ABSODEX

AX1000T Series

High accuracy specifications (index accuracy, output shaft runout, etc.)
Compatible function allows free combination of driver, actuator, and cable

- Max. torque: 22/45/75/150/210 N·m
- Supported driver: TS/TH driver

Actuator specifications

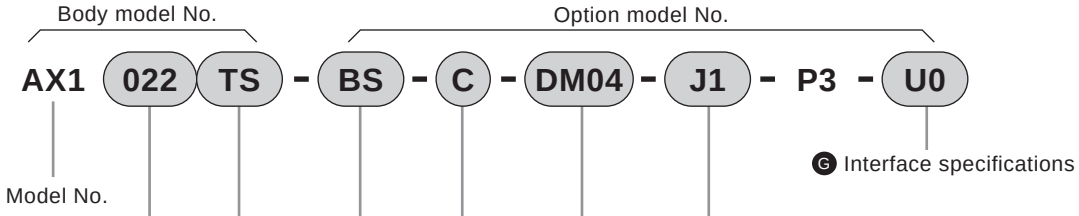
Item		AX1022T	AX1045T	AX1075T	AX1150T	AX1210T
Max. output torque	N·m	22	45	75	150	210
Continuous output torque	N·m	7	15	25	50	70
Max. rotation speed	rpm	240 (*1)		140 (*1)	120 (*1)	
Allowable axial load	N	600		2200		
Allowable moment load	N·m	19	38	70	140	170
Output shaft moment of inertia	kg·m^2	0.00505	0.00790	0.03660	0.05820	0.09280
Allowable moment of load inertia	kg·m^2	0.6	0.9	4.0	6.0	10.0
Index accuracy (*3)	sec	±15				
Repeatability (*3)	sec	±5				
Output shaft friction torque	N·m	2.0		8.0		
Resolution	P/rev	540672				
Motor insulation class		Class F				
Motor withstand voltage		1500 VAC 1 min				
Motor insulation resistance		10 MΩ or more 500 VDC				
Operating ambient temperature		0 to 45°C (0 to 40°C: *4)				
Operating ambient humidity		20 to 85% RH, no condensation				
Storage ambient temperature		−20 to 80°C				
Storage ambient humidity		20 to 90% RH, no condensation				
Atmosphere		No corrosive gas, explosive gas, or dust				
Weight	kg	8.9 (10.8) *2	12.0 (13.9) *2	23.0 (27.1) *2	32.0 (36.1) *2	44.0 (48.1) *2
Output shaft runout (*3)	mm	0.01				
Output shaft surface runout (*3)	mm	0.01				
Degree of protection		IP20				

*1: Use at a speed of 80 rpm or less during continuous rotation operation.
*2: The values in ( ) are the actuator weight with the mounting base option.
*3: Refer to the "Glossary" on page 52 for index accuracy, repeatability, output shaft runout and output shaft surface runout.
*4: When using as a UL certified product, the maximum temperature is 40°C.

⚠ Always read the safety precautions on pages 61 to 66 before use.

How to order

● Set model No. (actuator, driver, cable)



Code	Description
A Size (max. torque)	
022	22 N·m
045	45 N·m
075	75 N·m
150	150 N·m
210	210 N·m
B Driver type	
TS	TS type with driver
TH	TH driver
C Mounting base	
Blank	Standard (without mounting base)
BS	With mounting base
D Connector mounting direction	
Blank	Standard (connector horizontal mounting)
C	Connector downward mounting
E Cable length	
DM00	Without cable
DM02	2 m
DM04	4 m (standard length)
DM06	6 m
DM08	8 m
DM10	10 m
DM15	15 m
DM20	20 m
F Driver power voltage	
Refer to the driver power voltage compatibility table at left.	
G Interface specifications	
U0	Parallel I/O (NPN specifications)
U1	Parallel I/O (PNP specifications)
U2	CC-Link
U3	PROFIBUS-DP
U4	DeviceNet
U5	EtherCAT
U6	EtherNet/IP

Precautions for model No. selection

*1: Select the driver according to the compatibility table below.

Driver power voltage compatibility table

Drivers type / Model	TS driver		TH driver
	Three-phase/ single-phase 200 to 230 VAC	Single phase 100 to 115 VAC	Three-phase/ single-phase 200 to 230 VAC
AX1022T	Blank	J1	
AX1045T	Blank	J1	
AX1075T	Blank *2		
AX1150T			Blank *2
AX1210T			Blank *2

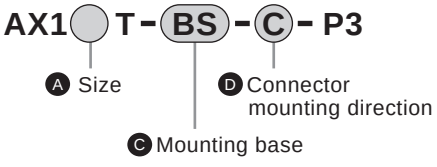
*2: For models with maximum torque 75 N·m or more, the calculation of torque limit region is different from the usual when used at single-phase 200 VAC. Contact CKD to determine usability.

*3: Cable is a movable cable.
Refer to page 48 for dimensions of the cable.

*4: C When the "BS" option with the mounting base is selected, the positioning pin hole on the bottom is not available. The surface is treated with electroless nickel plating.

*5: Positioning pin holes may not be surface treated.

● Actuator body discrete model No.



● Driver discrete model No.

● 200 to 230 VAC

AX9000TS - U0

AX9000TH - U0

● 100 to 115 VAC

AX9000TS - J1 - U0

G Interface specifications

● Cable discrete model No.

● Motor cable

AX - CBLM5 - DM04

● Resolver cable

AX - CBLR5 - DM04

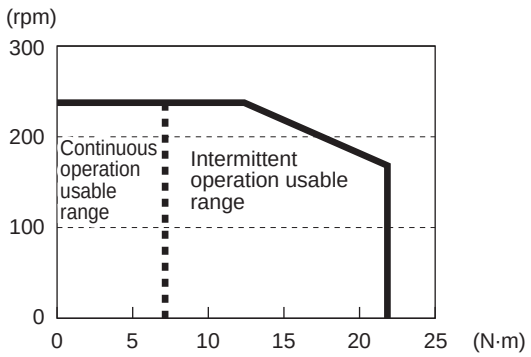
E Cable length

(Note: "DM04" when cable length is 4 m)

* Custom order products are CE, UL/cUL, and RoHS non-compliant. Contact CKD as needed.

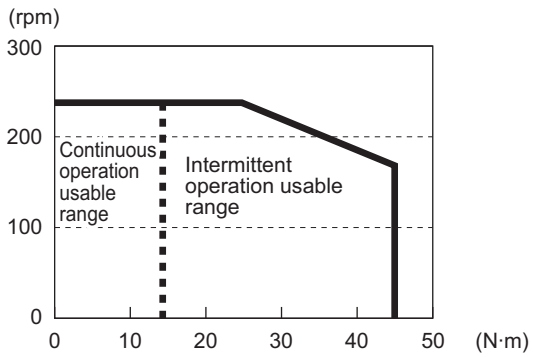
Speed/maximum torque characteristics

● AX1022T



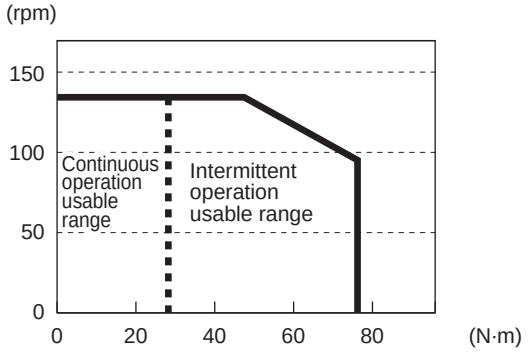
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX1045T



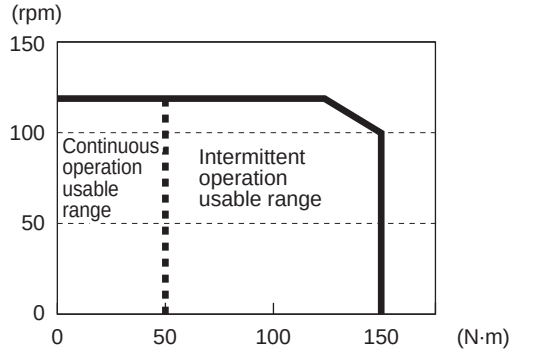
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX1075T



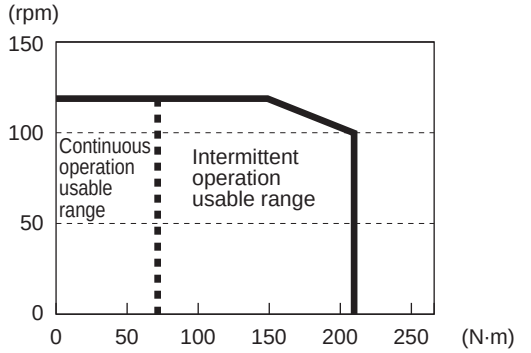
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX1150T



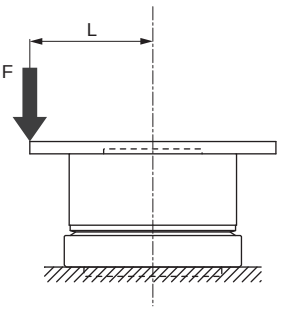
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX1210T



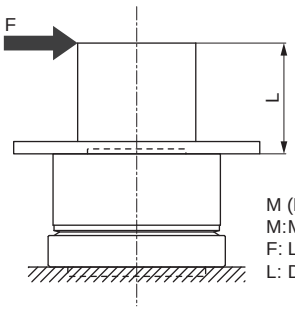
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

(Note) Moment load (simple formula)



M (N·m) = F (N) × L (m)
M:Moment load
F: Load
L: Distance from output shaft center

(Fig. a)



M (N·m) = F (N) × (L + 0.02) (m)
M:Moment load
F: Load
L: Distance from output shaft flange

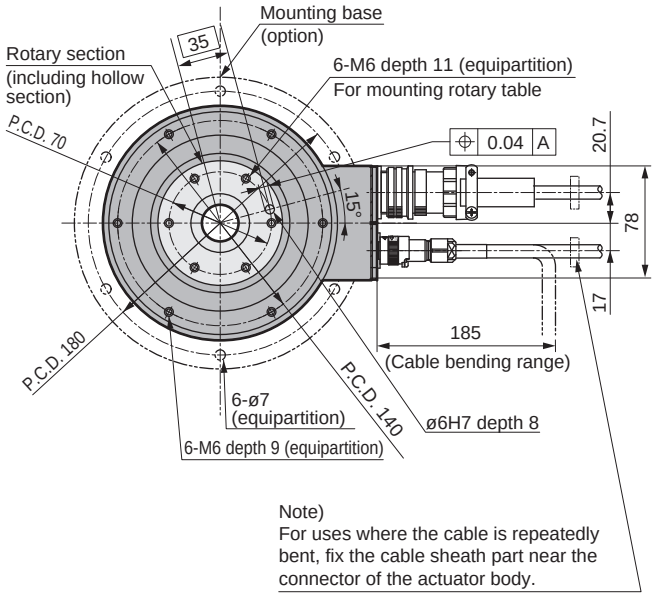
(Fig. b)

Actuator AX6000M
Drivers AX9000MU
Actuator AX1000T
Actuator AX2000T
Actuator AX4000T
Drivers AX9000TS/TH
Dialog terminal AX0180
Related parts model No. table

⚠ Always read the safety precautions on pages 61 to 66 before use.

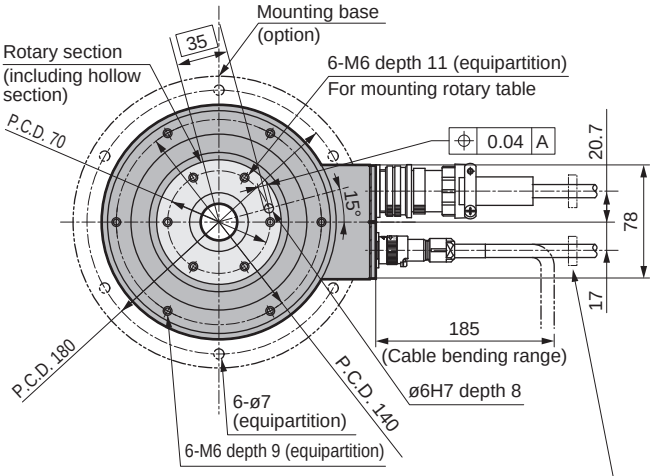
Dimensions

● AX1022T

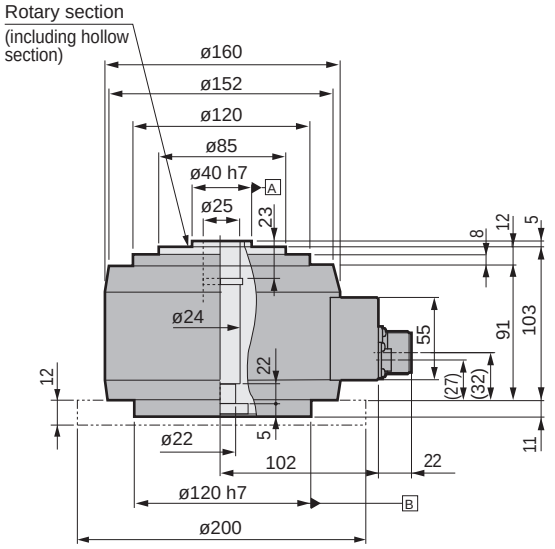


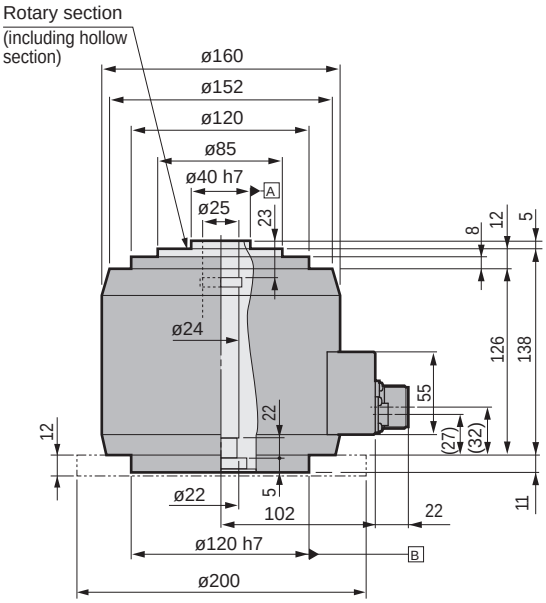
Note)
For uses where the cable is repeatedly bent, fix the cable sheath part near the connector of the actuator body.

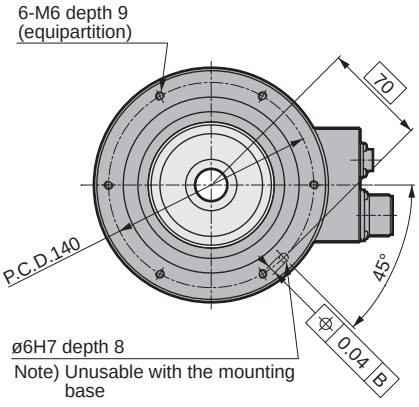
● AX1045T



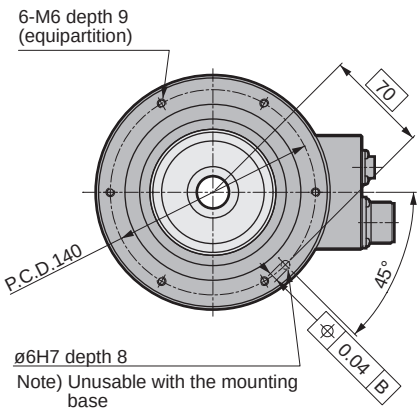
Note)
For uses where the cable is repeatedly bent, fix the cable sheath part near the connector of the actuator body.







Note) Unusable with the mounting base

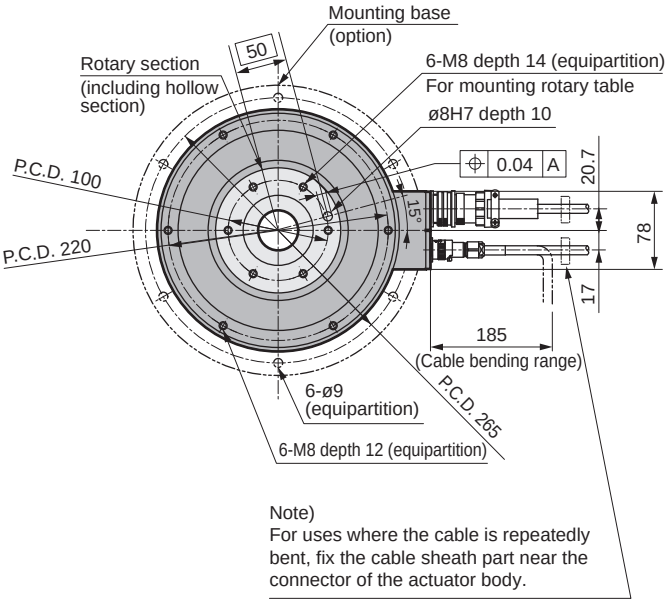


Note) Unusable with the mounting base

*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

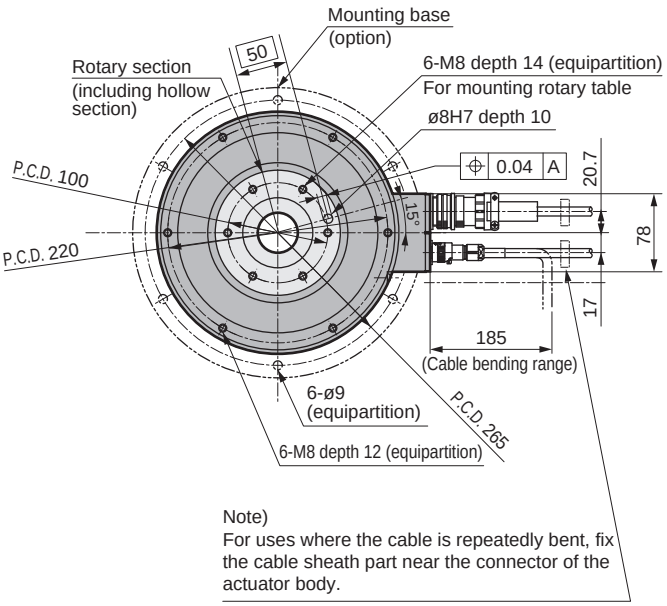
Dimensions

● AX1075T

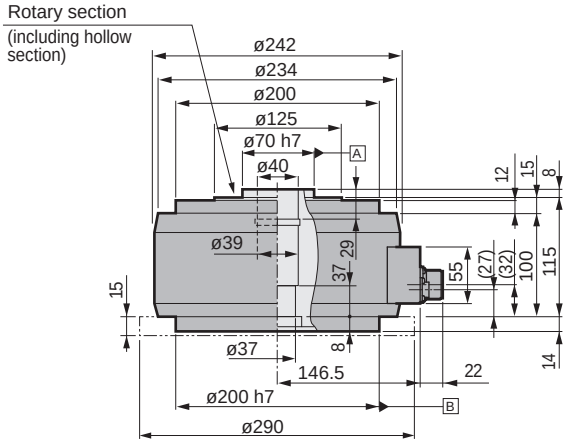


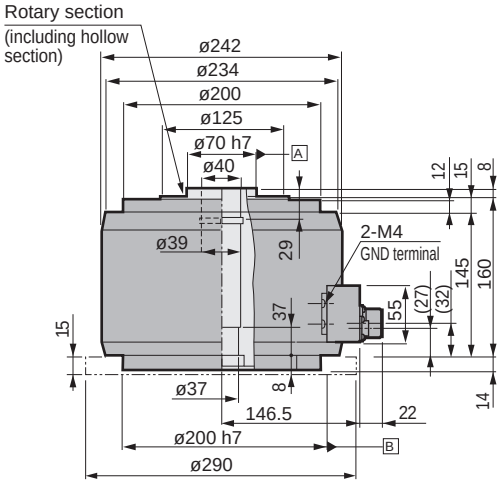
Note)
For uses where the cable is repeatedly bent, fix the cable sheath part near the connector of the actuator body.

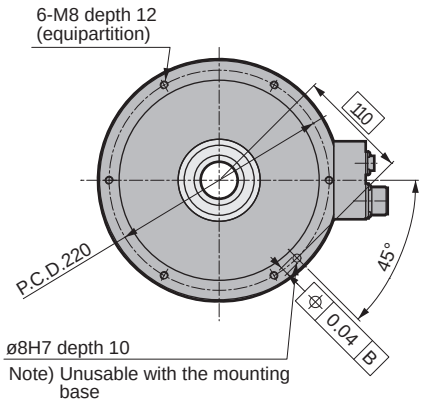
● AX1150T



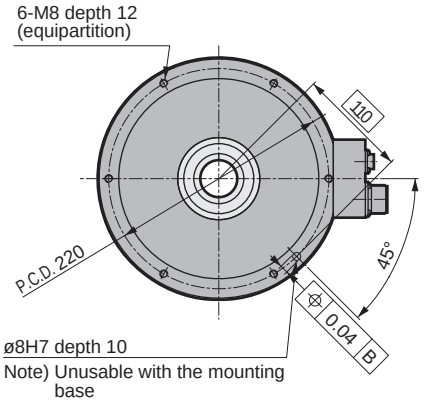
Note)
For uses where the cable is repeatedly bent, fix the cable sheath part near the connector of the actuator body.







