅300    | 307 | 25.0 | ∅300    | 307 | 25.0 | ∅350    | 330 | 25.0 |
| K914 | ∅200    | 353 | 25.0 | ∅250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    |





4.3.16 V shaft design (solid shaft), NF housing design (base + round flange)



q0 Applies to motors without brake.

3) Only for K1 (other sizes on request)

– K1 – K10: Solid shaft on both sides available.

q1 Applies to motors with brake.

– K1 – K4: solid shaft without feather key available, on request starting at K5.

## Dimensions of gear units

| Type | a0  | Øa1 | Øb1               | b3  | b4  | b5  | b7  | B   | B2  | c1 | c2   | Ød                | Øe1 | f1  | h   | H   | i2    | l   | l1 | m1  | n2  | n3 | n4  | n5 | Øs   | Øs1 | s2  | t     | u          |
|------|-----|-----|-------------------|-----|-----|-----|-----|-----|-----|----|------|-------------------|-----|-----|-----|-----|-------|-----|----|-----|-----|----|-----|----|------|-----|-----|-------|------------|
| K1   | 115 | 160 | 110 <sub>js</sub> | 30  | 90  | 30  | 90  | 90  | 106 | 10 | 32.0 | 25 <sub>js</sub>  | 130 | 3.5 | 75  | 175 | 30.0  | 50  | 4  | 75  | 30  | 13 | 140 | 15 | 9.0  | 9   | M10 | 28.0  | A8×7×40    |
| K3   | 170 | 160 | 110 <sub>js</sub> | 40  | 130 | 40  | 130 | 130 | 146 | 14 | 38.0 | 30 <sub>js</sub>  | 130 | 3.5 | 98  | 236 | 31.0  | 60  | 4  | 98  | 45  | 20 | 200 | 23 | 11.0 | 9   | M10 | 33.0  | A8×7×50    |
| K5   | 200 | 250 | 180 <sub>js</sub> | 40  | 140 | 100 | 140 | 160 | 185 | 15 | 39.5 | 45 <sub>js</sub>  | 215 | 4.0 | 190 | 290 | 90.0  | 90  | 4  | 130 | 60  | 27 | 240 | 30 | 18.0 | 14  | M16 | 48.5  | A14×9×80   |
| K6   | 210 | 300 | 230 <sub>js</sub> | 50  | 160 | 110 | 160 | 168 | 200 | 17 | 36.0 | 50 <sub>js</sub>  | 265 | 4.0 | 220 | 340 | 100.0 | 100 | 4  | 150 | 65  | 27 | 250 | 30 | 18.5 | 14  | M16 | 53.5  | A14×9×90   |
| K7   | 241 | 350 | 250 <sub>h6</sub> | 55  | 180 | 125 | 180 | 190 | 226 | 18 | 44.0 | 60 <sub>m6</sub>  | 300 | 5.0 | 250 | 380 | 120.0 | 120 | 4  | 163 | 70  | 35 | 290 | 38 | 23.0 | 18  | M20 | 64.0  | A18×11×110 |
| K8   | 300 | 400 | 300 <sub>h6</sub> | 75  | 240 | 165 | 240 | 235 | 282 | 20 | 45.0 | 70 <sub>m6</sub>  | 350 | 5.0 | 310 | 455 | 140.0 | 140 | 5  | 190 | 85  | 41 | 360 | 45 | 27.0 | 18  | M20 | 74.5  | A20×12×125 |
| K9   | 360 | 450 | 350 <sub>h6</sub> | 95  | 280 | 185 | 280 | 285 | 330 | 23 | 50.0 | 90 <sub>m6</sub>  | 400 | 5.0 | 365 | 545 | 170.0 | 170 | 8  | 230 | 95  | 46 | 430 | 50 | 31.0 | 18  | M24 | 95.0  | A25×14×140 |
| K10  | 330 | 550 | 450 <sub>h6</sub> | 115 | 350 | 265 | 420 | 400 | 356 | 25 | 78.0 | 110 <sub>m6</sub> | 500 | 5.0 | 420 | 636 | 210.0 | 210 | 15 | 270 | 120 | –  | 400 | 45 | 39.0 | 18  | M24 | 116.0 | A28×16×180 |

## Dimensions of additional round flanges

| Type | Øa1 | Øb1               | c1 | Øe1 | f1 | Øs1 |
|------|-----|-------------------|----|-----|----|-----|
| K1   | 140 | 95 <sub>js</sub>  | 10 | 115 | 3  | 9   |
| K8   | 350 | 250 <sub>h6</sub> | 18 | 300 | 5  | 18  |
| K8   | 450 | 350 <sub>h6</sub> | 20 | 400 | 5  | 18  |

## Dimensions of motors

| Type        | g   | q0  | q1  | w   | x1    | y1    | z     |
|-------------|-----|-----|-----|-----|-------|-------|-------|
| IE3D063K04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D063M04  | 124 | 208 | 261 | 121 | 109.0 | 97.0  | 94.0  |
| IE3D071K04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D071L04  | 139 | 238 | 295 | 128 | 109.0 | 97.0  | 97.0  |
| IE3D080K04  | 157 | 261 | 329 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D080L04  | 157 | 283 | 351 | 137 | 109.0 | 97.0  | 107.0 |
| IE3D090S04  | 177 | 310 | 380 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D090LX04 | 177 | 365 | 435 | 146 | 120.0 | 109.0 | 114.0 |
| IE3D100KX04 | 196 | 404 | 491 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D100LX04 | 196 | 444 | 531 | 155 | 120.0 | 109.0 | 120.0 |
| IE3D112M04  | 217 | 424 | 521 | 178 | 146.5 | 156.5 | 134.0 |
| IE3D132SX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D132MX04 | 258 | 476 | 591 | 199 | 146.5 | 156.5 | 141.5 |
| IE3D160MX04 | 313 | 526 | 641 | 199 | 166.5 | 193.5 | 138.0 |
| IE3D160LX04 | 313 | 549 | 627 | 242 | 166.5 | 193.5 | 138.0 |
| IE3D180MX04 | 313 | 549 | 677 | 242 | 166.5 | 193.5 | 178.0 |
| IE3D180LX04 | 351 | 601 | 748 | 260 | 166.5 | 193.5 | 178.0 |
| IE3D200LX04 | 390 | 729 | 878 | 298 | 207.0 | 209.0 | 242.0 |
| IE3D225SX04 | 390 | 706 | 855 | 300 | 207.0 | 209.0 | 169.0 |
| IE3D225MX04 | 440 | 787 | 935 | 324 | 207.0 | 209.0 | 242.0 |

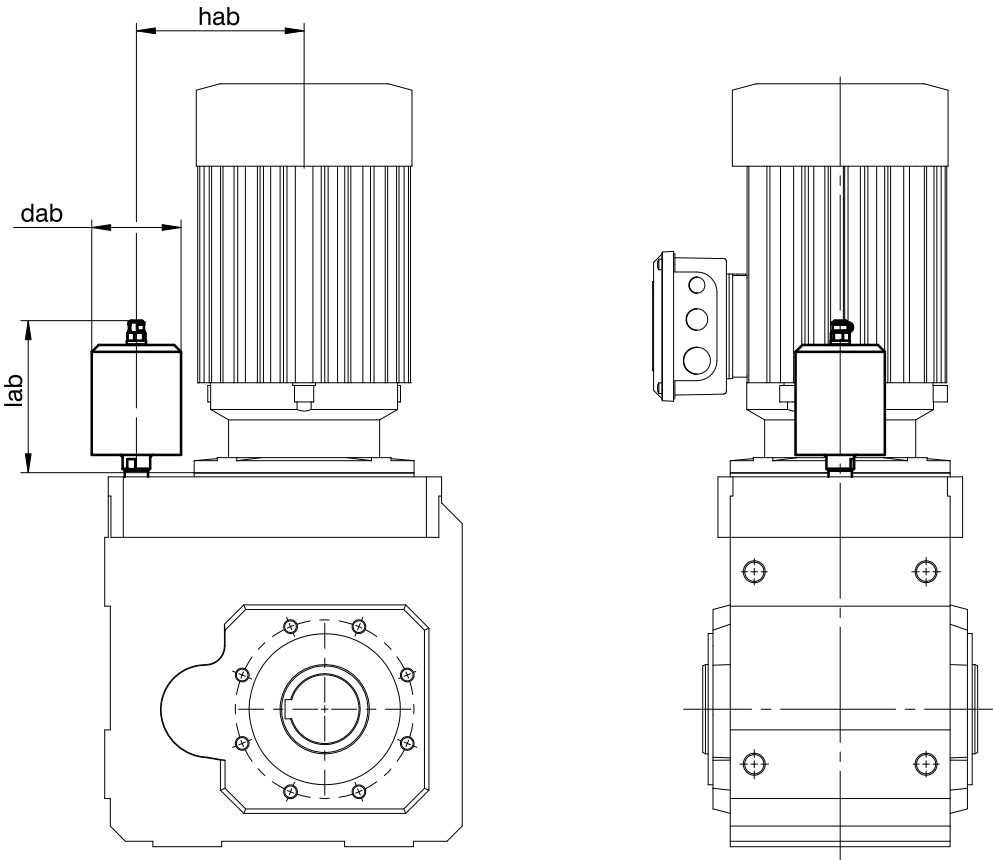
The dimensions a, m and n can be found on the next page.

## Dimensions of geared motors

| Type | IE3D063 |     |      | IE3D071 |     |      | IE3D080 |     |      | IE3D090 |     |      | IE3D100 |     |      |
|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|      | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K102 | Ø140    | 124 | 36.0 | Ø140    | 124 | 36.0 | Ø160    | 128 | 36.0 | Ø160    | 128 | 36.0 | –       | –   | –    |
| K302 | Ø140    | 163 | 52.5 | Ø140    | 163 | 52.5 | Ø160    | 167 | 52.5 | Ø160    | 167 | 52.5 | Ø200    | 169 | 52.5 |
| K303 | Ø140    | 200 | 52.5 | Ø140    | 200 | 52.5 | Ø160    | 210 | 16.0 | Ø160    | 210 | 16.0 | –       | –   | –    |
| K513 | –       | –   | –    | –       | –   | –    | Ø160    | 172 | 15.0 | Ø160    | 172 | 15.0 | Ø200    | 174 | 15.0 |
| K514 | –       | –   | –    | –       | –   | –    | Ø160    | 215 | 15.0 | Ø160    | 215 | 15.0 | –       | –   | –    |
| K613 | –       | –   | –    | –       | –   | –    | Ø160    | 191 | 18.0 | Ø160    | 191 | 18.0 | Ø200    | 193 | 18.0 |
| K614 | –       | –   | –    | –       | –   | –    | Ø160    | 234 | 18.0 | Ø160    | 234 | 18.0 | –       | –   | –    |
| K713 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 221 | 20.0 |
| K714 | –       | –   | –    | –       | –   | –    | Ø160    | 263 | 20.0 | Ø160    | 263 | 20.0 | Ø200    | 283 | 20.0 |
| K813 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 247 | 24.0 |
| K814 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 308 | 24.0 |
| K914 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | Ø200    | 353 | 25.0 |

| Type  | IE3D112 |     |      | IE3D132 |     |      | IE3D160 |     |      | IE3D180 |     |      | IE3D200 |     |      | IE3D225 |     |      |
|-------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|---------|-----|------|
|       | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    | a       | m   | n    |
| K302  | Ø200    | 169 | 52.5 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K513  | Ø200    | 174 | 15.0 | Ø250    | 177 | 15.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K613  | Ø200    | 193 | 18.0 | Ø250    | 196 | 18.0 | Ø300    | 210 | 18.0 | Ø300    | 210 | 18.0 | –       | –   | –    | –       | –   | –    |
| K713  | Ø200    | 221 | 20.0 | Ø250    | 224 | 20.0 | Ø300    | 237 | 20.0 | Ø300    | 237 | 20.0 | –       | –   | –    | –       | –   | –    |
| K714  | Ø200    | 283 | 20.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K813  | Ø200    | 247 | 24.0 | Ø250    | 249 | 24.0 | Ø300    | 262 | 24.0 | Ø300    | 262 | 24.0 | –       | –   | –    | –       | –   | –    |
| K814  | Ø200    | 308 | 24.0 | Ø250    | 320 | 5.0  | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K913  | –       | –   | –    | Ø250    | 294 | 25.0 | Ø300    | 307 | 25.0 | Ø300    | 307 | 25.0 | Ø350    | 330 | 25.0 | –       | –   | –    |
| K914  | Ø200    | 353 | 25.0 | Ø250    | 365 | 25.0 | –       | –   | –    | –       | –   | –    | –       | –   | –    | –       | –   | –    |
| K1013 | –       | –   | –    | –       | –   | –    | Ø300    | 392 | 28.0 | Ø300    | 392 | 28.0 | Ø350    | 415 | 28.0 | Ø400    | 415 | 28.0 |
| K1014 | –       | –   | –    | Ø250    | 450 | 28.0 | Ø300    | 475 | 28.0 | Ø300    | 475 | 28.0 | –       | –   | –    | –       | –   | –    |

4.3.17 Oil expansion tank



Dimensions

| Type  | IE3D080 |       |       | IE3D090 |       |       | IE3D100 |       |       | IE3D112 |       |       | IE3D132 |       |       | IE3D160 |       |       | IE3D180 |       |       | IE3D200 |       |       |
|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|---------|-------|-------|
|       | dab     | hab   | lab   | dab     | hab   | lab   | dab     | hab   | lab   | dab     | hab   | lab   | dab     | hab   | lab   | dab     | hab   | lab   | dab     | hab   | lab   | dab     | hab   | lab   |
| K513  | 65      | 122.0 | 113.5 | 65      | 122.0 | 113.5 | 65      | 130.0 | 165.0 | 65      | 130.0 | 165.0 | 65      | 167.0 | 165.0 | –       | –     | –     | –       | –     | –     | –       | –     | –     |
| K613  | 65      | 148.5 | 116.5 | 65      | 148.5 | 116.5 | 65      | 148.5 | 116.5 | 65      | 148.5 | 116.5 | 65      | 198.5 | 165.0 | 65      | 194.5 | 191.0 | 65      | 194.5 | 191.0 | –       | –     | –     |
| K713  | –       | –     | –     | –       | –     | –     | 65      | 170.0 | 114.5 | 65      | 170.0 | 114.5 | 65      | 170.0 | 115.5 | 65      | 214.0 | 191.5 | 65      | 214.0 | 191.5 | –       | –     | –     |
| K813  | –       | –     | –     | –       | –     | –     | 73      | 205.0 | 129.5 | 73      | 205.0 | 129.5 | 73      | 205.0 | 129.5 | 73      | 205.0 | 129.5 | 73      | 205.0 | 129.5 | –       | –     | –     |
| K913  | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | 73      | 255.0 | 129.5 | 73      | 255.0 | 129.5 | 73      | 255.0 | 129.5 | 73      | 255.0 | 129.5 |
| K1013 | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | –       | –     | –     | 73      | 305.0 | 126.0 | 73      | 305.0 | 126.0 | 73      | 305.0 | 112.0 |

More information can be found in Chapter [4.6.3](#)

## 4.4 Type designation

In this chapter, you can find an explanation of the type designation with the associated options.

Additional ordering information not included in the type designation can be found at the end of the chapter.

Sample code

|   |   |   |   |   |   |      |            |
|---|---|---|---|---|---|------|------------|
| K | 4 | 0 | 2 | A | G | 0560 | IE3D080L04 |
|---|---|---|---|---|---|------|------------|

Explanation

| Code    | Designation                         | Design                                            |
|---------|-------------------------------------|---------------------------------------------------|
| K       | Type                                | Helical bevel gear unit                           |
| 4       | Size                                | 4 (example)                                       |
| 0       | Generation                          | Generation 0                                      |
| 1       |                                     | Generation 1                                      |
| 2       | Stages                              | Two-stage                                         |
| 3       |                                     | Three-stage                                       |
| 4       |                                     | Four-stage                                        |
| A       | Shaft                               | Hollow shaft with keyway                          |
| S       |                                     | Hollow shaft with shrink ring                     |
| V       |                                     | Solid shaft                                       |
| G       | Housing                             | Pitch circle diameter                             |
| F       |                                     | Round flange                                      |
| NG      |                                     | Foot + pitch circle diameter                      |
| NF      |                                     | Foot + round flange                               |
| GD      |                                     | Pitch circle diameter + torque arm bracket        |
| NGD     |                                     | Foot + pitch circle diameter + torque arm bracket |
| 0560    | Transmission ratio (i x 10 rounded) | i = 55.71 (example)                               |
| IE3D080 | Motor                               | IE3D asynchronous motor                           |
| L04     |                                     |                                                   |

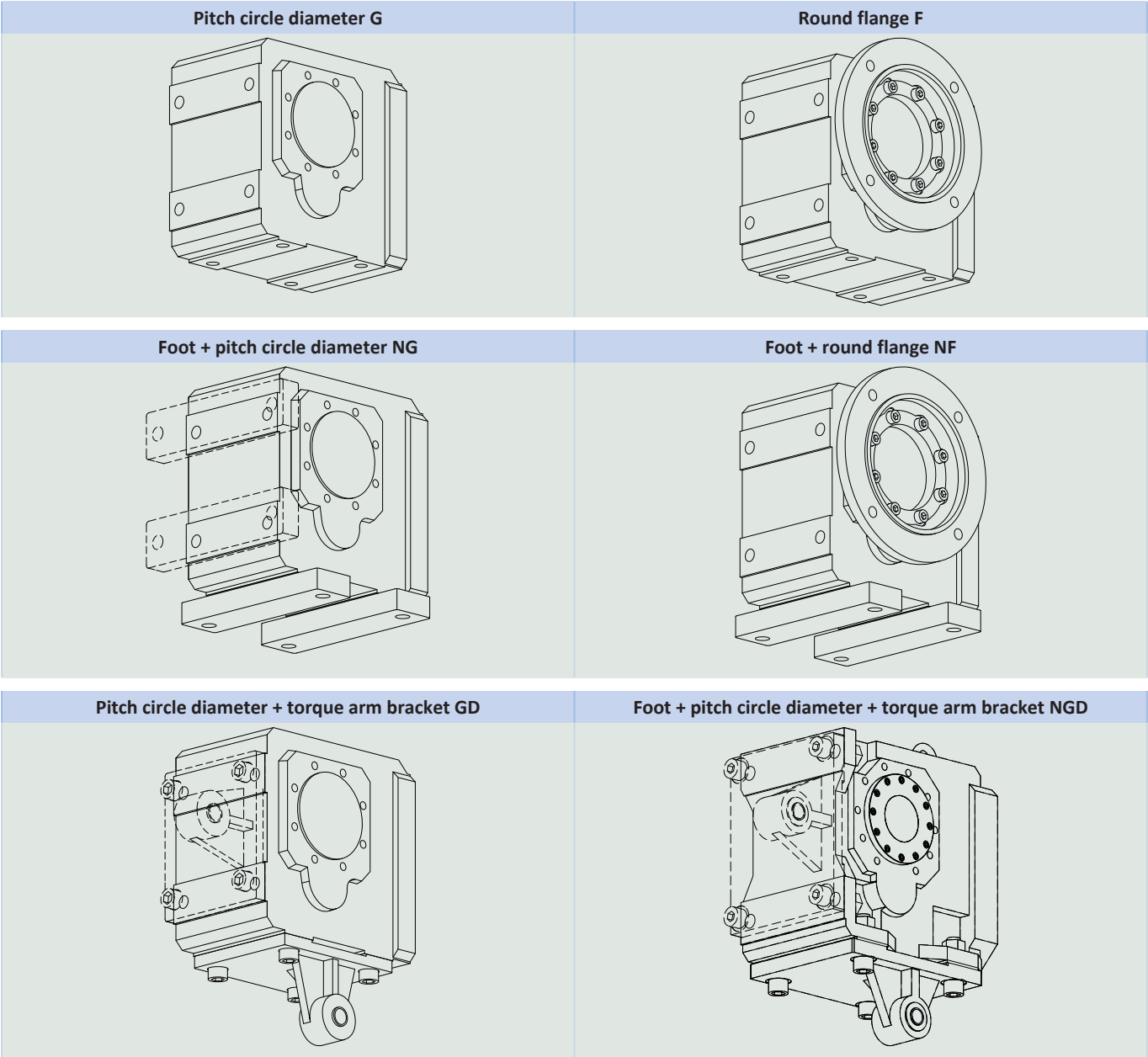
In order to complete the type designation, also specify:

- A detailed type designation of the motor, see the chapter [▶ 5.4](#)
- The mounting position, see the chapter [▶ 4.5.4](#)
- Attachment of solid shaft: gear unit side 3 or 4; solid shaft on both sides
- Attachment of hollow shaft with keyway: insertion side 3 or 4
- Attachment of hollow shaft with shrink ring: shrink ring on gear unit side 3 or 4
- Attachment of foot plates: gear unit side 1 or 5
- Attachment of flange: gear unit side 3 or 4
- Pitch circle diameter: gear unit side 3 or 4
- Attachment of torque arm bracket: torque arm bracket on gear unit side 1 or 5, eye on gear unit side 3 or 4
- The position of the terminal box, see the chapter [▶ 4.5.6](#)
- Oil expansion tank (recommended for gear units in mounting position EL5), see the chapter [▶ 4.6.3](#)
- Standard or reinforced output bearing

An explanation of the gear unit sides can be found in the chapter [▶ 4.5.4](#).

4.5 Product description

4.5.1 Housing design



|     | G | F | NG | NF | GD | NGD |
|-----|---|---|----|----|----|-----|
| K1  | ✓ | ✓ | ✓  | ✓  | ✓  | –   |
| K2  | ✓ | ✓ | ✓  | –  | ✓  | –   |
| K3  | ✓ | ✓ | ✓  | –  | ✓  | –   |
| K4  | ✓ | ✓ | ✓  | –  | ✓  | –   |
| K5  | ✓ | ✓ | ✓  | ✓  | ✓  | –   |
| K6  | ✓ | ✓ | ✓  | ✓  | ✓  | –   |
| K7  | ✓ | ✓ | ✓  | ✓  | ✓  | –   |
| K8  | ✓ | ✓ | ✓  | ✓  | ✓  | –   |
| K9  | ✓ | ✓ | ✓  | ✓  | ✓  | –   |
| K10 | – | – | ✓  | ✓  | –  | ✓   |

## 4.5.2 Combinatorial shaft/housing design

|                               | Housing design |    |    |     |     |     |      |
|-------------------------------|----------------|----|----|-----|-----|-----|------|
| Shaft design                  | Code           | G  | F  | NG  | NF  | GD  | NGD  |
| Hollow shaft with keyway      | A              | AG | AF | ANG | ANF | AGD | ANGD |
| Hollow shaft with shrink ring | S              | SG | SF | SNG | SNF | SGD | SNGD |
| Solid shaft <sup>1)</sup>     | V              | VG | VF | VNG | VNF | –   | –    |

<sup>1)</sup> Gear units in sizes K1 – K10 come with a solid shaft with feather key as standard. Gear units in sizes K1 – K4 can be ordered with the option of a solid shaft without feather key. Only upon request starting at size K5.

## 4.5.3 Installation conditions

### Hollow shaft

The hollow shaft hole tolerance is ISO H7. The tolerance of the machine shaft must be ISO k6.

Take care to align the machine shaft with the gear unit hollow shaft when attaching the gear unit.

Maximum deviation  $\leq 0.03$  mm.

For simpler assembly and disassembly of the machine shaft, the hollow shafts are equipped with a spiral groove (as a grease deposit).

A hardened, threaded keeper plate is included in the scope of delivery. You also have the option to order the hollow shaft without a keeper plate.

### Hollow shaft with shrink ring

The tolerance of the hollow shaft hole is ISO H7.

The machine shaft must be executed as follows:

| Gear unit type | Tolerance |
|----------------|-----------|
| K1 to K6       | ISO h9    |
| K7 to K10      | ISO h6    |

Select a material for the machine shaft with a permitted surface pressure of  $p \geq 325$  N/mm<sup>2</sup>.

Possible materials:

- C45E +QT
- 42CrMo4

### Fastening the gear units on the machine side using the pitch circle diameter

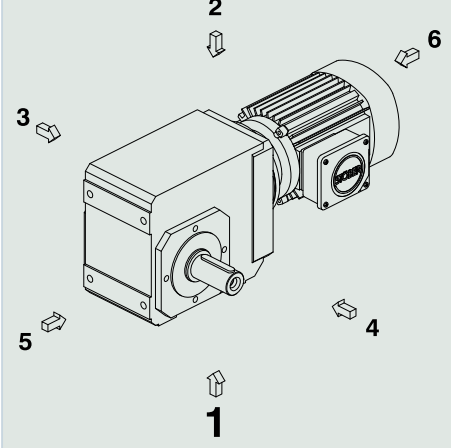
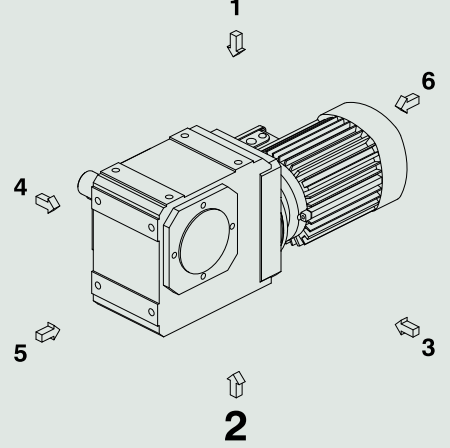
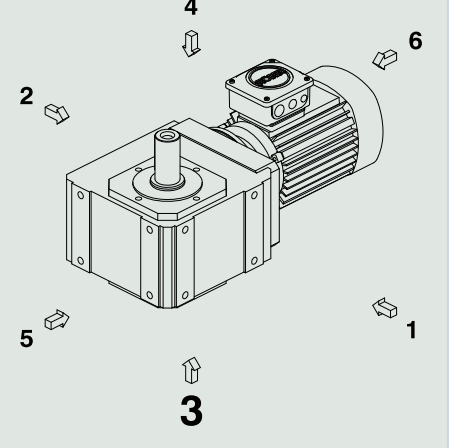
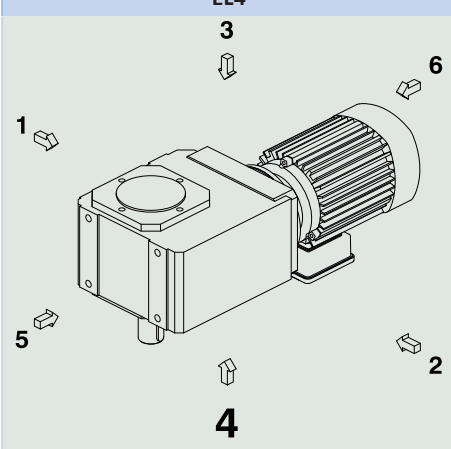
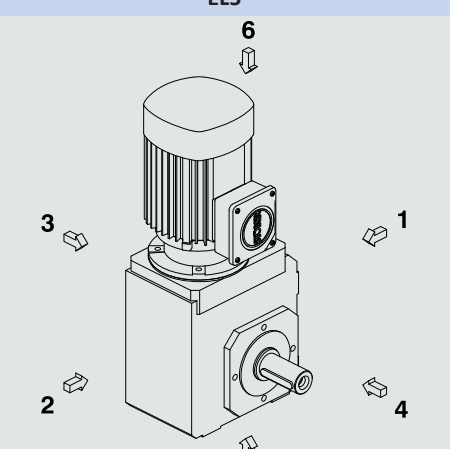
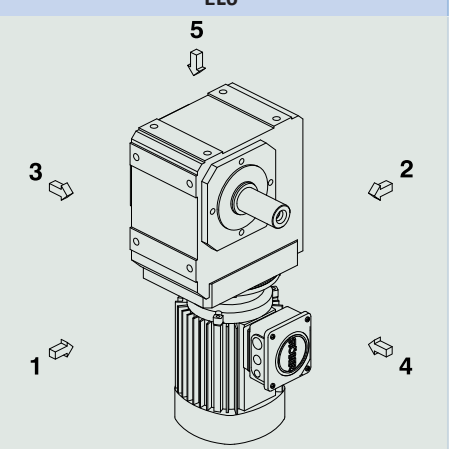
The specified torques and forces only apply when gear units are fastened on the machine side using screws of strength class 10.9. In addition, the gear housings must be adjusted at the pilot. The machine-side fit must be H7.

### 4.5.4 Mounting positions

The following table shows the standard mounting positions.

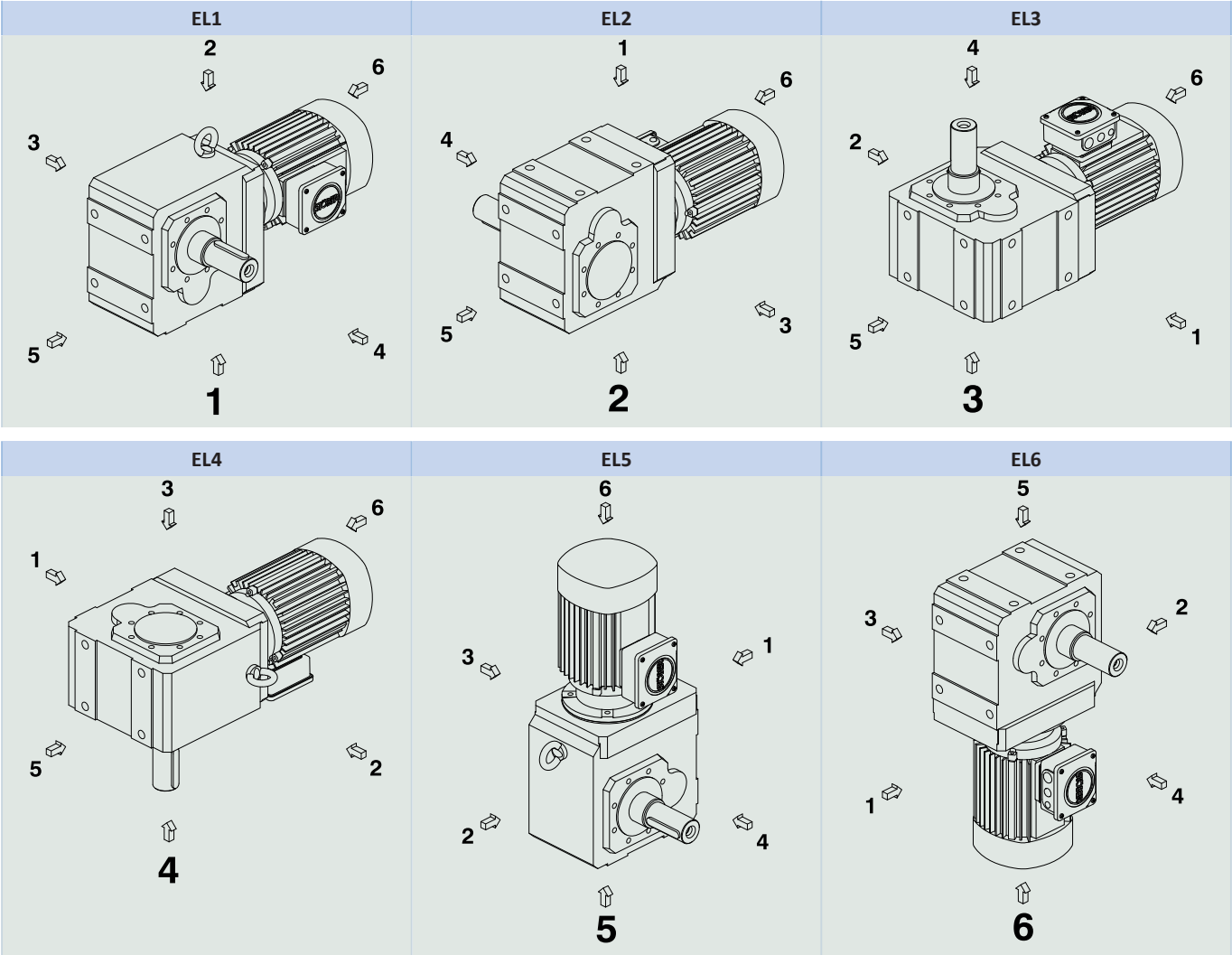
The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

Mounting positions for gear unit sizes K1 – K4

|                                                                                                         |                                                                                                          |                                                                                                           |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <div><p>EL1</p></div>  | <div><p>EL2</p></div>  | <div><p>EL3</p></div>  |
| <div><p>EL4</p></div> | <div><p>EL5</p></div> | <div><p>EL6</p></div> |



Mounting positions for gear unit sizes K5 – K10



Since the lubricant filling volume of the gear unit depends on the mounting position, the mounting position must be specified when ordering.

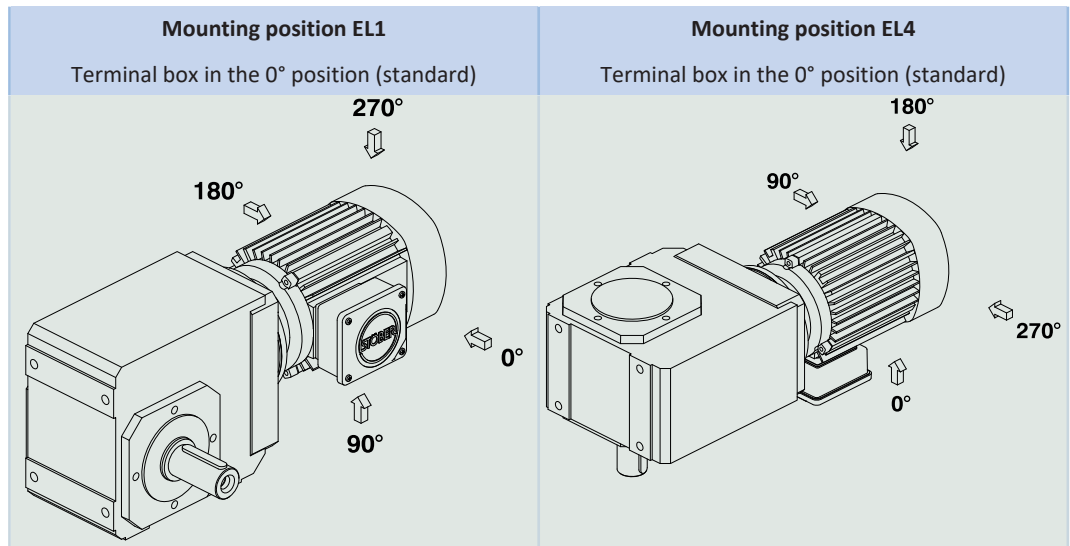
4.5.5 Lubricants

STOBER fills the gear units with the amount and type of lubricant specified on the nameplate. The filling volume and the structure of the gear units depend on the mounting position.

Only install the gear units in the intended mounting position! Reposition the gear units only after consulting STOBER. Otherwise, STOBER assumes no liability for the gear units.

You will receive lubricants for use in the food industry upon request.

## 4.5.6 Position of the terminal box



Indicate variations for your geared motor in the purchase order.

Note that the terminal box position rotates along with the geared motor if the geared motor rotates to another mounting position.

## 4.5.7 Other product features

| Feature                                                                | Value                                                                                    |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Max. permitted gear unit temperature (on the surface of the gear unit) | ≤ 80 °C                                                                                  |
| Paint                                                                  | RAL 7001 Silver gray<br>Optional selection of various RAL colors.                        |
| (ATEX) Directive 2014/34/EU                                            | You can get asynchronous motors for use in potentially explosive atmospheres on request. |
| <b>Efficiency:</b>                                                     |                                                                                          |
| $\eta_{\text{get}}$ two-stage                                          | 97%                                                                                      |
| $\eta_{\text{get}}$ three-stage                                        | 96%                                                                                      |
| $\eta_{\text{get}}$ four-stage                                         | 94%                                                                                      |
| Protection class                                                       | IP56                                                                                     |

## 4.5.8 Losses due to splashing

Increased losses due to splashing can occur in individual cases under certain operating conditions. These can lead to oil leakage or unacceptably high operating temperatures.

Please coordinate with STOBBER to determine a suitable course of action if:

- The surrounding temperature is under  $-10\text{ °C}$  or over  $+40\text{ °C}$
- The gear unit type meets the following conditions:

| Type    | Mounting position | $n_{1N}$<br>[rpm] | ED              | i    |
|---------|-------------------|-------------------|-----------------|------|
| K5, K6  | EL5, EL6          | > 2500            | > 60%, > 20 min | < 18 |
| K7, K8  | EL5, EL6          | > 2000            | > 60%, > 20 min | < 15 |
| K9, K10 | EL5, EL6          | > 1750            | > 60%, > 20 min | < 15 |

4.5.9 Maintenance

The instructions for maintenance can be found in the operating manual, ID 443027\_en, at <http://www.stoeber.de/en/downloads/>. Enter the ID of the documentation in the Search... field.

Ventilation

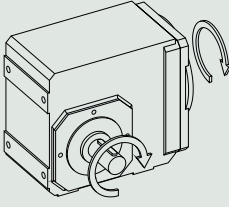
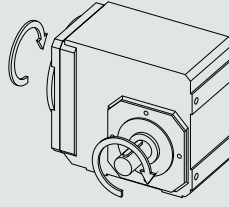
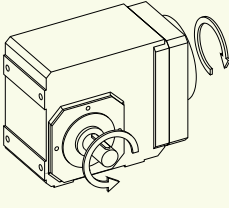
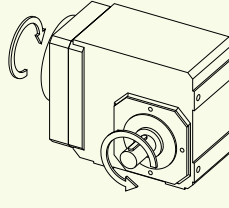
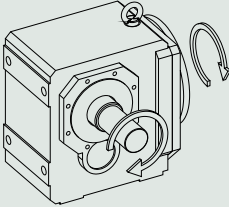
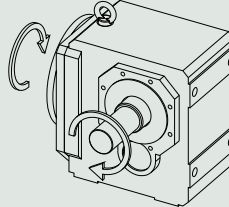
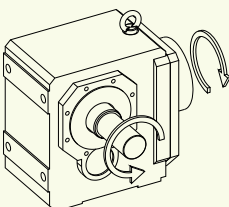
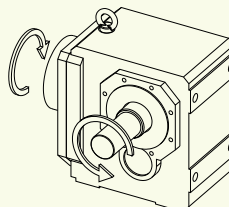
Air release valves are fitted as a standard feature and independently of installation position for gear unit sizes K5 to K10.

For the position and dimensions of the air release valve, refer to the 3D model.

Download the 3D model at <http://configurator.stoeber.de>.

4.5.10 Direction of rotation

Solid shaft (V), solid shaft on both sides (V), hollow shaft with keyway (A)

| Type         | Output side 4                                                                       | Output side 3                                                                         |
|--------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| K102 – K402  |    |    |
| K203 – K403  |   |   |
| K513 – K1013 |  |  |
| K514 – K1014 |  |  |

The specified directions of rotation also apply to gear units with hollow shaft (A) if the entry side of the machine shaft corresponds to the side of the solid shaft that is shown.

The direction of rotation for the shaft design of a solid shaft on both sides corresponds to the direction of rotation for output side 4.

The pictures show mounting position EL1.

Hollow shaft with shrink ring (S)

| Type         | Shrink ring side 4 | Shrink ring side 3 |
|--------------|--------------------|--------------------|
| K102 – K402  |                    |                    |
| K203 – K403  |                    |                    |
| K513 – K813  |                    |                    |
| K514 – K814  |                    |                    |
| K913 – K1013 |                    |                    |
| K914 – K1014 |                    |                    |

The pictures show mounting position EL1.

## 4.6 Project configuration

Project your drives using the information in this chapter. In doing so, observe the limit conditions in this chapter to ensure a safe design.

An explanation of the formula symbols can be found in Chapter [13.1](#)

**Determine the following for your application:**

- The actual torque  $M_{2N^*}$
- The actual speed  $n_{2^*}$
- The operating mode operating factor  $fB_{op}$
- The runtime operating factor  $fB_t$
- The motor operating factor  $fB_{mot}$
- The duty cycle ED in %

$$ED = \frac{t_{op}}{T} \cdot 100\%$$

**For the S4 and S8 operating mode:**

- The mass moment of inertia  $J_{2^*}$

$$J_{1^*} = \frac{J_{2^*}}{i^2}$$

**Calculate the motor rating necessary for your application:**

$$P_{N^*} = \frac{M_{2N^*} \cdot n_{2^*} \cdot fB_{mot}}{9550}$$

Using the determined values and the calculated motor rating, select a suitable drive from the selection table.

**Then check the following conditions:**

$$M_{2N^*} \cdot fB_{op} \cdot fB_t < M_{2N} \cdot S$$

$$P_{N^*} < P_N$$

**Operating factors**

| Run time             | $fB_t$ |
|----------------------|--------|
| Daily runtime ≤ 8 h  | 1.00   |
| Daily runtime ≤ 16 h | 1.15   |
| Daily runtime ≤ 24 h | 1.20   |

| Operating mode                                                                                                                                                                                                                                                   | Characteristic output curve | ED          | $fB_{op}$                                                  | $fB_{mot}$                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------|------------------------------------------------------------|------------------------------------------------------------|
| <b>S1</b> Continuous operation with soft start <ul style="list-style-type: none"> <li>Start time up to 30 s</li> </ul>                                                                                                                                           |                             | 100 %       | 1.00                                                       | 1.00                                                       |
| <b>S1</b> Continuous operation with normal start <ul style="list-style-type: none"> <li>Asynchronous motors with direct switch-on or dynamic loading</li> <li>Start time up to 30 s</li> </ul>                                                                   |                             | 100 %       | 1.25                                                       | 1.00                                                       |
| <b>S1</b> Continuous operation with high-load start <ul style="list-style-type: none"> <li>Start time up to 30 s</li> </ul>                                                                                                                                      |                             | 100 %       | 1.25                                                       | 1.25                                                       |
| <b>S2</b> brief operation <ul style="list-style-type: none"> <li>Operating time <math>t_{op} \leq 3</math> minutes</li> </ul>                                                                                                                                    |                             | $\leq 30$ % | 0.75                                                       | 0.75                                                       |
| <b>S3</b> Periodic cyclic operation <ul style="list-style-type: none"> <li>Cycle time <math>T \leq 10</math> minutes</li> <li>Cyclic operation with braking motor</li> <li>Low additional flywheel weights<br/><math>J_{1*} &lt; 0,5 \cdot J_1</math></li> </ul> |                             | $\leq 25$ % | 0.70                                                       | 0.70                                                       |
|                                                                                                                                                                                                                                                                  |                             | $\leq 40$ % | 1.00                                                       | 1.00                                                       |
|                                                                                                                                                                                                                                                                  |                             | $\leq 60$ % | 1.25                                                       | 1.25                                                       |
| <b>S4</b> Periodic cyclic operation with the effect of the start-up process <ul style="list-style-type: none"> <li>Cycle time <math>T \leq 10</math> minutes</li> <li>Cyclic operation with braking motor</li> <li>Larger additional flywheel weights</li> </ul> |                             | 40 %        | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | 1.40                                                       |
| <b>S6</b> Uninterrupted periodic operation                                                                                                                                                                                                                       |                             | 100 %       | 1.25                                                       | 1.00                                                       |
| <b>S6</b> Uninterrupted periodic operation with short-term loading <ul style="list-style-type: none"> <li>Low speeds</li> <li>Low additional flywheel weights<br/><math>J_{1*} &lt; 0,5 \cdot J_1</math></li> </ul>                                              |                             | 100 %       | 1.40                                                       | 1.00                                                       |
| <b>S6</b> Uninterrupted periodic operation with impact loading <ul style="list-style-type: none"> <li>High speeds</li> <li>Large additional flywheel weights</li> </ul>                                                                                          |                             | 100 %       | 1.60                                                       | 1.25                                                       |
| <b>S8</b> Uninterrupted periodic operation <ul style="list-style-type: none"> <li>With load changes</li> <li>With speed changes</li> </ul>                                                                                                                       |                             | 100 %       | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | $J_{1*} \leq J_1: 1.25$<br>$J_{1*} \sim 3 \cdot J_1: 1.40$ |
| <b>S9</b> Non-periodic operation <ul style="list-style-type: none"> <li>With load changes</li> <li>With speed changes</li> </ul>                                                                                                                                 |                             | 100 %       | $J_{1*} \leq J_1: 1.40$<br>$J_{1*} \sim 3 \cdot J_1: 1.60$ | $J_{1*} \leq J_1: 1.25$<br>$J_{1*} \sim 3 \cdot J_1: 1.40$ |
| <b>S10</b> Operation with individual constant loads                                                                                                                                                                                                              |                             | 100 %       | 1.00                                                       | 1.00                                                       |

Tab. 1: Operating factors for operating modes S1 to S10

## 4.6.1 Permitted shaft loads for the output shaft

The values specified in the tables apply to the permitted shaft loads:

- For shaft dimensions in accordance with the catalog
- For output speeds  $n_{2m^*} \leq 20$  rpm ( $F_{2axN} = F_{2ax20}$ ;  $F_{2radN} = F_{2rad20}$ ;  $M_{2kN} = M_{2k20}$ )
- Only if radial forces on the gear unit are stabilized by its pilots for the pitch circle diameter and flange housing design

### 4.6.1.1 V shaft design

Permitted shaft loads for V shaft design (solid shaft)

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| K1   | 40.0          | 1900               | 5000                | 5000                  | 360                | 360                  |
| K2   | 42.0          | 2100               | 6000                | 6000                  | 430                | 430                  |
| K3   | 45.0          | 2400               | 7000                | 7000                  | 525                | 525                  |
| K4   | 52.0          | 3500               | 11200               | 11200                 | 1050               | 1050                 |
| K5   | 72.0          | 3500               | 13450               | 13450                 | 1580               | 1580                 |
| K6   | 72.0          | 4000               | 16000               | 16000                 | 1960               | 1960                 |
| K7   | 85.0          | 5500               | 22000               | 22000                 | 3200               | 3200                 |
| K8   | 60.0          | 7250               | 29000               | 29000                 | 3800               | 3800                 |
| K9   | 87.0          | 16500              | 65000               | 65000                 | 11200              | 11200                |
| K10  | 84.0          | 25000              | 80000               | 80000                 | 15200              | 15200                |

Reduced values apply in the case of a V shaft design (solid shaft) in conjunction with an NF housing design (foot + round flange):

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| K10  | 132.0         | 25000              | 64000               | 64000                 | 15200              | 15200                |

For the V solid shaft design on both sides, the values for  $F_{2rad20}$  and  $M_{2k20}$  must be multiplied by a factor of 0.7.

For other output speeds, download diagrams at <http://configurator.stoeber.de>.

The following applies to output speeds  $n_{2m^*} > 20$  rpm:

$$F_{2axN} = \frac{F_{2ax20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad F_{2radN} = \frac{F_{2rad20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}} \quad M_{2kN} = \frac{M_{2k20}}{\sqrt[3]{\frac{n_{2m^*}}{20 \text{ rpm}}}}$$

The values for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  can be found in the table "Permitted shaft loads" in this chapter.

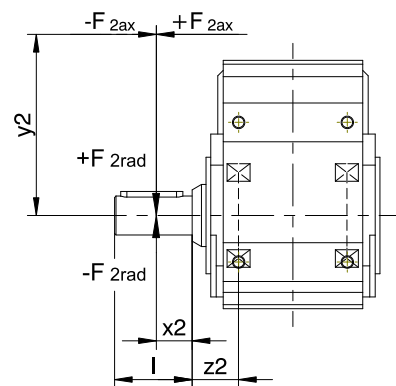


Fig. 1: Force application points for solid shaft

The specified values for  $F_{2rad20}$  are based on application of force at the middle of the output shaft:  $x_2 = l/2$ .

Shaft dimensions can be found in the "Dimensional drawings" chapter.

The following applies to other force application points:

$$M_{2k*} = \frac{2 \cdot F_{2ax*} \cdot y_2 + F_{2rad*} \cdot (x_2 + z_2)}{1000} \leq M_{2kN}$$

$$F_{2rad*} \leq F_{2radN}$$

$$F_{2ax*} \leq F_{2axN}$$

For applications with multiple axial and/or radial forces, you must add the forces as vectors.

In the event of EMERGENCY OFF operation (max. 1000 load changes), you can multiply the permitted forces and torques for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  by a factor of two.

#### 4.6.1.2 A and S shaft design

Permitted shaft loads for A shaft design (hollow shaft with keyway)

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| K1   | 40.0          | 1900               | 5000                | 5000                  | 240                | 240                  |
| K2   | 42.0          | 2100               | 6000                | 6000                  | 310                | 310                  |
| K3   | 45.0          | 2400               | 7000                | 7000                  | 380                | 380                  |
| K4   | 52.0          | 3500               | 11200               | 11200                 | 740                | 740                  |
| K5   | 39.0          | 2500               | 13450               | 13450                 | 1000               | 1000                 |
| K6   | 42.0          | 3000               | 16000               | 16000                 | 1300               | 1300                 |
| K7   | 45.0          | 4100               | 22000               | 22000                 | 2100               | 2100                 |
| K8   | 50.0          | 5300               | 29000               | 29000                 | 2600               | 2600                 |
| K9   | 56.0          | 7000               | 65000               | 65000                 | 3600               | 3600                 |
| K10  | 56.0          | 9000               | 80000               | 80000                 | 5000               | 5000                 |

Permitted shaft loads for S shaft design (hollow shaft with shrink ring)

| Type | $z_2$<br>[mm] | $F_{2ax20}$<br>[N] | $F_{2rad20}$<br>[N] | $F_{2rad,acc}$<br>[N] | $M_{2k20}$<br>[Nm] | $M_{2k,acc}$<br>[Nm] |
|------|---------------|--------------------|---------------------|-----------------------|--------------------|----------------------|
| K1   | 40.0          | 1900               | 5000                | 5000                  | 240                | 240                  |
| K2   | 42.0          | 2100               | 6000                | 6000                  | 310                | 310                  |
| K3   | 45.0          | 2400               | 7000                | 7000                  | 380                | 380                  |
| K4   | 52.0          | 3500               | 11200               | 11200                 | 740                | 740                  |
| K5   | 39.0          | 2500               | 13450               | 13450                 | 1000               | 1000                 |
| K6   | 42.0          | 3000               | 16000               | 16000                 | 1300               | 1300                 |
| K7   | 45.0          | 4100               | 22000               | 22000                 | 2100               | 2100                 |
| K8   | 50.0          | 5300               | 29000               | 29000                 | 2600               | 2600                 |
| K9   | 56.0          | 7000               | 65000               | 65000                 | 3600               | 3600                 |
| K10  | 56.0          | 9000               | 80000               | 80000                 | 5000               | 5000                 |

For other output speeds, download diagrams at <http://configurator.stoeber.de>.

The following applies to output speeds  $n_{2m*} > 20$  rpm:

$$F_{2axN} = \frac{F_{2ax20}}{\sqrt[3]{\frac{n_{2m*}}{20 \text{ rpm}}}} \quad F_{2radN} = \frac{F_{2rad20}}{\sqrt[3]{\frac{n_{2m*}}{20 \text{ rpm}}}} \quad M_{2kN} = \frac{M_{2k20}}{\sqrt[3]{\frac{n_{2m*}}{20 \text{ rpm}}}}$$

The values for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  can be found in the table "Permitted shaft loads" in this chapter.



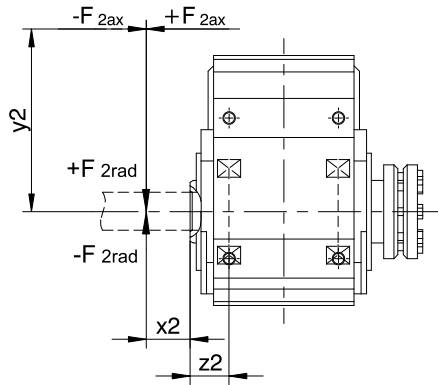


Fig. 2: Force application points for hollow shaft

You can determine the permitted radial forces from the permitted breakdown torque  $M_{2kN}$ . The actual radial forces may not exceed the permitted radial forces. The permitted radial forces pertain to the shaft end ( $x_2 = 0$ ).

$$M_{2k*} = \frac{2 \cdot F_{2ax*} \cdot y_2 + F_{2rad*} \cdot (x_2 + z_2)}{1000} \leq M_{2kN}$$

$$F_{2ax*} \leq F_{2axN}$$

For applications with multiple axial and/or radial forces, you must add the forces as vectors.

In the event of EMERGENCY OFF operation (max. 1000 load changes), you can multiply the permitted forces and torques for  $F_{2ax20}$ ,  $F_{2rad20}$  and  $M_{2k20}$  by a factor of two.

4.6.2 Radial shaft seal rings

Leak-proofness

Our gear units are equipped with high-quality radial shaft seal rings and checked for leaks. However, a leak cannot be fully ruled out over the length of use of a gear unit. If you use a gear unit with goods incompatible with the lubricant, you must take measures to prevent direct contact with the gear unit lubricant in case of a leak.

4.6.3 Oil expansion tank

The gear units have a higher fill level in mounting position EL5. The oil expansion tank prevents oil from escaping out of the gear unit.

Notes

- We recommend using an oil expansion tank in mounting position EL5 (additional cost) for fast running gear units with an input speed  $n_1 > 1750$  rpm and gear ratios  $i < 20$ .
- It is not possible to use an oil expansion tank if the plug connector is at 90°!
- The oil expansion tank can only be used with certain sizes; see the chapter [▶ 4.3.17]

4.7 Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/downloads/>

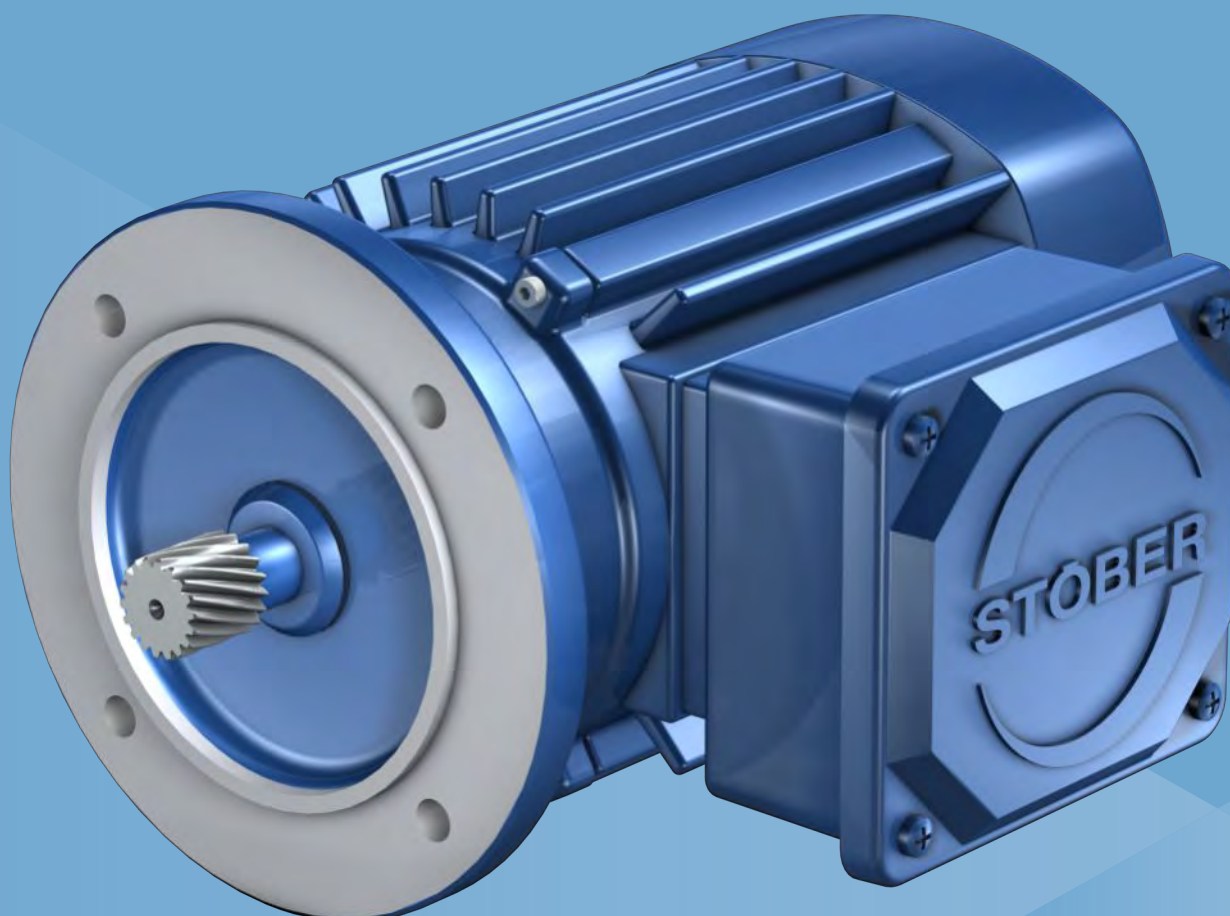
Enter the ID of the documentation in the Search... field.

| Documentation                                           | ID        |
|---------------------------------------------------------|-----------|
| Operating manual for C/F/K/S gear units and gear motors | 443027_en |

# 5      Asynchronous motors

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## 5 Asynchronous motors

### 5.1 Overview

#### Asynchronous motors

##### Features

|                                                                         |   |
|-------------------------------------------------------------------------|---|
| Self-ventilation or forced ventilation (optional)                       | ✓ |
| Spring-loaded brake (optional)                                          | ✓ |
| Incremental encoder (optional) or SSI absolute encoder (optional)       | ✓ |
| Elimination of referencing with multi-turn absolute encoders (optional) | ✓ |
| Terminal box                                                            | ✓ |
| Energy efficiency class IE3 in accordance with EN 60034-30-1            | ✓ |

#### Technical data (400 V ± 10%, 50 Hz)

|       |                 |
|-------|-----------------|
| $n_2$ | 1400 – 1480 rpm |
| $P_N$ | 0.12 – 45 kW    |
| $M_N$ | 0.82 – 291 Nm   |
| $I_N$ | 0.35 – 83 A     |

## 5.2 Selection tables

The technical data specified in the following selection table applies to:

- Installation altitudes up to 1000 m above sea level
- Surrounding temperatures from -20 °C to 40 °C
- 230 / 400 V AC nominal voltage
- 50 Hz nominal frequency
- 4 poles

For technical data for other motor designs, go to <http://configurator.stoeber.de>.

An explanation of the formula symbols can be found in the chapter [▶ 13.1](#).

Observe the legal requirements in the chapter [▶ 5.6.1](#).

The type designation for the motors in this product catalog and on the nameplate of the motor are different. The allocation is shown in the following table.

| Type on nameplate | Type in catalog |
|-------------------|-----------------|
| IE3-W41R 63 K4    | IE3D063K04      |
| IE3-W41R 63 G4    | IE3D063M04      |
| IE3-W41R 71 K4    | IE3D071K04      |
| IE3-W41R 71 G4    | IE3D071L04      |
| IE3-W41R 80 K4    | IE3D080K04      |
| IE3-W41R 80 G4    | IE3D080L04      |
| IE3-W41R 90 SY4   | IE3D090S04      |
| IE3-W41R 90 LX4   | IE3D090LX04     |
| IE3-W41R 100 L4   | IE3D100KX04     |
| IE3-W41R 100 LU4  | IE3D100LX04     |
| IE3-W41R 112 MW4  | IE3D112M04      |
| IE3-W42R 132 S4   | IE3D132SX04     |
| IE3-W43R 132 M4   | IE3D132MX04     |
| IE3-W43R 160 M4   | IE3D160MX04     |
| IE3-W41R 160 L4   | IE3D160LX04     |
| IE3-W43R 180 M4   | IE3D180MX04     |
| IE3-W43R 180 L4   | IE3D180LX04     |
| IE3-W43R 200 L4   | IE3D200LX04     |
| IE3-W43R 225 S4   | IE3D225SX04     |
| IE3-W43R 225 M4   | IE3D225MX04     |

The technical data for the motors can be found in the following selection table.

| Type        | Y/Δ | η<br>[%]<br>100% | η<br>[%]<br>75% | η<br>[%]<br>50% | cosφ <sub>N</sub> | P <sub>N</sub><br>[kW] | n <sub>N</sub><br>[rpm] | I <sub>N</sub><br>[A] | M <sub>N</sub><br>[Nm] | I <sub>1mot</sub> /<br>I <sub>N</sub> | M <sub>1mot</sub> /<br>M <sub>N</sub> | M <sub>k</sub> /<br>M <sub>N</sub> | J<br>[kgcm <sup>2</sup> ] | m<br>[kg] |
|-------------|-----|------------------|-----------------|-----------------|-------------------|------------------------|-------------------------|-----------------------|------------------------|---------------------------------------|---------------------------------------|------------------------------------|---------------------------|-----------|
| IE3D063K04  | Y   | 64.80            | 63.40           | 58.70           | 0.71              | 0.12                   | 1400                    | 0.35                  | 0.82                   | 3.8                                   | 2.0                                   | 2.3                                | 4.0                       | 6.3       |
| IE3D063M04  | Y   | 69.90            | 69.50           | 64.30           | 0.67              | 0.18                   | 1415                    | 0.55                  | 1.21                   | 4.4                                   | 2.8                                   | 2.9                                | 5.0                       | 7.1       |
| IE3D071K04  | Y   | 73.50            | 73.10           | 69.60           | 0.71              | 0.25                   | 1430                    | 0.66                  | 1.67                   | 5.6                                   | 2.5                                   | 2.9                                | 8.7                       | 9.9       |
| IE3D071L04  | Y   | 77.30            | 78.20           | 73.10           | 0.69              | 0.37                   | 1430                    | 0.98                  | 2.50                   | 6.2                                   | 2.8                                   | 3.2                                | 10.7                      | 11.0      |
| IE3D080K04  | Y   | 80.80            | 80.10           | 76.70           | 0.77              | 0.55                   | 1440                    | 1.27                  | 3.65                   | 6.6                                   | 3.0                                   | 3.6                                | 20.7                      | 14.5      |
| IE3D080L04  | Y   | 82.50            | 82.30           | 79.60           | 0.77              | 0.75                   | 1445                    | 1.70                  | 5.00                   | 7.0                                   | 3.1                                   | 3.7                                | 26.0                      | 17.0      |
| IE3D090S04  | Y   | 84.10            | 82.60           | 79.70           | 0.76              | 1.10                   | 1440                    | 2.50                  | 7.30                   | 6.7                                   | 2.8                                   | 3.7                                | 40.0                      | 22.5      |
| IE3D090LX04 | Y   | 85.30            | 85.80           | 82.90           | 0.75              | 1.50                   | 1455                    | 3.40                  | 9.80                   | 9.5                                   | 4.5                                   | 4.9                                | 58.0                      | 31.0      |
| IE3D100KX04 | Y   | 86.70            | 87.00           | 85.10           | 0.81              | 2.20                   | 1450                    | 4.55                  | 14.50                  | 8.2                                   | 2.9                                   | 3.8                                | 110.0                     | 45.0      |
| IE3D100LX04 | Y   | 87.70            | 88.80           | 87.70           | 0.77              | 3.00                   | 1450                    | 6.35                  | 19.80                  | 7.7                                   | 3.0                                   | 4.0                                | 130.0                     | 50.0      |
| IE3D112M04  | Δ   | 88.60            | 88.90           | 87.40           | 0.82              | 4.00                   | 1465                    | 7.90                  | 26.10                  | 9.4                                   | 3.0                                   | 4.5                                | 170.0                     | 56.0      |
| IE3D132SX04 | Δ   | 90.20            | 91.00           | 90.60           | 0.87              | 5.50                   | 1465                    | 10.00                 | 36.00                  | 7.1                                   | 2.1                                   | 3.3                                | 350.0                     | 90.0      |
| IE3D132MX04 | Δ   | 90.50            | 90.50           | 89.20           | 0.75              | 7.50                   | 1470                    | 16.00                 | 49.00                  | 7.6                                   | 3.0                                   | 3.9                                | 350.0                     | 88.0      |
| IE3D160MX04 | Δ   | 91.40            | 91.90           | 91.50           | 0.82              | 11.00                  | 1465                    | 21.00                 | 72.00                  | 7.0                                   | 2.3                                   | 3.4                                | 430.0                     | 105.0     |
| IE3D160LX04 | Δ   | 92.20            | 92.40           | 91.60           | 0.85              | 15.00                  | 1475                    | 27.50                 | 97.00                  | 8.7                                   | 3.1                                   | 3.5                                | 1150.0                    | 165.0     |
| IE3D180MX04 | Δ   | 92.60            | 92.70           | 91.90           | 0.84              | 18.50                  | 1475                    | 34.50                 | 120.00                 | 7.8                                   | 2.9                                   | 3.3                                | 1150.0                    | 160.0     |
| IE3D180LX04 | Δ   | 93.00            | 93.30           | 92.70           | 0.83              | 22.00                  | 1475                    | 41.00                 | 142.00                 | 6.9                                   | 2.0                                   | 3.0                                | 1680.0                    | 206.0     |
| IE3D200LX04 | Δ   | 93.60            | 94.00           | 93.70           | 0.86              | 30.00                  | 1480                    | 54.00                 | 194.00                 | 6.4                                   | 1.8                                   | 2.5                                | 3130.0                    | 304.0     |
| IE3D225SX04 | Δ   | 93.90            | 94.40           | 94.20           | 0.85              | 37.00                  | 1475                    | 67.00                 | 240.00                 | 6.4                                   | 2.2                                   | 2.6                                | 3560.0                    | 341.0     |
| IE3D225MX04 | Δ   | 94.30            | 94.80           | 94.70           | 0.83              | 45.00                  | 1475                    | 83.00                 | 291.00                 | 7.2                                   | 2.5                                   | 2.4                                | 5250.0                    | 377.0     |

2-pole motors are available on request.

