Intelligent Drivesystems, Worldwide Services

VERSATILE FREQUENCY INVERTER FOR CONTROL CABINET APPLICATIONS

EN

NORDAC *PRO*
SK 500E FREQUENCY INVERTER

NORD DRIVESYSTEMS

THE ALL-ROUNDER
THE NORDAC *PRO* PRODUCT FAMILY

NORDAC *PRO*

The NORDAC *PRO* frequency inverter family from NORD Drivesystems is available for motors with rated powers of 0.25 - 160 kW. With its very compact design it is perfect for space-saving installation in control cabinets.

Notable features across the entire product line include:

- Sensorless current vector control which ensures constant speeds in case of fluctuating loads and very high torques during start-up
- 200% overload reserve which provides greater operational safety in cranes and lifting gear applications
- Operation of asynchronous and synchronous motors
- An integrated brake chopper for 4-quadrant operation
- An integrated mains filter serving as the basis for optimal EMC performance

These features are as much a part of the basic configuration as the separately configurable PID or the process controller. These controllers independently carry out the control tasks in your application.

The range is supplied with either with an integrated 24 V power supply unit or with a separate connection for the control board supply.

The advantage of externally powered devices is that access to parameter data and communication through any bus interfaces are possible even when the power is switched off. Moreover, an evacuation run controlled from the inverter itself can be performed, and this constitutes an enormous boost in safety for lifting gear and similar security critical drive applications.

The SK 51xE and SK 53xE models support the Safe Stop function according to EN 13849-1 (up to maximum safety category 4, stop category 0 and 1). In addition, the SK 53xE version equipped with the built-in POSICON function makes it perfectly suitable for all types of positioning tasks (relative and absolute).

As standard, an integrated PLC on all models starting from the SK 520E allows simple and free programming of drive-related functions in accordance with IEC 61131.

In addition, the top model SK 540E/SK 545E features a universal encoder interface which allows the connection of SSI or EnDat encoders. The frequency inverters maintain uniform dimensions even with the different functional configurations.

Basic configuration

- Sensorless current vector control (ISD control) for high control quality and fast reaction times
- Brake management, electromechanical holding brake
- Brake chopper to divert generated energy to a braking resistor
- RS 232 diagnostic interface
- 4 switchable parameter sets for flexible use of parameter settings (e.g. switching between drive units with different motor data)
- All common drive functions such as acceleration/ braking on a ramp
- Parameters pre-set with standard values, hence immediately ready for use
- Scalable display values
- Stator resistance measurement to ensure optimal controller characteristics

Optional

- ❍ Interfaces for many bus systems
- ❍ Various control options (switches, potentiometers or parameterisation units)
- ❍ Versions with functional safety (Safe Stop (STO, SS1)) **Available for SK 510E and from 230 V and above**
- ❍ Variants with incremental encoder interface for speed feedback (servo mode) **Available for SK 520E and above**
- ❍ Variants with PLC functionality **Available for SK 520E and above**
- ❍ POSICON variants with positioning function (relative and absolute) **Available for SK 530E and above**
- ❍ Universal encoder interface **Available for SK 540E and above**

NORD ELECTRONIC DRIVESYSTEMS

CENTRALISED AND DECENTRALISED DRIVE ELECTRONICS

NORDAC FREQUENCY INVERTERS

Advantages

- Scalable functionality – flexibility of equipment and function
- Market-leading torques for all drive applications
- Simple commissioning and operation

Functions (optional / depending on the device)

- POSICON – integrated positioning mode and synchronisation
- PLC functionality for tasks close to the drive unit
- Operation of asynchronous and synchronous motors
- Energy-saving function for partial load operation
- High precision regulation with current vector control
- 4-quadrant operation
- Integrated brake rectifier for motor brake control
- Control and closed-loop regulation
- STO and SS1 – integrated functional safety
- Integrated mains filter for compliance with EMC regulations
- Compatible with all common bus systems
- Control and parameterisation tools and simple parameter structure

NORDAC *PRO*

SK 500E

The frequency inverter for all drive applications: large power range and capability of extended functionality with plug-in option modules.
Heat removal is optimised thanks to the variable cooling concept.

Frequency inverter

- Power range up to 160 kW
- Control cabinet installation
- IP20

NORDAC *FLEX*

SK 200E

Decentralised drive unit with versatile installation possibilities. Scalable functionality and flexible configuration. Simple installation and maintenance through extensive plug-in capability and simple parameter transfer via EEPROM memory.

Frequency inverters

- Power range up to 22 kW
- Wall or motor mounting
- IP55, IP66

NORDAC *BASE*

SK 180E

Economical decentralised version for simple drive applications. Low installation costs as well as robust design for simple installation outside the control cabinet.

Frequency inverters

- Power range up to 2.2 kW
- Wall or motor mounting
- IP55, IP66, IP69K

NORDAC *START*

SK 135E

Decentralised, wear-free electronic motor starter for all types of soft starting. With integrated motor protection and reversing function for flexible integration into the system.

Motor starters

- Power range up to 7.5 kW
- Wall or motor mounting
- IP55, IP66, IP69K

Frequency inverters
- Power range up to 7.5 kW
- Field installation
- IP55, IP65

The field distribution system for flexible, decentralised installation. Flexibility of equipment and function – free configurability according to requirements and the application. Available as frequency inverters and motor starters. Fast commissioning through high level of plug-in capability. Simple servicing of the system through integrated maintenance switch and local manual control facility.

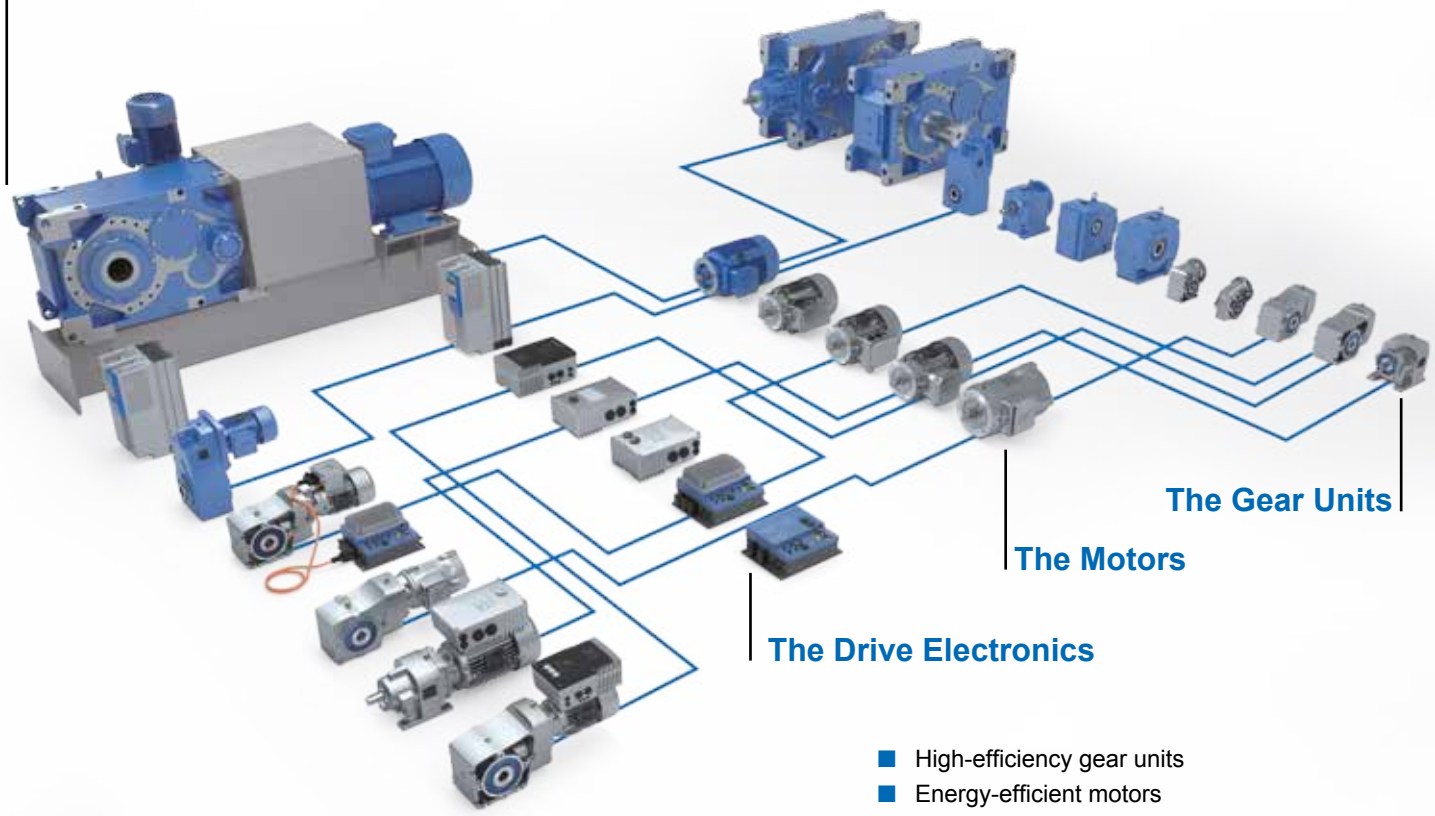
NORDAC *LINK*
SK 250E

Motor starters
- Power range up to 3 kW
- Field installation
- IP65

NORDAC *LINK*
SK 155E

NORD DRIVESYSTEMS
COMPLETE DRIVE SOLUTIONS FROM A SINGLE SOURCE

The Drive Solutions



- High-efficiency gear units
- Energy-efficient motors
- Frequency inverters and motor starters for installation in the field or in control cabinets