Note) Unusable with the mounting base

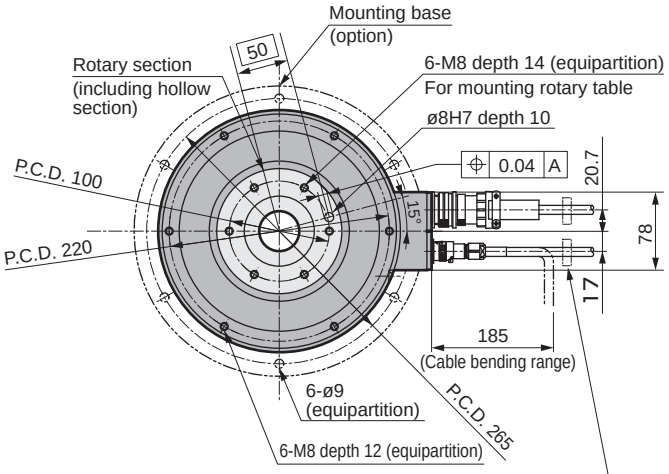


Note) Unusable with the mounting base

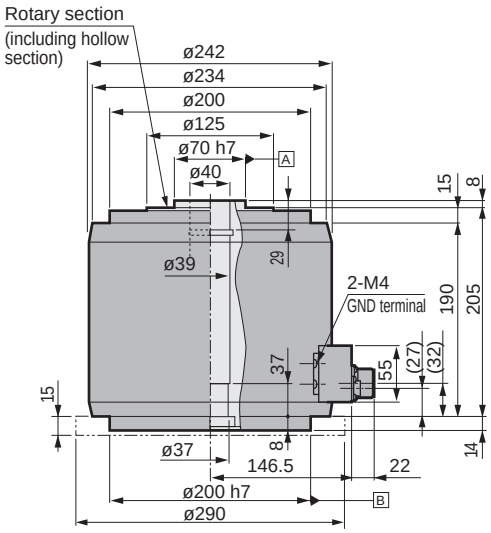
*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

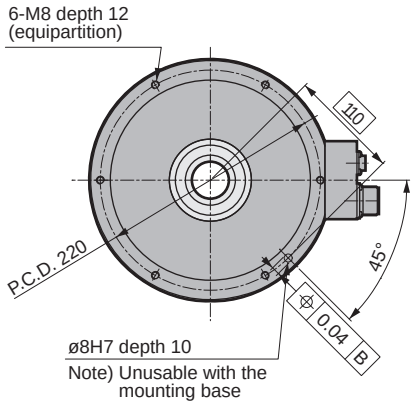
Dimensions

● AX1210T



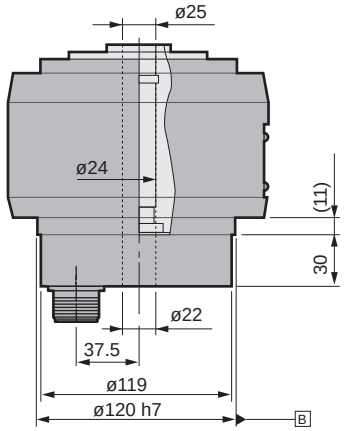
Note)
For uses where the cable is repeatedly bent, fix the cable sheath part near the connector of the actuator body.

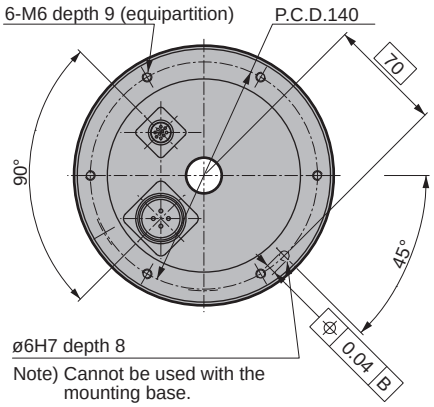




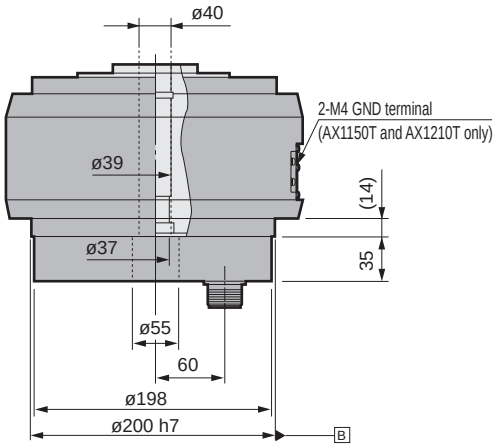
Dimensions (-C: Connector downward mounting)

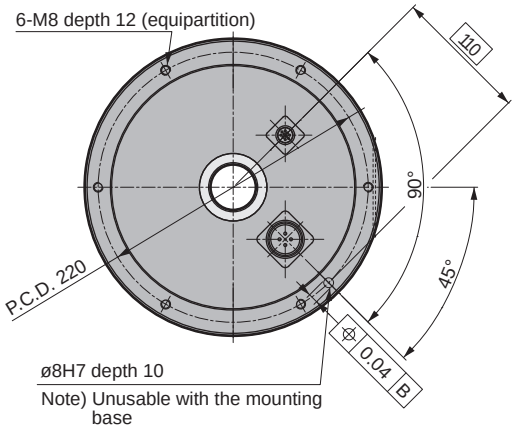
● AX1022T/AX1045T-C





● AX1075T/AX1150T/AX1210T-C





*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

ABSODEX

AX2000T Series

High-speed rotation (max. rotation speed 300 rpm), compact with small diameter, large hollow diameter (ø30)
Compatible function allows free combination of driver, actuator, and cable

- Max. torque: 6/12/18 N·m
- Supported driver: TS driver

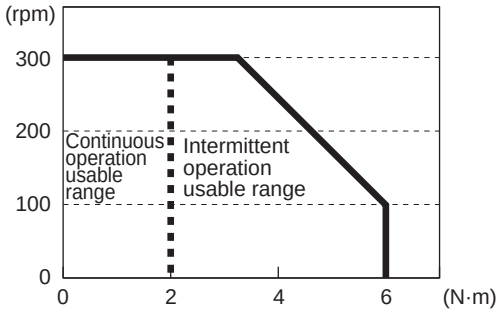
Actuator specifications

Item		AX2006T	AX2012T	AX2018T
Max. output torque	N·m	6	12	18
Continuous output torque	N·m	2	4	6
Max. rotation speed	rpm	300 (*1)		
Allowable axial load	N	1000		
Allowable moment load	N·m	40		
Output shaft moment of inertia	kg·m²	0.00575	0.00695	0.00910
Allowable moment of load inertia	kg·m²	0.3	0.4	0.5
Index accuracy (*3)	sec	±30		
Repeatability (*3)	sec	±5		
Output shaft friction torque	N·m	0.6		0.7
Resolution	P/rev	540672		
Motor insulation class		Class F		
Motor withstand voltage		1,500 VAC 1 min		
Motor insulation resistance		10 MΩ or more 500 VDC		
Operating ambient temperature		0 to 45°C (0 to 40°C: *4)		
Operating ambient humidity		20 to 85% RH, no condensation		
Storage ambient temperature		−20 to 80°C		
Storage ambient humidity		20 to 90% RH, no condensation		
Atmosphere		No corrosive gas, explosive gas, or dust		
Weight	kg	4.7 (6.0) *2	5.8 (7.1) *2	7.5 (8.8) *2
Output shaft runout (*3)	mm	0.03		
Output shaft surface runout (*3)	mm	0.03		
Degree of protection		IP20		

*1: Use at a speed of 80 rpm or less during continuous rotation operation.
*2: The values in ( ) are the actuator weight with the mounting base option.
*3: Refer to the "Glossary" on page 64 for index accuracy, repeatability, output shaft runout and output shaft surface runout.
*4: When using as a UL certified product, the maximum temperature is 40°C.

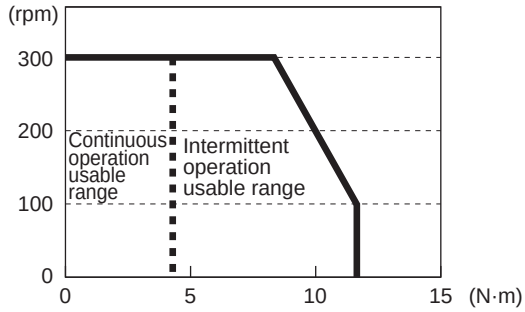
Speed/maximum torque characteristics

● AX2006T



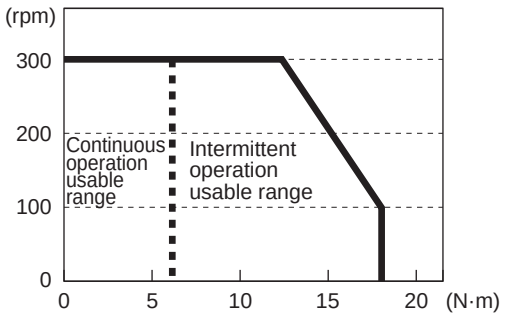
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX2012T



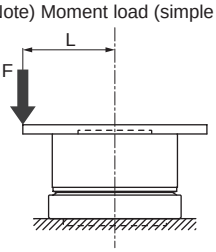
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX2018T



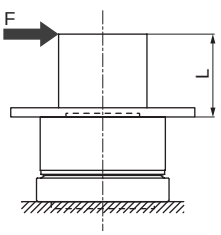
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

(Note) Moment load (simple formula)



(Fig. a)

M (N·m) = F (N) × L (m)
M: Moment load
F: Load
L: Distance from output shaft center



(Fig. b)

M (N·m) = F (N) × (L + 0.02) (m)
M: Moment load
F: Load
L: Distance from output shaft flange

⚠ Always read the safety precautions on pages 61 to 66 before use.

How to order

● Set model No. (actuator, driver, cable)

Body model No. | Option model No.

AX2 018 TS - BS - DM04 - J1 - P3 - S - U0

- AX2: Model No.
- 018 / TS: Ⓐ Size (max. torque)
- BS: Ⓒ Mounting base *3
- DM04: Ⓓ Cable length *2
- J1: Ⓔ Driver power voltage *1
- P3: Ⓑ Driver type
- S: Ⓕ Interface specifications
- U0: Ⓕ Interface specifications

Code	Description
Ⓐ Size (max. torque)	
006	6 N·m
012	12 N·m
018	18 N·m
Ⓑ Driver type	
TS	TS driver
Ⓒ Mounting base	
Blank	Standard (without mounting base)
BS	With mounting base
Ⓓ Cable length	
DM00	Without cable
DM02	2 m
DM04	4 m (standard length)
DM06	6 m
DM08	8 m
DM10	10 m
DM15	15 m
DM20	20 m
Ⓔ Driver power voltage	
Refer to the driver power voltage compatibility table at left.	
Ⓕ Interface specifications	
U0	Parallel I/O (NPN specifications)
U1	Parallel I/O (PNP specifications)
U2	CC-Link
U3	PROFIBUS-DP
U4	DeviceNet
U5	EtherCAT
U6	EtherNet/IP

Precautions for model No. selection

*1: Select the driver according to the compatibility table below.

Driver power voltage compatibility table

Drivers type / Model	TS driver	
	Three-phase/ single-phase 200 to 230 VAC	Single phase 100 to 115 VAC
AX2006T	Blank	J1
AX2012T	Blank	J1
AX2018T	Blank	J1

*2: Cable is a movable cable.
Refer to page 48 for dimensions of the cable. Body lead-out cable is not a movable cable.

*3: Ⓒ When the "BS" option with the mounting base is selected, the positioning pin hole on the bottom is not available. The surface is treated with electroless nickel plating.

*4: Positioning pin holes may not be surface treated.

*5: The surface is treated with electroless nickel plating.

● Actuator body discrete model No.

AX2 ○ T - BS - P3 - S

- ○: Ⓐ Size
- BS: Ⓒ Mounting base

● Driver discrete model No.

- 200 to 230 VAC: **AX9000TS - U0**
- 100 to 115 VAC: **AX9000TS - J1 - U0**

U0: Ⓕ Interface specifications

● Cable discrete model No.

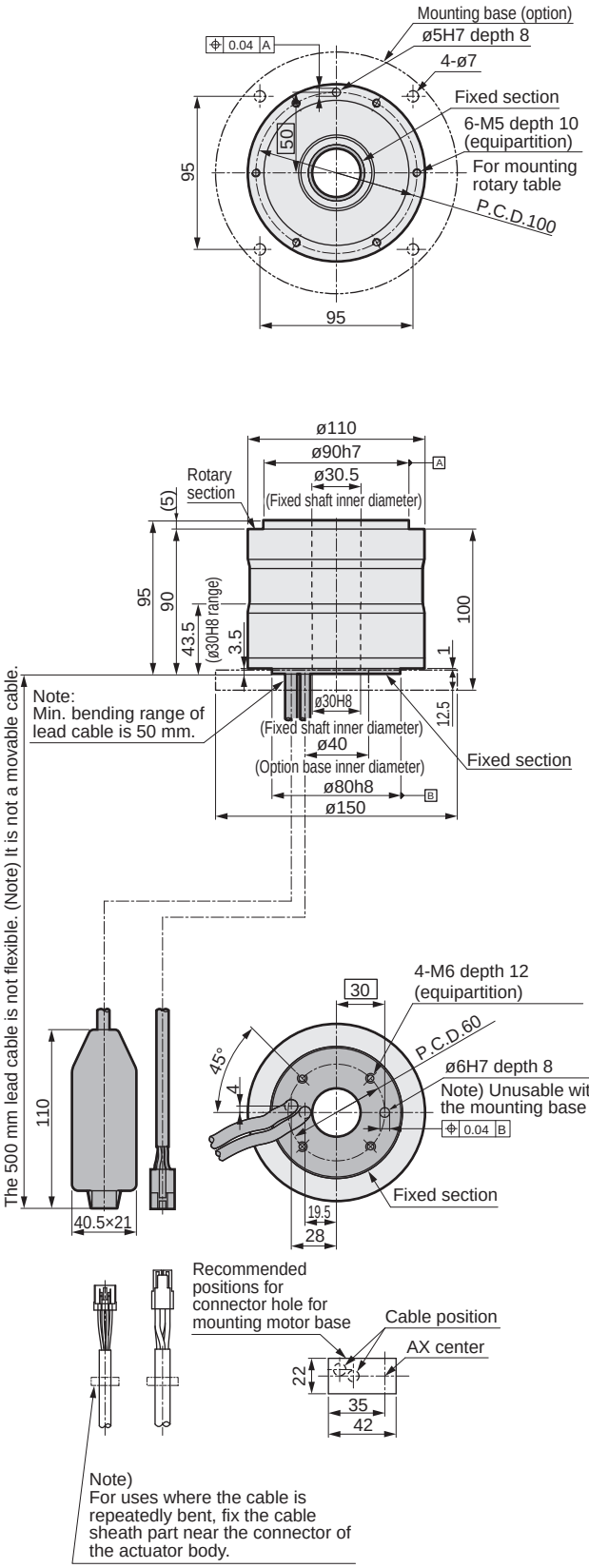
- Motor cable: **AX - CBLM6 - DM04**
- Resolver cable: **AX - CBLR6 - DM04**

DM04: Ⓓ Cable length (Note: "DM04" when cable length is 4 m)

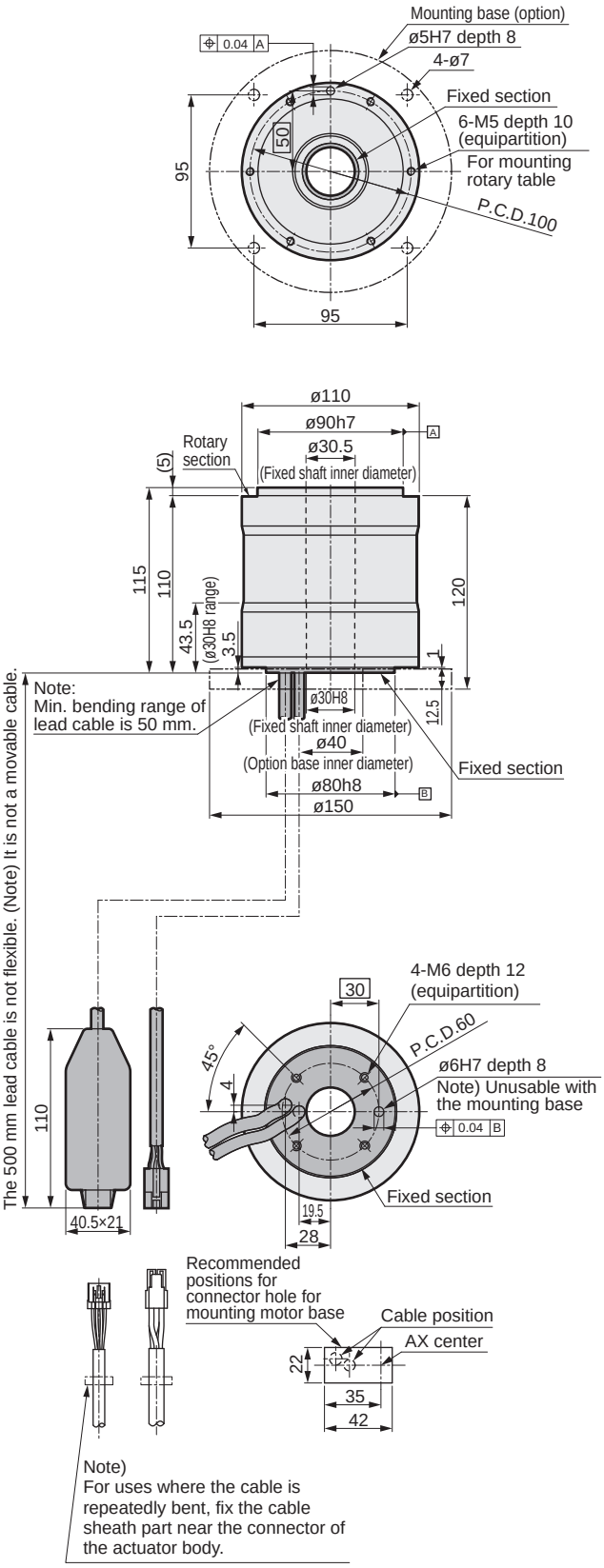
* Custom order products are CE, UL/cUL, and RoHS non-compliant. Contact CKD as needed.

Dimensions

● AX2006T



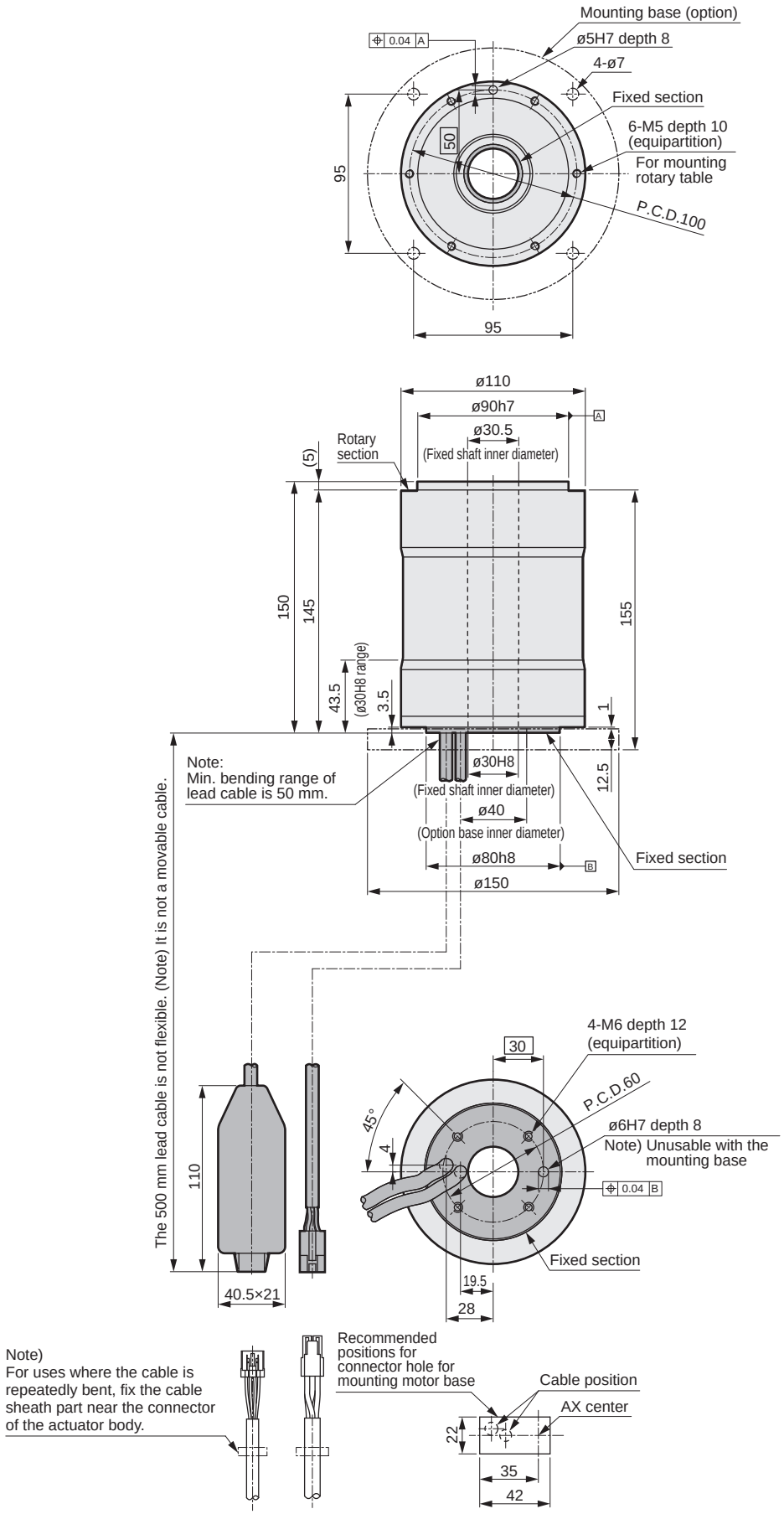
● AX2012T



*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

Dimensions

● AX2018T



*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

ABSODEX

AX4000T Series

Supports large moments of inertia
Compatible function allows free combination of driver, actuator, and cable
Large hollow diameter is convenient for cable wiring and piping, abundant options available

- Max. torque: 9/22/45/75 N·m
- Supported driver: TS driver

Actuator specifications

Item		AX4009T	AX4022T	AX4045T	AX4075T
Max. output torque	N·m	9	22	45	75
Continuous output torque	N·m	3	7	15	25
Max. rotation speed	rpm	240 (*1)			140 (*1)
Allowable axial load	N	800	3700		20000
Allowable moment load	N·m	40	60	80	200
Output shaft moment of inertia	kg·m²	0.009	0.0206	0.0268	0.1490
Allowable moment of load inertia	kg·m²	0.35 (1.75) (*2)	0.60 (3.00) (*2)	0.90 (5.00) (*2)	5.00 (25.00) (*2)
Index accuracy (*5)	sec	±30			
Repeatability (*5)	sec	±5			
Output shaft friction torque	N·m	0.8	3.5		10.0
Resolution	P/rev	540672			
Motor insulation class		Class F			
Motor withstand voltage		1,500 VAC 1 min			
Motor insulation resistance		10 MΩ or more 500 VDC			
Operating ambient temperature		0 to 45°C (0 to 40°C: *6)			
Operating ambient humidity		20 to 85% RH, no condensation			
Storage ambient temperature		−20 to 80°C			
Storage ambient humidity		20 to 90% RH, no condensation			
Atmosphere		No corrosive gas, explosive gas, or dust			
Weight	kg	5.5	12.3 (14.6) *3	15.0 (17.3) *3	36.0 (41.0) *3
Weight with brake	kg	−	16.4 (18.7) *3	19.3 (21.6) *3	54.0 (59.0) *3
Output shaft runout (*5)	mm	0.03			
Output shaft surface runout (*5)	mm	0.05			
Degree of protection		IP20			

*1: Use at a speed of 80 rpm or less during continuous rotation operation.
*2: When using in load conditions up to those given in ( ), set parameter 72 (integral gain magnification) = 0.3 (reference value).
*3: The values in ( ) are the actuator weight with the mounting base option.
*4: Contact CKD whenever using continuous rotation operation in combination with parameter 72 (integral gain magnification).
*5: Refer to the "Glossary" on page 52 for index accuracy, repeatability, output shaft runout and output shaft surface runout.
*6: When using as a UL certified product, the maximum temperature is 40°C.