## 5.3 Dimensional drawings

In the following dimensional drawings, motors are shown with an output flange for direct attachment to STOEGER gear units. Note that other dimensions may apply to motors with an IEC output flange, cURus test symbol or EISA 2007 certification in some cases. You can find corresponding dimensional drawings at <http://configurator.stoeber.de>.

For IE3D080 – IE3D112 motors, the center of the terminal box is not at the center line of the motor axis.

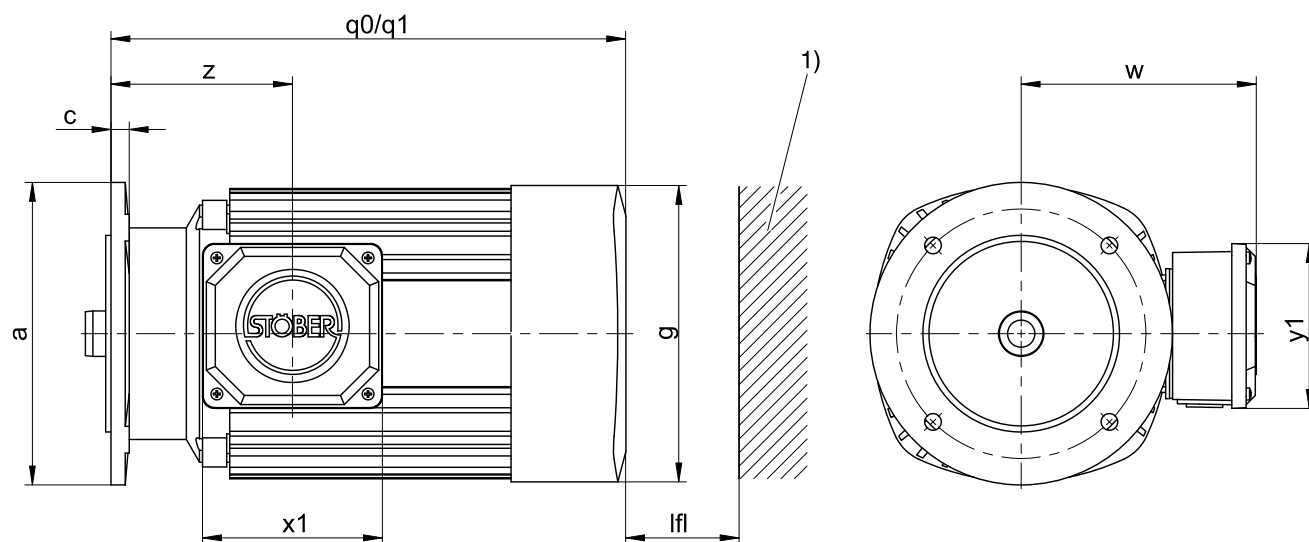
Dimensions can exceed the specifications of ISO 2768-mK due to casting tolerances or accumulation of individual tolerances.

We reserve the right to make dimensional changes due to ongoing technical development.

You can download 3D models of our standard drives at <http://configurator.stoeber.de>.

### 5.3.1 Motors with self-ventilation

In the following dimensional drawings, motors are shown with an output flange for direct attachment to STÖBER gear units. Note that other dimensions may apply to motors with an IEC output flange, cURus test symbol or EISA 2007 certification in some cases. You can find corresponding dimensional drawings at <http://configurator.stoeber.de>.



|    |                                 |
|----|---------------------------------|
| q0 | Applies to motors without brake |
|----|---------------------------------|

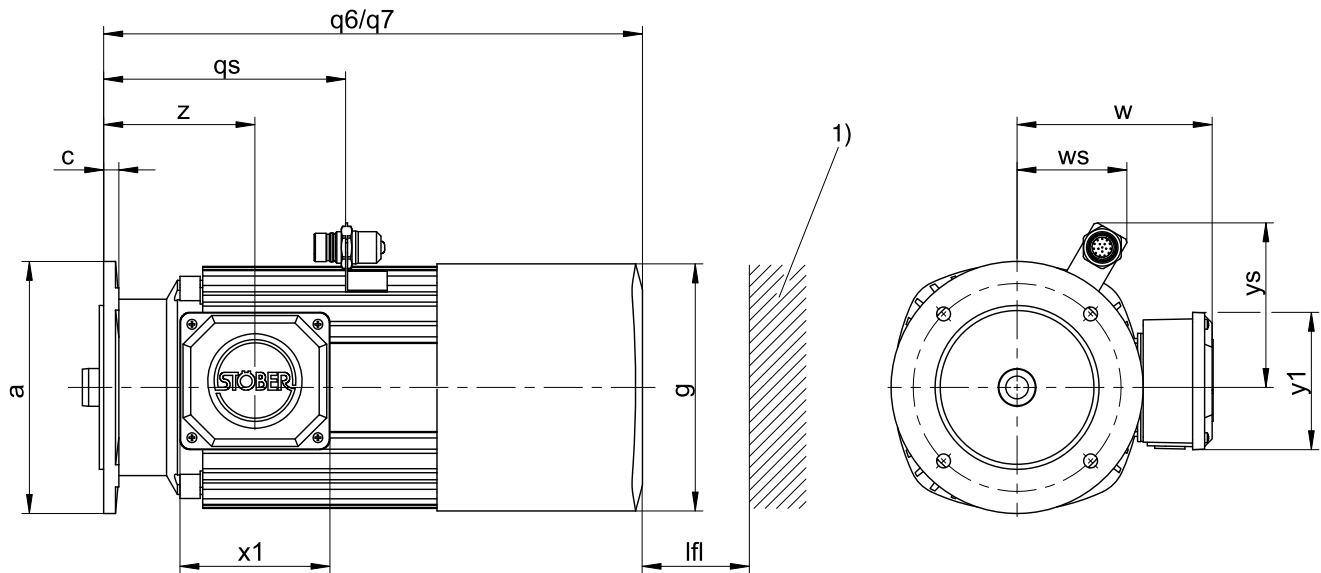
q1 Applies to motors with brake

1) Machine wall

| Type        | pz | Øa  | c  | g   | lfl | q0  | q1  | w   | x1  | y1  | z   |
|-------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| IE3D063K04  | 4  | 140 | 11 | 124 | 14  | 208 | 261 | 121 | 109 | 97  | 94  |
| IE3D063M04  | 4  | 140 | 11 | 124 | 14  | 208 | 261 | 121 | 109 | 97  | 94  |
| IE3D071K04  | 4  | 140 | 11 | 139 | 14  | 238 | 295 | 128 | 109 | 97  | 97  |
| IE3D071L04  | 4  | 140 | 11 | 139 | 14  | 238 | 295 | 128 | 109 | 97  | 97  |
| IE3D080K04  | 4  | 160 | 10 | 157 | 16  | 261 | 329 | 137 | 109 | 97  | 107 |
| IE3D080L04  | 4  | 160 | 11 | 157 | 16  | 283 | 351 | 137 | 109 | 97  | 107 |
| IE3D090S04  | 4  | 160 | 11 | 177 | 18  | 310 | 380 | 146 | 120 | 109 | 114 |
| IE3D090L04  | 4  | 160 | 11 | 177 | 18  | 340 | 410 | 146 | 120 | 109 | 114 |
| IE3D090LX04 | 4  | 160 | 11 | 177 | 18  | 365 | 435 | 146 | 120 | 109 | 114 |
| IE3D100K04  | 4  | 200 | 12 | 196 | 20  | 394 | 481 | 155 | 120 | 109 | 120 |
| IE3D100KX04 | 4  | 200 | 12 | 196 | 20  | 404 | 491 | 155 | 120 | 109 | 120 |
| IE3D100L04  | 4  | 200 | 12 | 196 | 20  | 444 | 531 | 155 | 120 | 109 | 120 |
| IE3D100LX04 | 4  | 200 | 12 | 196 | 20  | 444 | 531 | 155 | 120 | 109 | 120 |
| IE3D112M04  | 4  | 200 | 12 | 217 | 35  | 424 | 521 | 178 | 147 | 157 | 134 |
| IE3D132SX04 | 4  | 250 | 11 | 258 | 35  | 476 | 591 | 199 | 147 | 157 | 142 |
| IE3D132MX04 | 4  | 250 | 11 | 258 | 35  | 476 | 591 | 199 | 147 | 157 | 142 |
| IE3D160MX04 | 4  | 300 | 12 | 313 | 35  | 526 | 641 | 199 | 167 | 194 | 138 |
| IE3D160LX04 | 4  | 300 | 12 | 313 | 35  | 549 | 627 | 242 | 167 | 194 | 138 |
| IE3D180MX04 | 4  | 300 | 16 | 313 | 35  | 549 | 677 | 242 | 167 | 194 | 178 |
| IE3D180LX04 | 4  | 300 | 16 | 351 | 35  | 601 | 748 | 260 | 167 | 194 | 178 |
| IE3D200LX04 | 4  | 350 | 20 | 390 | 35  | 729 | 878 | 298 | 207 | 209 | 242 |
| IE3D225SX04 | 4  | 400 | 15 | 390 | 40  | 706 | 855 | 300 | 207 | 209 | 169 |
| IE3D225MX04 | 4  | 400 | 20 | 440 | 45  | 787 | 935 | 324 | 207 | 209 | 242 |

### 5.3.2 Motors with self-ventilation and encoder

In the following dimensional drawings, motors are shown with an output flange for direct attachment to STÖBER gear units. Note that other dimensions may apply to motors with an IEC output flange, cURus test symbol or EISA 2007 certification in some cases. You can find corresponding dimensional drawings at <http://configurator.stoeber.de>.



q6 Applies to motors without brake

q7 Applies to motors with brake

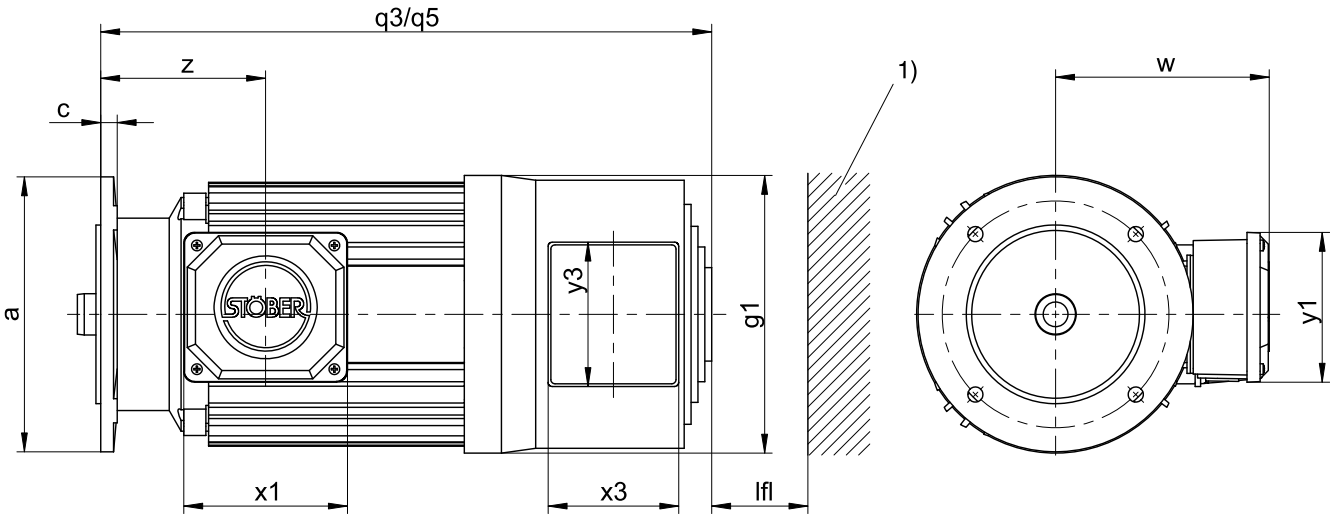
1) Machine wall

| Type        | pz | Øa  | c  | g   | lfl | q6  | q7   | qs  | w   | ws  | x1  | y1  | ys  | z   |
|-------------|----|-----|----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|
| IE3D063K04  | 4  | 140 | 11 | 124 | 14  | 261 | 316  | 111 | 121 | 58  | 109 | 97  | 83  | 94  |
| IE3D063M04  | 4  | 140 | 11 | 124 | 14  | 261 | 316  | 111 | 121 | 58  | 109 | 97  | 83  | 94  |
| IE3D071K04  | 4  | 140 | 11 | 139 | 14  | 295 | 353  | 123 | 128 | 63  | 109 | 97  | 90  | 97  |
| IE3D071L04  | 4  | 140 | 11 | 139 | 14  | 295 | 353  | 123 | 128 | 63  | 109 | 97  | 90  | 97  |
| IE3D080K04  | 4  | 160 | 10 | 157 | 16  | 329 | 386  | 126 | 137 | 67  | 109 | 97  | 97  | 107 |
| IE3D080L04  | 4  | 160 | 11 | 157 | 16  | 351 | 408  | 172 | 137 | 77  | 109 | 97  | 113 | 107 |
| IE3D090S04  | 4  | 160 | 11 | 177 | 18  | 380 | 437  | 186 | 146 | 82  | 120 | 109 | 121 | 114 |
| IE3D090L04  | 4  | 160 | 11 | 177 | 18  | 410 | 467  | 186 | 146 | 82  | 120 | 109 | 121 | 114 |
| IE3D090LX04 | 4  | 160 | 11 | 177 | 18  | 435 | 492  | 186 | 146 | 82  | 120 | 109 | 121 | 114 |
| IE3D100K04  | 4  | 200 | 12 | 196 | 20  | 481 | 533  | 192 | 155 | 87  | 120 | 109 | 131 | 120 |
| IE3D100KX04 | 4  | 200 | 12 | 196 | 20  | 491 | 543  | 192 | 155 | 87  | 120 | 109 | 131 | 120 |
| IE3D100L04  | 4  | 200 | 12 | 196 | 20  | 531 | 583  | 192 | 155 | 87  | 120 | 109 | 131 | 120 |
| IE3D100LX04 | 4  | 200 | 12 | 196 | 20  | 531 | 583  | 192 | 155 | 87  | 120 | 109 | 131 | 120 |
| IE3D112M04  | 4  | 200 | 12 | 217 | 35  | 521 | 569  | 102 | 178 | 92  | 147 | 157 | 131 | 134 |
| IE3D132SX04 | 4  | 250 | 11 | 258 | 35  | 591 | 706  | 213 | 199 | 102 | 147 | 157 | 145 | 142 |
| IE3D132MX04 | 4  | 250 | 11 | 258 | 35  | 591 | 716  | 213 | 199 | 102 | 147 | 157 | 145 | 142 |
| IE3D160MX04 | 4  | 300 | 12 | 313 | 35  | 641 | 756  | 213 | 199 | 102 | 167 | 194 | 145 | 138 |
| IE3D160LX04 | 4  | 300 | 12 | 313 | 35  | 627 | 804  | 285 | 242 | 123 | 167 | 194 | 166 | 138 |
| IE3D180MX04 | 4  | 300 | 16 | 313 | 35  | 677 | 804  | 285 | 242 | 123 | 167 | 194 | 166 | 178 |
| IE3D180LX04 | 4  | 300 | 16 | 351 | 35  | 748 | 895  | 326 | 260 | 136 | 167 | 194 | 179 | 178 |
| IE3D200LX04 | 4  | 350 | 20 | 390 | 35  | 878 | 1026 | 361 | 298 | 155 | 207 | 209 | 198 | 242 |
| IE3D225SX04 | 4  | 400 | 15 | 390 | 40  | 855 | 1003 | 399 | 300 | 155 | 207 | 209 | 198 | 169 |
| IE3D225MX04 | 4  | 400 | 20 | 440 | 45  | 935 | 1045 | 472 | 324 | 180 | 207 | 209 | 223 | 242 |



5.3.3
Motors with forced ventilation

In the following dimensional drawings, motors are shown with an output flange for direct attachment to STOEBER gear units. Note that other dimensions may apply to motors with an IEC output flange, cURus test symbol or EISA 2007 certification in some cases. You can find corresponding dimensional drawings at <http://configurator.stoeber.de>.

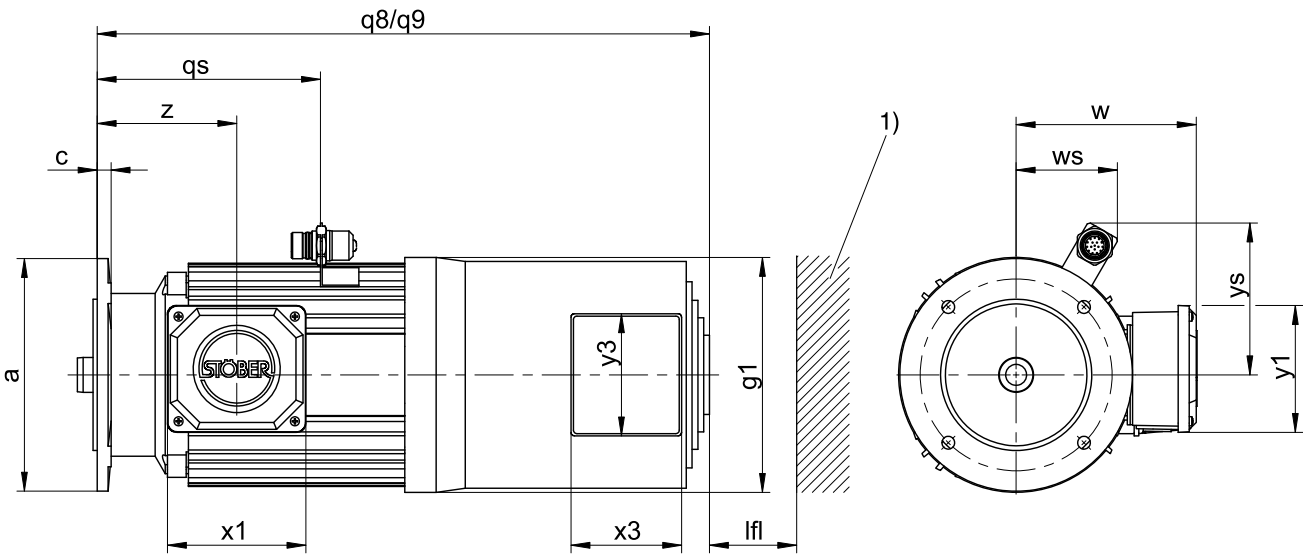


- q3
Applies to motors without brake
- q5
Applies to motors with brake
- 1)
Machine wall

| Type        | pz | Øa  | c  | g1  | lfl | q3  | q5   | w   | x1  | x3  | y1  | y3  | z   |
|-------------|----|-----|----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|
| IE3D063K04  | 4  | 140 | 11 | 115 | 14  | 311 | 350  | 121 | 109 | 105 | 97  | 105 | 94  |
| IE3D063M04  | 4  | 140 | 11 | 115 | 14  | 311 | 350  | 121 | 109 | 105 | 97  | 105 | 94  |
| IE3D071K04  | 4  | 140 | 11 | 131 | 14  | 343 | 388  | 128 | 109 | 105 | 97  | 105 | 97  |
| IE3D071L04  | 4  | 140 | 11 | 131 | 14  | 343 | 388  | 128 | 109 | 105 | 97  | 105 | 97  |
| IE3D080K04  | 4  | 160 | 10 | 146 | 16  | 362 | 421  | 137 | 109 | 105 | 97  | 105 | 107 |
| IE3D080L04  | 4  | 160 | 11 | 162 | 16  | 384 | 443  | 137 | 109 | 95  | 97  | 105 | 107 |
| IE3D090S04  | 4  | 160 | 11 | 180 | 18  | 416 | 467  | 146 | 120 | 95  | 109 | 105 | 114 |
| IE3D090L04  | 4  | 160 | 11 | 180 | 18  | 446 | 497  | 146 | 120 | 95  | 109 | 105 | 114 |
| IE3D090LX04 | 4  | 160 | 11 | 180 | 18  | 471 | 522  | 146 | 120 | 95  | 109 | 105 | 114 |
| IE3D100K04  | 4  | 200 | 12 | 202 | 20  | 498 | 580  | 155 | 120 | 95  | 109 | 105 | 120 |
| IE3D100KX04 | 4  | 200 | 12 | 200 | 20  | 508 | 590  | 155 | 120 | 95  | 109 | 105 | 120 |
| IE3D100L04  | 4  | 200 | 12 | 202 | 20  | 548 | 630  | 155 | 120 | 95  | 109 | 105 | 120 |
| IE3D100LX04 | 4  | 200 | 12 | 200 | 20  | 548 | 630  | 155 | 120 | 95  | 109 | 105 | 120 |
| IE3D112M04  | 4  | 200 | 12 | 234 | 35  | 514 | 559  | 178 | 147 | 95  | 157 | 105 | 134 |
| IE3D132SX04 | 4  | 250 | 11 | 258 | 35  | 615 | 715  | 199 | 147 | 95  | 157 | 105 | 142 |
| IE3D132MX04 | 4  | 250 | 11 | 258 | 35  | 615 | 715  | 199 | 147 | 95  | 157 | 105 | 142 |
| IE3D160MX04 | 4  | 300 | 12 | 313 | 35  | 665 | 765  | 199 | 167 | 95  | 194 | 105 | 138 |
| IE3D160LX04 | 4  | 300 | 12 | 313 | 35  | 722 | 835  | 242 | 167 | 95  | 194 | 105 | 138 |
| IE3D180MX04 | 4  | 300 | 16 | 338 | 35  | 722 | 835  | 242 | 167 | 95  | 194 | 105 | 178 |
| IE3D180LX04 | 4  | 300 | 16 | 338 | 35  | 774 | 909  | 260 | 167 | 95  | 194 | 105 | 178 |
| IE3D200LX04 | 4  | 350 | 20 | 424 | 35  | 923 | 1108 | 298 | 207 | 95  | 209 | 105 | 242 |
| IE3D225SX04 | 4  | 400 | 15 | 424 | 40  | 900 | 1085 | 300 | 207 | 95  | 209 | 105 | 169 |
| IE3D225MX04 | 4  | 400 | 20 | 424 | 45  | 942 | 1092 | 324 | 207 | 95  | 209 | 105 | 242 |

5.3.4 Motors with forced ventilation and encoder

In the following dimensional drawings, motors are shown with an output flange for direct attachment to STÖBER gear units. Note that other dimensions may apply to motors with an IEC output flange, cURus test symbol or EISA 2007 certification in some cases. You can find corresponding dimensional drawings at <http://configurator.stoeber.de>.



q8 Applies to motors without brake  
q9 Applies to motors with brake  
1) Machine wall

| Type        | pz | Øa  | c  | g1  | lfl | q8   | q9   | qs  | w   | ws  | x1  | x3  | y1  | y3  | ys  | z   |
|-------------|----|-----|----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| IE3D063K04  | 4  | 140 | 11 | 115 | 14  | 350  | 400  | 111 | 121 | 58  | 109 | 105 | 97  | 105 | 83  | 94  |
| IE3D063M04  | 4  | 140 | 11 | 115 | 14  | 350  | 400  | 111 | 121 | 58  | 109 | 105 | 97  | 105 | 83  | 94  |
| IE3D071K04  | 4  | 140 | 11 | 131 | 14  | 388  | 423  | 123 | 128 | 63  | 109 | 105 | 97  | 105 | 90  | 97  |
| IE3D071L04  | 4  | 140 | 11 | 131 | 14  | 388  | 423  | 123 | 128 | 63  | 109 | 105 | 97  | 105 | 90  | 97  |
| IE3D080K04  | 4  | 160 | 10 | 146 | 16  | 421  | 451  | 126 | 137 | 67  | 109 | 105 | 97  | 105 | 97  | 107 |
| IE3D080L04  | 4  | 160 | 11 | 162 | 16  | 443  | 473  | 172 | 137 | 77  | 109 | 95  | 97  | 105 | 113 | 107 |
| IE3D090S04  | 4  | 160 | 11 | 180 | 18  | 467  | 517  | 186 | 146 | 82  | 120 | 95  | 109 | 105 | 121 | 114 |
| IE3D090L04  | 4  | 160 | 11 | 180 | 18  | 497  | 547  | 186 | 146 | 82  | 120 | 95  | 109 | 105 | 121 | 114 |
| IE3D090LX04 | 4  | 160 | 11 | 180 | 18  | 522  | 572  | 186 | 146 | 82  | 120 | 95  | 109 | 105 | 121 | 114 |
| IE3D100K04  | 4  | 200 | 12 | 202 | 20  | 580  | 608  | 192 | 155 | 87  | 120 | 95  | 109 | 105 | 131 | 120 |
| IE3D100KX04 | 4  | 200 | 12 | 200 | 20  | 590  | 618  | 192 | 155 | 87  | 120 | 95  | 109 | 105 | 131 | 120 |
| IE3D100L04  | 4  | 200 | 12 | 202 | 20  | 630  | 658  | 192 | 155 | 87  | 120 | 95  | 109 | 105 | 131 | 120 |
| IE3D100LX04 | 4  | 200 | 12 | 200 | 20  | 630  | 658  | 192 | 155 | 87  | 120 | 95  | 109 | 105 | 131 | 120 |
| IE3D112M04  | 4  | 200 | 12 | 234 | 35  | 559  | 624  | 102 | 178 | 92  | 147 | 95  | 157 | 105 | 131 | 134 |
| IE3D132SX04 | 4  | 250 | 11 | 258 | 35  | 715  | 815  | 213 | 199 | 102 | 147 | 95  | 157 | 105 | 145 | 142 |
| IE3D132MX04 | 4  | 250 | 11 | 258 | 35  | 715  | 815  | 213 | 199 | 102 | 147 | 95  | 157 | 105 | 145 | 142 |
| IE3D160MX04 | 4  | 300 | 12 | 313 | 35  | 765  | 865  | 213 | 199 | 102 | 167 | 95  | 194 | 105 | 145 | 138 |
| IE3D160LX04 | 4  | 300 | 12 | 313 | 35  | 835  | 935  | 285 | 242 | 123 | 167 | 95  | 194 | 105 | 166 | 138 |
| IE3D180MX04 | 4  | 300 | 16 | 338 | 35  | 835  | 935  | 285 | 242 | 123 | 167 | 95  | 194 | 105 | 166 | 178 |
| IE3D180LX04 | 4  | 300 | 16 | 338 | 35  | 909  | 1009 | 326 | 260 | 136 | 167 | 95  | 194 | 105 | 179 | 178 |
| IE3D200LX04 | 4  | 350 | 20 | 424 | 35  | 1108 | 1216 | 361 | 298 | 155 | 207 | 95  | 209 | 105 | 198 | 242 |
| IE3D225SX04 | 4  | 400 | 15 | 424 | 40  | 1085 | 1193 | 399 | 300 | 155 | 207 | 95  | 209 | 105 | 198 | 169 |
| IE3D225MX04 | 4  | 400 | 20 | 424 | 45  | 1092 | 1192 | 472 | 324 | 180 | 207 | 95  | 209 | 105 | 223 | 242 |

## 5.4 Type designation

|     |   |     |   |    |
|-----|---|-----|---|----|
| IE3 | D | 080 | K | 04 |
|-----|---|-----|---|----|

### Explanation

| Code                         | Designation                                              | Design                           |
|------------------------------|----------------------------------------------------------|----------------------------------|
| IE3                          | Energy efficiency class in accordance with EN 60034-30-1 | IE3                              |
| D                            | Type                                                     | Asynchronous motor               |
| 080                          | Size                                                     | 80 (example)                     |
| K/KX<br>L/LX<br>M/MX<br>S/SX | Length                                                   | Short<br>Long<br>Medium<br>Small |
| 02                           | Number of poles                                          | 2                                |
| 04                           |                                                          | 4                                |

The type designation on the motor nameplate differs from the type designation in the product catalog. The allocation can be found in the Selection Tables chapter.

### In order to complete the type designation, also specify:

- With IEC output flange or for direct attachment to STOBBER gear units?
- With spring-loaded brake? (see the chapter [\[ 5.5.7 \]](#))?
- With cURus test symbol option?
- With EISA 2007 certification option?
- With forced ventilation option (see the chapter [\[ 5.5.6.1 \]](#))?
- With forced ventilation and encoder option (see the chapter Encoders)?
- Side for cable entry (see the chapter [\[ 5.5.8.1 \]](#))

## 5.5 Product description

### 5.5.1 General features

| Feature             | Description                                                                       |
|---------------------|-----------------------------------------------------------------------------------|
| Design              | IM B5, IM V1, IM V3 in accordance with EN 60034-7                                 |
| Protection class    | IP54                                                                              |
| Thermal class       | 155 (F) in accordance with EN 60034-1 (155 °C, heating $\Delta\vartheta = 100$ K) |
| Cooling             | IC 411 self-ventilation<br>IC 416 forced ventilation (option)                     |
| Paint               | RAL 7001 Silver gray<br>Optional selection of various RAL colors.                 |
| Bearing             | Rolling bearing with lifetime lubrication                                         |
| Vibration intensity | A in accordance with EN 60034-14                                                  |
| Noise level         | Limit values in accordance with EN 60034-9                                        |

### 5.5.2 Electrical features

General electrical features of the asynchronous motors are described in this chapter. Details can be found in the "Selection tables" chapter.

#### IE3D063 – IE3D100

|                 | 50 Hz                                                               | 60 Hz                                                               |
|-----------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
| Nominal voltage | Delta connection: AC 230 V<br>Star connection: AC 400 V             | Delta connection: AC 265 V<br>Star connection: AC 460 V             |
| Voltage range   | Delta connection: AC 220 – 240 V<br>Star connection: AC 380 – 420 V | Delta connection: AC 220 – 275 V<br>Star connection: AC 380 – 480 V |

**IE3D112 – IE3D225 motors**

|                 | 50 Hz                            | 60 Hz                            |
|-----------------|----------------------------------|----------------------------------|
| Nominal voltage | Delta connection: AC 400 V       | Delta connection: AC 460 V       |
| Voltage range   | Delta connection: AC 380 – 420 V | Delta connection: AC 380 – 480 V |

**5.5.3 Ambient conditions**

Standard ambient conditions for transport, storage and operation of the motor are described in this chapter.

| Feature                                       | Description                                                        |
|-----------------------------------------------|--------------------------------------------------------------------|
| Surrounding temperature for transport/storage | –30 °C to +85 °C                                                   |
| Surrounding temperature for operation         | –20 °C to +40 °C                                                   |
| Relative humidity                             | 5% to 95%, no condensation                                         |
| Installation altitude                         | ≤ 1000 m above sea level                                           |
| Shock load                                    | ≤ 50 m/s <sup>2</sup> (5 g), 6 ms in accordance with EN 60068-2-27 |

**Notes**

- STÖBER asynchronous motors are not suitable for potentially explosive atmospheres. You can get asynchronous motors for use in potentially explosive atmospheres on request.
- Secure the connection cables close to the motor so that cable vibrations do not place impermissible loads on the screw connections, terminal boxes or plug connectors.
- Also take into consideration the shock load of the motor due to output units (such as gear units and pumps) which are coupled with the motor.

**5.5.4 Encoders**

Asynchronous motors with forced ventilation can optionally be equipped with an incremental or absolute encoder. Self-ventilated asynchronous motors are optionally available with an incremental encoder. The encoder connection method is described in Chapter [5.5.8](#).

**5.5.4.1 Incremental encoders**

Incremental encoder technical data can be found in this chapter.

| Feature               | Description |
|-----------------------|-------------|
| Sensing principle     | Optical     |
| Pulses per revolution | 2048        |
| Reference signal      | Zero pulse  |
| TTL output level      | RS422       |
| HTL output level      | Push-pull   |
| TTL operating voltage | DC 5 V ± 5% |
| HTL operating voltage | DC 8 – 30 V |

**5.5.4.2 Multi-turn absolute encoders**

Multi-turn absolute encoder technical data can be found in this chapter. This encoder is used to detect several revolutions of the motor shaft, making it possible to reduce the amount of referencing.

**Technical Data**

| Feature                        | Description    |
|--------------------------------|----------------|
| Type                           | EQN 425        |
| Interface                      | SSI            |
| Code                           | Gray           |
| Position values per revolution | 8192 (13 bits) |
| Recordable revolutions         | 4096 (12 bits) |
| Operating voltage              | DC 4.75 – 30 V |

5.5.5
PTC thermistor

In this chapter, you can find technical data on the PTC thermistor that can optionally be installed in STOB-  
 ER asynchronous motors for implementing thermal winding protection. To prevent damage to the motor, al-  
 ways monitor the PTC thermistor with appropriate devices that will turn off the motor if the maximum per-  
 mitted winding temperature is exceeded.

The PTC thermistor is a triple thermistor in accordance with DIN 44082 that allows the temperature of each  
 winding phase to be monitored. The resistance values in the following table and curve refer to a single ther-  
 mistor in accordance with DIN 44081. These values must be multiplied by 3 for a triple thermistor in accor-  
 dance with DIN 44082.

| Feature                                            | Description                                                                            |
|----------------------------------------------------|----------------------------------------------------------------------------------------|
| Nominal response temperature $\vartheta_{NAT}$     | 145 °C ± 5 K                                                                           |
| Resistance R -20 °C up to $\vartheta_{NAT} - 20$ K | ≤ 250 Ω                                                                                |
| Resistance R with $\vartheta_{NAT} - 5$ K          | ≤ 550 Ω                                                                                |
| Resistance R with $\vartheta_{NAT} + 5$ K          | ≥ 1330 Ω                                                                               |
| Resistance R with $\vartheta_{NAT} + 15$ K         | ≥ 4000 Ω                                                                               |
| Operating voltage                                  | ≤ DC 7.5 V                                                                             |
| Thermal response time                              | < 5 s                                                                                  |
| Thermal class                                      | 155 (F) in accordance with EN 60034-1 (155 °C, heat-<br>ing $\Delta\vartheta = 100$ K) |

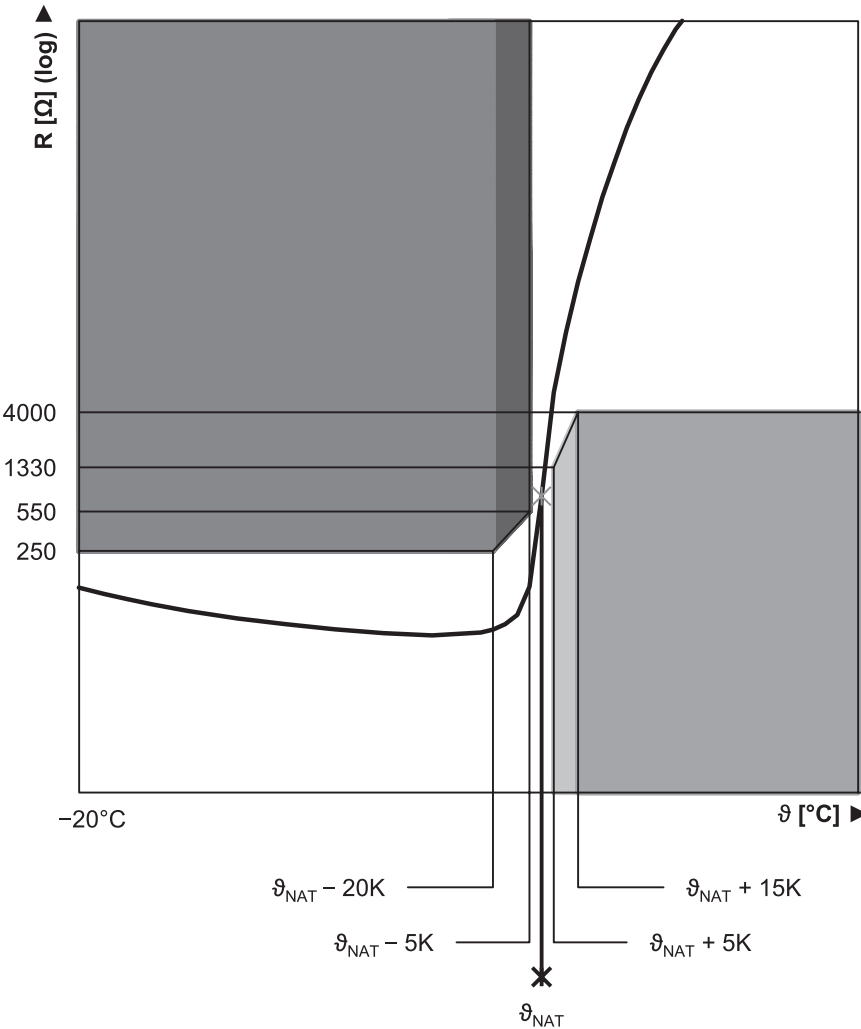


Fig. 1: PTC thermistor curve (single thermistor)

## 5.5.6 Cooling

STOBER asynchronous motors in the standard design are cooled using the impeller installed on the motor shaft (self-ventilation). In this process, the motor waste heat is transported away by the air aspirated by the impeller and blown over the motor cooling fins.

### 5.5.6.1 Forced ventilation

STOBER asynchronous motors can be equipped with an optional forced ventilation unit. This may be necessary at low speeds or for operation on a drive controller in order to ensure cooling independent of the motor speed. A forced ventilation unit can also be added later. The performance data for motors with forced ventilation can be found in Chapter [5.2](#) and the dimensional drawings in Chapter [5.3](#).

#### Technical data (50 Hz)

| Motor                   | Type   | $U_{N,F}$<br>[V]             | $I_{N,F}$<br>[A] | $\cos\phi_F$ | $n_F$<br>[rpm] | $q_{vF}$<br>[m³/h] | $L_{pA,F}$<br>[dBA] | $C_F$<br>[μF] |
|-------------------------|--------|------------------------------|------------------|--------------|----------------|--------------------|---------------------|---------------|
| IE3D063K04.IE3D063M04   | FL-63  | $\Delta_C$                   | 0.18             | 0.99         | 2710           | 54                 | 47                  | 3             |
| IE3D063K04.IE3D063M04   | FL-63  | $\Delta$ 220–240 / Y 380–420 | 0.15/0.09        | 0.45         | 2830           | 54                 | 47                  | –             |
| IE3D071K04.IE3D071L04   | FL-71  | $\Delta_C$                   | 0.18             | 0.99         | 2730           | 78                 | 51                  | 3             |
| IE3D071K04.IE3D071L04   | FL-71  | $\Delta$ 220–240 / Y 380–420 | 0.15/0.09        | 0.48         | 2820           | 78                 | 51                  | –             |
| IE3D080L04              | FL-80  | $\Delta_C$                   | 0.19             | 0.98         | 2650           | 128                | 54                  | 3             |
| IE3D080L04              | FL-80  | $\Delta$ 220–240 / Y 380–420 | 0.16/0.09        | 0.56         | 2760           | 128                | 54                  | –             |
| IE3D090LX04.IE3D090S04  | FL-90  | $\Delta_C$                   | 0.29             | 0.89         | 2890           | 216                | 59                  | 3             |
| IE3D090LX04.IE3D090S04  | FL-90  | $\Delta$ 220–240 / Y 380–420 | 0.39/0.22        | 0.47         | 2890           | 216                | 59                  | –             |
| IE3D100KX04.IE3D100LX04 | FL-100 | $\Delta_C$                   | 0.29             | 0.94         | 2820           | 278                | 60                  | 3             |
| IE3D100KX04.IE3D100LX04 | FL-100 | $\Delta$ 220–240 / Y 380–420 | 0.37/0.21        | 0.56         | 2830           | 278                | 60                  | –             |
| IE3D112M04              | FL-112 | $\Delta_C$                   | 0.27             | 0.96         | 2750           | 355                | 62                  | 3             |
| IE3D112M04              | FL-112 | $\Delta$ 220–240 / Y 380–420 | 0.35/0.20        | 0.69         | 2780           | 355                | 62                  | –             |

Technical data for force-ventilated motors of size 132 or larger are available on request.

#### Technical data (60 Hz)

| Motor                   | Type   | $U_{N,F}$<br>[V]             | $I_{N,F}$<br>[A] | $\cos\phi_F$ | $n_F$<br>[rpm] | $q_{vF}$<br>[m³/h] | $L_{pA,F}$<br>[dBA] | $C_F$<br>[μF] |
|-------------------------|--------|------------------------------|------------------|--------------|----------------|--------------------|---------------------|---------------|
| IE3D063K04.IE3D063M04   | FL-63  | $\Delta_C$                   | 0.21             | 0.98         | 3020           | 69                 | 52                  | 3             |
| IE3D063K04.IE3D063M04   | FL-63  | $\Delta$ 220–275 / Y 380–480 | 0.14/0.08        | 0.47         | 3420           | 69                 | 52                  | –             |
| IE3D071K04.IE3D071L04   | FL-71  | $\Delta_C$                   | 0.21             | 0.98         | 3000           | 99                 | 56                  | 3             |
| IE3D071K04.IE3D071L04   | FL-71  | $\Delta$ 220–275 / Y 380–480 | 0.13/0.07        | 0.52         | 3370           | 99                 | 56                  | –             |
| IE3D080L04              | FL-80  | $\Delta_C$                   | 0.22             | 0.97         | 2600           | 151                | 58                  | 3             |
| IE3D080L04              | FL-80  | $\Delta$ 220–275 / Y 380–480 | 0.13/0.07        | 0.70         | 3250           | 151                | 58                  | –             |
| IE3D090LX04.IE3D090S04  | FL-90  | $\Delta_C$                   | 0.23             | 0.99         | 3390           | 258                | 63                  | 3             |
| IE3D090LX04.IE3D090S04  | FL-90  | $\Delta$ 220–275 / Y 380–480 | 0.32/0.18        | 0.55         | 3430           | 258                | 63                  | –             |
| IE3D100KX04.IE3D100LX04 | FL-100 | $\Delta_C$                   | 0.28             | 0.99         | 3240           | 328                | 65                  | 3             |
| IE3D100KX04.IE3D100LX04 | FL-100 | $\Delta$ 220–275 / Y 380–480 | 0.30/0.18        | 0.66         | 3390           | 328                | 65                  | –             |
| IE3D112M04              | FL-112 | $\Delta_C$                   | 0.36             | 0.99         | 2800           | 418                | 66                  | 3             |
| IE3D112M04              | FL-112 | $\Delta$ 220–275 / Y 380–480 | 0.29/0.17        | 0.77         | 3260           | 418                | 66                  | –             |

Technical data for force-ventilated motors of size 132 or larger are available on request.

## 5.5.7 Brake

STOBER asynchronous motors can optionally be equipped with a spring-loaded brake that engages automatically when switching off the supply voltage and quickly brings the motor shaft to a stop. The spring-loaded brake is designed for dynamic applications with regular braking operations at high speed.

The spring-loaded brake can be released in the de-energized state using an optional manual release lever.

### 5.5.7.1 Power supply

DC voltage is needed to supply power to the spring-loaded brake. The DC voltage can be provided by an external DC voltage source or by rectifiers installed in the motor terminal box or control cabinet. If you use an external DC voltage source, connect a S14 K35 varistor (or comparable) in parallel to the brake coil to protect your machine from switching surges.

The brake coil is designed for 115 V DC (K38 brake type) or 127 V DC (L48 brake type) by default. Additional designs are optionally available.

Rectifiers installed in the motor terminal box can be supplied with AC voltage directly from the motor terminal board in many applications. During project configuration, ensure that the permitted input voltage  $U_{1rf}$  for the rectifier and the nominal voltage for the brake are not exceeded. The following interactions apply depending on the rectifier design:

- Half-wave rectifier:  $U_{2rf} = 0.45 \times U_{1rf}$
- Bridge rectifier:  $U_{2rf} = 0.9 \times U_{1rf}$
- Powerbox rectifier:  $220 \text{ V AC} \leq U_{1rf} \leq 277 \text{ V AC}$

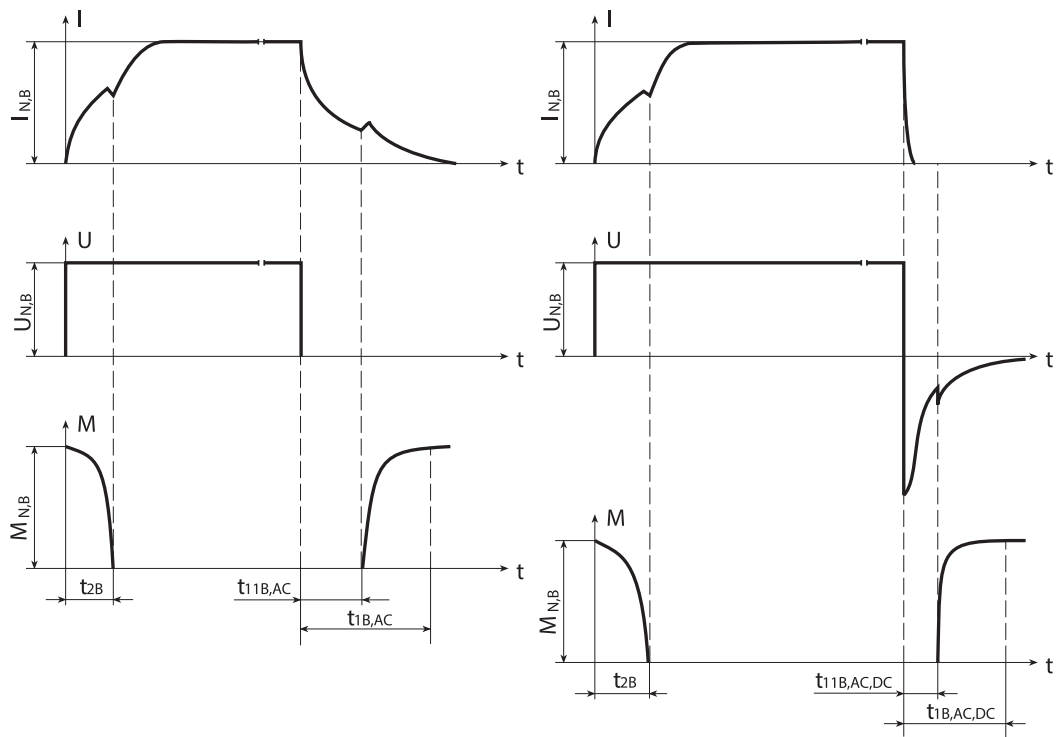
Supplying the rectifier with power from the motor terminal board is not permitted in the following applications:

- Motors operated on a frequency inverter;
- Motors with polarity reversal;
- Motors operated in a star/delta circuit.

5.5.7.2 Connection

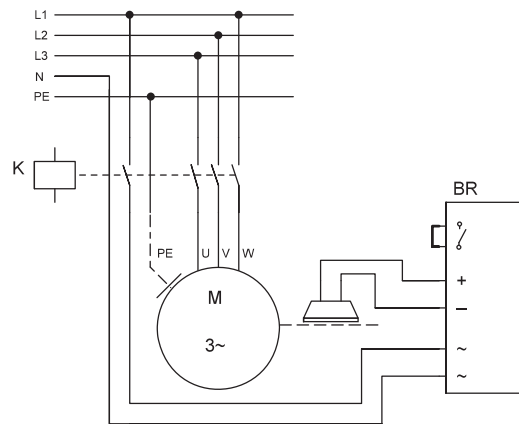
The spring-loaded brake engages once its power supply is switched off. In terms of the circuitry, the power supply can be switched off in two ways. The alternating current side of the rectifier always has to be switched. Simultaneously switching the alternating current side of the rectifier significantly reduces the linking time  $t_{1,B}$  and trigger delay  $t_{11,B}$  until the brake engages. The following diagrams and technical data illustrate this point.

For more information, refer to the connection plan included in the delivery of every motor.

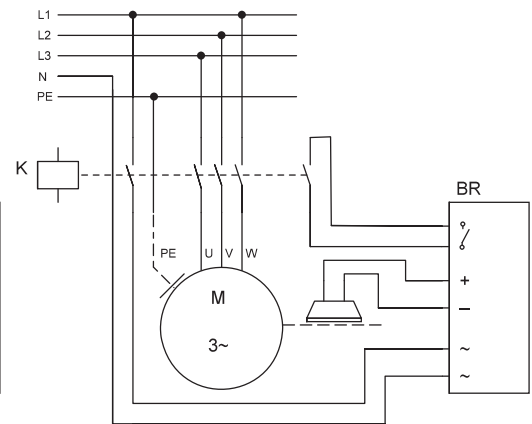


Switching behavior of the brake during AC-side switching

Switching behavior of the brake during DC-side switching



Switching example for AC-side switching



Switching example for AC and DC-side switching

### 5.5.7.3 Powerbox rectifier

STOBER asynchronous motors with spring-loaded brake are equipped with a device called a Powerbox rectifier as standard. A Powerbox rectifier acts as a bridge rectifier during overexcitation and then as a half-wave rectifier afterwards. This provides the following advantages:

- Faster brake engaging;
- Longer intervals between maintenance because the maximum permitted air gap  $x_{Bmax}$  increases;
- Increase in brake life span.

The Powerbox rectifier also offers the advantage that it is possible to supply the rectifier with power from the motor terminal board in many applications for wide-range motors.

#### Features

| Feature                                | Description                                                                                                 |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Installation location                  | IE3D63 – IE3D132 motors: Terminal box or control cabinet<br>IE3D160 to IE3D225 motors: control cabinet      |
| Input voltage                          | 180 – 300 V AC $\pm 0\%$ , 50/60 Hz<br>(applicable for a wide range of 220 – 275 V AC $\pm 5\%$ , 50/60 Hz) |
| Overexcitation time                    | 350 ms $\pm 10\%$                                                                                           |
| Conductor length                       | Maximum of 100 m (from Powerbox rectifier to brake coil)                                                    |
| Max. permitted output current at 45 °C | 1.2 A continuously<br>2.4 A for 350 ms                                                                      |
| Max. permitted output current at 75 °C | 0.7 A continuously<br>1.4 A for 350 ms                                                                      |

The following table describes the technical data for spring-loaded brakes operated using a Powerbox rectifier.

#### Technical data

| Motor                   | Type    | $M_{N,B}$<br>[Nm] | $U_{N,B}$<br>[V] | $U_{1rf}$<br>[V]<br>50-60 [Hz] | $x_{B,N}$<br>[mm] | $x_{B,max}$<br>[mm] | $t_{2B}$<br>[ms] | $t_{11B,AC,DC}$<br>[ms] | $t_{11B,AC}$<br>[ms] | $K_{Bpb}$ | $Z_B$<br>[1/h] |
|-------------------------|---------|-------------------|------------------|--------------------------------|-------------------|---------------------|------------------|-------------------------|----------------------|-----------|----------------|
| IE3D063K_B.IE3D063M_B   | K38-02R | 2.5               | 115              | 220 – 275                      | 0.2               | 0.8 – 1.02          | 26 – 21          | 9 – 11                  | 30 – 33              | 3.0 – 4.1 | 3300           |
| IE3D071K_B.IE3D071L_B   | K38-02  | 5.0               | 115              | 220 – 275                      | 0.2               | 0.8 – 1.02          | 26 – 21          | 9 – 11                  | 30 – 33              | 3.0 – 4.1 | 3300           |
| IE3D080K_B.IE3D080L_B   | K38-03  | 10                | 115              | 220 – 275                      | 0.2               | 1.36 – 1.75         | 31 – 26          | 13 – 16                 | 78 – 85              | 3.9 – 5.2 | 2400           |
| IE3D090LX_B.IE3D090S_B  | K38-04  | 20                | 115              | 220 – 275                      | 0.2               | 1.6 – 2.1           | 50 – 44          | 17 – 21                 | 126 – 139            | 3.5 – 5.3 | 2400           |
| IE3D100KX_B.IE3D100LX_B | K38-05  | 36                | 115              | 220 – 275                      | 0.2               | 2.1 – 2.8           | 55 – 48          | 35 – 42                 | 186 – 198            | 4.8 – 6.5 | 1500           |
| IE3D112M_B              | L48-14  | 60                | 127              | 220 – 275                      | 0.3               | 2.5 – 3.4           | 89 – 76          | 54 – 65                 | 359 – 390            | 4.6 – 6.2 | 300            |
| IE3D132MX_B.IE3D132SX_B | L48-16  | 80                | 127              | 220 – 275                      | 0.3               | 2.5 – 3.4           | 107 – 91         | 75 – 90                 | 497 – 540            | 4.1 – 5.6 | 300            |
| IE3D160LX_B.IE3D160MX_B | L48-18  | 150               | 127              | 220 – 275                      | 0.4               | 2.5 – 3.4           | 179 – 152        | 91 – 110                | 608 – 660            | 4.7 – 6.3 | 300            |
| IE3D180LX_B.IE3D180MX_B | L48-20  | 260               | 127              | 220 – 275                      | 0.4               | 2.5 – 3.4           | 238 – 203        | 166 – 200               | 1105 – 1200          | 3.5 – 5.9 | 120            |
| IE3D200LX_B             | L48-25  | 400               | 127              | 220 – 275                      | 0.5               | 2.5 – 3.4           | 286 – 244        | 224 – 270               | 1492 – 1620          | 4.3 – 6.0 | 60             |
| IE3D225MX_B.IE3D225SX_B | L48-25  | 400               | 127              | 220 – 275                      | 0.5               | 2.5 – 3.4           | 286 – 244        | 224 – 270               | 1492 – 1620          | 4.3 – 6.0 | 60             |

#### Notes

Note that the performance data for the brake depends on the Powerbox rectifier input voltage  $U_{1rf}$ .

An explanation of the formula symbols can be found in the Chapter [13.1](#).



5.5.7.4
Half-wave or bridge rectifier

The DC voltage for the spring-loaded brake can also be converted from AC voltage by an optional half-wave rectifier or bridge rectifier.

Half-wave rectifiers are intended for applications lacking an AC voltage  $\leq 277$  V AC for the rectifier. If lower voltages are available, a bridge rectifier with better DC voltage quality should be used.

The following table describes the technical data for spring-loaded brakes operated using a half-wave or bridge rectifier.

Technical data

| Motor                   | Type    | $M_{N,B}$<br>[Nm] | $P_{B20}$<br>[W] | $W_{B,Adj}$<br>[10 <sup>6</sup> J] | $W_{B,R01}$<br>[10 <sup>6</sup> J] | $x_{B,N}$<br>[mm] | $x_{B,max}$<br>[mm] | $y_{Blim}$<br>[mm] | $t_{2B}$<br>[ms] | $t_{11B,AC,DC}$<br>[ms] | $t_{11B,AC}$<br>[ms] | $\Delta J_B$<br>[kgcm <sup>2</sup> ] | $\Delta m_B$<br>[kg] |
|-------------------------|---------|-------------------|------------------|------------------------------------|------------------------------------|-------------------|---------------------|--------------------|------------------|-------------------------|----------------------|--------------------------------------|----------------------|
| IE3D063K_B.IE3D063M_B   | K38-02R | 2.5               | 25               | 15.0                               | 7.5                                | 0.2               | 0.4                 | 5.5                | 40               | 10                      | 70                   | 0.28                                 | 1.1                  |
| IE3D071K_B.IE3D071L_B   | K38-02  | 5.0               | 25               | 15.0                               | 7.5                                | 0.2               | 0.4                 | 5.5                | 40               | 10                      | 70                   | 0.28                                 | 1.1                  |
| IE3D080K_B.IE3D080L_B   | K38-03  | 10                | 30               | 37.5                               | 12.5                               | 0.2               | 0.5                 | 6.5                | 55               | 15                      | 100                  | 0.79                                 | 1.7                  |
| IE3D090LX_B.IE3D090S_B  | K38-04  | 20                | 30               | 76.0                               | 19.0                               | 0.2               | 0.6                 | 8.0                | 90               | 25                      | 180                  | 1.50                                 | 3.3                  |
| IE3D100KX_B.IE3D100LX_B | K38-05  | 36                | 48               | 112.0                              | 28.0                               | 0.2               | 0.6                 | 10.0               | 110              | 25                      | 220                  | 3.85                                 | 5.0                  |
| IE3D112M_B              | L48-14  | 60                | 50               | 215.0                              | 43.0                               | 0.3               | 0.8                 | 6.0                | 150              | 65                      | 390                  | 6.93                                 | 5.7                  |
| IE3D132MX_B.IE3D132SX_B | L48-16  | 80                | 55               | 434.0                              | 62.0                               | 0.3               | 1.0                 | 7.5                | 180              | 90                      | 540                  | 16.5                                 | 8.7                  |
| IE3D160LX_B.IE3D160MX_B | L48-18  | 150               | 85               | 540.0                              | 90.0                               | 0.4               | 1.0                 | 8.0                | 300              | 110                     | 660                  | 31.9                                 | 13.2                 |
| IE3D180LX_B.IE3D180MX_B | L48-20  | 260               | 100              | 612.0                              | 76.5                               | 0.4               | 1.2                 | 9.6                | 400              | 200                     | 1200                 | 80.3                                 | 21.2                 |
| IE3D200LX_B             | L48-25  | 400               | 110              | 792.0                              | 88.0                               | 0.5               | 1.4                 | 12.5               | 500              | 270                     | 1620                 | 220                                  | 32.0                 |
| IE3D225MX_B.IE3D225SX_B | L48-25  | 400               | 110              | 792.0                              | 88.0                               | 0.5               | 1.4                 | 12.5               | 500              | 270                     | 1620                 | 220                                  | 32.0                 |

An explanation of the formula symbols can be found in the Chapter [13.1](#).

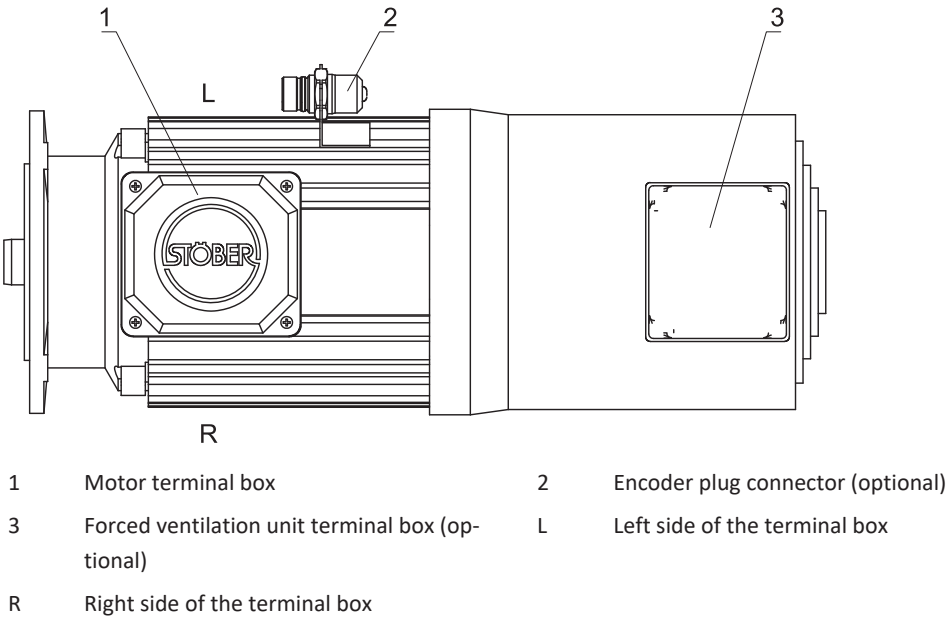
5.5.8
Connection method

5.5.8.1
Position of the connections

In the following figure, there are markings on both sides of the terminal box through which the connecting cables can be routed into the terminal box. Specify one of the two sides when placing your purchase order. If the motor is installed in another mounting position, the position of the terminal box and optional connections changes accordingly.

You can find the position of the motor terminal box in relation to the geared motor in the corresponding chapter of this catalog.

You can find the dimensions of the terminal box in Chapter [5.3](#).



### 5.5.8.2 Motor terminal box

The motor power connections and other connections are located in the terminal box.