THE INNER VALUES ARE WHAT COUNT
EXTENSIVE BASIC EQUIPMENT

Load monitor

- Monitoring of load torque depending on the output frequency
- Individual adaptation of load monitoring to protect the system from overload in certain frequency ranges

Available in all devices

Energy-saving function

- Maximum efficiency in partial load operation
- Reduced operating costs due to energy savings of up to 60%
- Simple adjustment

Available in all devices

Lifting gear functions

- High-precision current vector control for rapid and precise load pickup
- Integrated brake chopper to divert generated energy to a braking resistor (braking resistor optional)
- Brake management for optimum control of an electromechanical holding brake for wear-free brake actuation

Available in all devices

Process controller/PID controller

- Feedback and evaluation of actual values for implementation of a closed-loop control circuit (e.g. flow or dancer control)
- P, I and D components can be set separately

Available in all devices

Master/slave operation

- Control of one or more slave inverters by a master inverter
- Communication via USS or CANopen with control word and setpoint values

Available in all devices

Evacuation runs

- Evacuation run possible if the main supply fails
- Emergency operation with low DC voltage from UPS (e.g. battery) possible

Available in all SK 5x5E

Encoder feedback (Servo mode)

- High-precision speed regulation
- Highest possible acceleration due to direct feedback of the actual speed characteristics to the frequency inverter and therefore also:
  - Full torque down to standstill (speed 0)
  - Digital speed controller with wide range of settings

Available in all devices

Link circuit coupling

Intermediate circuit via terminals for all device versions

- Energy-saving effect with balanced motor and generator operation
- Elimination of braking resistors possible

Available in all devices

THE INNER VALUES ARE WHAT COUNT

EXTENSIVE BASIC EQUIPMENT

User friendliness

- Easy adaptation to communication systems via snap-on technology units.
- Quick and simple diagnostics via easily visible LED indicators
- Technology units available for display, operation and parameterisation
  - Clear display by large LCD screen in 14 languages (optional)
  - Simple operation and parameterisation through logical parameter structure and intuitive layout of control elements
  - Variants for control cabinet installation

Available in all devices

Safety

The SK 500E has a comprehensive safety concept for all drive components

Motor, gear unit and application

- Thermal motor protection TF (PTC), I^2t
- Short-circuit/earth fault monitoring
- Phase error and magnetisation monitoring
- Speed, rotational direction and slip monitoring with encoder feedback
- Load monitoring and limitation
- Error management with storage of malfunctions and their ancillary conditions, error statistics

Frequency inverter

- Temperature monitoring
- Short-circuit/earth fault/current monitoring
- Overvoltage/undervoltage and phase monitoring

Peripherals

- Communication monitoring via integrated watchdogs
- Parameterisable inputs to assess sensor signals

Environment

- RoHS compliance
- High EMC due to integrated mains filter (C1 up to 5 m cable length for devices up to 7.5 kW, C2 up to 20 m cable length, shielded)

Operational safety due to real and large overload reserves

- 200% rated load, 3.5 s/150% rated load, 60 s

Available in all devices

IF REQUIRED
SAFE STOP STO AND SS1

Safe Stop

Personnel safety and high machine availability are the focus in system operations. After a safety circuit is actuated by opening a safety cover or door, it must be ensured that no rotating system components can lead to accidents at work.
With a motor controlled by a NORD frequency inverter, this is implemented by a safe pulse block which provides protection against the motor restarting in compliance with the standard.
This safe block includes voltage supply to the circuit breaker by means of a safety switching device. The frequency inverter is therefore immediately ready to be switched on without re-initialisation after the safety circuit is closed.

Standards

- DIN EN ISO 13849-1:
  Performance Level e
- DIN EN 61508: SIL 3
- DIN EN 60204-1: Stop function
- DIN EN 61800-5-2:
  Safety functions

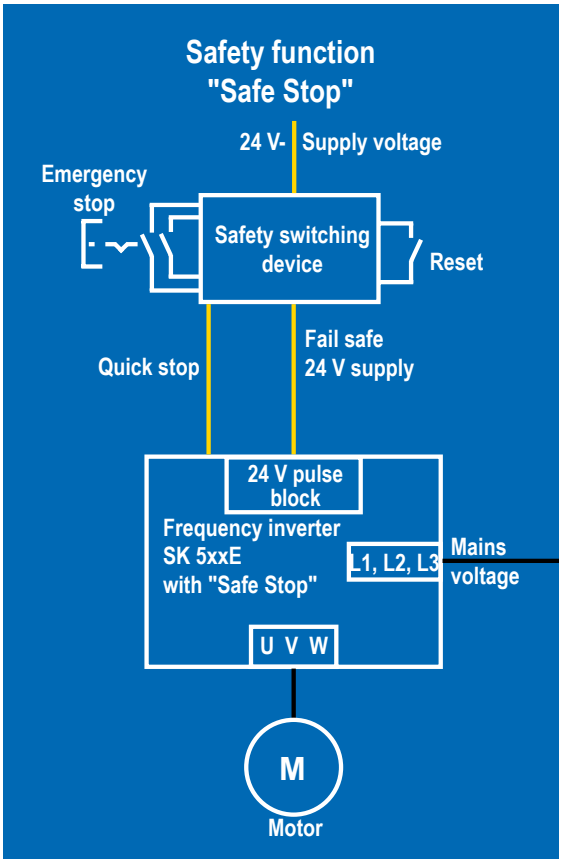
Applications

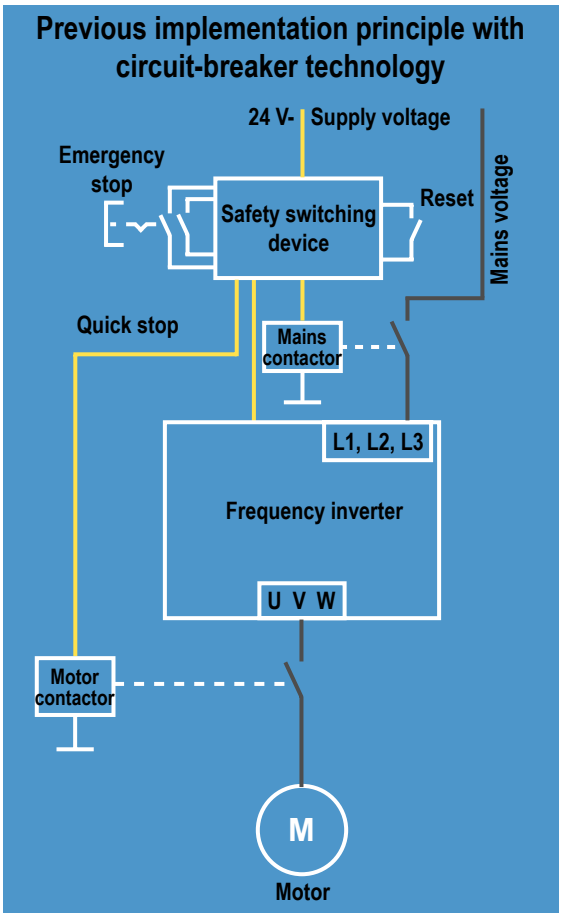
- Rotating machining equipment
  (e.g. milling machine)
- Closed moving systems with safety doors

Advantages at a glance

- Certified by TÜV NORD
- Safe Torque Off (STO)
- Safe Stop 1 (SS1)
- High availability through continuous online operation
- Elimination of contactor components
- No initialisation delays
- Long service life due to electronic switching
  (no electromechanical contacts)
- Low-cost solution with compact device

Available for SK 510E and above, except for SK 520E
Not for 115 V devices





WHEN EXTREME PRECISION IS NEEDED
POSITIONING WITH POSICON

POSICON

Frequency inverters with integrated POSICON functionality are able to determine the actual position of the drive unit via appropriate interfaces. Incremental encoder inputs (TTL/HTL) or absolute encoders are available as interfaces via CANopen (from SK 540E and above, sine wave encoders, SSI, BISS, EnDat 2.1 and Hiperface are also available). In addition to conventional point-to-point positioning (absolute positioning), POSICON also provides the facility for relative positioning of endless axes as well as various technology functions (rotating platform "with travel optimisation", synchronous operation and flying saw).

By means of the standard POSICON position memory and features such as "teach in", "approach reference point", "reset position", "offset position", "target window positioning" and "S-ramp", the frequency inverter can carry out fully independent positioning control. The tasks for the external control are therefore reduced to the starting pulse and communication of the target position (via digital I/O or at the field bus level). The frequency inverter can even monitor the positioning process and report the operating status.

