

Discontinue



Direct drive actuator

# AX4000 Series actuator

Large hollow shaft handy for cable wiring and piping, and a variety of options.

- Max. torque: 9, 22, 45, 75, 150, 300, 500N·m

## Actuator specifications

| Descriptions                                       | AX4009                               | AX4022 | AX4045 | AX4075 | AX4150 | AX4300 | AX4500 |
|--|--------------------------------------|--------|--------|--------|--------|--------|--------|
| Maximum output torque N·m                          | 9                                    | 22     | 45     | 75     | 150    | 300    | 500    |
| Continuous output torque N·m                       | 3                                    | 7      | 15     | 25     | 50     | 100    | 160    |
| Maximum rotation speed rpm                         | 100 (Note 2)                         |        |        | 100    |        |        | 70     |
| Allowable axial load N                             | 800                                  | 3700   |        | 20000  |        |        |        |
| Allowable moment load N·m                          | 40                                   | 60     | 80     | 200    | 300    | 400    | 500    |
| Output shaft moment of inertia kg·m <sup>2</sup>   | 0.0090                               | 0.0206 | 0.0268 | 0.1490 | 0.2120 | 0.3260 | 0.7210 |
| Allowable load moment of inertia kg·m <sup>2</sup> | 0.35                                 | 0.60   | 0.90   | 5.00   | 7.50   | 18.00  | 30.00  |
| Index accuracy (Note 1) sec.                       |                                      |        |        | ±30    |        |        |        |
| Repeatability sec.                                 |                                      |        |        | ±5     |        |        |        |
| Output shaft friction torque N·m                   | 0.8                                  | 3.5    |        | 10.0   |        |        | 15.0   |
| Resolver resolution P/rev                          | 540672                               |        |        |        |        |        |        |
| Motor insulation grade                             | Class F                              |        |        |        |        |        |        |
| Motor withstanding voltage                         | 1500 VAC for one minute              |        |        |        |        |        |        |
| Motor insulation resistance                        | 10MΩ and over 500 VDC                |        |        |        |        |        |        |
| Working ambient temperature range                  | 0 to 45°C                            |        |        |        |        |        |        |
| Working ambient humidity range                     | 20 to 85%RH with no dew condensation |        |        |        |        |        |        |
| Storage ambient temperature range                  | -20 to 80°C                          |        |        |        |        |        |        |
| Storage ambient humidity range                     | 20 to 90%RH with no dew condensation |        |        |        |        |        |        |
| Weight kg  | 5.5                                  | 12.3   | 15.0   | 36.0   | 44.0   | 66.0   | 115.0  |
| Brake set total weight kg                          | -                                    | 16.4   | 19.3   | 54.0   | 63.0   | 86.0   | -      |
| Runout of output shaft mm                          | 0.03                                 |        |        |        |        |        |        |
| Runout of output shaft surface mm                  | 0.05                                 |        |        |        |        |        |        |

Note 1: Refer to the "CKD Index Units General Catalog" (CB-019SA) "Technical explanation, Static index precision" for details on the index precision.

Note 2: Rotational speed exceeding 100 rpm are compatible with the direct drive actuator compatible model (AX4\*\*\*GS).

With models having a max. torque of 45 N·m or less, the S driver is used with special specifications up to 150 rpm and the H driver up to 180 rpm. Contact CKD for details. Note that max. speed cannot be changed after delivery.

## Electromagnetic brake specifications (option)

| Descriptions                           | Applicable model | AX4022/AX4045                                  |  | AX4075/AX4150/AX4300  |  |
|--|------------------|--|--|-----------------------|--|
|  |                  |  |  |                       |  |
| Type                                   |                  | Non-backlash dry non-excitation operation type |  |                       |  |
| Rated voltage V                        |                  | 24 VDC   |  |                       |  |
| Power supply wattage W                 |                  | 30   |  | 55                    |  |
| Rated current A                        |                  | 1.25   |  | 2.30                  |  |
| Static friction torque N·m             |                  | 35   |  | 200                   |  |
| Armature release time (brake on) msec  |                  | 50 (reference value)                           |  | 50 (reference value)  |  |
| Armature suction time (brake off) msec |                  | 150 (reference value)                          |  | 250 (reference value) |  |
| Holding precision min.                 |                  | 45 (reference value)                           |  |                       |  |
| Max. cycle rate time/min.              |                  | 60   |  | 40                    |  |

Note 1: When the output shaft is rotating, rubbing may be generated at the electromagnetic brake's disk and fixing section.

Note 2: When moving after brakes are turned OFF, the delay time parameter must be changed based on armature suction time.

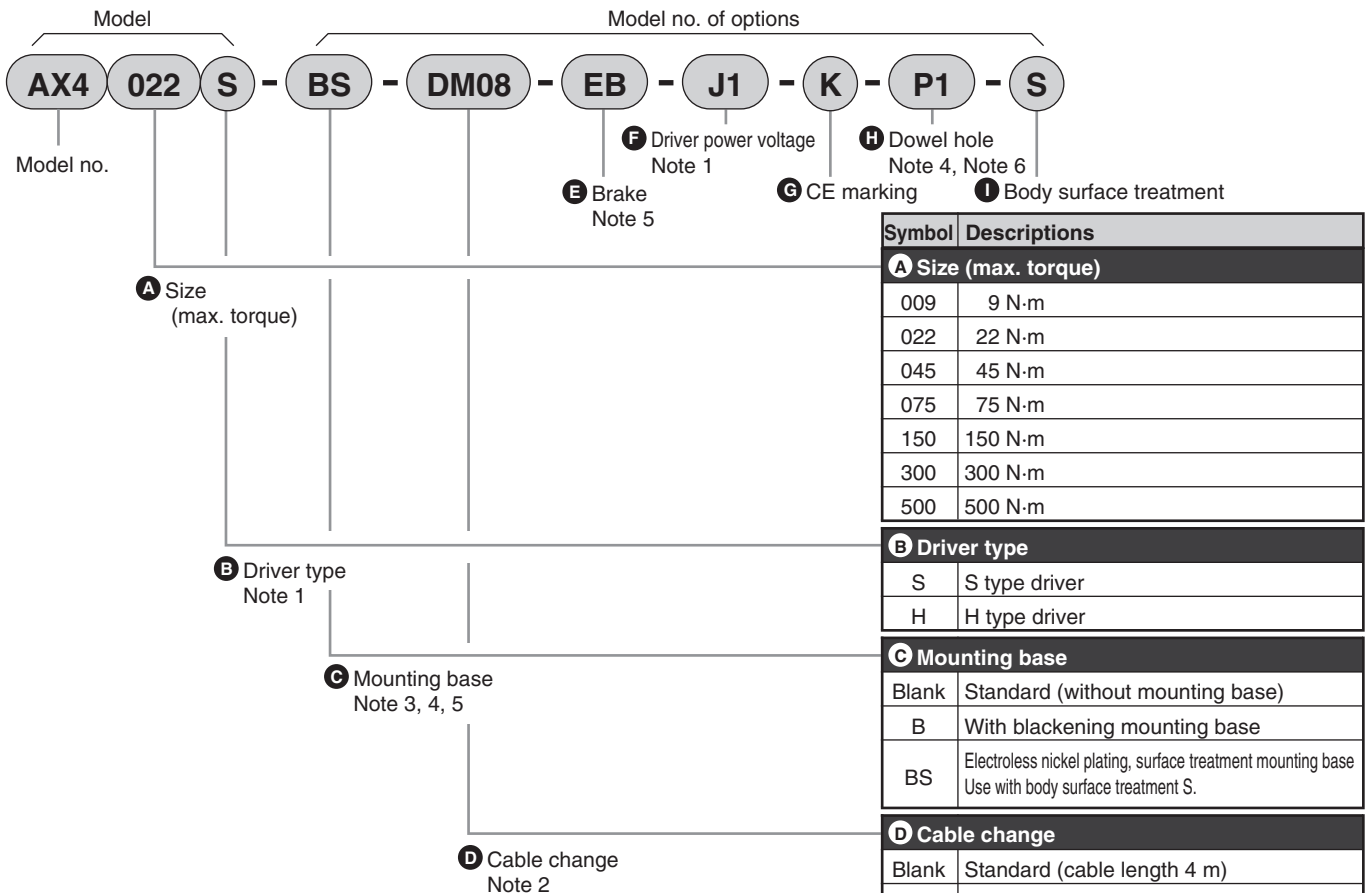
Note 3: This is a non-backlash type, but it may be hard to hold a set position if a load is applied on the rotational direction.