In the terminal box, there are three metric tapped holes for screw connections. The tapped holes are closed with plugs. The diameter of the tapped holes depends on the size of the motor, as shown in the following table.

| Size | 1st bore | 2nd bore | 3rd bore |
|------|----------|----------|----------|
| 063  | M20      | M16      | M12      |
| 071  | M20      | M16      | M12      |
| 080  | M20      | M16      | M12      |
| 090  | M25      | M20      | M12      |
| 100  | M25      | M20      | M12      |
| 112  | M25      | M20      | M12      |
| 132  | M32      | M32      | M20      |
| 160  | M40      | M40      | M20      |
| 180  | M40      | M40      | M20      |
| 200  | M50      | M50      | M20      |
| 225  | M50      | M50      | M20      |

For the motor connection, use shielded cables and screw connections connected to the cable shielding in order to avoid EMC problems.

#### Power connection

The terminal box contains a terminal board with connections labeled in accordance with EN 60034-8. Terminal links are provided for a wye or delta connection. The terminal box contains 3 metric threaded holes for connection cable screw connections. The screw connections are not included in the scope of delivery.

The connection schema for the different connection types is shown in the following table.

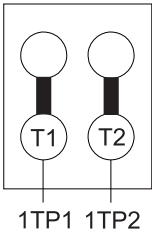
| Connection type       | Connection schema |
|-----------------------|-------------------|
| Delta connection      |                   |
| Star connection       |                   |
| Star/Delta connection |                   |

#### Grounding conductor connection

For connecting the grounding conductor, the terminal box contains a grounding screw that is marked with the symbol in accordance with IEC 60417-DB. The cross-section of the grounding conductor has to be at least as large as the cross-section of the lines in the power connection.

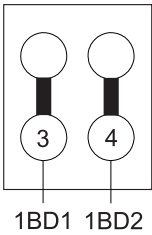
PTC thermistor connection

The terminal box contains connection terminals for the PTC thermistor for implementing thermal winding protection (optional).



Spring-loaded brake connection

The terminal box also contains connection terminals for the spring-loaded brake (optional).



5.5.8.3 Encoder connection

A plug connector with a quick lock is installed on the motor housing for the optional encoder connection. You can find the dimensions and position of the plug connector in Chapter [ 5.3]. You can find appropriate cables for the connection to the drive controller in Chapter [ 11].

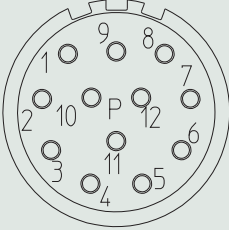
In the following connection assignment, the colors of the motor-internal connecting wires are specified in accordance with IEC 60757.

SSI digital encoder, plug connector size con.23

| Connection diagram                                                                                                                                                                                                                                                                                                                            | Pin | Connection | Color |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------|-------|
| A circular diagram of a 12-pin connector. The pins are numbered 1 through 12 in a clockwise direction starting from the top. Pin 1 is at the top, pin 6 is at the right, pin 11 is at the bottom, and pin 12 is at the left. The center of the circle is labeled 'P'. The diagram is enclosed in a rectangular frame with a notch at the top. | 1   | Clock +    | VT    |
|                                                                                                                                                                                                                                                                                                                                               | 2   | Up sense   | WH GN |
|                                                                                                                                                                                                                                                                                                                                               | 3   |            |       |
|                                                                                                                                                                                                                                                                                                                                               | 4   |            |       |
|                                                                                                                                                                                                                                                                                                                                               | 5   | Data –     | PK    |
|                                                                                                                                                                                                                                                                                                                                               | 6   | Data +     | GY    |
|                                                                                                                                                                                                                                                                                                                                               | 7   |            |       |
|                                                                                                                                                                                                                                                                                                                                               | 8   | Clock –    | YE    |
|                                                                                                                                                                                                                                                                                                                                               | 9   |            |       |
|                                                                                                                                                                                                                                                                                                                                               | 10  | 0 V GND    | WH GN |
|                                                                                                                                                                                                                                                                                                                                               | 11  |            |       |
|                                                                                                                                                                                                                                                                                                                                               | 12  | Up +       | BN GN |
| Pin 2 is connected to pin 12 in the plug connector                                                                                                                                                                                                                                                                                            |     |            |       |

HTL/TTL incremental encoder, plug connector size con.23

Color 1 of the motor-internal connecting wires applies up to motor size 80, color 2 applies starting with motor size 90.

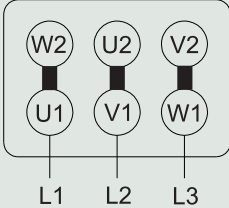
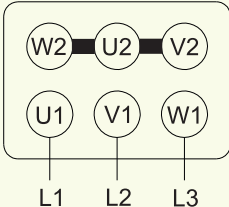
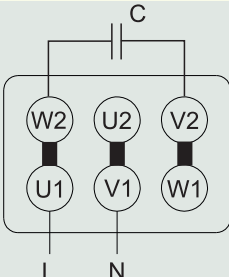
| Connection diagram                                                                | Pin | Connection | Color 1 | Color 2 |
|-----------------------------------------------------------------------------------|-----|------------|---------|---------|
|  | 1   | B –        | PK      | BK      |
|                                                                                   | 2   | Up sense   | –       | YE      |
|                                                                                   | 3   | N +        | BU      | PK      |
|                                                                                   | 4   | N –        | RD      | WH      |
|                                                                                   | 5   | A +        | GN      | GN      |
|                                                                                   | 6   | A –        | YE      | BN      |
|                                                                                   | 7   |            |         |         |
|                                                                                   | 8   | B +        | GY      | GY      |
|                                                                                   | 9   |            |         |         |
|                                                                                   | 10  | 0 V GND    | WH      | BU      |
|                                                                                   | 11  | 0 V GND    | –       | VT      |
|                                                                                   | 12  | Up +       | BN      | RD      |

5.5.8.4 Forced ventilation unit terminal box

The power connections for the optional forced ventilation unit are located in a separate terminal box.

The terminal box contains a terminal board with connections labeled in accordance with EN 60034-8. Terminal links are provided for a wye or delta connection. The terminal box contains 3 metric threaded holes for connection cable screw connections. The screw connections are not included in the scope of delivery.

The connection types for the forced ventilation unit power supply are described in the following table.

| Connection type                                 | Connection schema                                                                    |
|-------------------------------------------------|--------------------------------------------------------------------------------------|
| Delta connection                                |  |
| Star connection                                 |  |
| Steinmetz connection with operating capacitor C |  |

The operating capacitor C for the Steinmetz connection is not included in the forced ventilation unit scope of delivery.

For connecting the grounding conductor, the terminal box contains a grounding screw that is marked with the  symbol in accordance with IEC 60417-DB. The cross-section of the grounding conductor has to be at least as large as the cross-section of the lines in the power connection.

5.6
Project configuration

5.6.1
Legal requirements

In many countries or economic regions, putting asynchronous motors on the market requires complying with certain laws. Below you can find information on a few legal requirements to be observed in conjunction with projecting STOBBER asynchronous motors.

**European Union**

Asynchronous motors fall under the scope of the (Low Voltage) Directive 2014/35/EU and must bear the CE mark.

Asynchronous motors are also subject to (Ecodesign) Directive 2009/125/EC. The products offered in this catalog correspond to current regulation on electric motors and variable speed drives (EU) 2019/1781 of 2019-10-01.

Accordingly, asynchronous motors brought onto the market on or after 2021-07-01 that have a nominal output voltage of 0.12 to 0.55 kW must meet at least efficiency class IE2.

Similarly, asynchronous motors brought onto the market on or after 2021-07-01 that have a nominal output voltage of 0.75 to 1000 kW must meet at least efficiency class IE3.

STOBBER supplies motors with a nominal power of 0.12 kW – 0.55 kW in the efficiency class IE3 as well as motors with a nominal power of 0.75 kW – 45 kW, also in efficiency class IE3.

**USA**

Asynchronous motors brought onto the market in the United States are subject to the Energy Independence and Security Act of 2007 (EISA) under US law and must be registered with the US Department of Energy (DoE). This includes labeling the asynchronous motor's nameplate with the "ee" logo and the CC registration number.

**Certificates and standards**

The following certificates and standards are not required by law but are common in some countries:

- Registration with Underwriters Laboratory (UL). This includes labeling the asynchronous motor's nameplate with the CURus logo and registration number.
- Electrical design of the asynchronous motor in accordance with the NEMA-MG 1 standard in the United States.

**Available combinations**

STOBBER Asynchronous motors are available in the following combinations in relation to the properties listed above:

| Conformity/Certificate | Nominal frequency  |
|------------------------|--------------------|
| CE                     | 50 Hz              |
| CE, cURus, NEMA        | 50/60 Hz           |
| EISA, cURus            | 60 Hz (on request) |

5.6.2
Operation on a drive controller

Drive controllers can adjust the speed of asynchronous motors to any value with minimal losses. In this chapter, you can find information on operating asynchronous motors above and below the nominal frequency.

**Operation below the nominal frequency**

Operating asynchronous motors with self-ventilation below approximately 60% of the nominal frequency requires limiting the motor current as well as the torque as a result. Otherwise the motor may overheat. This type of limiting is not necessary on motors with forced ventilation.

### 5.6.2.1 Operation above the nominal frequency

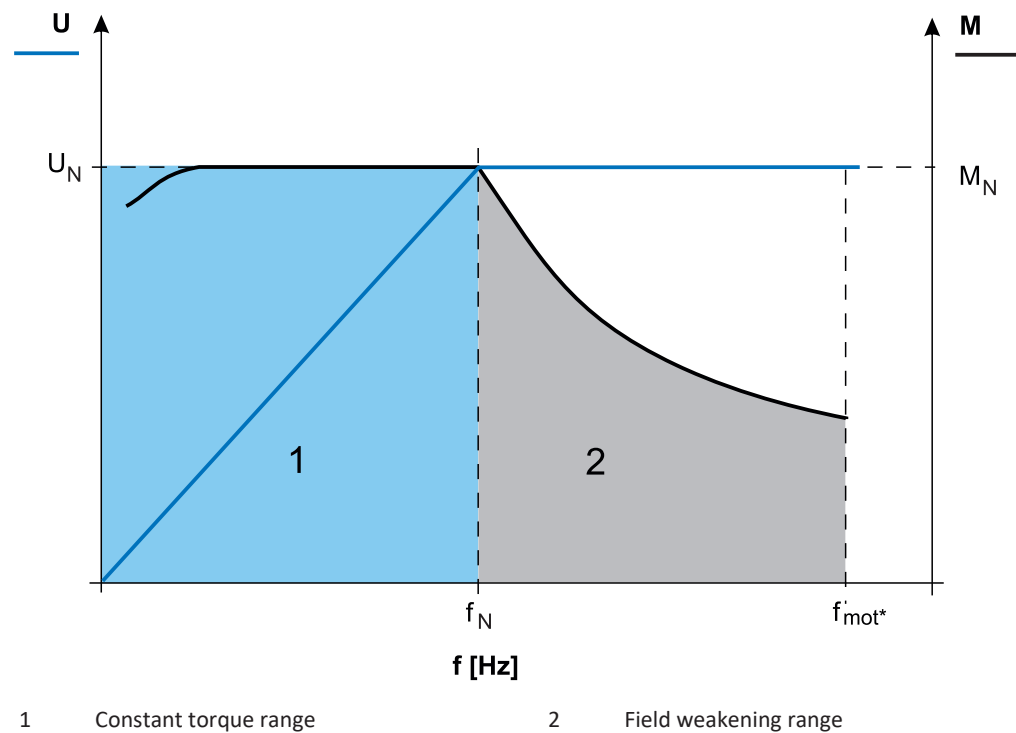
The motor can also be operated above its nominal frequency. Two basic operating modes for doing so are explained below:

- Operation in a field weakening range
- Operation per the 87 Hz curve

#### Operation in a field weakening range

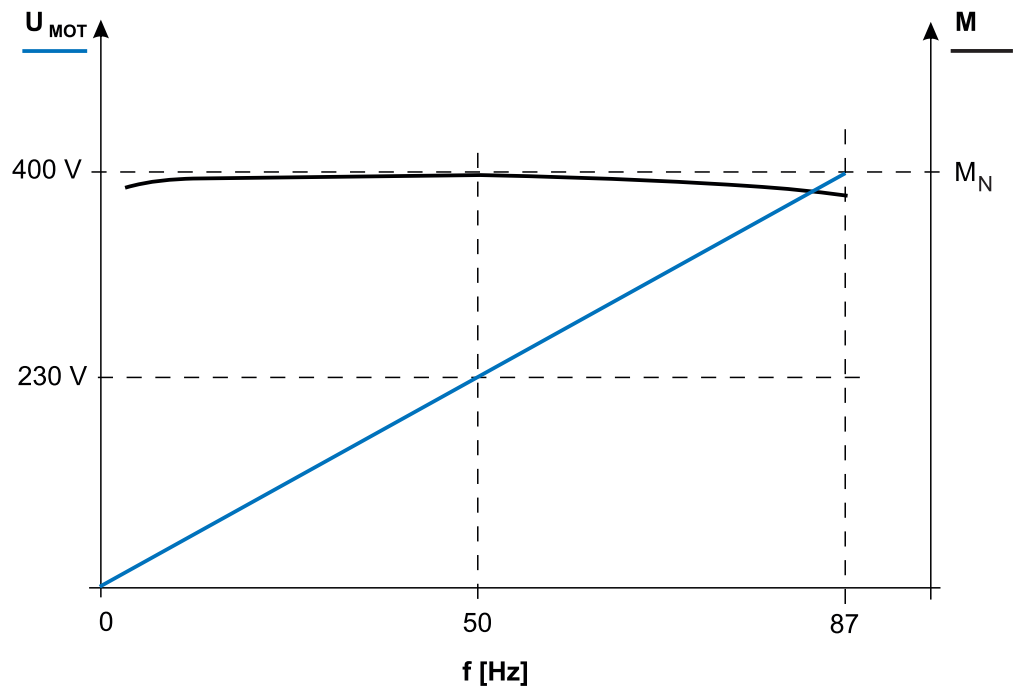
If the motor is operated above its nominal frequency at a constant nominal voltage, operation is considered in the field weakening range. For this operating mode, the drive controller is configured to a maximum frequency that is greater than the nominal frequency (e.g. 80 Hz/400 V). Speed increases as the drive controller frequency increases; torque, in contrast, decreases proportionally because the flux in the motor drops.

You can operate the motor in the field weakening range using both a delta and a star connection.



#### Operation per the 87 Hz curve

In this operating mode, the speed of the motor also increases proportionally to the motor voltage to a value above its nominal frequency. In this process, the torque remains almost constant. To this end, a 50 Hz, 230/400 V motor is connected with a delta setup, but the drive controller is configured to 87 Hz, 400 V. This can increase the speed by  $\sqrt{3}$  times the nominal frequency (87 Hz) with virtually constant torque. In doing so, the motor voltage is also increased continuously so that the motor operates with constant flux instead of field weakening.



Keep the following information in mind in this context:

- The motor must be designed for operation per the 87 Hz characteristic. Keep this in mind when placing a purchase order.
- Take the higher ( $\sqrt{3}$ -times) current requirement of the motor when selecting the drive controller.
- You can find the connection schema for the delta connection in the chapter [▶ 5.5.8.2](#).

## 5.7 Further information

### 5.7.1 Directives and standards

STOBER asynchronous motors correspond to the following directives and standards:

- (Low Voltage) Directive 2014/35/EU
- (Ecodesign) Directive 2009/125/EC (if applicable)
- EN 60034-1:2010 + Cor.:2010
- EN 60204-1:2018
- EN 60038:2011

## 5.7.2 Marks and test symbols

STOBER asynchronous motors can be provided with the following marks and test symbols:



CE mark: The product meets the requirements of EU directives (standard).



cURus test symbol "Systems, Electrical Insulation - Component", registered with Underwriters Laboratories USA (optional).



ee logo: The asynchronous motor conforms to the Energy Independence and Security Act of 2007 (EISA) under US law and is registered with the US Department of Energy (DoE) under registration number CC301B (optional).

## 5.7.3 Additional documentation

Additional documentation related to the product can be found at

<http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

| Documentation                                      | ID        |
|----------------------------------------------------|-----------|
| Operating manual for asynchronous motors           | 442577_en |
| Operating manual for asynchronous motor encoder    | 442025_en |
| Operating manual for brake for asynchronous motors | 442015_en |





# 6 SC6 drive controllers

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## 6 Drive controllers

### SC6

#### 6.1 Overview

Our more compact version for the encoderless Lean motor

##### Features

- Single or double-axis controller with a nominal output current up to 19 A and 250% overload capacity
- Sensorless position control of STOBER Lean motors
- Control of rotary synchronous servo motors, asynchronous motors and torque motors
- HIPERFACE DSL One Cable Solution
- Electronic motor nameplate via HIPERFACE DSL or EnDat 2.2 digital encoder interface
- Integrated EtherCAT or PROFINET communication
- STO safety technology using terminals or STO and SS1 using FSoE (Fail Safe over EtherCAT): SIL 3, PL e (cat. 4)
- Integrated brake control
- Single-ended nominal power consumption on double-axis controllers for operation of motors with different power
- Energy supply through direct power supply
- Flexible DC link connection for multi-axis applications

## 6.1.1 Features

The compact stand-alone SC6 drive controller allows for sensorless control of Lean motors of the LM series. These motors provide energy efficiency at the performance level of synchronous servo motors. They also guarantee high investment protection, thanks to energy efficiency class IE5 and the corresponding higher efficiency compared to IE4 asynchronous motors. However, the SC6 can also be used in combination with asynchronous motors or synchronous servo motors with encoders (e.g. the EZ series). SC6 is available in three sizes with a nominal output current of up to 19 A: Sizes 0 and 1 as a double-axis controller, size 2 as a single-axis controller.

The optimized vector control, sensorless vector control, U/f slip-compensated and U/f controller control types are available for use with asynchronous motors.



*The compact SC6 for Lean motors of the LM series*

### As small as a paperback

You save valuable space in your control cabinet because, with a width of just 45 mm, this drive controller is the most compact solution on the market. It offers all the features that a designer requires.

### Quick DC-Link

The drive controllers have the option of a DC link connection. This technology makes it possible for the regenerative production of energy from one drive to be used as motor energy by another drive. The Quick DC-Link rear structure element has been developed to set up a reliable and efficient rail connection to the DC link connection. This optionally available accessory connects the DC links of the individual drive controllers by means of copper rails that can carry a load of up to 200 A. The rails can be attached without any tools using quick fastening clamps.



### Perfectly adapted combinations

SC6 drive controllers can be combined with the STÖBER SI6 and SD6 series as needed. For the general energy supply, the drive controllers from the SC6, SI6 and SD6 series are connected to each other using Quick DC-Link modules.

### Tailored energy usage

When using double-axis modules, the unused power reserves of one axis can be used for other axes.

### Fewer clicks, less wiring

The installation of the drive controller is as easy as you could imagine. There is no difficult wiring. Even if you are connecting the drive controllers in a DC link, the patented Quick DC-Link modules allow for a simple "click" into the standard copper rails as well as the simple installation and connection of the drive controllers.

### Safety functions

The safety concept of the drive controller is based on the STO (Safe Torque Off) function. The concept corresponds to SIL 3 according to DIN EN 61800-5-2 and PL e (Cat. 4) according to DIN EN ISO 13849-1. For double-axis controllers, the STO safety function has a two-channel structure that acts upon both axes. For connection to a higher-level safety circuit, different interfaces are available (terminals or FSoE).

**Heavy duty**

There is an extremely robust design concealed behind the elegant exterior. All components—from the stable, well-shielded sheet steel housing to the motor connectors—far exceed the set values of industry standards. The inside is also anything but small-scale: ample computer capacities, high-quality components, careful workmanship.

## 6.1.2 Software components

**Project configuration and commissioning**

The 6th generation of DriveControlSuite project configuration and commissioning software has all the functions for the efficient use of drive controllers in single-axis and multi-axis applications. The program guides you step by step through the complete project configuration and parameterization process using wizards.

**Open communication**

The Ethernet-based EtherCAT and PROFINET fieldbus systems are available in the drive controller.

**Applications**

Drive-based motion control is recommended for the decentralized motion control of sophisticated machines.

The drive-based application package from STÖBER is the right choice wherever universal and flexible solutions are needed. The Drive Based application provides drive-based motion control for positioning, velocity and torque/force with the PLCopen Motion Control command set. These standard commands have been combined into operating modes for different applications and supplemented with additional functions such as motion block linking, cams and much more. For the command operating mode, all properties of the movements are specified directly by the controller. The properties of the movements in the drive are predefined in the motion block operating mode so that only a start signal is necessary to perform the movement. Linking can be used to define complete motion sequences. There is a separate operating mode available for applications controlled by velocity or torque/force such as pumps, fans or conveyor belts. This also allows for operation without a controller.

In addition, the CiA 402 application is also available, which includes both the controller-based and drive-based operating modes (csp, csv, cst, ip, pp, pv, pt).

## 6.1.3 Application training

STÖBER offers a multi-level training program that focuses essentially on application programming of the motion controller and drive controller.

**G6 Basic**

Training content: System overview, installation and commissioning of the drive controller. Use of option modules. Parameterization, commissioning and diagnostics using the commissioning software. Remote maintenance. Basics of controller optimization. Configuration of the drive train. Integrated software functions. Software applications. Connection to a higher-level controller. Basics of safety technology. Practical exercises on training topics.

Software used: DriveControlSuite.

**G6 Advanced**

Training content: Special knowledge for regulating, control and safety technology. Practical exercises on training topics.

## 6.2 Technical data

Technical data for the drive controller can be found in the following chapters.

### 6.2.1 Type designation

|    |   |   |   |   |   |   |
|----|---|---|---|---|---|---|
| SC | 6 | A | 0 | 6 | 2 | Z |
|----|---|---|---|---|---|---|

Tab. 1: Example code for type designation

| Code  | Designation        | Design                             |
|-------|--------------------|------------------------------------|
| SC    | Series             | ServoCompact                       |
| 6     | Generation         | Generation 6                       |
| A     | Version            |                                    |
| 0 – 2 | Size               |                                    |
| 6     | Power output stage | Power output stage within the size |
| 2     | Axis controller    | Double-axis controller             |
| 1     |                    | Single-axis controller             |
| Z     | Safety technology  | SZ6: Without safety technology     |
| R     |                    | SR6: STO using terminals           |
| Y     |                    | SY6: STO and SS1 using FSoE        |

Tab. 2: Meaning of the example code

### 6.2.2 Sizes

| Type    | ID No. | Size   | Axis controller        |
|---------|--------|--------|------------------------|
| SC6A062 | 56690  | Size 0 | Double-axis controller |
| SC6A162 | 56691  | Size 1 | Double-axis controller |
| SC6A261 | 56692  | Size 2 | Single-axis controller |

Tab. 3: Available SC6 types and sizes



SC6 in sizes 0 to 2

Note that the basic device is delivered without terminals. Suitable terminal sets are available separately for each size.

6.2.3 General technical data

The following information applies to all device types.

| Device features                            |                                                                                          |
|--------------------------------------------|------------------------------------------------------------------------------------------|
| Protection class of the device             | IP20                                                                                     |
| Protection class of the installation space | At least IP54                                                                            |
| Protection class                           | Protection class I in accordance with DIN EN 61140                                       |
| Radio interference suppression             | Integrated line filter in accordance with DIN EN 61800-3, interference emission class C3 |
| Overvoltage category                       | III in accordance with DIN EN 61800-5-1                                                  |
| Test symbols                               |         |

Tab. 4: Device features

| Transport and storage conditions                                                                                                       |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Storage/transport temperature                                                                                                          | –20 °C to +70 °C<br>Maximum change: 20 K/h                                            |
| Relative humidity                                                                                                                      | Maximum relative humidity 85%, non-condensing                                         |
| Vibration (transport) in accordance with DIN EN 60068-2-6                                                                              | 5 Hz ≤ f ≤ 9 Hz: 3.5 mm<br>9 Hz ≤ f ≤ 200 Hz: 10 m/s²<br>200 Hz ≤ f ≤ 500 Hz: 15 m/s² |
| Fall height for freefall <sup>1</sup><br>Weight < 100 kg<br>in accordance with DIN EN 61800-2<br>(or DIN EN 60721-3-2:1997, class 2M1) | 0.25 m                                                                                |

Tab. 5: Transport and storage conditions

| Operating conditions                                      |                                                                                                                  |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Surrounding temperature during operation                  | 0 °C to 45 °C with nominal data<br>45 °C to 55 °C with derating –2.5% / K                                        |
| Relative humidity                                         | Maximum relative humidity 85%, non-condensing                                                                    |
| Installation altitude                                     | 0 m to 1000 m above sea level without restrictions<br>1000 m to 2000 m above sea level with –1.5%/100 m derating |
| Pollution degree                                          | Pollution degree 2 in accordance with EN 50178                                                                   |
| Ventilation                                               | Installed fan                                                                                                    |
| Vibration (operation) in accordance with DIN EN 60068-2-6 | 5 Hz ≤ f ≤ 9 Hz: 0.35 mm<br>9 Hz ≤ f ≤ 200 Hz: 1 m/s²                                                            |

Tab. 6: Operating conditions

| Discharge times           |        |
|---------------------------|--------|
| Self-discharge of DC link | 15 min |

Tab. 7: Discharge times of the DC link circuit

6.2.4 Electrical data

The electrical data of the available SC6 sizes as well as the properties of the brake chopper can be found in the following sections.

Information

For the time span between two energizing processes, note that:

- a) Direct, repeat activation of the supply voltage is possible for power-on/power-off operation.
- b) A time span of > 15 must be observed between two energizing processes during continuous, cyclical power-on/power-off operation with increased charging capacity.

Information

The STO safety function is available for safe stopping as an alternative to continuous, cyclical power-on/power-off operation.

An explanation of the formula symbols used can be found in the chapter [\[► 13.1\]](#).

6.2.4.1 Control unit

| Electrical data | All types                    |
|-----------------|------------------------------|
| $U_{1CU}$       | 24 V <sub>DC</sub> +20%/–15% |
| $I_{1maxCU}$    | 0.5 A                        |

Tab. 8: Control unit electrical data



## 6.2.4.2 Power unit: Size 0

| Electrical data | SC6A062                                                                                         |
|-----------------|-------------------------------------------------------------------------------------------------|
| $U_{1PU}$       | $3 \times 400 V_{AC}$ , +32% / -50%, 50/60 Hz;<br>$3 \times 480 V_{AC}$ , +10% / -58%, 50/60 Hz |
| $f_{2PU}$       | 0 – 700 Hz                                                                                      |
| $U_{2PU}$       | 0 – max. $U_{1PU}$                                                                              |
| $C_{PU}$        | 270 $\mu F$                                                                                     |
| $C_{maxPU}$     | 1400 $\mu F$                                                                                    |

Tab. 9: SC6 electrical data, size 0

The maximum charging capacity depends on the time between energizing two devices:

| Information                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| If a time span of $\geq 15$ min is maintained between energizing two devices, the maximum charging capacity $C_{maxPU}$ increases to 1880 $\mu F$ . |

## Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SC6A062          |
|-----------------|------------------|
| $f_{PWM,PU}$    | 4 kHz            |
| $I_{1N,PU}$     | 10 A             |
| $I_{2N,PU}$     | $2 \times 4.5$ A |
| $I_{2maxPU}$    | 210% for 2 s     |

Tab. 10: SC6 electrical data, size 0, for 4 kHz clock frequency

| Electrical data | SC6A062        |
|-----------------|----------------|
| $f_{PWM,PU}$    | 8 kHz          |
| $I_{1N,PU}$     | 8.9 A          |
| $I_{2N,PU}$     | $2 \times 4$ A |
| $I_{2maxPU}$    | 250% for 2 s   |

Tab. 11: SC6 electrical data, size 0, for 8 kHz clock frequency

| Electrical data | SC6A062            |
|-----------------|--------------------|
| $U_{onCH}$      | 780 – 800 $V_{DC}$ |
| $U_{offCH}$     | 740 – 760 $V_{DC}$ |
| $R_{2minRB}$    | 100 $\Omega$       |
| $P_{maxRB}$     | 6.4 kW             |
| $P_{effRB}$     | 2.9 kW             |

Tab. 12: Brake chopper electrical data, size 0

### 6.2.4.3 Power unit: Size 1

| Electrical data | SC6A162                                                                                         |
|-----------------|-------------------------------------------------------------------------------------------------|
| $U_{1PU}$       | $3 \times 400 V_{AC}$ , +32% / -50%, 50/60 Hz;<br>$3 \times 480 V_{AC}$ , +10% / -58%, 50/60 Hz |
| $f_{2PU}$       | 0 – 700 Hz                                                                                      |
| $U_{2PU}$       | 0 – max. $U_{1PU}$                                                                              |
| $C_{PU}$        | 940 $\mu F$                                                                                     |
| $C_{maxPU}$     | 1400 $\mu F$                                                                                    |

Tab. 13: SC6 electrical data, size 1

#### Information

If a time span of  $\geq 15$  min is maintained between energizing two devices, the maximum charging capacity  $C_{maxPU}$  increases to 1880  $\mu F$ .

#### Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SC6A162         |
|-----------------|-----------------|
| $f_{PWM,PU}$    | 4 kHz           |
| $I_{1N,PU}$     | 23.2 A          |
| $I_{2N,PU}$     | $2 \times 10$ A |
| $I_{2maxPU}$    | 210% for 2 s    |

Tab. 14: SC6 electrical data, size 1, for 4 kHz clock frequency

| Electrical data | SC6A162        |
|-----------------|----------------|
| $f_{PWM,PU}$    | 8 kHz          |
| $I_{1N,PU}$     | 20.9 A         |
| $I_{2N,PU}$     | $2 \times 9$ A |
| $I_{2maxPU}$    | 250% for 2 s   |

Tab. 15: SC6 electrical data, size 1, for 8 kHz clock frequency

| Electrical data | SC6A162            |
|-----------------|--------------------|
| $U_{onCH}$      | 780 – 800 $V_{DC}$ |
| $U_{offCH}$     | 740 – 760 $V_{DC}$ |
| $R_{2minRB}$    | 47 $\Omega$        |
| $P_{maxRB}$     | 13.6 kW            |
| $P_{effRB}$     | 6.2 kW             |

Tab. 16: Brake chopper electrical data, size 1

## 6.2.4.4 Power unit: Size 2

| Electrical data | SC6A261                                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------------------------------|
| $U_{1PU}$       | $3 \times 400 V_{AC}, +32\% / -50\%, 50/60 \text{ Hz};$<br>$3 \times 480 V_{AC}, +10\% / -58\%, 50/60 \text{ Hz}$ |
| $f_{2PU}$       | 0 – 700 Hz                                                                                                        |
| $U_{2PU}$       | 0 – max. $U_{1PU}$                                                                                                |
| $C_{PU}$        | 940 $\mu\text{F}$                                                                                                 |
| $C_{maxPU}$     | 1400 $\mu\text{F}$                                                                                                |

Tab. 17: SC6 electrical data, size 2

| Information |
|-------------|
|-------------|

If a time span of  $\geq 15$  min is maintained between energizing two devices, the maximum charging capacity  $C_{maxPU}$  increases to 1880  $\mu\text{F}$ .

## Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SC6A261      |
|-----------------|--------------|
| $f_{PWM,PU}$    | 4 kHz        |
| $I_{1N,PU}$     | 22.6 A       |
| $I_{2N,PU}$     | 19 A         |
| $I_{2maxPU}$    | 210% for 2 s |

Tab. 18: SC6 electrical data, size 2, for 4 kHz clock frequency

| Electrical data | SC6A261      |
|-----------------|--------------|
| $f_{PWM,PU}$    | 8 kHz        |
| $I_{1N,PU}$     | 17.9 A       |
| $I_{2N,PU}$     | 15 A         |
| $I_{2maxPU}$    | 250% for 2 s |

Tab. 19: SC6 electrical data, size 2, for 8 kHz clock frequency

| Electrical data | SC6A261            |
|-----------------|--------------------|
| $U_{onCH}$      | 780 – 800 $V_{DC}$ |
| $U_{offCH}$     | 740 – 760 $V_{DC}$ |
| $R_{2minRB}$    | 47 $\Omega$        |
| $P_{maxRB}$     | 13.6 kW            |
| $P_{effRB}$     | 6.2 kW             |

Tab. 20: Brake chopper electrical data, size 2

### 6.2.4.5 Parallel connection

The charging capacity of the driver controllers can be increased by a parallel connection only if the power grid supply is connected to all drive controllers simultaneously.

### 6.2.4.6 Single-ended nominal power consumption on double-axis controllers

Operating two motors on one double-axis controller makes it possible to operate one of the motors with a continuous current above the nominal current of the drive controller if the continuous current of the second connected motor is lower than the nominal current of the drive controller. This enables economical combinations of double-axis controllers and motors.

The nominal output current for axis B can be determined using the following formula if the output current for axis A is known:

#### Example 1

$$I_{2PU(B)} = I_{2N,PU} - (I_{2PU(A)} - I_{2N,PU}) \times \frac{3}{5} \quad \text{where} \quad 0 \leq I_{2PU(A)} \leq I_{2N,PU}$$

#### Example 2

$$I_{2PU(B)} = I_{2N,PU} - (I_{2PU(A)} - I_{2N,PU}) \times \frac{5}{3} \quad \text{where} \quad I_{2N,PU} \leq I_{2PU(A)} \leq 1,6 \times I_{2N,PU}$$

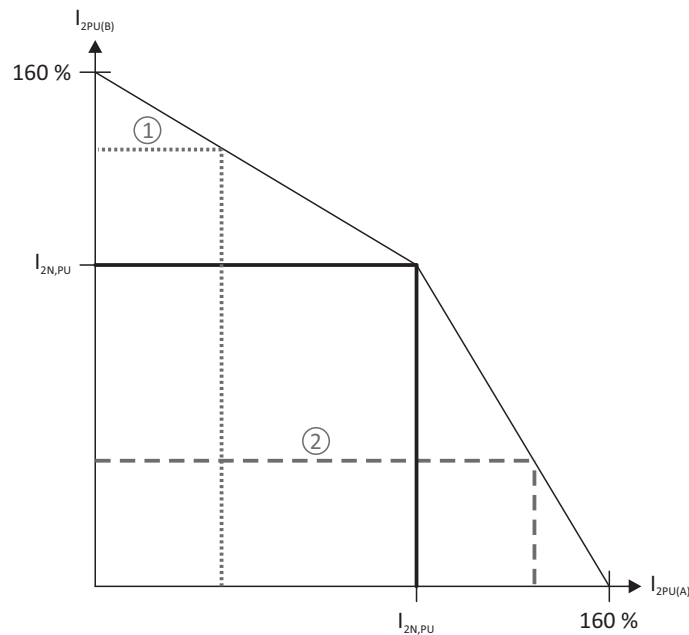


Fig. 1: Asymmetric load on double-axis controllers

#### Information

Note that the available maximum currents  $I_{2maxPU}$  of the axis controllers are also relative to the nominal output current  $I_{2N,PU}$  for single-ended nominal power consumption.

## 6.2.4.7 Power loss data in accordance with EN 61800-9-2

| Type            | Nominal<br>current<br>$I_{2N,PU}$ | Apparent<br>power | Absolute<br>losses<br>$P_{V,CU}^2$ | Operating points <sup>3</sup> |        |         |         |         |          |         |          | IE<br>class <sup>4</sup> | Compar-<br>ison <sup>5</sup> |
|-----------------|-----------------------------------|-------------------|------------------------------------|-------------------------------|--------|---------|---------|---------|----------|---------|----------|--------------------------|------------------------------|
|                 |                                   |                   |                                    | (0/25)                        | (0/50) | (0/100) | (50/25) | (50/50) | (50/100) | (90/50) | (90/100) |                          |                              |
|                 | Relative losses                   |                   |                                    |                               |        |         |         |         |          |         |          |                          |                              |
|                 | [A]                               | [kVA]             | [W]                                | [%]                           |        |         |         |         |          |         |          |                          |                              |
| SC6A062         | 4.5                               | 6.2               | Max. 10                            | 1.34                          | 1.49   | 1.86    | 1.40    | 1.63    | 2.19     | 1.84    | 2.77     | IE2                      |                              |
| SC6A162         | 10                                | 13.9              | Max. 10                            | 0.76                          | 0.92   | 1.43    | 0.81    | 1.04    | 1.75     | 1.22    | 2.29     | IE2                      |                              |
| SC6A261         | 19                                | 13.2              | 10                                 | 0.77                          | 0.95   | 1.56    | 0.82    | 1.08    | 1.89     | 1.25    | 2.43     | IE2                      |                              |
| Absolute losses |                                   |                   |                                    |                               |        |         |         |         |          |         |          |                          |                              |
| $P_V$           |                                   |                   |                                    |                               |        |         |         |         |          |         |          |                          |                              |
|                 | [A]                               | [kVA]             | [W]                                | [W]                           |        |         |         |         |          |         |          |                          | [%]                          |
| SC6A062         | 4.5                               | 6.2               | Max. 10                            | 83.2                          | 92.5   | 115.2   | 86.7    | 100.8   | 135.8    | 113.9   | 171.7    | IE2                      | 36.0                         |
| SC6A162         | 10                                | 13.9              | Max. 10                            | 105.5                         | 128.3  | 198.8   | 113.1   | 145.1   | 243.5    | 170.1   | 318.7    | IE2                      | 40.8                         |
| SC6A261         | 19                                | 13.2              | Max. 10                            | 101.2                         | 125.8  | 206.1   | 108.5   | 142.0   | 249.5    | 165.6   | 320.4    | IE2                      | 41.0                         |

Tab. 21: Power loss data of the SC6 drive controller in accordance with EN 61800-9-2

**General conditions**

The specified losses apply to a drive controller. They apply to both axes together in the case of double-axis controllers.

The loss data applies to drive controllers without any accessories.

The power loss calculation is based on a three-phase supply voltage with 400 V<sub>AC</sub>/50 Hz.

The calculated data includes a supplement of 10% in accordance with EN 61800-9-2.

The power loss specifications refer to a clock frequency of 4 kHz.

The absolute losses for a power unit that is switched off refer to the 24 V<sub>DC</sub> power supply of the control electronics.

<sup>2</sup> Absolute losses for a power unit that is switched off

<sup>3</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>4</sup> IE class in accordance with EN 61800-9-2

<sup>5</sup> Comparison of the losses for the reference related to IE2 in the nominal point (90, 100)

## 6.2.5 Derating

When dimensioning the drive controller, observe the derating of the nominal output current as a function of the clock frequency, surrounding temperature and installation altitude. There is no restriction for a surrounding temperature from 0 °C to 45 °C and an installation altitude of 0 m to 1000 m. The details given below apply to values outside these ranges.

### 6.2.5.1 Effect of the clock frequency

Changing the clock frequency  $f_{PWM}$  affects the amount of noise produced by the drive, among other things. However, increasing the clock frequency results in increased losses. During project configuration, define the highest clock frequency and use it to determine the nominal output current  $I_{2N,PU}$  for dimensioning the drive controller.

| Type    | $I_{2N,PU}$<br>4 kHz [A] | $I_{2N,PU}$<br>8 kHz [A] | $I_{2N,PU}$<br>16 kHz [A] |
|---------|--------------------------|--------------------------|---------------------------|
| SC6A062 | $2 \times 4.5$           | $2 \times 4$             | $2 \times 3$              |
| SC6A162 | $2 \times 10$            | $2 \times 9$             | $2 \times 5$              |
| SC6A261 | 19                       | 15                       | 8                         |

Tab. 22: Nominal output current  $I_{2N,PU}$  dependent on the clock frequency

### 6.2.5.2 Effect of the surrounding temperature

Derating as a function of the surrounding temperature is determined as follows:

- 0 °C to 45 °C: No restrictions ( $D_T = 100\%$ )
- 45 °C to 55 °C: Derating  $-2.5\%/K$

#### Example

The drive controller needs to be operated at 50 °C.

The derating factor  $D_T$  is calculated as follows

$$D_T = 100\% - 5 \times 2.5\% = 87.5\%$$

### 6.2.5.3 Effect of the installation altitude

Derating as a function of the installation altitude is determined as follows:

- 0 m to 1000 m: No restriction ( $D_{IA} = 100\%$ )
- 1000 m to 2000 m: Derating  $-1.5\%/100$  m

#### Example

The drive controller needs to be installed at an altitude of 1500 m above sea level.

The derating factor  $D_{IA}$  is calculated as follows:

$$D_{IA} = 100\% - 5 \times 1.5\% = 92.5\%$$

### 6.2.5.4 Calculating the derating

Follow these steps for the calculation:

1. Determine the highest clock frequency ( $f_{PWM}$ ) that will be used during operation and use it to determine the nominal current  $I_{2N,PU}$ .
2. Determine the derating factors for installation altitude and surrounding temperature.
3. Calculate the reduced nominal current  $I_{2N,PU(red)}$  in accordance with the following formula:

$$I_{2N,PU(red)} = I_{2N,PU} \times D_T \times D_{IA}$$

#### Example

A drive controller of type SC6A062 needs to be operated at a clock frequency of 8 kHz at an altitude of 1500 m above sea level and a surrounding temperature of 50 °C.

The nominal current of the SC6A062 at 8 kHz is 4 A per axis. The derating factor  $D_T$  is calculated as follows:

$$D_T = 100\% - 5 \times 2.5\% = 87.5\%$$

The derating factor  $D_{IA}$  is calculated as follows:

$$D_{IA} = 100\% - 5 \times 1.5\% = 92.5\%$$

The output current of importance for the project configuration is:

$$I_{2N,PU(red)} = 4 \text{ A} \times 0.875 \times 0.925 = 3.24 \text{ A}$$

6.2.6
Dimensions

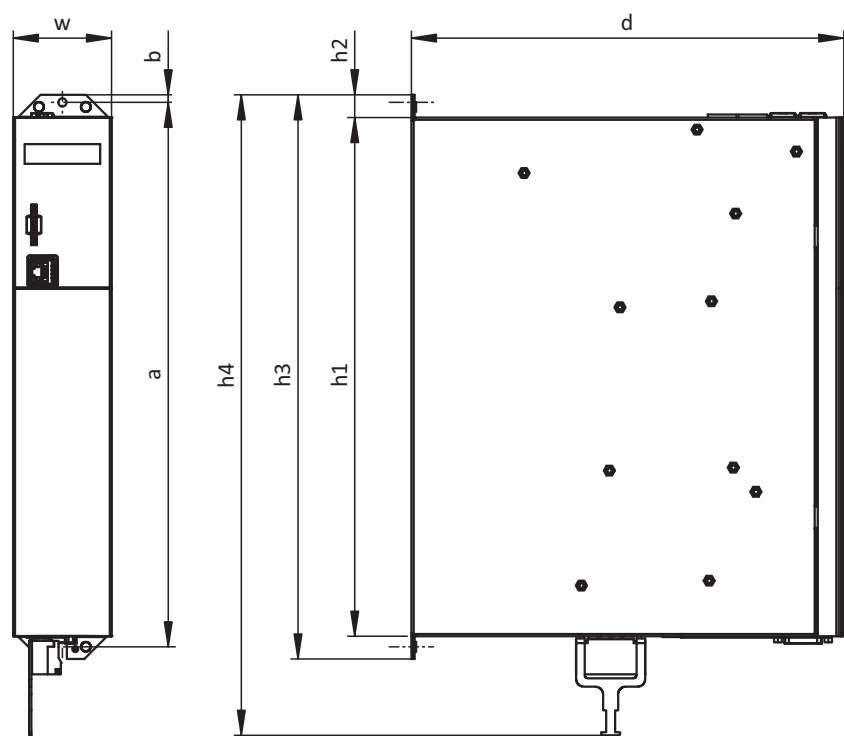


Fig. 2: SC6 dimensional drawing

| Dimension                           |                                      |                   | Size 0 | Size 1 | Size 2 |
|-------------------------------------|--------------------------------------|-------------------|--------|--------|--------|
| Drive controller                    | Width                                | w                 | 45     | 65     |        |
|                                     | Depth                                | d                 | 265    | 286    |        |
|                                     | Body height                          | h1                | 343    |        |        |
|                                     | Fastening clip height                | h2                | 15     |        |        |
|                                     | Height incl. fastening clips         | h3                | 373    |        |        |
|                                     | Total height incl. shield connection | h4                | 423    |        |        |
|                                     | Fastening holes (M5)                 | Vertical distance | a      | 360+2  |        |
| Vertical distance to the upper edge |                                      | b                 | 5      |        |        |

Tab. 23: SC6 dimensions [mm]

6.2.7
Weight

| Type    | Weight without packaging [g] | Weight with packaging [g] |
|---------|------------------------------|---------------------------|
| SC6A062 | 3600                         | 5200                      |
| SC6A162 | 5300                         | 6700                      |
| SC6A261 | 5200                         | 6400                      |

Tab. 24: SC6 weight [g]

6.2.8 Minimum clearances

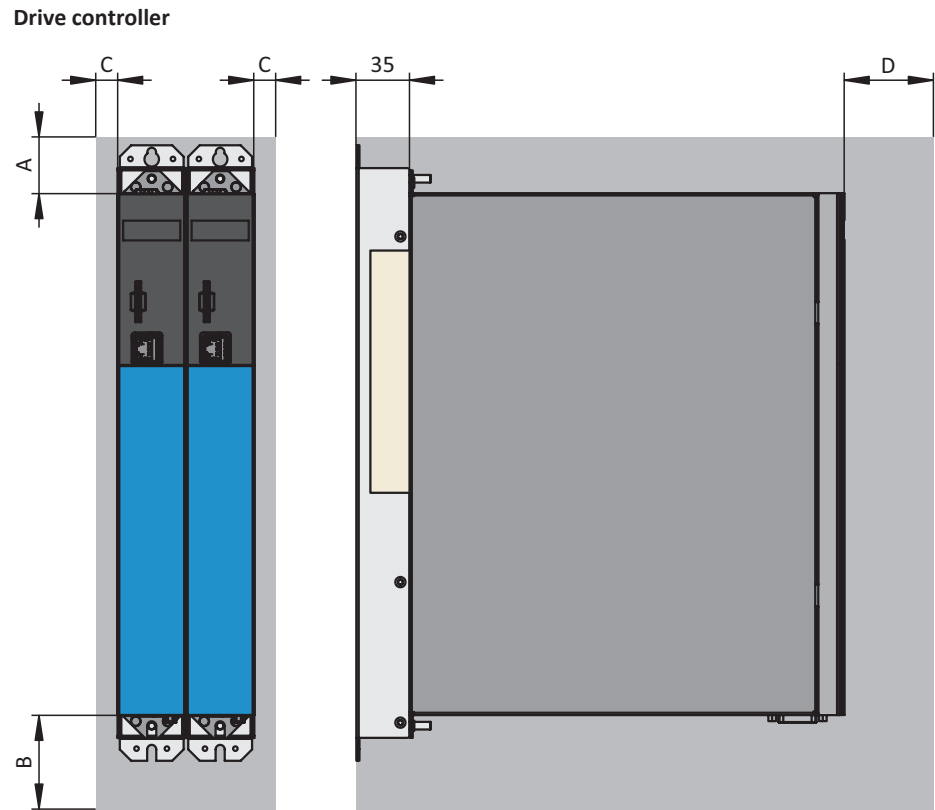


Fig. 3: Minimum clearances

The specified dimensions relate to the outer edges of the drive controller.

| Minimum clearance | A (above) | B (below) | C (on the side) | D (in front)    |
|-------------------|-----------|-----------|-----------------|-----------------|
| All sizes         | 100       | 200       | 5               | 50 <sup>6</sup> |

Tab. 25: Minimum clearances [mm]

Chokes and filters

Avoid installation below drive controllers or supply modules. For installation in a control cabinet, a distance of approximately 100 mm to other neighboring components is recommended. This distance ensures proper heat dissipation for chokes and filters.

Braking resistors

Avoid installation below drive controllers or supply modules. In order for heated air to flow out unimpeded, a minimum clearance of approximately 200 mm must be maintained in relation to neighboring components or walls and approximately 300 mm must be maintained to components above or ceilings.

<sup>6</sup> Minimum clearance to be taken into account for permanent connection of the X9 service interface



## 6.3 Drive controller/motor combinations

Parameterization of a STÖBER drive controller is exceptionally easy, especially together with four-pole STÖBER asynchronous motors. The motor is fully typified by inputting just the motor size (e.g. 90L) and its wiring (star or delta). A delta connection (measurement point 230 V, 50 Hz) is available for motors up to 3 kW (size 100). By increasing the voltage at higher frequencies, the full torque can be drawn through the motor up to 87 Hz. It usually makes sense to take this expanded speed adjustment range into account when selecting the gear unit. You can find more detailed information in the chapter [\[► 5.6\]](#).

An explanation of the formula symbols used can be found in the chapter [\[► 13.1\]](#).

|                                        |               |    |                 |               |                |               |           |              | SC6A062                                             | SC6A162 | SC6A261 |
|----------------------------------------|---------------|----|-----------------|---------------|----------------|---------------|-----------|--------------|-----------------------------------------------------|---------|---------|
|                                        |               |    |                 |               |                |               |           |              | $I_{2N,PU}$ [A]<br>( $f_{PWM,PU} = 4 \text{ kHz}$ ) |         |         |
|                                        | $f_T$<br>[Hz] | pz | Con-<br>nection | $P_N$<br>[kW] | $n_N$<br>[rpm] | $M_N$<br>[Nm] | $M_k/M_N$ | $I_N$<br>[A] | 4.5                                                 | 10      | 19      |
| <b>Δ 230 V / Y 400 V motor winding</b> |               |    |                 |               |                |               |           |              | $I_{2N,PU} / I_N$                                   |         |         |
| IE3D080L04                             | 50            | 4  | Y               | 0.75          | 1445           | 5.0           | 3.7       | 1.7          | 2.6                                                 |         |         |
| IE3D080L04                             | 87            | 4  | Δ               | 1.3           | 2503           | 5.0           | 3.7       | 2.94         | 1.5                                                 |         |         |
| IE3D090S04                             | 50            | 4  | Y               | 1.1           | 1440           | 7.3           | 3.7       | 2.5          | 1.8                                                 |         |         |
| IE3D090S04                             | 87            | 4  | Δ               | 1.91          | 2494           | 7.3           | 3.7       | 4.33         | 1.0                                                 |         |         |
| IE3D090LX04                            | 50            | 4  | Y               | 1.5           | 1455           | 9.8           | 4.9       | 3.4          | 1.3                                                 |         |         |
| IE3D090LX04                            | 87            | 4  | Δ               | 2.6           | 2503           | 9.8           | 4.9       | 5.89         |                                                     | 1.7     |         |
| IE3D100KX04                            | 50            | 4  | Y               | 2.2           | 1450           | 14.5          | 3.8       | 4.55         |                                                     | 2.2     |         |
| IE3D100KX04                            | 87            | 4  | Δ               | 3.81          | 2511           | 14.5          | 3.8       | 7.88         |                                                     | 1.3     |         |
| IE3D100LX04                            | 50            | 4  | Y               | 3.0           | 1450           | 19.8          | 4         | 6.35         |                                                     | 1.6     |         |
| IE3D100LX04                            | 87            | 4  | Δ               | 5.2           | 2511           | 19.8          | 4         | 11           |                                                     |         | 1.7     |
| IE3D112M04                             | 50            | 4  | Δ               | 4.0           | 1465           | 26.1          | 4.5       | 7.9          |                                                     | 1.3     |         |
| IE3D132SX04                            | 50            | 4  | Δ               | 5.5           | 1465           | 36            | 3.3       | 10           |                                                     | 1.0     | 1.9     |
| IE3D132MX04                            | 50            | 4  | Δ               | 7.5           | 1470           | 49            | 3.9       | 16           |                                                     |         | 1.2     |

## 6.4 Accessories

You can find information about the available accessories in the following chapters.

### 6.4.1 Safety technology

#### Information

Note that the drive controller is delivered as a standard version without safety technology (SZ6 option). If you want a drive controller with integrated safety technology, you must order it together with the drive controller. The safety modules are an integrated part of the drive controllers and must not be modified.

#### SZ6 option – Without safety technology

ID No. 56660  
Standard version.

#### SR6 safety module – STO using terminals



ID No. 56661  
Optional accessory for the use of the Safe Torque Off safety function (STO) in safety-relevant applications (PL e, SIL 3) in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2. Connection to a higher-level safety circuit via terminal X12.

#### SY6 safety module – STO and SS1 using FSoE



ID No. 56662  
Optional accessory for the use of the Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions in safety-relevant applications (PL e, SIL 3) in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2. Connection to the higher-level safety circuit using Fail Safe over EtherCAT (FSoE).

## 6.4.2 Communication

The drive controller has two interfaces for the fieldbus connection on the top of the device as well as an Ethernet service interface on the front of the device. Cables for the connection are available separately.

### EtherCAT or PROFINET fieldbus system



Please specify the desired fieldbus system when placing your purchase order for the base device.



### EtherCAT cables



Ethernet patch cable, CAT5e, yellow.

The following designs are available:

ID No. 49313: Length approx. 0.2 m.

ID No. 49314: Length approx. 0.35 m.

### PC connecting cables



ID No. 49857

Cable for connecting the X9 service interface to the PC, CAT5e, blue, 5 m.

### USB 2.0 Ethernet adapter



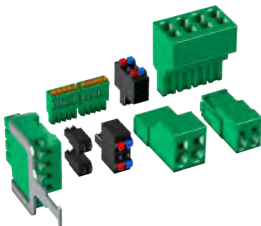
ID No. 49940

Adapter for connecting Ethernet to a USB port.

## 6.4.3 Terminal set

For connection, you need the fitting terminal set for each SC6 drive controller.

### Terminal set for drive controller – SZ6 option (without safety technology) or SY6 option (STO and SS1 using FSoE)



The following designs are available:

ID No. 138652

Terminal set for SC6A062Z/Y.

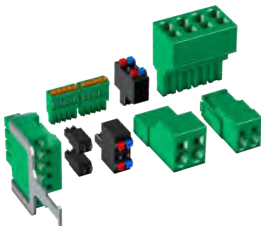
ID No. 138653

Terminal set for SC6A162Z/Y.

ID No. 138654

Terminal set for SC6A261Z/Y.

### Terminal set for drive controller – SR6 option (STO via terminals)



The following designs are available:

ID No. 138680

Terminal set for SC6A062R.

ID No. 138681

Terminal set for SC6A162R.

ID No. 138682

Terminal set for SC6A261R.

## 6.4.4 DC link connection

If you want to connect SC6 drive controllers in the DC link group, you will need Quick DC-Link modules of type DL6B.

You receive the DL6B rear section modules in different designs for a horizontal connection, suitable for the size of the drive controller.

The quick fastening clamps for attaching the copper rails and an insulation connection piece are contained in the scope of delivery. The copper rails are not included in the scope of delivery. These must have a cross-section of 5 x 12 mm. Insulation end sections are available separately.

### Quick DC-Link DL6B for drive controller



The following designs are available:

DL6B10

ID No. 56655

Rear section module for size 0 drive controller:

SC6A062

DL6B11

ID No. 56656

Rear section module for size 1 or 2 drive controller:

SC6A162 and SC6A261

### Quick DC-Link DL6B insulation end section



ID No. 56659

Insulation end sections for the left and right termination of the group,  
2 pcs.

6.4.5Braking resistor

In addition to drive controllers, STÖBER offers the following braking resistors described below in various sizes and performance classes. For the selection, note the minimum permitted braking resistors specified in the technical data of the individual drive controller types.

6.4.5.1Tubular fixed resistor FZMU, FZZMU

| Type    | FZMU 400×65 | FZZMU 400×65 |
|---------|-------------|--------------|
| ID No.  | 49010       | 53895        |
| SC6A062 | X           | —            |
| SC6A162 | (X)         | X            |
| SC6A261 | (X)         | X            |

Tab. 26: Assignment of FZMU, FZZMU braking resistor – SC6 drive controller

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

Properties

| Specification                      | FZMU 400×65                                                                          | FZZMU 400×65                                                                          |
|------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                             | 49010                                                                                | 53895                                                                                 |
| Type                               | Tubular fixed resistor                                                               | Tubular fixed resistor                                                                |
| Resistance [Ω]                     | 100                                                                                  | 47                                                                                    |
| Power [W]                          | 600                                                                                  | 1200                                                                                  |
| Therm. time const. $\tau_{th}$ [s] | 40                                                                                   | 40                                                                                    |
| Pulse power for < 1 s [kW]         | 18                                                                                   | 36                                                                                    |
| $U_{max}$ [V]                      | 848                                                                                  | 848                                                                                   |
| Weight without packaging [g]       | 2200                                                                                 | 4170                                                                                  |
| Protection class                   | IP20                                                                                 | IP20                                                                                  |
| Test symbols                       |  |  |

Tab. 27: FZMU, FZZMU specification

Dimensions

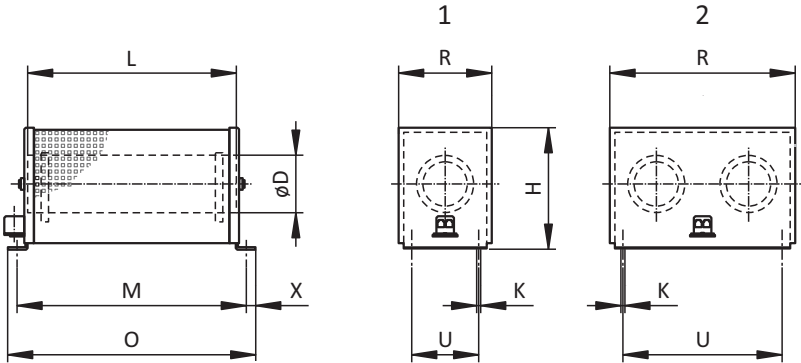


Fig. 4: FZMU (1), FZZMU (2) dimensional drawing

| Dimension | FZMU 400×65 | FZZMU 400×65 |
|-----------|-------------|--------------|
| ID No.    | 49010       | 53895        |
| L x D     | 400 × 65    | 400 × 65     |
| H         | 120         | 120          |
| K         | 6.5 × 12    | 6.5 × 12     |
| M         | 430         | 426          |
| O         | 485         | 450          |
| R         | 92          | 185          |
| U         | 64          | 150          |
| X         | 10          | 10           |

Tab. 28: FZMU, FZZMU dimensions [mm]

### 6.4.5.2 GVADU, GBADU flat resistor

| Type    | GVADU 210×20 | GBADU 265×30 | GBADU 335×30 |
|---------|--------------|--------------|--------------|
| ID No.  | 55441        | 55442        | 55443        |
| SC6A062 | X            | X            | —            |
| SC6A162 | (X)          | (X)          | X            |
| SC6A261 | (X)          | (X)          | X            |

Tab. 29: Assignment of GVADU, GBADU braking resistor – SC6 drive controller

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

#### Properties

| Specification                      | GVADU 210×20                     | GBADU 265×30                    | GBADU 335×30                    |
|------------------------------------|----------------------------------|---------------------------------|---------------------------------|
| ID No.                             | 55441                            | 55442                           | 55443                           |
| Type                               | Flat resistor                    | Flat resistor                   | Flat resistor                   |
| Resistance [ $\Omega$ ]            | 100                              | 100                             | 47                              |
| Power [W]                          | 150                              | 300                             | 400                             |
| Therm. time const. $\tau_{th}$ [s] | 60                               | 60                              | 60                              |
| Pulse power for < 1 s [kW]         | 3.3                              | 6.6                             | 8.8                             |
| $U_{max}$ [V]                      | 848                              | 848                             | 848                             |
| Cable design                       | Radox                            | FEP                             | FEP                             |
| Cable length [mm]                  | 500                              | 500                             | 500                             |
| Conductor cross-section [AWG]      | 18/19<br>(0.82 mm <sup>2</sup> ) | 14/19<br>(1.9 mm <sup>2</sup> ) | 14/19<br>(1.9 mm <sup>2</sup> ) |
| Weight without packaging [g]       | 300                              | 930                             | 1200                            |
| Protection class                   | IP54                             | IP54                            | IP54                            |
| Test symbols                       |                                  |                                 |                                 |

Tab. 30: GVADU, GBADU specification

#### Dimensions

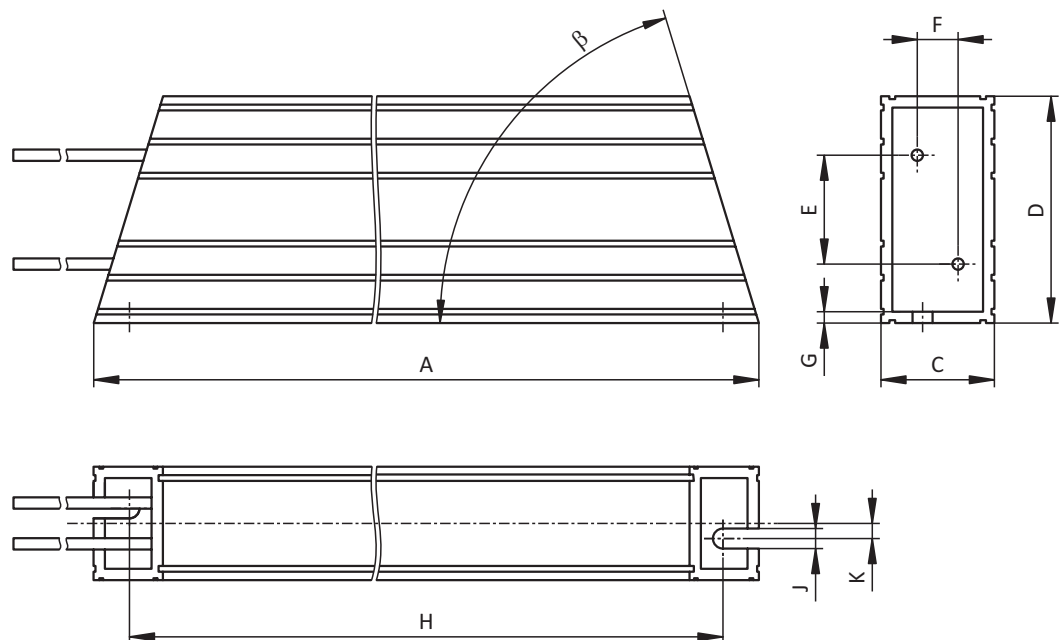


Fig. 5: GVADU, GBADU dimensional drawing

| Dimension | GVADU 210×20 | GBADU 265×30 | GBADU 335×30 |
|-----------|--------------|--------------|--------------|
| ID No.    | 55441        | 55442        | 55443        |
| A         | 210          | 265          | 335          |
| H         | 192          | 246          | 316          |
| C         | 20           | 30           | 30           |
| D         | 40           | 60           | 60           |
| E         | 18.2         | 28.8         | 28.8         |
| F         | 6.2          | 10.8         | 10.8         |
| G         | 2            | 3            | 3            |
| K         | 2.5          | 4            | 4            |
| J         | 4.3          | 5.3          | 5.3          |
| $\beta$   | 65°          | 73°          | 73°          |

Tab. 31: GVADU, GBADU dimensions [mm]

## 6.4.6 Choke

Technical specifications for suitable chokes can be found in the following chapters.