Electromagnetic brake specifications (option)

Item \ Compatibility		AX4022T/AX4045T	AX4075T
Type		Non-backlash dry type non-excitation type	
Rated voltage	V	24 VDC	
Power capacity	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)
Retention accuracy	Minutes	45 (reference value)	
Max. operating frequency	times/min	60	40

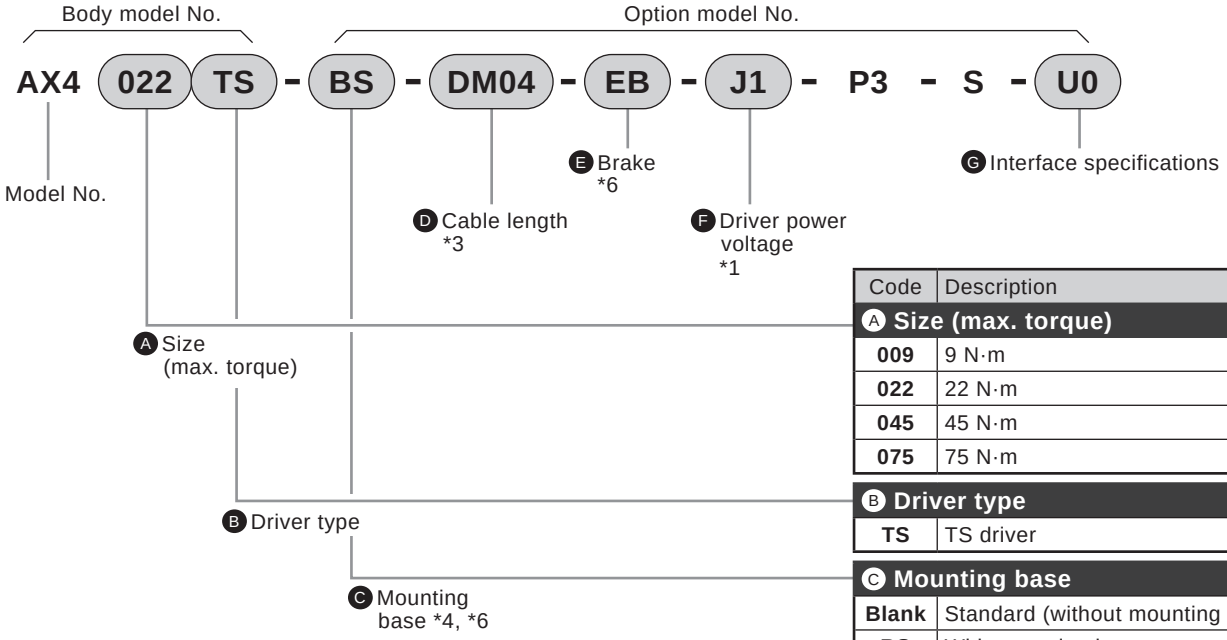
*1: During output shaft rotation, the electromagnetic brake disc and fixed part may cause a scraping sound. Also, impact noise is generated when electromagnetic brakes operate.
*2: For travel after brake off, you must change the parameter delay time by the above-mentioned armature suction time.
*3: Though it is a non-backlash type, holding a constant position is difficult if load is applied in the rotation direction. It is not for maintaining braking/precision.
*4: Manual release of the electromagnetic brake is possible by evenly tightening the bolts in the manual release tap (3 locations).
*5: Use a non-magnetic material (SUS303, etc.) when putting a shaft through the hollow hole in the type with magnetic brakes. Peripheral devices may be affected due to magnetization.

Please read the technical data and user's manual for details on the precautions.

⚠ Always read the safety precautions on pages 61 to 66 before use.

How to order

● Set model No. (actuator, driver, cable)



Code	Description
Ⓐ Size (max. torque)	
009	9 N·m
022	22 N·m
045	45 N·m
075	75 N·m
Ⓑ Driver type	
TS	TS driver
Ⓒ Mounting base	
Blank	Standard (without mounting base)
BS	With mounting base
Ⓓ Cable length	
DM00	Without cable
DM02	2 m
DM04	4 m (standard length)
DM06	6 m
DM08	8 m
DM10	10 m
DM15	15 m
DM20	20 m
Ⓔ Brake	
Blank	Standard (without electromagnetic brake)
EB	Negative-actuated electromagnetic brake
Ⓕ Driver power voltage	
Refer to the driver power voltage compatibility table at left.	
Ⓖ Interface specifications	
U0	Parallel I/O (NPN specifications)
U1	Parallel I/O (PNP specifications)
U2	CC-Link
U3	PROFIBUS-DP
U4	DeviceNet
U5	EtherCAT
U6	EtherNet/IP

Precautions for model No. selection

*1: Select the driver according to the compatibility table below.

Driver power voltage compatibility table

Drivers type / Model	TS driver	
	Three-phase/ single-phase 200 to 230 VAC	Single phase 100 to 115 VAC
AX4009T	Blank	J1
AX4022T	Blank	J1
AX4045T	Blank	J1
AX4075T	Blank *2	

*2: For models with maximum torque 75 N·m, the calculation of torque limit region is different from the usual when used at single-phase 200 VAC. Contact CKD to determine usability.

*3: Cable is a movable cable.
Refer to page 48 for dimensions of the cable. Body lead-out cable is not a movable cable.

*4: Ⓒ When the "BS" option with the mounting base is selected, the positioning pin hole on the bottom is not available. The surface is treated with electroless nickel plating.

*5: Positioning pin holes may not be surface treated.

*6: When selecting an electromagnetic brake, refer to the precautions (Page 65) for instructions on how to connect electromagnetic brakes.
For options, select according to the "Option compatibility table" below.
Option compatibility table

	AX4009T	AX4022T	AX4045T	AX4075T
Mounting base (-BS)	×	○	○	○
Brake (-EB)	×	○	○	○

*7: The surface of the body is treated with electroless nickel plating.

● Actuator body discrete model No.

AX4 ○ T - BS - ○ - P3 - S

Ⓐ Size, Ⓔ Brake, Ⓒ Mounting base

● Driver discrete model No.

• 200 to 230 VAC
AX9000TS - U0

• 100 to 115 VAC
AX9000TS - J1 - U0

Ⓖ Interface specifications

● Cable discrete model No.

• Motor cable
AX - CBLM6 - DM04

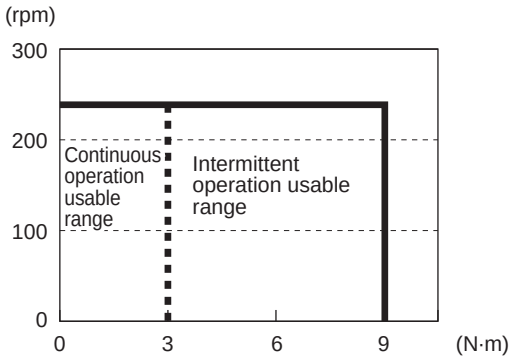
• Resolver cable
AX - CBLR6 - DM04

Ⓓ Cable length
(Note: "DM04" when cable length is 4 m)

* Custom order products are CE, UL/cUL, and RoHS non-compliant. Contact CKD as needed.

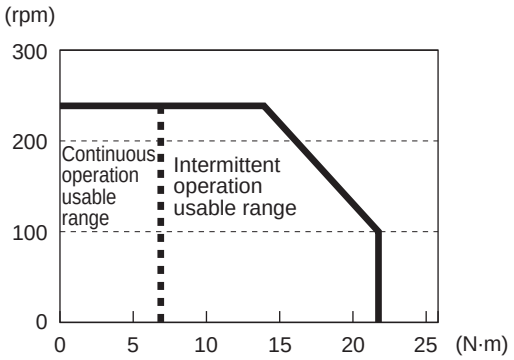
Speed/maximum torque characteristics

● AX4009T



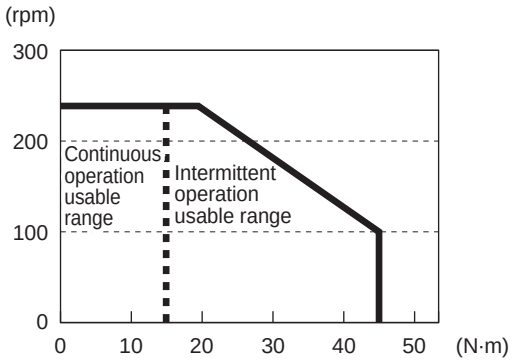
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX4022T



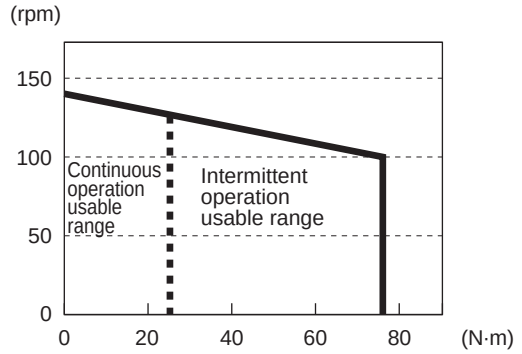
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX4045T



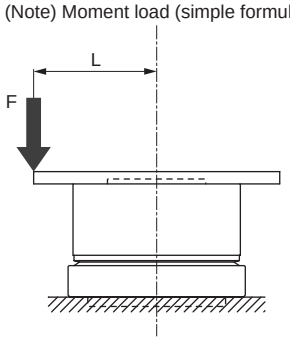
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX4075T



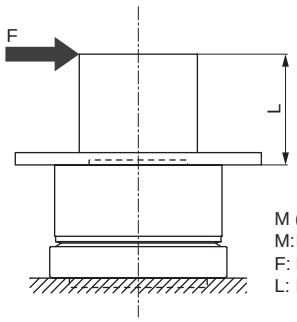
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

(Note) Moment load (simple formula)



M (N·m) = F (N) × L (m)
M: Moment load
F: Load
L: Distance from output shaft center

(Fig. a)



M (N·m) = F (N) × (L + 0.02) (m)
M: Moment load
F: Load
L: Distance from output shaft flange

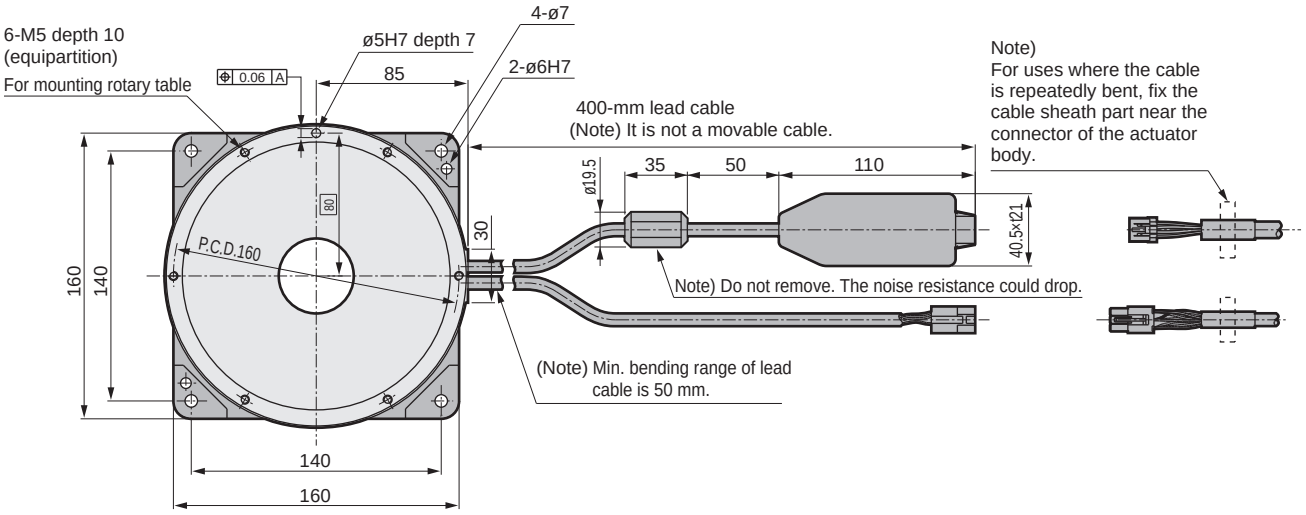
(Fig. b)

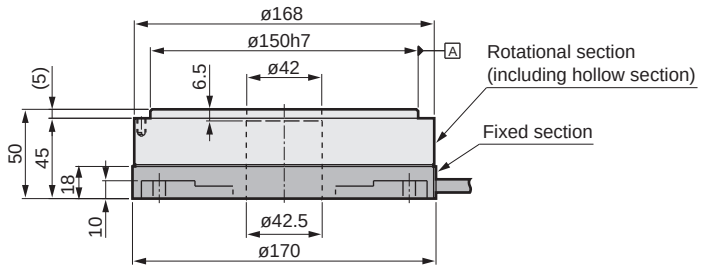
⚠ Always read the safety precautions on pages 61 to 66 before use.

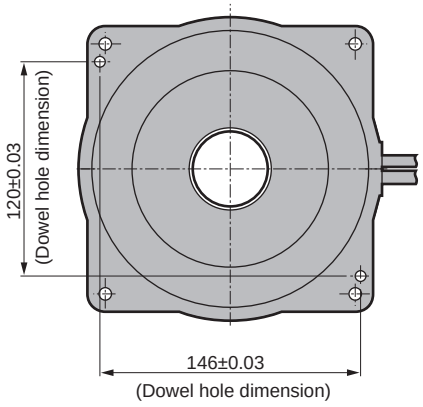
MEMO

Dimensions

● AX4009T



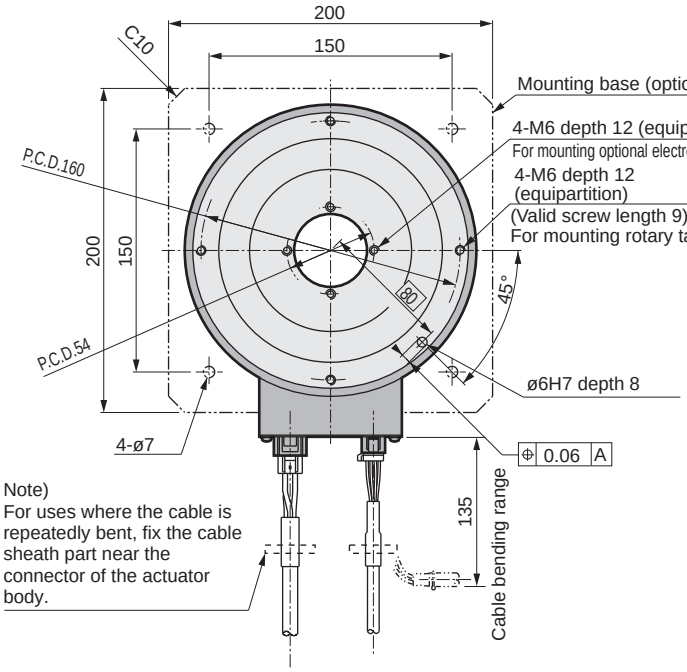


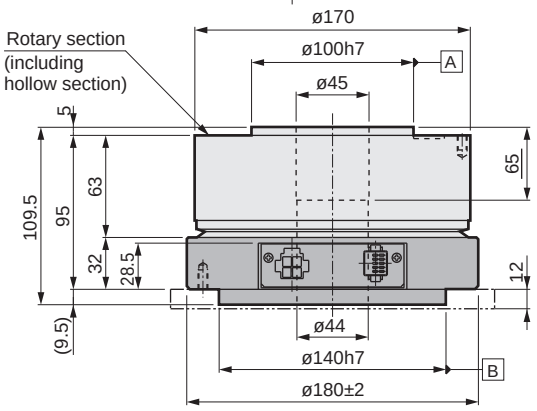


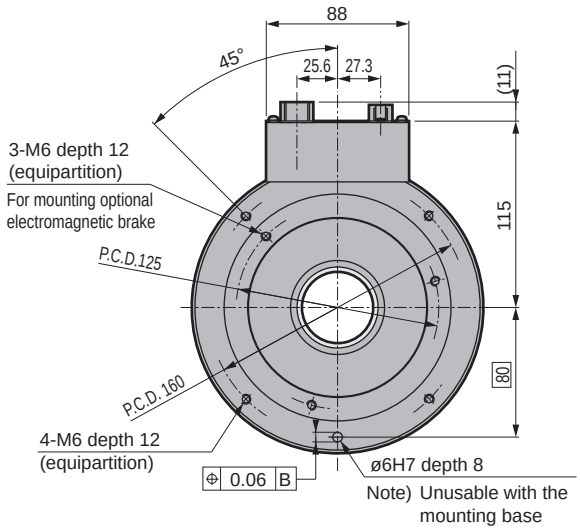
*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

Dimensions

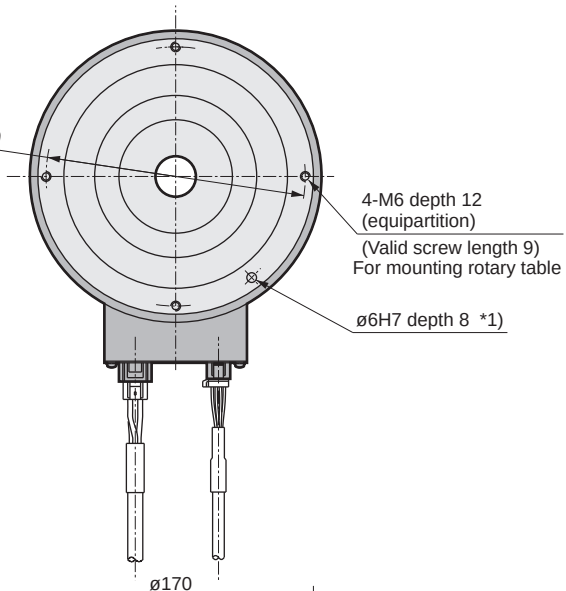
● AX4022T

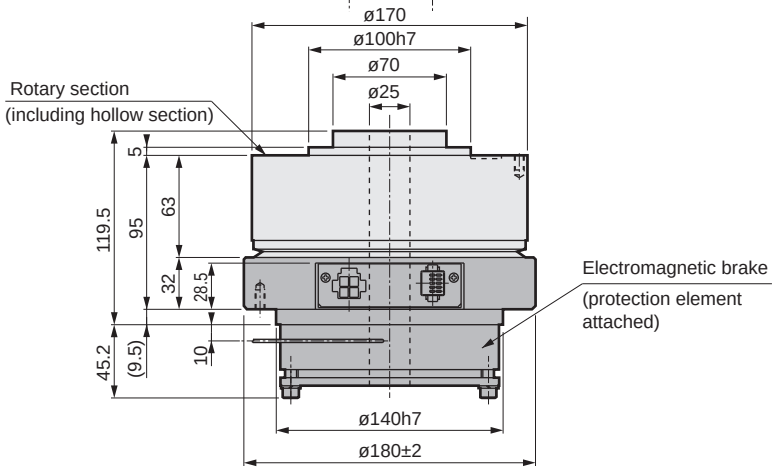


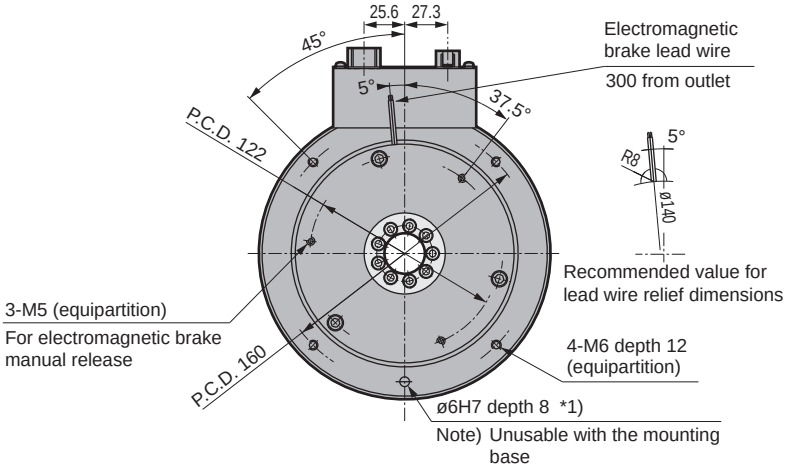




● AX4022T-EB
Electromagnetic brake
For other options, refer to the left figure on the left.