Applications

- Lifting gear/shelf storage and retrieval devices with approach to precise positions
- Running gear of material conveyors/portal cranes with synchronous function of all driven axes
- Rotating table functions for tool magazines on machines
- Flying saw: coupling and parallel movement of a positioning axis relative to a moving object

Available for SK 530E and above

PLC

The intelligent drive electronics with integrated PLC functionality reduces the load on the higher level system control unit. This enables a modular design of the system. Application data can be evaluated in real time by the decentralised PLC, for example for the optimisation of diagnostic facilities. The PLC functionality enables the application to respond according to the situation.

- The PLC can be programmed with the NORD CON Tool (IEC 61131-3, Structured Text ST and Instruction List IL). There are no license fees or other runtime costs.
- Customer-specific control functions can be simply integrated with the PLC. Evaluation of sensor data and control of actuators replaces the machine control or drive control.
- Motion Control function blocks for implementation of movement control based on the PLCopen standard are available.

Applications

- Regulation/control of one or more devices by the frequency inverter

Available for SK 520E and above

VERSATILE AND SUSTAINABLE
THE FREQUENCY INVERTER WITH "SERVO GENES"

HTL / TTL
incremental encoder connection

Up-to-date motor speed feedback is needed for high-precision speed control (closed-loop). This is realised using an incremental rotary encoder mounted on the motor shaft and directly connected to the frequency inverter.

Available for SK 520E and above

HTL

TTL

CANopen
absolute encoder connection

For positioning tasks a suitable absolute encoder can be connected directly to the CANopen interface of the frequency inverter.

Available for SK 530E and above

Universal encoder interface

The universal encoder interface enables the connection of various encoder systems to the frequency inverter. This absolute encoder interface is especially important for the operation of synchronous motors.

In addition to SSI encoders and BISS encoders (a further development of the SSI encoder), EnDat encoders with profile 2.1 and Hiperface encoders can also be evaluated.

Available for SK 540E and above

STAY COOL

ALTERNATIVE COOLING SYSTEMS FOR OUR SMALL DEVICES

Cold Plate

External heat sink technology

Alternative cooling systems "Cold-Plate" and external heat sink technology

In the Cold-Plate variant, the standard heat sink is replaced by a flat cooling flange. To transfer the heat from the frequency inverter, the flange is mounted on a surface cooled by, e.g. water, air or oil. Important advantages here are the reduction in installation depth of devices by approx. 35 mm to 119 mm and improved heat dissipation. With the external heat sink technology, a ribbed heat sink is supplied as an optional module and mounted on the Cold-Plate unit. The frequency inverter is installed in the control cabinet with the heat sink located outside the cabinet so that a large part of the heat to be dissipated is transferred there. This reduces the internal temperature of the cabinet and so air conditioners and fans can be correspondingly smaller or completely omitted.

Optionally available

External heat sink technology:
for all devices up to size 2, 2.2 kW

Cold-Plate technology:
for all devices up to size 4, 7.5 kW

DIALOGUE BETWEEN EXPERTS
NORD CON SOFTWARE INCLUDED

NORD CON software

NORD CON is the free operating software for controlling, parameterisation and diagnostics of all NORD frequency inverters and motor starters.

Controlling

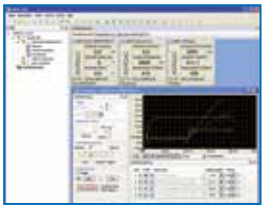
A virtual control unit, analogous to a SimpleBox (optional control and parameterisation unit), enables the display of operating values, parameterisation and control of a connected frequency inverter or motor starter.

Parameterisation

By means of a convenient overview the user can view and adjust each available parameter. By means of an appropriate printing option, parameter lists are generated in printed form either completely or only with the values which deviate from the factory settings. The finished data sets can be saved on a PC/laptop and archived for future use or sent by e-mail.

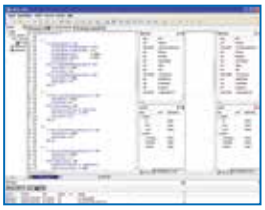
Diagnostics

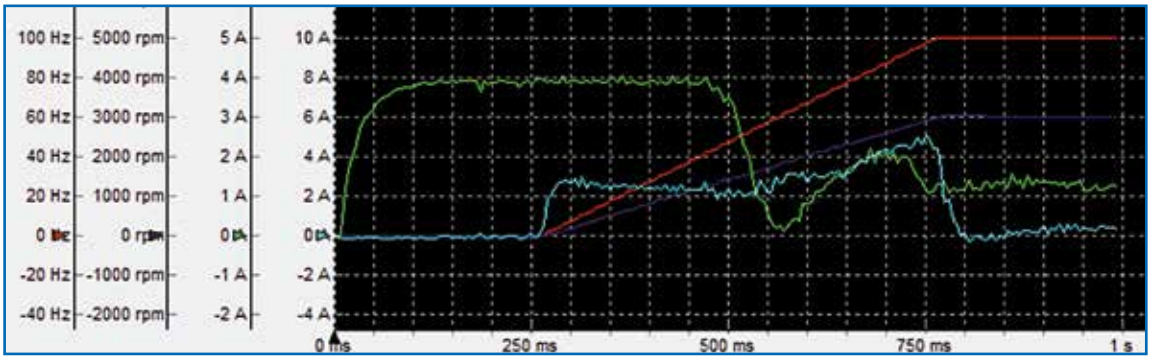
The NORD CON oscilloscope function is an extremely useful instrument for the optimum adjustment of drive systems. By means of line graphs, all drive characteristics (current, torque, etc.) can be recorded and analysed. On the basis of the results, fine tuning of the ideal parameter settings of the relevant drive unit is possible.



Programming the PLC (SK 520E or higher)

A PLC editor is available for creating, editing and managing a PLC program. The PLC programs can also be tested (debugged) with this editor and communicated to the frequency inverter. The programming languages "Structured Text" and "Instruction List" according to IEC 61131-3 are supported.





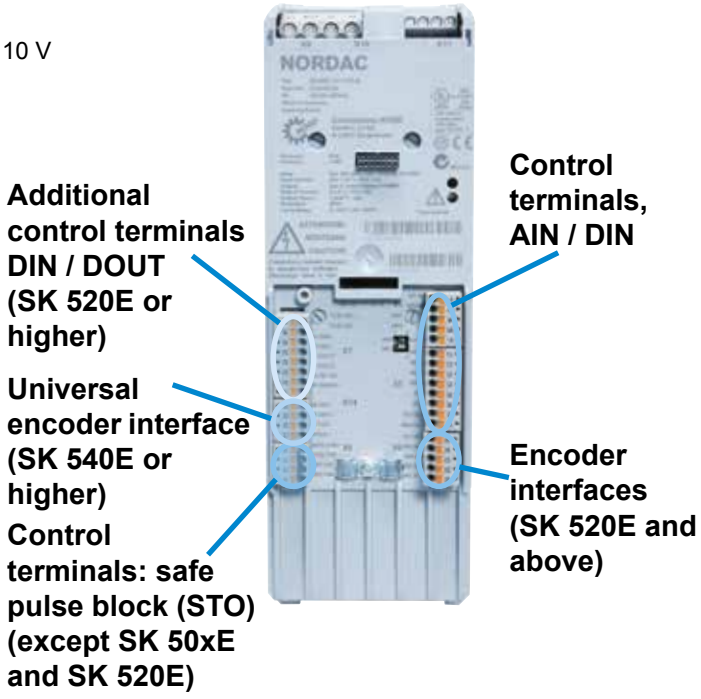
THE ENTIRE TEAM
ALL DEVICE VERSIONS AT A GLANCE

		SK 500E	SK 510E	SK 511E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 515E	SK 535E	SK 545E
		Size 1-4								Size 5-11		
Basic functions	Sensorless current vector control (ISD control)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Brake management for mechanical holding brake	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Brake chopper (braking resistor optional)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RS 232 diagnostic interface	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4 switchable parameter sets	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	All normal drive functions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Parameters pre-set with standard values	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Scalable display values	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Stator resistance measurement	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Automatic flux optimisation (energy saving function).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Line filter Class C2, up to 5 m motor cable Class C1 up to size 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Monitoring functions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Load monitor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Link circuit coupling	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Lifting gear functionality	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Process controller/PID controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Synchronous motor operation (PMSM)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Options	Cold Plate up to Size 4, External heat sink up to Size 4	❍	❍	❍	❍	❍	❍	❍	❍			
	All common field bus systems	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
	Safe Stop function (STO, SS1) (Not for 115 V devices)		✓	✓		✓	✓	✓	✓	✓	✓	✓
	CANopen on board			✓	✓	✓	✓	✓	✓	✓	✓	✓
	Evacuation runs						✓		✓	✓	✓	✓
	Incremental encoder input (servo mode)				✓	✓	✓	✓	✓		✓	✓
	POSICON					✓	✓	✓	✓		✓	✓
	Internal 24 V power supply unit to supply the control board	✓	✓	✓	✓	✓		✓		✓	✓	✓
	External 24 V supply for the control board						✓		✓	✓	✓	✓
	Automatic switching between external and internal 24 V control voltage									✓	✓	✓
	PLC functionality				✓	✓	✓	✓	✓		✓	✓
	Universal encoder interface							✓	✓			✓