### 6.4.6.1 TEP output choke

Output chokes are required for connecting size 0 to 2 drive controllers to synchronous servo motors or asynchronous motors from a cable length > 50 m in order to reduce interference pulses and protect the drive system. If Lean motors are connected, output chokes must not be used.

#### Information

The following technical data only applies to a rotating magnetic field frequency of 200 Hz. For example, this rotating magnetic field frequency is achieved with a motor with 4 pole pairs and a nominal speed of 3000 rpm. Always observe the specified derating for higher rotating magnetic field frequencies. Also observe the relationship with the clock frequency.

#### Properties

| Specification                                       | TEP3720-0ES41                                                                         | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|---------------|---------------|
| ID No.                                              | 53188                                                                                 | 53189         | 53190         |
| Voltage range                                       | 3 × 0 to 480 V <sub>AC</sub>                                                          |               |               |
| Frequency range                                     | 0 – 200 Hz                                                                            |               |               |
| Nominal current $I_{N,MF}$ at 4 kHz                 | 4 A                                                                                   | 17.5 A        | 38 A          |
| Nominal current $I_{N,MF}$ at 8 kHz                 | 3.3 A                                                                                 | 15.2 A        | 30.4 A        |
| Max. permitted motor cable length with output choke | 100 m                                                                                 |               |               |
| Max. surrounding temperature $\vartheta_{amb,max}$  | 40 °C                                                                                 |               |               |
| Protection class                                    | IP00                                                                                  |               |               |
| Winding losses                                      | 11 W                                                                                  | 29 W          | 61 W          |
| Iron losses                                         | 25 W                                                                                  | 16 W          | 33 W          |
| Connection                                          | Screw terminal                                                                        |               |               |
| Max. conductor cross-section                        | 10 mm <sup>2</sup>                                                                    |               |               |
| UL Recognized Component (CAN; USA)                  | Yes                                                                                   |               |               |
| Test symbols                                        |  |               |               |

Tab. 32: TEP specification

## Dimensions

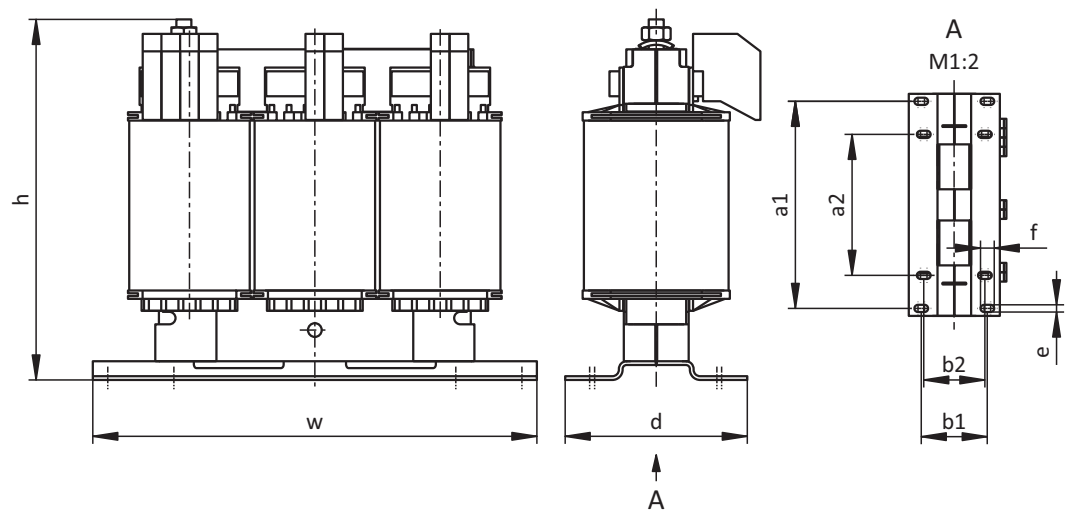


Fig. 6: TEP dimensional drawing

| Dimension                                     | TEP3720-0ES41 | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------|---------------|---------------|---------------|
| Height h [mm]                                 | Max. 153      | Max. 153      | Max. 180      |
| Width w [mm]                                  | 178           | 178           | 219           |
| Depth d [mm]                                  | 73            | 88            | 119           |
| Vertical distance – Fastening holes a1 [mm]   | 166           | 166           | 201           |
| Vertical distance – Fastening holes a2 [mm]   | 113           | 113           | 136           |
| Horizontal distance – Fastening holes b1 [mm] | 53            | 68            | 89            |
| Horizontal distance – Fastening holes b2 [mm] | 49            | 64            | 76            |
| Drill holes – Depth e [mm]                    | 5.8           | 5.8           | 7             |
| Drill holes – Width f [mm]                    | 11            | 11            | 13            |
| Screw connection – M                          | M5            | M5            | M6            |
| Weight without packaging [g]                  | 2900          | 5900          | 8800          |

Tab. 33: TEP dimensions and weight

## 6.4.7 HTL-to-TTL adapter

## HT6 HTL-to-TTL adapter



ID No. 56665

Adapters for SC6 and SI6 series drive controllers for level conversion from HTL signals to TTL signals.

It is used to connect an HTL differential incremental encoder to terminal X4 of the drive controller.



## 6.5 Further information

### 6.5.1 Directives and standards

The following European directives and standards are relevant to the drive controllers:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- EN 61326-3-1:2008
- EN 61800-3:2004 and A1:2012
- EN 61800-5-1:2007
- EN 61800-5-2:2007
- EN 50178:1997
- IEC 61784-3:2010

### 6.5.2 Symbols, marks and test symbols



**Grounding symbol**  
Grounding symbol in accordance with IEC 60417, symbol 5019.



**RoHS lead-free mark**  
Marking in accordance with RoHS directive 2011-65-EU.



**CE mark**  
Manufacturer's self declaration: The product meets the requirements of EU directives.



**UL test symbol**  
This product is listed by UL for the United States and Canada.  
Representative samples of this product have been evaluated by UL and meet the requirements of applicable standards.



**UL recognized component mark**  
This component or material is recognized by UL. Representative samples of this product have been evaluated by UL and meet applicable requirements.

### 6.5.3 Additional documentation

Additional documentation related to the product can be found at  
<http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

| Documentation                    | ID     |
|----------------------------------|--------|
| Manual for SC6 drive controllers | 442790 |

## 7 SI6 Drive controllers

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## 7 Drive controllers

SI6

### 7.1 Overview

Drive control in a multi-axis drive system

#### Features

- Single or double-axis controller with a nominal output current up to 50 A and 250% overload capacity
- Supply modules up to 20 kW nominal power
- Sensorless position control of STOBBER Lean motors
- Control of rotary synchronous servo motors, asynchronous motors and torque motors
- HIPERFACE DSL One Cable Solution
- Electronic motor nameplate via HIPERFACE DSL and EnDat 2.2 digital encoder interfaces
- Integrated EtherCAT or PROFINET communication
- STO safety technology using terminals or STO and SS1 using FSoE (Fail Safe over EtherCAT): SIL 3, PL e (cat. 4)
- Integrated brake control
- Energy supply over DC link connection
- Single-ended nominal power consumption on double-axis controllers for operation of motors with different power
- Variable feed-in power using supply modules that can be connected in parallel

## 7.1.1 Features

The completely re-designed STÖBER multi-axis drive system consists of the SI6 drive controller and PS6 supply module combination. Matching Quick DC-Link modules handle the energy supply for the networked drive controllers. The SI6 drive controller is available in four sizes as a single or double-axis controller with a nominal output current of up to 50. The PS6 supply module is available in two sizes with a nominal power of 10 kW or 20 kW. As an economically attractive system with a minimized device width, the SI6 opens a new dimension in multi-axis applications.

The optimized vector control, sensorless vector control, U/f slip-compensated and U/f controller control types are available for use with asynchronous motors.



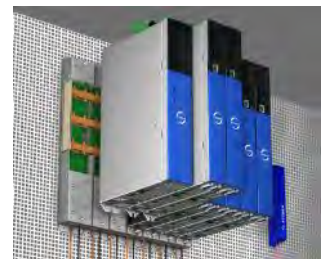
*Drive control in multi-axis drive systems with SI6 and PS6*

### As small as a paperback

You save valuable space in your control cabinet because, with a width of just 45 mm, this drive controller is the most compact solution on the market. It offers all the features that a designer requires.

### Dimension capacities precisely

4 axes? 16? Or even 97? A single SI6 drive controller can control up to two axes. Thanks to the multi-axis drive system, the number of motors or axes to be controlled can be scaled without limit. If required, SI6 drive controllers can be combined with stand-alone units from the STÖBER SC6 or SD6 series. For the general energy supply, the drive controllers from the SI6, SC6 and SD6 series can be connected to each other using Quick DC-Link modules.



### Tailored energy usage

The SI6 drive controllers are connected to a central supply module. There is no need for decentralized supply modules or fuses and cabling for each axis. When using double-axis modules, the unused power reserves of one axis can be used for the second axis. A significant reduction in space and cost!

### Fewer clicks, less wiring

Installation is exceptionally simple. No difficult wiring. The patented Quick DC-Link modules allow for a simple “click” into the standard copper rails, as well as the simple installation and connection of the drive controllers.

### Safety functions

The safety concept of the drive controller is based on the STO (Safe Torque Off) function. The concept corresponds to SIL 3 according to DIN EN 61800-5-2 and PL e (Cat. 4) according to DIN EN ISO 13849-1. For double-axis controllers, the STO safety function has a two-channel structure that acts upon both axes. For connection to a higher-level safety circuit, different interfaces are available (terminals or FSoE).

**Heavy duty**

There is an extremely robust design concealed behind the elegant exterior. All components—from the stable, well-shielded sheet steel housing to the motor connectors—far exceed the set values of industry standards. The inside is also anything but small-scale: ample computer capacities, high-quality components, careful workmanship.

## 7.1.2 Software components

**Project configuration and commissioning**

The 6th generation of DriveControlSuite project configuration and commissioning software has all the functions for the efficient use of drive controllers in single-axis and multi-axis applications. The program guides you step by step through the complete project configuration and parameterization process using wizards.

**Open communication**

The Ethernet-based EtherCAT and PROFINET fieldbus systems are available in the drive controller.

**Applications**

Controller-based motion control is recommended for the central motion control of complex machines.

Using the controller-based operating modes of the CiA 402 application, you can implement applications with synchronized, cyclic set value specification (csp, csv, cst, ip) by a motion controller. In addition, the drive controllers can also independently handle motion tasks, such as referencing and jogging during commissioning.

Drive-based Drive Based and Drive Based Synchronous applications and drive-based operating modes (pp, pv, pt) of the CiA 402 application are also available for torque/force mode, velocity mode or positioning mode.

## 7.1.3 Application training

STOBER offers a multi-level training program that focuses essentially on application programming of the motion controller and drive controller.

**G6 Basic**

Training content: System overview, installation and commissioning of the drive controller. Use of option modules. Parameterization, commissioning and diagnostics using the commissioning software. Remote maintenance. Basics of controller optimization. Configuration of the drive train. Integrated software functions. Software applications. Connection to a higher-level controller. Basics of safety technology. Practical exercises on training topics.

Software used: DriveControlSuite.

**G6 Advanced**

Training content: Special knowledge for regulating, control and safety technology. Practical exercises on training topics.

## 7.2 Technical data

Technical data for the drive controllers, supply modules and accessories can be found in the following chapters.

### 7.2.1 General technical data

The following specifications apply equally to the SI6 drive controller and the PS6 supply module.

| Device features                            |                                                                                          |
|--------------------------------------------|------------------------------------------------------------------------------------------|
| Protection class of the device             | IP20                                                                                     |
| Protection class of the installation space | At least IP54                                                                            |
| Protection class                           | Protection class I in accordance with DIN EN 61140                                       |
| Radio interference suppression             | Integrated line filter in accordance with DIN EN 61800-3, interference emission class C3 |
| Overvoltage category                       | III in accordance with DIN EN 61800-5-1                                                  |
| Test symbols                               |         |

Tab. 1: Device features

| Transport and storage conditions                                                                                                       |                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Storage/transport temperature                                                                                                          | –20 °C to +70 °C<br>Maximum change: 20 K/h                                                                    |
| Relative humidity                                                                                                                      | Maximum relative humidity 85%, non-condensing                                                                 |
| Vibration (transport) in accordance with DIN EN 60068-2-6                                                                              | 5 Hz ≤ f ≤ 9 Hz: 3.5 mm<br>9 Hz ≤ f ≤ 200 Hz: 10 m/s <sup>2</sup><br>200 Hz ≤ f ≤ 500 Hz: 15 m/s <sup>2</sup> |
| Fall height for freefall <sup>1</sup><br>Weight < 100 kg<br>in accordance with DIN EN 61800-2<br>(or DIN EN 60721-3-2:1997, class 2M1) | 0.25 m                                                                                                        |

Tab. 2: Transport and storage conditions

| Operating conditions                                      |                                                                                                                  |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Surrounding temperature during operation                  | 0 °C to 45 °C with nominal data<br>45 °C to 55 °C with derating –2.5% / K                                        |
| Relative humidity                                         | Maximum relative humidity 85%, non-condensing                                                                    |
| Installation altitude                                     | 0 m to 1000 m above sea level without restrictions<br>1000 m to 2000 m above sea level with –1.5%/100 m derating |
| Pollution degree                                          | Pollution degree 2 in accordance with EN 50178                                                                   |
| Ventilation                                               | Installed fan                                                                                                    |
| Vibration (operation) in accordance with DIN EN 60068-2-6 | 5 Hz ≤ f ≤ 9 Hz: 0.35 mm<br>9 Hz ≤ f ≤ 200 Hz: 1 m/s <sup>2</sup>                                                |

Tab. 3: Operating conditions

| Discharge times                |                                                                                |
|--------------------------------|--------------------------------------------------------------------------------|
| Self-discharge of DC link      | 15 min                                                                         |
| DC link circuit fast discharge | Thanks to PS6 supply module in combination with a braking resistor:<br>< 1 min |

Tab. 4: Discharge times of the DC link circuit

<sup>1</sup> Only valid for components in original packaging

7.2.2
Drive controllers

The following chapters contain specifications for the electrical data, dimensions and weight of the drive controller.

7.2.2.1
Type designation

|    |   |   |   |   |   |   |
|----|---|---|---|---|---|---|
| SI | 6 | A | 0 | 6 | 1 | Z |
|----|---|---|---|---|---|---|

Tab. 5: Example code for SI6 type designation

| Code  | Designation        | Design                             |
|-------|--------------------|------------------------------------|
| SI    | Series             | ServolInverter                     |
| 6     | Generation         | Generation 6                       |
| A     | Version            |                                    |
| 0 – 3 | Size               |                                    |
| 6     | Power output stage | Power output stage within the size |
| 1     | Axis controller    | Single-axis controller             |
| 2     |                    | Double-axis controller             |
| Z     | Safety technology  | SZ6: Without safety technology     |
| R     |                    | SR6: STO using terminals           |
| Y     |                    | SY6: STO and SS1 using FSoE        |

Tab. 6: Meaning of the SI6 example code

7.2.2.2
Sizes

| Type    | ID No. | Size   | Axis controller        |
|---------|--------|--------|------------------------|
| SI6A061 | 56645  | Size 0 | Single-axis controller |
| SI6A062 | 56646  | Size 0 | Double-axis controller |
| SI6A161 | 56647  | Size 1 | Single-axis controller |
| SI6A162 | 56648  | Size 1 | Double-axis controller |
| SI6A261 | 56649  | Size 2 | Single-axis controller |
| SI6A262 | 56653  | Size 2 | Double-axis controller |
| SI6A361 | 56654  | Size 3 | Single-axis controller |

Tab. 7: Available SI6 types and sizes



SI6 in sizes 0 to 3

Note that the basic device is delivered without terminals. Suitable terminal sets are available separately for each size.

### 7.2.2.3 Electrical data

The electrical data of the available SI6 sizes can be found in the following sections.

An explanation of the formula symbols used can be found in the chapter [\[ 13.1 \]](#).

#### 7.2.2.3.1 Control unit

| Electrical data | All types                    |
|-----------------|------------------------------|
| $U_{1CU}$       | 24 V <sub>DC</sub> +20%/–15% |
| $I_{1maxCU}$    | 0.5 A                        |

Tab. 8: Control unit electrical data

#### 7.2.2.3.2 Power unit: Size 0

| Electrical data | SI6A061                             | SI6A062 |
|-----------------|-------------------------------------|---------|
| $U_{1PU}$       | 280 – 800 V <sub>DC</sub>           |         |
| $f_{2PU}$       | 0 – 700 Hz                          |         |
| $U_{2PU}$       | 0 – max. $\frac{U_{1PU}}{\sqrt{2}}$ |         |
| $C_{PU}$        | 180 µF                              | 270 µF  |

Tab. 9: SI6 electrical data, size 0

Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SI6A061      | SI6A062 |
|-----------------|--------------|---------|
| $f_{PWM,PU}$    | 4 kHz        |         |
| $I_{2N,PU}$     | 5 A          | 2 × 5 A |
| $I_{2maxPU}$    | 210% for 2 s |         |

Tab. 10: SI6 electrical data, size 0, for 4 kHz clock frequency

| Electrical data | SI6A061      | SI6A062   |
|-----------------|--------------|-----------|
| $f_{PWM,PU}$    | 8 kHz        |           |
| $I_{2N,PU}$     | 4.5 A        | 2 × 4.5 A |
| $I_{2maxPU}$    | 250% for 2 s |           |

Tab. 11: SI6 electrical data, size 0, for 8 kHz clock frequency

#### 7.2.2.3.3 Power unit: Size 1

| Electrical data | SI6A161                             | SI6A162 |
|-----------------|-------------------------------------|---------|
| $U_{1PU}$       | 280 – 800 V <sub>DC</sub>           |         |
| $f_{2PU}$       | 0 – 700 Hz                          |         |
| $U_{2PU}$       | 0 – max. $\frac{U_{1PU}}{\sqrt{2}}$ |         |
| $C_{PU}$        | 470 µF                              | 940 µF  |

Tab. 12: SI6 electrical data, size 1

Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SI6A161      | SI6A162  |
|-----------------|--------------|----------|
| $f_{PWM,PU}$    | 4 kHz        |          |
| $I_{2N,PU}$     | 12 A         | 2 × 12 A |
| $I_{2maxPU}$    | 210% for 2 s |          |

Tab. 13: SI6 electrical data, size 1, for 4 kHz clock frequency

| Electrical data | SI6A161      | SI6A162  |
|-----------------|--------------|----------|
| $f_{PWM,PU}$    | 8 kHz        |          |
| $I_{2N,PU}$     | 10 A         | 2 × 10 A |
| $I_{2maxPU}$    | 250% for 2 s |          |

Tab. 14: SI6 electrical data, size 1, for 8 kHz clock frequency



## 7.2.2.3.4 Power unit: Size 2

| Electrical data | SI6A261                             | SI6A262 |
|-----------------|-------------------------------------|---------|
| $U_{1PU}$       | 280 – 800 V <sub>DC</sub>           |         |
| $f_{2PU}$       | 0 – 700 Hz                          |         |
| $U_{2PU}$       | 0 – max. $\frac{U_{1PU}}{\sqrt{2}}$ |         |
| $C_{PU}$        | 940 µF                              | 2250 µF |

Tab. 15: SI6 electrical data, size 2

Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SI6A261      | SI6A262  |
|-----------------|--------------|----------|
| $f_{PWM,PU}$    | 4 kHz        |          |
| $I_{2N,PU}$     | 22 A         | 2 × 25 A |
| $I_{2maxPU}$    | 210% for 2 s |          |

Tab. 16: SI6 electrical data, size 2, for 4 kHz clock frequency

| Electrical data | SI6A261      | SI6A262  |
|-----------------|--------------|----------|
| $f_{PWM,PU}$    | 8 kHz        |          |
| $I_{2N,PU}$     | 20 A         | 2 × 20 A |
| $I_{2maxPU}$    | 250% for 2 s |          |

Tab. 17: SI6 electrical data, size 2, for 8 kHz clock frequency

## 7.2.2.3.5 Power unit: Size 3

| Electrical data | SI6A361                             |
|-----------------|-------------------------------------|
| $U_{1PU}$       | 280 – 800 V <sub>DC</sub>           |
| $f_{2PU}$       | 0 – 700 Hz                          |
| $U_{2PU}$       | 0 – max. $\frac{U_{1PU}}{\sqrt{2}}$ |
| $C_{PU}$        | 2250 µF                             |

Tab. 18: SI6 electrical data, size 3

Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SI6A361      |
|-----------------|--------------|
| $f_{PWM,PU}$    | 4 kHz        |
| $I_{2N,PU}$     | 50 A         |
| $I_{2maxPU}$    | 210% for 2 s |

Tab. 19: SI6 electrical data, size 3, for 4 kHz clock frequency

| Electrical data | SI6A361      |
|-----------------|--------------|
| $f_{PWM,PU}$    | 8 kHz        |
| $I_{2N,PU}$     | 40 A         |
| $I_{2maxPU}$    | 250% for 2 s |

Tab. 20: SI6 electrical data, size 3, for 8 kHz clock frequency

### 7.2.2.3.6 Single-ended nominal power consumption on double-axis controllers

Operating two motors on one double-axis controller makes it possible to operate one of the motors with a continuous current above the nominal current of the drive controller if the continuous current of the second connected motor is lower than the nominal current of the drive controller. This enables economical combinations of double-axis controllers and motors.

The nominal output current for axis B can be determined using the following formula if the output current for axis A is known:

#### Example 1

$$I_{2PU(B)} = I_{2N,PU} - (I_{2PU(A)} - I_{2N,PU}) \times \frac{3}{5} \quad \text{where} \quad 0 \leq I_{2PU(A)} \leq I_{2N,PU}$$

#### Example 2

$$I_{2PU(B)} = I_{2N,PU} - (I_{2PU(A)} - I_{2N,PU}) \times \frac{5}{3} \quad \text{where} \quad I_{2N,PU} \leq I_{2PU(A)} \leq 1,6 \times I_{2N,PU}$$

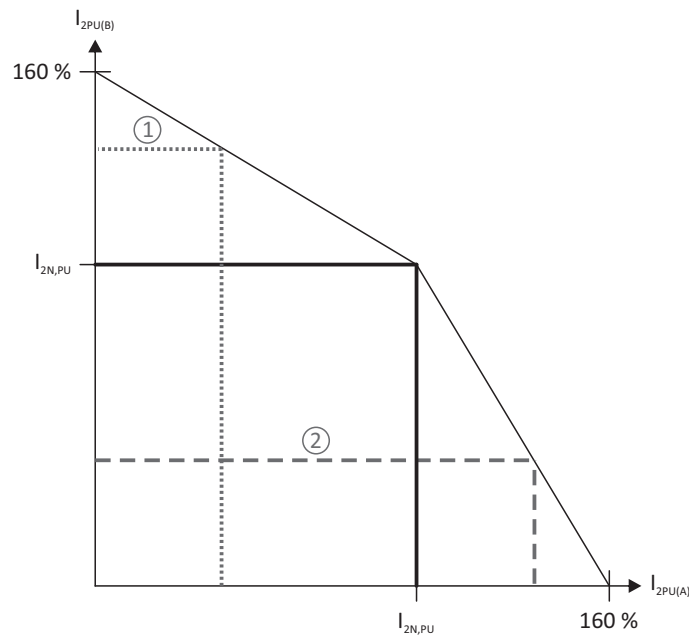


Fig. 1: Asymmetric load on double-axis controllers

#### Information

Note that the available maximum currents  $I_{2maxPU}$  of the axis controllers are also relative to the nominal output current  $I_{2N,PU}$  for single-ended nominal power consumption.

## 7.2.2.3.7 Power loss data in accordance with EN 61800-9-2

| Type    | Nominal<br>current<br>$I_{2N,PU}$ | Apparent<br>power | Absolute<br>losses<br>$P_{V,CU}^2$ | Operating points <sup>3</sup> |        |         |         |         |          |         |          | IE<br>class <sup>4</sup> | Compari-<br>son <sup>5</sup> |
|---------|-----------------------------------|-------------------|------------------------------------|-------------------------------|--------|---------|---------|---------|----------|---------|----------|--------------------------|------------------------------|
|         |                                   |                   |                                    | (0/25)                        | (0/50) | (0/100) | (50/25) | (50/50) | (50/100) | (90/50) | (90/100) |                          |                              |
|         |                                   |                   |                                    | Relative losses               |        |         |         |         |          |         |          |                          |                              |
|         | [A]                               | [kVA]             | [W]                                | [%]                           |        |         |         |         |          |         |          |                          |                              |
| SI6A06x | 5                                 | 3.5               | Max. 10                            | 0.71                          | 0.86   | 1.33    | 0.76    | 0.97    | 1.61     | 1.13    | 2.13     | IE2                      |                              |
| SI6A16x | 12                                | 8.3               | Max. 10                            | 0.55                          | 0.71   | 1.19    | 0.59    | 0.80    | 1.44     | 0.94    | 1.87     | IE2                      |                              |
| SI6A261 | 22                                | 16.6              | Max. 10                            | 0.55                          | 0.71   | 1.19    | 0.59    | 0.80    | 1.44     | 0.94    | 1.87     | IE2                      |                              |
| SI6A262 | 25                                | 17.3              | Max. 10                            | 0.45                          | 0.62   | 1.12    | 0.50    | 0.74    | 1.47     | 0.95    | 2.12     | IE2                      |                              |
| SI6A361 | 50                                | 34.6              | Max. 10                            | 0.45                          | 0.62   | 1.12    | 0.50    | 0.74    | 1.47     | 0.95    | 2.12     | IE2                      |                              |
|         |                                   |                   |                                    | Absolute losses $P_V$         |        |         |         |         |          |         |          |                          |                              |
|         | [A]                               | [kVA]             | [W]                                | [W]                           |        |         |         |         |          |         |          |                          | [%]                          |
| SI6A06x | 5                                 | 3.5               | Max. 10                            | 25                            | 30.2   | 46.5    | 26.5    | 33.8    | 56.5     | 39.5    | 74.4     | IE2                      | 24.9                         |
| SI6A16x | 12                                | 8.3               | Max. 10                            | 45.7                          | 58.7   | 98.7    | 49.1    | 66.3    | 119.6    | 78.1    | 155.4    | IE2                      | 26.7                         |
| SI6A261 | 22                                | 16.6              | Max. 10                            | 91.5                          | 117.4  | 197.3   | 98.2    | 132.6   | 239.2    | 156.2   | 310.8    | IE2                      | 30.8                         |
| SI6A262 | 25                                | 17.3              | Max. 10                            | 77.9                          | 106.5  | 193.0   | 87.1    | 127.9   | 254.3    | 163.8   | 367.6    | IE2                      | 36.4                         |
| SI6A361 | 50                                | 34.6              | Max. 10                            | 155.8                         | 213.1  | 386.0   | 174.3   | 255.8   | 508.6    | 327.6   | 735.2    | IE2                      | 39.5                         |

Tab. 21: Power loss data in accordance with EN 61800-9-2 for one axis of a SI6 drive controller

**General conditions**

The specified losses apply to an axis of a drive controller and take into account the proportionate losses of the PS6 supply module for that axis.

For a group with a total of x axes, the values are to be multiplied by the number of axis controllers (x), e.g. x = 4 for 1 × PS6 and 2 × SI6A062.

The loss data applies to drive controllers without any accessories.

The power loss calculation is based on a three-phase supply voltage with 400 V<sub>AC</sub>/50 Hz.

The calculated data includes a supplement of 10% in accordance with EN 61800-9-2.

The power loss specifications refer to a clock frequency of 4 kHz.

The absolute losses for a power unit that is switched off refer to the 24 V<sub>DC</sub> power supply of the control electronics.

<sup>2</sup> Absolute losses for a power unit that is switched off

<sup>3</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>4</sup> IE class in accordance with EN 61800-9-2

<sup>5</sup> Comparison of the losses for the reference related to IE2 in the nominal point (90, 100)

### 7.2.2.4 Derating

When dimensioning the drive controller, observe the derating of the nominal output current as a function of the clock frequency, surrounding temperature and installation altitude. There is no restriction for a surrounding temperature from 0 °C to 45 °C and an installation altitude of 0 m to 1000 m. The details given below apply to values outside these ranges.

#### 7.2.2.4.1 Effect of the clock frequency

Changing the clock frequency  $f_{PWM}$  affects the amount of noise produced by the drive, among other things. However, increasing the clock frequency results in increased losses. During project configuration, define the highest clock frequency and use it to determine the nominal output current  $I_{2N,PU}$  for dimensioning the drive controller.

| Type    | $I_{2N,PU}$<br>4 kHz [A] | $I_{2N,PU}$<br>8 kHz [A] | $I_{2N,PU}$<br>16 kHz [A] |
|---------|--------------------------|--------------------------|---------------------------|
| SI6A061 | 5                        | 4.5                      | 3.5                       |
| SI6A062 | 2 × 5                    | 2 × 4.5                  | 2 × 3.5                   |
| SI6A161 | 12                       | 10                       | 6                         |
| SI6A162 | 2 × 12                   | 2 × 10                   | 2 × 6                     |
| SI6A261 | 22                       | 20                       | 10                        |
| SI6A262 | 2 × 25                   | 2 × 20                   | 2 × 10                    |
| SI6A361 | 50                       | 40                       | —                         |

Tab. 22: Nominal output current  $I_{2N,PU}$  dependent on the clock frequency

#### 7.2.2.4.2 Effect of the surrounding temperature

Derating as a function of the surrounding temperature is determined as follows:

- 0 °C to 45 °C: No restrictions ( $D_T = 100\%$ )
- 45 °C to 55 °C: Derating  $-2.5\%/K$

##### Example

The drive controller needs to be operated at 50 °C.

The derating factor  $D_T$  is calculated as follows

$$D_T = 100\% - 5 \times 2.5\% = 87.5\%$$

#### 7.2.2.4.3 Effect of the installation altitude

Derating as a function of the installation altitude is determined as follows:

- 0 m to 1000 m: No restriction ( $D_{IA} = 100\%$ )
- 1000 m to 2000 m: Derating  $-1.5\%/100\text{ m}$

##### Example

The drive controller needs to be installed at an altitude of 1500 m above sea level.

The derating factor  $D_{IA}$  is calculated as follows:

$$D_{IA} = 100\% - 5 \times 1.5\% = 92.5\%$$

#### 7.2.2.4.4 Calculating the derating

Follow these steps for the calculation:

1. Determine the highest clock frequency ( $f_{PWM}$ ) that will be used during operation and use it to determine the nominal current  $I_{2N,PU}$ .
2. Determine the derating factors for installation altitude and surrounding temperature.
3. Calculate the reduced nominal current  $I_{2N,PU(red)}$  in accordance with the following formula:

$$I_{2N,PU(red)} = I_{2N,PU} \times D_T \times D_{IA}$$

##### Example

A drive controller of type SI6A061 needs to be operated at a clock frequency of 8 kHz at an altitude of 1500 m above sea level and a surrounding temperature of 50 °C.

The nominal current of the SI6A061 at 8 kHz is 4.5 A. The derating factor  $D_T$  is calculated as follows:

$$D_T = 100\% - 5 \times 2.5\% = 87.5\%$$

The derating factor  $D_{IA}$  is calculated as follows:

$$D_{IA} = 100\% - 5 \times 1.5\% = 92.5\%$$

The output current of importance for the project configuration is:

$$I_{2N,PU(red)} = 4.5\text{ A} \times 0.875 \times 0.925 = 3.64\text{ A}$$

7.2.2.5
Dimensions

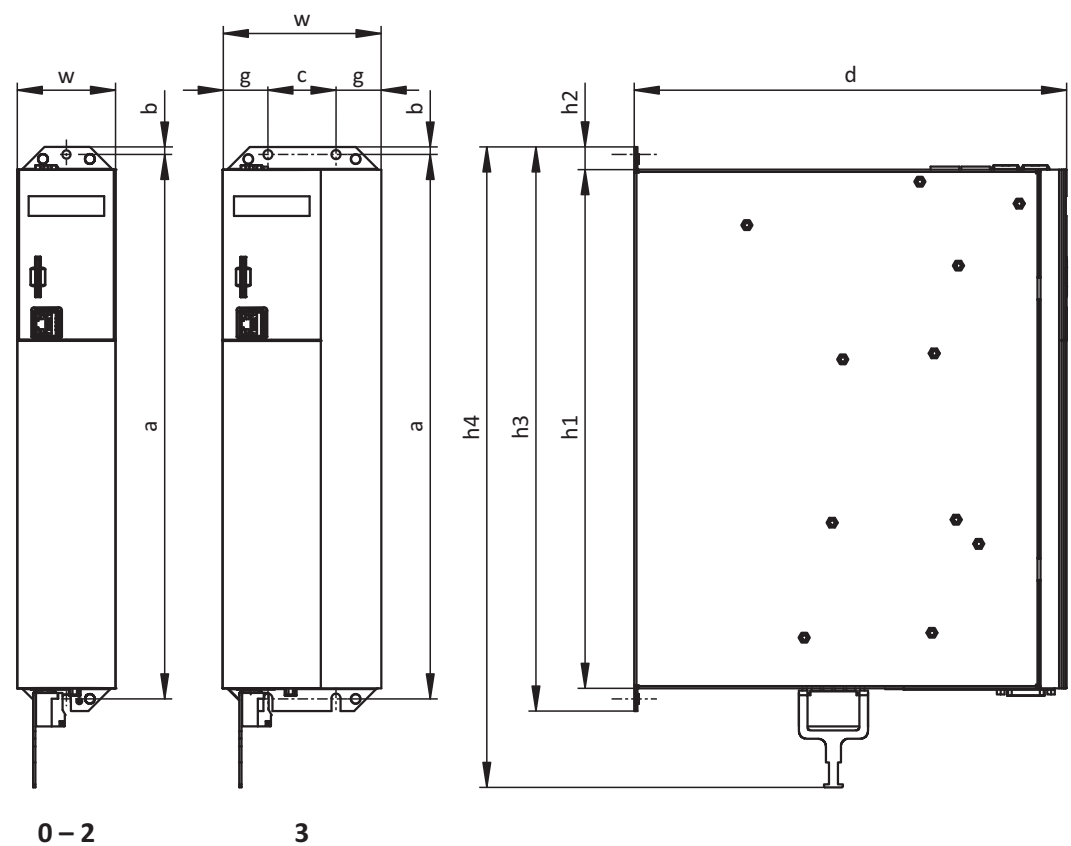


Fig. 2: SI6 dimensional drawing

| Dimension            |                                              |    | Size 0 | Size 1 | Size 2 <sup>6</sup> | Size 2 <sup>7</sup> | Size 3 |
|----------------------|----------------------------------------------|----|--------|--------|---------------------|---------------------|--------|
| Drive controller     | Width                                        | w  | 45     | 65     |                     | 105                 |        |
|                      | Depth                                        | d  | 265    | 286    |                     |                     |        |
|                      | Body height                                  | h1 | 343    |        |                     |                     |        |
|                      | Fastening clip height                        | h2 | 15     |        |                     |                     |        |
|                      | Height incl.<br>fastening clips              | h3 | 373    |        |                     |                     |        |
|                      | Total height incl.<br>shield connection      | h4 | 423    |        |                     |                     |        |
| Fastening holes (M5) | Vertical distance                            | a  | 360+2  |        |                     |                     |        |
|                      | Vertical distance to<br>the upper edge       | b  | 5      |        |                     |                     |        |
|                      | Horizontal spacing of<br>the fastening holes | c  | 45     |        |                     |                     |        |
|                      | Horizontal distance to<br>the side edge      | g  | 30     |        |                     |                     |        |

Tab. 23: SI6 dimensions [mm]

<sup>6</sup> Single-axis controller

<sup>7</sup> Double-axis controller

7.2.2.6 Weight

| Type    | Weight without packaging [g] | Weight with packaging [g] |
|---------|------------------------------|---------------------------|
| SI6A061 | 2980                         | 4600                      |
| SI6A062 | 3460                         | 5060                      |
| SI6A161 | 3880                         | 5260                      |
| SI6A162 | 4820                         | 6240                      |
| SI6A261 | 4760                         | 6200                      |
| SI6A262 | 6240                         | 7420                      |
| SI6A361 | 6180                         | 7360                      |

Tab. 24: SI6 weight [g]

7.2.3 Supply module

The following section contains specifications for the electrical data, dimensions and weight of the PS6 supply module.

7.2.3.1 Type designation

|    |   |   |   |   |
|----|---|---|---|---|
| PS | 6 | A | 2 | 4 |
|----|---|---|---|---|

Tab. 25: Example code for PS6 type designation

| Code  | Designation        | Design       |
|-------|--------------------|--------------|
| PS    | Series             | PowerSupply  |
| 6     | Generation         | Generation 6 |
| A     | Version            |              |
| 2 – 3 | Size               |              |
| 4     | Power output stage |              |

Tab. 26: Meaning of the PS6 example code

7.2.3.2 Sizes

| Type   | ID No. | Size   |
|--------|--------|--------|
| PS6A24 | 56650  | Size 2 |
| PS6A34 | 56651  | Size 3 |

Tab. 27: Available PS6 types and sizes



PS6 in sizes 2 and 3

Note that the basic device is delivered without terminals. Suitable terminal sets are available separately for each size.

### 7.2.3.3 Electrical data

The electrical data of the available PS6 sizes as well as the properties of the brake chopper can be found in the following sections.

#### Information

The STO safety function is available for safe stopping as an alternative to continuous, cyclical power-on/power-off operation.

An explanation of the formula symbols used can be found in the chapter [▶ 13.1](#).

#### 7.2.3.3.1 Control unit

| Electrical data | All types                      |
|-----------------|--------------------------------|
| $U_{1CU}$       | 24 V <sub>DC</sub> , +20%/–15% |
| $I_{1maxCU}$    | 0.5 A                          |

Tab. 28: Control unit electrical data

#### 7.2.3.3.2 Power unit: Size 2

| Electrical data | PS6A24                                                                                          |
|-----------------|-------------------------------------------------------------------------------------------------|
| $U_{1PU}$       | 3 × 400 V <sub>AC</sub> , +32%/–50%, 50/60 Hz;<br>3 × 480 V <sub>AC</sub> , +10%/–58%, 50/60 Hz |
| $U_{2PU}$       | $\sqrt{2} \times U_{1PU}$                                                                       |
| $P_{N,PU}$      | 10 kW                                                                                           |
| $I_{1N,PU}$     | 25 A                                                                                            |
| $I_{1maxPU}$    | $I_{1N,PU} \times 180\%$ for 5 s;<br>$I_{1N,PU} \times 150\%$ for 30 s                          |
| $C_{maxPU}$     | 5000 μF                                                                                         |

Tab. 29: PS6 electrical data, size 2

#### 7.2.3.3.3 Power unit: Size 3

| Electrical data | PS6A34                                                                                          |
|-----------------|-------------------------------------------------------------------------------------------------|
| $U_{1PU}$       | 3 × 400 V <sub>AC</sub> , +32%/–50%, 50/60 Hz;<br>3 × 480 V <sub>AC</sub> , +10%/–58%, 50/60 Hz |
| $U_{2PU}$       | $\sqrt{2} \times U_{1PU}$                                                                       |
| $P_{N,PU}$      | 20 kW                                                                                           |
| $I_{1N,PU}$     | 50 A                                                                                            |
| $I_{1maxPU}$    | $I_{1N,PU} \times 180\%$ for 5 s;<br>$I_{1N,PU} \times 150\%$ for 30 s                          |
| $C_{maxPU}$     | 10000 μF                                                                                        |

Tab. 30: PS6 electrical data, size 3

#### 7.2.3.3.4 Parallel connection

The power and current increase if supply modules are connected in parallel. Take into account that the total is derated by a factor of 0.8 in doing so.

The charging capacity of the supply modules can be increased by a parallel connection only if the power grid supply is connected to all supply modules simultaneously. Increasing the charging capacity also requires derating the total by a factor of 0.8.

The following table shows example combinations for parallel connection.

| Electrical data | 2 x PS6A24 | 3 x PS6A24 | 2 x PS6A34 | 3 x PS6A34 |
|-----------------|------------|------------|------------|------------|
| $P_{N,PU}$      | 16 kW      | 24 kW      | 32 kW      | 48 kW      |
| $I_{1N,PU}$     | 40 A       | 60 A       | 80 A       | 120 A      |
| $C_{maxPU}$     | 8000 μF    | 12000 μF   | 16000 μF   | 24000 μF   |

Tab. 31: Electrical data for parallel connection: Example combinations

The following general conditions apply to the parallel connection of several PS6 supply modules:

- Only the same sizes may be connected in parallel.
- You can connect a maximum of 3 PS6A34 in parallel.

### 7.2.3.3.5 Brake chopper

| Electrical data | All types                 |
|-----------------|---------------------------|
| $U_{onCH}$      | 780 – 800 V <sub>DC</sub> |
| $U_{offCH}$     | 740 – 760 V <sub>DC</sub> |
| $R_{2minRB}$    | 22 Ω                      |
| $P_{maxRB}$     | 29.1 kW                   |
| $P_{effRB}$     | 13.2 kW                   |

Tab. 32: Brake chopper electrical data

### 7.2.3.3.6 Fast discharge

Fast discharge is activated when no power supply is present for 20 s and the DC link voltage has reduced over this time. For active fast discharge, the DC link is discharged via the brake chopper and the braking resistor. Fast discharge does not take place for constant or increasing DC link voltage as this behavior indicates a second supply module in the DC link group. If the temperature sensor of the braking resistor is active, the fast discharge also remains off.

### 7.2.3.4 Dimensions

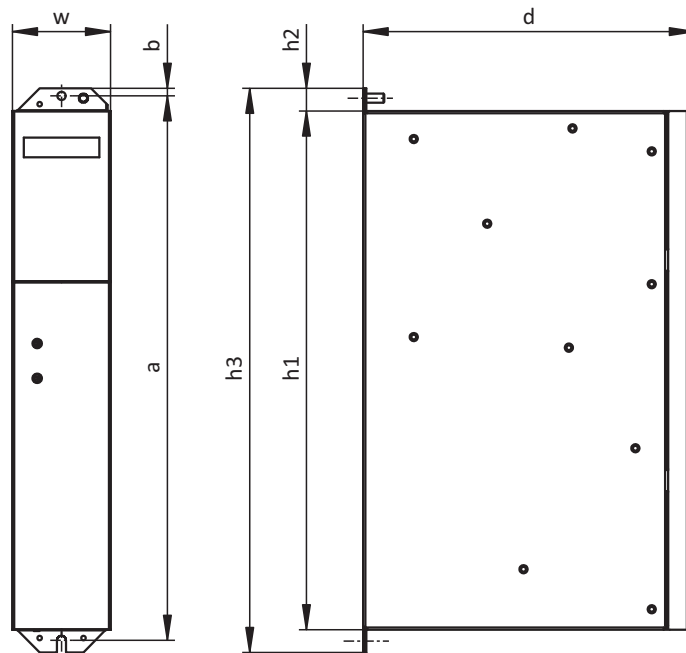


Fig. 3: PS6 dimensional drawing

| Dimension            |                                     |    | Size 2 | Size 3 |
|----------------------|-------------------------------------|----|--------|--------|
| Supply module        | Width                               | w  | 45     | 65     |
|                      | Depth                               | d  | 204    | 219    |
|                      | Body height                         | h1 | 343    |        |
|                      | Fastening clip height               | h2 | 15     |        |
|                      | Height incl. fastening clips        | h3 | 373    |        |
| Fastening holes (M5) | Vertical distance                   | a  | 360+2  |        |
|                      | Vertical distance to the upper edge | b  | 5      |        |

Tab. 33: PS6 dimensions [mm]

### 7.2.3.5 Weight

| Type   | Weight without packaging [g] | Weight with packaging [g] |
|--------|------------------------------|---------------------------|
| PS6A24 | 2680                         | 4180                      |
| PS6A34 | 3820                         | 4920                      |

Tab. 34: PS6 weight [g]



## 7.2.4 DC link connection

The following section contains specifications for the electrical data, dimensions and weight of the DL6B modules Quick DC-Link.

### 7.2.4.1 General technical data

The following information applies to all Quick DC-Link modules and corresponds to the general technical data for the base device.

| Device features                            |                                                                    |
|--------------------------------------------|--------------------------------------------------------------------|
| Protection class of the device             | IP20 (if built over)                                               |
| Protection class                           | Protection class I in accordance with DIN EN 61140 (if built over) |
| Protection class of the installation space | At least IP54                                                      |

Tab. 35: Device features

| Transport and storage conditions                                                                                                          |                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Storage/<br>transport temperature                                                                                                         | –20 °C to +70 °C<br>Maximum change: 20 K/h                                                                    |
| Relative humidity                                                                                                                         | Maximum relative humidity 85%, non-condensing                                                                 |
| Vibration (transport) in accordance with DIN EN 60068-2-6                                                                                 | 5 Hz ≤ f ≤ 9 Hz: 3.5 mm<br>9 Hz ≤ f ≤ 200 Hz: 10 m/s <sup>2</sup><br>200 Hz ≤ f ≤ 500 Hz: 15 m/s <sup>2</sup> |
| Fall height for freefall <sup>8</sup><br>Weight < 100 kg<br>in accordance with DIN EN 61800-2<br>(or DIN EN 60721-3-2:1997,<br>class 2M1) | 0.25 m                                                                                                        |

Tab. 36: Transport and storage conditions

| Operating conditions                                      |                                                                                                                  |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Surrounding temperature during operation                  | 0 °C to 45 °C with nominal data<br>45 °C to 55 °C with derating –2.5% / K                                        |
| Relative humidity                                         | Maximum relative humidity 85%, non-condensing                                                                    |
| Installation altitude                                     | 0 m to 1000 m above sea level without restrictions<br>1000 m to 2000 m above sea level with –1.5%/100 m derating |
| Pollution degree                                          | Pollution degree 2 in accordance with EN 50178                                                                   |
| Vibration (operation) in accordance with DIN EN 60068-2-6 | 5 Hz ≤ f ≤ 9 Hz: 0.35 mm<br>9 Hz ≤ f ≤ 200 Hz: 1 m/s <sup>2</sup>                                                |

Tab. 37: Operating conditions

### 7.2.4.2 assignment to DL6B – SI6 and PS6

DL6B is available in the following designs suitable for the individual drive controller types and supply module types:

| Type    | DL6B10 | DL6B11 | DL6B12 | DL6B20 | DL6B21 |
|---------|--------|--------|--------|--------|--------|
| ID No.  | 56655  | 56656  | 56663  | 56657  | 56658  |
| SI6A061 | X      | –      | –      | –      | –      |
| SI6A062 | X      | –      | –      | –      | –      |
| SI6A161 | –      | X      | –      | –      | –      |
| SI6A162 | –      | X      | –      | –      | –      |
| SI6A261 | –      | X      | –      | –      | –      |
| SI6A262 | –      | –      | X      | –      | –      |
| SI6A361 | –      | –      | X      | –      | –      |
| PS6A24  | –      | –      | –      | X      | –      |
| PS6A34  | –      | –      | –      | –      | X      |

Tab. 38: DL6B assignment to SI6 and PS6

7.2.4.3 Dimensions

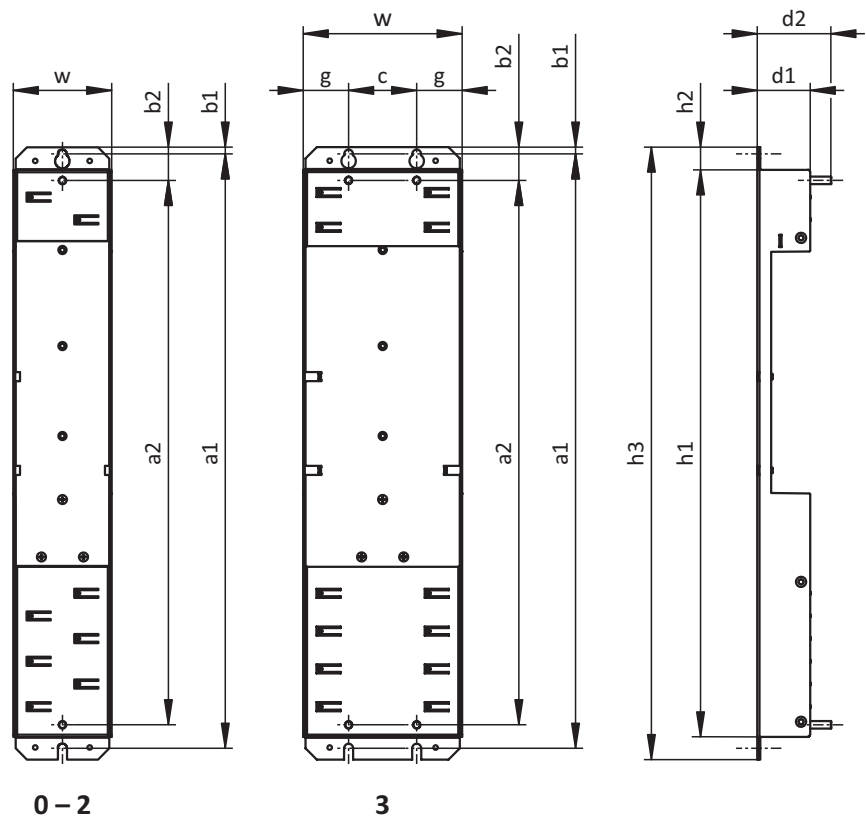


Fig. 4: DL6B dimensional drawing

| Dimension       |                                           |    | DL6B10<br>DL6B20 | DL6B11<br>DL6B21 | DL6B12 |
|-----------------|-------------------------------------------|----|------------------|------------------|--------|
| Quick DC-Link   | Width                                     | w  | 45               | 65               | 105    |
|                 | Depth                                     | d1 | 35               |                  |        |
|                 | Depth incl. attachment bolts              | d2 | 49               |                  |        |
|                 | Height                                    | h1 | 375              |                  |        |
|                 | Fastening clip height                     | h2 | 15               |                  |        |
|                 | Height incl. fastening clips              | h3 | 405              |                  |        |
|                 | Vertical distance (wall mounting)         | a1 | 393+2            |                  |        |
| Fastening holes | Vertical distance (module mounting)       | a2 | 360              |                  |        |
|                 | Vertical distance to the upper edge       | b1 | 4.5              |                  |        |
|                 | Vertical distance to the upper edge       | b2 | 22               |                  |        |
|                 | Horizontal spacing of the fastening holes | c  | —                |                  | 45     |
|                 | Horizontal distance to the side edge      | g  | —                |                  | 30     |

Tab. 39: DL6B dimensions [mm]

7.2.4.4 Weight

| Type   | Weight without packaging [g] | Weight with packaging [g] |
|--------|------------------------------|---------------------------|
| DL6B10 | 440                          | 480                       |
| DL6B11 | 560                          | 600                       |
| DL6B12 | 880                          | 920                       |
| DL6B20 | 480                          | 520                       |
| DL6B21 | 740                          | 780                       |

Tab. 40: DL6B weight [g]

7.2.5 Minimum clearances

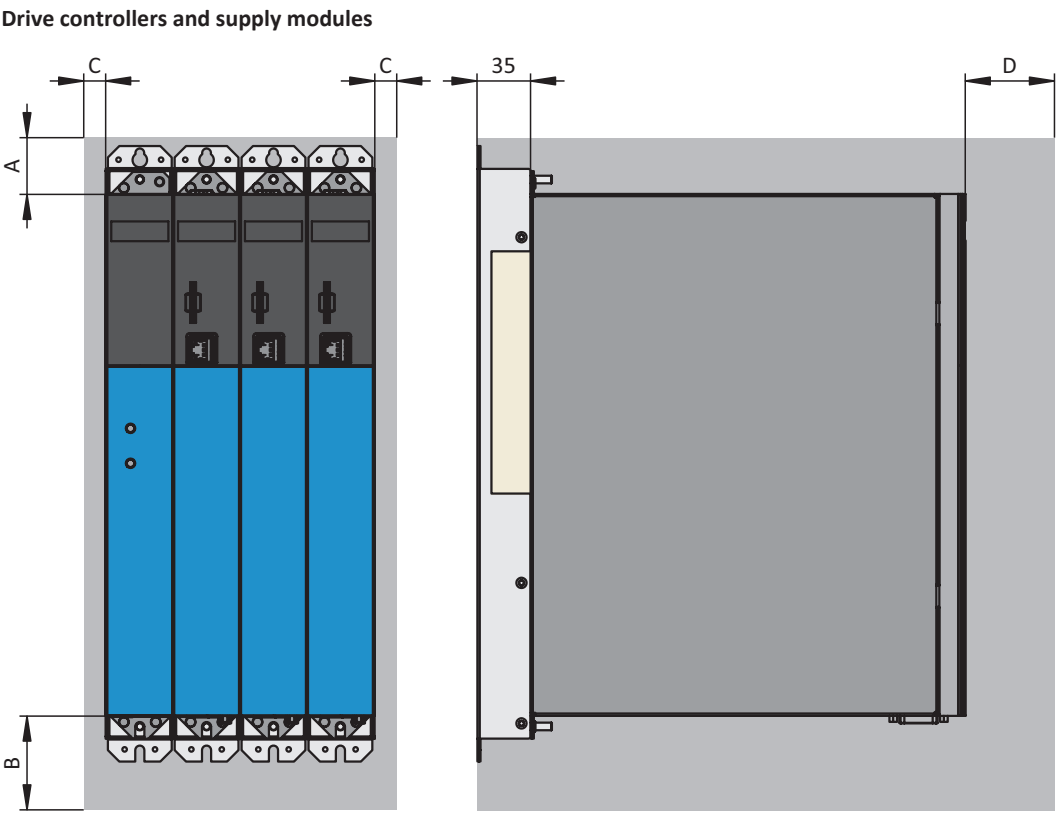


Fig. 5: Minimum clearances

The specified dimensions refer to the outside edges of the drive controller or supply module including the Quick DC-Link rear section module.

| Minimum clearance | A (above) | B (below) | C (on the side) | D (in front)    |
|-------------------|-----------|-----------|-----------------|-----------------|
| All sizes         | 100       | 200       | 5               | 50 <sup>9</sup> |

Tab. 41: Minimum clearances [mm]

Chokes and filters

Avoid installation below drive controllers or supply modules. For installation in a control cabinet, a distance of approximately 100 mm to other neighboring components is recommended. This distance ensures proper heat dissipation for chokes and filters.

Braking resistors

Avoid installation below drive controllers or supply modules. In order for heated air to flow out unimpeded, a minimum clearance of approximately 200 mm must be maintained in relation to neighboring components or walls and approximately 300 mm must be maintained to components above or ceilings.

## 7.3 Drive controller/motor combinations

Parameterization of a STÖBER drive controller is exceptionally easy, especially together with four-pole STÖBER asynchronous motors. The motor is fully typified by inputting just the motor size (e.g. 90L) and its wiring (star or delta). A delta connection (measurement point 230 V, 50 Hz) is available for motors up to 3 kW (size 100). By increasing the voltage at higher frequencies, the full torque can be drawn through the motor up to 87 Hz. It usually makes sense to take this expanded speed adjustment range into account when selecting the gear unit. You can find more detailed information in the chapter [\[► 5.6\]](#).

An explanation of the formula symbols used can be found in the chapter [\[► 13.1\]](#).

|  |               |    |                 |               |                |               |           |              | SI6A061<br>SI6A062                                  | SI6A161<br>SI6A162 | SI6A261 | SI6A262 | SI6A361 |
|--|---------------|----|-----------------|---------------|----------------|---------------|-----------|--------------|-----------------------------------------------------|--------------------|---------|---------|---------|
|  |               |    |                 |               |                |               |           |              | $I_{2N,PU}$ [A]<br>( $f_{PWM,PU} = 4 \text{ kHz}$ ) |                    |         |         |         |
|  | $f_T$<br>[Hz] | pz | Con-<br>nection | $P_N$<br>[kW] | $n_N$<br>[rpm] | $M_N$<br>[Nm] | $M_k/M_N$ | $I_N$<br>[A] | 5                                                   | 12                 | 22      | 25      | 50      |

| $\Delta 230 \text{ V} / Y 400 \text{ V}$ motor winding |    |   |          |      |      |      |     |      | $I_{2N,PU} / I_N$ |     |     |     |     |
|--------------------------------------------------------|----|---|----------|------|------|------|-----|------|-------------------|-----|-----|-----|-----|
| IE3D080L04                                             | 50 | 4 | Y        | 0.75 | 1445 | 5.0  | 3.7 | 1.7  | 2.9               |     |     |     |     |
| IE3D080L04                                             | 87 | 4 | $\Delta$ | 1.3  | 2503 | 5.0  | 3.7 | 2.94 | 1.7               |     |     |     |     |
| IE3D090S04                                             | 50 | 4 | Y        | 1.1  | 1440 | 7.3  | 3.7 | 2.5  | 2.0               |     |     |     |     |
| IE3D090S04                                             | 87 | 4 | $\Delta$ | 1.91 | 2494 | 7.3  | 3.7 | 4.33 | 1.2               |     |     |     |     |
| IE3D090LX04                                            | 50 | 4 | Y        | 1.5  | 1455 | 9.8  | 4.9 | 3.4  | 1.5               |     |     |     |     |
| IE3D090LX04                                            | 87 | 4 | $\Delta$ | 2.6  | 2503 | 9.8  | 4.9 | 5.89 |                   | 2.0 |     |     |     |
| IE3D100KX04                                            | 50 | 4 | Y        | 2.2  | 1450 | 14.5 | 3.8 | 4.55 | 1.1               |     |     |     |     |
| IE3D100KX04                                            | 87 | 4 | $\Delta$ | 3.81 | 2511 | 14.5 | 3.8 | 7.88 |                   | 1.5 |     |     |     |
| IE3D100LX04                                            | 50 | 4 | Y        | 3.0  | 1450 | 19.8 | 4   | 6.35 |                   | 1.9 |     |     |     |
| IE3D100LX04                                            | 87 | 4 | $\Delta$ | 5.2  | 2511 | 19.8 | 4   | 11   |                   | 1.1 | 2.0 |     |     |
| IE3D112M04                                             | 50 | 4 | $\Delta$ | 4.0  | 1465 | 26.1 | 4.5 | 7.9  |                   | 1.5 |     |     |     |
| IE3D132SX04                                            | 50 | 4 | $\Delta$ | 5.5  | 1465 | 36   | 3.3 | 10   |                   | 1.2 | 2.2 |     |     |
| IE3D132MX04                                            | 50 | 4 | $\Delta$ | 7.5  | 1470 | 49   | 3.9 | 16   |                   |     | 1.4 | 1.6 |     |
| IE3D160MX04                                            | 50 | 4 | $\Delta$ | 11   | 1465 | 72   | 3.4 | 21   |                   |     | 1.0 | 1.2 |     |
| IE3D160LX04                                            | 50 | 4 | $\Delta$ | 15   | 1475 | 97   | 3.5 | 27.5 |                   |     |     |     | 1.8 |
| IE3D180MX04                                            | 50 | 4 | $\Delta$ | 18.5 | 1475 | 120  | 3.3 | 34.5 |                   |     |     |     | 1.4 |
| IE3D180LX04                                            | 50 | 4 | $\Delta$ | 22   | 1475 | 142  | 3   | 41   |                   |     |     |     | 1.2 |

## 7.4 Accessories

You can find information about the available accessories in the following chapters.

### 7.4.1 Safety technology

| Information                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Note that the drive controller is delivered as a standard version without safety technology (SZ6 option). If you want a drive controller with integrated safety technology, you must order it together with the drive controller. The safety modules are an integrated part of the drive controllers and must not be modified.</p> |                                                                                                                                                                                                                                                                                                                  |
| <b>SZ6 option – Without safety technology</b>                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                       | ID No. 56660<br>Standard version.                                                                                                                                                                                                                                                                                |
| <b>SR6 safety module – STO using terminals</b>                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                      | ID No. 56661<br>Optional accessory for the use of the Safe Torque Off safety function (STO) in safety-relevant applications (PL e, SIL 3) in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2. Connection to a higher-level safety circuit via terminal X12.                                              |
| <b>SY6 safety module – STO and SS1 using FSoE</b>                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                    | ID No. 56662<br>Optional accessory for the use of the Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions in safety-relevant applications (PL e, SIL 3) in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2. Connection to the higher-level safety circuit using Fail Safe over EtherCAT (FSoE). |

### 7.4.2 Communication

|                                                                                                                                                                                                                       |                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| The drive controller has two interfaces for the fieldbus connection on the top of the device as well as an Ethernet service interface on the front of the device. Cables for the connection are available separately. |                                                                                                  |
| <b>EtherCAT or PROFINET fieldbus system</b>                                                                                                                                                                           |                                                                                                  |
|                                                                                                                                    | Please specify the desired fieldbus system when placing your purchase order for the base device. |

#### EtherCAT cables



Ethernet patch cable, CAT5e, yellow.  
 The following designs are available:  
 ID No. 49313: Length approx. 0.2 m.  
 ID No. 49314: Length approx. 0.35 m.

#### PC connecting cables



ID No. 49857  
 Cable for connecting the X9 service interface to the PC, CAT5e, blue, 5 m.

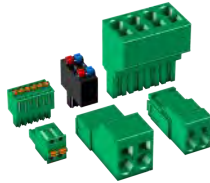
**USB 2.0 Ethernet adapter**

ID No. 49940

Adapter for connecting Ethernet to a USB port.

### 7.4.3 Terminal set

For the connection, you need suitable terminal sets for each PS6 supply module and each SI6 drive controller.

**Terminal set for supply module**

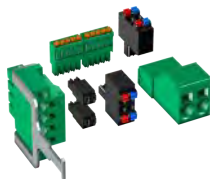
The following designs are available:

ID No. 138660

Terminal set for PS6A24.

ID No. 138661

Terminal set for PS6A34.

**Terminal set for drive controller – SZ6 option (without safety technology) or SY6 option (STO and SS1 using FSoE)**

The following designs are available:

ID No. 138655

Terminal set for SI6A061Z/Y.

ID No. 138656

Terminal set for SI6A062Z/Y.

ID No. 138657

Terminal set for SI6A161Z/Y.

ID No. 138658

Terminal set for SI6A162Z/Y.

ID No. 138659

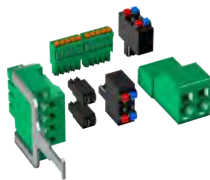
Terminal set for SI6A261Z/Y.

ID No. 138662

Terminal set for SI6A262Z/Y.

ID No. 138663

Terminal set for SI6A361Z/Y.

**Terminal set for drive controller – SR6 option (STO via terminals)**

The following designs are available:

ID No. 138683

Terminal set for SI6A061R.

ID No. 138684

Terminal set for SI6A062R.

ID No. 138685

Terminal set for SI6A161R.

ID No. 138686

Terminal set for SI6A162R.