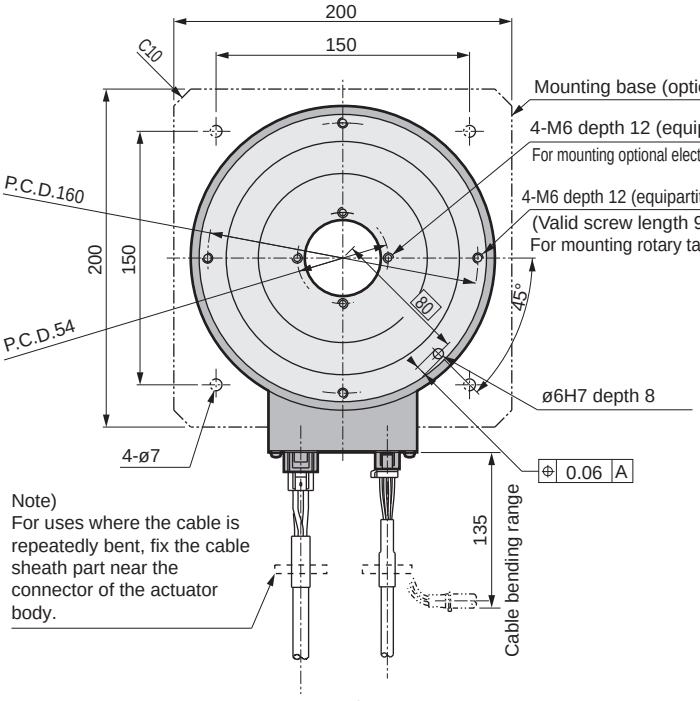




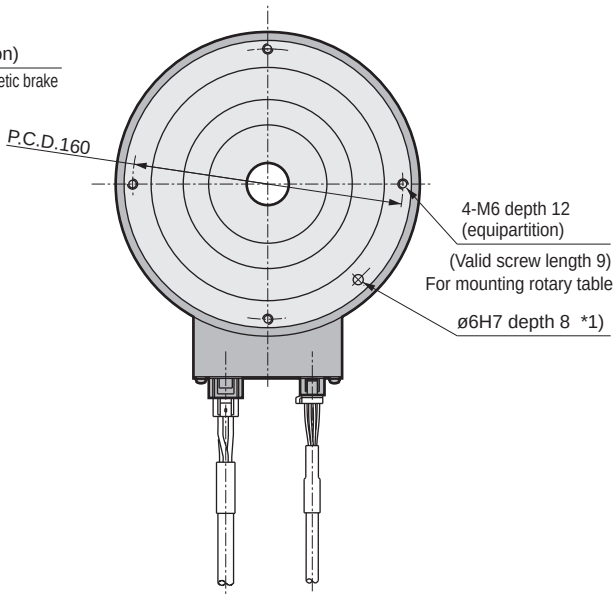
*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position. The position of the positioning pin hole is the same as that of AX4022T when an electromagnetic brake is mounted.

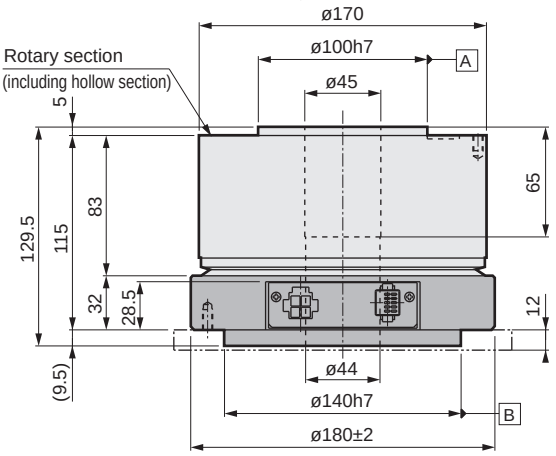
Dimensions

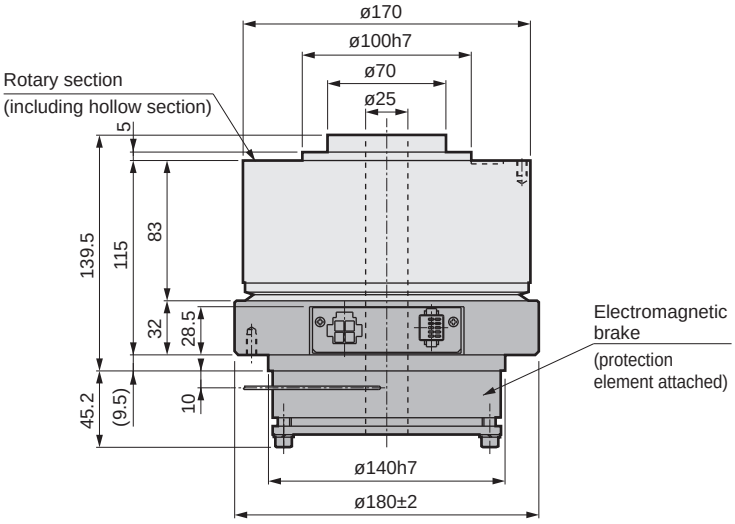
● AX4045T

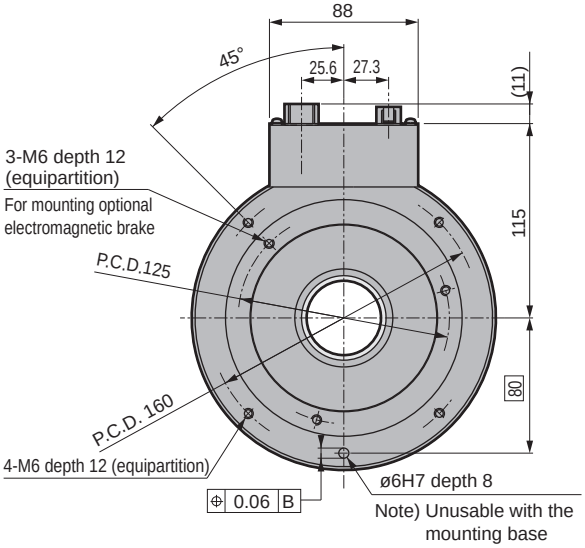


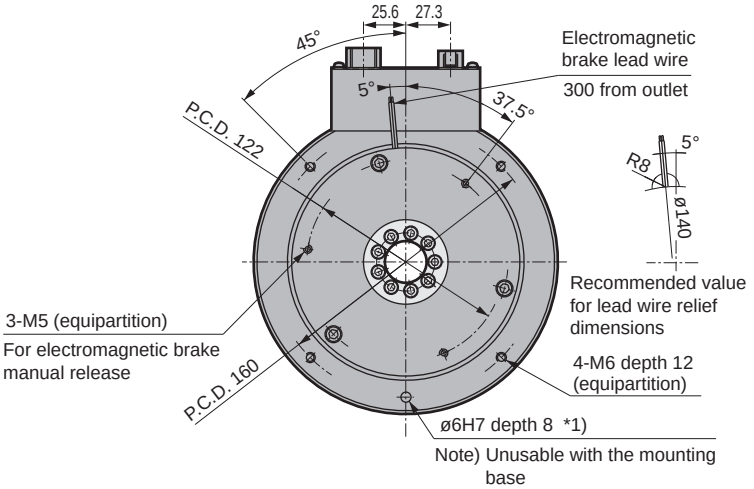
● AX4045T-EB
Electromagnetic brake
For other options, refer to the left figure on the left.







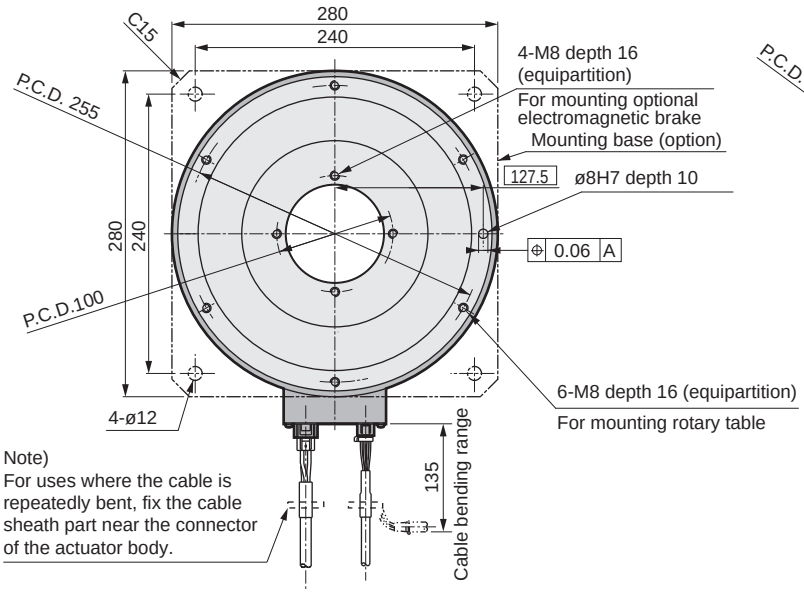




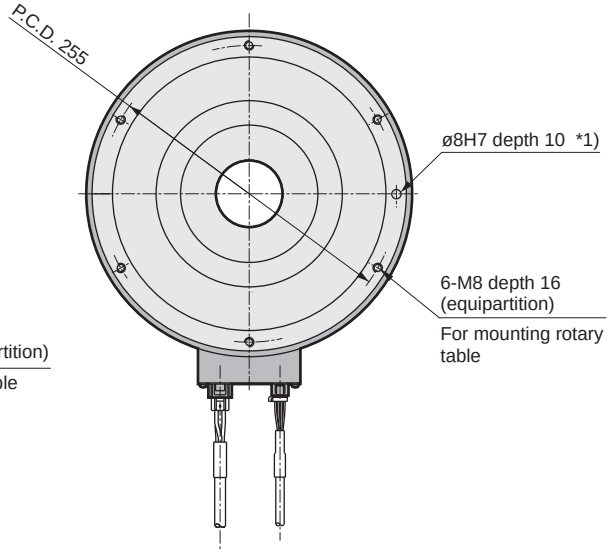
*1) The origin position of the actuator may differ from that shown in the dimensions. The origin offset function allows you to set a desired origin position.The position of the positioning pin hole is the same as that of AX4045T when an electromagnetic brake is mounted.

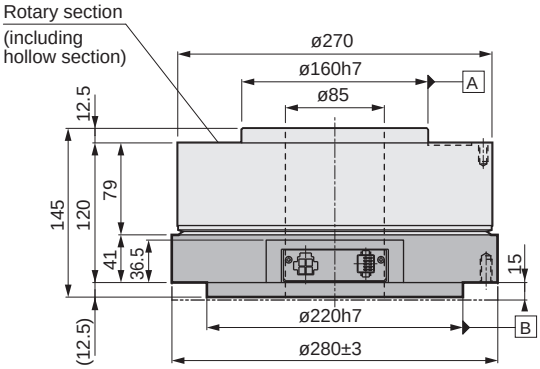
Dimensions

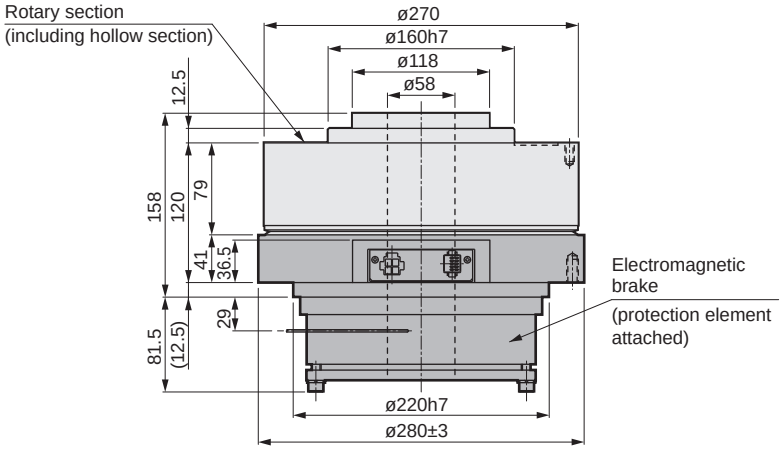
● AX4075T

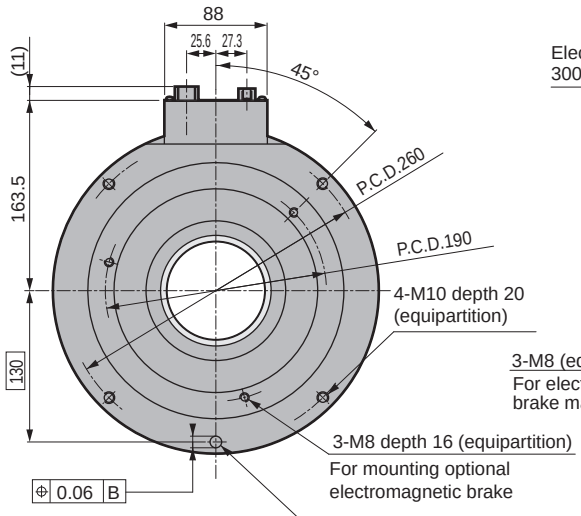


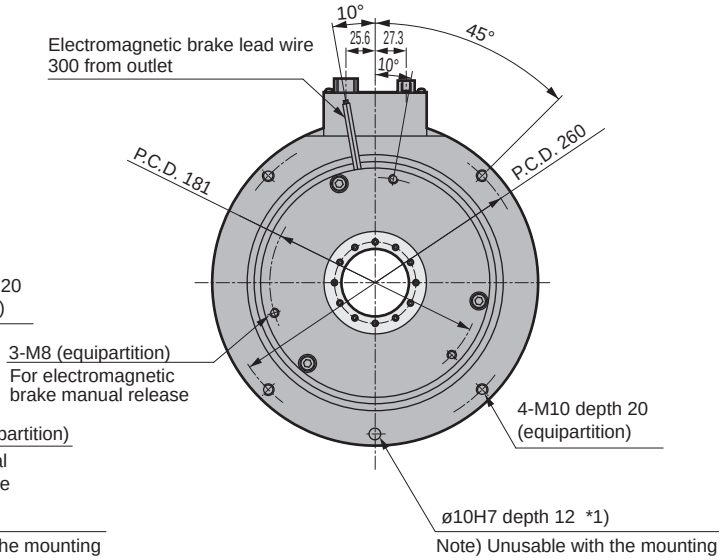
● AX4075T-EB
Electromagnetic brake
For other options, refer to the left figure on the left.











*1) The origin position of the actuator may differ from that shown in the dimensions. The origin offset function allows you to set a desired origin position. The position of the positioning pin hole is the same as that of AX4045T when an electromagnetic brake is mounted.

ABSODEX

AX4000T Series

Supports large moments of inertia load
Compatible function allows free combination of driver, actuator, and cable
Large hollow diameter is convenient for cable wiring and piping, abundant options available

- Max. torque: 150/300/500/1000 N·m
- Supported driver: TH driver

Actuator specifications

Item		AX4150T	AX4300T	AX4500T	AX410WT
Max. output torque	N·m	150	300	500	1000
Continuous output torque	N·m	50	100	160	330
Max. rotation speed	rpm	100 (*1)		70	30
Allowable axial load	N	20000			
Allowable moment load	N·m	300	400	500	400
Output shaft moment of inertia	kg·m^2	0.2120	0.3260	0.7210	2.7200
Allowable moment of load inertia	kg·m^2	75.00 (*2)	180.00 (*2)	300.00 (*2)	600.00 (*2)
Index accuracy (*4)	sec	±30			
Repeatability (*4)	sec	±5			
Output shaft friction torque	N·m	10.0		15.0	20.0
Resolution	P/rev	540672			
Motor insulation class		Class F			
Motor withstand voltage		1,500 VAC 1 min			
Motor insulation resistance		10 MΩ or more 500 VDC			
Operating ambient temperature		0 to 45°C (0 to 40°C: *5)			
Operating ambient humidity		20 to 85% RH, no condensation			
Storage ambient temperature		−20 to 80°C			
Storage ambient humidity		20 to 90% RH, no condensation			
Atmosphere		No corrosive gas, explosive gas, or dust			
Weight	kg	44.0 (49.0) *3	66.0 (74.0) *3	115.0 (123.0) *3	198.0 (217.0) *3
Weight with brake	kg	63.0 (68.0) *3	86.0 (94.0) *3	-	-
Output shaft runout (*4)	mm	0.03			
Output shaft surface runout (*4)	mm	0.05			0.08
Degree of protection		IP20			

*1: Use at a speed of 80 rpm or less during continuous rotation operation.
*2: Settings when shipped support large moment of inertia.
*3: The values in ( ) are the actuator weight with the mounting base option.
*4: Refer to the "Glossary" on page 52 for index accuracy, repeatability, output shaft runout and output shaft surface runout.
*5: When using as a UL certified product, the maximum temperature is 40°C.

Electromagnetic brake specifications (option)

Item \ Compatibility		AX4150T/AX4300T
Type		Non-backlash dry type non-excitation type
Rated voltage	V	24 VDC
Power capacity	W	55
Rated current	A	2.30
Static friction torque	N·m	200
Armature release time (brake on)	msec	50 (reference value)
Armature suction time (brake off)	msec	250 (reference value)
Retention accuracy	Minutes	45 (reference value)
Max. operating frequency	times/min	40

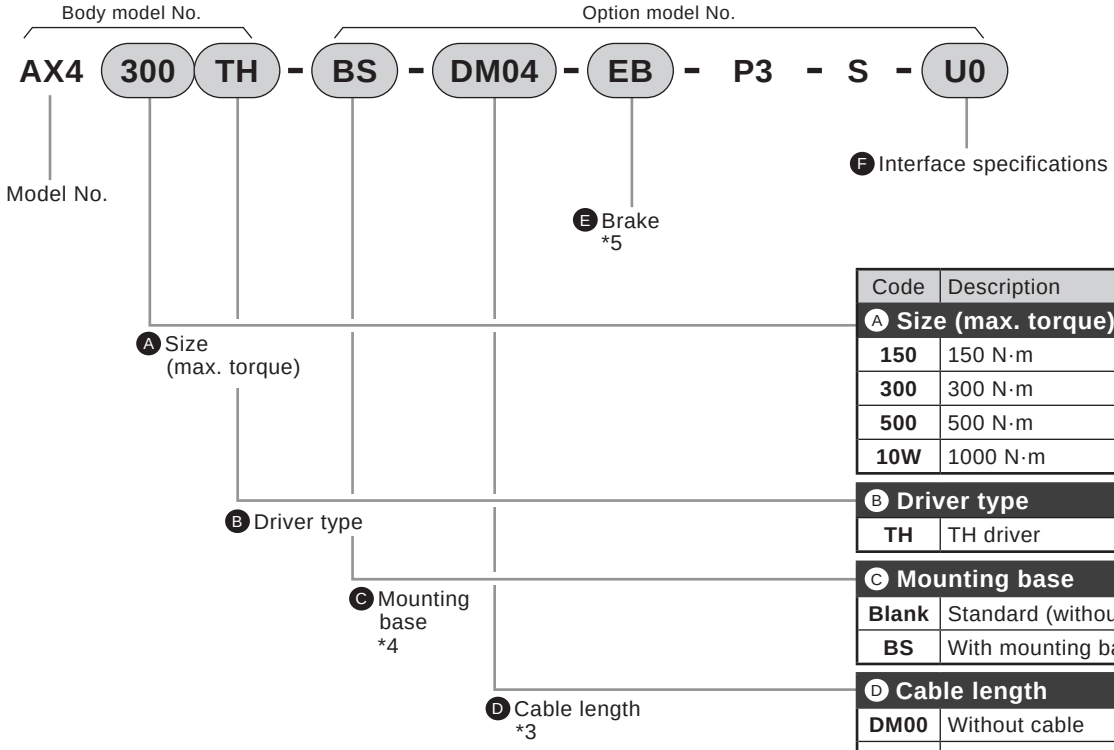
*1: During output shaft rotation, the electromagnetic brake disc and fixed part may cause a scraping sound. Also, impact noise is generated when electromagnetic brakes operate.
*2: For travel after brake off, you must change the parameter delay time by the above-mentioned armature suction time.
*3: Though it is a non-backlash type, holding a constant position is difficult if load is applied in the rotation direction. It is not for maintaining braking/precision.
*4: Manual release of the electromagnetic brake is possible by evenly tightening the bolts in the manual release tap (3 locations).
*5: Use a non-magnetic material (SUS303, etc.) when putting a shaft through the hollow hole in the type with magnetic brakes. Peripheral devices may be affected due to magnetization.

Please read the technical data and user's manual for details on the precautions.

⚠ Always read the safety precautions on pages 61 to 66 before use.

How to order

● Set model No. (actuator, driver, cable)



Code	Description
Ⓐ Size (max. torque)	
150	150 N·m
300	300 N·m
500	500 N·m
10W	1000 N·m
Ⓑ Driver type	
TH	TH driver
Ⓒ Mounting base	
Blank	Standard (without mounting base)
BS	With mounting base
Ⓓ Cable length	
DM00	Without cable
DM02	2 m
DM04	4 m (standard length)
DM06	6 m
DM08	8 m
DM10	10 m
DM15	15 m
DM20	20 m
Ⓔ Brake	
Blank	Standard (without electromagnetic brake)
EB	Negative-actuated electromagnetic brake
Ⓕ Interface specifications	
U0	Parallel I/O (NPN specifications)
U1	Parallel I/O (PNP specifications)
U2	CC-Link
U3	PROFIBUS-DP
U4	DeviceNet
U5	EtherCAT
U6	EtherNet/IP

Precautions for model No. selection

*1: Select the driver according to the compatibility table below.

Driver power voltage compatibility table

Drivers type / Model	TH driver Three-phase/single-phase 200 to 230 VAC
AX4150T	Blank *2
AX4300T	Blank *2
AX4500T	Blank *2
AX410WT	Blank *2

*2: The calculation of torque limit region is different from the usual when used at single-phase 200 VAC. Contact CKD to determine usability.

*3: Cable is a movable cable.
Refer to page 48 for dimensions of the cable.

*4: Ⓒ When the "BS" option with the mounting base is selected, the positioning pin hole on the bottom is not available. The surface is treated with electroless nickel plating.

*5: When selecting an electromagnetic brake, refer to the precautions (Page 65) for instructions on how to connect electromagnetic brakes.
For options, select according to the "Option compatibility table" below.

Option compatibility table

	AX4150T	AX4300T	AX4500T	AX410WT
Electromagnetic brake (-EB)	○	○	×	×

*6: Positioning pin holes may not be surface treated.

*7: The surface is treated with electroless nickel plating.

● Actuator body discrete model No.

AX4 ○ T - BS - ○ - P3 - S

Ⓐ Size, Ⓒ Mounting base, Ⓔ Brake

● Driver discrete model No.

● 200 to 230 VAC

AX9000TH - U0

Ⓕ Interface specifications

● Cable discrete model No.