✓ Available as standard
❍ Optional

		SK 500E	SK 510E	SK 511E	SK 520E	SK 530E	SK 535E	SK 540E	SK 545E	SK 515E	SK 535E	SK 545E
		Size 1-4								Size 5-11		
Control terminals	DIN	5	5	5	7	7	7	5 – 7 [1]	5 – 7 [1]	5	7	6 – 8 [1]
	DOUT	0	0	0	2	2	2	3 – 1 [1]	3 – 1 [1]	0	2	3 – 1 [1]
	Alarm relay[2] (… 230VAC, 2A)	2	2	2	2	2	2	2	2	2	2	2
	AIN[3]	2	2	2	2	2	2	2	2	2	2	2
	AOUT[3]	1	1	1	1	1	1	1	1	1	1	1
	Temperature sensor (PTC)	1[4]	1[4]	1[4]	1[4]	1[4]	1[4]	1	1	1	1	1
Encoder interfaces	TTL RS422				✓	✓	✓	✓	✓		✓	✓
	HTL[4]				✓	✓	✓	✓	✓		✓	✓
	SIN/COS							✓	✓			✓
	SSI							✓	✓			✓
	BISS							✓	✓			✓
	Hiperface							✓	✓			✓
	Endat 2.1							✓	✓			✓
	CANopen					✓	✓	✓	✓		✓	✓
Communication	CAN / CANopen RJ45			2	2	2	2	2	2	2	2	2
	RS 485 / RS232 RJ12	1	1	1	1	1	1	1	1	1	1	1
	RS 485 Terminal connection				1	1	1	1	1		1	1
	Modbus RTU							✓	✓			✓

)[1] 2 digital IOs optionally parameterisable as DIN or DOUT
)[2] with DOUT functions parameterisable
)[3] AIN/AOUT can also be used for digital signals.
AIN: 0(2) – 10 V, 0(4) – 20 mA, size 5 and above additionally ± 10 V
)[4] Function parameterisable through a digital input



CAN BE FOUND EVERYWHERE
NORD DRIVE TECHNOLOGY IN INDUSTRY

NORD, with its drive units and control technology, is represented in many sectors of industry. Depending on the application, the functions required range from simple speed control to technological and safety functions such as Safe Stop, positioning and "flying saw".

Sectors


Waste water technology


Material handling


Stage equipment


Airport technology


Food industry


Mining and quarrying


Pump industry


Construction


Printing


Steel industry


Cement industry

Applications


Lifting gear
Cranes


Portal cranes
Bridge trolleys


Lifts
Storage and retrieval equipment


Fans
Ventilators


Bottling plants


Bucket conveyors


Small devices
Pumps
Cooling circuits


Tool magazines
Distribution equipment
Sorting equipment


Conveyor belts
Material conveyors


Crusher
Mixers
Crushers

TECHNICAL DATA
ACCESSORIES

WOULD YOU LIKE
ANYTHING ELSE?

Each frequency inverter has a slot for the installation of an SK TU3- type technology unit.

You can choose between operation and parameterisation modules or interfaces for field bus systems.

Installation of the modules is thereby quick and easy.

Operation and parameterisation

Optional modules with up to 14 languages for displaying status and operational indications, parameterisation and operation of the frequency inverter. Apart from variants for direct mounting on the device or installation in a control cabinet door, there are also handheld versions available.

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Interfaces for field bus systems

The frequency inverter is integrated into a field bus system (classic or Ethernet-based) through a suitable interface in the form of an SK TU3- type technology unit. This is fitted directly on the technology unit slot on the device.

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Mains filter

Line filters are generally used to reduce the emission of electromagnetic interference. NORDAC PRO series frequency inverters are equipped with an integrated class C2 (max. 20 m shielded motor cable) or class C1 (size 1-4, max. 5 m shielded motor cable) line filter.
Various adaptive line filters are available for longer cable lengths or to improve interference suppression.

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Line chokes / link circuit chokes

Depending on the system, use of a line choke may be necessary. This is used to reduce effects on the mains and mains current surges / current harmonics.
It is recommended that a line choke be used at all times for a frequency inverter capacity of 45 kW and above.

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Motor chokes

Long motor cable lengths (cable capacity) often require the use of additional motor chokes (output chokes) on the frequency inverter output. These are used to protect the device and for improved EMC characteristics.

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Braking resistors

The integrated brake chopper enables direct connection of a braking resistor.
With a braking resistor it is possible to brake dynamically and to dissipate excess energy.

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Other accessories

The range of accessories is rounded off, for example, by modules that adapt the device to special regulations for different countries.

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INTERFACES FOR
OPERATION AND PARAMETERISATION

SK TU3-PAR

SK PAR-3E

SK TU3-CTR

SK CSX-3E

SK CSX-0

SK TU3-POT

Type	Designation	Material number
Control and parameterisation software	NORD CON	–
ParameterBox	SK TU3-PAR	275 900 100
	SK PAR-3E	275 281 414
Simple Control Box	SK TU3-CTR	275 900 090
	SK CSX-3E	275 281 413
	SK CSX-0	275 900 095
PotentiometerBox	SK TU3-POT	275 900 110

Control cabinet installation	Mounted on the device	Description	Remarks
–	–	Software for control and parameterisation as well as support for commissioning and fault analysis of NORD electronic drive technology. Parameter names in 14 languages	Free download: www.nord.com
–	✓	Suitable for control and parameterisation, LCD screen (illuminated), plain text display in 14 languages, memory for 5 device data sets, convenient control keypad.	This module occupies the optional slot on the frequency inverter. Therefore, an SK TU3 type bus interface can not be simultaneously installed and run on the device.
✓	–	Suitable for control and parameterisation, LCD display screen (illuminated), plain text display in 14 languages, direct control of up to 5 devices, memory for 5 device data sets, convenient control keypad, for installation in a control cabinet door.	Connection for exchange of data with NORD CON on a PC via RS232 (USB 2.0), incl. 1 m connection cable, 4.5 … 30 V DC / 1.3 W Supply e.g. directly via frequency inverter
–	✓	Suitable for control and parameterisation, 4-digit, 7-segment display, convenient control keypad.	This module occupies the optional slot on the frequency inverter. Therefore, an SK TU3 type bus interface can not be simultaneously installed and run on the device.
✓	–	Suitable for control and parameterisation, 4-digit, 7-segment display, direct control of a device, convenient control keypad.	Electrical data: 4.5 … 30 V DC / 1,3 W, Supply e.g. directly via the frequency inverter
–	✓	Suitable for control and parameterisation, 4-digit, 7-segment display, direct control of a device, one-button operation.	The module is connected to the RJ 12 interface of the frequency inverter and does not occupy the optional slot for SK TU3 modules. Simultaneous control of a bus interface is therefore possible.
–	✓	Suitable for control, potentiometer 0 … 100% .	

COMMUNICATION INTERFACES
INDUSTRIAL ETHERNET, FIELD BUS AND IO EXTENSIONS

Type	Designation	Material number
INTERBUS	SK TU3-IBS	275 900 065
PROFIBUS	SK TU3-PBR	275 900 030
	SK TU3-PBR-24V	275 900 160
CANopen	SK TU3-CAO	275 900 075
DeviceNet	SK TU3-DEV	275 900 085
AS-Interface	SK TU3-AS1	275 900 170

Type	Designation	Material number
EtherCAT	SK TU3-ECT	275 900 180
EtherNet/IP	SK TU3-EIP	275 900 150
ETHERNET POWERLINK	SK TU3-POL	275 900 140
PROFINET	SK TU3-PNT	275 900 190

Connection	Description	Remarks
2x Sub-D9		Baud rate: 500 kBit/s (2 Mbit/s)
Sub-D9	Interface to connect the frequency inverter to a PROFIBUS DP field bus.	Baud rate: maximum 1.5 MBaud Protocol: DPV 0 Addressing: via parameter
Sub-D9		Baud rate: maximum 12 MBaud Protocol: DPV 0 Addressing: Addressing:via rotary coding switch or parameter 24 V DC connection: via connection terminals
Sub-D9	Interface to connect the frequency inverter to a CANopen field bus.	Baud rate: maximum 1 MBaud Protocol: DS 301 and DS 402
5 pin screw terminal	Interface to connect the frequency inverter to a DeviceNet field bus.	Baud rate: maximum 500 kBaud Profile: AC-Drive and NORD-AC
5-pole and 8-pole screw terminals	Interface to connect the frequency inverter to an AS interface field bus.	4 sensors/2 actuators

Connection	Description	Remarks
2 x RJ 45	Interface to connect the frequency inverter to an EtherCAT field bus.	Baud rate: maximum 100 MBaud 24 V DC connection: via terminal Usable as a gateway to control up to a total of 4 frequency inverters.
2 x RJ 45	Interface to connect the frequency inverter to an EtherNet / IP field bus.	Baud rate: maximum 100 MBaud, 24 V DC connection: via terminal Usable as a gateway to control up to a total of 8 frequency inverters.
2 x RJ 45	Interface to connect the frequency inverter to a POWERLINK field bus.	Baud rate: maximum 100 MBaud, 24 V DC connection: via terminal Usable as a gateway to control up to a total of 8 frequency inverters.
2 x RJ 45	Interface to connect the frequency inverter to a PROFINET IO field bus.	Baud rate: maximum 100 MBaud, 24 V DC connection: via terminal Usable as a gateway to control up to a total of 8 frequency inverters.