ID No. 138687

Terminal set for SI6A261R.

ID No. 138688

Terminal set for SI6A262R.

ID No. 138689

Terminal set for SI6A361R.

### 7.4.4 DC link connection

For the energy supply of the existing networked drive controllers, you need suitable Quick DC-Link modules of type DL6B for each PS6 supply module and each SI6 drive controller.

For the horizontal connection, you receive DL6B rear section modules in various designs, matched to the size of the drive controller or supply module.

The quick fastening clamps for attaching the copper rails and an insulation connection piece are contained in the scope of delivery. The copper rails are not included in the scope of delivery. These must have a cross-section of 5 x 12 mm. Insulation end sections are available separately.

#### Quick DC-Link DL6B for drive controller



The following designs are available:

DL6B10

ID No. 56655

Rear section module for size 0 drive controller:

SI6A061 and SI6A062

DL6B11

ID No. 56656

Rear section module for size 1 or 2 (single-axis controller) drive controller:

SI6A161, SI6A162 and SI6A261

DL6B12

ID No. 56663

Rear section module for size 2 (double-axis controller) or 3 drive controller:

SI6A262 and SI6A361

#### Quick DC-Link DL6B for supply module



The following designs are available:

DL6B20

ID No. 56657

Rear section module for size 2 supply module:

PS6A24

DL6B21

ID No. 56658

Rear section module for size 3 supply module:

PS6A34

#### Quick DC-Link DL6B insulation end section



ID No. 56659

Insulation end sections for the left and right termination of the group,  
2 pcs.

7.4.5 Braking resistor

In addition to the supply modules, STÖBER offers braking resistors in the various sizes and performance classes described below. For the selection, note the minimum permitted braking resistors specified in the technical data of the supply modules. In the event of a fault, such as a defective brake chopper, the supply module must be disconnected from the power supply.

7.4.5.1 Braking resistor assignment – PS6

| Type   | KWADQU | FZZMQU | FGFKQU |
|--------|--------|--------|--------|
| ID No. | 56634  | 56635  | 56636  |
| PS6A24 | (—)    | (X)    | X      |
| PS6A34 | (—)    | (X)    | X      |

Tab. 42: Braking resistor assignment to PS6 supply module

- XRecommended
- (X)Possible
- (—)Useful under certain conditions



7.4.5.2 KWADQU flat resistor

Properties

| Specification                         | KWADQU 420×91                                                                       |
|---------------------------------------|-------------------------------------------------------------------------------------|
| ID No.                                | 56634                                                                               |
| Type                                  | Flat resistor with temperature switch<br>(incl. mounting bracket)                   |
| Resistance [Ω]                        | 100                                                                                 |
| Power [W]                             | 600                                                                                 |
| Thermal time constant $\tau_{th}$ [s] | 60                                                                                  |
| Pulse power for < 1 s [kW]            | 13                                                                                  |
| $U_{max}$ [V]                         | 848                                                                                 |
| Cable design                          | FEP                                                                                 |
| Cable length [mm]                     | 500                                                                                 |
| Conductor cross-section [AWG]         | 14/19<br>(1.9 mm²)                                                                  |
| Weight without packaging [g]          | 2600                                                                                |
| Protection class                      | IP54                                                                                |
| Test symbols                          |  |

Tab. 43: KWADQU specification

| Specification                                  | Temperature switch              |
|------------------------------------------------|---------------------------------|
| Switching capacity                             | 2 A / 24 V <sub>DC</sub> (DC11) |
| Nominal response temperature $\vartheta_{NAT}$ | 180 °C ± 5 K                    |
| Type                                           | NC                              |
| Cable design                                   | FEP                             |
| Cable length [mm]                              | 500                             |
| Conductor cross-section [AWG]                  | 22                              |

Tab. 44: Temperature switch specification

Dimensions

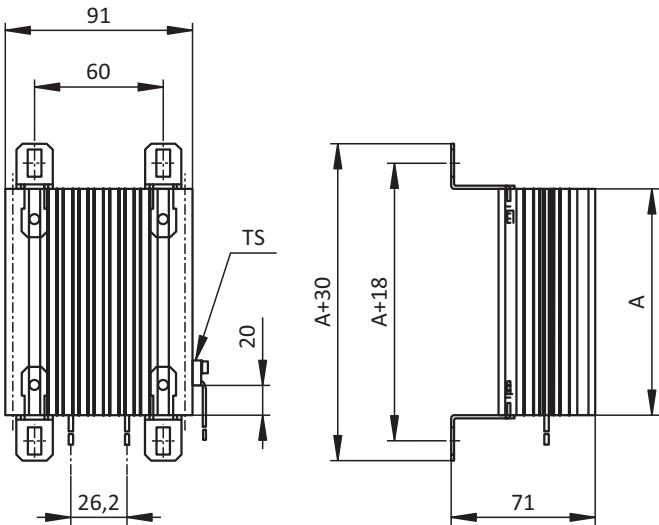


Fig. 6: KWADQU dimensional drawing

| Dimension | KWADQU 420×91 |
|-----------|---------------|
| A         | 420           |

Tab. 45: KWADQU dimensions [mm]

### 7.4.5.3 FZZMQU tubular fixed resistor

#### Properties

| Specification                         | FZZMQU 400×65                                                                       |
|---------------------------------------|-------------------------------------------------------------------------------------|
| ID No.                                | 56635                                                                               |
| Type                                  | Tubular fixed resistor with temperature switch                                      |
| Resistance [ $\Omega$ ]               | 47                                                                                  |
| Power [W]                             | 1200                                                                                |
| Thermal time constant $\tau_{th}$ [s] | 40                                                                                  |
| Pulse power for < 1 s [kW]            | 36                                                                                  |
| $U_{max}$ [V]                         | 848                                                                                 |
| Weight without packaging [g]          | 4200                                                                                |
| Protection class                      | IP20                                                                                |
| Test symbols                          |  |

Tab. 46: FZZMQU specification

| Specification                                  | Temperature switch              |
|------------------------------------------------|---------------------------------|
| Switching capacity                             | 2 A / 24 V <sub>DC</sub> (DC11) |
| Nominal response temperature $\vartheta_{NAT}$ | 180 °C $\pm$ 5 K                |
| Type                                           | NC                              |
| Cable design                                   | FEP                             |
| Cable length [mm]                              | 500                             |
| Conductor cross-section [AWG]                  | 22                              |

Tab. 47: Temperature switch specification

#### Dimensions

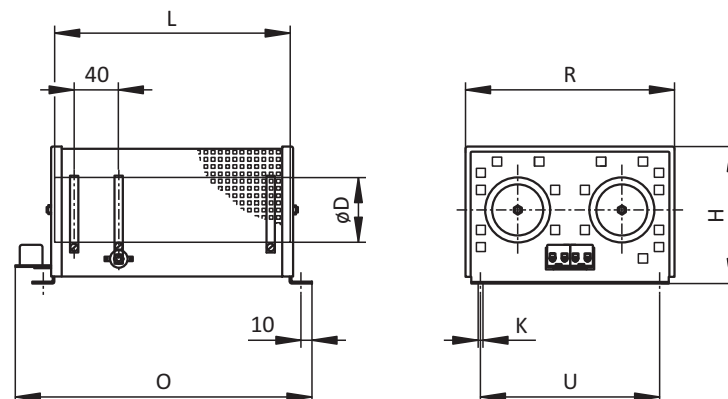


Fig. 7: FZZMQU dimensional drawing

| Dimension | FZZMQU 400×65 |
|-----------|---------------|
| L × D     | 400 × 65      |
| H         | 120           |
| K         | 6.5 × 12      |
| O         | 475           |
| R         | 185           |
| U         | 150           |

Tab. 48: FZZMQU dimensions [mm]

7.4.5.4 FGFKQU steel-grid fixed resistor

Properties

| Specification                         | FGFKQU 31005                                                                        |
|---------------------------------------|-------------------------------------------------------------------------------------|
| ID No.                                | 56636                                                                               |
| Type                                  | Steel-grid fixed resistor with temperature switch                                   |
| Resistance [ $\Omega$ ]               | 22                                                                                  |
| Power [W]                             | 2500                                                                                |
| Thermal time constant $\tau_{th}$ [s] | 30                                                                                  |
| Pulse power for < 1 s [kW]            | 50                                                                                  |
| $U_{max}$ [V]                         | 848                                                                                 |
| Weight without packaging [g]          | 7500                                                                                |
| Protection class                      | IP20                                                                                |
| Test symbols                          |  |

Tab. 49: FGFKQU specification

| Specification                                  | Temperature switch              |
|------------------------------------------------|---------------------------------|
| Switching capacity                             | 2 A / 24 V <sub>DC</sub> (DC11) |
| Nominal response temperature $\vartheta_{NAT}$ | 180 °C $\pm$ 5 K                |
| Type                                           | NC                              |
| Cable design                                   | FEP                             |
| Cable length [mm]                              | 500                             |
| Conductor cross-section [AWG]                  | 22                              |

Tab. 50: Temperature switch specification

Dimensions

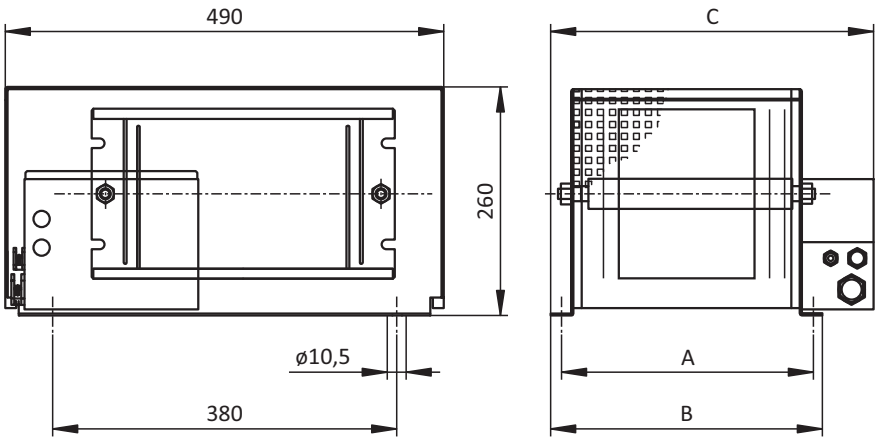


Fig. 8: FGFKQU dimensional drawing

| Dimension | FGFKQU 31005 |
|-----------|--------------|
| A         | 270          |
| B         | 295          |
| C         | 355          |

Tab. 51: FGFKQU dimensions [mm]

7.4.6 Choke

Technical specifications for suitable chokes can be found in the following chapters.

7.4.6.1 TEP power choke

Power chokes are used to dampen voltage and current peaks and reduce the load of the power feed-in of the supply modules.

Properties

| Specification                                      | TEP4010-2US00                                                                          |
|----------------------------------------------------|----------------------------------------------------------------------------------------|
| ID No.                                             | 56528                                                                                  |
| Phases                                             | 3                                                                                      |
| Thermally allowed continuous current               | 100 A                                                                                  |
| Nominal current $I_{N,MF}$                         | 90 A                                                                                   |
| Absolute loss $P_v$                                | 103 W                                                                                  |
| Inductance                                         | 0.14 mH                                                                                |
| Voltage range                                      | $3 \times 400\text{ V}_{AC}$<br>+32%/–50%<br>$3 \times 480\text{ V}_{AC}$<br>+10%/–58% |
| Voltage drop $U_k$                                 | 2%                                                                                     |
| Frequency range                                    | 50/60 Hz                                                                               |
| Protection class                                   | IP00                                                                                   |
| Max. surrounding temperature $\vartheta_{amb,max}$ | 40 °C                                                                                  |
| Insulation class                                   | B                                                                                      |
| Connection                                         | Screw terminal                                                                         |
| Connection type                                    | Flexible with and without end sleeve                                                   |
| Max. conductor cross-section                       | 6 – 35 mm <sup>2</sup>                                                                 |
| Tightening torque                                  | 2.5 Nm                                                                                 |
| Insulation stripping length                        | 17 mm                                                                                  |
| Installation                                       | Screws                                                                                 |
| Directive                                          | EN 61558-2-20                                                                          |
| UL Recognized Component (CAN; USA)                 | Yes                                                                                    |
| Test symbol, symbol                                |   |

Tab. 52: TEP specification

Dimensions

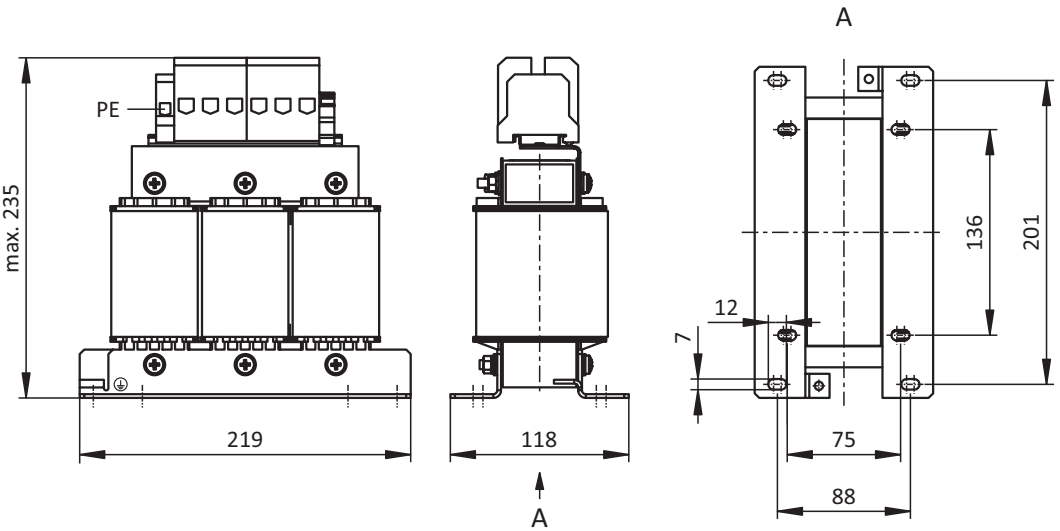


Fig. 9: Power choke dimensional drawing

| Dimensions                                   | TEP4010-2US00 |
|----------------------------------------------|---------------|
| Height [mm]                                  | 235           |
| Width [mm]                                   | 219           |
| Depth [mm]                                   | 118           |
| Vertical distance 1 – fastening holes [mm]   | 201           |
| Vertical distance 2 – Fastening holes [mm]   | 136           |
| Horizontal distance 1 – fastening holes [mm] | 88            |
| Horizontal distance 2 – Fastening holes [mm] | 75            |
| Drill holes – Depth [mm]                     | 7             |
| Drill holes – Width [mm]                     | 12            |
| Screw connection – M                         | M6            |
| Weight without packaging [g]                 | 9900          |

Tab. 53: TEP dimensions and weight

### 7.4.6.2 TEP output choke

Output chokes are required for connecting size 0 to 2 drive controllers to synchronous servo motors or asynchronous motors from a cable length > 50 m in order to reduce interference pulses and protect the drive system. If Lean motors are connected, output chokes must not be used.

#### Information

The following technical data only applies to a rotating magnetic field frequency of 200 Hz. For example, this rotating magnetic field frequency is achieved with a motor with 4 pole pairs and a nominal speed of 3000 rpm. Always observe the specified derating for higher rotating magnetic field frequencies. Also observe the relationship with the clock frequency.

#### Properties

| Specification                                       | TEP3720-0ES41                                                                         | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|---------------|---------------|
| ID No.                                              | 53188                                                                                 | 53189         | 53190         |
| Voltage range                                       | 3 × 0 to 480 V <sub>AC</sub>                                                          |               |               |
| Frequency range                                     | 0 – 200 Hz                                                                            |               |               |
| Nominal current I <sub>N,MF</sub> at 4 kHz          | 4 A                                                                                   | 17.5 A        | 38 A          |
| Nominal current I <sub>N,MF</sub> at 8 kHz          | 3.3 A                                                                                 | 15.2 A        | 30.4 A        |
| Max. permitted motor cable length with output choke | 100 m                                                                                 |               |               |
| Max. surrounding temperature $\vartheta_{amb,max}$  | 40 °C                                                                                 |               |               |
| Protection class                                    | IP00                                                                                  |               |               |
| Winding losses                                      | 11 W                                                                                  | 29 W          | 61 W          |
| Iron losses                                         | 25 W                                                                                  | 16 W          | 33 W          |
| Connection                                          | Screw terminal                                                                        |               |               |
| Max. conductor cross-section                        | 10 mm <sup>2</sup>                                                                    |               |               |
| UL Recognized                                       | Yes                                                                                   |               |               |
| Component (CAN; USA)                                |                                                                                       |               |               |
| Test symbols                                        |  |               |               |

Tab. 54: TEP specification

## Dimensions

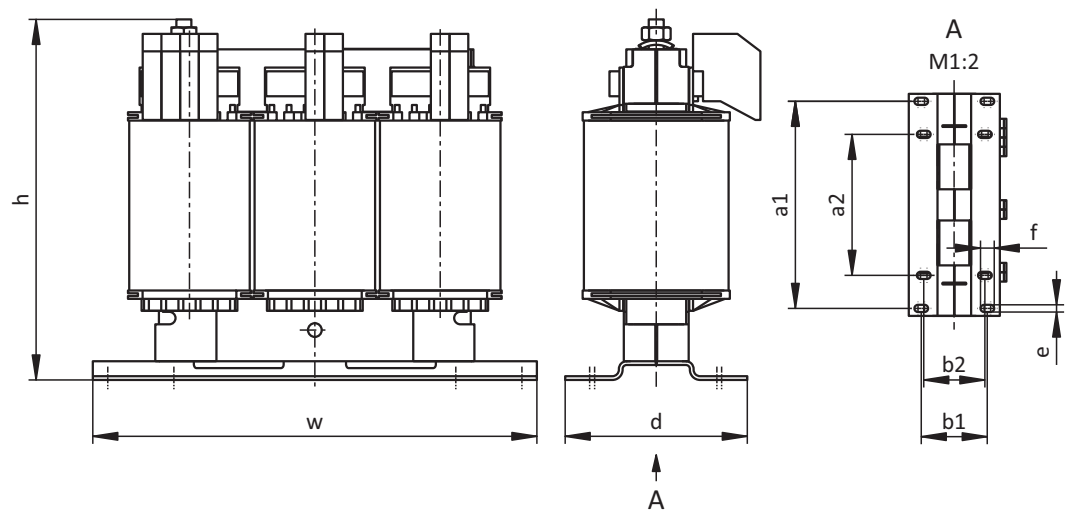


Fig. 10: TEP dimensional drawing

| Dimension                                     | TEP3720-0ES41 | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------|---------------|---------------|---------------|
| Height h [mm]                                 | Max. 153      | Max. 153      | Max. 180      |
| Width w [mm]                                  | 178           | 178           | 219           |
| Depth d [mm]                                  | 73            | 88            | 119           |
| Vertical distance – Fastening holes a1 [mm]   | 166           | 166           | 201           |
| Vertical distance – Fastening holes a2 [mm]   | 113           | 113           | 136           |
| Horizontal distance – Fastening holes b1 [mm] | 53            | 68            | 89            |
| Horizontal distance – Fastening holes b2 [mm] | 49            | 64            | 76            |
| Drill holes – Depth e [mm]                    | 5.8           | 5.8           | 7             |
| Drill holes – Width f [mm]                    | 11            | 11            | 13            |
| Screw connection – M                          | M5            | M5            | M6            |
| Weight without packaging [g]                  | 2900          | 5900          | 8800          |

Tab. 55: TEP dimensions and weight

7.4.7
HTL-to-TTL adapter

HT6 HTL-to-TTL adapter



ID No. 56665

Adapters for SC6 and SI6 series drive controllers for level conversion from HTL signals to TTL signals.

It is used to connect an HTL differential incremental encoder to terminal X4 of the drive controller.

7.5
Further information

7.5.1
Directives and standards

The following European directives and standards are relevant to the drive controllers:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- EN 61326-3-1:2008
- EN 61800-3:2004 and A1:2012
- EN 61800-5-1:2007
- EN 61800-5-2:2007
- EN 50178:1997
- IEC 61784-3:2010

7.5.2
Symbols, marks and test symbols



**Grounding symbol**

Grounding symbol in accordance with IEC 60417, symbol 5019.



**RoHS lead-free mark**

Marking in accordance with RoHS directive 2011-65-EU.



**CE mark**

Manufacturer's self declaration: The product meets the requirements of EU directives.



**UL test symbol**

This product is listed by UL for the United States and Canada.

Representative samples of this product have been evaluated by UL and meet the requirements of applicable standards.



**UL recognized component mark**

This component or material is recognized by UL. Representative samples of this product have been evaluated by UL and meet applicable requirements.

7.5.3
Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

| Documentation                    | ID     |
|----------------------------------|--------|
| Manual for SI6 drive controllers | 442728 |

# 8 SD6 drive controllers

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## 8 Drive controllers

## SD6

### 8.1 Overview

High performance and flexibility

#### Features

- Nominal output current up to 85 A
- 250% overload capacity
- Control of linear and rotary synchronous servo motors and asynchronous motors
- Multi-functional encoder interfaces
- Automatic motor parameterization from the electronic motor nameplate
- Isochronic system bus (IGB motion bus) for parameterization and multi-axis applications
- Communication over CANopen, EtherCAT or PROFINET
- Safe Torque Off (STO) in the standard version, expanded safety technology (SIL 3, PL e, Cat. 4) as an option
- Digital and analog inputs and outputs as an option
- Brake chopper, brake control and line filter
- Energy supply through direct power supply
- Flexible DC link connection for multi-axis applications
- Convenient operating unit consisting of graphical display and keys
- Paramodul removable data storage for quick commissioning and service

## 8.1.1 Features

STOBER drive controllers of the SD6 series offer maximum precision and productivity for automation technology and mechanical engineering despite ever more complex functions. Highly dynamic drives ensure the shortest recovery times from fast changes in set value and load jumps. There is also an option of connecting the drive controllers in a DC link for multi-axis applications, which improves the energy footprint of the entire system. The SD6 drive controller is available in four sizes with a nominal output current of up to 85 A.

The optimized vector control, sensorless vector control, U/f slip-compensated and U/f controller control types are available for use with asynchronous motors.



*SD6 drive controller*

### Fully electronic STO as a standard feature

There is already a wear-free, fully electronic interface for the Safe Torque Off (STO) safety function available in the standard series version. The solution is a technical innovation that works without any system tests disrupting operation. In practical terms, this means an impressive increase in the availability of machines and systems. Time-consuming planning and documentation of tests are also eliminated. In multi-axis applications with SD6 drive controllers, the STO safety function can simply be looped through. The safety-relevant functions were developed together with Pilz GmbH & Co. KG.



### Expanded safety option

In addition to the safe stop functions Safe Stop 1 (SS1) and Safe Stop 2 (SS2), additional safety functions such as Safely-Limited Speed (SLS), Safe Brake Control (SBC), Safe Brake Test (SBT), Safe Direction (SDI) and Safely-Limited Increment (SLI) are also available.

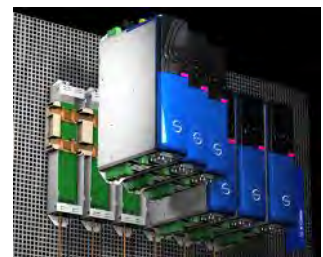
### Certified safety

TÜV certification makes it possible to use SD6 drive controllers even in applications with challenging safety requirements:

- SIL 3, HFT 1 in accordance with EN 61800-5-2
- PL e, category 4 in accordance with DIN EN ISO 13849

### Quick DC-Link

All the product types of the SD6 drive controller have the option of a DC link connection. This technology makes it possible for the regenerative production of energy from one drive to be used as motor energy by another drive. The Quick DC-Link rear structure element has been developed to set up a reliable and efficient rail connection to the DC link connection. This optionally available accessory connects the DC links of the individual drive controllers by means of copper rails that can carry a load of up to 200 A. The rails can be attached without any tools using quick fastening clamps.



### Paramodul removable data storage

Removable data storage with integrated microSD card is available for fast series commissioning by copying and for easy service when replacing devices. It represents the ideal medium for saving additional project data and documentation and can be used for direct editing on a PC.



### Integrated bus (IGB)

SD6 drive controllers have two interfaces for the integrated bus in the standard version. The integrated bus is used for easy configuration over Ethernet and isochronic data exchange for the following functions:

- Multi-axis synchronization between the drive controllers (IGB motion bus)
- Direct connection for remote maintenance of individual and multiple drive controllers
- Direct connection between one or more drive controllers and a PC



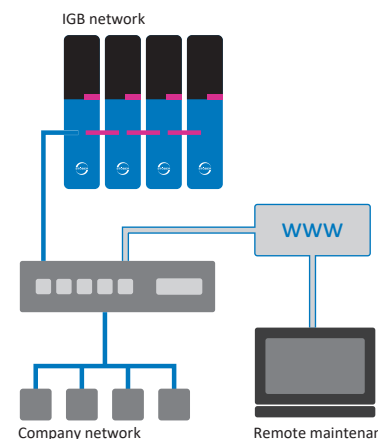
*Interface for the Integrated Bus*

### IGB motion bus

The IGB motion bus allows for cyclic, isochronic data exchange between multiple SD6 drive controllers integrated into the IGB network. In addition to transferring guide values for master/slave operation, it is possible to exchange any other data as well.

### STOBER remote maintenance concept

STOBER remote maintenance enables commissioning software to be used to perform all processes and sequences just like an on-site service visit. The concept guides users through a controlled and protected procedure. It ensures that the person responsible for the machine is there on site to pay attention to special situations and personal safety. On the other end, the remote maintenance specialist has the assurance of communicating with a responsible employee on site who is monitoring the situation on the machine.



*Remote maintenance enables all processes and sequences to be performed just like an on-site service visit.*

### Brake management

The SD6 drive controller can activate a 24 V<sub>DC</sub> brake using an integrated brake control. Brake management provides two functions for the brake system:

- Cyclic brake test
- Bed in brake

## 8.1.2 Software components

### Project configuration and commissioning

The 6th generation of DriveControlSuite project configuration and commissioning software has all the functions for the efficient use of drive controllers in single-axis and multi-axis applications. The program guides you step by step through the complete project configuration and parameterization process using wizards.

### Open communication

Device communication is possible using EtherCAT, CANopen or PROFINET.

### Applications

Drive-based motion control is recommended for the decentralized motion control of sophisticated machines.

The drive-based application package from STÖBER is the right choice wherever universal and flexible solutions are needed. The Drive Based Synchronous application provides drive-based motion control for synchronous run, positioning, velocity and torque/force with the PLCopen Motion Control command set. These standard commands have been combined into operating modes for different application cases and supplemented with additional functions such as motion block linking or cams. For the command operating mode, all properties of the movements are specified directly by the controller. The properties of the movements in the drive are predefined in the motion block operating mode so that only a start signal is necessary to perform the movement. Linking can be used to define complete motion sequences.

In addition, the CiA 402 application is also available, which includes both the controller-based and drive-based operating modes (csp, csv, cst, ip, pp, pv, pt).

## 8.1.3 Application training

STÖBER offers a multi-level training program that focuses essentially on application programming of the motion controller and drive controller.

### G6 Basic

Training content: System overview, installation and commissioning of the drive controller. Use of option modules. Parameterization, commissioning and diagnostics using the commissioning software. Remote maintenance. Basics of controller optimization. Configuration of the drive train. Integrated software functions. Software applications. Connection to a higher-level controller. Basics of safety technology. Practical exercises on training topics.

Software used: DriveControlSuite.

### G6 Advanced

Training content: Special knowledge for regulating, control and safety technology. Practical exercises on training topics.

## 8.2 Technical data

Technical data for the drive controller can be found in the following chapters.

### 8.2.1 Type designation

|    |   |   |   |   |   |   |   |
|----|---|---|---|---|---|---|---|
| SD | 6 | A | 0 | 6 | T | E | X |
|----|---|---|---|---|---|---|---|

Tab. 1: Example code for type designation

| Code      | Designation          | Design                                           |
|-----------|----------------------|--------------------------------------------------|
| SD        | Series               | ServoDrive                                       |
| 6         | Generation           | Generation 6                                     |
| A, B      | Version              |                                                  |
| 0 – 3     | Size                 |                                                  |
| 6 (0 – 9) | Power output stage   | Power output stage within the size               |
| T         | Safety module        | ST6: STO via terminals                           |
| E         |                      | SE6: Expanded safety functionality via terminals |
| N         | Communication module | Empty                                            |
| E         |                      | EC6: EtherCAT                                    |
| C         |                      | CA6: CANopen                                     |
| P         |                      | PN6: PROFINET                                    |
| N         | Terminal module      | Empty                                            |
| X         |                      | XI6: Extended                                    |
| R         |                      | RI6: Resolver                                    |
| I         |                      | IO6: Standard                                    |

Tab. 2: Meaning of the example code

### 8.2.2 Sizes

| Type   | Size   |
|--------|--------|
| SD6A02 | Size 0 |
| SD6A04 | Size 0 |
| SD6A06 | Size 0 |
| SD6A14 | Size 1 |
| SD6A16 | Size 1 |
| SD6A24 | Size 2 |
| SD6A26 | Size 2 |
| SD6A34 | Size 3 |
| SD6A36 | Size 3 |
| SD6A38 | Size 3 |

Tab. 3: Available SD6 types and sizes



SD6 in sizes 0, 1, 2 and 3

## 8.2.3 General technical data

The following information applies to all device types.

| Device features                            |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protection class of the device             | IP20                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Protection class of the installation space | At least IP54                                                                                                                                                                                                                                                                                                                                                                                                               |
| Protection class                           | Protection class I in accordance with DIN EN 61140                                                                                                                                                                                                                                                                                                                                                                          |
| Radio interference suppression             | Integrated line filter in accordance with DIN EN 61800-3, interference emission class C3                                                                                                                                                                                                                                                                                                                                    |
| Overvoltage category                       | III in accordance with DIN EN 61800-5-1                                                                                                                                                                                                                                                                                                                                                                                     |
| Test symbols                               |      |

Tab. 4: Device features

| Transport and storage conditions                                                                                                       |                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Storage/transport temperature                                                                                                          | –20 °C to +70 °C<br>Maximum change: 20 K/h                                                                    |
| Relative humidity                                                                                                                      | Maximum relative humidity 85%, non-condensing                                                                 |
| Vibration (transport) in accordance with DIN EN 60068-2-6                                                                              | 5 Hz ≤ f ≤ 9 Hz: 3.5 mm<br>9 Hz ≤ f ≤ 200 Hz: 10 m/s <sup>2</sup><br>200 Hz ≤ f ≤ 500 Hz: 15 m/s <sup>2</sup> |
| Fall height for freefall <sup>1</sup><br>Weight < 100 kg<br>in accordance with DIN EN 61800-2<br>(or DIN EN 60721-3-2:1997, class 2M1) | 0.25 m                                                                                                        |

Tab. 5: Transport and storage conditions

| Operating conditions                                      |                                                                                                                  |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Surrounding temperature during operation                  | 0 °C to 45 °C with nominal data<br>45 °C to 55 °C with derating –2.5% / K                                        |
| Relative humidity                                         | Maximum relative humidity 85%, non-condensing                                                                    |
| Installation altitude                                     | 0 m to 1000 m above sea level without restrictions<br>1000 m to 2000 m above sea level with –1.5%/100 m derating |
| Pollution degree                                          | Pollution degree 2 in accordance with EN 50178                                                                   |
| Ventilation                                               | Installed fan                                                                                                    |
| Vibration (operation) in accordance with DIN EN 60068-2-6 | 5 Hz ≤ f ≤ 9 Hz: 0.35 mm<br>9 Hz ≤ f ≤ 200 Hz: 1 m/s <sup>2</sup>                                                |

Tab. 6: Operating conditions

| Discharge times           |       |
|---------------------------|-------|
| Self-discharge of DC link | 6 min |

Tab. 7: Discharge times of the DC link circuit

## 8.2.4 Electrical data

The electrical data of the available SD6 sizes as well as the properties of the brake chopper can be found in the following chapters.

<sup>1</sup> Only valid for components in original packaging

## Information

For the time span between two energizing processes, note that:

- a) Direct, repeat activation of the supply voltage is possible for power-on/power-off operation.
- b) A time span of > 15 must be observed between two energizing processes during continuous, cyclical power-on/power-off operation with increased charging capacity.

## Information

The STO safety function is available for safe stopping as an alternative to continuous, cyclical power-on/power-off operation.

An explanation of the formula symbols used can be found in the chapter [\[► 13.1\]](#).

### 8.2.4.1 Control unit

| Electrical data | All types                      |
|-----------------|--------------------------------|
| $U_{1CU}$       | 24 V <sub>DC</sub> , +20%/–15% |
| $I_{1maxCU}$    | 1.5 A                          |

Tab. 8: Control unit electrical data

### 8.2.4.2 Power unit: Size 0

| Electrical data    | SD6A02                                                | SD6A04                                                                                                    | SD6A06 |
|--------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------|
| U <sub>1PU</sub>   | 1 × 230 V <sub>AC</sub> ,<br>+20% / –40%,<br>50/60 Hz | 3 × 400 V <sub>AC</sub> ,<br>+32% / –50%, 50/60 Hz;<br>3 × 480 V <sub>AC</sub> ,<br>+10% / –58%, 50/60 Hz |        |
| f <sub>2PU</sub>   | 0 – 700 Hz                                            |                                                                                                           |        |
| U <sub>2PU</sub>   | 0 – max. U <sub>1PU</sub>                             |                                                                                                           |        |
| C <sub>PU</sub>    | 340 μF                                                | 135 μF                                                                                                    | 135 μF |
| C <sub>maxPU</sub> | 1620 μF                                               | 540 μF                                                                                                    | 540 μF |

Tab. 9: SD6 electrical data, size 0

#### Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SD6A02                      | SD6A04 | SD6A06 |
|-----------------|-----------------------------|--------|--------|
| $f_{PWM,PU}$    | 4 kHz                       |        |        |
| $I_{1N,PU}$     | 8.3 A                       | 2.8 A  | 5.4 A  |
| $I_{2N,PU}$     | 4 A                         | 2.3 A  | 4.5 A  |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |        |        |

Tab. 10: SD6 electrical data, size 0, for 4 kHz clock frequency

| Electrical data | SD6A02                     | SD6A04 | SD6A06 |
|-----------------|----------------------------|--------|--------|
| $f_{PWM,PU}$    | 8 kHz                      |        |        |
| $I_{1N,PU}$     | 6 A                        | 2.2 A  | 4 A    |
| $I_{2N,PU}$     | 3 A                        | 1.7 A  | 3.4 A  |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |        |        |

Tab. 11: SD6 electrical data, size 0, for 8 kHz clock frequency

| Electrical data     | SD6A02                    | SD6A04                    | SD6A06 |
|---------------------|---------------------------|---------------------------|--------|
| U <sub>onCH</sub>   | 400 – 420 V <sub>DC</sub> | 780 – 800 V <sub>DC</sub> |        |
| U <sub>offCH</sub>  | 360 – 380 V <sub>DC</sub> | 740 – 760 V <sub>DC</sub> |        |
| R <sub>2minRB</sub> | 100 Ω                     |                           |        |
| P <sub>maxRB</sub>  | 1.8 kW                    | 6.4 kW                    |        |
| P <sub>effRB</sub>  | 1.0 kW                    | 2.9 kW                    |        |

Tab. 12: Brake chopper electrical data, size 0

### 8.2.4.3 Power unit: Size 1

| Electrical data | SD6A14                                                                                              | SD6A16  |
|-----------------|-----------------------------------------------------------------------------------------------------|---------|
| $U_{1PU}$       | 3 × 400 V <sub>AC</sub> , +32% / -50%, 50/60 Hz;<br>3 × 480 V <sub>AC</sub> , +10% / -58%, 50/60 Hz |         |
| $f_{2PU}$       | 0 – 700 Hz                                                                                          |         |
| $U_{2PU}$       | 0 – max. $U_{1PU}$                                                                                  |         |
| $C_{PU}$        | 470 µF                                                                                              | 560 µF  |
| $C_{maxPU}$     | 1400 µF                                                                                             | 1400 µF |

Tab. 13: SD6 electrical data, size 1

#### Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SD6A14                      | SD6A16 |
|-----------------|-----------------------------|--------|
| $f_{PWM,PU}$    | 4 kHz                       |        |
| $I_{1N,PU}$     | 12 A                        | 19.2 A |
| $I_{2N,PU}$     | 10 A                        | 16 A   |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |        |

Tab. 14: SD6 electrical data, size 1, for 4 kHz clock frequency

| Electrical data | SD6A14                     | SD6A16 |
|-----------------|----------------------------|--------|
| $f_{PWM,PU}$    | 8 kHz                      |        |
| $I_{1N,PU}$     | 9.3 A                      | 15.8 A |
| $I_{2N,PU}$     | 6 A                        | 10 A   |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |        |

Tab. 15: SD6 electrical data, size 1, for 8 kHz clock frequency

| Electrical data | SD6A14                    | SD6A16 |
|-----------------|---------------------------|--------|
| $U_{onCH}$      | 780 – 800 V <sub>DC</sub> |        |
| $U_{offCH}$     | 740 – 760 V <sub>DC</sub> |        |
| $R_{2minRB}$    | 47 Ω                      |        |
| $P_{maxRB}$     | 13.6 kW                   |        |
| $P_{effRB}$     | 6.2 kW                    |        |

Tab. 16: Brake chopper electrical data, size 1

### 8.2.4.4 Power unit: Size 2

| Electrical data | SD6A24                                                                                              | SD6A26  |
|-----------------|-----------------------------------------------------------------------------------------------------|---------|
| $U_{1PU}$       | 3 × 400 V <sub>AC</sub> , +32% / -50%, 50/60 Hz;<br>3 × 480 V <sub>AC</sub> , +10% / -58%, 50/60 Hz |         |
| $f_{2PU}$       | 0 – 700 Hz                                                                                          |         |
| $U_{2PU}$       | 0 – max. $U_{1PU}$                                                                                  |         |
| $C_{PU}$        | 680 µF                                                                                              | 1000 µF |
| $C_{maxPU}$     | 1400 µF                                                                                             | 1400 µF |

Tab. 17: SD6 electrical data, size 2

#### Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SD6A24                      | SD6A26 |
|-----------------|-----------------------------|--------|
| $f_{PWM,PU}$    | 4 kHz                       |        |
| $I_{1N,PU}$     | 26.4 A                      | 38.4 A |
| $I_{2N,PU}$     | 22 A                        | 32 A   |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |        |

Tab. 18: SD6 electrical data, size 2, for 4 kHz clock frequency



| Electrical data | SD6A24                     | SD6A26 |
|-----------------|----------------------------|--------|
| $f_{PWM,PU}$    | 8 kHz                      |        |
| $I_{1N,PU}$     | 24.5 A                     | 32.6 A |
| $I_{2N,PU}$     | 14 A                       | 20 A   |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |        |

Tab. 19: SD6 electrical data, size 2, for 8 kHz clock frequency

| Electrical data | SD6A24                    | SD6A26 |
|-----------------|---------------------------|--------|
| $U_{onCH}$      | 780 – 800 V <sub>DC</sub> |        |
| $U_{offCH}$     | 740 – 760 V <sub>DC</sub> |        |
| $R_{2minRB}$    | 22 Ω                      |        |
| $P_{maxRB}$     | 29.1 kW                   |        |
| $P_{effRB}$     | 13.2 kW                   |        |

Tab. 20: Brake chopper electrical data, size 2

### 8.2.4.5 Power unit: Size 3

| Electrical data | SD6A34                                                                                              | SD6A36  | SD6A38  |
|-----------------|-----------------------------------------------------------------------------------------------------|---------|---------|
| $U_{1PU}$       | 3 × 400 V <sub>AC</sub> , +32% / -50%, 50/60 Hz;<br>3 × 480 V <sub>AC</sub> , +10% / -58%, 50/60 Hz |         |         |
| $f_{2PU}$       | 0 – 700 Hz                                                                                          |         |         |
| $U_{2PU}$       | 0 – max. $U_{1PU}$                                                                                  |         |         |
| $C_{PU}$        | 430 μF                                                                                              | 900 μF  | 900 μF  |
| $C_{maxPU}$     | 5100 μF                                                                                             | 5100 μF | 5100 μF |

Tab. 21: SD6 electrical data, size 3

#### Nominal currents up to +45 °C (in the control cabinet)

| Electrical data | SD6A34                      | SD6A36 | SD6A38            |
|-----------------|-----------------------------|--------|-------------------|
| $f_{PWM,PU}$    | 4 kHz                       |        |                   |
| $I_{1N,PU}$     | 45.3 A                      | 76 A   | 76 A              |
| $I_{2N,PU}$     | 44 A                        | 70 A   | 85 A <sup>2</sup> |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |        |                   |

Tab. 22: SD6 electrical data, size 3, for 4 kHz clock frequency

| Electrical data | SD6A34                     | SD6A36 | SD6A38 |
|-----------------|----------------------------|--------|--------|
| $f_{PWM,PU}$    | 8 kHz                      |        |        |
| $I_{1N,PU}$     | 37 A                       | 62 A   | 76 A   |
| $I_{2N,PU}$     | 30 A                       | 50 A   | 60 A   |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |        |        |

Tab. 23: SD6 electrical data, size 3, for 8 kHz clock frequency

| Electrical data | SD6A34                                                    | SD6A36 | SD6A38 |
|-----------------|-----------------------------------------------------------|--------|--------|
| $U_{onCH}$      | 780 – 800 V <sub>DC</sub>                                 |        |        |
| $U_{offCH}$     | 740 – 760 V <sub>DC</sub>                                 |        |        |
| $R_{intRB}$     | 30 Ω (PTC resistance; 100 W; max. 1 kW for 1 s; τ = 40 s) |        |        |
| $R_{2minRB}$    | 15 Ω                                                      |        |        |
| $P_{maxRB}$     | 42 kW                                                     |        |        |
| $P_{effRB}$     | 19.4 kW                                                   |        |        |

Tab. 24: Brake chopper electrical data, size 3

### 8.2.4.6 Power loss data in accordance with EN 61800-9-2

| Type   | Nominal<br>current | Apparent<br>power | Absolute<br>losses<br>$P_{V,CU}^3$ | Operating points <sup>4</sup> |        |         |         |         |          |         |          | IE<br>class <sup>5</sup> | Compar-<br>ison <sup>6</sup> |
|--------|--------------------|-------------------|------------------------------------|-------------------------------|--------|---------|---------|---------|----------|---------|----------|--------------------------|------------------------------|
|        | $I_{2N,PU}$        |                   |                                    | (0/25)                        | (0/50) | (0/100) | (50/25) | (50/50) | (50/100) | (90/50) | (90/100) |                          |                              |
|        |                    |                   |                                    | Relative losses               |        |         |         |         |          |         |          |                          |                              |
|        | [A]                | [kVA]             | [W]                                | [%]                           |        |         |         |         |          |         |          |                          |                              |
| SD6A02 | 4                  | 0.9               | 10                                 | 5.01                          | 5.07   | 5.68    | 5.20    | 5.37    | 6.30     | 5.88    | 7.43     | IE2                      |                              |
| SD6A04 | 2.3                | 1.6               | 10                                 | 2.98                          | 3.13   | 3.49    | 3.02    | 3.22    | 3.71     | 3.36    | 4.09     | IE2                      |                              |
| SD6A06 | 4.5                | 3.1               | 12                                 | 1.71                          | 1.86   | 2.24    | 1.75    | 1.97    | 2.51     | 2.16    | 3.04     | IE2                      |                              |
| SD6A14 | 10                 | 6.9               | 12                                 | 1.38                          | 1.54   | 1.93    | 1.43    | 1.64    | 2.17     | 1.80    | 2.57     | IE2                      |                              |
| SD6A16 | 16                 | 11.1              | 12                                 | 0.95                          | 1.12   | 1.66    | 0.99    | 1.23    | 1.98     | 1.41    | 2.52     | IE2                      |                              |
| SD6A24 | 22                 | 15.2              | 15                                 | 0.80                          | 0.97   | 1.49    | 0.84    | 1.06    | 1.75     | 1.21    | 2.19     | IE2                      |                              |
| SD6A26 | 32                 | 22.2              | 15                                 | 0.70                          | 0.87   | 1.40    | 0.74    | 0.97    | 1.67     | 1.11    | 2.10     | IE2                      |                              |
| SD6A34 | 44                 | 30.5              | 35                                 | 0.61                          | 0.76   | 1.21    | 0.68    | 0.90    | 1.53     | 1.06    | 1.96     | IE2                      |                              |
| SD6A36 | 70                 | 48.5              | 35                                 | 0.53                          | 0.69   | 1.18    | 0.59    | 0.82    | 1.49     | 0.97    | 1.89     | IE2                      |                              |
| SD6A38 | 85                 | 58.9              | 35                                 | 0.47                          | 0.64   | 1.18    | 0.54    | 0.78    | 1.50     | 0.94    | 1.94     | IE2                      |                              |
|        |                    |                   |                                    | Absolute losses               |        |         |         |         |          |         |          |                          |                              |
|        |                    |                   |                                    | $P_V$                         |        |         |         |         |          |         |          |                          |                              |
|        | [A]                | [kVA]             | [W]                                | [W]                           |        |         |         |         |          |         |          |                          | [%]                          |
| SD6A02 | 4                  | 0.9               | 10                                 | 45.1                          | 45.6   | 51.1    | 46.8    | 48.3    | 56.7     | 52.9    | 66.9     | IE2                      | 51.8                         |
| SD6A04 | 2.3                | 1.6               | 10                                 | 47.7                          | 50.1   | 55.8    | 48.3    | 51.5    | 59.3     | 53.8    | 65.4     | IE2                      | 40.2                         |
| SD6A06 | 4.5                | 3.1               | 12                                 | 52.9                          | 57.6   | 69.3    | 54.4    | 61.0    | 77.9     | 67.1    | 94.1     | IE2                      | 39.6                         |
| SD6A14 | 10                 | 6.9               | 12                                 | 95.3                          | 106.1  | 133.3   | 98.6    | 113.2   | 149.9    | 123.9   | 177.0    | IE2                      | 37.1                         |
| SD6A16 | 16                 | 11.1              | 12                                 | 104.9                         | 124.0  | 184.6   | 110.3   | 136.6   | 219.8    | 156.0   | 279.8    | IE2                      | 35.8                         |
| SD6A24 | 22                 | 15.2              | 15                                 | 121.5                         | 146.9  | 226.1   | 128.1   | 161.6   | 266.0    | 183.7   | 332.7    | IE2                      | 32.9                         |
| SD6A26 | 32                 | 22.2              | 15                                 | 154.7                         | 192.8  | 311.3   | 164.7   | 214.9   | 370.5    | 246.9   | 465.9    | IE2                      | 38.6                         |
| SD6A34 | 44                 | 30.5              | 35                                 | 187.5                         | 232.2  | 368.7   | 207.7   | 273.9   | 466.8    | 323.0   | 597.8    | IE2                      | 32.1                         |
| SD6A36 | 70                 | 48.5              | 35                                 | 256.6                         | 332.3  | 570.8   | 287.9   | 397.0   | 721.5    | 471.0   | 915.9    | IE2                      | 33.9                         |
| SD6A38 | 85                 | 58.9              | 35                                 | 277.8                         | 376.9  | 692.3   | 317.4   | 459.0   | 886.1    | 554.6   | 1143.1   | IE2                      | 35.3                         |

Tab. 25: Power loss data of the SD6 drive controller in accordance with EN 61800-9-2

#### General conditions

The loss data applies to drive controllers without any accessories.

The power loss calculation is based on a three-phase supply voltage with 400 V<sub>AC</sub>/50 Hz.

The calculated data includes a supplement of 10% in accordance with EN 61800-9-2.

The power loss specifications refer to a clock frequency of 4 kHz.

The absolute losses for a power unit that is switched off refer to the 24 V<sub>DC</sub> power supply of the control electronics.

<sup>3</sup> Absolute losses for a power unit that is switched off

<sup>4</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>5</sup> IE class in accordance with EN 61800-9-2

<sup>6</sup> Comparison of the losses for the reference related to IE2 in the nominal point (90, 100)

### 8.2.4.7 Power loss data of accessories

If you intend to order the drive controller with accessory parts, losses increase as follows:

| Type                     | Absolute losses<br>$P_v$ [W] |
|--------------------------|------------------------------|
| SE6 safety module        | < 4                          |
| ST6 safety module        | 1                            |
| IO6 terminal module      | < 2                          |
| XI6 terminal module      | < 5                          |
| RI6 terminal module      | < 5                          |
| CA6 communication module | 1                            |
| EC6 communication module | < 2                          |
| PN6 communication module | < 4                          |

Tab. 26: Absolute losses of the accessories

#### Information

Note the absolute power loss of the encoder (usually < 3 W) and of the brake when designing as well.

Loss specifications for other optional accessories can be found in the technical data of the respective accessory part.

## 8.2.5 Derating

When dimensioning the drive controller, observe the derating of the nominal output current as a function of the clock frequency, surrounding temperature and installation altitude. There is no restriction for a surrounding temperature from 0 °C to 45 °C and an installation altitude of 0 m to 1000 m. The details given below apply to values outside these ranges.

### 8.2.5.1 Effect of the clock frequency

Changing the clock frequency  $f_{PWM}$  affects the amount of noise produced by the drive, among other things. However, increasing the clock frequency results in increased losses. During project configuration, define the highest clock frequency and use it to determine the nominal output current  $I_{2N,PU}$  for dimensioning the drive controller.

| Type   | $I_{2N,PU}$<br>4 kHz | $I_{2N,PU}$<br>8 kHz | $I_{2N,PU}$<br>16 kHz |
|--------|----------------------|----------------------|-----------------------|
| SD6A02 | 4 A                  | 3 A                  | 2 A                   |
| SD6A04 | 2.3 A                | 1.7 A                | 1.1 A                 |
| SD6A06 | 4.5 A                | 3.4 A                | 2.3 A                 |
| SD6A14 | 10 A                 | 6 A                  | 4 A                   |
| SD6A16 | 16 A                 | 10 A                 | 5.7 A                 |
| SD6A24 | 22 A                 | 14 A                 | 8.1 A                 |
| SD6A26 | 32 A                 | 20 A                 | 12 A                  |
| SD6A34 | 44 A                 | 30 A                 | 18 A                  |
| SD6A36 | 70 A                 | 50 A                 | 31 A                  |
| SD6A38 | 85 A <sup>7</sup>    | 60 A                 | 37.8 A                |

Tab. 27: Nominal output current  $I_{2N,PU}$  dependent on the clock frequency

### 8.2.5.2 Effect of the installation altitude

Derating as a function of the installation altitude is determined as follows:

- 0 m to 1000 m: No restriction ( $D_{IA} = 100\%$ )
- 1000 m to 2000 m: Derating  $-1.5\%/100\text{ m}$

#### Example

The drive controller needs to be installed at an altitude of 1500 m above sea level.

The derating factor  $D_{IA}$  is calculated as follows:

$$D_{IA} = 100\% - 5 \times 1.5\% = 92.5\%$$

### 8.2.5.3 Effect of the surrounding temperature

Derating as a function of the surrounding temperature is determined as follows:

- 0 °C to 45 °C: No restrictions ( $D_T = 100\%$ )
- 45 °C to 55 °C: Derating  $-2.5\%/K$

#### Example

The drive controller needs to be operated at 50 °C.

The derating factor  $D_T$  is calculated as follows

$$D_T = 100\% - 5 \times 2.5\% = 87.5\%$$

### 8.2.5.4 Calculating the derating

Follow these steps for the calculation:

1. Determine the highest clock frequency ( $f_{PWM}$ ) that will be used during operation and use it to determine the nominal current  $I_{2N,PU}$ .
2. Determine the derating factors for installation altitude and surrounding temperature.
3. Calculate the reduced nominal current  $I_{2N,PU(red)}$  in accordance with the following formula:

$$I_{2N,PU(red)} = I_{2N,PU} \times D_T \times D_{IA}$$

#### Example

A drive controller of type SD6A06 needs to be operated at a clock frequency of 8 kHz at an altitude of 1500 m above sea level and a surrounding temperature of 50 °C.

The nominal current of the SD6A06 at 8 kHz is 3.4 A. The derating factor  $D_T$  is calculated as follows:

$$D_T = 100\% - 5 \times 2.5\% = 87.5\%$$

The derating factor  $D_{IA}$  is calculated as follows:

$$D_{IA} = 100\% - 5 \times 1.5\% = 92.5\%$$

The output current of importance for the project configuration is:

$$I_{2N,PU(red)} = 3.4\text{ A} \times 0.875 \times 0.925 = 2.75\text{ A}$$

8.2.6
Dimensions

The dimensions of the available SD6 sizes can be found in the following chapters.

8.2.6.1
Dimensions: sizes 0 to 2

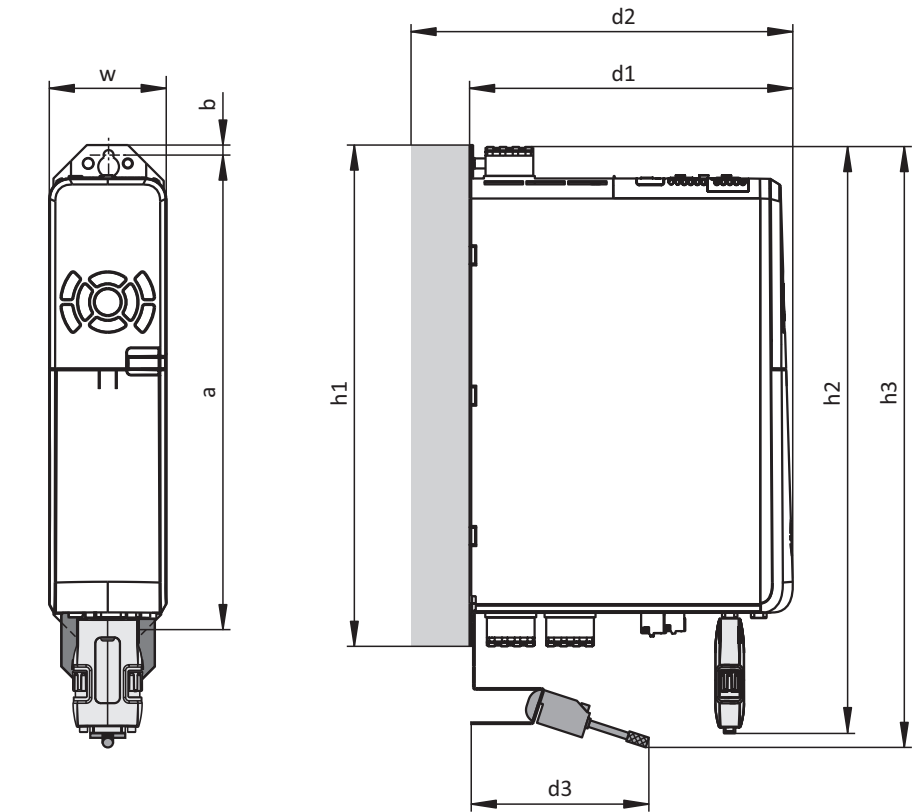


Fig. 1: SD6 dimensional drawing, sizes 0 to 2

| Dimension                                   |                                      |    | Size 0      | Size 1 | Size 2 |
|---------------------------------------------|--------------------------------------|----|-------------|--------|--------|
| Drive controller                            | Width                                | w  | 70          | 70     | 105    |
|                                             | Depth                                | d1 | 194         | 284    |        |
|                                             | Depth incl. RB 5000 braking resistor | d2 | 212         | 302    |        |
|                                             | Depth incl. Quick DC-Link            | d2 | 229         | 319    |        |
|                                             | Height incl. fastening clips         | h1 | 300         |        |        |
|                                             | Height incl. AES                     | h2 | 367         |        |        |
|                                             | Height incl. EMC shroud              | h3 | approx. 376 |        |        |
| EMC shroud incl. shield connection terminal | Depth                                | d3 | approx. 111 |        |        |
| Fastening holes                             | Vertical distance                    | a  | 283+2       |        |        |
|                                             | Vertical distance to the upper edge  | b  | 6           |        |        |

Tab. 28: SD6 dimensions, sizes 0 to 2 [mm]

## 8.2.6.2 Dimensions: size 3

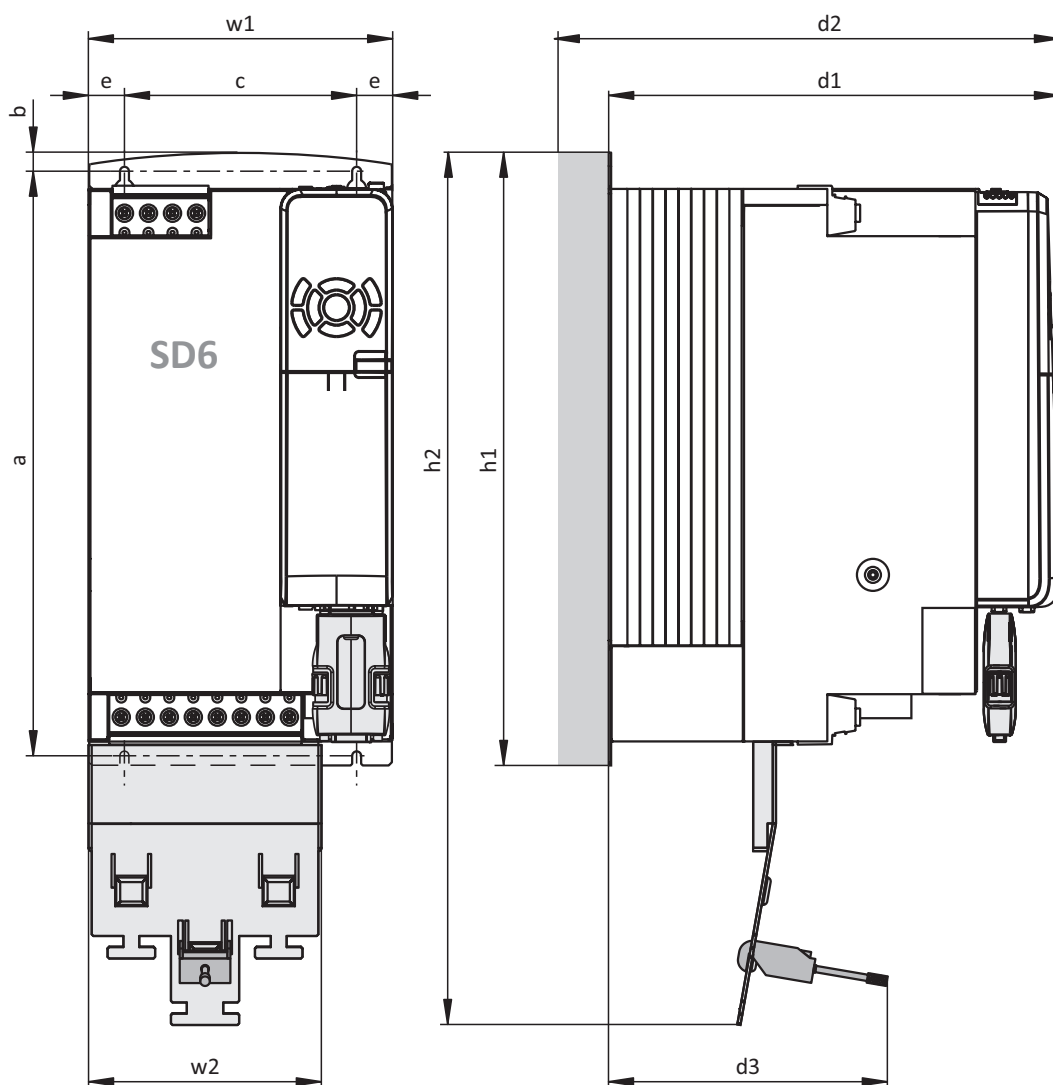


Fig. 2: SD6 dimensional drawing, size 3

| Dimension                                   |                                                                         |    | Size 3       |
|---------------------------------------------|-------------------------------------------------------------------------|----|--------------|
| Drive controller                            | Width                                                                   | w1 | 194          |
|                                             | Depth                                                                   | d1 | 305          |
|                                             | Depth incl. Quick DC-Link                                               | d2 | 340          |
|                                             | Height incl. fastening clips                                            | h1 | 382.5        |
|                                             | Height incl. EMC shroud                                                 | h2 | 540          |
| EMC shroud incl. shield connection terminal | Width                                                                   | w2 | 147          |
| Fastening holes                             | Depth                                                                   | d3 | approx. 174  |
|                                             | Vertical distance                                                       | a  | 365+2        |
|                                             | Vertical distance to the upper edge                                     | b  | 11.5         |
|                                             | Horizontal distance between the fastening holes of the drive controller | c  | 150+0.2/-0.2 |
|                                             | Horizontal distance to the side edge of the drive controller            | e  | 20           |

Tab. 29: SD6 dimensions, size 3 [mm]

8.2.7 Minimum clearances

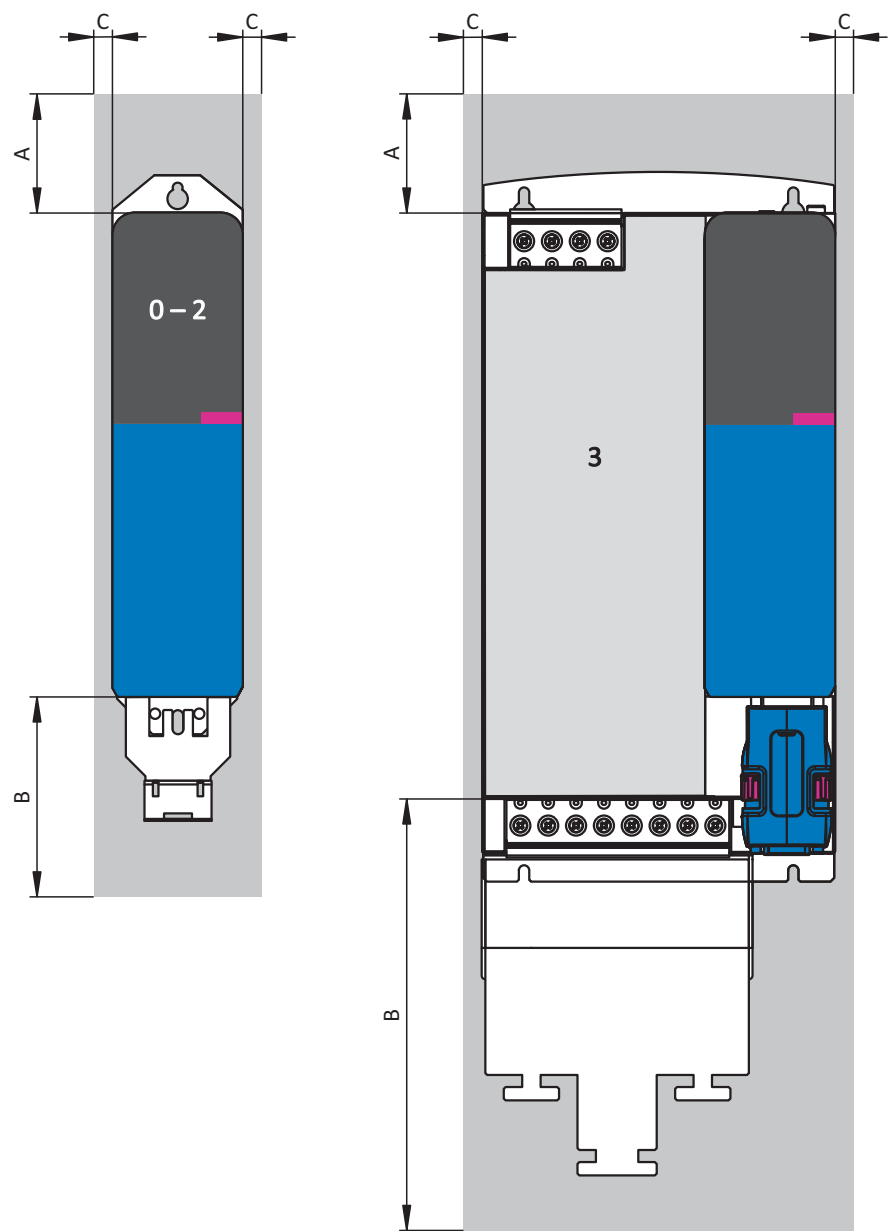


Fig. 3: Minimum clearances

The specified dimensions relate to the outer edges of the drive controller.

| Minimum clearance   | A (above) | B (below) | C (one the side) <sup>8</sup> |
|---------------------|-----------|-----------|-------------------------------|
| Size 0 – Size 2     | 100       | 100       | 5                             |
| ... with EMC shroud | 100       | 120       | 5                             |
| Size 3              | 100       | 100       | 5                             |
| ... with EMC shroud | 100       | 220       | 5                             |

Tab. 30: Minimum clearances [mm]

Chokes and filters

Avoid installation below drive controllers or supply modules. For installation in a control cabinet, a distance of approximately 100 mm to other neighboring components is recommended. This distance ensures proper heat dissipation for chokes and filters.

