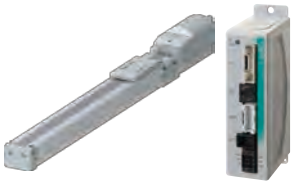
CKD

New Products

New Product

Electric actuator
ERL2/ESD2 Series



ELECTRIC ACTUATOR ERL2 / ESD2 SERIES

CKD Corporation

CC-1219A 1

NEW Electric actuator

ERL2/ESD2 Series

63 point available!!

Industry's smallest

New

Automatic

Flexible co

7 point positioning controller
EC07

63 point positioning controller
EC63

Easy! Flexible combination

- **Controller common to all models**
- **Actuator automatic recognition installed**

Contributes to reduction of spare part

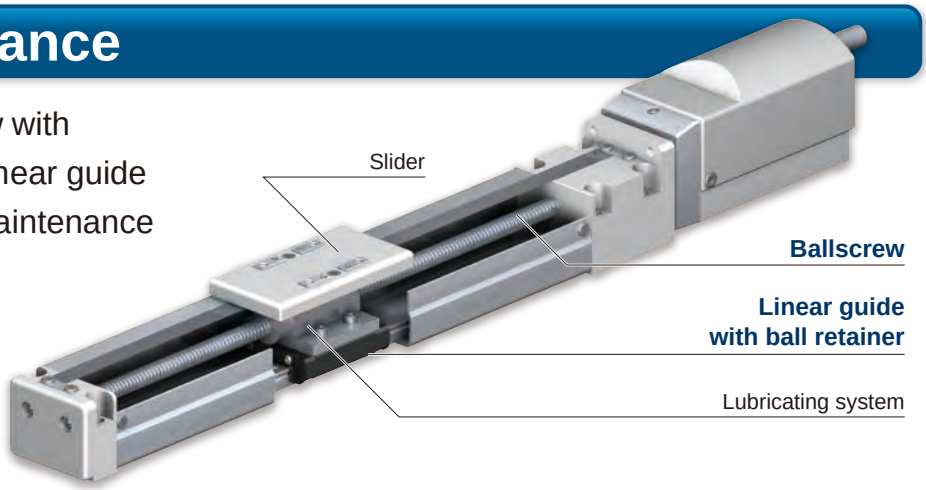
Controller

- **63 point positioning available** New
- **Compact Industry's smallest**

120×35×68mm (EC07)
140×35×68mm (EC63)

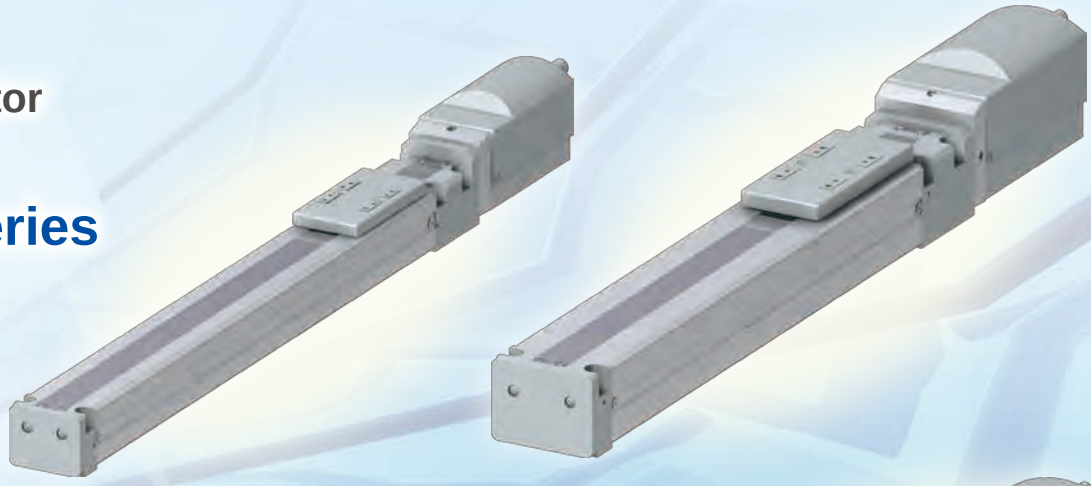
Easy! Maintenance

With the adoption of ballscrew with lubrication equipment and a linear guide with ball retainer, long term maintenance free operation provided



Electric actuator
(Slider type)

ERL2 Series



recognition

mbination!