Note 4: When electromagnetic brakes function, the armature may contact the magnetic brake's fixed section and generate noise.

Note 5: Brakes are manually released by alternately screwing screws into manual release taps (three positions). Lightly tighten screws until they stop, then turn them another 90°. When finished with manual release, remove the three bolts immediately and apply brakes.

⚠ Refer to the safety precautions on Intro 13 to 20 before operating.

### How to order



| Symbol                      | Descriptions |
|-----------------------------|--------------|
| <b>A Size (max. torque)</b> |              |
| 009                         | 9 N·m        |
| 022                         | 22 N·m       |
| 045                         | 45 N·m       |
| 075                         | 75 N·m       |
| 150                         | 150 N·m      |
| 300                         | 300 N·m      |
| 500                         | 500 N·m      |

| B Driver type |               |
|---------------|---------------|
| S             | S type driver |
| H             | H type driver |

| C Mounting base |   |
|-----------------|---|
| Blank           | Standard (without mounting base)  |
| B               | With blackening mounting base   |
| BS              | Electroless nickel plating, surface treatment mounting base<br>Use with body surface treatment S. |

| D Cable change |                              |
|----------------|------------------------------|
| Blank          | Standard (cable length 4 m)  |
| D**            | Cable length change          |
| DM**           | Flexible cable length change |

| ** cable length <small>Note: The length and type cannot be changed after delivery.</small> |      |   |
|--|------|---|
| 02   | 2 m  |   |
| Blank  | 4 m  | Flexible cable 4 m: DM  |
| 06   | 6 m  | [Note]<br>Use the noise filter for the motor cable if the cable is longer than 6 m. |
| 08   | 8 m  |   |
| 10   | 10 m |   |
| 15   | 15 m |   |
| 20   | 20 m |   |
| 25   | 25 m |   |
| 30   | 30 m |   |

| E Brake |   |
|---------|---|
| Blank   | Standard (without brake)  |
| EB      | With negative actuation type electromagnetic brake (AX4009 and AX4500 cannot be selected) |

| F Driver power voltage                                 |  |
|--|--|
| Refer to the driver - power voltage table on the left. |  |

| G CE marking |                                     |
|--------------|-------------------------------------|
| Blank        | Standard (CE marking not available) |
| K            | CE marking                          |

| H Dowel hole |  |
|--------------|--|
| Blank        | Standard (without dowel hole)  |
| P1           | 1 on top   |
| P2           | 1 on bottom (2 on bottom for AX4009)   |
| P3           | 1 each on both top and bottom <small>(1 on top/2 on bottom for AX4009)</small> |

| I Body surface treatment |  |
|--------------------------|--|
| Blank                    | Standard (rotational section - blackening, fixing section casting surface plane - paint) |
| S                        | Rotational section - electroless nickel plating treatment, fixing section - nitriding    |

### Note on model no. selection

Note 1: Select the driver according to the table below.

Driver - power voltage table

| Driver type \ Model | S type driver  |                | H type driver  |                |
|---------------------|----------------|----------------|----------------|----------------|
|                     | 200 to 230 VAC | 100 to 115 VAC | 200 to 230 VAC | 100 to 115 VAC |
| AX4009              | Blank          | J1             |                |                |
| AX4022              | Blank          | J1             |                |                |
| AX4045              | Blank          | J1             |                |                |
| AX4075              | Blank          |                |                |                |
| AX4150              |                |                | Blank          |                |
| AX4300              |                |                | Blank          |                |
| AX4500              |                |                | Blank          |                |

\* S type driver is recommended if the max. torque is 75 N·m or less.  
Contact CKD for details on the availability of the H type driver.

Note 2: Use the optional flexible cable in applications where the cable is bent repeatedly.  
Refer to page 57 for dimensions of the cable.

Note 3: Designate body surface treatment and mounting base surface treatment with (C) and (I).  
Note 4: "P2" and "P3" cannot be selected if "B" with blackening mounting base or "BS" electroless nickel plating surface treatment mounting base is designated for (C) mounting base.

Note 5: Refer to the Option Table below and select required options.