Braking resistors

Avoid installation below drive controllers or supply modules. In order for heated air to flow out unimpeded, a minimum clearance of approximately 200 mm must be maintained in relation to neighboring components or walls and approximately 300 mm must be maintained to components above or ceilings.

## 8.3 Drive controller/motor combinations

Parameterization of a STÖBER drive controller is exceptionally easy, especially together with four-pole STÖBER asynchronous motors. The motor is fully typified by inputting just the motor size (e.g. 90L) and its wiring (star or delta). A delta connection (measurement point 230 V, 50 Hz) is available for motors up to 3 kW (size 100). By increasing the voltage at higher frequencies, the full torque can be drawn through the motor up to 87 Hz. It usually makes sense to take this expanded speed adjustment range into account when selecting the gear unit. You can find more detailed information in the chapter [\[► 5.6\]](#).

An explanation of the formula symbols used can be found in the chapter [\[► 13.1\]](#).

|  |               |    |                 |               |                |               |           |              | SD6<br>A02                                          | SD6<br>A04 | SD6<br>A06 | SD6<br>A14 | SD6<br>A16 | SD6<br>A24 | SD6<br>A26 | SD6<br>A34 | SD6<br>A36 | SD6<br>A38 |
|--|---------------|----|-----------------|---------------|----------------|---------------|-----------|--------------|-----------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|  |               |    |                 |               |                |               |           |              | $I_{2N,PU}$ [A]<br>( $f_{PWM,PU} = 4 \text{ kHz}$ ) |            |            |            |            |            |            |            |            |            |
|  | $f_T$<br>[Hz] | pz | Con-<br>nection | $P_N$<br>[kW] | $n_N$<br>[rpm] | $M_N$<br>[Nm] | $M_k/M_N$ | $I_N$<br>[A] | 4                                                   | 2.3        | 4.5        | 10         | 16         | 22         | 32         | 44         | 70         | 85         |

| $\Delta 230 \text{ V} / Y 400 \text{ V}$ motor winding |    |   |          |      |      |      |     |      | $I_{2N,PU} / I_N$ |     |     |     |     |     |     |     |     |     |
|--------------------------------------------------------|----|---|----------|------|------|------|-----|------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| IE3D080L04                                             | 50 | 4 | Y        | 0.75 | 1445 | 5.0  | 3.7 | 1.7  |                   | 1.4 |     |     |     |     |     |     |     |     |
| IE3D080L04                                             | 87 | 4 | $\Delta$ | 1.3  | 2503 | 5.0  | 3.7 | 2.94 | 1.4               |     | 1.5 |     |     |     |     |     |     |     |
| IE3D090S04                                             | 50 | 4 | Y        | 1.1  | 1440 | 7.3  | 3.7 | 2.5  | 1.6               |     | 1.8 |     |     |     |     |     |     |     |
| IE3D090S04                                             | 87 | 4 | $\Delta$ | 1.91 | 2494 | 7.3  | 3.7 | 4.33 |                   |     | 1.0 |     |     |     |     |     |     |     |
| IE3D090LX04                                            | 50 | 4 | Y        | 1.5  | 1455 | 9.8  | 4.9 | 3.4  | 1.2               |     | 1.3 |     |     |     |     |     |     |     |
| IE3D090LX04                                            | 87 | 4 | $\Delta$ | 2.6  | 2520 | 9.8  | 4.9 | 5.89 |                   |     |     | 1.7 |     |     |     |     |     |     |
| IE3D100KX04                                            | 50 | 4 | Y        | 2.2  | 1450 | 14.5 | 3.8 | 4.55 |                   |     | 1.0 | 2.2 |     |     |     |     |     |     |
| IE3D100KX04                                            | 87 | 4 | $\Delta$ | 3.81 | 2511 | 14.5 | 3.8 | 7.88 |                   |     |     | 1.3 | 2.0 |     |     |     |     |     |
| IE3D100LX04                                            | 50 | 4 | Y        | 3.0  | 1450 | 19.8 | 4   | 6.35 |                   |     |     | 1.6 |     |     |     |     |     |     |
| IE3D100LX04                                            | 87 | 4 | $\Delta$ | 5.2  | 2511 | 19.8 | 4   | 11   |                   |     |     |     | 1.5 | 2.0 |     |     |     |     |
| IE3D112M04                                             | 50 | 4 | $\Delta$ | 4.0  | 1465 | 26.1 | 4.5 | 7.9  |                   |     |     | 1.3 | 2.0 |     |     |     |     |     |
| IE3D132SX04                                            | 50 | 4 | $\Delta$ | 5.5  | 1465 | 36   | 3.3 | 10   |                   |     |     | 1.0 | 1.6 | 2.2 |     |     |     |     |
| IE3D132MX04                                            | 50 | 4 | $\Delta$ | 7.5  | 1470 | 49   | 3.9 | 16   |                   |     |     |     | 1.0 | 1.4 | 2.0 |     |     |     |
| IE3D160MX04                                            | 50 | 4 | $\Delta$ | 11   | 1465 | 72   | 3.4 | 21   |                   |     |     |     |     | 1.0 | 1.5 | 2.1 |     |     |
| IE3D160LX04                                            | 50 | 4 | $\Delta$ | 15   | 1475 | 97   | 3.5 | 27.5 |                   |     |     |     |     |     | 1.2 | 1.6 |     |     |
| IE3D180MX04                                            | 50 | 4 | $\Delta$ | 18.5 | 1475 | 120  | 3.3 | 34.5 |                   |     |     |     |     |     |     | 1.3 | 2.0 |     |
| IE3D180LX04                                            | 50 | 4 | $\Delta$ | 22   | 1475 | 142  | 3   | 41   |                   |     |     |     |     |     |     | 1.1 | 1.7 | 2.1 |
| IE3D200LX04                                            | 50 | 4 | $\Delta$ | 30   | 1480 | 194  | 2.5 | 54   |                   |     |     |     |     |     |     |     | 1.3 | 1.6 |
| IE3D225SX04                                            | 50 | 4 | $\Delta$ | 37   | 1475 | 240  | 2.6 | 67   |                   |     |     |     |     |     |     |     | 1.0 | 1.3 |
| IE3D225MX04                                            | 50 | 4 | $\Delta$ | 45   | 1475 | 291  | 2.4 | 83   |                   |     |     |     |     |     |     |     |     | 1.0 |



## 8.4 Accessories

You can find information about the available accessories in the following chapters.

### 8.4.1 Safety technology

#### ST6 safety module – STO using terminals

Included in the standard version.



ID No. 56431

Optional accessory for the use of the Safe Torque Off safety function (STO) in safety-relevant applications (PL e, SIL 3) in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2. Connection to a higher-level safety circuit via terminal X12.

#### SE6 safety module – Expanded safety functionality via terminals



ID No. 56432

Optional accessory for use in safety-related applications up to PL e, SIL 3 in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2. In addition to the basic Safe Torque Off (STO) safety function, SE6 provides other safety functions specified in DIN EN 61800-5-2. In addition to the safe stop functions Safe Stop 1 (SS1) and Safe Stop 2 (SS2), these also include Safely-Limited Speed (SLS), Safe Brake Control (SBC), Safe Direction (SDI) and Safely-Limited Increment (SLI). The normative safety functions are supplemented by practical additional functions such as Safe Brake Test (SBT). Connection to the higher-level safety circuit using terminals X14 and X15.

#### X50 adapter cable (SE6 option)



ID No. 56434

Connection cable for the X50 encoder interface of the SE6 safety module with open cable ends. 1.5 m.

### 8.4.2 Communication

The SD6 drive controller has two interfaces for IGB communication on the top of the device as standard. The communication module is installed in the shaft at the top and it is used to connect the drive controller to the fieldbus system.

The following communication modules are available:

- EC6 for the EtherCAT connection
- CA6 for the CANopen connection
- PN6 for the PROFINET connection

#### IGB connecting cable



Cable for connecting the X3A or X3B interface for IGB, CAT5e, magenta.

The following designs are available:

ID No. 56489: 0.4 m.

ID No. 56490: 2 m.

#### PC connecting cables



ID No. 49857

Cable for connecting the X3A or X3B interface with the PC, CAT5e, blue, 5 m.

**USB 2.0 Ethernet adapter**

ID No. 49940

Adapter for connecting Ethernet to a USB port.

**EC6 communication module**

ID No. 138425

Communication module for the EtherCAT connection.

**EtherCAT cables**

Ethernet patch cable, CAT5e, yellow.

The following designs are available:

ID No. 49313: Length approx. 0.2 m.

ID No. 49314: Length approx. 0.35 m.

**CA6 communication module**

ID No. 138427

Communication module for the CANopen connection.

**PN6 communication module**

ID No. 138426

Communication module for the PROFINET connection.

### 8.4.3 Terminal module

XI6 terminal module



ID no. 138421

Terminal module for connecting analog and digital signals as well as encoders.

Supported inputs and outputs:

- 13 digital inputs ( $24 V_{DC}$ )
- 10 digital outputs ( $24 V_{DC}$ )
- 3 analog inputs ( $\pm 10 V_{DC}$ ,  $1 \times 0 - 20$  mA, 16 bits)
- 2 analog outputs ( $\pm 10 V_{DC}$ , 12 bits)

Supported encoders / interfaces:

- SSI encoder (simulation and evaluation)
- TTL incremental encoder, differential (simulation and evaluation)
- HTL incremental encoder, single-ended (simulation and evaluation)
- TTL pulse/direction interface, differential (simulation and evaluation)
- HTL pulse/direction interface, single-ended (simulation and evaluation)

RI6 terminal module



ID no. 138422

Terminal module for connecting analog and digital signals as well as encoders.

Supported inputs and outputs:

- 5 digital inputs ( $24 V_{DC}$ )
- 2 digital outputs ( $24 V_{DC}$ )
- 2 analog inputs ( $\pm 10 V_{DC}$ ,  $1 \times 0 - 20$  mA, 16 bits)
- 2 analog outputs ( $\pm 10 V_{DC}$ ,  $\pm 20$  mA, 12 bits)

Supported encoders / interfaces:

- Resolver (evaluation)
- EnDat 2.1 sin/cos encoder (evaluation)
- EnDat 2.1/2.2 digital encoder (evaluation)
- Sin/cos encoder (evaluation)
- SSI encoder (simulation and evaluation)
- TTL incremental encoder, differential (simulation and evaluation)
- TTL incremental encoder, single-ended (evaluation)
- HTL incremental encoder, single-ended (simulation and evaluation)
- TTL pulse/direction interface, differential (simulation and evaluation)
- TTL pulse/direction interface, single-ended (evaluation)
- HTL pulse/direction interface, single-ended (simulation and evaluation)

#### Information

For connecting STOBBER EnDat 2.1 sin/cos cables with a 15-pin D-sub connector to an integrated motor temperature sensor, you must use the AP6A02 interface adapter (ID No. 56523), available separately, to lead out the temperature sensor cores.

## IO6 terminal module



ID no. 138420

Terminal module for connecting analog and digital signals as well as encoders.

Supported inputs and outputs:

- 5 digital inputs ( $24 V_{DC}$ )
- 2 digital outputs ( $24 V_{DC}$ )
- 2 analog inputs ( $\pm 10 V_{DC}$ , 1 x 0 – 20 mA, 12 bits)
- 2 analog outputs ( $\pm 10 V_{DC}$ ,  $\pm 20$  mA, 12 bits)

Supported encoders / interfaces:

- HTL incremental encoder, single-ended (simulation and evaluation)
- HTL pulse/direction interface, single-ended (simulation and evaluation)

## 8.4.4 DC link connection

If you want to connect SD6 drive controllers in the DC link group, you will need Quick DC-Link modules of type DL6A.

You receive the DL6A rear section modules in different designs for a horizontal connection, suitable for the size of the drive controller.

The quick fastening clamps for attaching the copper rails and an insulation connection piece are contained in the scope of delivery. The copper rails are not included in the scope of delivery. These must have a cross-section of 5 x 12 mm. Insulation end sections are available separately.

### DL6A Quick DC-Link for drive controllers



The following designs are available:

DL6A0

ID No. 56440

Rear section module for size 0 drive controller.

DL6A1

ID No. 56441

Rear section module for size 1 drive controller.

DL6A2

ID No. 56442

Rear section module for size 2 drive controller.

DL6A3

ID No. 56443

Rear section module for size 3 drive controller.

### DL6A Quick DC-Link insulation end section



ID No. 56494

Insulation end sections for the left and right termination of the group,  
2 pcs.

## 8.4.5 Braking resistor

In addition to drive controllers, STÖBER offers the following braking resistors described below in various sizes and performance classes. For the selection, note the minimum permitted braking resistors specified in the technical data of the individual drive controller types.

### 8.4.5.1 Tubular fixed resistor FZMU, FZZMU

| Type   | FZMU 400×65 |       |       | FZZMU 400×65 |       |       |
|--------|-------------|-------|-------|--------------|-------|-------|
| ID No. | 49010       | 55445 | 55446 | 53895        | 55447 | 55448 |
| SD6A02 | X           | —     | —     | —            | —     | —     |
| SD6A04 | X           | —     | —     | —            | —     | —     |
| SD6A06 | X           | —     | —     | —            | —     | —     |
| SD6A14 | (X)         | —     | —     | X            | —     | —     |
| SD6A16 | (X)         | —     | —     | X            | —     | —     |
| SD6A24 | (—)         | X     | —     | (X)          | X     | —     |
| SD6A26 | (—)         | X     | —     | (X)          | X     | —     |
| SD6A34 | (—)         | (X)   | X     | (—)          | (X)   | X     |
| SD6A36 | (—)         | (X)   | X     | (—)          | (X)   | X     |
| SD6A38 | (—)         | (X)   | X     | (—)          | (X)   | X     |

Tab. 31: Assignment of FZMU, FZZMU braking resistor – SD6 drive controller

|     |                                 |
|-----|---------------------------------|
| X   | Recommended                     |
| (X) | Possible                        |
| (—) | Useful under certain conditions |
| —   | Not possible                    |

#### Properties

| Specification                      | FZMU 400×65                                                                          |       |       | FZZMU 400×65                                                                          |       |       |
|------------------------------------|--------------------------------------------------------------------------------------|-------|-------|---------------------------------------------------------------------------------------|-------|-------|
| ID No.                             | 49010                                                                                | 55445 | 55446 | 53895                                                                                 | 55447 | 55448 |
| Type                               | Tubular fixed resistor                                                               |       |       | Tubular fixed resistor                                                                |       |       |
| Resistance [ $\Omega$ ]            | 100                                                                                  | 22    | 15    | 47                                                                                    | 22    | 15    |
| Power [W]                          | 600                                                                                  |       |       | 1200                                                                                  |       |       |
| Therm. time const. $\tau_{th}$ [s] | 40                                                                                   |       |       | 40                                                                                    |       |       |
| Pulse power for < 1 s [kW]         | 18                                                                                   |       |       | 36                                                                                    |       |       |
| $U_{max}$ [V]                      | 848                                                                                  |       |       | 848                                                                                   |       |       |
| Weight without packaging [g]       | 2200                                                                                 |       |       | 4170                                                                                  |       |       |
| Protection class                   | IP20                                                                                 |       |       | IP20                                                                                  |       |       |
| Test symbols                       |  |       |       |  |       |       |

Tab. 32: FZMU, FZZMU specification

Dimensions

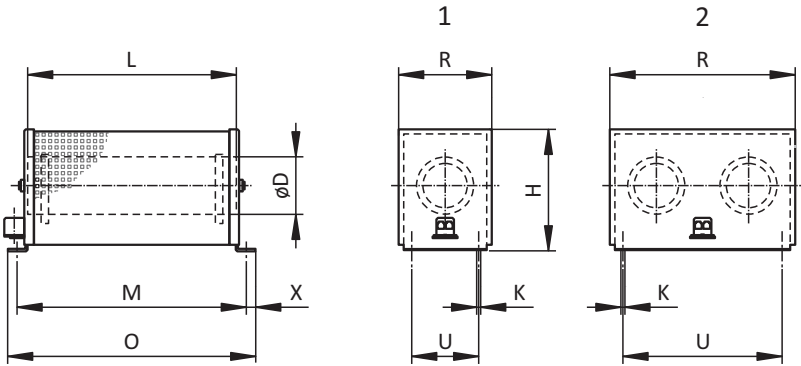


Fig. 4: FZMU (1), FZZMU (2) dimensional drawing

| Dimension | FZMU 400×65 |       |       | FZZMU 400×65 |       |       |
|-----------|-------------|-------|-------|--------------|-------|-------|
| ID No.    | 49010       | 55445 | 55446 | 53895        | 55447 | 55448 |
| L x D     | 400 × 65    |       |       | 400 × 65     |       |       |
| H         | 120         |       |       | 120          |       |       |
| K         | 6.5 × 12    |       |       | 6.5 × 12     |       |       |
| M         | 430         |       |       | 426          |       |       |
| O         | 485         |       |       | 450          |       |       |
| R         | 92          |       |       | 185          |       |       |
| U         | 64          |       |       | 150          |       |       |
| X         | 10          |       |       | 10           |       |       |

Tab. 33: FZMU, FZZMU dimensions [mm]

## 8.4.5.2 GVADU, GBADU flat resistor

| Type   | GVADU<br>210×20 | GBADU<br>265×30 | GBADU<br>405×30 | GBADU<br>335×30 | GBADU<br>265×30 |
|--------|-----------------|-----------------|-----------------|-----------------|-----------------|
| ID No. | 55441           | 55442           | 55499           | 55443           | 55444           |
| SD6A02 | X               | X               | X               | —               | —               |
| SD6A04 | X               | X               | X               | —               | —               |
| SD6A06 | X               | X               | X               | —               | —               |
| SD6A14 | (X)             | (X)             | (X)             | X               | —               |
| SD6A16 | (X)             | (X)             | (X)             | X               | —               |
| SD6A24 | (—)             | (—)             | (—)             | (X)             | X               |
| SD6A26 | (—)             | (—)             | (—)             | (X)             | X               |
| SD6A34 | (—)             | (—)             | (—)             | (—)             | (X)             |
| SD6A36 | (—)             | (—)             | (—)             | (—)             | (X)             |
| SD6A38 | (—)             | (—)             | (—)             | (—)             | (X)             |

Tab. 34: Assignment of GVADU, GBADU braking resistor – SD6 drive controller

|     |                                 |
|-----|---------------------------------|
| X   | Recommended                     |
| (X) | Possible                        |
| (—) | Useful under certain conditions |
| —   | Not possible                    |

## Properties

| Specification                      | GVADU<br>210×20                                                                     | GBADU<br>265×30                                                                      | GBADU<br>405×30                                                                       | GBADU<br>335×30                                                                       | GBADU<br>265×30                                                                       |
|------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                             | 55441                                                                               | 55442                                                                                | 55499                                                                                 | 55443                                                                                 | 55444                                                                                 |
| Type                               | Flat resistor                                                                       | Flat resistor                                                                        | Flat resistor                                                                         | Flat resistor                                                                         | Flat resistor                                                                         |
| Resistance [ $\Omega$ ]            | 100                                                                                 | 100                                                                                  | 100                                                                                   | 47                                                                                    | 22                                                                                    |
| Power [W]                          | 150                                                                                 | 300                                                                                  | 500                                                                                   | 400                                                                                   | 300                                                                                   |
| Therm. time const. $\tau_{th}$ [s] | 60                                                                                  | 60                                                                                   | 60                                                                                    | 60                                                                                    | 60                                                                                    |
| Pulse power for < 1 s [kW]         | 3.3                                                                                 | 6.6                                                                                  | 11                                                                                    | 8.8                                                                                   | 6.6                                                                                   |
| $U_{max}$ [V]                      | 848                                                                                 | 848                                                                                  | 848                                                                                   | 848                                                                                   | 848                                                                                   |
| Cable design                       | Radox                                                                               | FEP                                                                                  | FEP                                                                                   | FEP                                                                                   | FEP                                                                                   |
| Cable length [mm]                  | 500                                                                                 | 500                                                                                  | 500                                                                                   | 500                                                                                   | 500                                                                                   |
| Conductor cross-section [AWG]      | 18/19<br>(0.82 mm <sup>2</sup> )                                                    | 14/19<br>(1.9 mm <sup>2</sup> )                                                      | 14/19<br>(1.9 mm <sup>2</sup> )                                                       | 14/19<br>(1.9 mm <sup>2</sup> )                                                       | 14/19<br>(1.9 mm <sup>2</sup> )                                                       |
| Weight without packaging [g]       | 300                                                                                 | 930                                                                                  | 1410                                                                                  | 1200                                                                                  | 930                                                                                   |
| Protection class                   | IP54                                                                                | IP54                                                                                 | IP54                                                                                  | IP54                                                                                  | IP54                                                                                  |
| Test symbols                       |  |  |  |  |  |

Tab. 35: GVADU, GBADU specification



Dimensions

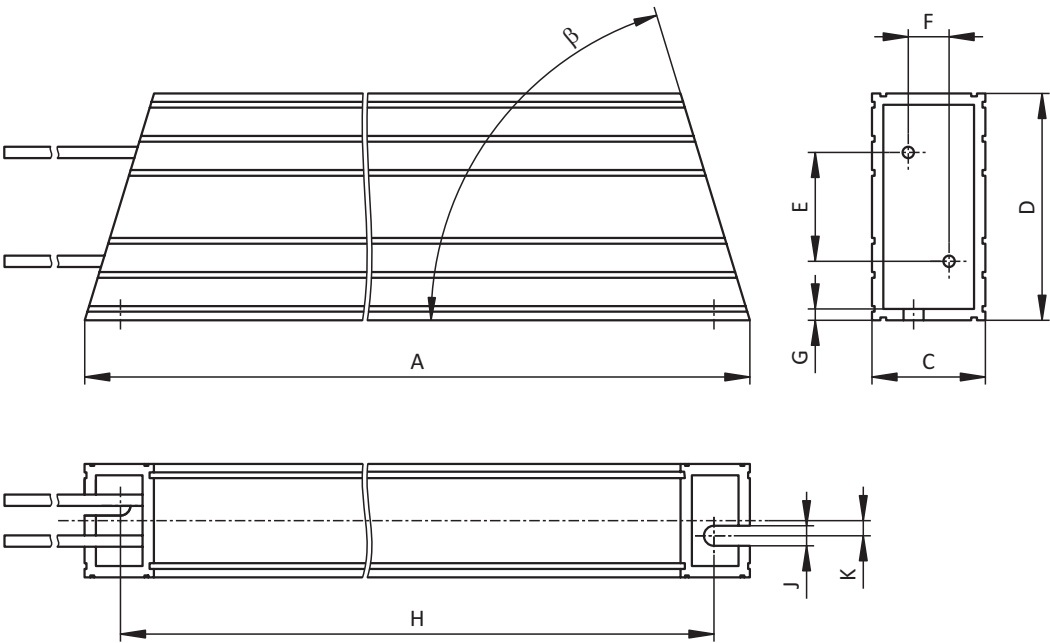


Fig. 5: GVADU, GBADU dimensional drawing

| Dimension | GVADU<br>210×20 | GBADU<br>265×30 | GBADU<br>405×30 | GBADU<br>335×30 | GBADU<br>265×30 |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|
| ID No.    | 55441           | 55442           | 55499           | 55443           | 55444           |
| A         | 210             | 265             | 405             | 335             | 265             |
| H         | 192             | 246             | 386             | 316             | 246             |
| C         | 20              | 30              | 30              | 30              | 30              |
| D         | 40              | 60              | 60              | 60              | 60              |
| E         | 18.2            | 28.8            | 28.8            | 28.8            | 28.8            |
| F         | 6.2             | 10.8            | 10.8            | 10.8            | 10.8            |
| G         | 2               | 3               | 3               | 3               | 3               |
| K         | 2.5             | 4               | 4               | 4               | 4               |
| J         | 4.3             | 5.3             | 5.3             | 5.3             | 5.3             |
| β         | 65°             | 73°             | 73°             | 73°             | 73°             |

Tab. 36: GVADU, GBADU dimensions [mm]

### 8.4.5.3 FGFKU steel-grid fixed resistor

| Type   | FGFKU<br>3100502 | FGFKU<br>3100502 | FGFKU<br>3111202 | FGFKU<br>3121602 |
|--------|------------------|------------------|------------------|------------------|
| ID No. | 55449            | 55450            | 55451            | 53897            |
| SD6A24 | X                | —                | —                | —                |
| SD6A26 | X                | —                | —                | —                |
| SD6A34 | (X)              | X                | X                | X                |
| SD6A36 | (X)              | X                | X                | X                |
| SD6A38 | (X)              | X                | X                | X                |

Tab. 37: Assignment of FGFKU braking resistor – SD6 drive controller

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

#### Properties

| Specification                      | FGFKU<br>3100502                                                                    | FGFKU<br>3100502                                                                      | FGFKU<br>3111202                                                                      | FGFKU<br>3121602                                                                      |
|------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                             | 55449                                                                               | 55450                                                                                 | 55451                                                                                 | 53897                                                                                 |
| Type                               | Steel-grid fixed resistor                                                           |                                                                                       |                                                                                       |                                                                                       |
| Resistance [ $\Omega$ ]            | 22                                                                                  | 15                                                                                    | 15                                                                                    | 15                                                                                    |
| Power [W]                          | 2500                                                                                | 2500                                                                                  | 6000                                                                                  | 8000                                                                                  |
| Therm. time const. $\tau_{th}$ [s] | 30                                                                                  | 30                                                                                    | 20                                                                                    | 20                                                                                    |
| Pulse power for < 1 s [kW]         | 50                                                                                  | 50                                                                                    | 120                                                                                   | 160                                                                                   |
| $U_{max}$ [V]                      | 848                                                                                 | 848                                                                                   | 848                                                                                   | 848                                                                                   |
| Weight without packaging [g]       | 7500                                                                                | 7500                                                                                  | 12000                                                                                 | 18000                                                                                 |
| Protection class                   | IP20                                                                                | IP20                                                                                  | IP20                                                                                  | IP20                                                                                  |
| Test symbols                       |  |  |  |  |

Tab. 38: FGFKU specification

#### Dimensions

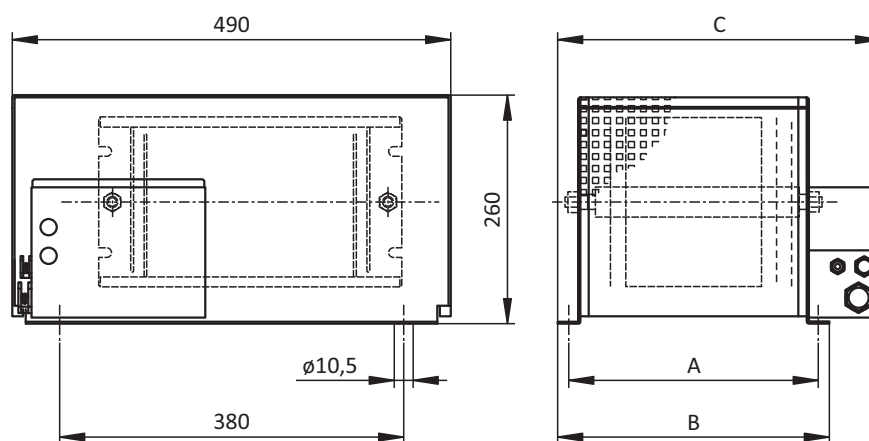


Fig. 6: FGFKU dimensional drawing

| Dimension | FGFKU<br>3100502 | FGFKU<br>3100502 | FGFKU<br>3111202 | FGFKU<br>3121602 |
|-----------|------------------|------------------|------------------|------------------|
| ID No.    | 55449            | 55450            | 55451            | 53897            |
| A         | 270              | 270              | 370              | 570              |
| B         | 295              | 295              | 395              | 595              |
| C         | 355              | 355              | 455              | 655              |

Tab. 39: FGFKU dimensions [mm]

## 8.4.5.4 RB 5000 rear section braking resistor

| Type   | RB 5022 | RB 5047 | RB 5100 |
|--------|---------|---------|---------|
| ID No. | 45618   | 44966   | 44965   |
| SD6A02 | —       | —       | X       |
| SD6A04 | —       | —       | X       |
| SD6A06 | —       | —       | X       |
| SD6A14 | —       | X       | (X)     |
| SD6A16 | —       | X       | (X)     |
| SD6A24 | X       | —       | —       |
| SD6A26 | X       | —       | —       |
| SD6A34 | —       | —       | —       |
| SD6A36 | —       | —       | —       |
| SD6A38 | —       | —       | —       |

Tab. 40: Assignment of RB 5000 braking resistor – SD6 drive controller

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

## Properties

| Specification                            | RB 5022                                                                              | RB 5047                                                                               | RB 5100                                                                               |
|------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                                   | 45618                                                                                | 44966                                                                                 | 44965                                                                                 |
| Resistance [ $\Omega$ ]                  | 22                                                                                   | 47                                                                                    | 100                                                                                   |
| Power [W]                                | 100                                                                                  | 60                                                                                    | 60                                                                                    |
| Therm. time const. $\tau_{th}$ [s]       | 8                                                                                    | 8                                                                                     | 8                                                                                     |
| Pulse power for < 1 s [kW]               | 1.5                                                                                  | 1.0                                                                                   | 1.0                                                                                   |
| $U_{max}$ [V]                            | 800                                                                                  | 800                                                                                   | 800                                                                                   |
| Weight without packaging [g]             | 640                                                                                  | 460                                                                                   | 440                                                                                   |
| Cable design                             | Radox                                                                                | Radox                                                                                 | Radox                                                                                 |
| Cable length [mm]                        | 250                                                                                  | 250                                                                                   | 250                                                                                   |
| Conductor cross-section [AWG]            | 18/19<br>(0.82 mm <sup>2</sup> )                                                     | 18/19<br>(0.82 mm <sup>2</sup> )                                                      | 18/19<br>(0.82 mm <sup>2</sup> )                                                      |
| Maximum torque of M5 threaded bolts [Nm] | 5                                                                                    | 5                                                                                     | 5                                                                                     |
| Protection class                         | IP40                                                                                 | IP40                                                                                  | IP40                                                                                  |
| Test symbols                             |  |  |  |

Tab. 41: RB 5000 specification

## Dimensions

| Dimension                            | RB 5022 | RB 5047 | RB 5100           |
|--------------------------------------|---------|---------|-------------------|
| ID No.                               | 45618   | 44966   | 44965             |
| Height                               | 300     | 300     | 300               |
| Width                                | 94      | 62      | 62                |
| Depth                                | 18      | 18      | 18                |
| Drilling diagram corresponds to size | Size 2  | Size 1  | Size 0 and Size 1 |

Tab. 42: RB 5000 dimensions [mm]

## 8.4.6 Choke

Technical specifications for suitable chokes can be found in the following chapters.

### 8.4.6.1 TEP power choke

For each size 3 SD6 drive controller, you need one power choke. It dampens voltage and current peaks and reduces the load of the drive controller power feed-in.

#### Properties

| Specification                                      | TEP4010-2US00                                                                            |
|----------------------------------------------------|------------------------------------------------------------------------------------------|
| ID No.                                             | 56528                                                                                    |
| Phases                                             | 3                                                                                        |
| Thermally allowed continuous current               | 100 A                                                                                    |
| Nominal current $I_{N,MF}$                         | 90 A                                                                                     |
| Absolute loss $P_v$                                | 103 W                                                                                    |
| Inductance                                         | 0.14 mH                                                                                  |
| Voltage range                                      | $3 \times 400 \text{ V}_{AC}$<br>+32%/-50%<br>$3 \times 480 \text{ V}_{AC}$<br>+10%/-58% |
| Voltage drop $U_k$                                 | 2%                                                                                       |
| Frequency range                                    | 50/60 Hz                                                                                 |
| Protection class                                   | IP00                                                                                     |
| Max. surrounding temperature $\vartheta_{amb,max}$ | 40 °C                                                                                    |
| Insulation class                                   | B                                                                                        |
| Connection                                         | Screw terminal                                                                           |
| Connection type                                    | Flexible with and without end sleeve                                                     |
| Max. conductor cross-section                       | 6 – 35 mm <sup>2</sup>                                                                   |
| Tightening torque                                  | 2.5 Nm                                                                                   |
| Insulation stripping length                        | 17 mm                                                                                    |
| Installation                                       | Screws                                                                                   |
| Directive                                          | EN 61558-2-20                                                                            |
| UL Recognized Component (CAN; USA)                 | Yes                                                                                      |
| Test symbol, symbol                                |     |

Tab. 43: TEP specification

Dimensions

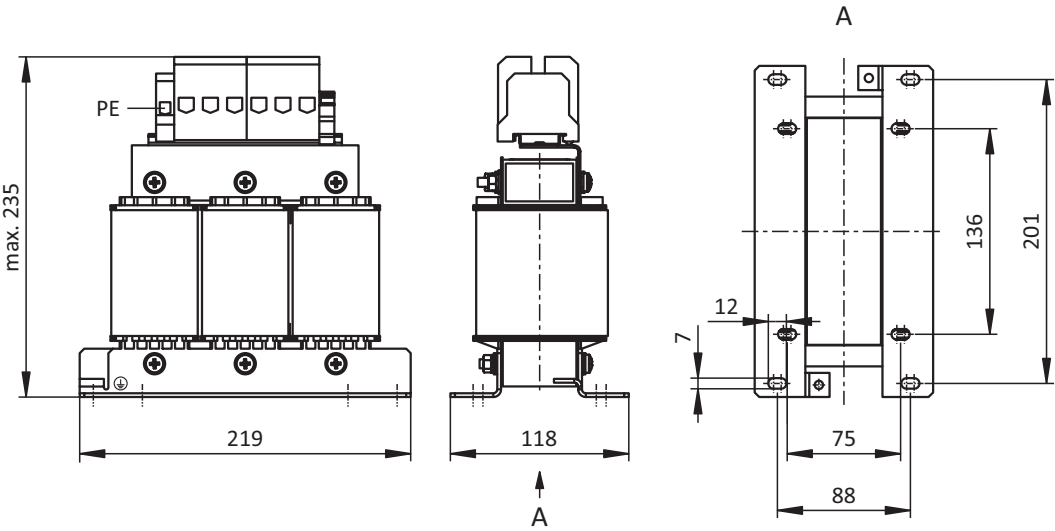


Fig. 7: Power choke dimensional drawing

| Dimensions                                   | TEP4010-2US00 |
|----------------------------------------------|---------------|
| Height [mm]                                  | 235           |
| Width [mm]                                   | 219           |
| Depth [mm]                                   | 118           |
| Vertical distance 1 – fastening holes [mm]   | 201           |
| Vertical distance 2 – Fastening holes [mm]   | 136           |
| Horizontal distance 1 – fastening holes [mm] | 88            |
| Horizontal distance 2 – Fastening holes [mm] | 75            |
| Drill holes – Depth [mm]                     | 7             |
| Drill holes – Width [mm]                     | 12            |
| Screw connection – M                         | M6            |
| Weight without packaging [g]                 | 9900          |

Tab. 44: TEP dimensions and weight

### 8.4.6.2 TEP output choke

Output chokes are required for connecting size 0 to 2 drive controllers from a cable length > 50 m in order to reduce interference pulses and protect the drive system.

#### Information

The following technical data only applies to a rotating magnetic field frequency of 200 Hz. For example, this rotating magnetic field frequency is achieved with a motor with 4 pole pairs and a nominal speed of 3000 rpm. Always observe the specified derating for higher rotating magnetic field frequencies. Also observe the relationship with the clock frequency.

#### Properties

| Specification                                       | TEP3720-0ES41                                                                         | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|---------------|---------------|
| ID No.                                              | 53188                                                                                 | 53189         | 53190         |
| Voltage range                                       | 3 × 0 to 480 V <sub>AC</sub>                                                          |               |               |
| Frequency range                                     | 0 – 200 Hz                                                                            |               |               |
| Nominal current $I_{N,MF}$ at 4 kHz                 | 4 A                                                                                   | 17.5 A        | 38 A          |
| Nominal current $I_{N,MF}$ at 8 kHz                 | 3.3 A                                                                                 | 15.2 A        | 30.4 A        |
| Max. permitted motor cable length with output choke | 100 m                                                                                 |               |               |
| Max. surrounding temperature $\vartheta_{amb,max}$  | 40 °C                                                                                 |               |               |
| Protection class                                    | IP00                                                                                  |               |               |
| Winding losses                                      | 11 W                                                                                  | 29 W          | 61 W          |
| Iron losses                                         | 25 W                                                                                  | 16 W          | 33 W          |
| Connection                                          | Screw terminal                                                                        |               |               |
| Max. conductor cross-section                        | 10 mm <sup>2</sup>                                                                    |               |               |
| UL Recognized                                       | Yes                                                                                   |               |               |
| Component (CAN; USA)                                |                                                                                       |               |               |
| Test symbols                                        |  |               |               |

Tab. 45: TEP specification

Dimensions

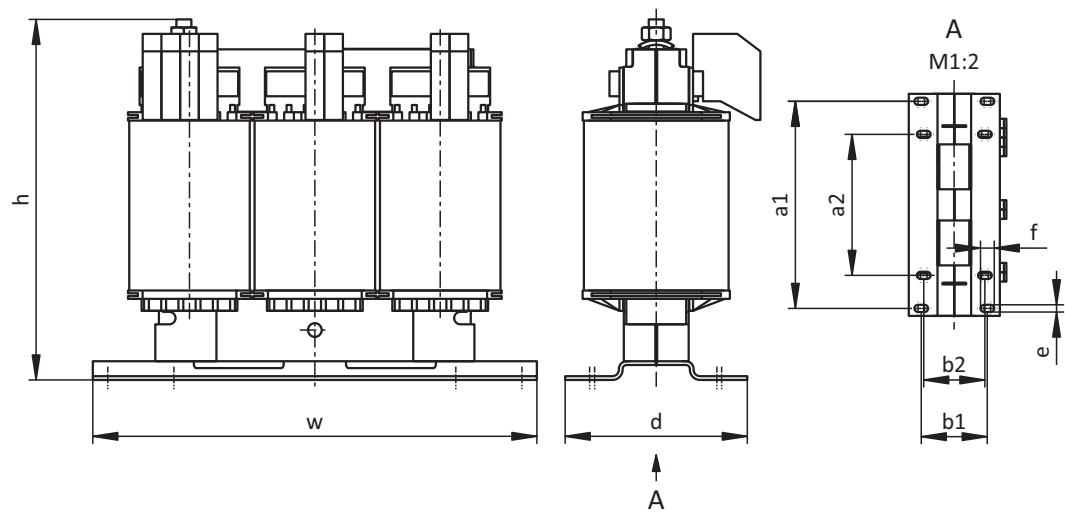


Fig. 8: TEP dimensional drawing

| Dimension                                     | TEP3720-0ES41 | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------|---------------|---------------|---------------|
| Height h [mm]                                 | Max. 153      | Max. 153      | Max. 180      |
| Width w [mm]                                  | 178           | 178           | 219           |
| Depth d [mm]                                  | 73            | 88            | 119           |
| Vertical distance – Fastening holes a1 [mm]   | 166           | 166           | 201           |
| Vertical distance – Fastening holes a2 [mm]   | 113           | 113           | 136           |
| Horizontal distance – Fastening holes b1 [mm] | 53            | 68            | 89            |
| Horizontal distance – Fastening holes b2 [mm] | 49            | 64            | 76            |
| Drill holes – Depth e [mm]                    | 5.8           | 5.8           | 7             |
| Drill holes – Width f [mm]                    | 11            | 11            | 13            |
| Screw connection – M                          | M5            | M5            | M6            |
| Weight without packaging [g]                  | 2900          | 5900          | 8800          |

Tab. 46: TEP dimensions and weight

## 8.4.7 EMC shroud

You can use the EM6A EMC shroud to connect the cable shield of the power cable. Two different designs are available.

### EM6A0 EMC shroud



ID No. 56459

EMC shroud for the SD6 drive controller up to size 2.

Accessory part for shield connection of the power cable.

Can be attached to the basic housing.

Including shield connection terminal.

### EMC shroud EM6A3



ID No. 56521

EMC shroud for drive controllers of the MDS 5000, SDS 5000 and SD6 series.

Accessory part for shield connection of the power cable for drive controllers up to size 3.

Can be attached to the basic housing.

Including shield connection terminal.

If necessary you can also connect the cable shield of the braking resistor and DC link connection to the shroud. Additional shield connection terminals are available as accessories for this purpose (ID No. 56521).

## 8.4.8 Removable data storage

### Paramodul removable data storage

Included in the standard version.



ID No. 56403

The plug-in Paramodul with integrated microSD card (from 512 MB, industrial type) is available as a storage medium.

The microSD card is also available separately as a replacement part (ID No. 56436).



## 8.5 Further information

### 8.5.1 Directives and standards

The following European directives and standards are relevant to the drive controllers:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- EN 61326-3-1:2008
- EN 61800-3:2004 and A1:2012
- EN 61800-5-1:2007
- EN 61800-5-2:2007
- EN 50178:1997

### 8.5.2 Symbols, marks and test symbols



Choke without overload protection in accordance with DIN EN 61558-2-20.



**Grounding symbol**  
Grounding symbol in accordance with IEC 60417, symbol 5019.



**RoHS lead-free mark**  
Marking in accordance with RoHS directive 2011-65-EU.



**CE mark**  
Manufacturer's self declaration: The product meets the requirements of EU directives.



**UL test symbol**  
This product is listed by UL for the United States and Canada. Representative samples of this product have been evaluated by UL and meet the requirements of applicable standards.



**UL recognized component mark**  
This component or material is recognized by UL. Representative samples of this product have been evaluated by UL and meet applicable requirements.

### 8.5.3 Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

| Documentation                    | ID     |
|----------------------------------|--------|
| Manual for SD6 drive controllers | 442426 |

## 9 POSIDYN SDS 5000 Servo inverters

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## 9

## Servo inverters

# POSIDYN SDS 5000

### 9.1 Overview

High dynamics for fully digital servo axes

#### Features

- Nominal output current up to 85 A
- 250% overload capacity
- Power range: 0.75 kW to 45 kW
- Control of rotary synchronous servo motors and asynchronous motors
- Multi-functional encoder interfaces
- Automatic motor parameterization from the electronic motor nameplate
- Isochronic system bus (IGB motion bus) for parameterization and multi-axis applications
- Communication using PROFIBUS DP, PROFINET, CANopen or EtherCAT
- Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions: SIL 3, PL e (cat. 3)
- Digital and analog inputs and outputs as an option
- Brake chopper, brake control and line filter
- Convenient operating unit consisting of plain-text display and buttons
- Paramodul removable data storage

## 9.1.1 Features

The 5th generation series of STOBBER inverters are purely digital, modular inverter systems for operating rotary synchronous and asynchronous motors. It includes product types for direct operation on a one or three-phase network in a voltage range from 200 V<sub>AC</sub> to 528 V<sub>AC</sub>. An EMC line filter is integrated. EnDat 2.1/2.2 digital, SSI and incremental (HTL/TTL) are available as encoder interfaces in the standard design. A resolver evaluation is available as an option. The inverter can be adapted to the requirements of individual applications using different option modules. The ASP 5001 safety module makes it possible to implement the Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2 for safety-relevant applications. Communication modules provide the connection to a controller over the PROFIBUS DP, PROFINET, CANopen or EtherCAT fieldbus. In addition, terminal modules are available for connecting analog and digital signals as well as additional encoder signals. A plain text display and keyboard simplify diagnostics in the event of a fault and enable fast access to parameters. The Paramodul removable data storage can be used to transfer all application-relevant data from one inverter to another.

The vector control, sensorless vector control, high performance sensorless vector control and U/f controller control modes are available for use with asynchronous motors.



POSIDYN SDS 5000

### Integrated bus (IGB) for performance, convenience and safety

SDS 5000 servo inverters feature two interfaces for the integrated bus in the standard version. The integrated bus is used for easy configuration over Ethernet and isochronic data exchange for the following functions:

- Multi-axis synchronization between the servo inverters (IGB motion bus)
- Internet connection for remote maintenance of individual and multiple inverters
- Direct connection between servo inverter and PC

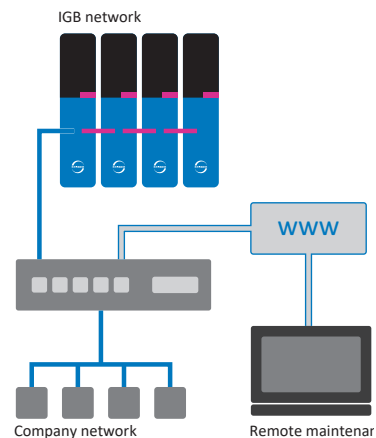
### IGB motion bus

The IGB motion bus allows for cyclic, isochronic data exchange between multiple POSIDYN SDS 5000 units integrated into the IGB network. In addition to transferring guide values for master/slave operation, any other data items can also be exchanged, such as tailor-made applications.



**STOBER remote maintenance concept**

STOBER remote maintenance enables commissioning software to be used to perform all processes and sequences just like an on-site service visit. The concept guides users through a controlled and protected procedure. It ensures that the person responsible for the machine is there on site to pay attention to special situations and personal safety. On the other end, the remote maintenance specialist has the assurance of communicating with a responsible employee on site who is monitoring the situation on the machine.



*Remote maintenance enables all processes and sequences to be performed just like an on-site service visit.*

**Brake management**

Using the optional BRS 5001 brake module, the POSIDYN SDS 5000 servo inverter can activate one or two 24 V<sub>DC</sub> brake systems. Brake management provides the following functions for both brake systems:

- Cyclic brake test
- Bed in brake



*Optionally available: BRS 5001 brake module*

**POSITool**

The 5th generation of POSITool project configuration and commissioning software has all the functions needed for efficient use of inverters in single and multi-axis applications.

**Paramodul removable data storage**

Removable data storage for fast series commissioning by copying and easy service when replacing devices.



## 9.1.2 Software components

**Modular application software**

Various standard applications can be loaded onto the devices of the 5th STOBER inverter generation with the POSITool commissioning software as needed. Furthermore, programming based on IEC 61131-3 with CFC can be used to create new applications or expand existing ones. The inverter operating system is multi-axis capable. It supports up to four axes with separate application and parameter ranges.

**Velocity mode (standard application)**

- **Fast set value**

Simple speed application for lean applications. The speed reference value and torque limiting can be specified using analog inputs as well as digitally.

**Torque/force and velocity mode (standard application)**

- **Comfort set value**  
Expanded torque and speed set value application. Set values and limits can be assigned with the fast set value as well as using fixed values, motor potentiometers and other functions.
- **Technology controller**  
PID controller for torque or speed-controlled applications.

**Positioning and master/slave mode (standard application)**

- **Command, synchronous command**  
High-performance positioning application with a command interface based on PLCopen. The data for a motion task including target position, velocity and acceleration are transferred together over fieldbus to the inverter, which then processes them independently. The functional scope is rounded out by an electrical cam, motion block switching point and Posi-Latch.
- **Motion block**  
Extensive positioning application with up to 256 motion blocks based on PLCopen. The motion blocks can be selected individually over fieldbus or with digital inputs. They can also be started in a chain. The functional scope is rounded out by an electrical cam, motion block switching point and Posi-Latch.

**Electronic cam disk with PLCopen interface (tailor-made applications)**

The electronic cam disk application makes it possible to implement complex motion tasks such as:

- Flying saw
- Synchronizer (clock in/clock out)
- Cross cutter
- Welding bar/embossing stamp
- Print mark control

These applications can be implemented quickly and easily using readily understandable, free graphical programming based on IEC 61131-3 CFC. This also allows for customer-specific adaptations to special system conditions. Function blocks based on PLCopen Motion Control are available for this purpose for trained users.

## 9.1.3 Application training

STOBER offers a multi-level training program that focuses essentially on application programming of the motion controller and inverter.

**G5 Basic**

Training content: System overview, installation and commissioning of the inverter. Use of option modules. Parameterization, commissioning and diagnostics using the integrated display and commissioning software. Remote maintenance. Basics of controller optimization. Configuration of the drive train. Integrated software functions. Software applications. Connection to a higher-level controller. Basics of safety technology. Practical exercises on training topics.

Software used: POSITool.

**G5 Advanced**

Training content: Graphical programming with CFC. Special knowledge for regulating, control and safety technology. Practical exercises on training topics.

**G5 CAM**

Training content: Special knowledge of electronic cam disks. Practical exercises on training topics.

9.2
Technical data

Technical data for inverters can be found in the following sections.

9.2.1
Type designation

|     |   |     |   |
|-----|---|-----|---|
| SDS | 5 | 075 | A |
|-----|---|-----|---|

Tab. 1: Example code for type designation

| Code | Designation       | Design                             |
|------|-------------------|------------------------------------|
| SDS  | Series            |                                    |
| 5    | Generation        | Generation 5                       |
| 075  | Power             | 075 = 7.5 kW                       |
| –    | Hardware variants | No identification: HW 199 or lower |
| A    |                   | A: HW 200 or higher                |

Tab. 2: Meaning of the example code

9.2.2
Sizes

| Type      | ID No. | Size   |
|-----------|--------|--------|
| SDS 5007A | 55428  | Size 0 |
| SDS 5008A | 55429  | Size 0 |
| SDS 5015A | 55430  | Size 0 |
| SDS 5040A | 55431  | Size 1 |
| SDS 5075A | 55432  | Size 1 |
| SDS 5110A | 55433  | Size 2 |
| SDS 5150A | 55434  | Size 2 |
| SDS 5220A | 55435  | Size 3 |
| SDS 5370A | 55436  | Size 3 |
| SDS 5450A | 55437  | Size 3 |

Tab. 3: Available SDS 5000 types and sizes



SDS 5000 in sizes 3, 2, 1 and 0

## 9.2.3 General technical data

The following information applies to all inverter types.

| Device features                            |                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protection class of the device             | IP20                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Protection class of the installation space | At least IP54                                                                                                                                                                                                                                                                                                                                                                                                              |
| Protection class                           | Protection class I in accordance with DIN EN 61140                                                                                                                                                                                                                                                                                                                                                                         |
| Radio interference suppression             | Integrated line filter in accordance with DIN EN 61800-3, interference emission class C3                                                                                                                                                                                                                                                                                                                                   |
| Overvoltage category                       | III in accordance with DIN EN 61800-5-1                                                                                                                                                                                                                                                                                                                                                                                    |
| Test symbols                               |      |

Tab. 4: Device features

| Transport and storage conditions                                                                                                       |                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Storage/transport temperature                                                                                                          | –20 °C to +70 °C<br>Maximum change: 20 K/h                                                                    |
| Relative humidity                                                                                                                      | Maximum relative humidity 85%, non-condensing                                                                 |
| Vibration (transport) in accordance with DIN EN 60068-2-6                                                                              | 5 Hz ≤ f ≤ 9 Hz: 3.5 mm<br>9 Hz ≤ f ≤ 200 Hz: 10 m/s <sup>2</sup><br>200 Hz ≤ f ≤ 500 Hz: 15 m/s <sup>2</sup> |
| Fall height for freefall <sup>1</sup><br>Weight < 100 kg<br>in accordance with DIN EN 61800-2<br>(or DIN EN 60721-3-2:1997, class 2M1) | 0.25 m                                                                                                        |

Tab. 5: Transport and storage conditions

| Operating conditions                                      |                                                                                                                  |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Surrounding temperature during operation                  | 0 °C to 45 °C with nominal data<br>45 °C to 55 °C with derating –2.5% / K                                        |
| Relative humidity                                         | Maximum relative humidity 85%, non-condensing                                                                    |
| Installation altitude                                     | 0 m to 1000 m above sea level without restrictions<br>1000 m to 2000 m above sea level with –1.5%/100 m derating |
| Pollution degree                                          | Pollution degree 2 in accordance with EN 50178                                                                   |
| Ventilation                                               | Installed fan                                                                                                    |
| Vibration (operation) in accordance with DIN EN 60068-2-6 | 5 Hz ≤ f ≤ 9 Hz: 0.35 mm<br>9 Hz ≤ f ≤ 200 Hz: 1 m/s <sup>2</sup>                                                |

Tab. 6: Operating conditions

| Discharge times           |       |
|---------------------------|-------|
| Self-discharge of DC link | 6 min |

Tab. 7: Discharge times of the DC link circuit

<sup>1</sup> Only valid for components in original packaging



## 9.2.4 Electrical data

The electrical data of the available sizes as well as the properties of the brake chopper can be found in the following sections.

An explanation of the formula symbols used can be found in the chapter [\[ 13.1 \]](#).

### 9.2.4.1 Size 0: SDS 5007A to SDS 5015A

| Electrical data          | SDS 5007A                              | SDS 5008A                                                             | SDS 5015A |
|--------------------------|----------------------------------------|-----------------------------------------------------------------------|-----------|
| ID No.                   | 55428                                  | 55429                                                                 | 55430     |
| Recommended motor rating | 0.75 kW                                | 0.75 kW                                                               | 1.5 kW    |
| $U_{1PU}$                | 1 × 230 V,<br>+20% / -40%,<br>50/60 Hz | 3 × 400 V,<br>+32% / -50%, 50 Hz;<br>3 × 480 V,<br>+10% / -58%, 60 Hz |           |
| $I_{1N,PU}$              | 1 × 5.9 A                              | 3 × 2.2 A                                                             | 3 × 4 A   |
| $f_{2PU}$                | 0 – 700 Hz                             |                                                                       |           |
| $U_{2PU}$                | 0 – 230 V                              | 0 – 400 V                                                             |           |
| $U_{maxPU}$              | 440 V                                  | 830 V                                                                 |           |

Tab. 8: SDS 5000 electrical data, size 0

Nominal currents up to +45 °C (in the control cabinet)

Operation with asynchronous motor

| Electrical data | SDS 5007A                   | SDS 5008A | SDS 5015A |
|-----------------|-----------------------------|-----------|-----------|
| $I_{2N,PU}$     | 3 × 4 A                     | 3 × 2.3 A | 3 × 4.5 A |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |           |           |
| $f_{PWM,PU}$    | 4 kHz <sup>2</sup>          |           |           |

Tab. 9: SDS 5000 electrical data, size 0, for 4 kHz clock frequency

Operation with synchronous servo motor

| Electrical data | SDS 5007A                  | SDS 5008A | SDS 5015A |
|-----------------|----------------------------|-----------|-----------|
| $I_{2N,PU}$     | 3 × 3 A                    | 3 × 1.7 A | 3 × 3.4 A |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |           |           |
| $f_{PWM,PU}$    | 8 kHz <sup>3</sup>         |           |           |

Tab. 10: SDS 5000 electrical data, size 0, for 8 kHz clock frequency

| Electrical data | SDS 5007A   | SDS 5008A   | SDS 5015A |
|-----------------|-------------|-------------|-----------|
| $U_{onCH}$      | 400 – 420 V | 780 – 800 V |           |
| $U_{offCH}$     | 360 – 380 V | 740 – 760 V |           |
| $R_{2minRB}$    | 100 Ω       | 100 Ω       |           |
| $P_{maxRB}$     | 1.8 kW      | 6.4 kW      |           |

Tab. 11: Brake chopper electrical data, size 0

<sup>2</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

<sup>3</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

### 9.2.4.2 Size 1: SDS 5040A to SDS 5075A

| Electrical data          | SDS 5040A                                                             | SDS 5075A  |
|--------------------------|-----------------------------------------------------------------------|------------|
| ID No.                   | 55431                                                                 | 55432      |
| Recommended motor rating | 4.0 kW                                                                | 7.5 kW     |
| $U_{1PU}$                | 3 × 400 V,<br>+32% / -50%, 50 Hz;<br>3 × 480 V,<br>+10% / -58%, 60 Hz |            |
| $I_{1N,PU}$              | 3 × 9.3 A                                                             | 3 × 15.8 A |
| $f_{2PU}$                | 0 – 700 Hz                                                            |            |
| $U_{2PU}$                | 0 – 400 V                                                             |            |
| $U_{maxPU}$              | 830 V                                                                 |            |

Tab. 12: SDS 5000 electrical data, size 1

#### Nominal currents up to +45 °C (in the control cabinet)

##### Operation with asynchronous motor

| Electrical data | SDS 5040A                   | SDS 5075A |
|-----------------|-----------------------------|-----------|
| $I_{2N,PU}$     | 3 × 10 A                    | 3 × 16 A  |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |           |
| $f_{PWM,PU}$    | 4 kHz <sup>4</sup>          |           |

Tab. 13: SDS 5000 electrical data, size 1, for 4 kHz clock frequency

##### Operation with synchronous servo motor

| Electrical data | SDS 5040A                  | SDS 5075A |
|-----------------|----------------------------|-----------|
| $I_{2N,PU}$     | 3 × 6 A                    | 3 × 10 A  |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |           |
| $f_{PWM,PU}$    | 8 kHz <sup>5</sup>         |           |

Tab. 14: SDS 5000 electrical data, size 1, for 8 kHz clock frequency

| Electrical data | SDS 5040A   | SDS 5075A |
|-----------------|-------------|-----------|
| $U_{onCH}$      | 780 – 800 V |           |
| $U_{offCH}$     | 740 – 760 V |           |
| $R_{2minRB}$    | 47 Ω        | 47 Ω      |
| $P_{maxRB}$     | 13.6 kW     | 13.6 kW   |

Tab. 15: Brake chopper electrical data, size 1

<sup>4</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

<sup>5</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

## 9.2.4.3 Size 2: SDS 5110A to SDS 5150A

| Electrical data          | SDS 5110A                                                             | SDS 5150A  |
|--------------------------|-----------------------------------------------------------------------|------------|
| ID No.                   | 55433                                                                 | 55434      |
| Recommended motor rating | 11 kW                                                                 | 15 kW      |
| $U_{1PU}$                | 3 × 400 V,<br>+32% / -50%, 50 Hz;<br>3 × 480 V,<br>+10% / -58%, 60 Hz |            |
| $I_{1N,PU}$              | 3 × 24.5 A                                                            | 3 × 32.6 A |
| $f_{2PU}$                | 0 – 700 Hz                                                            |            |
| $U_{2PU}$                | 0 – 400 V                                                             |            |
| $U_{maxPU}$              | 830 V                                                                 |            |

Tab. 16: SDS 5000 electrical data, size 2

## Nominal currents up to +45 °C (in the control cabinet)

## Operation with asynchronous motor

| Electrical data | SDS 5110A                   | SDS 5150A |
|-----------------|-----------------------------|-----------|
| $I_{2N,PU}$     | 3 × 22 A                    | 3 × 32 A  |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |           |
| $f_{PWM,PU}$    | 4 kHz <sup>6</sup>          |           |

Tab. 17: SDS 5000 electrical data, size 2, for 4 kHz clock frequency

## Operation with synchronous servo motor

| Electrical data | SDS 5110A                  | SDS 5150A |
|-----------------|----------------------------|-----------|
| $I_{2N,PU}$     | 3 × 14 A                   | 3 × 20 A  |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |           |
| $f_{PWM,PU}$    | 8 kHz <sup>7</sup>         |           |

Tab. 18: SDS 5000 electrical data, size 2, for 8 kHz clock frequency

| Electrical data | SDS 5110A   | SDS 5150A |
|-----------------|-------------|-----------|
| $U_{onCH}$      | 780 – 800 V |           |
| $U_{offCH}$     | 740 – 760 V |           |
| $R_{2minRB}$    | 22 Ω        |           |
| $P_{maxRB}$     | 29.1 kW     |           |

Tab. 19: Brake chopper electrical data, size 2

<sup>6</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)<sup>7</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

#### 9.2.4.4 Size 3: SDS 5220A to SDS 5450A

| Electrical data          | SDS 5220A                                                             | SDS 5370A | SDS 5450A |
|--------------------------|-----------------------------------------------------------------------|-----------|-----------|
| ID No.                   | 55435                                                                 | 55436     | 55437     |
| Recommended motor rating | 22 kW                                                                 | 37 kW     | 45 kW     |
| $U_{1PU}$                | 3 × 400 V,<br>+32% / -50%, 50 Hz;<br>3 × 480 V,<br>+10% / -58%, 60 Hz |           |           |
| $I_{1N,PU}$              | 1 × 37 A                                                              | 3 × 62 A  | 3 × 76 A  |
| $f_{2PU}$                | 0 – 700 Hz                                                            |           |           |
| $U_{2PU}$                | 0 – 400 V                                                             |           |           |
| $U_{maxPU}$              | 830 V                                                                 |           |           |

Tab. 20: SDS 5000 electrical data, size 3

##### Nominal currents up to +45 °C (in the control cabinet)

##### Operation with asynchronous motor

| Electrical data | SDS 5220A                   | SDS 5370A | SDS 5450A |
|-----------------|-----------------------------|-----------|-----------|
| $I_{2N,PU}$     | 3 × 44 A                    | 3 × 70 A  | 3 × 85 A  |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |           |           |
| $f_{PWM,PU}$    | 4 kHz <sup>8</sup>          |           |           |

Tab. 21: SDS 5000 electrical data, size 3, for 4 kHz clock frequency

##### Operation with synchronous servo motor

| Electrical data | SDS 5220A                  | SDS 5370A | SDS 5450A |
|-----------------|----------------------------|-----------|-----------|
| $I_{2N,PU}$     | 3 × 30 A                   | 3 × 50 A  | 3 × 60 A  |
| $I_{2maxPU}$    | 250% for 2 s; 200% for 5 s |           |           |
| $f_{PWM,PU}$    | 8 kHz <sup>9</sup>         |           |           |

Tab. 22: SDS 5000 electrical data, size 3, for 8 kHz clock frequency

| Electrical data | SDS 5220A                                                      | SDS 5370A | SDS 5450A |
|-----------------|----------------------------------------------------------------|-----------|-----------|
| $U_{onCH}$      | 780 – 800 V                                                    |           |           |
| $U_{offCH}$     | 740 – 760 V                                                    |           |           |
| $R_{intRB}$     | 30 Ω (PTC resistance; 100 W; max. 1 kW for 1 s; $\tau = 40$ s) |           |           |
| $R_{2minRB}$    | 15 Ω                                                           |           |           |
| $P_{maxRB}$     | 42 kW                                                          |           |           |

Tab. 23: Brake chopper electrical data, size 3

<sup>8</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)<sup>9</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

## 9.2.4.5 Power loss data in accordance with EN 61800-9-2

| Type      | Nominal current<br>$I_{2N,PU}$ | Apparent power | Absolute losses<br>$P_{V,CU}^{10}$ | Operating points <sup>11</sup> |        |         |         |         |          |         |          | IE class <sup>12</sup> |
|-----------|--------------------------------|----------------|------------------------------------|--------------------------------|--------|---------|---------|---------|----------|---------|----------|------------------------|
|           |                                |                |                                    | (0/25)                         | (0/50) | (0/100) | (50/25) | (50/50) | (50/100) | (90/50) | (90/100) |                        |
|           |                                |                |                                    | Relative losses                |        |         |         |         |          |         |          |                        |
|           | [A]                            | [kVA]          | [W]                                | [%]                            |        |         |         |         |          |         |          |                        |
| SDS 5007A | 4                              | 0.9            | 10                                 | 5.01                           | 5.07   | 5.68    | 5.20    | 5.37    | 6.30     | 5.88    | 7.43     | IE2                    |
| SDS 5008A | 2.3                            | 1.6            | 10                                 | 2.98                           | 3.13   | 3.49    | 3.02    | 3.22    | 3.71     | 3.36    | 4.09     | IE2                    |
| SDS 5015A | 4.5                            | 3.1            | 12                                 | 1.71                           | 1.86   | 2.24    | 1.75    | 1.97    | 2.51     | 2.16    | 3.04     | IE2                    |
| SDS 5040A | 10                             | 6.9            | 12                                 | 1.38                           | 1.54   | 1.93    | 1.43    | 1.64    | 2.17     | 1.80    | 2.57     | IE2                    |
| SDS 5075A | 16                             | 11.1           | 12                                 | 0.95                           | 1.12   | 1.66    | 0.99    | 1.23    | 1.98     | 1.41    | 2.52     | IE2                    |
| SDS 5110A | 22                             | 15.2           | 15                                 | 0.80                           | 0.97   | 1.49    | 0.84    | 1.06    | 1.75     | 1.21    | 2.19     | IE2                    |
| SDS 5150A | 32                             | 22.2           | 15                                 | 0.70                           | 0.87   | 1.40    | 0.74    | 0.97    | 1.66     | 1.11    | 2.08     | IE2                    |
| SDS 5220A | 44                             | 30.5           | 35                                 | 0.61                           | 0.76   | 1.21    | 0.68    | 0.90    | 1.53     | 1.06    | 1.96     | IE2                    |
| SDS 5370A | 70                             | 48.5           | 35                                 | 0.53                           | 0.69   | 1.18    | 0.59    | 0.82    | 1.49     | 0.97    | 1.89     | IE2                    |
| SDS 5450A | 85                             | 58.9           | 35                                 | 0.47                           | 0.64   | 1.18    | 0.54    | 0.78    | 1.50     | 0.94    | 1.94     | IE2                    |

Tab. 24: Relative losses of inverter SDS 5000 according to EN 61800-9-2

<sup>10</sup> Absolute losses for a power unit that is switched off<sup>11</sup> Operating points for relative motor stator frequency in % and relative torque current in %<sup>12</sup> IE class in accordance with EN 61800-9-2

| Type      | Nominal current | Apparent power | Absolute losses | Operating points <sup>14</sup> |        |         |         |         |          |         |          | IE class <sup>15</sup> | Compar-ison <sup>16</sup> |
|-----------|-----------------|----------------|-----------------|--------------------------------|--------|---------|---------|---------|----------|---------|----------|------------------------|---------------------------|
|           | $I_{2N,PU}$     |                | $P_{V,CU}^{13}$ |                                |        |         |         |         |          |         |          |                        |                           |
|           |                 |                |                 | (0/25)                         | (0/50) | (0/100) | (50/25) | (50/50) | (50/100) | (90/50) | (90/100) |                        |                           |
|           |                 |                |                 | Absolute losses                |        |         |         |         |          |         |          |                        |                           |
|           |                 |                |                 | $P_V$                          |        |         |         |         |          |         |          |                        |                           |
|           | [A]             | [kVA]          | [W]             | [W]                            |        |         |         |         |          |         |          |                        | [%]                       |
| SDS 5007A | 4               | 0.9            | 10              | 45.1                           | 45.6   | 51.1    | 46.8    | 48.3    | 56.7     | 52.9    | 66.9     | IE2                    | 51.8                      |
| SDS 5008A | 2.3             | 1.6            | 10              | 47.7                           | 50.1   | 55.8    | 48.3    | 51.5    | 59.3     | 53.8    | 65.4     | IE2                    | 40.2                      |
| SDS 5015A | 4.5             | 3.1            | 12              | 52.9                           | 57.6   | 69.3    | 54.4    | 61.0    | 77.9     | 67.1    | 94.1     | IE2                    | 39.6                      |
| SDS 5040A | 10              | 6.9            | 12              | 95.3                           | 106.1  | 133.3   | 98.6    | 113.2   | 149.9    | 123.9   | 177.0    | IE2                    | 37.1                      |
| SDS 5075A | 16              | 11.1           | 12              | 104.9                          | 124.0  | 184.6   | 110.3   | 136.6   | 219.8    | 156.0   | 279.8    | IE2                    | 35.8                      |
| SDS 5110A | 22              | 15.2           | 15              | 121.5                          | 146.9  | 226.1   | 128.1   | 161.6   | 266.0    | 183.7   | 332.7    | IE2                    | 32.9                      |
| SDS 5150A | 32              | 22.2           | 15              | 154.7                          | 192.8  | 311.3   | 164.6   | 214.6   | 369.3    | 245.9   | 462.1    | IE2                    | 38.3                      |
| SDS 5220A | 44              | 30.5           | 35              | 187.5                          | 232.2  | 368.7   | 207.7   | 273.9   | 466.8    | 323.0   | 597.8    | IE2                    | 32.1                      |
| SDS 5370A | 70              | 48.5           | 35              | 256.6                          | 332.3  | 570.8   | 287.9   | 397.0   | 721.5    | 471.0   | 915.9    | IE2                    | 33.9                      |
| SDS 5450A | 85              | 58.9           | 35              | 277.8                          | 376.9  | 692.3   | 317.4   | 459.0   | 886.1    | 554.6   | 1143.1   | IE2                    | 35.3                      |

Tab. 25: Power loss data of SDS 5000 inverter in accordance with EN 61800-9-2

**General conditions**

The loss data applies to inverters without accessories.