● Motor cable

AX-CBLM6-DM04

● Resolver cable

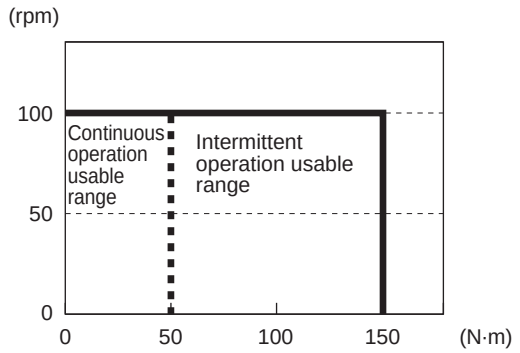
AX-CBLR6-DM04

Ⓓ Cable length
(Note: "DM04" when cable length is 4 m)

* Custom order products are CE, UL/cUL, and RoHS non-compliant. Contact CKD as needed.

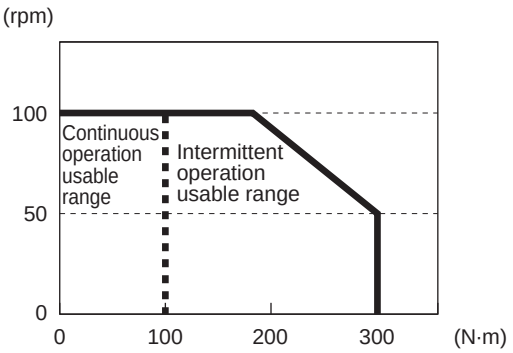
Speed/maximum torque characteristics

● AX4150T



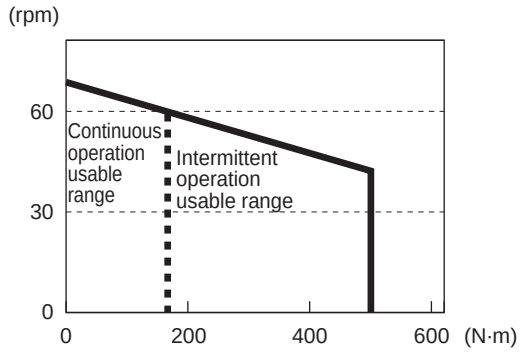
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX4300T



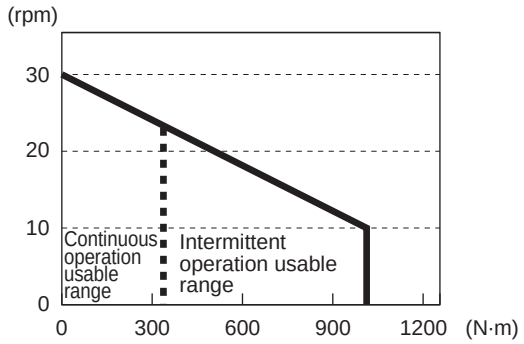
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX4500T



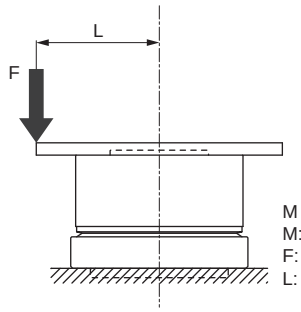
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

● AX410WT



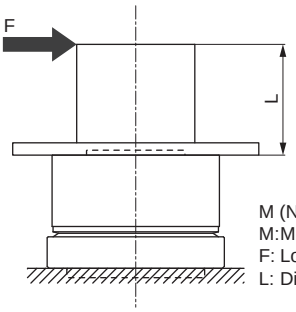
* Fig. This graph shows the characteristics for 3-phase 200 VAC.

(Note) Moment load (simple formula)



M (N·m) = F (N) × L (m)
M:Moment load
F: Load
L: Distance from output shaft center

(Fig. a)



M (N·m) = F (N) × (L + 0.02) (m)
M:Moment load
F: Load
L: Distance from output shaft flange

(Fig. b)

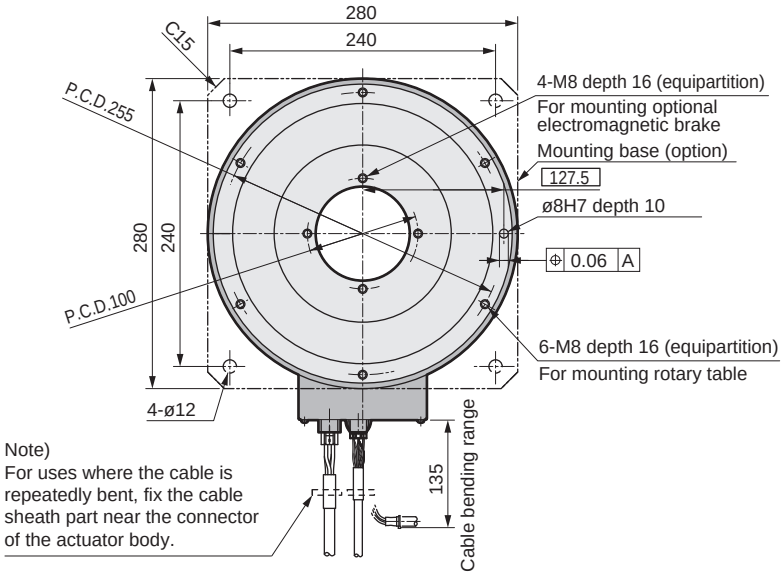
Actuator AX6000M
Drivers AX9000MU
Actuator AX1000T
Actuator AX2000T
Actuator AX4000T
Drivers AX9000TS/TH
Dialog terminal AX0180
Related parts model No. table

⚠ Always read the safety precautions on pages 61 to 66 before use.

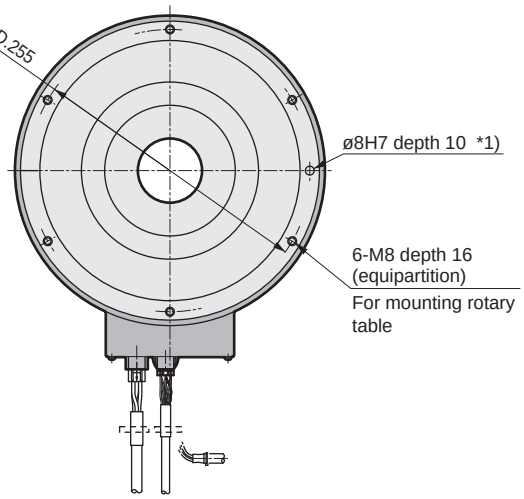
MEMO

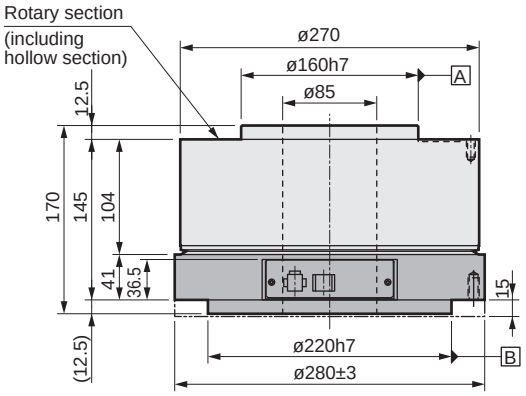
Dimensions

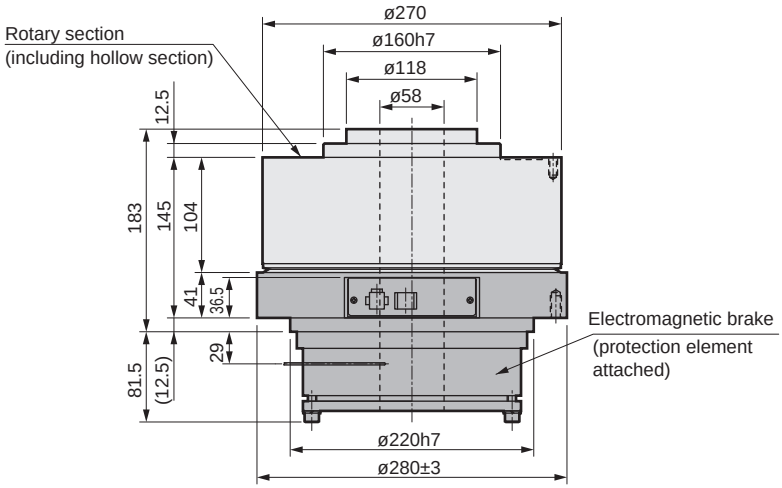
● AX4150T

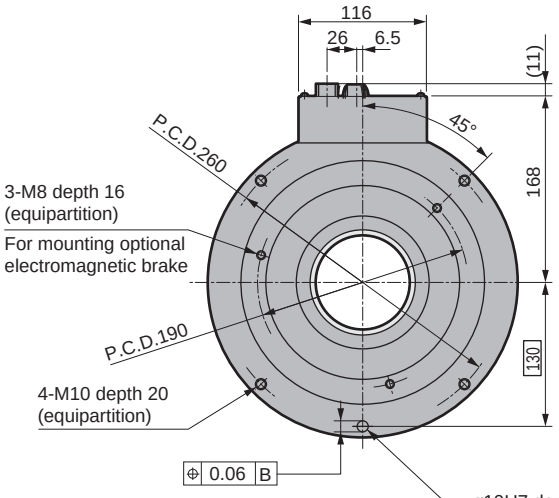


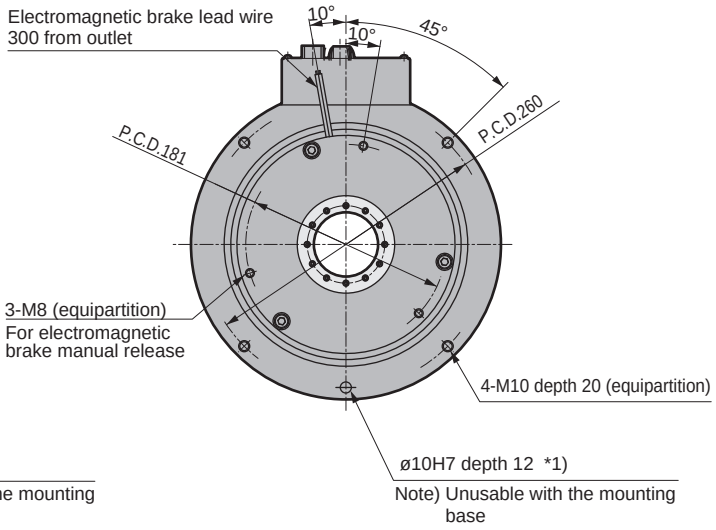
● AX4150T-EB
Electromagnetic brake
For other options, refer to the left figure on the left.







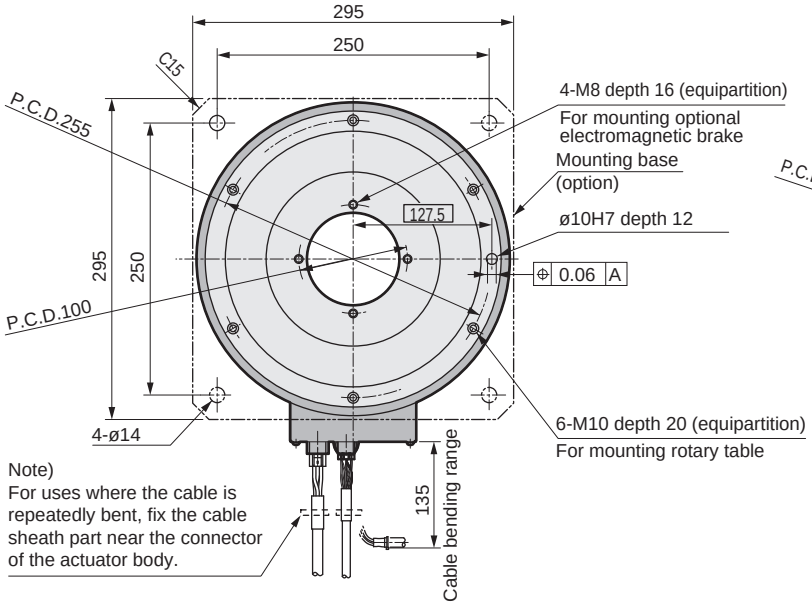




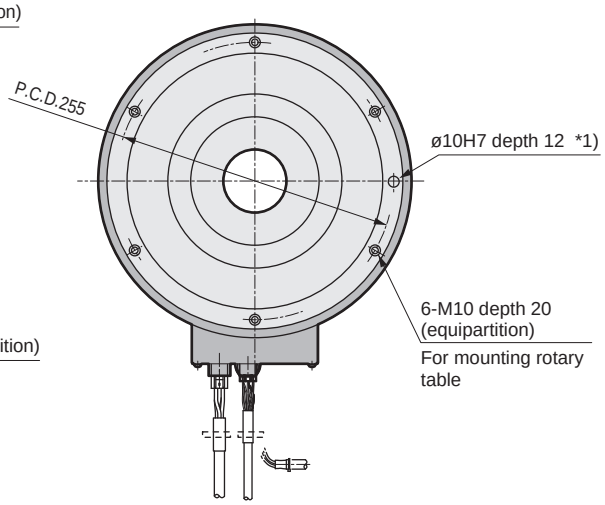
*1) The origin position of the actuator may differ from that shown in the dimensions. The origin offset function allows you to set a desired origin position. The position of the positioning pin hole is the same as that of AX4150T when an electromagnetic brake is mounted.

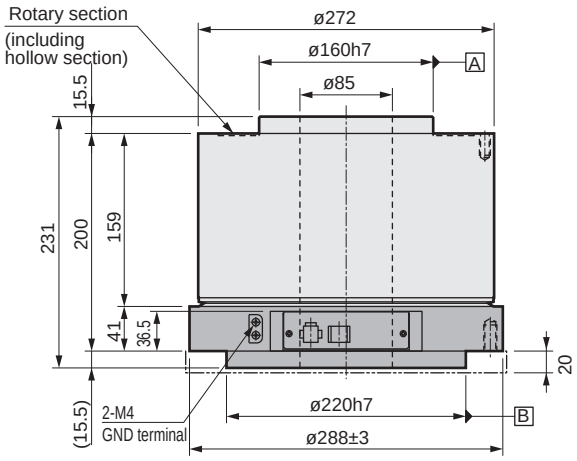
Dimensions

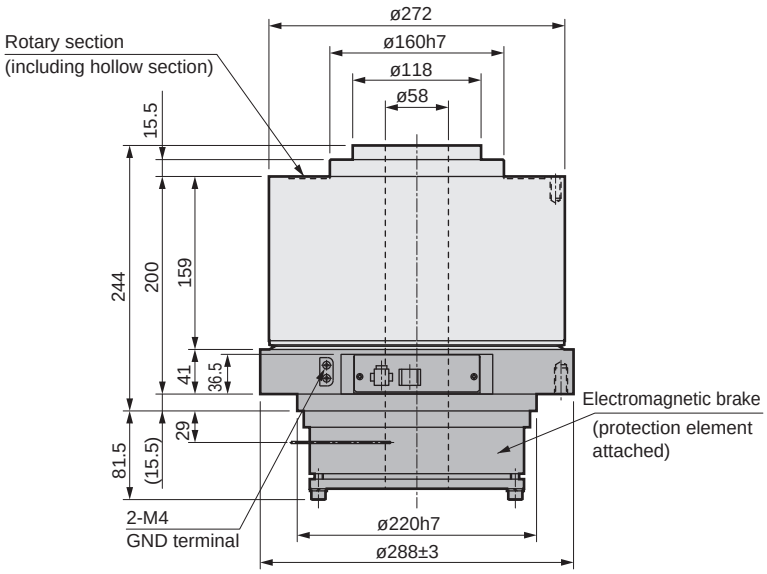
● AX4300T

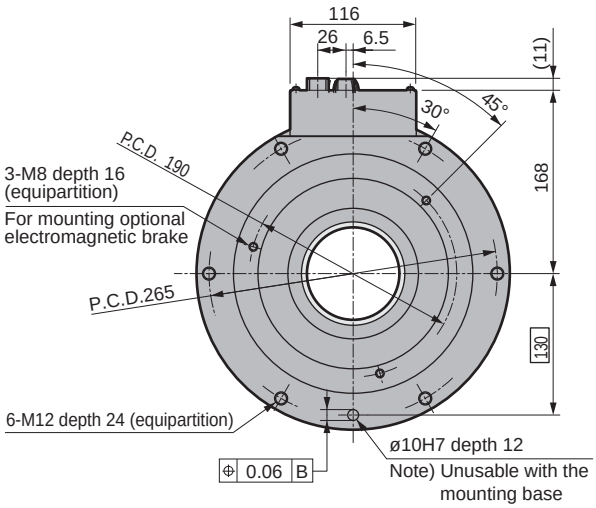


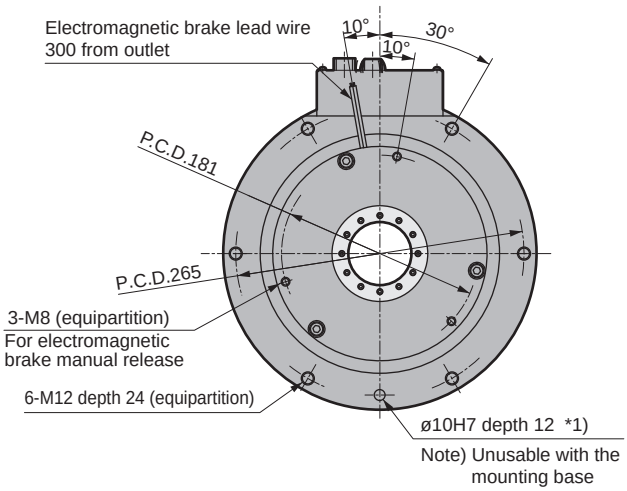
● AX4300T-EB
Electromagnetic brake
For other options, refer to the left figure on the left.







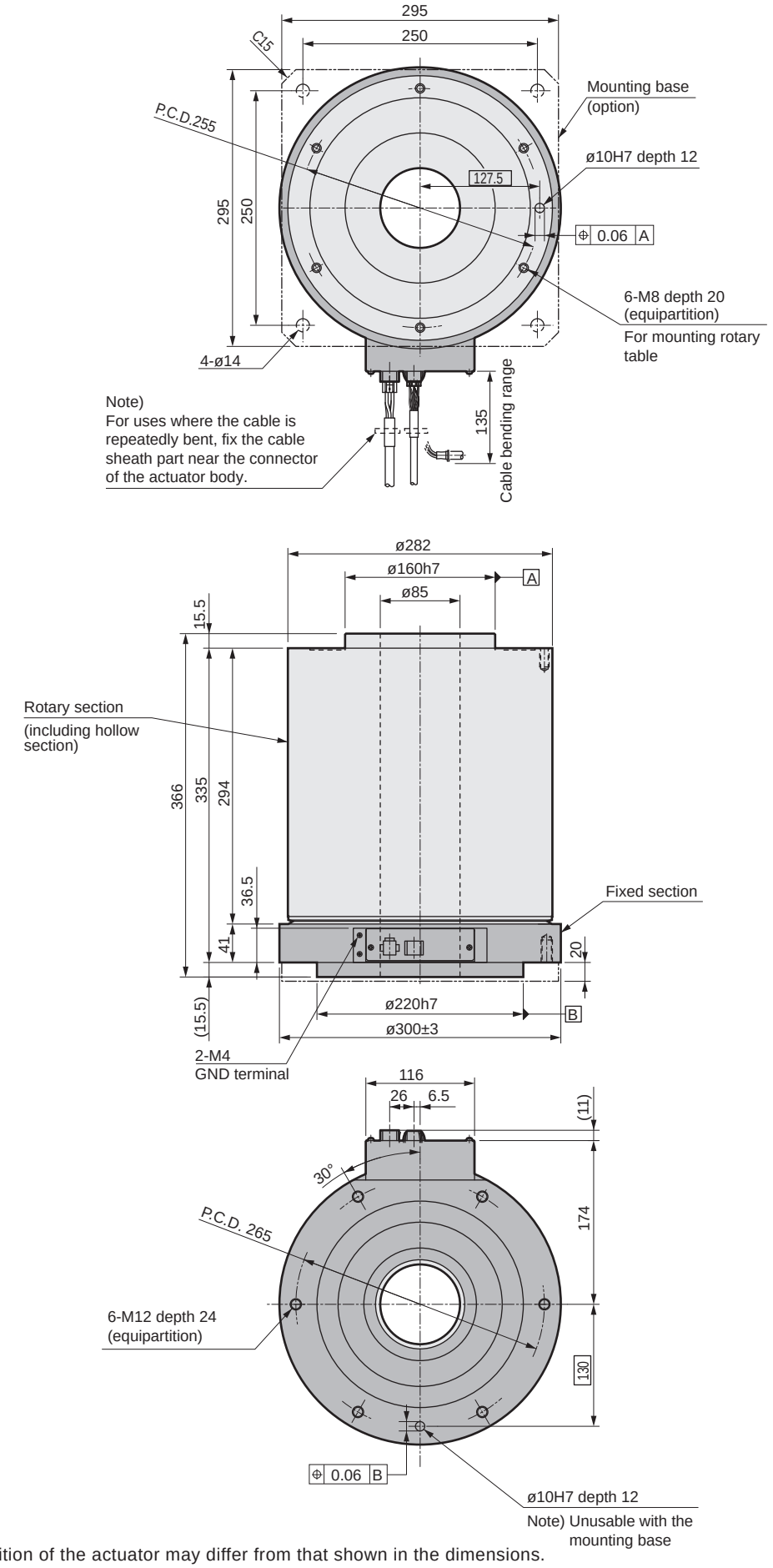




*1) The origin position of the actuator may differ from that shown in the dimensions. The origin offset function allows you to set a desired origin position. The position of the positioning pin hole is the same as that of AX4300T when an electromagnetic brake is mounted.