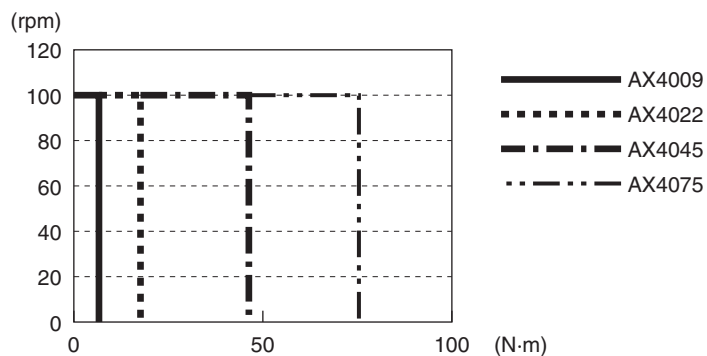
Option table

|                     | AX4009 | AX4022 | AX4045 | AX4075 | AX4150 | AX4300 | AX4500 |
|---------------------|--------|--------|--------|--------|--------|--------|--------|
| Mounting base (-B)  | X      | ○      | ○      | ○      | ○      | ○      | ○      |
| Mounting base (-BS) | X      | ○      | ○      | ○      | ○      | ○      | ○      |
| Brake (-EB)         | X      | ○      | ○      | ○      | ○      | ○      | X      |

Note 6: Additionally machined sections may not have a treated surface.

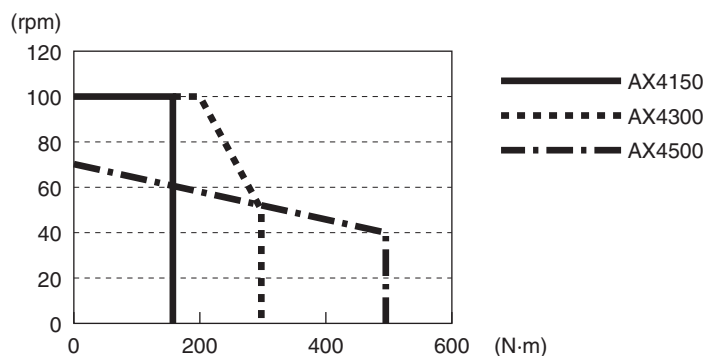
## Speed/max. torque characteristics

● AX4009, AX4022, AX4045, AX4075



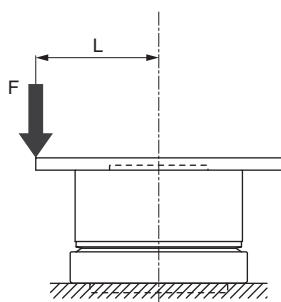
\*This is characteristics at three phase 200 VAC .

● AX4150, AX4300, AX4500

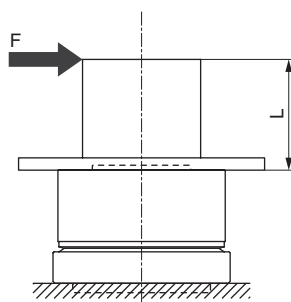


\*This is characteristics at three phase 200 VAC .

(Note) Moment load



(Fig. a)



(Fig. b)

$$M \text{ (N-m)} = F \text{ (N)} \times L \text{ (m)}$$

M : Moment load

F : Load

L : Distance from center of output shaft

$$M \text{ (N-m)} = F \text{ (N)} \times (L + 0.02) \text{ (m)}$$

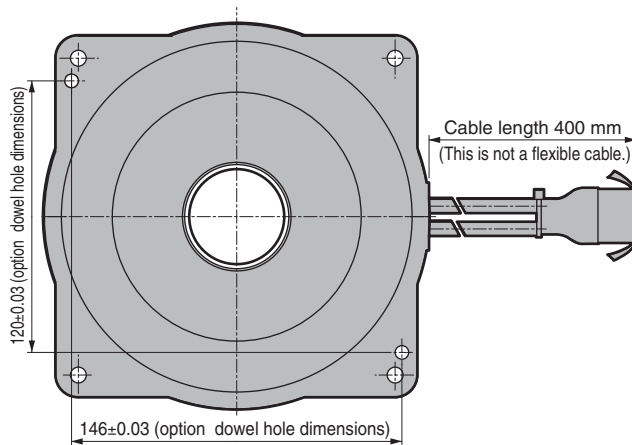
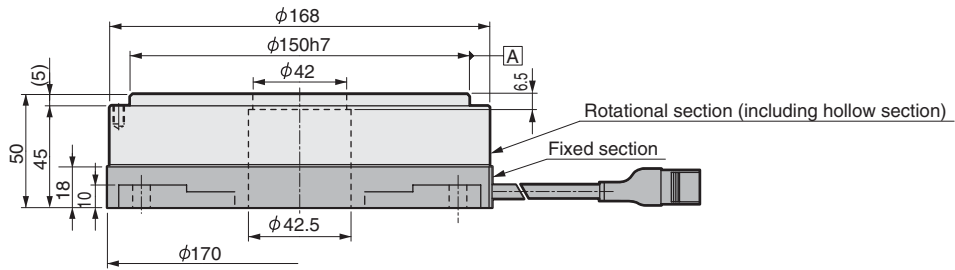
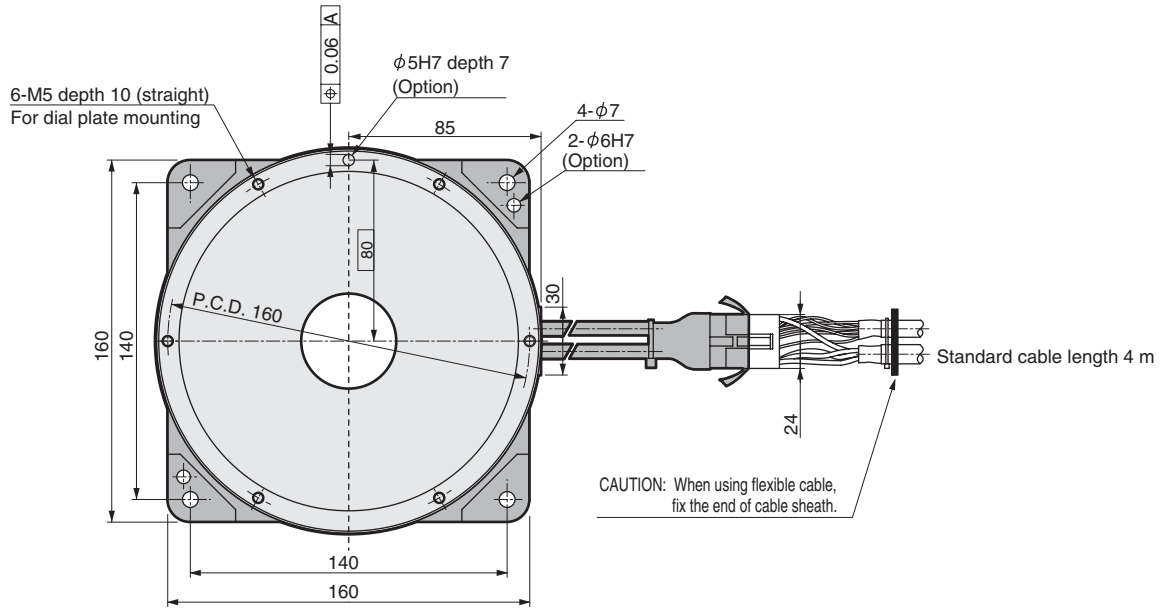
M : Moment load