The power loss calculation is based on a three-phase supply voltage with 400 V<sub>AC</sub>/50 Hz.

The calculated data includes a supplement of 10% in accordance with EN 61800-9-2.

The power loss specifications refer to a clock frequency of 4 kHz.

The absolute losses for a power unit that is switched off refer to the 24 V<sub>DC</sub> power supply of the control electronics.

<sup>13</sup> Absolute losses for a power unit that is switched off

<sup>14</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>15</sup> IE class in accordance with EN 61800-9-2

<sup>16</sup> Comparison of the losses for the reference inverter related to IE2 in the nominal point (90, 100)

### 9.2.4.6 Power loss data of accessories

If the inverter needs to be ordered with accessory parts, the losses increase as follows:

| Type                             | Absolute losses<br>$P_V$ [W] |
|----------------------------------|------------------------------|
| ASP 5001 safety module           | 1                            |
| SEA 5001 terminal module         | < 2                          |
| XEA 5001 terminal module         | < 5                          |
| REA 5001 terminal module         | < 5                          |
| CAN 5000 communication module    | 1                            |
| DP 5000 communication module     | < 2                          |
| ECS 5000 communication module    | < 2                          |
| PN 5000 communication module     | < 4                          |
| BRM 5000 / BRS 5001 brake module | < 1                          |

Tab. 26: Absolute losses in the accessories

#### Information

Note the absolute power loss of the encoder (usually < 3 W) and of the brake when designing as well.

Loss specifications for other optional accessories can be found in the technical data of the respective accessory part.

### 9.2.5 Derating by increasing the clock frequency

Depending on the clock frequency  $f_{PWM,PU}$ , the following values for nominal output currents  $I_{2N,PU}$  arise.

| Type      | $I_{2N,PU}$<br>4 kHz | $I_{2N,PU}$<br>8 kHz | $I_{2N,PU}$<br>16 kHz |
|-----------|----------------------|----------------------|-----------------------|
| SDS 5007A | 4 A                  | 3 A                  | 2 A                   |
| SDS 5008A | 2.3 A                | 1.7 A                | 1.2 A                 |
| SDS 5015A | 4.5 A                | 3.4 A                | 2.2 A                 |
| SDS 5040A | 10 A                 | 6 A                  | 3.3 A                 |
| SDS 5075A | 16 A                 | 10 A                 | 5.7 A                 |
| SDS 5110A | 22 A                 | 14 A                 | 8.1 A                 |
| SDS 5150A | 32 A                 | 20 A                 | 11.4 A                |
| SDS 5220A | 44 A                 | 30 A                 | 18.3 A                |
| SDS 5370A | 70 A                 | 50 A                 | 31.8 A                |
| SDS 5450A | 85 A                 | 60 A                 | 37.8 A                |

Tab. 27: Nominal output current  $I_{2N,PU}$  dependent on the clock frequency

## 9.2.6 Dimensions

The dimensions of the available SDS 5000 sizes can be found in the following chapters.

### 9.2.6.1 Dimensions: sizes 0 to 2

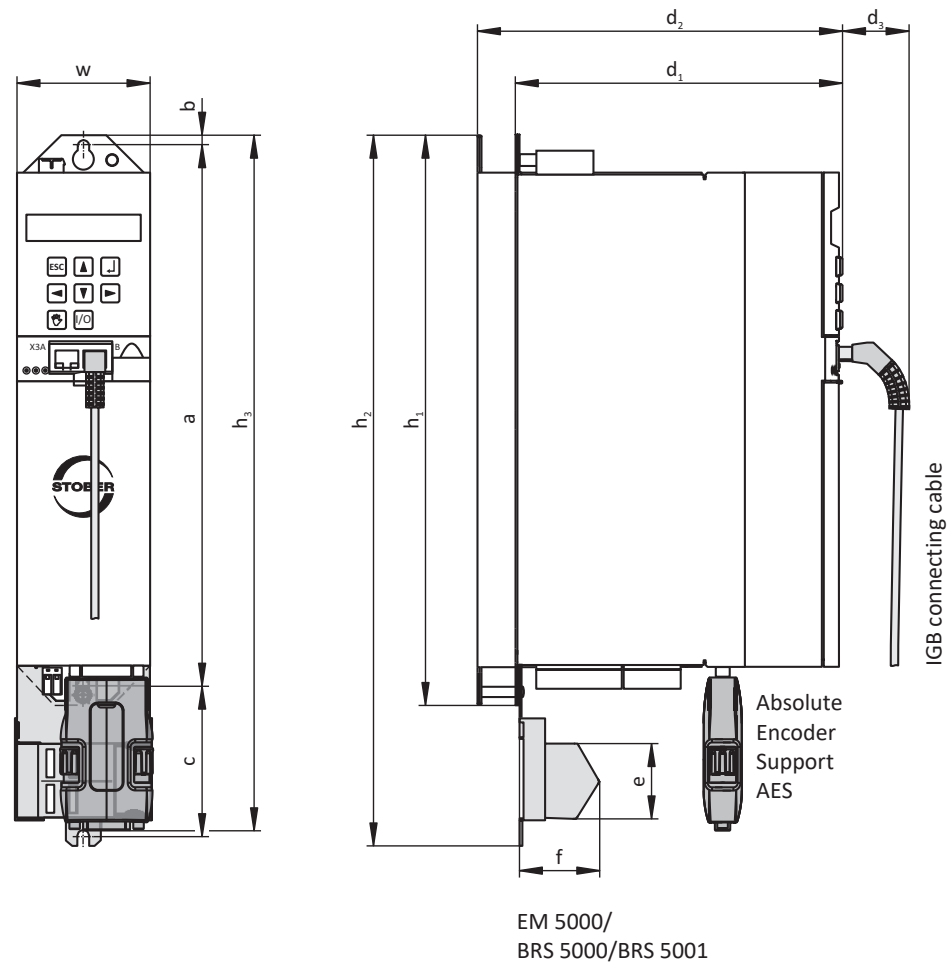


Fig. 1: SDS 5000 dimensional drawing, sizes 0 to 2

| Dimensions [mm] |                                     |                     | Size 0                                | Size 1 | Size 2 |
|-----------------|-------------------------------------|---------------------|---------------------------------------|--------|--------|
| Inverter        | Height                              | $h_1$               | 300                                   |        |        |
|                 |                                     | $h_2$               | 360 <sup>17</sup> / 373 <sup>18</sup> |        |        |
|                 |                                     | $h_3$ <sup>19</sup> | 365                                   |        |        |
|                 | Width                               | w                   | 70                                    |        | 105    |
|                 | Depth                               | $d_1$               | 175                                   | 260    | 260    |
|                 |                                     | $d_2$ <sup>20</sup> | 193                                   | 278    | 278    |
|                 |                                     | $d_3$               | 40                                    |        |        |
| EMC shroud      | Height                              | e                   | 37.5 <sup>21</sup> / 44 <sup>22</sup> |        |        |
|                 | Depth                               | f                   | 40                                    |        |        |
| Fastening holes | Vertical distance to the upper edge | b                   | 6                                     |        |        |
|                 | Vertical distance                   | a                   | 283+2                                 |        |        |
|                 | Vertical distance                   | c <sup>23</sup>     | 79                                    |        |        |

Tab. 28: SDS 5000 dimensions, sizes 0 to 2 [mm]

<sup>17</sup>  $h_2$  = height incl. EMC shroud EM 5000

<sup>18</sup>  $h_2$  = height incl. brake module BRS 5001

<sup>19</sup>  $h_3$  = Height incl. AES

<sup>20</sup>  $d_2$  = Depth including RB 5000 brake resistor

<sup>21</sup> e = height of EM 5000 EMC shroud

<sup>22</sup> e = height of BRS 5001 brake module

<sup>23</sup> c = vertical distance with BRS 5001 brake module



9.2.6.2 Dimensions: size 3

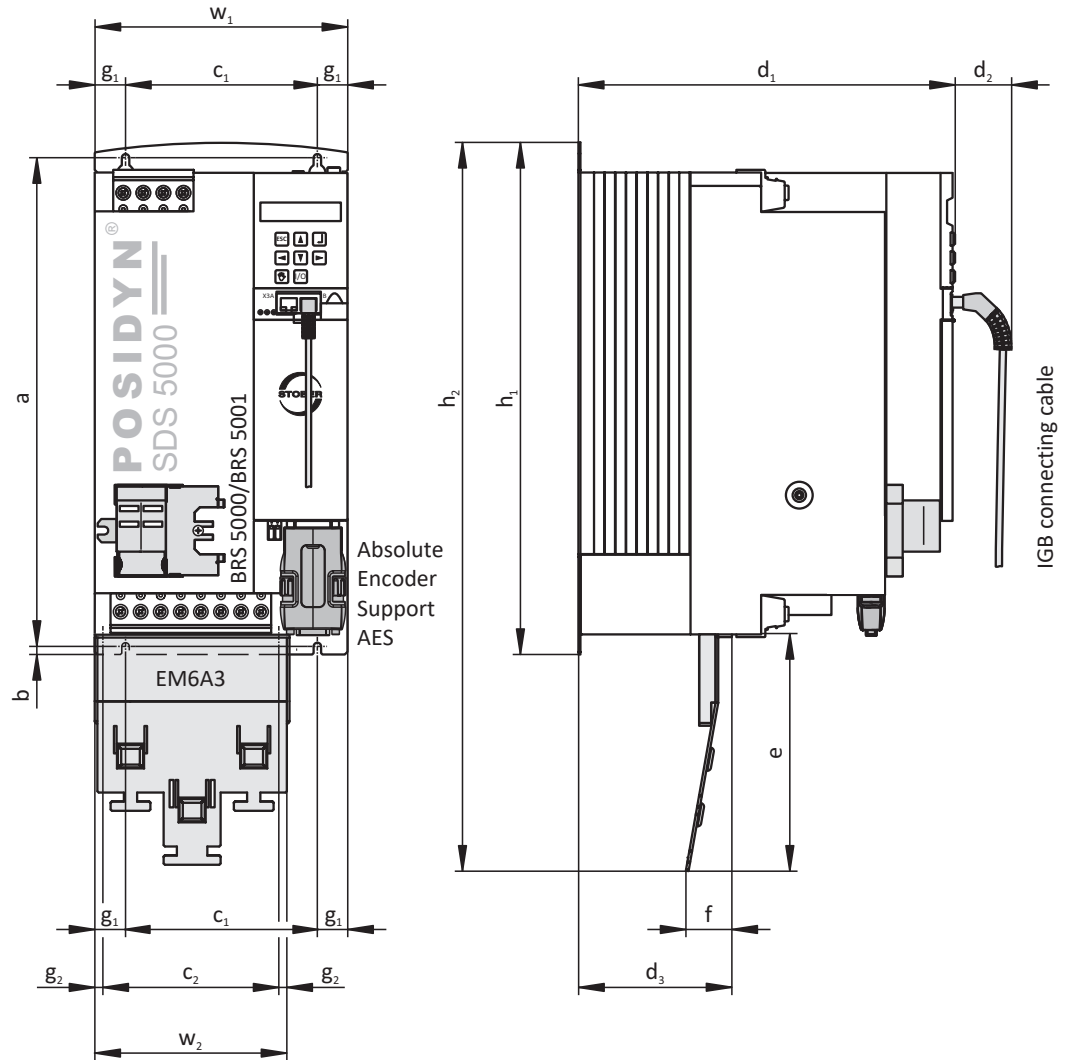


Fig. 2: SDS 5000 dimensional drawing, size 3

| Dimensions [mm] |                                      |            | Size 3       |
|-----------------|--------------------------------------|------------|--------------|
| Inverter        | Height                               | $h_1$      | 382.5        |
|                 |                                      | $h_2^{24}$ | 540          |
|                 | Width                                | $w_1$      | 194          |
|                 | Depth                                | $d_1$      | 276          |
|                 |                                      | $d_2$      | 40           |
| EMC shroud      | Height                               | $e$        | 174          |
|                 | Width                                | $w_2$      | 147          |
|                 | Depth                                | $f$        | 34           |
|                 | Depth                                | $d_3$      | 113          |
| Fastening holes | Vertical distance                    | $a$        | 365+2        |
|                 | Vertical distance to the bottom edge | $b$        | 6            |
|                 | Horizontal distance                  | $c_1^{25}$ | 150+0.2/-0.2 |
|                 | Horizontal distance to the side edge | $g_1^{26}$ | 20           |
|                 | Horizontal distance                  | $c_2^{27}$ | 132          |
|                 | Horizontal distance to the side edge | $g_2^{28}$ | 7.5          |

Tab. 29: SDS 5000 dimensions, size 3 [mm]

<sup>24</sup>  $h_2$  = Height incl. EM6A3 EMC shroud

<sup>25</sup>  $c_1$  = Horizontal distance to the fastening holes of the inverter

<sup>26</sup>  $g_1$  = Horizontal distance to the side edge of the inverter

<sup>27</sup>  $c_2$  = Horizontal distance to the fastening holes of the EM6A3 EMC shroud

<sup>28</sup>  $g_2$  = Horizontal distance to the side edge of the EM6A3 EMC shroud

## 9.2.7 Minimum clearances

The specified dimensions refer to the outside edges of the inverter.

| Minimum clearance                   | Above | Below | On the side |
|-------------------------------------|-------|-------|-------------|
| Size 0 – Size 2                     | 100   | 100   | 5           |
| ... with EMC shroud or brake module | 100   | 120   | 5           |
| Size 3                              | 100   | 100   | 5           |
| ... with EMC shroud                 | 100   | 220   | 5           |

Tab. 30: Minimum clearances [mm]

## 9.3 Inverter/motor combinations

Parameterization of a STÖBER inverter is exceptionally easy, especially together with four-pole STÖBER asynchronous motors. The motor is fully typified by inputting just the motor size (e.g. 90L) and its wiring (star or delta). A delta connection (measurement point 230 V, 50 Hz) is available for motors up to 3 kW (size 100). By increasing the voltage at higher frequencies, the full torque can be drawn through the motor up to 87 Hz. It usually makes sense to take this expanded speed adjustment range into account when selecting the gear unit. You can find more detailed information in the chapter [\[► 5.6\]](#).

An explanation of the formula symbols used can be found in the chapter [\[► 13.1\]](#).

|  |               |    |                 |               |                |               |                 |              | SDS<br>5007A                                        | SDS<br>5008A | SDS<br>5015A | SDS<br>5040A | SDS<br>5075A | SDS<br>5110A | SDS<br>5150A | SDS<br>5220A | SDS<br>5370A | SDS<br>5450A |
|--|---------------|----|-----------------|---------------|----------------|---------------|-----------------|--------------|-----------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|  |               |    |                 |               |                |               |                 |              | $I_{2N,PU}$ [A]<br>( $f_{PWM,PU} = 4 \text{ kHz}$ ) |              |              |              |              |              |              |              |              |              |
|  | $f_T$<br>[Hz] | pz | Con-<br>nection | $P_N$<br>[kW] | $n_N$<br>[rpm] | $M_N$<br>[Nm] | $M_k/$<br>$M_N$ | $I_N$<br>[A] | 4                                                   | 2.3          | 4.5          | 10           | 16           | 22           | 32           | 44           | 70           | 85           |

| Δ 230 V / Y 400 V motor winding |    |   |   |      |      |      |     |      | I <sub>2N,PU</sub> / I <sub>N</sub> |     |     |     |     |     |     |     |     |     |
|---------------------------------|----|---|---|------|------|------|-----|------|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| IE3D080L04                      | 50 | 4 | Y | 0.75 | 1445 | 5.0  | 3.7 | 1.7  |                                     | 1.4 |     |     |     |     |     |     |     |     |
| IE3D080L04                      | 87 | 4 | Δ | 1.3  | 2503 | 5.0  | 3.7 | 2.94 | 1.4                                 |     | 1.5 |     |     |     |     |     |     |     |
| IE3D090S04                      | 50 | 4 | Y | 1.1  | 1440 | 7.3  | 3.7 | 2.5  | 1.6                                 |     | 1.8 |     |     |     |     |     |     |     |
| IE3D090S04                      | 87 | 4 | Δ | 1.91 | 2494 | 7.3  | 3.7 | 4.33 |                                     |     | 1.0 |     |     |     |     |     |     |     |
| IE3D090LX04                     | 50 | 4 | Y | 1.5  | 1455 | 9.8  | 4.9 | 3.4  | 1.2                                 |     | 1.3 |     |     |     |     |     |     |     |
| IE3D090LX04                     | 87 | 4 | Δ | 2.6  | 2503 | 9.8  | 4.9 | 5.89 |                                     |     |     | 1.7 |     |     |     |     |     |     |
| IE3D100KX04                     | 50 | 4 | Y | 2.2  | 1450 | 14.5 | 3.8 | 4.55 |                                     |     |     | 2.2 |     |     |     |     |     |     |
| IE3D100KX04                     | 87 | 4 | Δ | 3.81 | 2511 | 14.5 | 3.8 | 7.88 |                                     |     |     | 1.3 | 2.0 |     |     |     |     |     |
| IE3D100LX04                     | 50 | 4 | Y | 3.0  | 1450 | 19.8 | 4   | 6.35 |                                     |     |     | 1.6 |     |     |     |     |     |     |
| IE3D100LX04                     | 87 | 4 | Δ | 5.2  | 2511 | 19.8 | 4   | 11   |                                     |     |     |     | 1.5 | 2.0 |     |     |     |     |
| IE3D112M04                      | 50 | 4 | Δ | 4.0  | 1465 | 26.1 | 4.5 | 7.9  |                                     |     |     | 1.3 | 2.0 |     |     |     |     |     |
| IE3D132SX04                     | 50 | 4 | Δ | 5.5  | 1465 | 36   | 3.3 | 10   |                                     |     |     | 1.0 | 1.6 | 2.2 |     |     |     |     |
| IE3D132MX04                     | 50 | 4 | Δ | 7.5  | 1470 | 49   | 3.9 | 16   |                                     |     |     |     | 1.0 | 1.4 | 2.0 |     |     |     |
| IE3D160MX04                     | 50 | 4 | Δ | 11   | 1465 | 72   | 3.4 | 21   |                                     |     |     |     |     | 1.0 | 1.5 | 2.1 |     |     |
| IE3D160LX04                     | 50 | 4 | Δ | 15   | 1475 | 97   | 3.5 | 27.5 |                                     |     |     |     |     |     | 1.2 | 1.6 |     |     |
| IE3D180MX04                     | 50 | 4 | Δ | 18.5 | 1475 | 120  | 3.3 | 34.5 |                                     |     |     |     |     |     |     | 1.3 | 2.0 |     |
| IE3D180LX04                     | 50 | 4 | Δ | 22   | 1475 | 142  | 3   | 41   |                                     |     |     |     |     |     |     | 1.1 | 1.7 | 2.1 |
| IE3D200LX04                     | 50 | 4 | Δ | 30   | 1480 | 194  | 2.5 | 54   |                                     |     |     |     |     |     |     |     | 1.3 | 1.6 |
| IE3D225SX04                     | 50 | 4 | Δ | 37   | 1475 | 240  | 2.6 | 67   |                                     |     |     |     |     |     |     |     | 1.0 | 1.3 |
| IE3D225MX04                     | 50 | 4 | Δ | 45   | 1475 | 291  | 2.4 | 83   |                                     |     |     |     |     |     |     |     |     | 1.0 |

## 9.4 Accessories

You can find information about the available accessories in the following chapters.

### 9.4.1 Safety technology

#### ASP 5001 – Safe Torque Off

Available with the standard design.



Option module for implementation of integrated safety function Safe Torque Off (STO).

The ASP 5001 may only be installed by STÖBER Antriebstechnik GmbH + Co. KG!

The ASP 5001 must be ordered with the basic device.

### 9.4.2 Communication

#### IGB connecting cable



Cable for connecting the interface X3A or X3B on the inverter front for IGB, CAT5e, magenta, connector angled at 45°.

The following versions are available:

ID No. 49855: 0.4 m.

ID No. 49856: 2 m.

#### PC connecting cables



ID No. 49857

Cable for connecting the X3A or X3B interface with the PC, CAT5e, blue, 5 m.

#### USB 2.0 Ethernet adapter



ID No. 49940

Adapter for connecting Ethernet to a USB port.

#### CANopen DS-301 CAN 5000 communication module



ID No. 44574

Accessory part for connecting CAN bus.

#### PROFIBUS DP-V1 DP 5000 communication module



ID No. 44575

Accessory module for connecting PROFIBUS DP-V1.

#### EtherCAT ECS 5000 communication module



ID No. 49014

Accessory part for connecting EtherCAT (CANopen over EtherCAT).

#### EtherCAT cables



Ethernet patch cable, CAT5e, yellow.

The following designs are available:

ID No. 49313: Length approx. 0.2 m.

ID No. 49314: Length approx. 0.35 m.

#### PROFINET PN 5000 communication module



ID No. 53893

Accessory part for connecting PROFINET.

### 9.4.3 Terminal module

#### SEA 5001 standard terminal module



ID No. 49576

Terminals:

- 2 analog inputs
- 2 analog outputs
- 5 digital inputs
- 2 digital outputs

#### XEA 5001 extended terminal module



ID No. 49015

Terminals:

- 3 analog inputs
- 2 analog outputs
- 13 digital inputs
- 10 digital outputs

Encoder / interfaces:

- TTL incremental encoder (simulation and evaluation)
- Pulse/direction interface (simulation and evaluation)
- SSI encoder (simulation and evaluation)

**X120 SSI/TTL connection cable**

ID No. 49482

Cable for connecting the X120 TTL interface on the SD6 drive controller (on terminal module RI6 or XI6) with the X301 interface on the LA6 adapter box in order to transfer Hall sensor signals. 0.3 m.

**REA 5001 resolver terminal module**

ID No. 49854

Terminals:

- 2 analog inputs
- 2 analog outputs
- 5 binary inputs
- 2 binary outputs

Encoder / interfaces:

- Resolver
- EnDat 2.1 sin/cos encoders
- TTL incremental encoder (simulation and evaluation)
- SSI encoder (simulation and evaluation)
- Pulse/direction interface (simulation and evaluation)



Resolver cables that were connected to an POSIDYN SDS 4000 can be connected using the resolver adapter (9-pin to 15-pin) included in the scope of delivery to terminal X140 of REA 5001.

## 9.4.4 Braking resistor

In addition to the inverters, STÖBER offers braking resistors in different sizes and performance classes described below. For the selection, note the minimum permitted braking resistances specified in the technical data of the individual inverter types.

### 9.4.4.1 FZMU, FZZMU tubular fixed resistor

| Type      | FZMU 400×65 |       |       | FZZMU 400×65 |       |       |
|-----------|-------------|-------|-------|--------------|-------|-------|
| ID No.    | 49010       | 55445 | 55446 | 53895        | 55447 | 55448 |
| SDS 5007A | X           | —     | —     | —            | —     | —     |
| SDS 5008A | X           | —     | —     | —            | —     | —     |
| SDS 5015A | X           | —     | —     | —            | —     | —     |
| SDS 5040A | (X)         | —     | —     | X            | —     | —     |
| SDS 5075A | (X)         | —     | —     | X            | —     | —     |
| SDS 5110A | (—)         | X     | —     | (X)          | X     | —     |
| SDS 5150A | (—)         | X     | —     | (X)          | X     | —     |
| SDS 5220A | (—)         | (X)   | X     | (—)          | (X)   | X     |
| SDS 5370A | (—)         | (X)   | X     | (—)          | (X)   | X     |
| SDS 5450A | (—)         | (X)   | X     | (—)          | (X)   | X     |

Tab. 31: Assignment of FZMU, FZZMU braking resistor – SDS 5000 inverter

|     |                                 |
|-----|---------------------------------|
| X   | Recommended                     |
| (X) | Possible                        |
| (—) | Useful under certain conditions |
| —   | Not possible                    |

Properties

| Specification                      | FZMU 400×65                                                                        |       |       | FZZMU 400×65                                                                        |       |       |
|------------------------------------|------------------------------------------------------------------------------------|-------|-------|-------------------------------------------------------------------------------------|-------|-------|
| ID No.                             | 49010                                                                              | 55445 | 55446 | 53895                                                                               | 55447 | 55448 |
| Type                               | Tubular fixed resistor                                                             |       |       | Tubular fixed resistor                                                              |       |       |
| Resistance [Ω]                     | 100                                                                                | 22    | 15    | 47                                                                                  | 22    | 15    |
| Power [W]                          | 600                                                                                |       |       | 1200                                                                                |       |       |
| Therm. time const. $\tau_{th}$ [s] | 40                                                                                 |       |       | 40                                                                                  |       |       |
| Pulse power for < 1 s [kW]         | 18                                                                                 |       |       | 36                                                                                  |       |       |
| $U_{max}$ [V]                      | 848                                                                                |       |       | 848                                                                                 |       |       |
| Weight without packaging [g]       | 2200                                                                               |       |       | 4170                                                                                |       |       |
| Protection class                   | IP20                                                                               |       |       | IP20                                                                                |       |       |
| Test symbols                       |  |       |       |  |       |       |

Tab. 32: FZMU, FZZMU specification

Dimensions

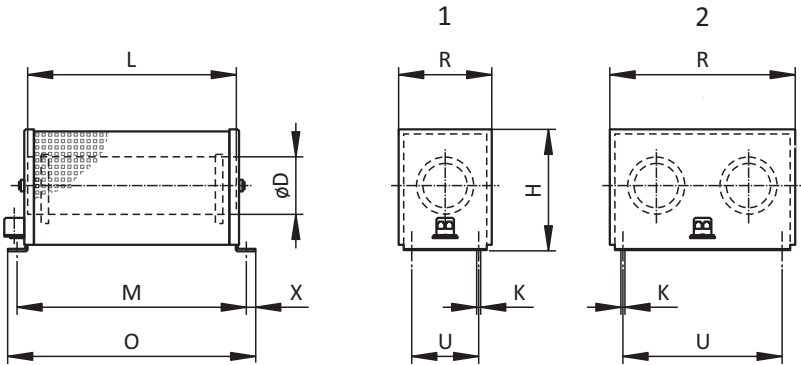


Fig. 3: FZMU (1), FZZMU (2) dimensional drawing

| Dimension | FZMU 400×65 |       |       | FZZMU 400×65 |       |       |
|-----------|-------------|-------|-------|--------------|-------|-------|
| ID No.    | 49010       | 55445 | 55446 | 53895        | 55447 | 55448 |
| L x D     | 400 × 65    |       |       | 400 × 65     |       |       |
| H         | 120         |       |       | 120          |       |       |
| K         | 6.5 × 12    |       |       | 6.5 × 12     |       |       |
| M         | 430         |       |       | 426          |       |       |
| O         | 485         |       |       | 450          |       |       |
| R         | 92          |       |       | 185          |       |       |
| U         | 64          |       |       | 150          |       |       |
| X         | 10          |       |       | 10           |       |       |

Tab. 33: FZMU, FZZMU dimensions [mm]

## 9.4.4.2 GVADU, GBADU flat resistor

| Type      | GVADU<br>210×20 | GBADU<br>265×30 | GBADU<br>405×30 | GBADU<br>335×30 | GBADU<br>265×30 |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|
| ID No.    | 55441           | 55442           | 55499           | 55443           | 55444           |
| SDS 5007A | X               | X               | X               | —               | —               |
| SDS 5008A | X               | X               | X               | —               | —               |
| SDS 5015A | X               | X               | X               | —               | —               |
| SDS 5040A | (X)             | (X)             | (X)             | X               | —               |
| SDS 5075A | (X)             | (X)             | (X)             | X               | —               |
| SDS 5110A | (—)             | (—)             | (—)             | (X)             | X               |
| SDS 5150A | (—)             | (—)             | (—)             | (X)             | X               |
| SDS 5220A | (—)             | (—)             | (—)             | (—)             | (X)             |
| SDS 5370A | (—)             | (—)             | (—)             | (—)             | (X)             |
| SDS 5450A | (—)             | (—)             | (—)             | (—)             | (X)             |

Tab. 34: Assignment of GVADU, GBADU braking resistor – SDS 5000 inverters

|     |                                 |
|-----|---------------------------------|
| X   | Recommended                     |
| (X) | Possible                        |
| (—) | Useful under certain conditions |
| —   | Not possible                    |

## Properties

| Specification                      | GVADU<br>210×20                                                                     | GBADU<br>265×30                                                                      | GBADU<br>405×30                                                                       | GBADU<br>335×30                                                                       | GBADU<br>265×30                                                                       |
|------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                             | 55441                                                                               | 55442                                                                                | 55499                                                                                 | 55443                                                                                 | 55444                                                                                 |
| Type                               | Flat resistor                                                                       | Flat resistor                                                                        | Flat resistor                                                                         | Flat resistor                                                                         | Flat resistor                                                                         |
| Resistance [ $\Omega$ ]            | 100                                                                                 | 100                                                                                  | 100                                                                                   | 47                                                                                    | 22                                                                                    |
| Power [W]                          | 150                                                                                 | 300                                                                                  | 500                                                                                   | 400                                                                                   | 300                                                                                   |
| Therm. time const. $\tau_{th}$ [s] | 60                                                                                  | 60                                                                                   | 60                                                                                    | 60                                                                                    | 60                                                                                    |
| Pulse power for < 1 s [kW]         | 3.3                                                                                 | 6.6                                                                                  | 11                                                                                    | 8.8                                                                                   | 6.6                                                                                   |
| $U_{max}$ [V]                      | 848                                                                                 | 848                                                                                  | 848                                                                                   | 848                                                                                   | 848                                                                                   |
| Cable design                       | Radox                                                                               | FEP                                                                                  | FEP                                                                                   | FEP                                                                                   | FEP                                                                                   |
| Cable length [mm]                  | 500                                                                                 | 500                                                                                  | 500                                                                                   | 500                                                                                   | 500                                                                                   |
| Conductor cross-section [AWG]      | 18/19<br>(0.82 mm <sup>2</sup> )                                                    | 14/19<br>(1.9 mm <sup>2</sup> )                                                      | 14/19<br>(1.9 mm <sup>2</sup> )                                                       | 14/19<br>(1.9 mm <sup>2</sup> )                                                       | 14/19<br>(1.9 mm <sup>2</sup> )                                                       |
| Weight without packaging [g]       | 300                                                                                 | 930                                                                                  | 1410                                                                                  | 1200                                                                                  | 930                                                                                   |
| Protection class                   | IP54                                                                                | IP54                                                                                 | IP54                                                                                  | IP54                                                                                  | IP54                                                                                  |
| Test symbols                       |  |  |  |  |  |

Tab. 35: GVADU, GBADU specification



Dimensions

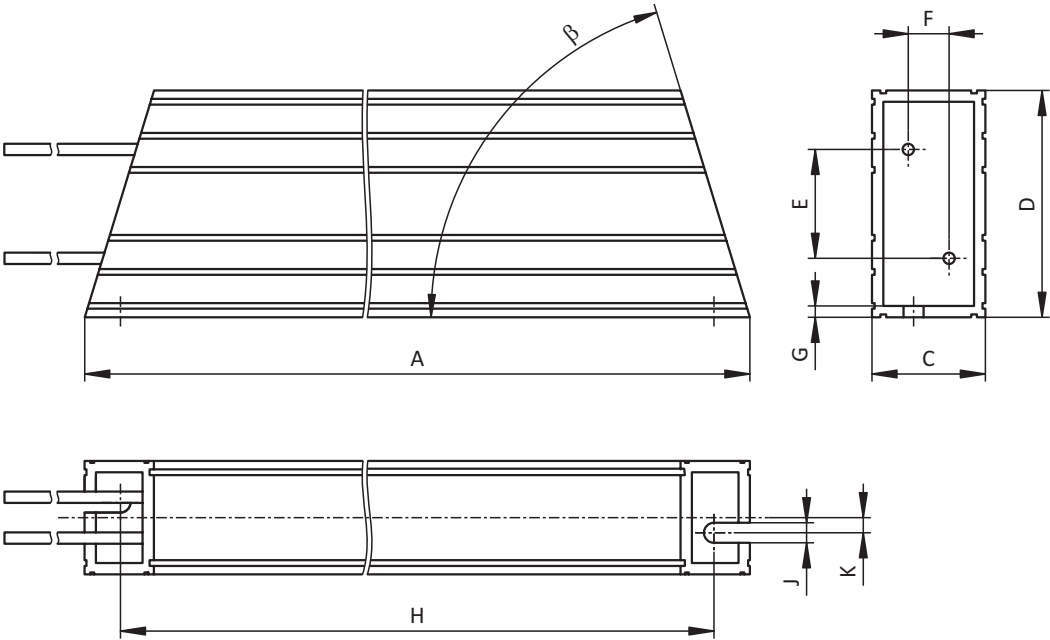


Fig. 4: GVADU, GBADU dimensional drawing

| Dimension | GVADU<br>210×20 | GBADU<br>265×30 | GBADU<br>405×30 | GBADU<br>335×30 | GBADU<br>265×30 |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|
| ID No.    | 55441           | 55442           | 55499           | 55443           | 55444           |
| A         | 210             | 265             | 405             | 335             | 265             |
| H         | 192             | 246             | 386             | 316             | 246             |
| C         | 20              | 30              | 30              | 30              | 30              |
| D         | 40              | 60              | 60              | 60              | 60              |
| E         | 18.2            | 28.8            | 28.8            | 28.8            | 28.8            |
| F         | 6.2             | 10.8            | 10.8            | 10.8            | 10.8            |
| G         | 2               | 3               | 3               | 3               | 3               |
| K         | 2.5             | 4               | 4               | 4               | 4               |
| J         | 4.3             | 5.3             | 5.3             | 5.3             | 5.3             |
| β         | 65°             | 73°             | 73°             | 73°             | 73°             |

Tab. 36: GVADU, GBADU dimensions [mm]

### 9.4.4.3 FGFKU steel-grid fixed resistor

| Type      | FGFKU<br>3100502 | FGFKU<br>3100502 | FGFKU<br>3111202 | FGFKU<br>3121602 |
|-----------|------------------|------------------|------------------|------------------|
| ID No.    | 55449            | 55450            | 55451            | 53897            |
| SDS 5110A | X                | —                | —                | —                |
| SDS 5150A | X                | —                | —                | —                |
| SDS 5220A | (X)              | X                | X                | X                |
| SDS 5370A | (X)              | X                | X                | X                |
| SDS 5450A | (X)              | X                | X                | X                |

Tab. 37: Assignment of FGFKU braking resistor – SDS 5000 inverter

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

#### Properties

| Specification                      | FGFKU<br>3100502          | FGFKU<br>3100502 | FGFKU<br>3111202 | FGFKU<br>3121602 |
|------------------------------------|---------------------------|------------------|------------------|------------------|
| ID No.                             | 55449                     | 55450            | 55451            | 53897            |
| Type                               | Steel-grid fixed resistor |                  |                  |                  |
| Resistance [ $\Omega$ ]            | 22                        | 15               | 15               | 15               |
| Power [W]                          | 2500                      | 2500             | 6000             | 8000             |
| Therm. time const. $\tau_{th}$ [s] | 30                        | 30               | 20               | 20               |
| Pulse power for < 1 s [kW]         | 50                        | 50               | 120              | 160              |
| $U_{max}$ [V]                      | 848                       | 848              | 848              | 848              |
| Weight without packaging [g]       | 7500                      | 7500             | 12000            | 18000            |
| Protection class                   | IP20                      | IP20             | IP20             | IP20             |
| Test symbols                       |                           |                  |                  |                  |

Tab. 38: FGFKU specification

#### Dimensions

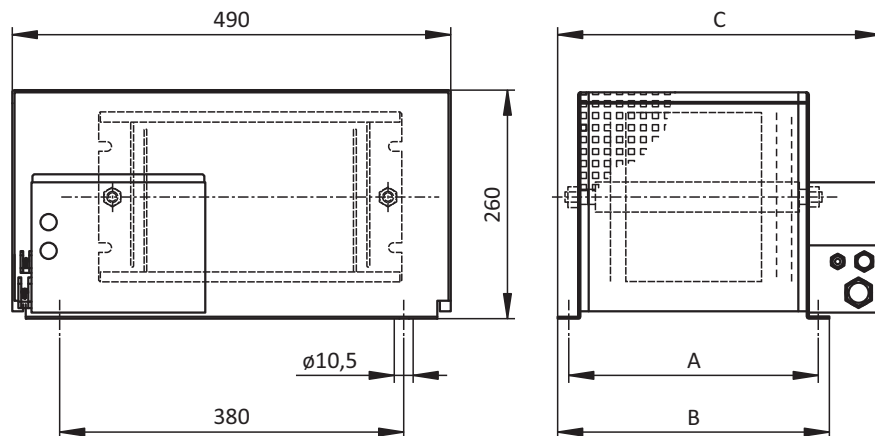


Fig. 5: FGFKU dimensional drawing

| Dimension | FGFKU<br>3100502 | FGFKU<br>3100502 | FGFKU<br>3111202 | FGFKU<br>3121602 |
|-----------|------------------|------------------|------------------|------------------|
| ID No.    | 55449            | 55450            | 55451            | 53897            |
| A         | 270              | 270              | 370              | 570              |
| B         | 295              | 295              | 395              | 595              |
| C         | 355              | 355              | 455              | 655              |

Tab. 39: FGFKU dimensions [mm]

#### 9.4.4.4 RB 5000 rear section braking resistor

| Type      | RB 5022 | RB 5047 | RB 5100 |
|-----------|---------|---------|---------|
| ID No.    | 45618   | 44966   | 44965   |
| SDS 5007A | —       | —       | X       |
| SDS 5008A | —       | —       | X       |
| SDS 5015A | —       | —       | X       |
| SDS 5040A | —       | X       | (X)     |
| SDS 5075A | —       | X       | (X)     |
| SDS 5110A | X       | —       | —       |
| SDS 5150A | X       | —       | —       |

Tab. 40: Assignment of RB 5000 braking resistor – SDS 5000 inverter

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

#### Properties

| Specification                            | RB 5022                                                                              | RB 5047                                                                               | RB 5100                                                                               |
|------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                                   | 45618                                                                                | 44966                                                                                 | 44965                                                                                 |
| Resistance [ $\Omega$ ]                  | 22                                                                                   | 47                                                                                    | 100                                                                                   |
| Power [W]                                | 100                                                                                  | 60                                                                                    | 60                                                                                    |
| Therm. time const. $\tau_{th}$ [s]       | 8                                                                                    | 8                                                                                     | 8                                                                                     |
| Pulse power for < 1 s [kW]               | 1.5                                                                                  | 1.0                                                                                   | 1.0                                                                                   |
| $U_{max}$ [V]                            | 800                                                                                  | 800                                                                                   | 800                                                                                   |
| Weight without packaging [g]             | 640                                                                                  | 460                                                                                   | 440                                                                                   |
| Cable design                             | Radox                                                                                | Radox                                                                                 | Radox                                                                                 |
| Cable length [mm]                        | 250                                                                                  | 250                                                                                   | 250                                                                                   |
| Conductor cross-section [AWG]            | 18/19<br>(0.82 mm <sup>2</sup> )                                                     | 18/19<br>(0.82 mm <sup>2</sup> )                                                      | 18/19<br>(0.82 mm <sup>2</sup> )                                                      |
| Maximum torque of M5 threaded bolts [Nm] | 5                                                                                    | 5                                                                                     | 5                                                                                     |
| Protection class                         | IP40                                                                                 | IP40                                                                                  | IP40                                                                                  |
| Test symbols                             |  |  |  |

Tab. 41: RB 5000 specification

#### Dimensions

| Dimension                            | RB 5022 | RB 5047 | RB 5100           |
|--------------------------------------|---------|---------|-------------------|
| ID No.                               | 45618   | 44966   | 44965             |
| Height                               | 300     | 300     | 300               |
| Width                                | 94      | 62      | 62                |
| Depth                                | 18      | 18      | 18                |
| Drilling diagram corresponds to size | Size 2  | Size 1  | Size 0 and Size 1 |

Tab. 42: RB 5000 dimensions [mm]

## 9.4.5 Choke

Technical specifications for suitable chokes can be found in the following chapters.

### 9.4.5.1 TEP output choke

Output chokes are required for connecting size 0 to 2 drive controllers from a cable length > 50 m in order to reduce interference pulses and protect the drive system.

#### Information

The following technical data only applies to a rotating magnetic field frequency of 200 Hz. For example, this rotating magnetic field frequency is achieved with a motor with 4 pole pairs and a nominal speed of 3000 rpm. Always observe the specified derating for higher rotating magnetic field frequencies. Also observe the relationship with the clock frequency.

#### Properties

| Specification                                       | TEP3720-0ES41                                                                         | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|---------------|---------------|
| ID No.                                              | 53188                                                                                 | 53189         | 53190         |
| Voltage range                                       | 3 × 0 to 480 V <sub>AC</sub>                                                          |               |               |
| Frequency range                                     | 0 – 200 Hz                                                                            |               |               |
| Nominal current I <sub>N,MF</sub> at 4 kHz          | 4 A                                                                                   | 17.5 A        | 38 A          |
| Nominal current I <sub>N,MF</sub> at 8 kHz          | 3.3 A                                                                                 | 15.2 A        | 30.4 A        |
| Max. permitted motor cable length with output choke | 100 m                                                                                 |               |               |
| Max. surrounding temperature $\vartheta_{amb,max}$  | 40 °C                                                                                 |               |               |
| Protection class                                    | IP00                                                                                  |               |               |
| Winding losses                                      | 11 W                                                                                  | 29 W          | 61 W          |
| Iron losses                                         | 25 W                                                                                  | 16 W          | 33 W          |
| Connection                                          | Screw terminal                                                                        |               |               |
| Max. conductor cross-section                        | 10 mm <sup>2</sup>                                                                    |               |               |
| UL Recognized                                       | Yes                                                                                   |               |               |
| Component (CAN; USA)                                |                                                                                       |               |               |
| Test symbols                                        |  |               |               |

Tab. 43: TEP specification

Dimensions

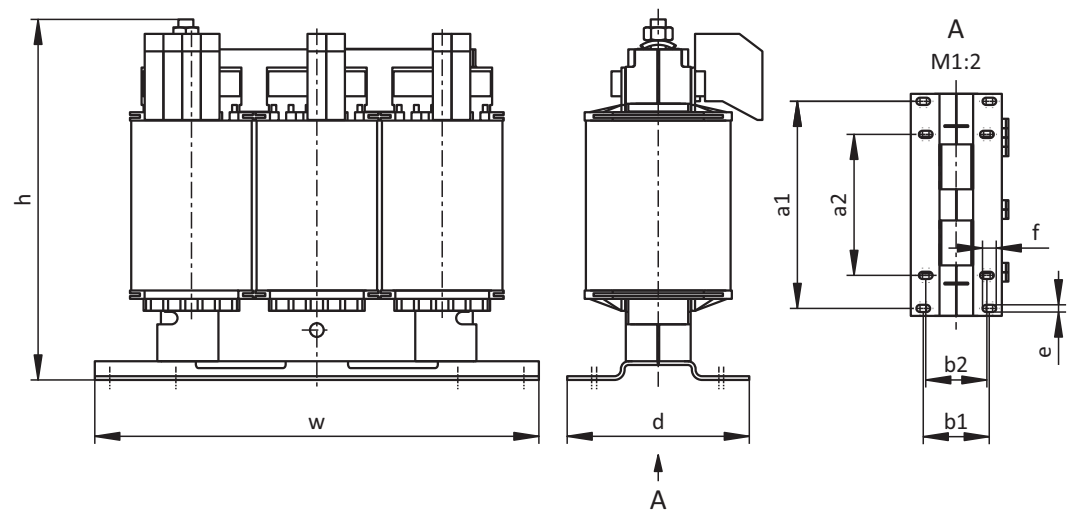


Fig. 6: TEP dimensional drawing

| Dimension                                     | TEP3720-0ES41 | TEP3820-0CS41 | TEP4020-0RS41 |
|-----------------------------------------------|---------------|---------------|---------------|
| Height h [mm]                                 | Max. 153      | Max. 153      | Max. 180      |
| Width w [mm]                                  | 178           | 178           | 219           |
| Depth d [mm]                                  | 73            | 88            | 119           |
| Vertical distance – Fastening holes a1 [mm]   | 166           | 166           | 201           |
| Vertical distance – Fastening holes a2 [mm]   | 113           | 113           | 136           |
| Horizontal distance – Fastening holes b1 [mm] | 53            | 68            | 89            |
| Horizontal distance – Fastening holes b2 [mm] | 49            | 64            | 76            |
| Drill holes – Depth e [mm]                    | 5.8           | 5.8           | 7             |
| Drill holes – Width f [mm]                    | 11            | 11            | 13            |
| Screw connection – M                          | M5            | M5            | M6            |
| Weight without packaging [g]                  | 2900          | 5900          | 8800          |

Tab. 44: TEP dimensions and weight

## 9.4.6 Brake module and EMC shroud

### BRS 5001 brake module



ID No. 56519

Brake module for inverters of the SDS 5000 series.

Accessory part for direct control of up to two brakes ( $24 V_{DC}$ ) and (for inverters up to size 2) for connecting to the shield of the power cable.

Can be attached to the basic housing.

Including connection cable for basic device and shield connection terminal.

### EM 5000 EMC shroud



ID No. 44959

EMC shroud for servo inverters of generation 5.

Accessory part for shield connection of the power cable for inverters up to size 2.

Can be attached to the basic housing.

Including shield connection terminal.

### EMC shroud EM6A3



ID No. 56521

EMC shroud for drive controllers of the MDS 5000, SDS 5000 and SD6 series.

Accessory part for shield connection of the power cable for drive controllers up to size 3.

Can be attached to the basic housing.

Including shield connection terminal.

If necessary you can also connect the cable shield of the braking resistor and DC link connection to the shroud. Additional shield connection terminals are available as accessories for this purpose (ID No. 56521).

## 9.4.7 Removable data storage

### Paramodul removable data storage

Included in the standard version.



ID No. 55464

Memory module for configuration and parameters.

## 9.5 Further information

### 9.5.1 Directives and standards

The following European directives and standards are relevant for inverters:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- EN 61326-3-1:2008
- EN 61800-3:2012-09 and 1:2014-02
- EN 61800-5-1:2008-04 and 1:2010-04
- EN 61800-5-2:2016-04
- EN 50178:1997

### 9.5.2 Symbols, marks and test symbols



**Grounding symbol**

Grounding symbol in accordance with IEC 60417, symbol 5019.



**RoHS lead-free mark**

Marking in accordance with RoHS directive 2011-65-EU.



**CE mark**

Manufacturer's self declaration: The product meets the requirements of EU directives.



**UL test symbol**

This product is listed by UL for the United States and Canada. Representative samples of this product have been evaluated by UL and meet the requirements of applicable standards.



**UL recognized component mark**

This component or material is recognized by UL. Representative samples of this product have been evaluated by UL and meet applicable requirements.

### 9.5.3 Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

| Documentation                                             | ID     |
|-----------------------------------------------------------|--------|
| Configuration manual for POSIDYN SDS 5000 servo inverters | 442277 |

## 10 POSIDRIVE FDS 5000 Frequency inverters

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## 10

## Frequency inverters

## POSIDRIVE FDS 5000

### 10.1 Overview

The purpose-built asynchronous servo axis

#### Features

- Nominal output current up to 16 A
- 180% overload capacity
- Power range: 0.37 kW to 7.5 kW
- Control of rotating asynchronous motors
- Interface for incremental encoder (HTL/TTL)
- Communication using PROFIBUS DP, PROFINET, CANopen or EtherCAT
- Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions: SIL 3, PL e (cat. 3)
- Digital and analog inputs and outputs
- Brake chopper and line filter
- Convenient operating unit consisting of plain-text display and buttons
- Paramodul removable data storage for quick commissioning and service

## 10.1.1 Features

The FDS 5000 series is a purely digital, modular inverter system for operating rotational asynchronous motors with product types for direct operation on a single-phase or three-phase network in a voltage range from 200 V<sub>AC</sub> to 528 V<sub>AC</sub>. An EMC line filter is integrated. An incremental encoder interface (HTL/TTL) is available by default. The ASP 5001 safety module makes it possible to implement the Safe Torque Off (STO) and Safe Stop 1 (SS1) safety functions in accordance with DIN EN ISO 13849-1 and DIN EN 61800-5-2 for safety-relevant applications. Communication modules provide the connection to a controller over the PROFIBUS DP, PROFINET, CANopen or EtherCAT fieldbus. Plain-text display and buttons simplify diagnostics in the event of faults and enable quick access to parameters. The Paramodul removable data storage can be used to transfer all application-relevant data from one inverter to another.

The vector control, sensorless vector control and U/f controller control modes are available for use with asynchronous motors.



POSIDRIVE FDS 5000

### Paramodul removable data storage

Removable data storage for fast series commissioning by copying and easy service when replacing devices.



### POSITool

The 5th generation of POSITool project configuration and commissioning software has all the functions needed for efficient use of inverters in single and multi-axis applications.

## 10.1.2 Software components

### Modular application software

Various standard applications can be loaded onto the devices of the 5th STÖBER inverter generation with the POSITool commissioning software as needed. Furthermore, programming based on IEC 61131-3 with CFC can be used to create new applications or expand existing ones. The inverter operating system is multi-axis capable. It supports up to four axes with separate application and parameter ranges.

### Velocity mode (standard application)

- **Fast set value**

Simple speed application for lean applications. The speed reference value and torque limiting can be specified using analog inputs as well as digitally.

**Torque/force and velocity mode (standard application)**

- **Comfort set value**  
Expanded torque and speed set value application. Set values and limits can be assigned with the fast set value as well as using fixed values, motor potentiometers and other functions.
- **Technology controller**  
PID controller for torque or speed-controlled applications.

**Positioning and master/slave mode (standard application)**

- **Command, synchronous command**  
High-performance positioning application with a command interface based on PLCopen. The data for a motion task including target position, velocity and acceleration are transferred together over fieldbus to the inverter, which then processes them independently. The functional scope is rounded out by an electrical cam, motion block switching point and Posi-Latch.
- **Motion block**  
Extensive positioning application with up to 256 motion blocks based on PLCopen. The motion blocks can be selected individually over fieldbus or with digital inputs. They can also be started in a chain. The functional scope is rounded out by an electrical cam, motion block switching point and Posi-Latch.

**Electronic cam disk with PLCopen interface (tailor-made applications)**

The electronic cam disk application makes it possible to implement complex motion tasks such as:

- Flying saw
- Synchronizer (clock in/clock out)
- Cross cutter
- Welding bar/embossing stamp
- Print mark control

These applications can be implemented quickly and easily using readily understandable, free graphical programming based on IEC 61131-3 CFC. This also allows for customer-specific adaptations to special system conditions. Function blocks based on PLCopen Motion Control are available for this purpose for trained users.

## 10.1.3 Application training

STOBER offers a multi-level training program that focuses essentially on application programming of the motion controller and inverter.

The application training is performed on the SDS 5000 series.

**G5 Basic**

Training content: System overview, installation and commissioning of the inverter. Use of option modules. Parameterization, commissioning and diagnostics using the integrated display and commissioning software. Remote maintenance. Basics of controller optimization. Configuration of the drive train. Integrated software functions. Software applications. Connection to a higher-level controller. Basics of safety technology. Practical exercises on training topics.

Software used: POSITool.

**G5 Advanced**

Training content: Graphical programming with CFC. Special knowledge for regulating, control and safety technology. Practical exercises on training topics.

**G5 CAM**

Training content: Special knowledge of electronic cam disks. Practical exercises on training topics.

## 10.2 Technical data

Technical data for inverters can be found in the following sections.

### 10.2.1 Type designation

|     |   |     |   |
|-----|---|-----|---|
| FDS | 5 | 015 | A |
|-----|---|-----|---|

Tab. 1: Example code for type designation

| Code | Designation       | Design                                                                                                                                                                                                                       |
|------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FDS  | Series            |                                                                                                                                                                                                                              |
| 5    | Generation        | Generation 5                                                                                                                                                                                                                 |
| 075  | Power             | 075 = 7.5 kW                                                                                                                                                                                                                 |
| –    | Hardware variants | Without marking: Up to HW 199                                                                                                                                                                                                |
| A    |                   | A: Starting from HW 200                                                                                                                                                                                                      |
| /H   | Version           | Auxiliary voltage for control electronics:                                                                                                                                                                                   |
| /L   |                   |                                                                                                                                                                                                                              |
|      |                   | <ul style="list-style-type: none"> <li>Supply for control electronics over DC link; no additional 24 V<sub>DC</sub> supply required</li> <li>Supply of control electronics over 24 V<sub>DC</sub> to terminal X11</li> </ul> |

Tab. 2: Meaning of the example code

### 10.2.2 Sizes

| Type      | ID No. /H | ID No. /L | Size   |
|-----------|-----------|-----------|--------|
| FDS 5004A | 55420     | 55412     | Size 0 |
| FDS 5007A | 55421     | 55413     | Size 0 |
| FDS 5008A | 55422     | 55414     | Size 0 |
| FDS 5015A | 55423     | 55415     | Size 0 |
| FDS 5022A | 55424     | 55416     | Size 1 |
| FDS 5040A | 55425     | 55417     | Size 1 |
| FDS 5055A | 55426     | 55418     | Size 1 |
| FDS 5075A | 55427     | 55419     | Size 1 |

Tab. 3: Available FDS 5000 types and sizes



FDS 5000 in sizes 0 and 1

10.2.3
General technical data

The following information applies to all inverter types.

| Device features                            |                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protection class of the device             | IP20                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Protection class of the installation space | At least IP54                                                                                                                                                                                                                                                                                                                                                                                                              |
| Protection class                           | Protection class I in accordance with DIN EN 61140                                                                                                                                                                                                                                                                                                                                                                         |
| Radio interference suppression             | Integrated line filter in accordance with DIN EN 61800-3, interference emission class C3                                                                                                                                                                                                                                                                                                                                   |
| Overvoltage category                       | III in accordance with DIN EN 61800-5-1                                                                                                                                                                                                                                                                                                                                                                                    |
| Test symbols                               |      |

Tab. 4: Device features

| Transport and storage conditions                                                                                                       |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Storage/transport temperature                                                                                                          | -20 °C to +70 °C<br>Maximum change: 20 K/h                                            |
| Relative humidity                                                                                                                      | Maximum relative humidity 85%, non-condensing                                         |
| Vibration (transport) in accordance with DIN EN 60068-2-6                                                                              | 5 Hz ≤ f ≤ 9 Hz: 3.5 mm<br>9 Hz ≤ f ≤ 200 Hz: 10 m/s²<br>200 Hz ≤ f ≤ 500 Hz: 15 m/s² |
| Fall height for freefall <sup>1</sup><br>Weight < 100 kg<br>in accordance with DIN EN 61800-2<br>(or DIN EN 60721-3-2:1997, class 2M1) | 0.25 m                                                                                |

Tab. 5: Transport and storage conditions

| Operating conditions                                      |                                                                                                                  |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Surrounding temperature during operation                  | 0 °C to 45 °C with nominal data<br>45 °C to 55 °C with derating -2.5% / K                                        |
| Relative humidity                                         | Maximum relative humidity 85%, non-condensing                                                                    |
| Installation altitude                                     | 0 m to 1000 m above sea level without restrictions<br>1000 m to 2000 m above sea level with -1.5%/100 m derating |
| Pollution degree                                          | Pollution degree 2 in accordance with EN 50178                                                                   |
| Ventilation                                               | Installed fan                                                                                                    |
| Vibration (operation) in accordance with DIN EN 60068-2-6 | 5 Hz ≤ f ≤ 9 Hz: 0.35 mm<br>9 Hz ≤ f ≤ 200 Hz: 1 m/s²                                                            |

Tab. 6: Operating conditions

| Discharge times           |       |
|---------------------------|-------|
| Self-discharge of DC link | 6 min |

Tab. 7: Discharge times of the DC link circuit

## 10.2.4 Electrical data

The electrical data of the available sizes as well as the properties of the brake chopper can be found in the following sections.