Dimensions

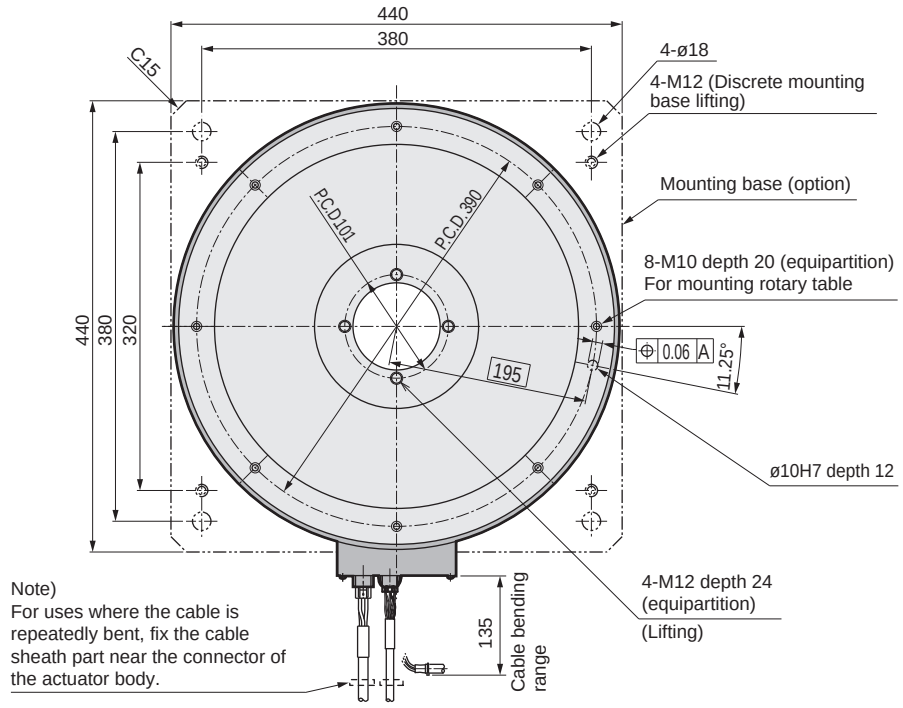
● AX4500T

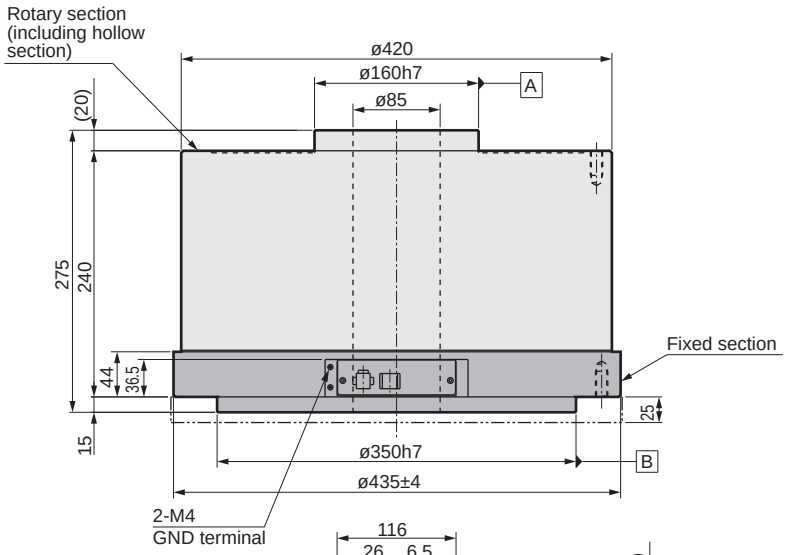


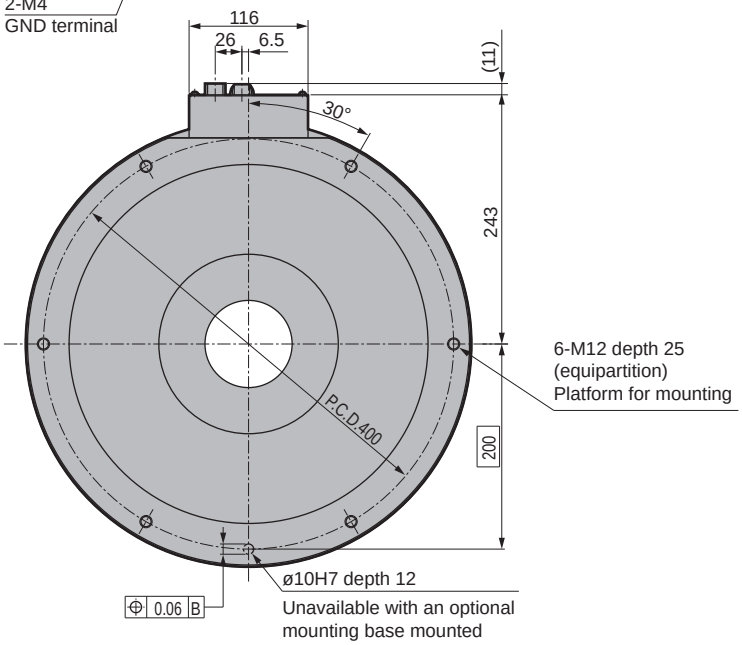
*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

Dimensions

● AX410WT







*1) The origin position of the actuator may differ from that shown in the dimensions.
The origin offset function allows you to set a desired origin position.

ABSODEX (AX1000T/AX2000T/AX4000T Series)

TS/TH driver

Interface specification: Parallel I/O (NPN), Parallel I/O (PNP)
CC-Link, PROFIBUS-DP, DeviceNet
EtherCAT, EtherNet/IP

c UL us LISTED CE RoHS

Features

- Power supply is divided into main power supply and control power supply
- Wiring method is changed from terminal block to connector
- Smaller/lighter weight (resin body adopted)
- 7-segment LED 2-digit display
- Compatible with encoder output (parallel I/O only)
- Serial communication options available
- Monitoring functions such as position information, alarm status, etc. (U2, U3, U4, U5, and U6 options only)

How to order

• 200 to 230 VAC

AX9000TS - U0

AX9000TH - U0

• 100 to 115 VAC

AX9000TS-J1- U0

Interface specifications
U0: Parallel I/O (NPN)
U1: Parallel I/O (PNP)
U2: CC-Link
U3: PROFIBUS-DP
U4: DeviceNet
U5: EtherCAT
U6: EtherNet/IP

General specifications

Item		Model	
		TS driver AX9000TS	TH driver AX9000TH
Power supply voltage	Main power supply	Three phase, Single phase 200 VAC ±10% to 230 VAC ±10% (*1) 100 VAC ±10% to 115 VAC ±10% (J1 Option) (*2) (*3)	
	Control power	200 VAC ±10% to 230 VAC ±10% 100 VAC ±10% to 115 VAC ±10% (J1 Option) (*2) (*3)	
Power frequency		50/60 Hz	
Rated input current		200 VAC: 1.8 A 100 VAC: 2.4 A	200 VAC: 5.0 A
Rated output current		1.9 A	5.0 A
Structure		Driver and controller integrated (open type)	
Operating ambient temperature		0 to 50°C	
Operating ambient humidity		20 to 90% RH (no condensation)	
Storage ambient temperature		−20 to 65°C	
Storage ambient humidity		20 to 90% RH (no condensation)	
Atmosphere		No corrosive gas or dust	
Anti-noise		1,000 V (P-P), pulse width 1 μsec, rising 1 nsec impulse noise test, induction noise (capacitive coupling)	
Vibration resistance		4.9 m/s^2	
Weight		Approx. 1.6 kg	Approx. 2.1 kg
Degree of protection		IP2X (excluding CN4 and CN5)	

*1) For models with maximum torque 75 N·m or more, the calculation of torque limit region is different from the usual when used at single-phase 200 VAC. Contact CKD to determine usability.
*2) If 200 to 230 VAC is connected by mistake, when using power voltage 100 to 115 VAC specifications (-J1 option), the driver internal circuit will be damaged.
*3) For models with maximum torque 75 N·m or more, "-J1" cannot be selected.
*4) If the main power is cut off while the actuator is rotating, the rotation may continue due to inertia.
*5) After the main power supply is cut OFF, the motor may rotate by the residual voltage of the driver.

Performance specifications

Item	Description
No. of control axes	1 axis, 540,672 pulses/1 rotation
Angle setting unit	° (degree), pulse, indexing No.
Angle min. setting unit	0.001°, 1 pulse
Speed setting unit	sec, rpm
Speed setting range	0.01 to 100 sec/0.11 to 300 rpm (*1)
Equal divisions	1 to 255
Max. command value	7-digit numeric input ±9,999,999
Timer	0.01 sec to 99.99 sec
Programming language	NC
Programming method	Set the data through RS-232C port with an interactive terminal, PC, etc.
Operation mode	Auto, MDI, jog, single block, servo OFF, pulse train input mode
Coordinates	Absolute, incremental
Acceleration curve	[5 types] Modified sine (MS), modified constant velocity (MC/MC2), modified trapezoid (MT), trapecloid (TR)
Status display	LED display CHARGE: Main power supply POWER: Control power
Operation display	Display with 7-segment LED (2 digits)
Communication interface	RS-232C compliant
I/O signal	Refer to interface specification pages.
Program capacity	Approx. 6,000 characters (256)
Electronic thermal	Overheating protection for actuator

*1) Maximum rotation speed differs depending on the actuator connected.

Breaker capacity

TS driver

Actuator model No.	Driver model No.	Rush current (A)		Breaker capacity
		Single phase 100 V	Single-phase/three-phase 200 V	Rated current (A)
AX2006T	AX9000TS	16 (*1)	56 (*1)	10
AX1022T, AX2012T, AX2018T AX4009T, AX4022T				
AX1045T, AX4045T				
AX1075T, AX4075T		—		

*1) The value of the rush current is a representative value at 115 VAC and 230 VAC.

TH driver

Actuator model No.	Driver model No.	Rush current (A)	Breaker capacity
		Three-phase 200 V	Rated current (A)
AX1150T, AX4150T	AX9000TH	56 (*1)	20
AX1210T, AX4300T			
AX4500T			
AX410WT			

*1) The value of the rush current is a representative value at 230 VAC.

Parallel I/O (NPN)

CN3 Input signal

Pin No.	Signal name	Logic	Determination
1 to 2	External power supply input +24 V ±10%		
3 to 4	External power supply input GND		
5	Program No. selection input (Bit 0)	Positive	Level
6	Program No. selection input (Bit 1)	Positive	Level
7	Program No. selection input (Bit 2)	Positive	Level
8	Program No. selection input (Bit 3)	Positive	Level
9	Program No. setting 2nd digit input/ Program No. selection input (Bit 4)	Positive	Edge Level
10	Program No. setting 1st digit input/ Program No. selection input (Bit 5)	Positive	Edge Level
11	Reset input	Positive	Edge
12	Origin return directive input	Positive	Edge
13	Start input	Positive	Edge
14	Servo on input/ Program stop input	Positive	Level Edge
15	Ready return/Continuous rotation stop input	Positive	Edge
16	Answer input/Position deviation counter reset input	Positive	Edge
17	Emergency stop input	Negative	Level
18	Brake release input	Positive	Level

CN3 Output signal

Pin No.	Signal name	Logic
33	M code output (Bit 0)	Positive
34	M code output (Bit 1)	Positive
35	M code output (Bit 2)	Positive
36	M code output (Bit 3)	Positive
37	M code output (Bit 4)	Positive
38	M code output (Bit 5)	Positive
39	M code output (Bit 6)	Positive
40	M code output (Bit 7)	Positive
41	Imposition output	Positive
42	Positioning completion output	Positive
43	Start input wait output	Positive
44	Alarm output 1	Negative
45	Alarm output 2	Negative
46	Output 1 during indexing/Origin position output	Positive
47	Output 2 during indexing/Servo state output	Positive
48	Ready output	Positive
49	Segment position strobe output	Positive
50	M code strobe output	Positive

CN3 pulse train input signal

Pin No.	Signal name
19	PULSE/UP/A phase
20	-PULSE/-UP/-A phase
21	DIR/DOWN/B phase
22	-DIR/-DOWN/-B phase

CN3 encoder output signal (Incremental)

Pin No.	Signal name
23	A phase (Line driver output)
24	-A phase (Line driver output)
25	B phase (Line driver output)
26	-B phase (Line driver output)
27	Z phase (Line driver output)
28	-Z phase (Line driver output)

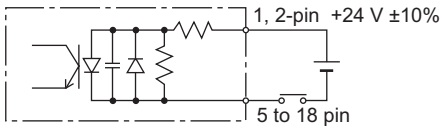
Input/output circuit specifications

Description	1 circuit current (mA)	Max. points (Circuit)	Max. current (mA)	Max. power consumption (mA)
Input circuit	4	14	56	1106
Output circuit	50	18	900	
Brake output (BK+, BK−)	75	2	150	

* The maximum simultaneous output points of the output circuit are 14 points out of 18 points.

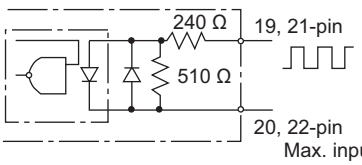
CN3 input/output circuit specifications

● Input circuit



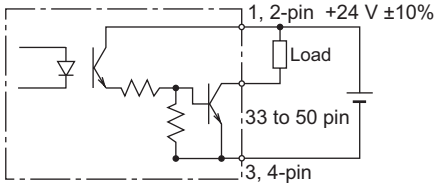
Rated voltage 24 V ±10%
Rated current 4 mA (at 24 VDC)

● Pulse string Input circuit



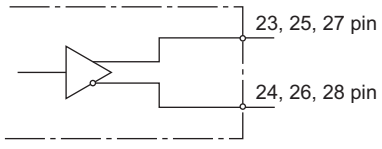
Rated voltage 5 V ±10%
Max. input frequency
Line driver 1 Mpps
Open collector 250 Kpps

● Output circuit



Rated voltage 24 V ±10%
Rated current 50 mA (MAX)

● Encoder Output circuit



Output: line driver
Use line driver: DS26C31

Always read the safety precautions on pages 61 to 66 before use.

*Custom order products are CE, UL/cUL, and RoHS non-compliant.

TS/TH driver

Parallel I/O (PNP)

CN3 Input signal

Pin No.	Signal name	Logic	Determination
1 to 2	External power supply input GND (*1)		
3 to 4	External power supply input +24 V ±10% (*1)		
5	Program No. selection input (Bit 0)	Positive	Level
6	Program No. selection input (Bit 1)	Positive	Level
7	Program No. selection input (Bit 2)	Positive	Level
8	Program No. selection input (Bit 3)	Positive	Level
9	Program No. setting 2nd digit input/ Program No. selection input (Bit 4)	Positive	Edge Level
10	Program No. setting 1st digit input/ Program No. selection input (Bit 5)	Positive	Edge Level
11	Reset input	Positive	Edge
12	Origin return directive input	Positive	Edge
13	Start input	Positive	Edge
14	Servo on input/ Program stop input	Positive	Level Edge
15	Ready return/Continuous rotation stop input	Positive	Edge
16	Answer input/Position deviation counter reset input	Positive	Edge
17	Emergency stop input	Negative	Level
18	Brake release input	Positive	Level

*1) The wiring differs from that under the PNP specification of AX9000GS/AX9000GH.

CN3 Output signal

Pin No.	Signal name	Logic
33	M code output (Bit 0)	Positive
34	M code output (Bit 1)	Positive
35	M code output (Bit 2)	Positive
36	M code output (Bit 3)	Positive
37	M code output (Bit 4)	Positive
38	M code output (Bit 5)	Positive
39	M code output (Bit 6)	Positive
40	M code output (Bit 7)	Positive
41	Imposition output	Positive
42	Positioning completion output	Positive
43	Start input wait output	Positive
44	Alarm output 1	Negative
45	Alarm output 2	Negative
46	Output 1 during indexing/Origin position output	Positive
47	Output 2 during indexing/Servo state output	Positive
48	Ready output	Positive
49	Segment position strobe output	Positive
50	M code strobe output	Positive

CN3 pulse train input signal

Pin No.	Signal name
19	PULSE/UP/A phase
20	-PULSE/-UP/-A phase
21	DIR/DOWN/B phase
22	-DIR/-DOWN/-B phase

CN3 encoder output signal (Incremental)

Pin No.	Signal name
23	A phase (Line driver output)
24	-A phase (Line driver output)
25	B phase (Line driver output)
26	-B phase (Line driver output)
27	Z phase (Line driver output)
28	-Z phase (Line driver output)

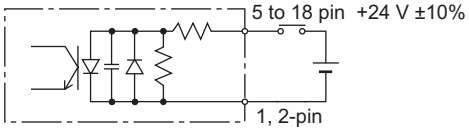
Input/output circuit specifications

Description	1 circuit current (mA)	Max. points (Circuit)	Max. current (mA)	Max. power consumption (mA)
Input circuit	4	14	56	1106
Output circuit	50	18	900	
Brake output (BK+, BK−)	75	2	150	

* The maximum simultaneous output points of the output circuit are 14 points out of 18 points.

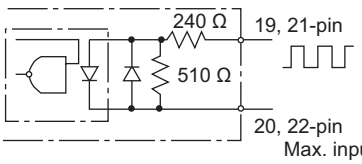
CN3 input/output circuit specifications

● Input circuit



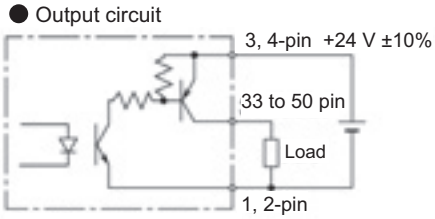
Rated voltage 24 V ±10%
Rated current 4 mA (at 24 VDC)

● Pulse string Input circuit



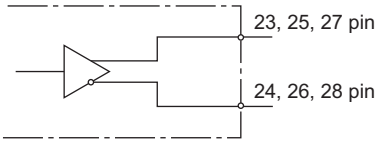
Rated voltage 5 V ±10%
Max. input frequency
Line driver 1 Mpps
Open collector 250 Kpps

● Output circuit



Rated voltage 24 V ±10%
Rated current 50 mA (MAX)

● Encoder Output circuit



Output: line driver
Use line driver: DS26C31

*Custom order products are CE, UL/cUL, and RoHS non-compliant.

CC-Link

Communication specifications

Item	Specifications
Power supply	5 VDC is supplied from the servo amplifier.
CC-Link version	Ver 1.10
Number of occupied stations (Station type)	2 stations (Remote device station)
Remote input points	48 points
Remote output points	48 points
Remote register input/output	Input 8 words/Output 8 words
Communication speed	10M/5M/2.5M/625k/156kbps (Selected by parameter setting)
Connection cable	CC-Link Ver. 1.10 compliant cable (3 core cable with shield)
Transmission format	HDLC compliant
Remote station No.	1 to 63 (Set by a parameter)
Number of connected units	For remote device station only, Max. 32 units/2 stations occupied
Monitor function	Present position within 1 rotation (degree, pulse), position deviation amount, program No., electronic thermal, rotation speed, point table No., torque load factor, acceleration, alarm, parameter, operation mode

I/O signal

PLC → AX (Input)

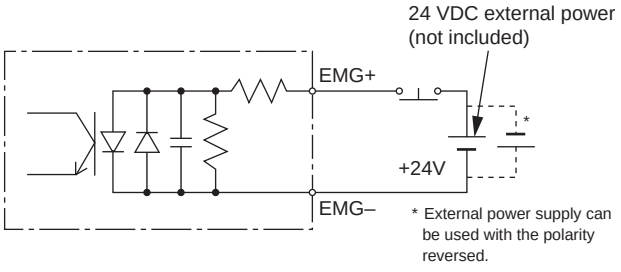
Device No.	Signal name	Logic	Determination
RYn0	Program No. selection input (Bit 0)	Positive	Level
RYn1	Program No. selection input (Bit 1)	Positive	Level
RYn2	Program No. selection input (Bit 2)	Positive	Level
RYn3	Program No. selection input (Bit 3)	Positive	Level
RYn4	Program No. setting 2nd digit input/ Program No. selection input (Bit 4)	Positive	Edge Level
RYn5	Program No. setting 1st digit input/ Program No. selection input (Bit 5)	Positive	Edge Level
RYn6	Reset input	Positive	Edge
RYn7	Origin return directive input	Positive	Edge
RYn8	Start input	Positive	Edge
RYn9	Servo on input/ Program stop input	Positive	Level Edge
RYnA	Ready return input/Continuous rotation stop input	Positive	Edge
RYnB	Answer input/Position deviation counter reset input	Positive	Edge
RYnC	Emergency stop input	Negative	Level
RYnD	Brake release input	Positive	Level
RYnE	Job operation input (CW direction)	Positive	Edge
RYnF	Job operation input (CCW direction)	Positive	Edge
RY(n+1)0	Unusable/Travel unit selection input (Bit 0)	Positive	Level
RY(n+1)1	Unusable/Travel unit selection input (Bit 1)	Positive	Level
RY(n+1)2	Unusable/Travel speed unit selection input	Positive	Level
RY(n+1)3	Operation by table, Operation by data input switching input	Positive	Level
RY(n+1)4 to RY(n+1)F	Unusable		
RY(n+2)0	Monitor output execution request	Positive	Level
RY(n+2)1	Command code execution request	Positive	Edge
RY(n+2)2 to RY(n+2)F	Unusable		
RY(n+3)0 to RY(n+3)F	Unusable		

AX (Output) → PLC

Device No.	Signal name	Logic
RXn0	M code output (Bit 0)	Positive
RXn1	M code output (Bit 1)	Positive
RXn2	M code output (Bit 2)	Positive
RXn3	M code output (Bit 3)	Positive
RXn4	M code output (Bit 4)	Positive
RXn5	M code output (Bit 5)	Positive
RXn6	M code output (Bit 6)	Positive
RXn7	M code output (Bit 7)	Positive
RXn8	Imposition output	Positive
RXn9	Positioning completion output	Positive
RXnA	Start input wait output	Positive
RXnB	Alarm output 1	Negative
RXnC	Alarm output 2	Negative
RXnD	Output 1 during indexing/ Origin position output	Positive
RXnE	Output 2 during indexing/ Servo state output	Positive
RXnF	Ready output	Positive
RX(n+1)0	Segment position strobe output	Positive
RX(n+1)1	M code strobe output	Positive
RX(n+1)2 to RX(n+1)F	Unusable	
RX(n+2)0	Monitoring	Positive
RX(n+2)1	Command code execution completed	Positive
RX(n+2)2 to RX(n+2)F	Unusable	
RX(n+3)0 to RX(n+3)A	Unusable	
RX(n+3)B	Remote READY	Positive
RX(n+3)C to RX(n+3)F	Unusable	

* n is determined by the setting of the station No.

TB3 Input circuit specifications (Machine stops)



* External power supply can be used with the polarity reversed.

Rated voltage 24 V ±10%, rated current 5 mA or less

Safety precautions

- Reserve a sufficient distance between the communication cable and power cable (motor cable, power supply cable, etc.).
- Placing the communication cable and power cable close to each other or bundling these cables makes communication unstable due to noise, possibly resulting in a communication error or retry.
- For details on the installation of the communication cable, refer to the CC-Link installation manuals.