F : Load

L : Distance from output shaft flange surface

**Dimensions**

● AX4009



AX4000 Actuator

# AX4000 Series

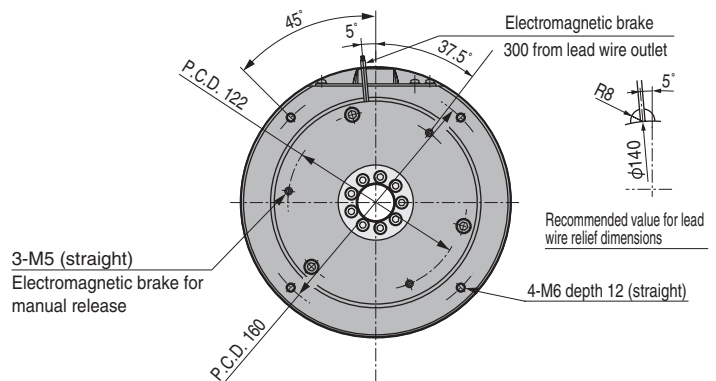
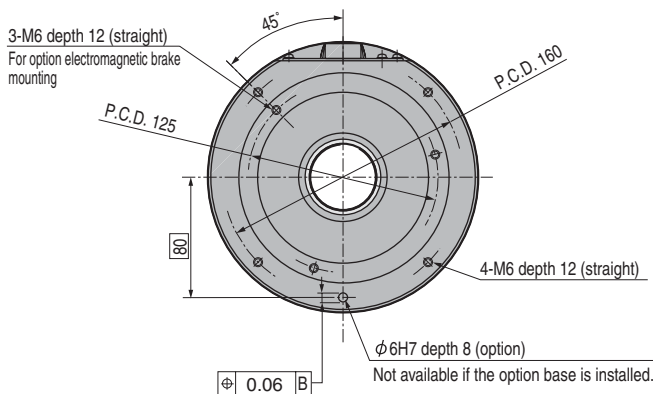
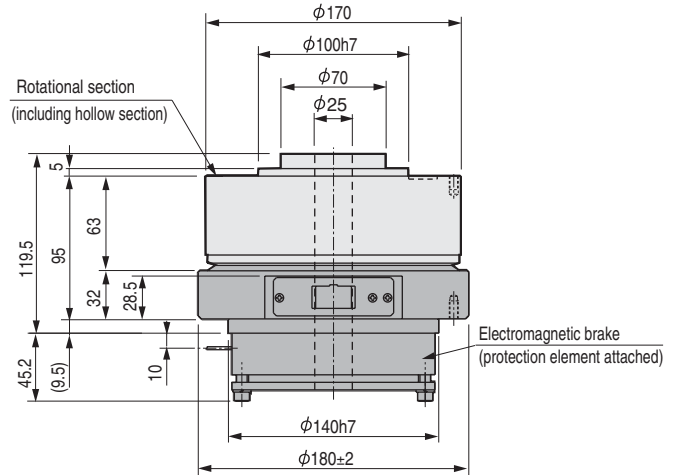
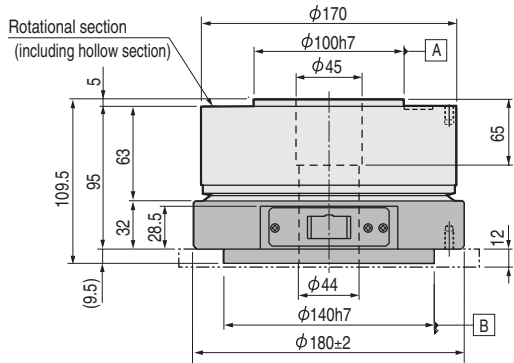
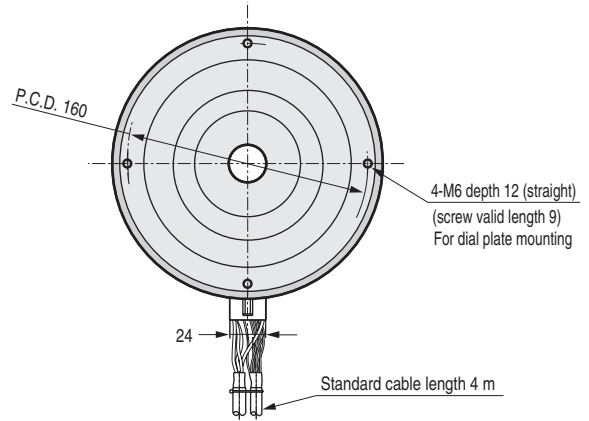
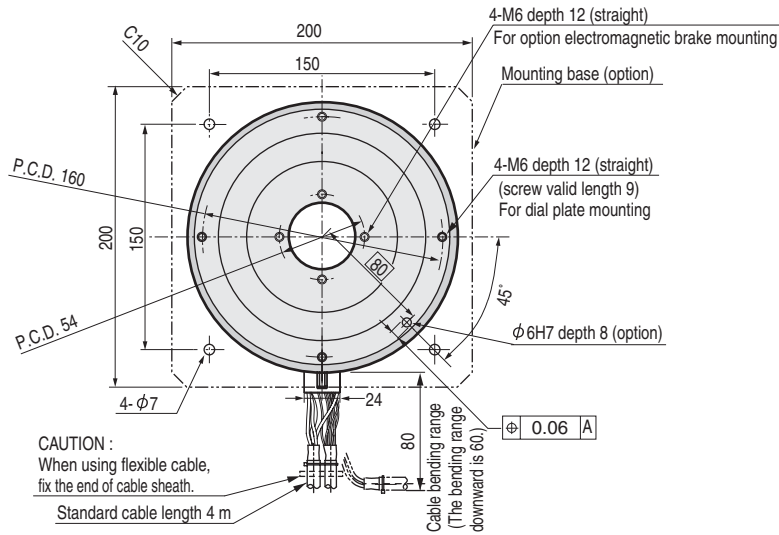
## Dimensions