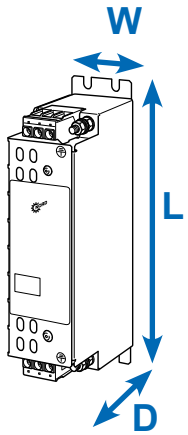
LINE FILTER
IMPROVEMENT OF EMC

General

Line filters are generally used to reduce the emission of electromagnetic interference. SK 500E series frequency inverters are equipped with an integrated class C2 (max. 20 m shielded motor cable) or class C1 (size 1-4, max. 5 m shielded motor cable) line filter.
Various adaptive line filters are available for longer cable lengths or to improve interference suppression.

Chassis line filter, SK HLD (IP20)

The line filters are mounted separately from the frequency inverter. These line filters enable interference suppression Class C1 with max. 25 m shielded motor cable and Class C2 with max. 50 m cable.



Inverter type SK 5xxE		Line filter type IP20	Part Number
3~ 230 V	0.25 + 1.1 kW	SK HLD 110-500/8	278 272 008
	1.5 + 2.2 kW	SK HLD 110-500/16	278 272 016
	3.0 + 5.5 kW	SK HLD 110-500/30	278 272 030
	7.7 kW	SK HLD 110-500/42	278 272 042
	11 kW	SK HLD 110-500/75	278 272 075
	15 kW	SK HLD 110-500/100	278 272 100
3~ 400 V	0.55 + 2.2 kW	SK HLD 110-500/8	278 272 008
	3.0 + 5.5 kW	SK HLD 110-500/16	278 272 016
	7.5 kW	SK HLD 110-500/30	278 272 030
	11 kW	SK HLD 110-500/42	278 272 042
	15 ...18.5 kW	SK HLD 110-500/55	278 272 055
	22 kW	SK HLD 110-500/75	278 272 075
	30 kW	SK HLD 110-500/100	278 272 100
	37... 45 kW	SK HLD 110-500/130	278 272 130
	55 kW	SK HLD 110-500/180	278 272 180
	75 + 90 kW	SK HLD 110-500/250	278 272 250
	110 ... 160 kW	Currently in preparation	

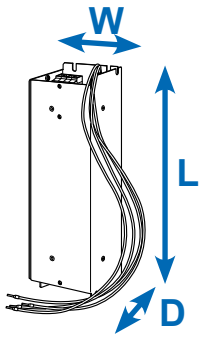
Continuous current [A]	Leakage current[1] [mA]	L [mm]	W [mm]	D [mm]
8	20 / 190	190	45	75
16	21 / 205	250	45	75
30	29 / 280	270	55	95
42	30 / 290	310	55	95
75	22 / 210	310	85	135
100	30 / 290	325	95	150
8	20 / 190	190	45	75
16	21 / 205	250	45	75
30	29 / 280	270	55	95
42	30 / 290	310	55	95
55	30 / 290	255	85	95
75	22 / 210	310	85	135
100	30 / 290	325	95	150
130	22 / 210	325	95	150
180	31 / 300	440	130	181
250	37 / 355	525	155	220

[1] Leakage current 1st value: rated for the maximum permissible fluctuation of input voltage according to IEC 38 + 10%
Leakage current 2nd value: Calculated with max. input voltage and failure of 2 phases (typically at 50 Hz)

LINE FILTER
IMPROVEMENT OF EMC

Footprint line filter, combination filter SK NHD (IP20)

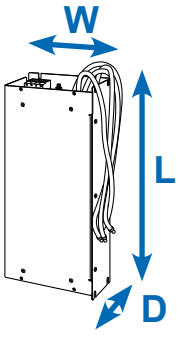
for frequency inverter power of up to 7.5 kW (400 V) are available. The line filter can be mounted flat underneath the frequency inverter. This reduces the space requirement. These combination filters combine the advantages of a line filter and a line choke in a single housing and enable class C1 interference suppression with max. 50 m shielded motor cable and class C2 with max. 100 m cable.



Inverter type SK 5xxE		Line filter type IP20	Part Number
3~ 230 V	0.25 + 0.75 kW	SK NHD-480/6-F	278 273 006
	1.1 + 2.2 kW	SK NHD-480/10-F	278 273 010
	3.0 + 4.0 kW	SK NHD-480/16-F	278 273 016
3~ 400 V	0.55 + 0.75 kW	SK NHD-480/3-F	278 273 003
	1.1 + 2.2 kW	SK NHD-480/6-F	278 273 006
	3.0 + 4.0 kW	SK NHD-480/10-F	278 273 010
	5.5 + 7.5 kW	SK NHD-480/16-F	278 273 016

Footprint line filter, SK LF2 (IP00)

for frequency inverter power of up to 37 kW (400 V) are available. The line filter can be mounted flat underneath the frequency inverter. This reduces the space requirement. These line filters enable class C1 interference suppression with max. 50 m shielded motor cable and class C2 with max. 100 m cable.



Inverter ID SK 5xxE		Line filter type IP00	Part Number
3~ 230 V	5.5 + 7.5 kW	SK LF2-480/45-F	278 273 045
	11 kW	SK LF2-480/66-F	278 273 066
	15 kW	SK LF2-480/105-F	278 273 105
3~ 400 V	0.55 ... 0.75 kW	SK LF2-480/2-F	278 273 002
	1.1 ... 2.2 kW	SK LF2-480/5-F	278 273 005
	3.0 ... 4.0 kW	SK LF2-480/9-F	278 273 009
	5.5 ... 7.5 kW	SK LF2-480/15-F	278 273 015
	11 + 15 kW	SK LF2-480/45-F	278 273 045
	18.5 + 22 kW	SK LF2-480/66-F	278 273 066
	30 ... 37 kW	SK LF2-480/105-F	278 273 105

Continuous current [A]	Inductance [mH]	Leakage current[1] [mA]	L [mm]	W [mm]	D [mm]
5.5	3 x 6.4	1 / 10	290	88	74
9.5	3 x 3.7	12 / 120	305	115	98
16	3 x 2.2	12 / 120	350	140	98
2.3	3 x 15.3	1 / 10	250	75	60
5.5	3 x 6.4	1 / 10	290	88	74
9.5	3 x 3.7	12 / 120	305	115	98
16	3 x 2.2	12 / 120	350	140	98

Continuous current [A]	Leakage current[1] [mA]	L [mm]	W [mm]	D [mm]
45	12 / 120	388	164	75
66	12 / 120	428	182	75
105	22 / 210	527	210	95
2.3	6.4 / 61.5	250	75	48
5.5	7.7 / 74.3	290	88	48
9.5	19.5 / 187	305	115	54
16	20.2 / 193	350	115	54
45	12 / 120	388	164	75
66	12 / 120	428	182	75
105	22 / 210	527	210	95

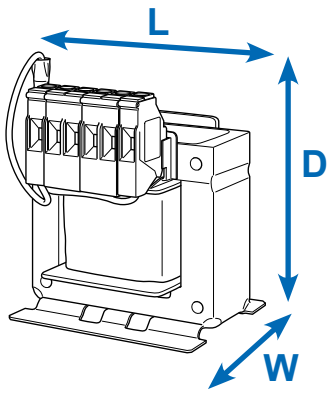
[1] Leakage current 1st value: rated for the maximum permissible fluctuation of input voltage according to IEC 38 + 10%
Leakage current 2nd value: calculated at maximum input voltage and failure of 2 phases (typically at 50 Hz)

LINE CHOKES / LINK CIRCUIT CHOKES
REDUCTION OF MAINS FEEDBACK

General

It may be necessary for some drive systems to use line chokes to reduce dangerous line current peaks. With their use, external line feedback effects are considerably reduced and the proportion of current harmonics is reduced to a minimum. The input current is reduced to approximately the value of the output current.

It is recommended that a line choke be used at all times for a frequency inverter capacity of 45 kW and above. This will have an additional positive effect on device protection and EMC behaviour. All chokes have protection class IP00 and are UL certified.



1~ 230 V

Inverter type SK 5xxE ...	Choke type IP00	Part Number
0.25 + 0.75 kW	SK CI1-230/8-C	278 999 030
1.1 + 2.2 kW	SK CI1-230/20-C	278 999 040

3~ 230 V

Inverter type SK 5xxE ...	Choke type IP00	Part Number
0.25 + 0.75 kW	SK CI1-480/6-C	276 993 006
1.1 + 1.5 kW	SK CI1-480/11-C	276 993 011
2.2 + 3.0 kW	SK CI1-480/20-C	276 993 020
4.0 + 7.5 kW	SK CI1-480/40-C	276 993 040
11 ... 15 kW	SK CI1-480/70-C	276 993 070

3~ 400 V

Inverter type SK 5xxE ...	Choke type IP00	Part Number
0.55 + 2.2 kW	SK CI1-480/6-C	276 993 006
3.0 + 4.0 kW	SK CI1-480/11-C	276 993 011
5.5 + 7.5 kW	SK CI1-480/20-C	276 993 020
11 + 15 kW	SK CI1-480/40-C	276 993 040
18.5 + 30 kW	SK CI1-480/70-C	276 993 070
37 ... 45 kW	SK CI1-480/100-C	276 993 100
55 + 75 kW	SK CI1-480/160-C	276 993 160
90 kW	SK CI1-480/280-C	276 993 280
110 ... 132 kW	SK CI1-480/350-C	276 993 350
160 kW	not available	

Link circuit choke SK DCL (IP00)

Similar to a line reactor, reduces the network loads of a frequency inverter that are inherent to its functional principle. It is connected to easily accessible contacts provided for this purpose in the frequency inverter's intermediate circuit and is available at 45 kW and above (IP00).