An explanation of the formula symbols used can be found in the chapter [\[ 13.1 \]](#).

### 10.2.4.1 Size 0: FDS 5007A to FDS 5015A

| Electrical data          | FDS 5007A                              | FDS 5004A                                                             | FDS 5008A | FDS 5015A |
|--------------------------|----------------------------------------|-----------------------------------------------------------------------|-----------|-----------|
| ID No. /H                | 55421                                  | 55420                                                                 | 55422     | 55423     |
| ID No. /L                | 55413                                  | 55412                                                                 | 55414     | 55415     |
| Recommended motor rating | 0.75 kW                                | 0.37 kW                                                               | 0.75 kW   | 1.5 kW    |
| $U_{1PU}$                | 1 × 230 V,<br>+20% / -40%,<br>50/60 Hz | 3 × 400 V,<br>+32% / -50%, 50 Hz;<br>3 × 480 V,<br>+10% / -58%, 60 Hz |           |           |
| $I_{1N,PU}$              | 1 × 5.9 A                              | 3 × 1.4 A                                                             | 3 × 2.2 A | 3 × 4 A   |
| $f_{2PU}$                | 0 – 700 Hz                             |                                                                       |           |           |
| $U_{2PU}$                | 0 – 230 V                              | 0 – 400 V                                                             |           |           |
| $U_{maxPU}$              | 440 V                                  | 830 V                                                                 |           |           |

Tab. 8: FDS 5000 electrical data, size 0

**Nominal currents up to +45 °C (in the control cabinet)**

**Operation with asynchronous motor**

| Electrical data | FDS 5007A                   | FDS 5004A | FDS 5008A | FDS 5015A |
|-----------------|-----------------------------|-----------|-----------|-----------|
| $I_{2N,PU}$     | 3 × 4 A                     | 3 × 1.3 A | 3 × 2.3 A | 3 × 4.5 A |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |           |           |           |
| $f_{PWM,PU}$    | 4 kHz <sup>2</sup>          |           |           |           |

Tab. 9: FDS 5000 electrical data, size 0, at 4 kHz clock frequency

| Electrical data | FDS 5007A   | FDS 5004A   | FDS 5008A | FDS 5015A |
|-----------------|-------------|-------------|-----------|-----------|
| $U_{onCH}$      | 400 – 420 V | 780 – 800 V |           |           |
| $U_{offCH}$     | 360 – 380 V | 740 – 760 V |           |           |
| $R_{2minRB}$    | 100 Ω       | 100 Ω       |           |           |
| $P_{maxRB}$     | 1.8 kW      | 6.4 kW      |           |           |

Tab. 10: Brake chopper electrical data, size 0

### 10.2.4.2 Size 1: FDS 5022A to FDS 5075A

| Electrical data          | FDS 5022A                                                             | FDS 5040A | FDS 5055A  | FDS 5075A  |
|--------------------------|-----------------------------------------------------------------------|-----------|------------|------------|
| ID No. /H                | 55424                                                                 | 55425     | 55426      | 55427      |
| ID No. /L                | 55416                                                                 | 55417     | 55418      | 55419      |
| Recommended motor rating | 2.2 kW                                                                | 4.0 kW    | 5.5 kW     | 7.5 kW     |
| $U_{1PU}$                | 3 × 400 V,<br>+32% / -50%, 50 Hz;<br>3 × 480 V,<br>+10% / -58%, 60 Hz |           |            |            |
| $I_{1N,PU}$              | 3 × 5.3 A                                                             | 3 × 9.3 A | 3 × 12.3 A | 3 × 15.8 A |
| $f_{2PU}$                | 0 – 700 Hz                                                            |           |            |            |
| $U_{2PU}$                | 0 – 400 V                                                             |           |            |            |
| $U_{maxPU}$              | 830 V                                                                 |           |            |            |

Tab. 11: FDS 5000 electrical data, size 1

<sup>2</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

Nominal currents up to +45 °C (in the control cabinet)

Operation with asynchronous motor

| Electrical data | FDS 5022A                   | FDS 5040A | FDS 5055A | FDS 5075A |
|-----------------|-----------------------------|-----------|-----------|-----------|
| $I_{2N,PU}$     | 3 × 5.5 A                   | 3 × 10 A  | 3 × 12 A  | 3 × 16 A  |
| $I_{2maxPU}$    | 180% for 5 s; 150% for 30 s |           |           |           |
| $f_{PWM,PU}$    | 4 kHz <sup>3</sup>          |           |           |           |

Tab. 12: FDS 5000 electrical data, size 1, at 4 kHz clock frequency

| Electrical data | FDS 5022A   | FDS 5040A | FDS 5055A | FDS 5075A |
|-----------------|-------------|-----------|-----------|-----------|
| $U_{onCH}$      | 780 – 800 V |           |           |           |
| $U_{offCH}$     | 740 – 760 V |           |           |           |
| $R_{2minRB}$    | 100 Ω       | 47 Ω      |           |           |
| $P_{maxRB}$     | 6.4 kW      | 13.6 kW   |           |           |

Tab. 13: Brake chopper electrical data, size 1

### 10.2.4.3 Power loss data in accordance with EN 61800-9-2

| Type         | Nominal<br>current<br><br>I <sub>2N,PU</sub> | Apparent<br>power | Absolute<br>losses<br><br>P <sub>V,CU</sub> <sup>4</sup> | Operating points <sup>5</sup> |        |         |         |         |          |         |          | IE class <sup>6</sup> |
|--------------|----------------------------------------------|-------------------|----------------------------------------------------------|-------------------------------|--------|---------|---------|---------|----------|---------|----------|-----------------------|
|              |                                              |                   |                                                          | (0/25)                        | (0/50) | (0/100) | (50/25) | (50/50) | (50/100) | (90/50) | (90/100) |                       |
|              |                                              |                   |                                                          | Relative losses               |        |         |         |         |          |         |          |                       |
|              | [A]                                          | [kVA]             | [W]                                                      | [%]                           |        |         |         |         |          |         |          |                       |
| FDS<br>5004A | 1.3                                          | 0.9               | 6                                                        | 5.92                          | 5.94   | 6.20    | 5.97    | 6.02    | 6.36     | 6.13    | 6.62     | IE2                   |
| FDS<br>5007A | 4                                            | 0.9               | 6                                                        | 5.01                          | 5.07   | 5.68    | 5.20    | 5.37    | 6.30     | 5.88    | 7.43     | IE2                   |
| FDS<br>5008A | 2.3                                          | 1.6               | 6                                                        | 2.98                          | 3.13   | 3.49    | 3.02    | 3.22    | 3.71     | 3.36    | 4.09     | IE2                   |
| FDS<br>5015A | 4.5                                          | 3.1               | < 9                                                      | 1.71                          | 1.86   | 2.24    | 1.75    | 1.97    | 2.51     | 2.16    | 3.04     | IE2                   |
| FDS<br>5022A | 5.5                                          | 3.8               | < 9                                                      | 1.64                          | 1.79   | 2.16    | 1.69    | 1.89    | 2.38     | 2.02    | 2.74     | IE2                   |
| FDS<br>5040A | 10                                           | 6.9               | < 9                                                      | 1.38                          | 1.54   | 1.93    | 1.43    | 1.64    | 2.17     | 1.80    | 2.57     | IE2                   |
| FDS<br>5055A | 12                                           | 8.3               | < 9                                                      | 1.10                          | 1.26   | 1.76    | 1.15    | 1.36    | 2.04     | 1.51    | 2.50     | IE2                   |
| FDS<br>5075A | 16                                           | 11.1              | < 9                                                      | 0.95                          | 1.12   | 1.67    | 1.00    | 1.23    | 1.98     | 1.41    | 2.52     | IE2                   |

Tab. 14: Relative losses in FDS 5000 inverters in accordance with EN 61800-9-2

<sup>3</sup> Clock frequency adjustable from 4 to 16 kHz (see the chapter on derating)

<sup>4</sup> Absolute losses for a power unit that is switched off

<sup>5</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>6</sup> IE class in accordance with EN 61800-9-2

| Type         | Nominal<br>current | Apparent<br>power | Absolute<br>losses             | Operating points <sup>8</sup>     |        |         |         |         |          |         |          | IE<br>class <sup>9</sup> | Compar-<br>ison <sup>10</sup> |
|--------------|--------------------|-------------------|--------------------------------|-----------------------------------|--------|---------|---------|---------|----------|---------|----------|--------------------------|-------------------------------|
|              | I <sub>2N,PU</sub> |                   | P <sub>V,CU</sub> <sup>7</sup> | (0/25)                            | (0/50) | (0/100) | (50/25) | (50/50) | (50/100) | (90/50) | (90/100) |                          |                               |
|              |                    |                   |                                | Absolute losses<br>P <sub>V</sub> |        |         |         |         |          |         |          |                          |                               |
|              | [A]                | [kVA]             | [W]                            | [W]                               |        |         |         |         |          |         |          |                          | [%]                           |
| FDS<br>5004A | 1.3                | 0.9               | 6                              | 53.3                              | 53.5   | 55.8    | 53.7    | 54.2    | 57.2     | 55.2    | 59.6     | IE2                      | 46.2                          |
| FDS<br>5007A | 4                  | 0.9               | 6                              | 45.1                              | 45.6   | 51.1    | 46.8    | 48.3    | 56.7     | 52.9    | 66.9     | IE2                      | 51.8                          |
| FDS<br>5008A | 2.3                | 1.6               | 6                              | 47.7                              | 50.1   | 55.8    | 48.3    | 51.5    | 59.3     | 53.8    | 65.4     | IE2                      | 40.2                          |
| FDS<br>5015A | 4.5                | 3.1               | < 9                            | 52.9                              | 57.6   | 69.3    | 54.4    | 61.0    | 77.9     | 67.1    | 94.1     | IE2                      | 39.6                          |
| FDS<br>5022A | 5.5                | 3.8               | < 9                            | 62.4                              | 68.0   | 82.0    | 64.1    | 71.7    | 90.6     | 76.9    | 104.1    | IE2                      | 34.9                          |
| FDS<br>5040A | 10                 | 6.9               | < 9                            | 95.3                              | 106.1  | 133.3   | 98.6    | 113.2   | 149.9    | 123.9   | 177.0    | IE2                      | 37.1                          |
| FDS<br>5055A | 12                 | 8.3               | < 9                            | 91.3                              | 104.6  | 145.9   | 95.1    | 113.1   | 169.2    | 125.7   | 207.7    | IE2                      | 35.7                          |
| FDS<br>5075A | 16                 | 11.1              | < 9                            | 104.9                             | 124.0  | 184.6   | 110.3   | 136.6   | 219.8    | 156.0   | 279.8    | IE2                      | 35.8                          |

Tab. 15: Absolute losses in FDS 5000 inverters in accordance with EN 61800-9-2

**General conditions**

The loss data applies to inverters without accessories.

The power loss calculation is based on a three-phase supply voltage with 400 V<sub>AC</sub>/50 Hz.

The calculated data includes a supplement of 10% in accordance with EN 61800-9-2.

The power loss specifications refer to a clock frequency of 4 kHz.

The absolute losses for a power unit that is switched off refer to the 24 V<sub>DC</sub> power supply of the control electronics.

**10.2.5 Derating by increasing the clock frequency**

Depending on the clock frequency  $f_{PWM,PU}$ , the following values for nominal output currents  $I_{2N,PU}$  arise.

| Type      | $I_{2N,PU}$<br>4 kHz | $I_{2N,PU}$<br>8 kHz | $I_{2N,PU}$<br>16 kHz |
|-----------|----------------------|----------------------|-----------------------|
| FDS 5004A | 1.3 A                | 1.0 A                | 0.7 A                 |
| FDS 5007A | 4.0 A                | 3.0 A                | 2.0 A                 |
| FDS 5008A | 2.3 A                | 1.7 A                | 1.2 A                 |
| FDS 5015A | 4.5 A                | 3.4 A                | 2.2 A                 |
| FDS 5022A | 5.5 A                | 4.0 A                | 2.6 A                 |
| FDS 5040A | 10 A                 | 6 A                  | 3.3 A                 |
| FDS 5055A | 12.0 A               | 7.5 A                | 4.8 A                 |
| FDS 5075A | 16.0 A               | 10.0 A               | 5.7 A                 |

Tab. 16: Nominal output current  $I_{2N,PU}$  dependent on the clock frequency

<sup>7</sup> Absolute losses for a power unit that is switched off

<sup>8</sup> Operating points for relative motor stator frequency in % and relative torque current in %

<sup>9</sup> IE class in accordance with EN 61800-9-2

<sup>10</sup> Comparison of the losses for the reference inverter related to IE2 in the nominal point (90, 100)



10.2.6
Dimensions

The dimensions of the available FDS 5000 sizes can be found in the following chapters.

10.2.6.1
Dimensions: size 0 to 1

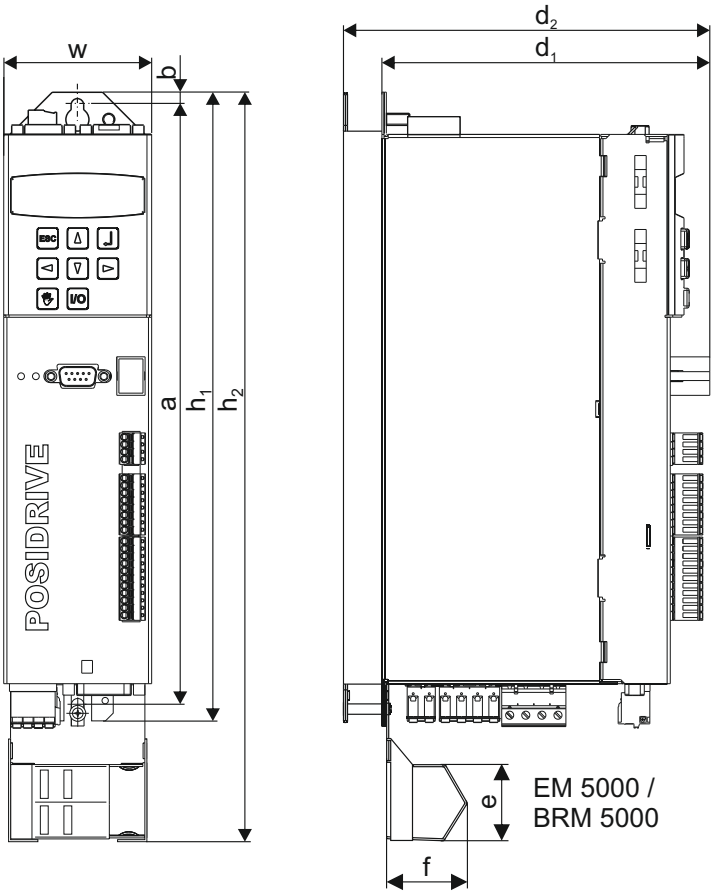


Fig. 1: FDS 5000 dimensional drawing

| Dimensions [mm] |                                     |            | Size 0 | Size 1 |
|-----------------|-------------------------------------|------------|--------|--------|
| Inverter        | Height                              | $h_1$      | 300    |        |
|                 |                                     | $h_2^{11}$ | 360    |        |
|                 | Width                               | w          | 70     |        |
|                 | Depth                               | $d_1$      | 157    | 242    |
|                 |                                     | $d_2^{12}$ | 175    | 260    |
| EMC shroud      | Height                              | e          | 37.5   |        |
|                 | Depth                               | f          | 40     |        |
| Fastening holes | Vertical distance                   | a          | 283    |        |
|                 | Vertical distance to the upper edge | b          | 6      |        |

Tab. 17: FDS 5000 dimensions [mm]

10.2.7
Minimum clearances

The specified dimensions refer to the outside edges of the inverter.

| Minimum clearance                   | Above | Below | On the side |
|-------------------------------------|-------|-------|-------------|
| Size 0 – Size 1                     | 100   | 100   | 5           |
| ... with EMC shroud or brake module | 100   | 120   | 5           |

Tab. 18: Minimum clearances [mm]

<sup>11</sup> h2 = height incl. EM 5000 EMC shroud or BRM 5000 brake module

<sup>12</sup> d2 = Depth including RB 5000 brake resistor

## 10.3 Inverter/motor combinations

Parameterization of a STÖBER inverter is exceptionally easy, especially together with four-pole STÖBER asynchronous motors. The motor is fully typified by inputting just the motor size (e.g. 90L) and its wiring (star or delta). A delta connection (measurement point 230 V, 50 Hz) is available for motors up to 3 kW (size 100). By increasing the voltage at higher frequencies, the full torque can be drawn through the motor up to 87 Hz. It usually makes sense to take this expanded speed adjustment range into account when selecting the gear unit. You can find more detailed information in the chapter [\[ 5.6\]](#).

An explanation of the formula symbols used can be found in the chapter [\[ 13.1\]](#).

|                                        |    |                 |               |                |               |           |              |      | FDS<br>5007A                               | FDS<br>5008A | FDS<br>5015A | FDS<br>5022A | FDS<br>5040A | FDS<br>5055A | FDS<br>5075A |
|----------------------------------------|----|-----------------|---------------|----------------|---------------|-----------|--------------|------|--------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                                        |    |                 |               |                |               |           |              |      | $I_{2N,PU}$ [A]<br>( $f_{PWM,PU} = 4$ kHz) |              |              |              |              |              |              |
| $f_T$<br>[Hz]                          | pz | Con-<br>nection | $P_N$<br>[kW] | $n_N$<br>[rpm] | $M_N$<br>[Nm] | $M_k/M_N$ | $I_N$<br>[A] |      | 4                                          | 2.3          | 4.5          | 5.5          | 10           | 12           | 16           |
| <b>Δ 230 V / Y 400 V motor winding</b> |    |                 |               |                |               |           |              |      | $I_{2N,PU} / I_N$                          |              |              |              |              |              |              |
| IE3D080L04                             | 50 | 4               | Y             | 0.75           | 1445          | 5.0       | 3.7          | 1.7  |                                            | 1.4          |              |              |              |              |              |
| IE3D080L04                             | 87 | 4               | Δ             | 1.3            | 2503          | 5.0       | 3.7          | 2.94 | 1.4                                        |              | 1.5          | 1.9          |              |              |              |
| IE3D090S04                             | 50 | 4               | Y             | 1.1            | 1440          | 7.3       | 3.7          | 2.5  | 1.6                                        |              | 1.8          | 2.2          |              |              |              |
| IE3D090S04                             | 87 | 4               | Δ             | 1.91           | 2494          | 7.3       | 3.7          | 4.33 |                                            |              | 1.0          | 1.3          |              |              |              |
| IE3D090LX04                            | 50 | 4               | Y             | 1.5            | 1455          | 9.8       | 4.9          | 3.4  | 1.2                                        |              | 1.3          | 1.6          |              |              |              |
| IE3D090LX04                            | 87 | 4               | Δ             | 2.6            | 2503          | 9.8       | 4.9          | 5.89 |                                            |              |              |              | 1.7          | 2.0          |              |
| IE3D100KX04                            | 50 | 4               | Y             | 2.2            | 1450          | 14.5      | 3.8          | 4.55 |                                            |              |              | 1.2          | 2.2          |              |              |
| IE3D100KX04                            | 87 | 4               | Δ             | 3.81           | 2511          | 14.5      | 3.8          | 7.88 |                                            |              |              |              | 1.3          | 1.5          | 2.0          |
| IE3D100LX04                            | 50 | 4               | Y             | 3.0            | 1450          | 19.8      | 4            | 6.35 |                                            |              |              |              | 1.6          | 1.9          |              |
| IE3D100LX04                            | 87 | 4               | Δ             | 5.2            | 2511          | 19.8      | 4            | 11   |                                            |              |              |              |              | 1.1          | 1.5          |
| IE3D112M04                             | 50 | 4               | Δ             | 4.0            | 1465          | 26.1      | 4.5          | 7.9  |                                            |              |              |              | 1.3          | 1.5          | 2.0          |
| IE3D132SX04                            | 50 | 4               | Δ             | 5.5            | 1465          | 36        | 3.3          | 10   |                                            |              |              |              | 1.0          | 1.2          | 1.6          |
| IE3D132MX04                            | 50 | 4               | Δ             | 7.5            | 1470          | 49        | 3.9          | 16   |                                            |              |              |              |              |              | 1.0          |

## 10.4 Accessories

You can find information about the available accessories in the following chapters.

### 10.4.1 Safety technology

#### ASP 5001 – Safe Torque Off

Available with the standard design.



Option module for implementation of integrated safety function Safe Torque Off (STO).

The ASP 5001 may only be installed by STÖBER Antriebstechnik GmbH + Co. KG!

The ASP 5001 must be ordered with the basic device.

### 10.4.2 Communication

#### G3 connection cable



ID No. 41488

Cable for connecting the inverter to terminal X3 with the PC, D-sub connector, 9-pin, socket/socket, approx. 5 m.

#### USB adapter to RS232



ID No. 45616

Adapter for connecting RS232 to a USB port.

#### CANopen DS-301 CAN 5000 communication module



ID No. 44574

Accessory part for connecting CAN bus.

#### PROFIBUS DP-V1 DP 5000 communication module



ID No. 44575

Accessory module for connecting PROFIBUS DP-V1.

**EtherCAT ECS 5000 communication module**

ID No. 49014

Accessory part for connecting EtherCAT (CANopen over EtherCAT).

**EtherCAT cables**

Ethernet patch cable, CAT5e, yellow.

The following designs are available:

ID No. 49313: Length approx. 0.2 m.

ID No. 49314: Length approx. 0.35 m.

**PROFINET PN 5000 communication module**

ID No. 53893

Accessory part for connecting PROFINET.

## 10.4.3 Terminal module

**LEA 5000 terminal module**

ID No. 49029

Terminals:

- 8 digital inputs
- 8 digital outputs

Delivery including mounting plate

10.4.4 Braking resistor

In addition to the inverters, STÖBER offers braking resistors in different sizes and performance classes described below. For the selection, note the minimum permitted braking resistances specified in the technical data of the individual inverter types.

10.4.4.1 FZMU, FZZMU tubular fixed resistor

| Type      | FZMU 400×65 | FZZMU 400×65 |
|-----------|-------------|--------------|
| ID No.    | 49010       | 53895        |
| FDS 5007A | X           | —            |
| FDS 5004A | X           | —            |
| FDS 5008A | X           | —            |
| FDS 5015A | X           | —            |
| FDS 5022A | X           | —            |
| FDS 5040A | (X)         | X            |
| FDS 5055A | (X)         | X            |
| FDS 5075A | (X)         | X            |

Tab. 19: Assignment of FZMU, FZZMU braking resistor – FDS 5000 inverter

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

Properties

| Specification                      | FZMU 400×65                                                                          | FZZMU 400×65                                                                          |
|------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                             | 49010                                                                                | 53895                                                                                 |
| Type                               | Tubular fixed resistor                                                               | Tubular fixed resistor                                                                |
| Resistance [Ω]                     | 100                                                                                  | 47                                                                                    |
| Power [W]                          | 600                                                                                  | 1200                                                                                  |
| Therm. time const. $\tau_{th}$ [s] | 40                                                                                   | 40                                                                                    |
| Pulse power for < 1 s [kW]         | 18                                                                                   | 36                                                                                    |
| $U_{max}$ [V]                      | 848                                                                                  | 848                                                                                   |
| Weight without packaging [g]       | 2200                                                                                 | 4170                                                                                  |
| Protection class                   | IP20                                                                                 | IP20                                                                                  |
| Test symbols                       |  |  |

Tab. 20: FZMU, FZZMU specification

## Dimensions

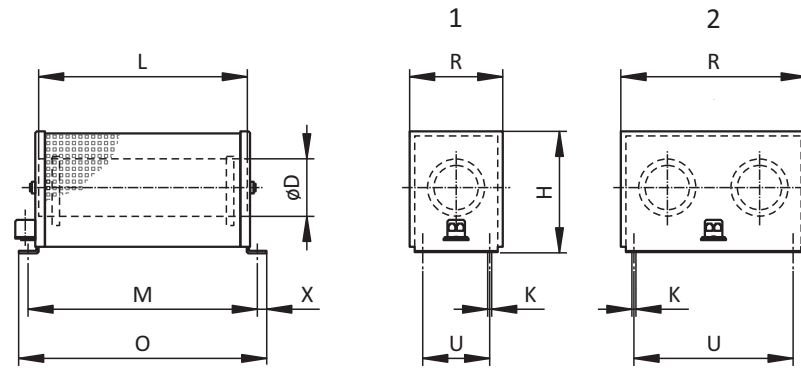


Fig. 2: FZMU (1), FZZMU (2) dimensional drawing

| Dimension | FZMU 400×65 | FZZMU 400×65 |
|-----------|-------------|--------------|
| ID No.    | 49010       | 53895        |
| L x D     | 400 × 65    | 400 × 65     |
| H         | 120         | 120          |
| K         | 6.5 × 12    | 6.5 × 12     |
| M         | 430         | 426          |
| O         | 485         | 450          |
| R         | 92          | 185          |
| U         | 64          | 150          |
| X         | 10          | 10           |

Tab. 21: FZMU, FZZMU dimensions [mm]

## 10.4.4.2 GVADU, GBADU flat resistor

| Type      | GVADU 210×20 | GBADU 265×30 | GBADU 405×30 | GBADU 335×30 |
|-----------|--------------|--------------|--------------|--------------|
| ID No.    | 55441        | 55442        | 55499        | 55443        |
| FDS 5007A | X            | X            | X            | —            |
| FDS 5004A | X            | X            | X            | —            |
| FDS 5008A | X            | X            | X            | —            |
| FDS 5015A | X            | X            | X            | —            |
| FDS 5022A | X            | X            | X            | —            |
| FDS 5040A | (X)          | (X)          | (X)          | X            |
| FDS 5055A | (X)          | (X)          | (X)          | X            |
| FDS 5075A | (X)          | (X)          | (X)          | X            |

Tab. 22: Assignment of GVADU, GBADU braking resistor – FDS 5000 inverter

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

**Properties**

| Specification                     | GVADU 210×20                                                                      | GBADU 265×30                                                                       | GBADU 405×30                                                                        | GBADU 335×30                                                                        |
|-----------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| ID No.                            | 55441                                                                             | 55442                                                                              | 55499                                                                               | 55443                                                                               |
| Type                              | Flat resistor                                                                     | Flat resistor                                                                      | Flat resistor                                                                       | Flat resistor                                                                       |
| Resistance [Ω]                    | 100                                                                               | 100                                                                                | 100                                                                                 | 47                                                                                  |
| Power [W]                         | 150                                                                               | 300                                                                                | 500                                                                                 | 400                                                                                 |
| Therm. time const.                | 60                                                                                | 60                                                                                 | 60                                                                                  | 60                                                                                  |
| $\tau_{th}$ [s]                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Pulse power for<br>< 1 s [kW]     | 3.3                                                                               | 6.6                                                                                | 11                                                                                  | 8.8                                                                                 |
| $U_{max}$ [V]                     | 848                                                                               | 848                                                                                | 848                                                                                 | 848                                                                                 |
| Cable design                      | Radox                                                                             | FEP                                                                                | FEP                                                                                 | FEP                                                                                 |
| Cable length [mm]                 | 500                                                                               | 500                                                                                | 500                                                                                 | 500                                                                                 |
| Conductor cross-<br>section [AWG] | 18/19<br>(0.82 mm <sup>2</sup> )                                                  | 14/19<br>(1.9 mm <sup>2</sup> )                                                    | 14/19<br>(1.9 mm <sup>2</sup> )                                                     | 14/19<br>(1.9 mm <sup>2</sup> )                                                     |
| Weight without<br>packaging [g]   | 300                                                                               | 930                                                                                | 1410                                                                                | 1200                                                                                |
| Protection class                  | IP54                                                                              | IP54                                                                               | IP54                                                                                | IP54                                                                                |
| Test symbols                      |  |  |  |  |

Tab. 23: GVADU, GBADU specification

**Dimensions**

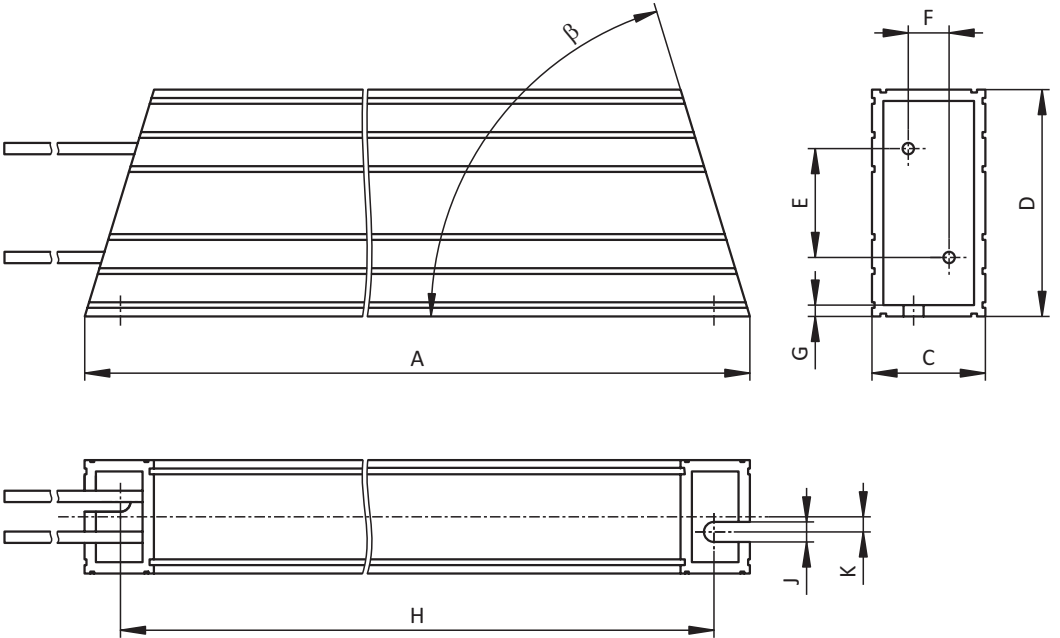


Fig. 3: GVADU, GBADU dimensional drawing

| Dimension | GVADU 210×20 | GBADU 265×30 | GBADU 405×30 | GBADU 335×30 |
|-----------|--------------|--------------|--------------|--------------|
| ID No.    | 55441        | 55442        | 55499        | 55443        |
| A         | 210          | 265          | 405          | 335          |
| H         | 192          | 246          | 386          | 316          |
| C         | 20           | 30           | 30           | 30           |
| D         | 40           | 60           | 60           | 60           |
| E         | 18.2         | 28.8         | 28.8         | 28.8         |
| F         | 6.2          | 10.8         | 10.8         | 10.8         |
| G         | 2            | 3            | 3            | 3            |
| K         | 2.5          | 4            | 4            | 4            |
| J         | 4.3          | 5.3          | 5.3          | 5.3          |
| $\beta$   | 65°          | 73°          | 73°          | 73°          |

Tab. 24: GVADU, GBADU dimensions [mm]

### 10.4.4.3 RB 5000 rear section braking resistor

| Type      | RB 5047 | RB 5100 |
|-----------|---------|---------|
| ID No.    | 44966   | 44965   |
| FDS 5007A | —       | X       |
| FDS 5004A | —       | X       |
| FDS 5008A | —       | X       |
| FDS 5015A | —       | X       |
| FDS 5022A | —       | X       |
| FDS 5040A | X       | (X)     |
| FDS 5055A | X       | (X)     |
| FDS 5075A | X       | (X)     |

Tab. 25: Assignment of RB 5000 braking resistor – FDS 5000 inverter

|     |              |
|-----|--------------|
| X   | Recommended  |
| (X) | Possible     |
| —   | Not possible |

#### Properties

| Specification                            | RB 5047                                                                              | RB 5100                                                                               |
|------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ID No.                                   | 44966                                                                                | 44965                                                                                 |
| Resistance [ $\Omega$ ]                  | 47                                                                                   | 100                                                                                   |
| Power [W]                                | 60                                                                                   | 60                                                                                    |
| Therm. time const. $\tau_{th}$ [s]       | 8                                                                                    | 8                                                                                     |
| Pulse power for < 1 s [kW]               | 1.5                                                                                  | 1.0                                                                                   |
| $U_{max}$ [V]                            | 800                                                                                  | 800                                                                                   |
| Weight without packaging [g]             | 460                                                                                  | 440                                                                                   |
| Cable design                             | Radox                                                                                | Radox                                                                                 |
| Cable length [mm]                        | 250                                                                                  | 250                                                                                   |
| Conductor cross-section [AWG]            | 18/19<br>(0.82 mm <sup>2</sup> )                                                     | 18/19<br>(0.82 mm <sup>2</sup> )                                                      |
| Maximum torque of M5 threaded bolts [Nm] | 5                                                                                    | 5                                                                                     |
| Protection class                         | IP40                                                                                 | IP40                                                                                  |
| Test symbols                             |  |  |

Tab. 26: RB 5000 specification

#### Dimensions

| Dimension                            | RB 5047 | RB 5100           |
|--------------------------------------|---------|-------------------|
| ID No.                               | 44966   | 44965             |
| Height                               | 300     | 300               |
| Width                                | 62      | 62                |
| Depth                                | 18      | 18                |
| Drilling diagram corresponds to size | Size 1  | Size 0 and Size 1 |

Tab. 27: RB 5000 dimensions [mm]



10.4.5 Choke

Technical specifications for suitable chokes can be found in the following chapters.

10.4.5.1 TEP output choke

Output chokes are required from a cable length > 50 m in order to reduce interference pulses and protect the drive system.

Information

The following technical data only applies to a rotating magnetic field frequency of 200 Hz. For example, this rotating magnetic field frequency is achieved with a motor with 4 pole pairs and a nominal speed of 3000 rpm. Always observe the specified derating for higher rotating magnetic field frequencies. Also observe the relationship with the clock frequency.

Properties

| Specification                                       | TEP3720-0ES41                                                                         | TEP3820-0CS41 |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|---------------|
| ID No.                                              | 53188                                                                                 | 53189         |
| Voltage range                                       | 3 × 0 to 480 V                                                                        |               |
| Frequency range                                     | 0 – 200 Hz                                                                            |               |
| Nominal current $I_{N,MF}$ at 4 kHz                 | 4 A                                                                                   | 17.5 A        |
| Nominal current $I_{N,MF}$ at 8 kHz                 | 3.3 A                                                                                 | 15.2 A        |
| Max. permitted motor cable length with output choke | 100 m                                                                                 |               |
| Max. surrounding temperature $\vartheta_{amb,max}$  | 40 °C                                                                                 |               |
| Protection class                                    | IP00                                                                                  |               |
| Winding losses                                      | 11 W                                                                                  | 29 W          |
| Iron losses                                         | 25 W                                                                                  | 16 W          |
| Connection                                          | Screw terminal                                                                        |               |
| Max. conductor cross-section                        | 10 mm <sup>2</sup>                                                                    |               |
| UL Recognized                                       | Yes                                                                                   |               |
| Component (CAN; USA)                                |                                                                                       |               |
| Test symbols                                        |  |               |

Tab. 28: TEP specification

Dimensions

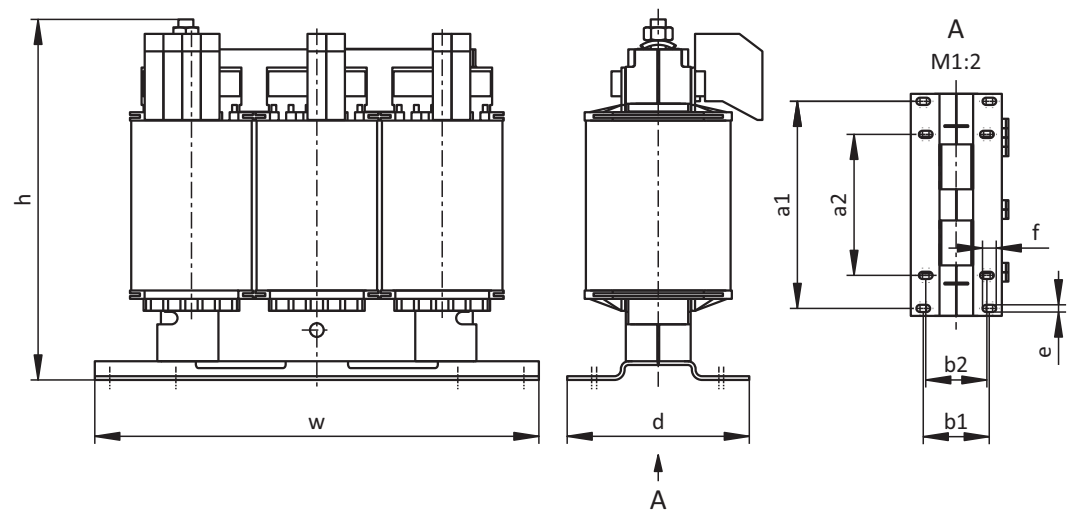


Fig. 4: TEP dimensional drawing

| Dimension                                     | TEP3720-0ES41 | TEP3820-0CS41 |
|-----------------------------------------------|---------------|---------------|
| Height h [mm]                                 | Max. 153      | Max. 153      |
| Width w [mm]                                  | 178           | 178           |
| Depth d [mm]                                  | 73            | 88            |
| Vertical distance – Fastening holes a1 [mm]   | 166           | 166           |
| Vertical distance – Fastening holes a2 [mm]   | 113           | 113           |
| Horizontal distance – Fastening holes b1 [mm] | 53            | 68            |
| Horizontal distance – Fastening holes b2 [mm] | 49            | 64            |
| Drill holes – Depth e [mm]                    | 5.8           | 5.8           |
| Drill holes – Width f [mm]                    | 11            | 11            |
| Screw connection – M                          | M5            | M5            |
| Weight [g]                                    | 2900          | 5900          |

Tab. 29: TEP dimensions and weight

## 10.4.6 Brake module and EMC shroud

### Brake module for 24 V brake BRM 5000



ID No. 44571

Brake module for inverters of the FDS 5000 and MDS 5000 series.

Accessory part for control of a brake (24 V<sub>DC</sub>) and (for inverters up to size 2) for connecting to the shield of the power cable.

Can be attached to the basic housing.

Including shield connection terminal.

### EM 5000 EMC shroud



ID No. 44959

EMC shroud for servo inverters of generation 5.

Accessory part for shield connection of the power cable for inverters up to size 2.

Can be attached to the basic housing.

Including shield connection terminal.

## 10.4.7 Control box

### Control box



Operating device for parameterization and operation of servo inverters from the FDS 5000 and MDS 5000 series.

The connection cable with a length of 1.5 m is included in the scope of delivery.

The following designs are available:

ID No. 42224: Service variant.

ID No. 42225: Installation DIN housing 96 x 96 mm, protection class IP54.



### Control box cable

Connection cable from control box to inverter.

The following designs are available:

ID No. 43216: 5 m.

ID No. 43217: 10 m.

## 10.4.8 Removable data storage

### Paramodul removable data storage

Included in the standard version.



ID No. 55463

Memory module for configuration and parameters.

## 10.5 Further information

### 10.5.1 Directives and standards

The following European directives and standards are relevant for inverters:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- EN 61326-3-1:2008
- EN 61800-3:2012-09 and 1:2014-02
- EN 61800-5-1:2008-04 and 1:2010-04
- EN 61800-5-2:2016-04
- EN 50178:1997

### 10.5.2 Symbols, marks and test symbols



#### Grounding symbol

Grounding symbol in accordance with IEC 60417, symbol 5019.



#### RoHS lead-free mark

Marking in accordance with RoHS directive 2011-65-EU.



#### CE mark

Manufacturer's self declaration: The product meets the requirements of EU directives.



#### UL test symbol

This product is listed by UL for the United States and Canada. Representative samples of this product have been evaluated by UL and meet the requirements of applicable standards.



#### UL recognized component mark

This component or material is recognized by UL. Representative samples of this product have been evaluated by UL and meet applicable requirements.

### 10.5.3 Additional documentation

Additional documentation related to the product can be found at

<http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

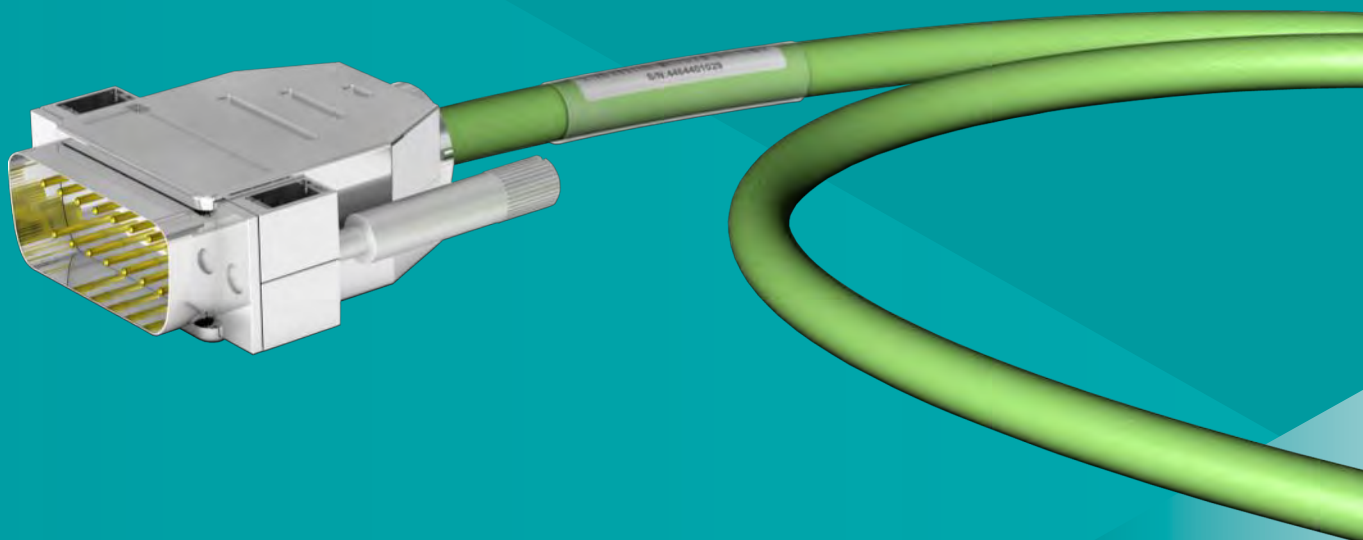
| Documentation                                                   | ID     |
|-----------------------------------------------------------------|--------|
| Configuration manual for POSIDRIVE FDS 5000 frequency inverters | 442269 |



# 11      Connection method

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## 11

# Connection method

## 11.1 Overview

Coordinated connection methods for STÖBER drive controllers

### Features

- Torsional stress  $\pm 30^\circ/\text{m}$
- Bending resistance
- Oil resistance
- Chemical resistance

A drive controller, cable and motor that are not coordinated with one another can lead to impermissibly high voltage peaks in the drive system, which may cause damage to the motor. The legal requirements of (EMC) Directive 2014/30/EU must also be observed.

Combining STÖBER motors, STÖBER cables and STÖBER drive controllers enables you to comply with these legal requirements.

STÖBER offers a range of cables to match. Cables are available in different lengths and are ready-made on both ends.

Using unsuitable connection cables may void any claims made under the warranty.

## 11.2 Conventions for cables

In the cable connection descriptions, core colors are shortened and used as follows.

### Cable colors

|     |        |     |        |
|-----|--------|-----|--------|
| BK: | BLACK  | PK: | PINK   |
| BN: | BROWN  | RD: | RED    |
| BU: | BLUE   | VT: | VIOLET |
| GN: | GREEN  | WH: | WHITE  |
| GY: | GRAY   | YE: | YELLOW |
| OG: | ORANGE |     |        |

### Formatting conventions

|                      |       |                                |
|----------------------|-------|--------------------------------|
| Two-colored core:    | WHYE  | WHITEYELLOW (white and yellow) |
| Single-colored core: | BK/BN | BLACK/BROWN (black or brown)   |

## 11.3 Encoder cables

STOBER motors are equipped with encoder systems and plug connectors as standard.

STOBER provides suitable cables in various lengths, conductor cross-sections and connector sizes.

The cables are available ready-made in the lengths 2.5 m, 5.0 m, 7.5 m, 10.0 m, 12.5 m, 15.0 m, 18.0 m, 20.0 m, 25.0 m, 30.0 m.

Other lengths on request.

You can find the technical data for the encoder systems in the chapter Encoders.

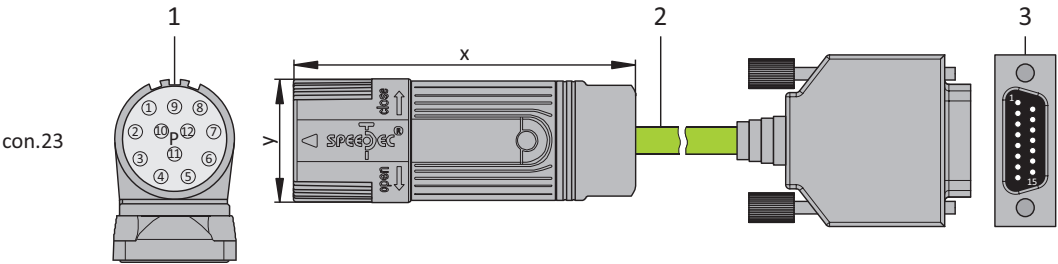


11.3.1 Differential HTL incremental encoders

Suitable encoder cables are described below.

11.3.1.1 Connection description

The encoder cable is available in plug connector size con.23 with a speedtec quick lock.



- 1: Plug connectors
- 2: STOBER encoder cable
- 3: D-sub X4

Information

For the connection of an HTL incremental encoder to terminal X4 of the SC6 or SI6 drive controller, you need the HT6 adapter (ID No. 56665). HT6 takes over level conversion from HTL signals to TTL signals.

Encoder cables – con.23 plug connectors

| Connection diagram | Motor (1) |                |                          |                              | Cable (2)  | Drive controller (3) |
|--------------------|-----------|----------------|--------------------------|------------------------------|------------|----------------------|
|                    | Pin       | Designation    | Core color up to size 80 | Core color size 90 or larger | Core color | Pin X4               |
|                    | 1         | B–             | PK                       | BK                           | YE         | 9                    |
|                    | 2         | –              | –                        | YE                           | –          | –                    |
|                    | 3         | N+             | BU                       | PK                           | PK         | 3                    |
|                    | 4         | N–             | RD                       | WH                           | GY         | 10                   |
|                    | 5         | A+             | GN                       | GN                           | BN         | 6                    |
|                    | 6         | A–             | YE                       | BN                           | WH         | 11                   |
|                    | 7         | –              | –                        | –                            | –          | –                    |
|                    | 8         | B+             | GY                       | GY                           | GN         | 1                    |
|                    | 9         | –              | –                        | –                            | –          | –                    |
|                    | 10        | GND            | WH                       | BU                           | BU         | 2 <sup>1</sup>       |
|                    | 11        | –              | –                        | VT                           | –          | –                    |
|                    | 12        | U <sub>2</sub> | BN                       | RD                           | RD         | 4                    |
|                    | Housing   | Shield         | –                        | –                            | –          | –                    |

Tab. 1: con.23 encoder cable pin assignment, incremental HTL

| Length x [mm] | Diameter y [mm] |
|---------------|-----------------|
| 58            | 26              |

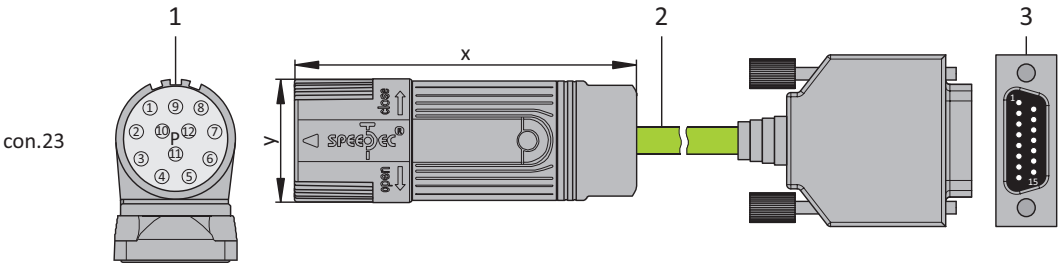
Tab. 2: con.23 dimensions

11.3.2 SSI encoders

Suitable encoder cables are described below.

11.3.2.1 Connection description

The encoder cable is available in plug connector size con.23 with a speedtec quick lock.



- 1: Plug connectors
- 2: STOEGER encoder cable
- 3: D-sub X4

Encoder cables – con.23 plug connectors

| Connection diagram | Motor (1) |                      |            | Cable (2)  | Drive controller (3) |
|--------------------|-----------|----------------------|------------|------------|----------------------|
|                    | Pin       | Designation          | Core color | Core color | Pin X4               |
|                    | 1         | Clock+               | VT         | YE         | 8                    |
|                    | 2         | Sense U <sub>2</sub> | BNGN       | PK         | 12                   |
|                    | 3         | –                    | –          | –          | –                    |
|                    | 4         | –                    | –          | –          | –                    |
|                    | 5         | Data–                | PK         | BN         | 13                   |
|                    | 6         | Data+                | GY         | WH         | 5                    |
|                    | 7         | –                    | –          | –          | –                    |
|                    | 8         | Clock–               | YE         | GN         | 15                   |
|                    | 9         | –                    | –          | –          | –                    |
|                    | 10        | GND                  | WHGN       | BU         | 2                    |
|                    | 11        | –                    | –          | –          | –                    |
|                    | 12        | U <sub>2</sub>       | BNGN       | RD         | 4                    |
|                    | Housing   | Shield               | –          | –          | –                    |

Tab. 3: con.23 encoder cable pin assignment, SSI

| Length x [mm] | Diameter y [mm] |
|---------------|-----------------|
| 58            | 26              |

Tab. 4: con.23 dimensions

11.4 Additional documentation

Additional documentation related to the product can be found at <http://www.stoeber.de/en/downloads/>

Enter the ID of the documentation in the Search... field.

| Documentation            | ID     |
|--------------------------|--------|
| Connection method manual | 443102 |

A world map in blue silhouette on an orange background. A large white clock face with the number '24' inside is positioned over the top half of the map, indicating 24-hour service.

# 24

12

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# 13      **Appendix**

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## 13.1 Formula symbols

The formula symbols for values actually present in the application are marked with \*.

| Symbol                  | Unit            | Explanation                                                                                                                                             |
|-------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| $C_F$                   | $\mu\text{F}$   | Capacitance of the operating capacitor for a Steinmetz connection                                                                                       |
| $C_{\text{maxPU}}$      | F               | Charging capacity of the power unit                                                                                                                     |
| $\cos\phi_N$            | —               | Active factor for the motor at the nominal point                                                                                                        |
| $\cos\phi_F$            | —               | Active factor of the forced ventilation unit at the nominal point                                                                                       |
| $C_{\text{PU}}$         | F               | Self-capacitance of the power unit                                                                                                                      |
| $\Delta$                | —               | Delta connection                                                                                                                                        |
| $\Delta\phi_2$          | arcmin          | Backlash at the output shaft with a blocked input                                                                                                       |
| $\Delta\vartheta$       | K               | Temperature difference                                                                                                                                  |
| $\Delta I_B$            | $\text{kgcm}^2$ | Additive mass moment of inertia of a motor with brake                                                                                                   |
| $\Delta m_B$            | kg              | Additive weight of a motor with brake                                                                                                                   |
| $D_{IA}$                | %               | Reduction in the nominal current depending on the installation altitude                                                                                 |
| $D_T$                   | %               | Reduction in the nominal current depending on the surrounding temperature                                                                               |
| $ED_{10}$               | %               | Duty cycle based on 10 minutes                                                                                                                          |
| $\eta$                  | %               | Efficiency                                                                                                                                              |
| $F_{2ax20}$             | N               | Permitted axial force at the gear unit output for $n_{2m*} \leq 20$ rpm (without radial force)                                                          |
| $F_{2axN}$              | N               | Permitted nominal axial force at the gear unit output (without radial force)                                                                            |
| $F_{2ax*}$              | N               | Actual axial force at the gear unit output                                                                                                              |
| $f_{2PU}$               | Hz              | Output frequency of the power unit                                                                                                                      |
| $F_{2rad20}$            | N               | Permitted radial force on the gear unit output for $n_{2m*} \leq 20$ rpm                                                                                |
| $F_{2radN}$             | N               | Permitted nominal radial force at the gear unit output                                                                                                  |
| $F_{2rad*}$             | N               | Actual radial force on the gear unit output                                                                                                             |
| $fB_{\text{mot}}$       | —               | Motor operating factor                                                                                                                                  |
| $fB_{\text{op}}$        | —               | Operating mode operating factor                                                                                                                         |
| $fB_t$                  | —               | Runtime operating factor                                                                                                                                |
| $f_{\text{mot}*}$       | Hz              | Application-based motor rotating magnetic field frequency                                                                                               |
| $f_N$                   | Hz              | Rotating magnetic field frequency at nominal speed                                                                                                      |
| $f_{\text{PWM,PU}}$     | Hz              | Frequency of the pulse width modulation of the power unit                                                                                               |
| $f_T$                   | Hz              | Rotating magnetic field frequency at nominal point                                                                                                      |
| $i$                     | —               | Gear ratio                                                                                                                                              |
| $i_{\text{exact}}$      | —               | Mathematically exact gear ratio                                                                                                                         |
| $I_{1\text{maxCU}}$     | A               | Maximum input current of the control unit                                                                                                               |
| $I_{1\text{mot}}$       | A               | Motor starting current                                                                                                                                  |
| $I_{1N,PU}$             | A               | Nominal input current of the power unit                                                                                                                 |
| $I_{2\text{maxPU}}$     | A               | Maximum output current of the power unit                                                                                                                |
| $I_{2N,PU}$             | A               | Nominal output current of the power unit                                                                                                                |
| $I_{2N,PU(\text{red})}$ | A               | Reduced nominal output current of the power unit                                                                                                        |
| $I_{2PU(A)}$            | A               | Output current of the power unit for axis A                                                                                                             |
| $I_{2PU(B)}$            | A               | Output current of the power unit for axis B                                                                                                             |
| $I_C$                   | A               | Capacitor current for a Steinmetz connection                                                                                                            |
| $I_N$                   | A               | Nominal current                                                                                                                                         |
| $I_{N,B}$               | A               | Nominal current of the brake at 20 °C                                                                                                                   |
| $I_{N,F}$               | A               | Nominal current of the forced ventilation unit                                                                                                          |
| $I_{N,MF}$              | A               | Nominal current of the choke or motor filter                                                                                                            |
| $J$                     | $\text{kgcm}^2$ | Mass moment of inertia                                                                                                                                  |
| $J_1$                   | $\text{kgcm}^2$ | Mass moment of inertia relative to the gear unit input                                                                                                  |
| $J_{1*}$                | $\text{kgcm}^2$ | Actual mass moment of inertia relative to the gear unit input                                                                                           |
| $J_{2*}$                | $\text{kgcm}^2$ | Actual mass moment of inertia relative to the gear unit output                                                                                          |
| $K_{Bpb}$               | —               | Factor by which the intervals between maintenance for the brake are extended if a Powerbox rectifier is used instead of a half-wave or bridge rectifier |
| $l$                     | mm              | Length of the output shaft                                                                                                                              |
| $L_{pA,F}$              | dBA             | Noise level of the forced ventilation unit in the optimal operating range                                                                               |
| $m$                     | kg              | Weight (for gear units without lubricant)                                                                                                               |

| Symbol                       | Unit              | Explanation                                                                                                                                                                                     |
|------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $M_{1\text{mot}}$            | Nm                | Motor starting torque                                                                                                                                                                           |
| $M_{2k20}$                   | Nm                | Permitted tilting torque on the gear unit output for $n_{2m^*} \leq 20$ rpm                                                                                                                     |
| $M_{2kN}$                    | Nm                | Permitted nominal tilting torque at the gear unit output                                                                                                                                        |
| $M_{2k^*}$                   | Nm                | Actual tilting torque on the gear unit output                                                                                                                                                   |
| $M_{2N}$                     | Nm                | Nominal torque on the gear unit output (relative to $n_{1N}$ )                                                                                                                                  |
| $M_{2N^*}$                   | Nm                | Actual nominal torque at the gear unit output (relative to $n_{1N}$ )                                                                                                                           |
| $M_{k^*}$                    | Nm                | Actual tilting torque on the output                                                                                                                                                             |
| $M_{k100}$                   | Nm                | Permitted tilting torque on the output for $n_m \leq 100$ rpm                                                                                                                                   |
| $M_k$                        | Nm                | Permitted tilting torque on the output                                                                                                                                                          |
| $M_{N,B}$                    | Nm                | Nominal braking torque                                                                                                                                                                          |
| $n_{1N}$                     | rpm               | Nominal speed at the gear unit input                                                                                                                                                            |
| $n_2$                        | rpm               | Speed at the gear unit output                                                                                                                                                                   |
| $n_{2^*}$                    | rpm               | Actual speed at the gear unit output                                                                                                                                                            |
| $n_{2m^*}$                   | rpm               | Actual average output speed                                                                                                                                                                     |
| $n_F$                        | rpm               | Nominal speed of the forced ventilation unit                                                                                                                                                    |
| $n_{m^*}$                    | rpm               | Actual average motor speed                                                                                                                                                                      |
| $n_N$                        | rpm               | Nominal speed: The speed for which the nominal torque $M_N$ is specified                                                                                                                        |
| $p$                          | –                 | Number of pole pairs                                                                                                                                                                            |
| $P_{B20}$                    | W                 | Power consumption of the brake at 20 °C                                                                                                                                                         |
| $P_{\text{effRB}}$           | W                 | Effective power at the external braking resistor                                                                                                                                                |
| $P_{\text{maxRB}}$           | W                 | Maximum power at the external braking resistor                                                                                                                                                  |
| $P_N$                        | kW                | Nominal power: the power the motor is able to deliver long term in S1 mode at the nominal point (tolerance $\pm 5$ %)                                                                           |
| $P_{N^*}$                    | kW                | Actual nominal power that the motor can output in S1 operation at the nominal point                                                                                                             |
| $P_{N,PU}$                   | W                 | Nominal power of the power unit                                                                                                                                                                 |
| $P_V$                        | W                 | Power loss                                                                                                                                                                                      |
| $P_{V,CU}$                   | W                 | Power loss of the control unit                                                                                                                                                                  |
| $p_z$                        | –                 | Number of poles                                                                                                                                                                                 |
| $q_{vF}$                     | m <sup>3</sup> /h | Delivery capacity of the forced ventilation unit in open air                                                                                                                                    |
| $R_{2\text{minRB}}$          | $\Omega$          | Minimum resistance of the external braking resistor                                                                                                                                             |
| $R_{\text{intRB}}$           | $\Omega$          | Resistance of the internal braking resistor                                                                                                                                                     |
| $S$                          | –                 | Service factor: Quotient of the nominal torque from the gear unit and the motor without consideration for thermal limiting performance. Represents a value for the reserve of the geared motor. |
| $\vartheta_{\text{amb,max}}$ | °C                | Maximum surrounding temperature                                                                                                                                                                 |
| $\vartheta_{\text{NAT}}$     | °C                | Nominal response temperature                                                                                                                                                                    |
| $T$                          | min               | Cycle time                                                                                                                                                                                      |
| $t_{11B,AC}$                 | ms                | Response delay: Time from when the current is turned off until the braking torque increases for AC-side switching of the brake rectifier                                                        |
| $t_{11B,AC,DC}$              | ms                | Response delay: Time from when the current is turned off until the braking torque increases for AC-side and DC-side switching of the brake rectifier                                            |
| $t_{2B}$                     | ms                | Disengagement time: time from when the current is turned on until the torque begins to drop                                                                                                     |
| $t_{\text{op}}$              | min               | Operating time                                                                                                                                                                                  |
| $\tau_{\text{th}}$           | °C                | Thermal time constant                                                                                                                                                                           |
| $U_{1CU}$                    | V                 | Input voltage of the control unit                                                                                                                                                               |
| $U_{1PU}$                    | V                 | Input voltage of the power unit                                                                                                                                                                 |
| $U_{1rf}$                    | V                 | Input voltage of the rectifier                                                                                                                                                                  |
| $U_{2PU}$                    | V                 | Output voltage of the power unit                                                                                                                                                                |
| $U_{2rf}$                    | V                 | Output voltage of the rectifier                                                                                                                                                                 |
| $U_{\text{max}}$             | V                 | Maximum voltage                                                                                                                                                                                 |
| $U_{\text{MOT}}$             | V                 | Motor voltage                                                                                                                                                                                   |
| $U_N$                        | V                 | Nominal voltage of the motor                                                                                                                                                                    |
| $U_{N,B}$                    | V                 | Nominal voltage of brake                                                                                                                                                                        |
| $U_{N,F}$                    | V                 | Nominal voltage of the forced ventilation unit                                                                                                                                                  |
| $U_{\text{offCH}}$           | V                 | Switch-off threshold of the brake chopper                                                                                                                                                       |
| $U_{\text{onCH}}$            | V                 | On limit of the brake chopper                                                                                                                                                                   |



| Symbol      | Unit             | Explanation                                                                          |
|-------------|------------------|--------------------------------------------------------------------------------------|
| $W_{B,R01}$ | $10^6 \text{ J}$ | Work done by friction until reaching 0.1 mm of wear                                  |
| $W_{B,Adj}$ | $10^6 \text{ J}$ | Work done by friction achievable by the brake until readjustment is necessary        |
| $x_2$       | mm               | Distance of the shaft shoulder to the force application point                        |
| $x_{Bmax}$  | mm               | Maximum permitted air gap at which the braking armature still experiences attraction |
| $x_{B,N}$   | mm               | Nominal air gap of brake                                                             |
| Y           | —                | Star connection                                                                      |
| $y_2$       | mm               | Distance of the shaft axis to the axial force application point                      |
| $y_{blim}$  | mm               | Wear limit of the brake disc                                                         |
| $z_2$       | mm               | Distance of the shaft shoulder to the middle of the output bearing                   |
| $z_{Bmax}$  | $\text{h}^{-1}$  | Maximum permitted switching frequency of the brake                                   |

## 13.2 Trademarks

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