● AX4022

● AX4022-EB

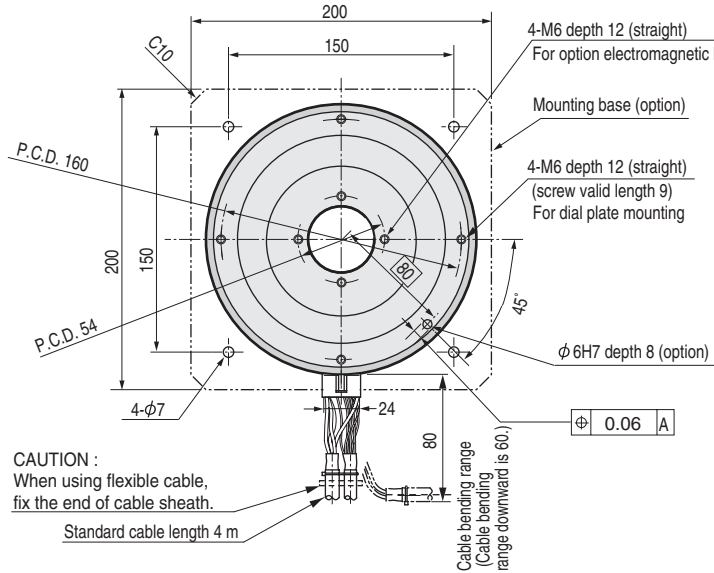
With electromagnetic brake

Refer to the left drawing for other options.



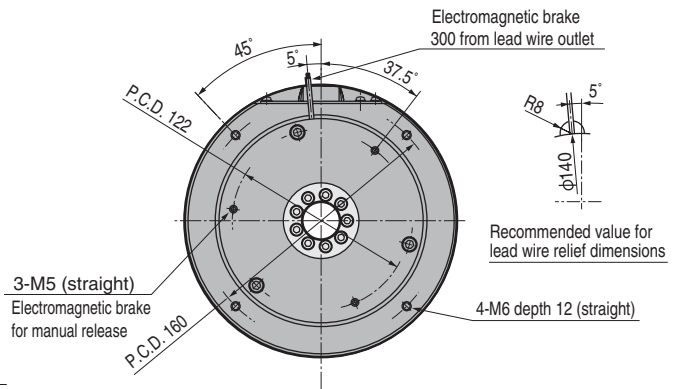
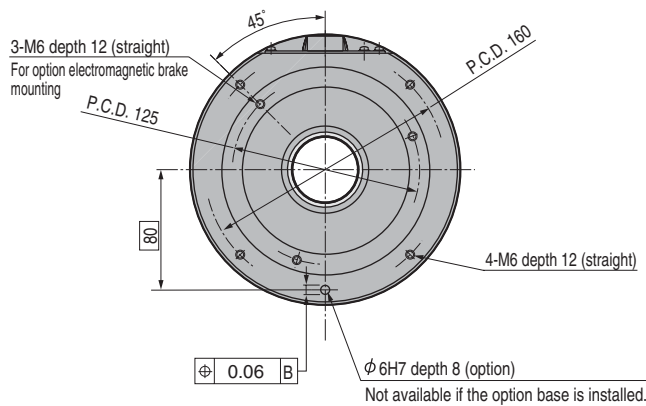
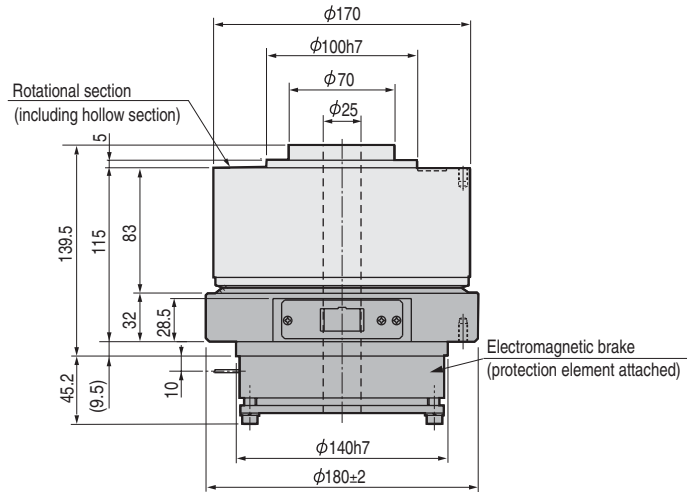
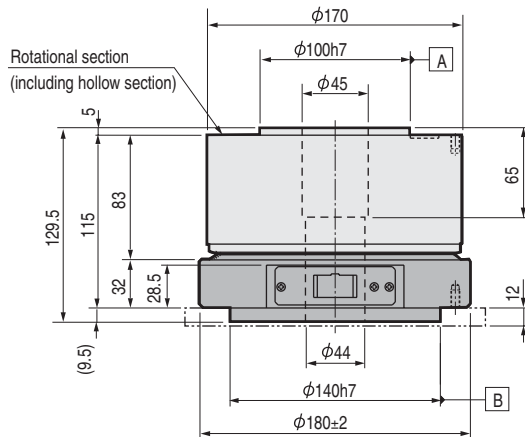
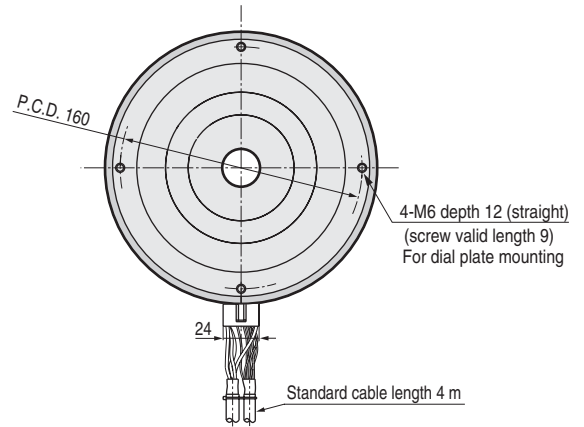
## Dimensions

● AX4045



● AX4045-EB

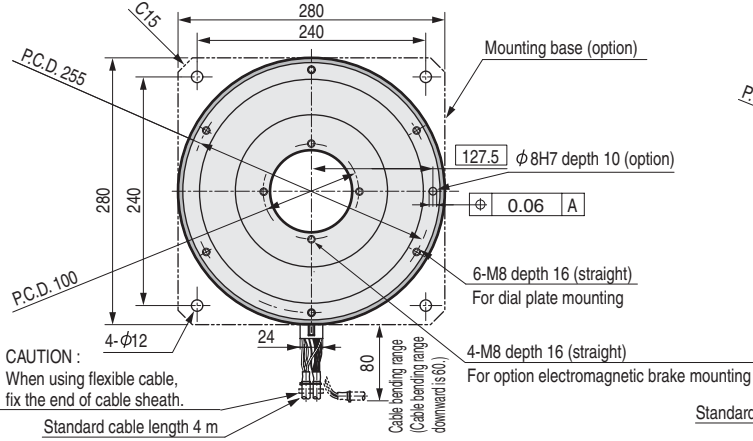
With electromagnetic brake  
 Refer to the left drawing for other options.