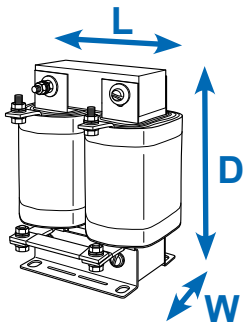
Inverter type SK 5xxE ...	Choke type IP00	Part Number
45 + 55 kW	SK DCL-950/120-C	276 997 120
75 + 90 kW	SK DCL-950/200-C	276 997 200
110 kW	SK DCL-950/260-C	276 997 260
132 kW	SK DCL-950/320-C	276 997 320
160 kW	SK DCL-950/380-C	276 997 380

Continuous current [A]	Inductance [mH]	L [mm]	W [mm]	D [mm]
8	2 x 1.0	65	78	89
20	2 x 0.4	90	96	106

Continuous current [A]	Inductance [mH]	L [mm]	W [mm]	D [mm]
6	3 x 4.88	96	60	117
11	3 x 2.93	120	85	140
20	3 x 1.47	155	110	177
40	3 x 0.73	155	115	172
70	3 x 0.47	185	122	220

Continuous current [A]	Inductance [mH]	L [mm]	W [mm]	D [mm]
6	3 x 4.88	96	60	117
11	3 x 2.93	120	85	140
20	3 x 1.47	155	110	177
40	3 x 0.73	155	115	172
70	3 x 0.47	185	122	220
100	3 x 0.29	240	148	263
160	3 x 0.18	352	140	268
280	3 x 0.10	352	169	268
350	3 x 0.08	352	169	268

Continuous current [A]	Inductance [mH]	L x W x D [mm]
120	0.50	148 x 147 x 230
200	0.30	170 x 153 x 260
260	0.25	180 x 174 x 284
320	0.20	180 x 189 x 282
200	0.17	180 x 189 x 282



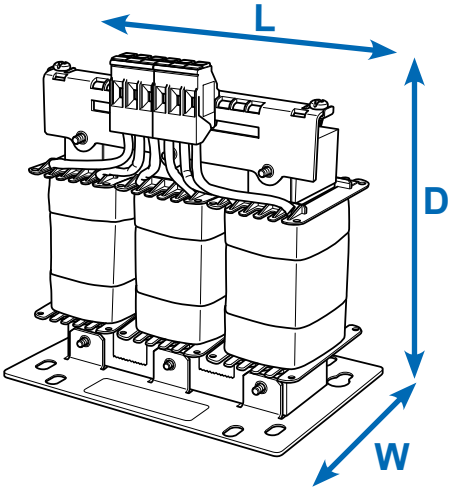
MOTOR CHOKES

IMPROVEMENT OF EMC, COMPENSATION OF CABLE CAPACITIES

General

Long motor cable lengths (cable capacity) often require the use of additional motor chokes (output chokes) on the frequency inverter output.
In addition, the use of motor chokes have a positive effect on device protection and EMC characteristics.

The specified motor chokes are rated for a pulse frequency of 3 to 6 kHz and an output frequency of 0 to 120 Hz. All chokes have protection class IP00 and are UL certified.



3~ 230 V

Inverter type SK 5xxE ...	Choke type IP00	Part Number
0.25 + 0.75 kW	SK CO1-460/4-C	276 996 004
1.1 + 1.5 kW	SK CO1-460/9-C	276 996 009
2.2 + 4.0 kW	SK CO1-460/17-C	276 996 017
5.5 + 7.5 kW	SK CO1-460/33-C	276 996 033
11 ... 15 kW	SK CO1-480/60-C	276 992 060

3~ 400 V

Inverter type SK 5xxE ...	Choke type IP00	Part Number
0.55 + 1.5 kW	SK CO1-460/4-C	276 996 004
2.2 + 4.0 kW	SK CO1-460/9-C	276 996 009
5.5 + 7.5 kW	SK CO1-460/17-C	276 996 017
11 + 15 kW	SK CO1-460/33-C	276 996 033
18.5 + 30 kW	SK CO1-480/60-C	276 992 060
37 ... 45 kW	SK CO1-460/90-C	276 996 090
55 + 75 kW	SK CO1-460/170-C	276 996 170
90 ... 110 kW	SK CO1-460/240-C	276 996 240
132 ... 160 kW	SK CO1-460/330-C	276 996 330

Continuous current [A]	Inductance [mH]	L [mm]	W [mm]	D [mm]
4	3 x 3.5	120	104	140
9	3 x 2.5	155	110	160
17	3 x 1.2	185	102	201
33	3 x 0.6	185	122	201
60	3 x 0.33	185	112	210

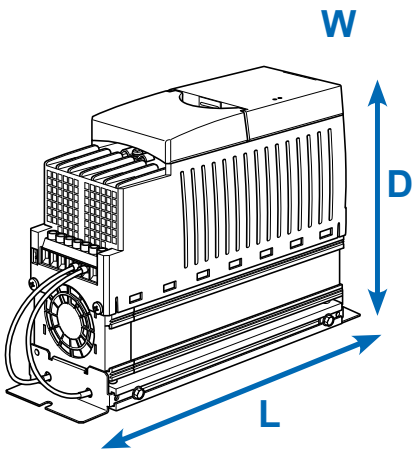
Continuous current [A]	Inductance [mH]	L [mm]	W [mm]	D [mm]
4	3 x 3.5	120	104	140
9	3 x 2.5	155	110	160
17	3 x 1.2	185	102	201
33	3 x 0.6	185	122	201
60	3 x 0.33	185	112	210
90	3 x 0.22	352	144	325
170	3 x 0.13	412	200	320
240	3 x 0.07	412	225	320
330	3 x 0.03	352	188	268

BRAKE RESISTORS
FOR DYNAMIC DRIVE CHARACTERISTICS

Footprint resistors SK BR4 (IP40)

are available in four sizes for frequency inverter capacities of up to 7.5 kW (400 V). This braking resistor can be mounted flat or vertically, next to the frequency inverter. This reduces the space requirement. The specified resistance values are electrically matched to standard applications.

Inverter type SK 5xxE		Resistor type IP40	Part Number
230 V/115 V	0.25 … 0.37 kW	SK BR4-240/100	275 991 110
	0.55 … 0.75 kW	SK BR4-150/100	275 991 115
	1.1 … 2.2 kW	SK BR4-75/200	275 991 120
	3.0 … 4.0 kW	SK BR4-35/400	275 991 140
400 V	0.55 … 0.75 kW	SK BR4-400/100	275 991 210
	1.1 … 2.2 kW	SK BR4-220/200	275 991 220
	3.0 … 4.0 kW	SK BR4-100/400	275 991 240
	5.5 … 7.5 kW	SK BR4-60/600	275 991 260
	Temperature monitoring for BR4 resistors with installation near the inverter		275 991 100
	Temperature monitoring for BR4 resistors and direct installation under the frequency inverter		275 991 200



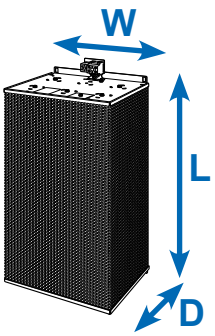
Resistance [Ω]	Continuous output [W]	Short-term power [kW]*	L [mm]	W [mm]	D [mm]
240	100	2.2	230	88	175
150	100	2.2	230	88	175
75	200	4.4	270	88	175
35	400	8.8	285	98	239
400	100	2.2	230	88	175
220	200	4.4	270	88	175
100	400	8.8	285	98	239
60	600	13.0	330	98	239
Bimetallic switch as opener			Wide brake resistor +10mm (one side) The dimensions apply to the frequency inverter. including the brake resistor		
Bimetallic switch as opener					

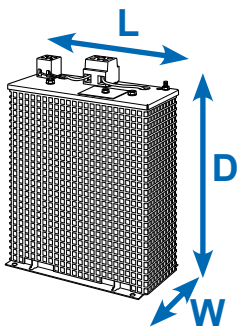
* once within 120 s,
for a maximum duration of 1.2 s

BRAKE RESISTORS
FOR DYNAMIC DRIVE CHARACTERISTICS

Chassis brake resistors, SK BR2 (IP20)

The resistor elements are integrated into a housing grating and must be connected to the particular frequency inverter via a separate connecting cable.
The braking resistors must be mounted horizontally (apart from SK BR2-xxx/400-C).
A shielded cable which is as short as possible should be used for this purpose.