Electric actuator
(Rod type)

ESD2 Series

Easy! Selectable setting tool

Easy setting with "E Tools" New

Setting PC software "E Tools" is easy to use as teaching pendant

- Point data setting
- Motion Instructions
- Monitor

Easy operation with teaching pendant

EU Standards compliance

CE marking

System Configuration

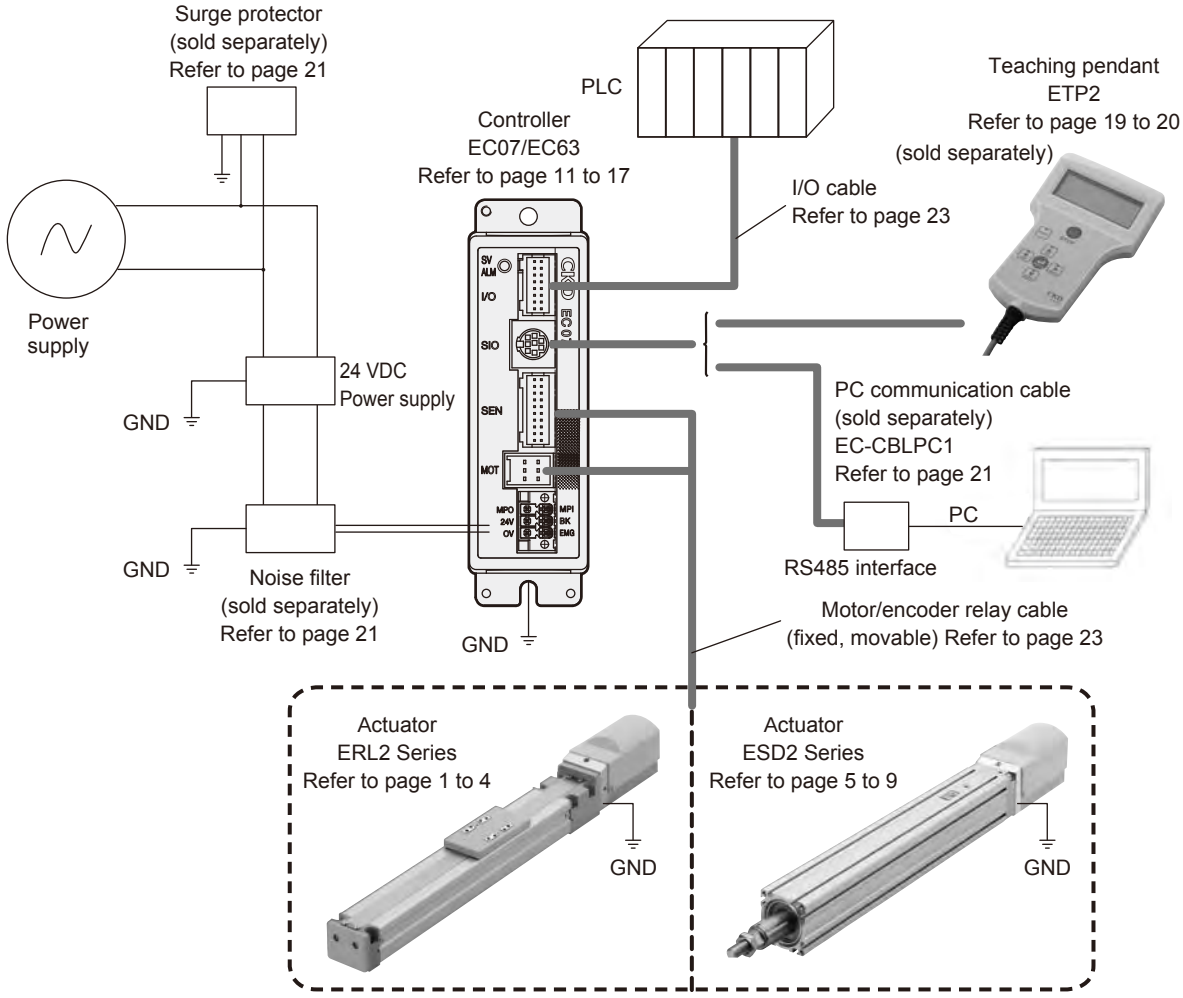
● Basic setting items

1. Set parameters with the PC or teaching pendant
2. Set point data in the same manner

● Basic drive methods

1. Destination point signal is input at the PLC
2. Start signal is input at the PLC
3. After operation start, output to positioning completion signal from controller

The parts indicated by the thin lines are not included.



Configuration (when selecting set model no.)

	Name	Quantity
Standard configuration	Actuator body	1
	Controller body	1
	I/O cable	1
	Motor/encoder relay cable	1

To comply to CE marking, surge protector is required. Refer to the instruction manual for details on settings, wiring method.

Used parts	Model no.	Manufacturer
Surge protector	R-A-V-781BXZ-4 R-A-V-781BWZ-4 RSPD-250-Q4 RSPD-250-U4	OKAYA Electric

Setting tool

- Teaching pendant "ETP2" is available.
- Electric actuator setting software "E Tools" is available. (Windows version, free)
  Use PC to set point data, parameter data and operation commands etc. for electric actuator ERL2/ESD2. Point data and parameter data can be saved to PC.
- PC communication cable (EC-CBLPC 1) and RS-485 interface are required for connection to PC.
- RS-485 interface recommended models
  MISUMI PCCM-COM-1PDUSBH-R
  CONTEC COM-1PD (USB) H

Note) PC communication cable is designed specifically for CKD electric actuator. You cannot use a cable available in the market.
If you use, the controller or PC may be damaged.