## AX4000 Series

### Dimensions

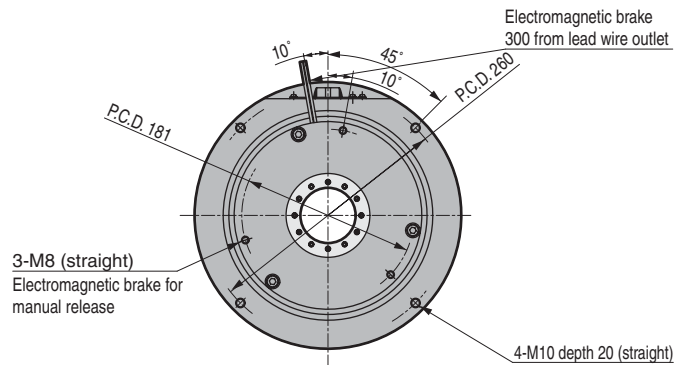
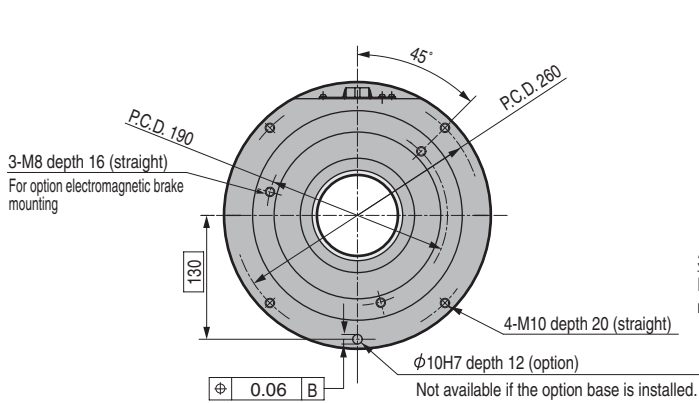
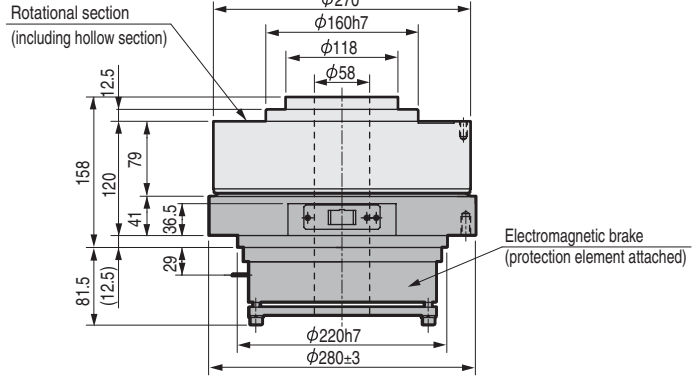
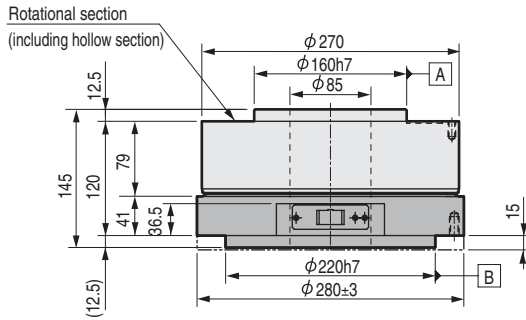
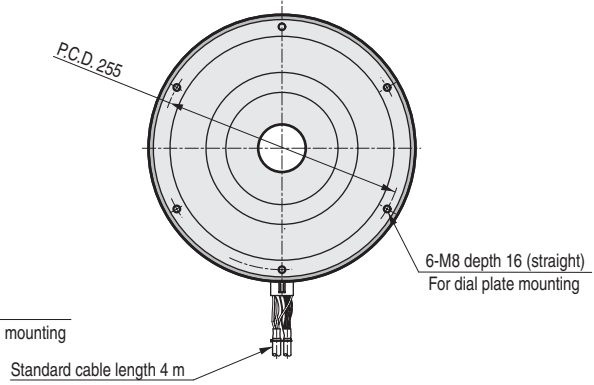
● AX4075



● AX4075-EB

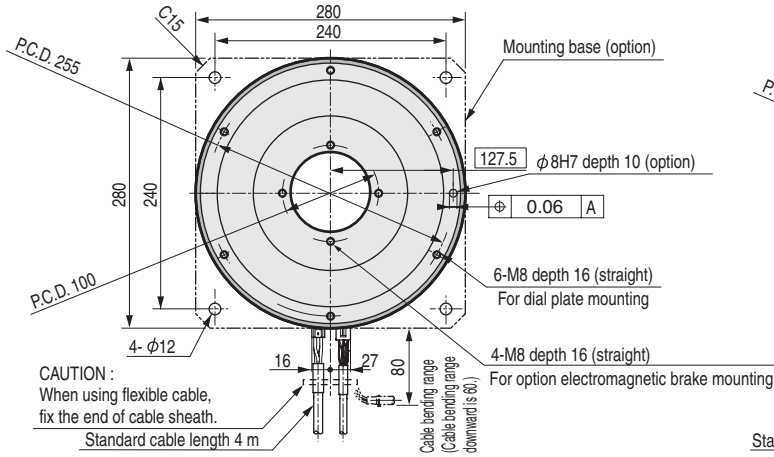
With electromagnetic brake

Refer to the left drawing for other options.