only SK BR2-xxx/400-C

Inverter type SK 5xxE ...		Resistor type IP20	Part Number
230 V	3.0 … 4.0 kW	SK BR2-35/400-C[1]	278 282 045
	5.5 + 7.5 kW	SK BR2-22/600-C	278 282 065
	11 kW	SK BR2-12/1500-C	278 282 015
	15 kW	SK BR2-9/2200-C	278 282 122
400 V	3.0 ... 4.0 kW	SK BR2-100/400-C[1]	278 282 040
	5.5 ... 7.5 kW	SK BR2-60/600-C	278 282 060
	11 ... 15 kW	SK BR2-30/1500-C	278 282 150
	18.5 ... 22 kW	SK BR2-22/2200-C	278 282 220
	30 ... 37 kW	SK BR2-12/4000-C	278 282 400
	45 ... 55 kW	SK BR2-8/6000-C	278 282 600
	75 ... 110 kW	SK BR2-6/7500-C	278 282 750
	132 ... 160 kW	SK BR2-3/7500-C	278 282 753
	132 ... 160 kW	SK BR2-3/17000-C	278 282 754
	Temperature monitoring for BR2 resistors integrated (2 terminals 4 mm²)		

[1] Type of assembly: vertical

Resistance [Ω]	Continuous output [W]	Short-term power [kW]*	L [mm]	W [mm]	D [mm]
35	400	12	178	100	252
22	600	18	385	92	120
12	1500	45	585	185	120
9	2200	66	485	275	120
100	400	12	178	100	252
60	600	18	385	110	120
30	1500	45	585	185	120
22	2200	66	485	275	120
12	4000	120	585	266	210
8	6000	180	395	490	260
6	7500	225	595	490	260
3	7500	225	595	490	260
3	17 000	510	795	490	260
Bimetallic switch as opener					

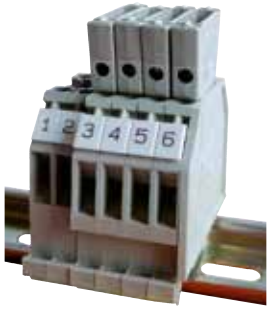
* once within 120 s,
for a maximum duration of 1.2 s

FREQUENCY INVERTER NORDAC *PRO*
ACCESSORIES

EMC kit

For the EMC-compliant connection of shielded cables and to produce strain relief.

Size of frequency inverter	EMC kit	Part number
Size 1 and size 2	SK EMC 2-1	275 999 011
Size 3 and size 4	SK EMC 2-2	275 999 021
Size 5	SK EMC 2-3	275 999 031
Size 6	SK EMC 2-4	275 999 041
Size 7	SK EMC 2-5	275 999 051
Size 8 and size 9	SK EMC 2-6	275 999 061
Size 10 and size 11	SK EMC 2-7	275 999 071



Connection kit
HTL -encoder WK 4/2/4*680 OHM

For connection of an HTL encoder to the TTL encoder input of the frequency inverter, top-hat rail mounting.
Material number 278 910 340

Signal converter +/- 10V

For connection of a bipolar analogue signal to the unipolar input of a frequency inverter (up to Size 4). Snap-on mounting.
Material number 278 910 320

IO expansion SK EBIOE-2

The generous number of standard inputs and outputs on the device can be supplemented using an extension provided for top-hat rail mounting.
Material number 275 900 210
Available for SK 540E and above

Electronic brake rectifier SK EBGR-1

For the direct control and actuation of an electromechanical holding brake.
Material number 19 140 990

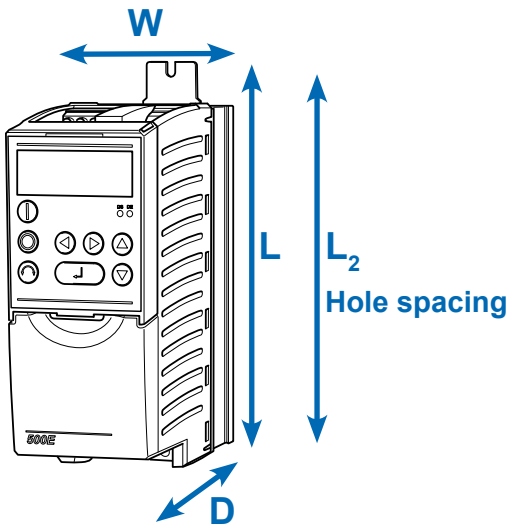
RJ45 WAGO connection module

For example to connect a CANopen encoder to one of the two RJ45 connection sockets of the frequency inverter.
Part number 278 910 300

FREQUENCY INVERTER NORDAC *PRO*

1~ 110 ... 120 V AND 1 / 3~ 200 ... 240 V

Output frequency	0.0 ... 400.0 Hz
Pulse frequency	3.0 ... 16.0 kHz
Typical overload capacity	150 % for 60 s, 200 % for 3.5 s,
Efficiency of frequency inverter	Size 1 - 4 approx. 95% Size 5 - 7 approx. 97% Size 8 - 11 approx. 98%
Ambient temperature	0°C ... +40°C (S1-100 % ED), 0°C ... +50°C (S3-70 % ED 10 min)
Protection class	IP20
Regulation and control	Sensorless current vector control (ISD), linear V/f characteristic
Motor temperature monitoring	I^2t motor PTC or bi-metal switch
Leakage current	<30 mA, depending on the size of the device and the configuration; in some cases considerably less (See manual for details)



Inverter type SK 5xxE ...	Mains voltage	Output voltage	Nominal motor power 230 V [kW]
-250-112-O	1~ 110 ... 120 V, +/- 10 %, 47 ... 63 Hz	3~ 0 - 2x mains voltage	0.25
-370-112-O			0.37
-550-112-O			0.55
-750-112-O			0.75
-111-112-O			1.1

Inverter type SK 5xxE ...	Mains voltage	Nominal motor power 230 V [kW]
-250-323-A	1 / 3~ 200 ... 240 V , +/- 10 %, 47 ... 63 Hz	0.25
-370-323-A		0.37
-550-323-A		0.55
-750-323-A		0.75
-111-323-A		1.1
-151-323-A		1.5
-221-323-A		2.2
-301-323-A	3~ 200 ... 240 V, +/- 10 %, 47 ... 63Hz	3.0
-401-323-A		4.0
-551-323-A		5.5
-751-323-A		7.5
-112-323-A		11
-152-323-A		15

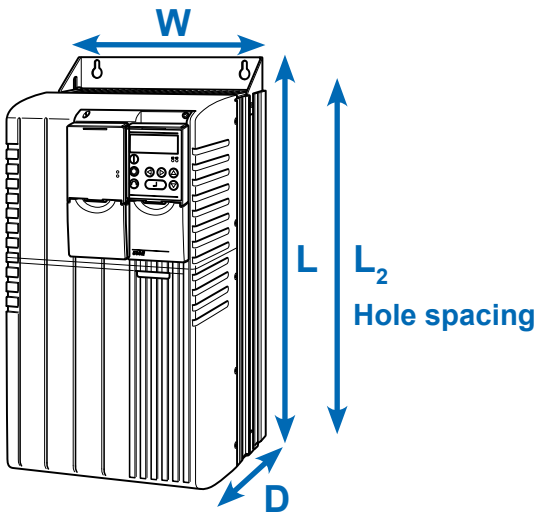
Nominal motor power 240 V [hp]	Nominal output current rms [A]	Typical Input current rms [A]	Weight [kg]	Dimensions L (L_2) x W x D [mm]	Size
$\frac{1}{3}$	1.7	8	1.4	186 (220) x 74 x 153	1
$\frac{1}{2}$	2.2	10	1.4		
$\frac{3}{4}$	3.0	13	1.4		
1	4.0	18	1.4		
$1\frac{1}{2}$	5.3	23.5	1.4		

Nominal motor power 240 V [hp]	Nominal output current rms [A]	Typical Input current rms [A]	Weight [kg]	Dimensions L (L_2) x W x D [mm]	Size
$\frac{1}{3}$	1.7	3.7 / 2.4	1.4	186 (220) x 74 x 153	1
$\frac{1}{2}$	2.2	4.8 / 3.1	1.4		
$\frac{3}{4}$	3.0	6.5 / 4.2	1.4		
1	4.0	8.7 / 5.6	1.4		
$1\frac{1}{2}$	5.5	12.0 / 7.7	1.8	226 (260) x 74 x 153	2
2	7.0	15.2 / 9.8	1.8		
3	9.5	19.6 / 13.3	1.8		
4	12.5	17.5	2.7	241 (275) x 98 x 181	3
5	16.0	22.4	2.7		
$7\frac{1}{2}$	22	30.8	8.0	327 (357) x 162 x 224	5
10	28	39.2	8.0		
15	46	64.4	10.3	367 (397) x 180 x 234	6
20	60	84	15.0	456 (485) x 210 x 236	7

FREQUENCY INVERTER NORDAC *PRO*

3~ 380 ... 480 V

Output frequency	0.0 ... 400.0 Hz
Pulse frequency	3.0 ... 16.0 kHz
Typical overload capacity	150 % for 60 s, 200 % for 3.5 s,
Efficiency of frequency inverter	Size 1 - 4 approx. 95% Size 5 - 7 approx. 97% Size 8 - 11 approx. 98%
Ambient temperature	0°C ... +40°C (S1-100 % ED), 0°C ... +50°C (S3-70 % ED 10 min)
Protection class	IP20
Regulation and control	Sensorless current vector control (ISD), linear V/f characteristic
Motor temperature monitoring	I^2t motor PTC or bi-metal switch
Leakage current	<30 mA, depending on the size of the device and the configuration; in some cases considerably less (See manual for details)