PROFIBUS-DP

Communication specifications

Item	Specifications
Communication protocol	PROFIBUS DP-V0 compliant
I/O data	Input 8 bytes/Output 8 bytes
Communication speed	12M/6M/3M/1.5M/500k /187.5k/93.75k/45.45k /19.2k/9.6kbps (Autobaud rate function)
Connection cable	PROFIBUS compliant cable (2-wire twisted pair cable with shield)
Node address	2 to 125 (Set by a parameter)
Number of connected units	Without repeater: Up to 32 stations for each segment With repeater: Up to 126 stations for each segment
Monitor function	Present position within 1 rotation (degree, pulse), position deviation amount, program No., electronic thermal, rotation speed, point table No., torque load factor, acceleration, alarm, parameter, operation mode

I/O signal

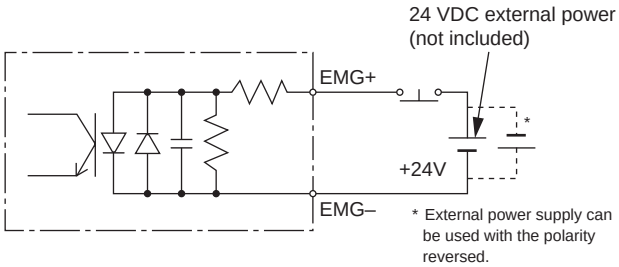
PLC → AX (Input)

Byte No.	Signal name	Logic	Determination
0.0	Program No. selection input (Bit 0)	Positive	Level
0.1	Program No. selection input (Bit 1)	Positive	Level
0.2	Program No. selection input (Bit 2)	Positive	Level
0.3	Program No. selection input (Bit 3)	Positive	Level
0.4	Program No. setting 2nd digit input/ Program No. selection input (Bit 4)	Positive	Edge Level
0.5	Program No. setting 1st digit input/ Program No. selection input (Bit 5)	Positive	Edge Level
0.6	Reset input	Positive	Edge
0.7	Origin return directive input	Positive	Edge
1.0	Start input	Positive	Edge
1.1	Servo on input/ Program stop input	Positive	Level Edge
1.2	Ready return input/Continuous rotation stop input	Positive	Edge
1.3	Answer input/Position deviation counter reset input	Positive	Edge
1.4	Emergency stop input	Negative	Level
1.5	Brake release input	Positive	Level
1.6	Job operation input (CW direction)	Positive	Edge
1.7	Job operation input (CCW direction)	Positive	Edge
2.0	Parameter No. (Bit 8)/Travel unit selection input (Bit 0)	Positive	Level
2.1	Parameter No. (Bit 9)/Travel unit selection input (Bit 1)	Positive	Level
2.2	Parameter No. (Bit 10)/Travel speed unit selection input	Positive	Level
2.3	Operation by table, Operation by data input switching input	Positive	Level
2.4 2.5	Unusable		
2.6	Monitor output execution request	Positive	Level
2.7	Command code execution request	Positive	Edge
3.0	Parameter No. (Bit 0)/Unusable	Positive	Level
3.1	Parameter No. (Bit 1)/Unusable	Positive	Level
3.2	Parameter No. (Bit 2)/Unusable	Positive	Level
3.3	Parameter No. (Bit 3)/Unusable	Positive	Level
3.4	Parameter No. (Bit 4)/Unusable	Positive	Level
3.5	Parameter No. (Bit 5)/Unusable	Positive	Level
3.6	Parameter No. (Bit 6)/Unusable	Positive	Level
3.7	Parameter No. (Bit 7)/Unusable	Positive	Level

AX (Output) → PLC

Byte No.	Signal name	Logic
0.0	M code output (Bit 0)	Positive
0.1	M code output (Bit 1)	Positive
0.2	M code output (Bit 2)	Positive
0.3	M code output (Bit 3)	Positive
0.4	M code output (Bit 4)	Positive
0.5	M code output (Bit 5)	Positive
0.6	M code output (Bit 6)	Positive
0.7	M code output (Bit 7)	Positive
1.0	Imposition output	Positive
1.1	Positioning completion output	Positive
1.2	Start input wait output	Positive
1.3	Alarm output 1	Negative
1.4	Alarm output 2	Negative
1.5	Output 1 during indexing/ Origin position output	Positive
1.6	Output 2 during indexing/ Servo state output	Positive
1.7	Ready output	Positive
2.0	Segment position strobe output	Positive
2.1	M code strobe output	Positive
2.2 to 2.5	Unusable	
2.6	Monitoring	Positive
2.7	Command code execution completed	Positive
3.0 to 3.7	Unusable	

TB3 Input circuit specifications (Machine stops)



* External power supply can be used with the polarity reversed.

Rated voltage 24 V ±10%, rated current 5 mA or less

Safety precautions

■ For details on the installation of a communication cable, refer to "Installation Guideline for PROFIBUS DP/FMS" issued by the PROFIBUS Organization or the PROFIBUS wiring guide.

DeviceNet

Communication specifications

Item	Specifications
Power supply for communication	11 to 25 VDC
Current consumption of power supply for communication	50 mA or less
Communication protocol	DeviceNet compliant: Remote I/O
Number of occupied nodes	Input 8 bytes/Output 8 bytes
Communication speed	500 k/250 k/125 kbps (Selected by parameter setting)
Connection cable	DeviceNet compliant cable (5-wire cable with shield, 2 signal lines, 2 power cables, 1 shield)
Node address	0 to 63 (Set by a parameter)
Number of connected units	Max. 64 units (including the master)
Monitor function	Present position within 1 rotation (degree, pulse), position deviation amount, program No., electronic thermal, rotation speed, point table No., torque load factor, acceleration, alarm, parameter, operation mode

I/O signal

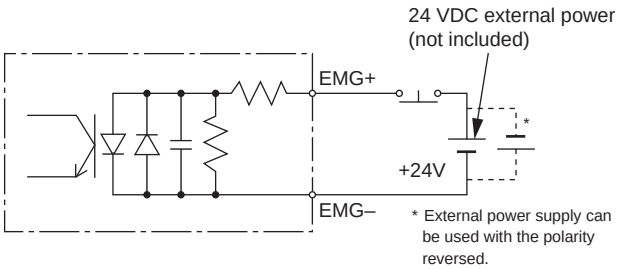
PLC → AX (Input)

Byte No.	Signal name	Logic	Determination
0.0	Program No. selection input (Bit 0)	Positive	Level
0.1	Program No. selection input (Bit 1)	Positive	Level
0.2	Program No. selection input (Bit 2)	Positive	Level
0.3	Program No. selection input (Bit 3)	Positive	Level
0.4	Program No. setting 2nd digit input/ Program No. selection input (Bit 4)	Positive	Edge Level
0.5	Program No. setting 1st digit input/ Program No. selection input (Bit 5)	Positive	Edge Level
0.6	Reset input	Positive	Edge
0.7	Origin return directive input	Positive	Edge
1.0	Start input	Positive	Edge
1.1	Servo on input/ Program stop input	Positive	Level Edge
1.2	Ready return input/Continuous rotation stop input	Positive	Edge
1.3	Answer input/Position deviation counter reset input	Positive	Edge
1.4	Emergency stop input	Negative	Level
1.5	Brake release input	Positive	Level
1.6	Job operation input (CW direction)	Positive	Edge
1.7	Job operation input (CCW direction)	Positive	Edge
2.0	Parameter No. (Bit 8)/Travel unit selection input (Bit 0)	Positive	Level
2.1	Parameter No. (Bit 9)/Travel unit selection input (Bit 1)	Positive	Level
2.2	Parameter No. (Bit 10)/Travel speed unit selection input	Positive	Level
2.3	Operation by table, Operation by data input switching input	Positive	Level
2.4 2.5	Unusable		
2.6	Monitor output execution request	Positive	Level
2.7	Command code execution request	Positive	Edge
3.0	Parameter No. (Bit 0)/Unusable	Positive	Level
3.1	Parameter No. (Bit 1)/Unusable	Positive	Level
3.2	Parameter No. (Bit 2)/Unusable	Positive	Level
3.3	Parameter No. (Bit 3)/Unusable	Positive	Level
3.4	Parameter No. (Bit 4)/Unusable	Positive	Level
3.5	Parameter No. (Bit 5)/Unusable	Positive	Level
3.6	Parameter No. (Bit 6)/Unusable	Positive	Level
3.7	Parameter No. (Bit 7)/Unusable	Positive	Level

AX (Output) → PLC

Byte No.	Signal name	Logic
0.0	M code output (Bit 0)	Positive
0.1	M code output (Bit 1)	Positive
0.2	M code output (Bit 2)	Positive
0.3	M code output (Bit 3)	Positive
0.4	M code output (Bit 4)	Positive
0.5	M code output (Bit 5)	Positive
0.6	M code output (Bit 6)	Positive
0.7	M code output (Bit 7)	Positive
1.0	Imposition output	Positive
1.1	Positioning completion output	Positive
1.2	Start input wait output	Positive
1.3	Alarm output 1	Negative
1.4	Alarm output 2	Negative
1.5	Output 1 during indexing/ Origin position output	Positive
1.6	Output 2 during indexing/ Servo state output	Positive
1.7	Ready output	Positive
2.0	Segment position strobe output	Positive
2.1	M code strobe output	Positive
2.2 to 2.5	Unusable	
2.6	Monitoring	Positive
2.7	Command code execution completed	Positive
3.0 to 3.7	Unusable	

TB3 Input circuit specifications (Machine stops)



Rated voltage 24 V ±10%, rated current 5 mA or less

Safety precautions

- Reserve a sufficient distance between the communication cable and power cable (motor cable, power supply cable, etc.).
- Placing the communication cable and power cable close to each other or bundling these cables makes communication unstable due to noise, possibly resulting in a communication error or retry.
- For details on the installation of the communication cable, refer to the DeviceNet installation manuals.

EtherCAT

Communication specifications

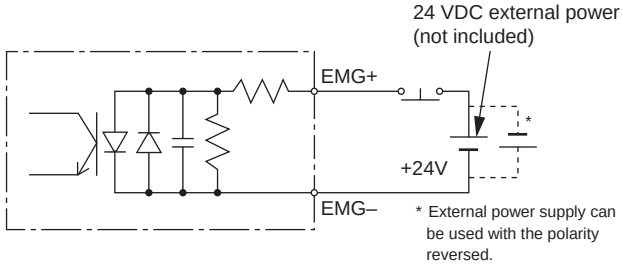
Item	Specifications
Communication protocol	EtherCAT
Communication speed	100 Mbps (fast Ethernet, full duplex)
Process data	Fixed PDO mapping
Max. PDO data length	RxPDO: 40 bytes/TxPDO: 40 bytes
Station arias	0 to 65535 (Set by a parameter)
Connection cable	EtherCAT compliant cable (CAT5e or higher twisted pair cable (double shield with aluminum tape and braid) is recommended.)
Node address	Automatic indexing the master
Monitor function (Output Data)	Present position within 1 rotation (degree, pulse), position deviation amount, program No., electronic thermal, rotation speed, point table No., torque load factor, acceleration, alarm, parameter, operation mode

I/O signal

PLC → AX (Input)

Index	Sub Index	Display name	bit	Signal name	Logic	Determination
0x2001	0x01	Input signal 1	0	Program No. selection input (Bit 0)	Positive	Level
			1	Program No. selection input (Bit 1)	Positive	Level
			2	Program No. selection input (Bit 2)	Positive	Level
			3	Program No. selection input (Bit 3)	Positive	Level
			4	Program No. setting 2nd digit input/ Program No. selection input (Bit 4)	Positive	Edge Level
			5	Program No. setting 1st digit input/ Program No. selection input (Bit 5)	Positive	Edge Level
			6	Reset input	Positive	Edge
			7	Origin return directive input	Positive	Edge
			8	Start input	Positive	Edge
			9	Servo on input/ Program stop input	Positive	Level Edge
			10	Ready return input/Continuous rotation stop input	Positive	Edge
			11	Answer input/Position deviation counter reset input	Positive	Edge
			12	Emergency stop input	Negative	Level
			13	Brake release input	Positive	Level
			14	Job operation input (CW direction)	Positive	Edge
			15	Job operation input (CCW direction)	Positive	Edge
			16	Unusable/Travel unit selection input (Bit 0)	Positive	Level
			17	Unusable/Travel unit selection input (Bit 1)	Positive	Level
			18	Unusable/Travel speed unit selection input	Positive	Level
			19	Operation by table, Operation by data input switching input	Positive	Level
			20 to 31	Unusable		
	0x02	Input signal 2	0	Monitor output execution request	Positive	Level
			1	Command code execution request	Positive	Edge
			2 to 31	Unusable		

TB3 Input circuit specifications (Machine stops)



Rated voltage 24 V ±10%, rated current 5 mA or less

PDO mapping

RxPDO

Index	Sub Index	Display name	Description
0x1600	0x00	Number of PDO objects	10
	0x01	Input signal 1	0x2001-0x01
	0x02	Input signal 2	0x2001-0x02
	0x03	Input data 1	0x2003-0x01
	0x04	Input data 2	0x2003-0x02
	0x05	Input data 3	0x2003-0x03
	0x06	Input data 4	0x2003-0x04
	0x07	Input data 5	0x2003-0x05
	0x08	Input command 1	0x2003-0x06
	0x09	Input command 2	0x2003-0x07
	0x0A	Input command 3	0x2003-0x08

TxPDO

Index	Sub Index	Display name	Description
0x1A00	0x00	Number of PDO objects	10
	0x01	Output signal 1	0x2005-0x01
	0x02	Output signal 2	0x2005-0x02
	0x03	Output data 1	0x2007-0x01
	0x04	Output data 2	0x2007-0x02
	0x05	Output data 3	0x2007-0x03
	0x06	Output data 4	0x2007-0x04
	0x07	Output data 5	0x2007-0x05
	0x08	Output command 1	0x2007-0x06
	0x09	Output command 2	0x2007-0x07
	0x0A	Output command 3	0x2007-0x08

I/O signal

AX (Output) → PLC

Index	Sub Index	Display name	bit	Signal name	Logic
0x2005	0x01	Output signal 1	0	M code output (Bit 0)	Positive
			1	M code output (Bit 1)	Positive
			2	M code output (Bit 2)	Positive
			3	M code output (Bit 3)	Positive
			4	M code output (Bit 4)	Positive
			5	M code output (Bit 5)	Positive
			6	M code output (Bit 6)	Positive
			7	M code output (Bit 7)	Positive
			8	Imposition output	Positive
			9	Positioning completion output	Positive
			10	Start input wait output	Positive
			11	Alarm output 1	Negative
			12	Alarm output 2	Negative
			13	Output 1 during indexing/Origin position output	Positive
			14	Output 2 during indexing/Servo state output	Positive
			15	Ready output	Positive
			16	Segment position strobe output	Positive
			17	M code strobe output	Positive
			18 to 31	Unusable	
	0x02	Output signal 2	0	Monitor	Positive
			1	Command code execution completed	Positive
			2 to 31	Unusable	

Safety precautions

- Reserve a sufficient distance between the communication cable and power cable (motor cable, power supply cable, etc.).
- Placing the communication cable and power cable close to each other or bundling these cables makes communication unstable due to noise, possibly resulting in a communication error or retry.
- For details on the installation of the communication cable, refer to ETG.1600 EtherCAT installation guidelines.

EtherNet/IP

Communication specifications

Item	Specifications
Communication protocol	EtherNet/IP
Communication speed	Automatic setting (100 Mbps/10 Mbps, full duplex/half duplex)
Occupied bytes	Input: 32 bytes/Output: 32 bytes
IP address	0.0.0.0 to 255.255.255.255 (Set by a parameter)
Subnet mask	0.0.0.0 to 255.255.255.255 (Set by a parameter)
Default gateway	0.0.0.0 to 255.255.255.255 (Set by a parameter)
RPI (Packet interval)	10 msec to 1,000 msec
Connection cable	EtherNet/IP compliant cable (CAT5 or higher twisted pair cable (double shield with aluminum tape and braid) is recommended.)
Monitor function	Present position within 1 rotation (degree, pulse), position deviation amount, program No., electronic thermal, rotation speed, point table No., torque load factor, acceleration, alarm, parameter, operation mode

I/O signal

PLC → AX (Input)

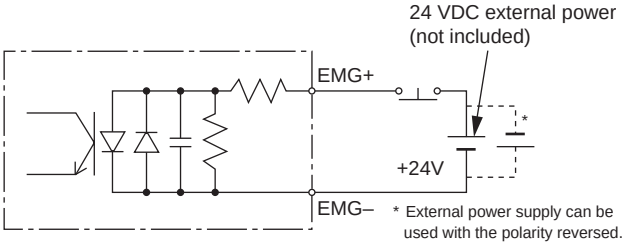
Byte	bit	Signal name	Logic	Determination
0	0	Program No. selection input (Bit 0)	Positive	Level
	1	Program No. selection input (Bit 1)	Positive	Level
	2	Program No. selection input (Bit 2)	Positive	Level
	3	Program No. selection input (Bit 3)	Positive	Level
	4	Program No. setting 2nd digit input/ Program No. selection input (Bit 4)	Positive	Edge Level
	5	Program No. setting 1st digit input/ Program No. selection input (Bit 5)	Positive	Edge Level
	6	Reset input	Positive	Edge
	7	Origin return directive input	Positive	Edge
1	0	Start input	Positive	Edge
	1	Servo on input/ Program stop input	Positive	Level Edge
	2	Ready return input/Continuous rotation stop input	Positive	Edge
	3	Answer input/Position deviation counter reset input	Positive	Edge
	4	Emergency stop input	Negative	Level
	5	Brake release input	Positive	Level
	6	Job operation input (CW direction)	Positive	Edge
	7	Job operation input (CCW direction)	Positive	Edge
2	0	Unusable/Travel unit selection input (Bit 0)	Positive	Level
	1	Unusable/Travel unit selection input (Bit 1)	Positive	Level
	2	Unusable/Travel speed unit selection input	Positive	Level
	3	Operation by table, Operation by data input switching input	Positive	Level
	4 to 7	Unusable		
3	-	Unusable		
4	0	Monitor output execution request	Positive	Level
	1	Command code execution request	Positive	Edge
	2 to 7	Unusable		
5	-	Unusable		
6	-	Unusable		
7	-	Unusable		
8	-	Monitor code 1		
9	-			
10	-			
11	-			
12	-	Monitor code 2		
13	-			
14	-			
15	-			
16	-	Monitor code 3		
17	-			
18	-			
19	-			
20	-	Command code		
21	-			
22	-			
23	-			
24	-	Write data/A code or P code		
25	-			
26	-			
27	-			
28	-	Data setting/F code		
29	-			
30	-			
31	-			

I/O signal

AX (Output) → PLC

Byte	bit	Signal name	Logic
0	0	M code output (Bit 0)	Positive
	1	M code output (Bit 1)	Positive
	2	M code output (Bit 2)	Positive
	3	M code output (Bit 3)	Positive
	4	M code output (Bit 4)	Positive
	5	M code output (Bit 5)	Positive
	6	M code output (Bit 6)	Positive
	7	M code output (Bit 7)	Positive
1	0	Imposition output	Positive
	1	Positioning completion output	Positive
	2	Start input wait output	Positive
	3	Alarm output 1	Negative
	4	Alarm output 2	Negative
	5	Output 1 during indexing/Origin position output	Positive
	6	Output 2 during indexing/Servo state output	Positive
	7	Ready output	Positive
2	0	Segment position strobe output	Positive
	1	M code strobe output	Positive
	2 to 7	Unusable	
3	-	Unusable	
4	0	Monitoring	Positive
	1	Command code execution completed	Positive
	2 to 7	Unusable	
5	-	Unusable	
6	-	Unusable	
7	-	Unusable	
8	-	Monitor data 1	
9	-		
10	-		
11	-		
12	-	Monitor data 2	
13	-		
14	-		
15	-		
16	-	Monitor data 3	
17	-		
18	-		
19	-		
20	-	Response code	
21	-		
22	-		
23	-		
24	-	Read data	
25	-		
26	-		
27	-		
28	-	Unusable	
29	-		
30	-		
31	-		

TB3 Input circuit specifications (Machine stops)



* External power supply can be used with the polarity reversed.

Rated voltage 24 V ±10%, rated current 5 mA or less

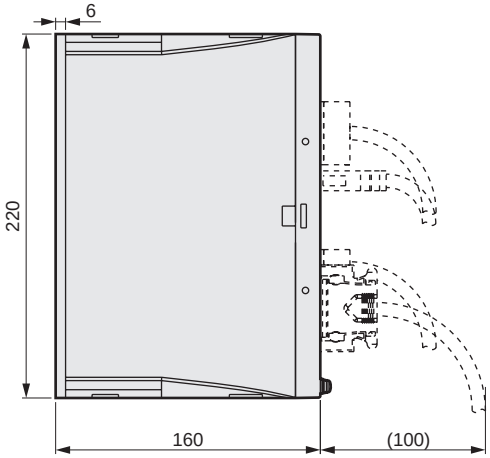
Safety precautions

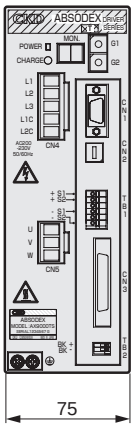
- Reserve a sufficient distance between the communication cable and power cable (motor cable, power supply cable, etc.).
- Placing the communication cable and power cable close to each other or bundling these cables makes communication unstable due to noise, possibly resulting in a communication error or retry.
- For details on the installation of the communication cable, refer to the EtherNet/IP installation manuals.