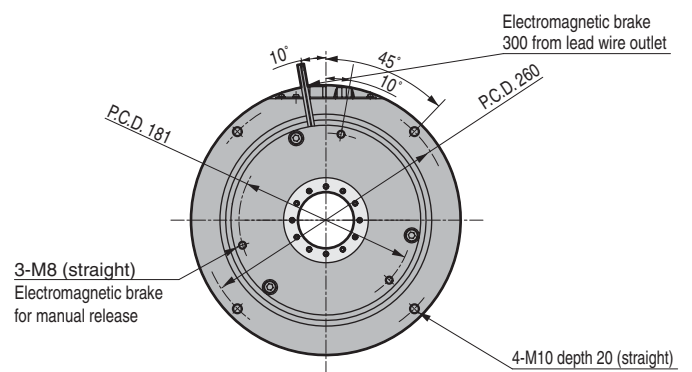
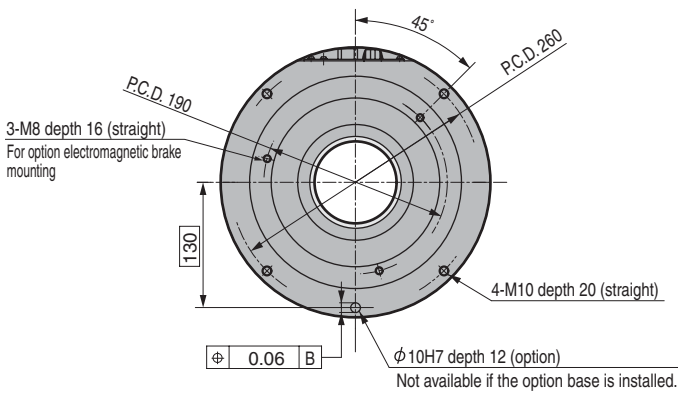
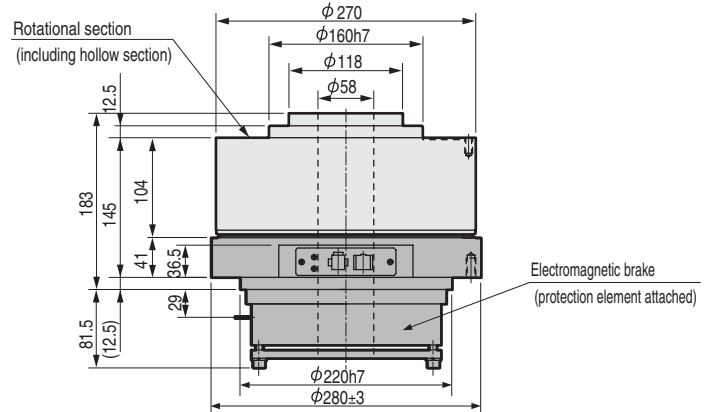
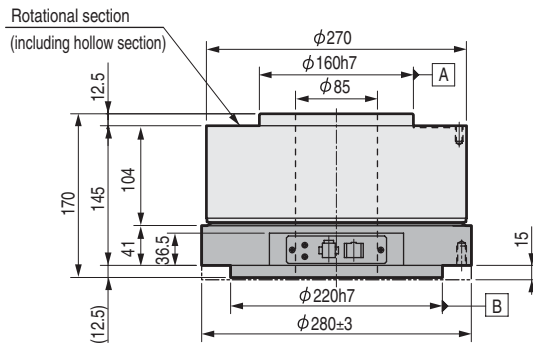
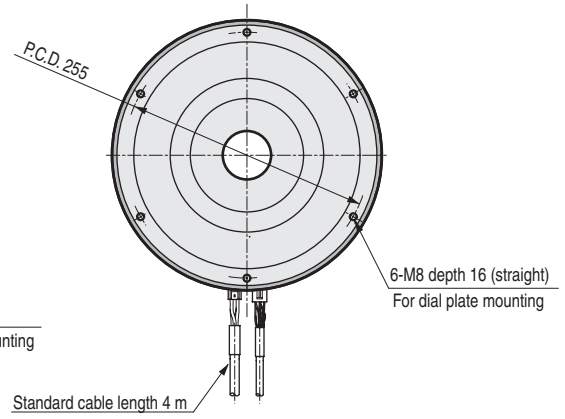
## Dimensions

● AX4150



● AX4150-EB

With electromagnetic brake  
 Refer to the left drawing for other options.



AX4000 Actuator



# AX4000 Series

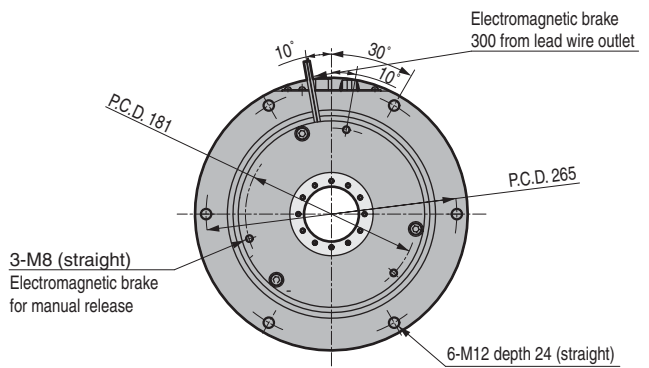
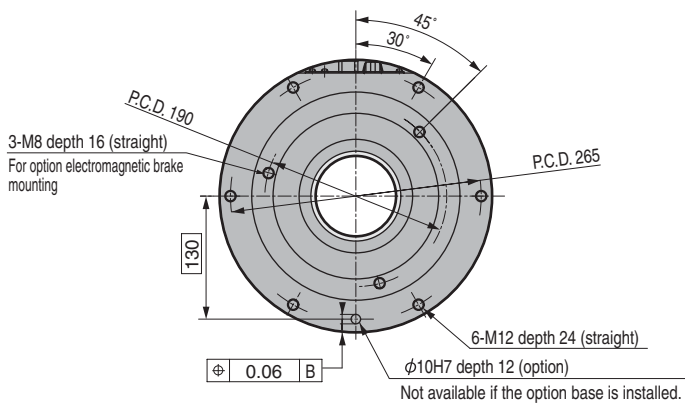
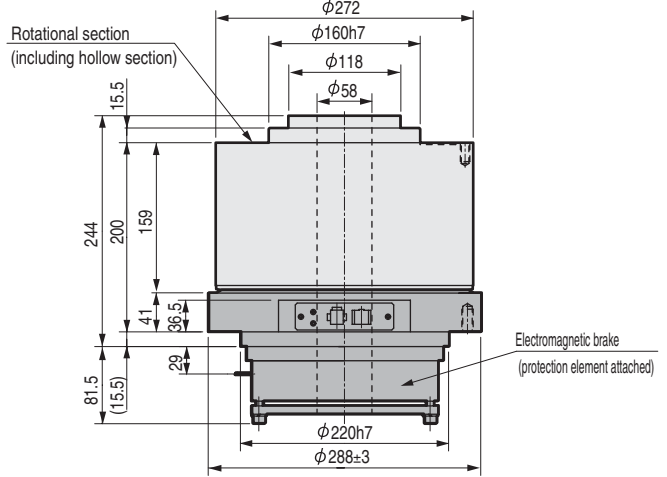
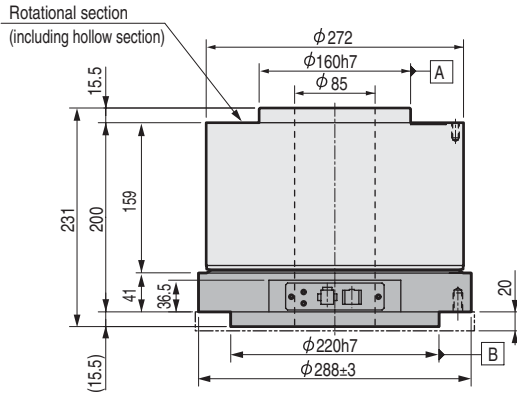
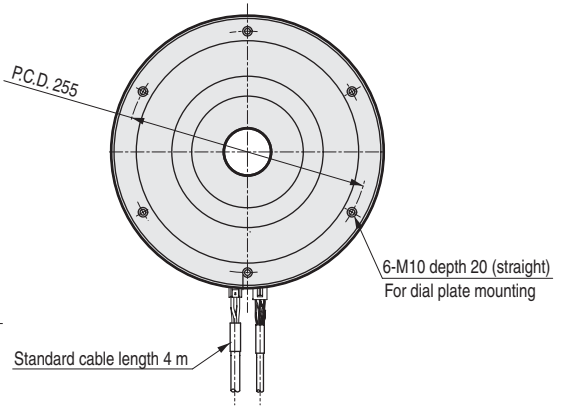
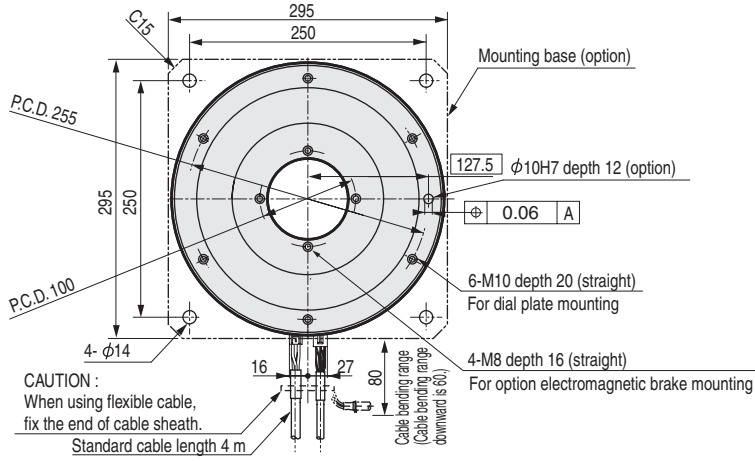
## Dimensions