Inverter type SK 5xxE	Mains voltage	Nominal motor power 400 V [kW]
-550-340-A	3~ 380 ... 480 V, -20 % / +10 %, 47 ... 63 Hz	0.55
-750-340-A		0.75
-111-340-A		1.1
-151-340-A		1.5
-221-340-A		2.2
-301-340-A		3.0
-401-340-A		4.0
-551-340-A		5.5
-751-340-A		7.5
-112-340-A		11.0
-152-340-A		15.0
-182-340-A		18.5
-222-340-A		22.0
-302-340-A		30.0
-372-340-A		37.0
-452-340-A		45.0
-552-340-A		55.0
-752-340-A		75.0
-902-340-A		90.0
-113-340-A		110.0
-133-340-A		132.0
-163-340-A*		160.0

)* Currently in preparation

Nominal motor power 480 V [hp]	Nominal output current rms [A]	Typical Input current rms [A]	Weight [kg]	Dimensions L (L_2) x W x D [mm]	Size
$\frac{3}{4}$	1.7	2.4	1.4	186 (220) x 74 x 153	1
1	2.3	3.2	1.4		
$1\frac{1}{2}$	3.1	4.3	1.8	226 (260) x 74 x 153	2
2	4.0	5.6	1.8		
3	5.5	7.7	1.8		
4	7.5	10.5	2.7	241 (275) x 98 x 181	3
5	9.5	13.3	2.7		
$7\frac{1}{2}$	12.5	17.5	3.1	286 (320) x 98 x 181	4
10	16.0	22.4	3.1		
15	24.0	33.6	8.0	327 (357) x 162 x 224	5
20	31.0	43.4	8.0		
25	38.0	53.2	10.3	367 (397) x 180 x 234	6
30	46.0	64.4	10.3		
40	60.0	84.0	16.0	456 (485) x 210 x 236	7
50	75.0	105.0	16.0		
60	90.0	126.0	20.0	598 (582) x 265 x 286	8
75	110.0	154.0	20.0		
100	150.0	210.0	25.0	636 (620) x 265 x 286	9
125	180.0	252.0	25.0		
150	220.0	308.0	46.0	720 (704) x 395 x 292	10
180	260.0	364.0	49.0		
220	320.0	448.0	52.0	799 (783) x 395 x 292	11

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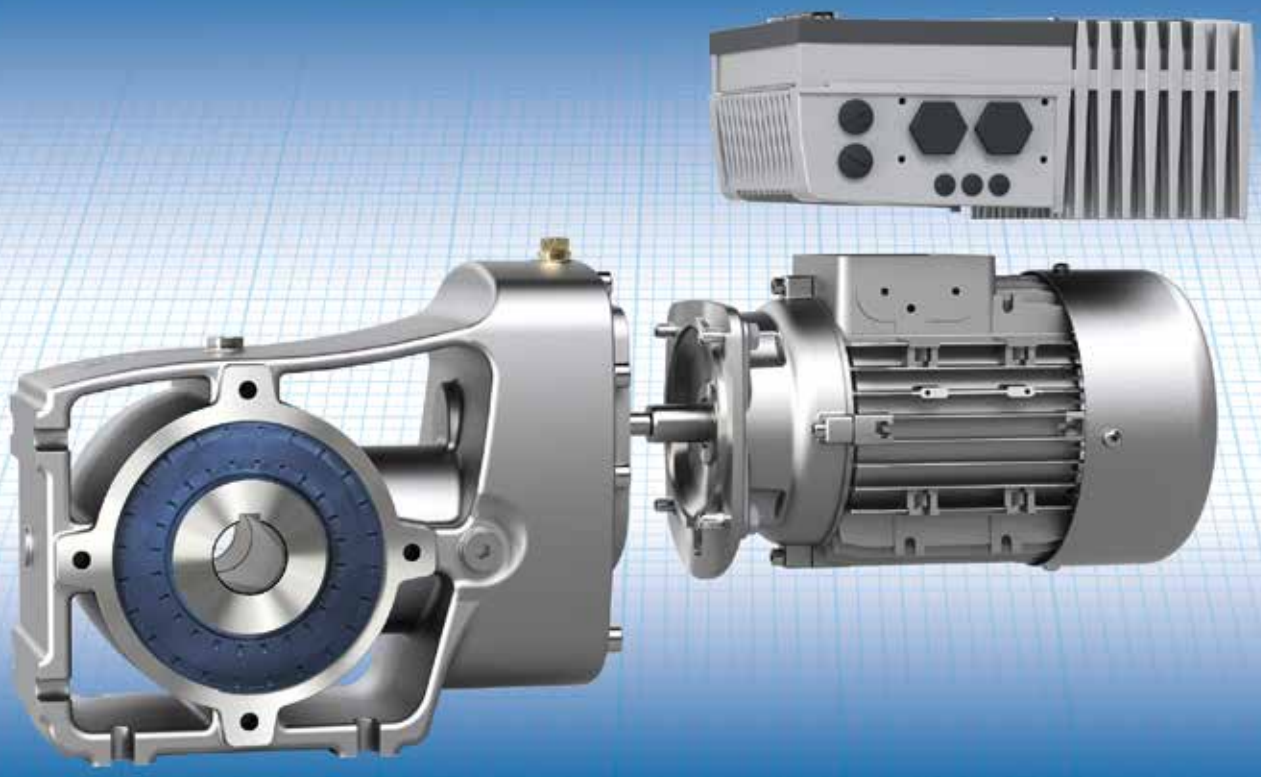

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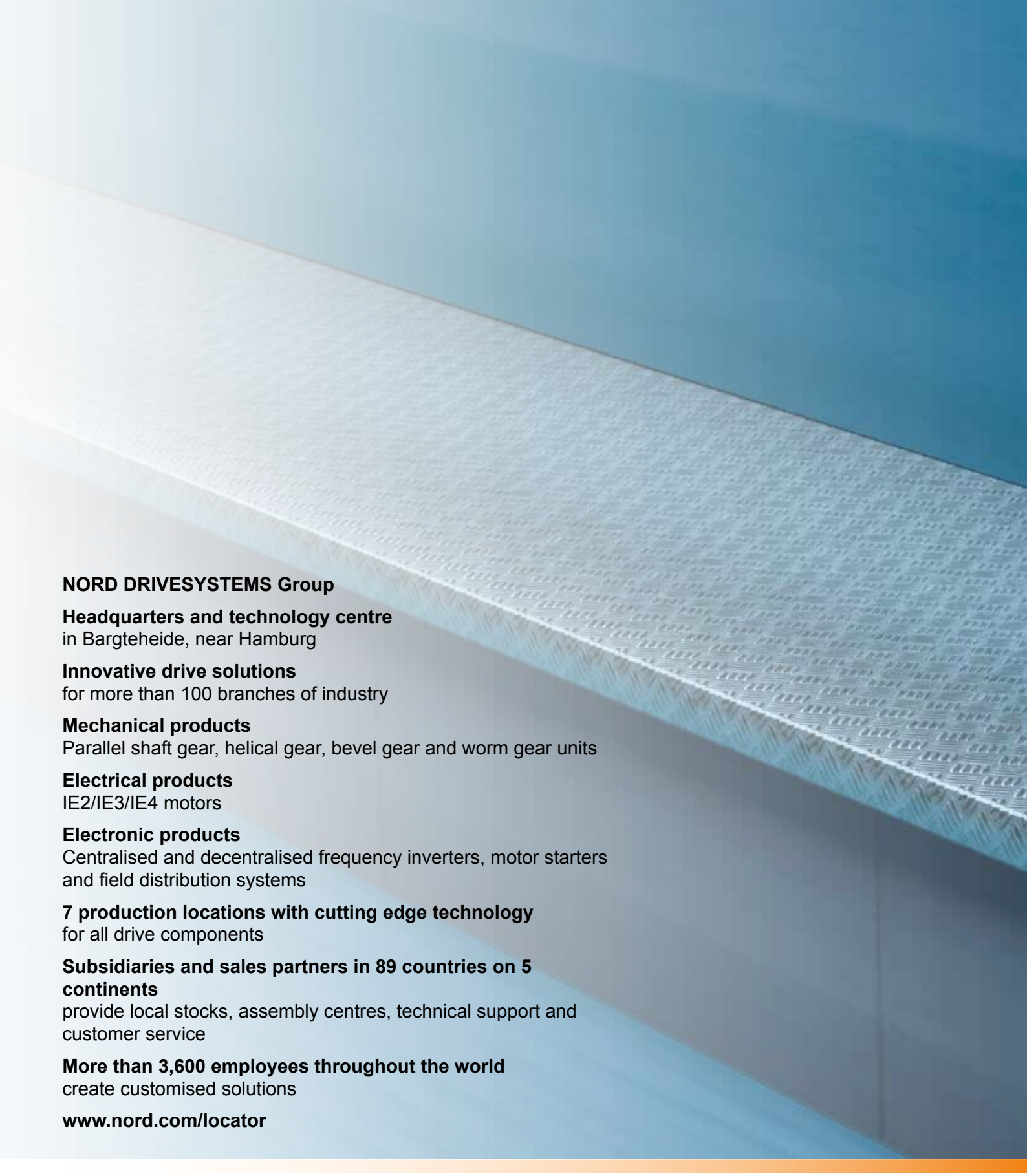

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