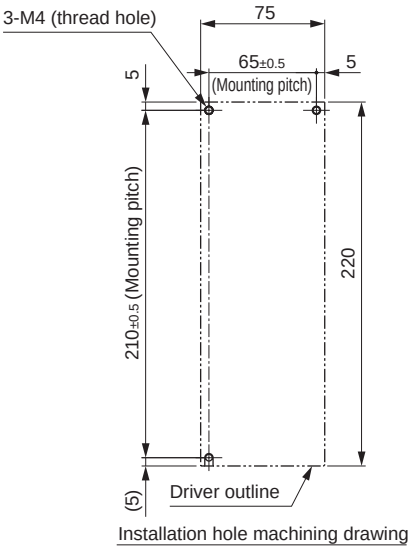
TS/TH driver

Dimensions

● TS driver

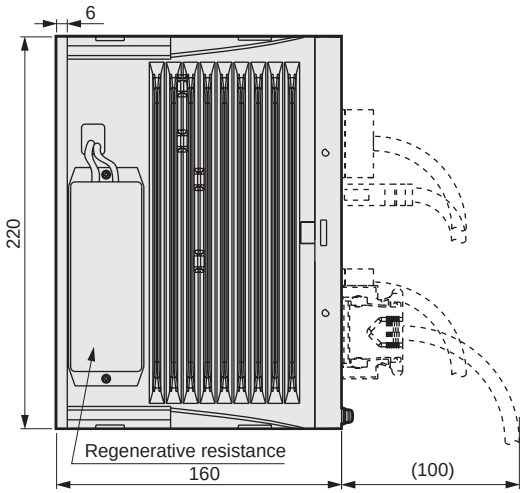


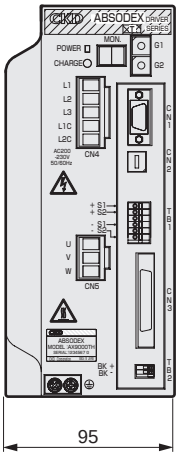


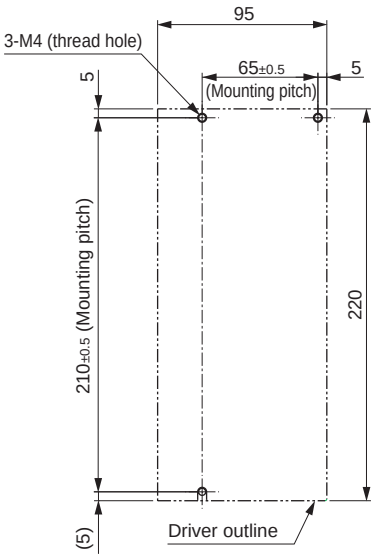


Installation hole machining drawing

● TH driver







Installation hole machining drawing

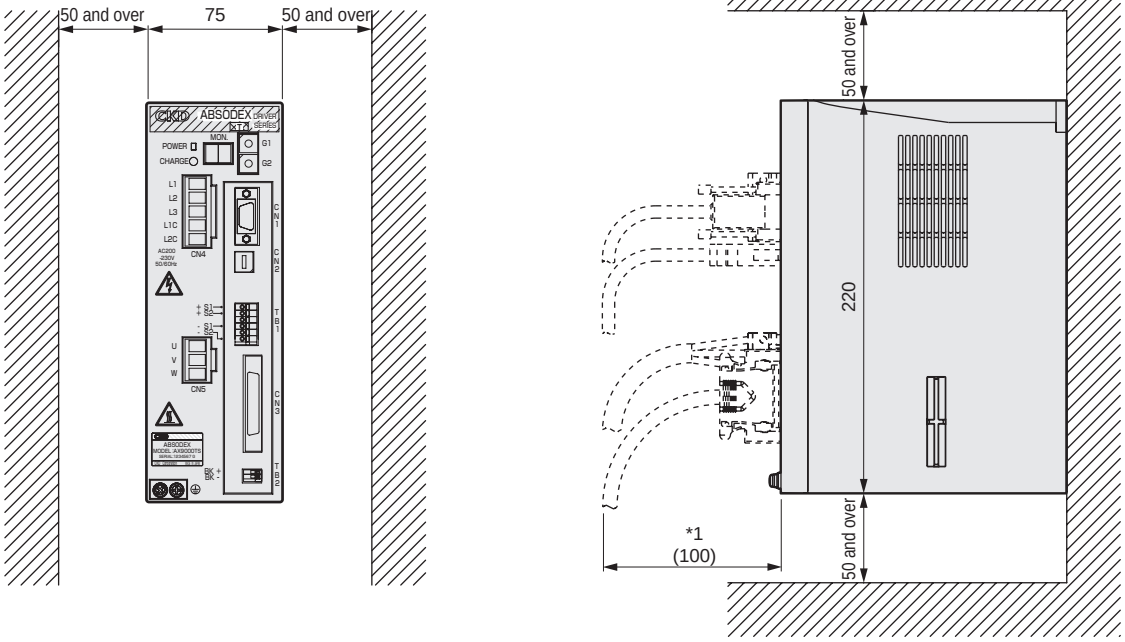
Accessories supplied with the driver

Model No.	Specifications	CN3 Connector	Power supply connector (CN4)	Motor cable connector (CN5)
AX9000TS-U0 AX9000TH-U0	Parallel I/O (NPN)	10150-3000PE (Plug) 10350-52A0-008 (Shell) Sumitomo 3M Ltd.	PC4/5-ST-7.62 Phoenix Contact	PC4/3-ST-7.62 Phoenix Contact
AX9000TS-U1 AX9000TH-U1	Parallel I/O (PNP)			
AX9000TS-U2 AX9000TH-U2	CC-Link	BLZP5.08HC/05/180F AU OR BX Weidmüller		
AX9000TS-U3 AX9000TH-U3	PROFIBUS-DP	Not attached		
AX9000TS-U4 AX9000TH-U4	DeviceNet	MSTB2.5/5-STF-5.08AUM Phoenix Contact		
AX9000TS-U5 AX9000TH-U5	EtherCAT	Not attached		
AX9000TS-U6 AX9000TH-U6	EtherNet/IP	Not attached		

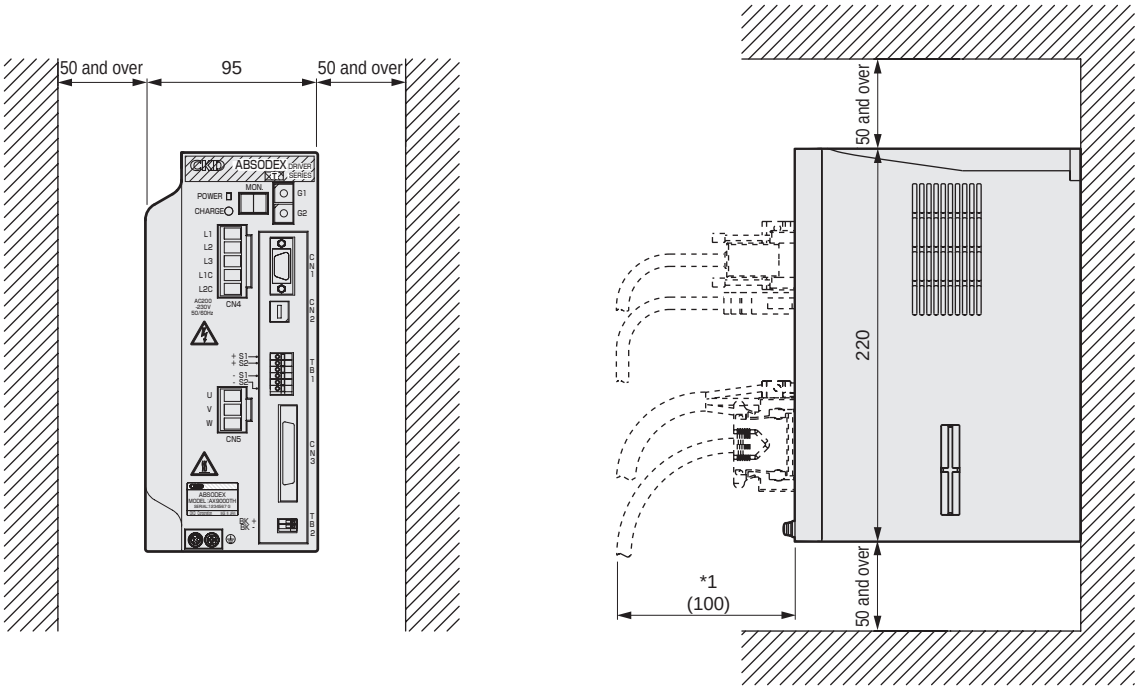
For additional orders of parts, refer to the parts model No. table.

Installation Dimension

● TS driver



● TH driver



*1) Determine the dimension with extra allowance according to a cable you want to use.

⚠ Safety precautions

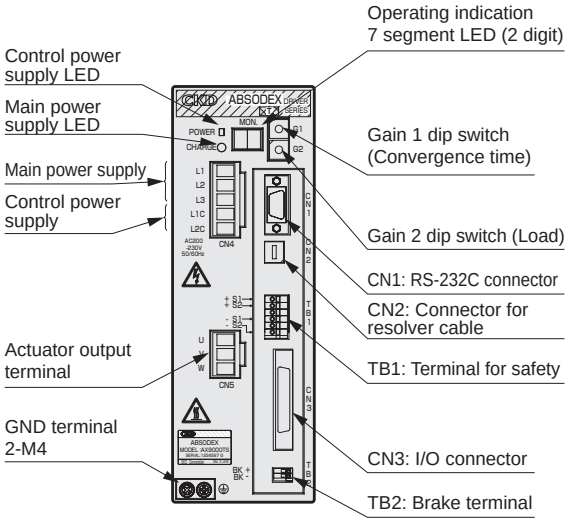
● The ABSODEX driver does not have a dust-proof/waterproof structure.
To prevent dust, water, oil or other substances from entering the driver, provide protection according to the working environment.

● Install the ABSODEX driver away from other devices, walls or other structures by 50 mm or more from the top, bottom and sides. When heat is generated from other drivers or devices, check that the ambient temperature does not exceed 50°C.

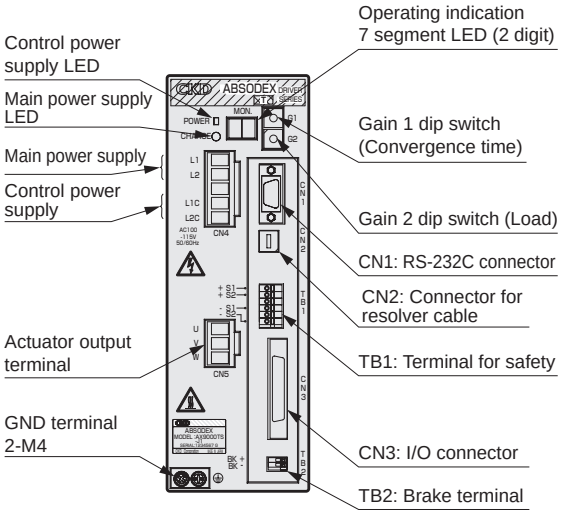
Panel Details

● Parallel I/O (NPN, PNP)

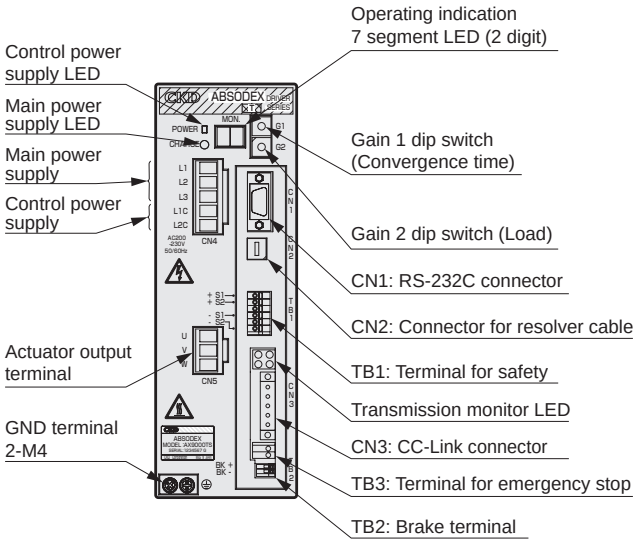
• For 200 VAC



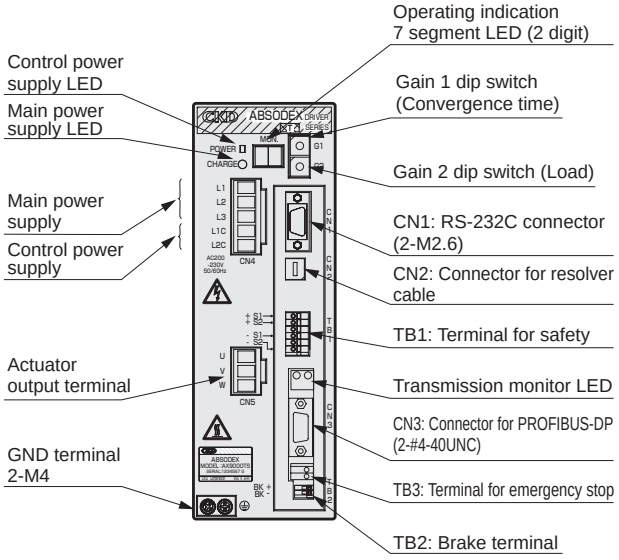
• For 100 VAC



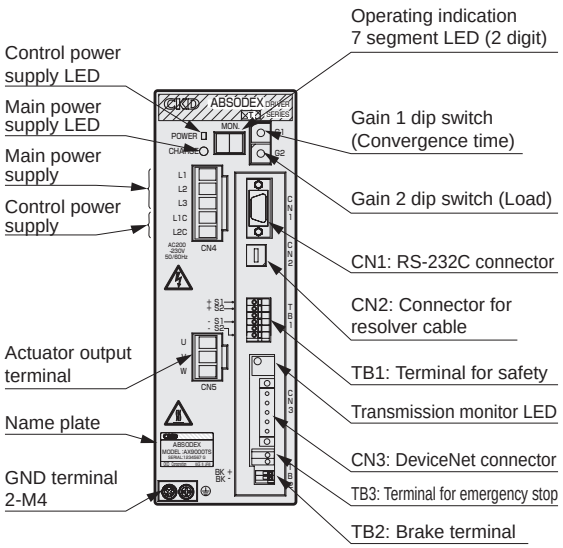
● CC-Link



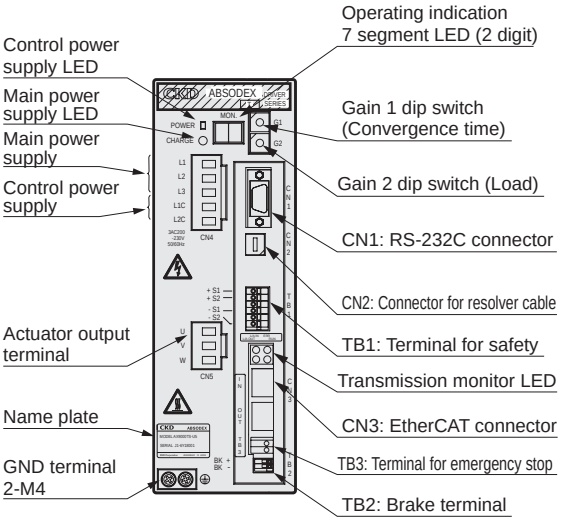
● PROFIBUS-DP



● DeviceNet

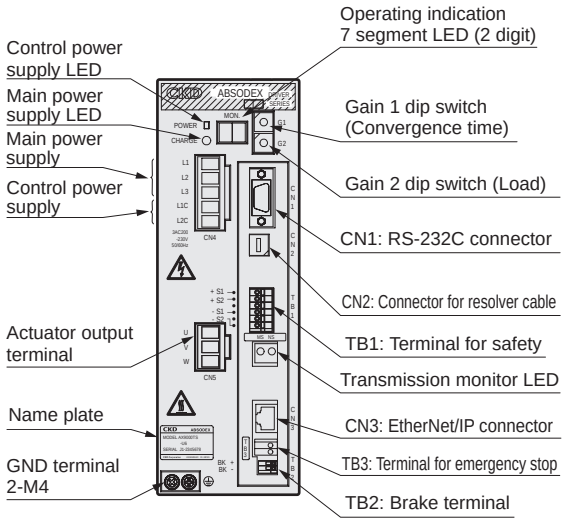


● EtherCAT



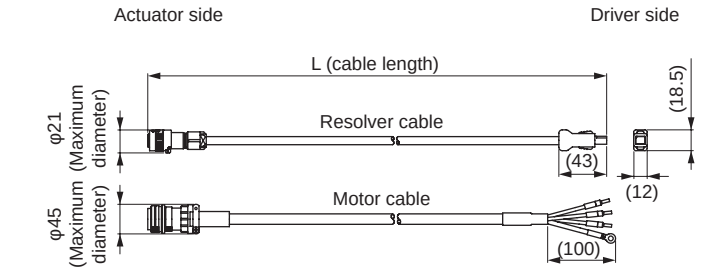
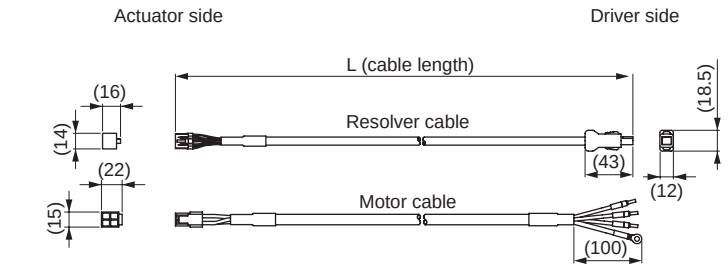
Panel Details

● EtherNet/IP



Cable Specifications

Cable dimensions

Product name/model No.	Cable's min. bending radius
● AX1000T 	Resolver cable AX-CBLR5-DM□□ (*1)	60 mm
	Motor cable AX-CBLM5-DM□□ (*1)	110 mm
● AX2000T, AX4000T 	Resolver cable AX-CBLR6-DM□□ (*1)	60 mm
	Motor cable AX-CBLM6-DM□□ (*1)	110 mm

*1) □□ represents the cable length.

Safety precautions

- Connect the correct motor cable and driver by checking the mark tube of the cable and the display of the driver.
- For uses where the cable is repeatedly bent, fix the cable sheath part near the connector of the actuator body.
- For the AX4009T and AX2000T Series, the lead-out cable of the actuator section is not movable. Make sure to fix the cable in the connector section to prevent the cable from moving. Do not pull the lead-out cable to lift the unit or do not apply an excessive force to the cable. Otherwise, malfunction, an alarm, damage of the connector part, or disconnection may result.
- When connecting the cable, fully insert the connector. Also, tighten the connector mounting screws and fix screws securely.
- Do not disconnect, extend, or make other modifications to the cable. Such modifications may cause failure or malfunction.
- For the cable length L, refer to the cable length shown in the How to order.

ABSODEX Handy Terminal

AX0180

● TS/TH driver

RoHS

Features

(1) Programming is easy.
For an equal segment program, you can easily write a program by answering the questions interactively from the handy terminal.
(2) No dedicated power supply is required.
The power is supplied from ABSODEX.
(3) Backup is available.
The programs and parameters can be stored, and programs can be copied.
(4) Available also for conventional models.
With the S/GS/H/GH/WGH type drivers, this product operates in the same way as the conventional handy terminal (AX0170H).

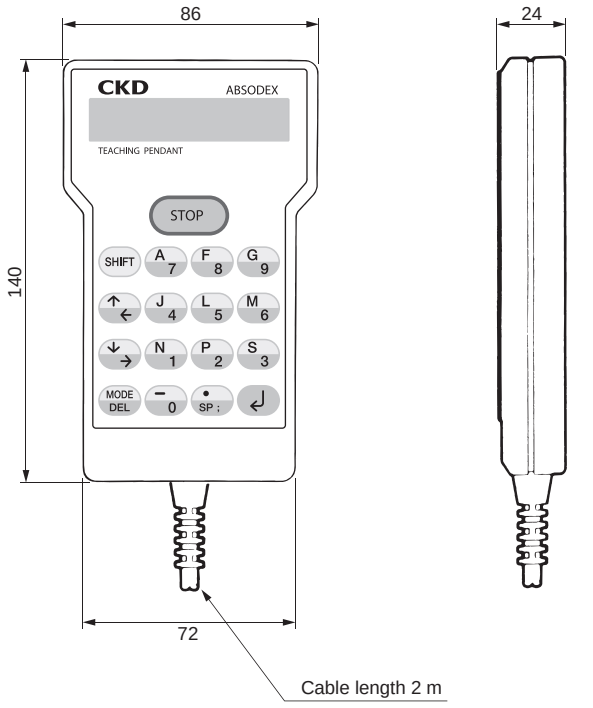
Specifications

Item	AX0180
Operation mode	Edit, Display, Parameter, Operation, and Copy modes
Program capacity	Equal segment or NC program 2,000 characters (One)
Program No.	Equal segment program: Program No. 0 to 999
Display	16 characters × 2 digits (LCD display)
Input keys	17 keys (Stop key: 1, Control key: 5 characters, Number key: 11)
Backup	Super capacitor (about 3 hours)
Power supply	Supplied by the ABSODEX driver
Cable length	2 m
Operating ambient temperature	0 to 50°C
Operating ambient humidity	20 to 90% (no condensation)
Storage ambient temperature	−20 to 80°C
Storage ambient humidity	20 to 90% (no condensation)
Atmosphere	No corrosive gas or dust
Weight	Body only About 140 g

* For the English version, messages are displayed in English. The characters on the operation panel are the same as those of the Japanese version.

Dimensions

● Handy terminal



How to order

Body model No. — Option model No.

AX0180 − **E**

Model No.

Code	Description
Blank	Standard (Japanese version)
E	English version

Handy terminal

Interactive programming

You can easily write a program by inputting values for items as follows:

[Example of input values for a program]

New	Program No. [0 to 999]
Origin return position	1. Origin 2. Indexing
Return direction	1. CW 2. CCW 3. Shortcut
Return speed	[1.0 to 20.0] rpm
Number of segments	[1 to 255]
Travel time	[0.01 to 100] seconds
Rotation direction	1. CW 2. CCW
Stop processing	1. Wait for start 2. Dwell
Brake	1. Using the product 2. Vacant
Delay timer	[0.01 to 99.99] seconds
M Cord	1. M Cord 2. Segmentation position

When you want to...

Make a trial run of ABSODEX! ⇒ Edit mode
12 sample programs are provided. You can try them when making adjustment.

Write an ABSODEX program and store it into ABSODEX! ⇒ Edit mode
You can input programming values and store the program by a simple procedure.

Run a program stored in ABSODEX! ⇒ Operation mode
You can easily start a program by specifying the program No.

Make use of the characteristics of the cam curve! ⇒ Parameter mode
5 types of cam curves are provided. Driving operation taking advantages of the properties is one touch away.

Check the ON/OFF of I/O! ⇒ Display mode
You can display the I/O status.