● AX4300

● AX4300-EB

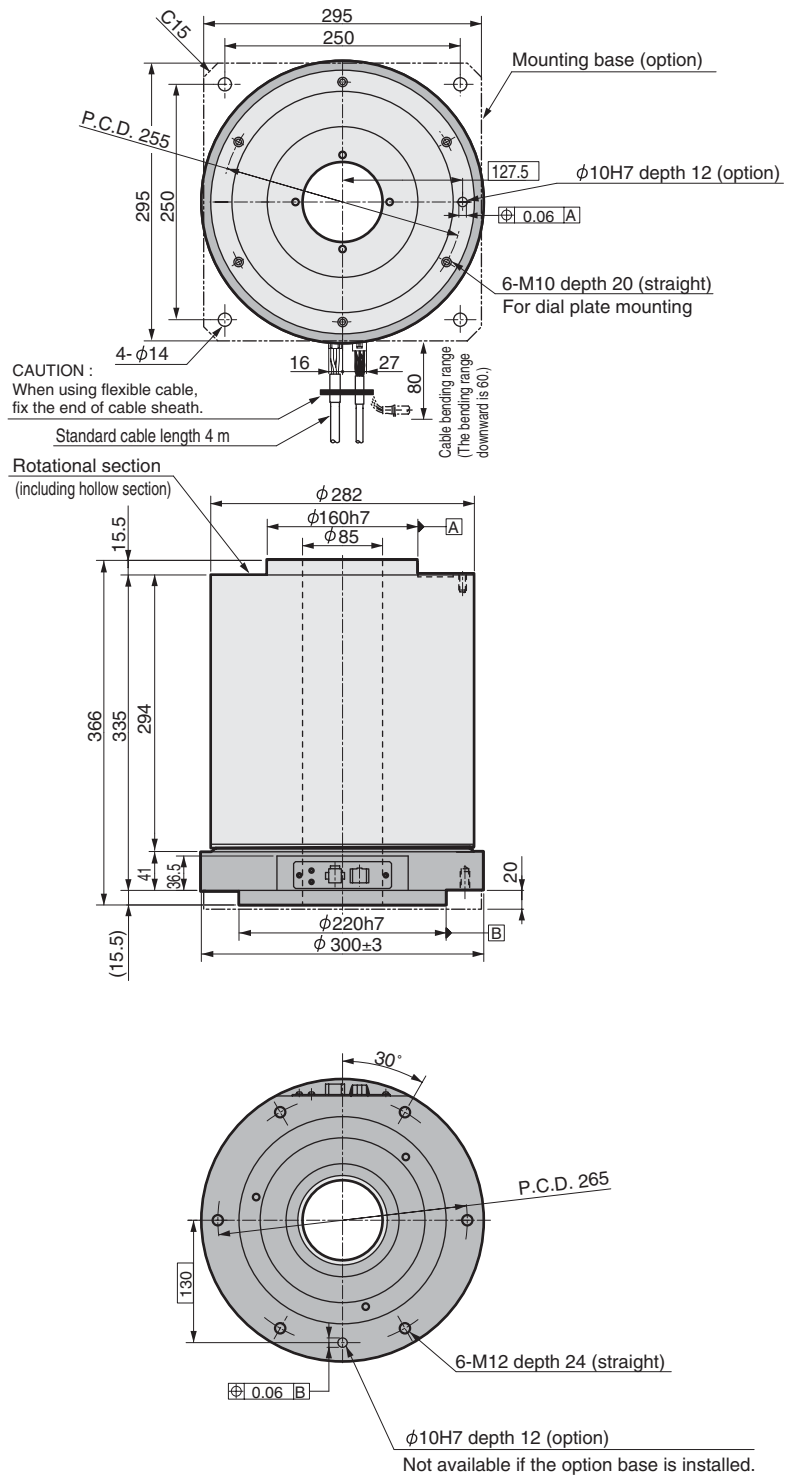
With electromagnetic brake

Refer to the left drawing for other options.



**Dimensions**

● AX4500



AX4000 Actuator