Note) Connect the teaching pendant and PC only when adjusting. Remove the cable from controller during normal operation.

Note) Do not set PC to sleep (standby) mode when PC and RS485 interface are connected. If it does, communication errors may result when the PC returns from the standby mode.

Electric actuator setting software "E Tools"

CAUTION RS485 interface and PC communication cable (page 21) are required for connection to PC and controller

For electric actuator setting software "E Tools" and instruction manual, please contact our sales office.

Main functions

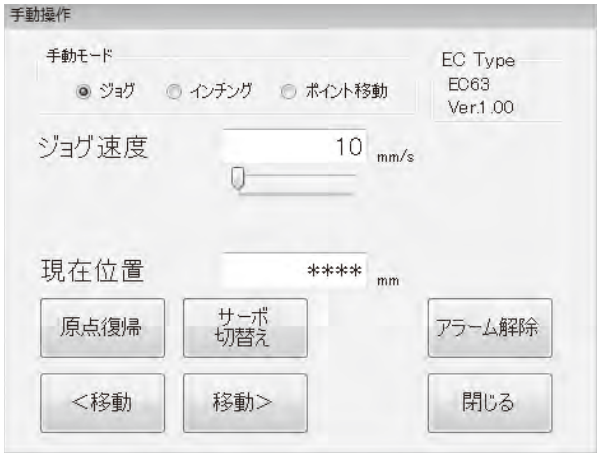
● Multiple point data can be set easily.

● Monitor
- Actuator operation status
- I/O status of general purpose I/O
- Verification of alarm history recorded in controller

● Setting
- Easy setting and revision of point data and parameters

● Motion Instructions
- The following manual operations can be done with E Tools
  - Jog
  - Inching
  - Moving between points

- Forced output of general purpose I/O

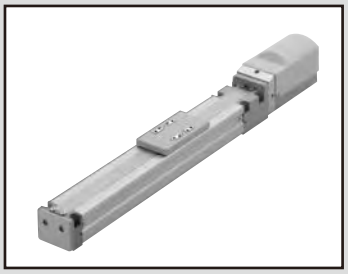


Selection guide

Type	Model no.		Stroke length (mm) 50	100	150	200	250	300	350	400	450	500
Slider type	ERL2-45E06											
	ERL2-45E12											
	ERL2-60E06											
	ERL2-60E12											
Rod type	ESD2-35E06											
	ESD2-35E12											
	ESD2-45E06											
	ESD2-45E12											
	ESD2-55E06											
	ESD2-55E12											

Max. load capacity(kg)												Lead (mm)	Max. pressure force (N)	Max. speed (mm/s)	Page
550	600	700	800	10	20	30	40	50	60	70	80				
				5	10							6	220 and over (Note 1)	300	1
				2	5							12	110 and over (Note 1)	600	
				11		30						6	640 and over (Note 1)	200	1
				6.5		16						12	320 and over (Note 1)	400	
				10			33 (Note 2)					6	220 and over	300	5
				4		16 (Note 2)						12	110 and over	600	
				10			33 (Note 2)					6	220 and over	300	5
				4		16 (Note 2)						12	110 and over	600	
				15							67 (Note 2)	6	640 and over	200	5
				6.5			34 (Note 2)					12	320 and over	400	

Note 1: Use within the allowable moment.
Note 2: Value in rod type load capacity (horizontal) always indicates with external guide.



Electric driven actuator slider type

ERL2 Series

Compatible functions enabling flexible combinations of controller, actuator, and cable
Air cylinder-like electric actuator
● Motor size: □42 • □56

Actuator specifications

Descriptions			ERL2-45		ERL2-60	
Actuator type			Slider type			
Motor			Stepping motor			
Encoder type			Incremental type			
Drive method			Rolling ball screw Outside diameter 8mm		Rolling ball screw Outside diameter 12mm	
Motor size		mm	□42		□56	
Screw lead		mm	6	12	6	12
Stroke length		mm	50, 100, 150, 200 250, 300, 350, 400 450, 500		50, 100, 150, 200 250, 300, 350, 400 450, 500, 550, 600 700	
Operating speed range		mm/s	15 to 300	30 to 600	15 to 200	30 to 400
Repeatability		mm	±0.02			
Lost motion		mm	0.1 or less			
Max. load capacity *1	Horizontal	kg	10	5	30	16
	Vertical	kg	5	2	11	6.5
Max. pressure force *2		N	220	110	640	320
Motor power voltage			24 VDC ± 10%			
Motor part max. instantaneous current		A	2.7		4	
Brake	Type		Power-off activated electromagnetic type			
	Power voltage		24 VDC ± 10%			
	Power consumption	W	6.1		7.2	
	Holding force	N	140	70	610	305
Insulation resistance			10MΩ and over 500VDC			
Withstanding voltage			500 VAC for 1 minute			
Ambient temperature			0 to 40ºC no freezing			
Ambient humidity			35~80%RH with no dew condensation			
Storage ambient temperature			-10 to 50ºC no freezing			
Storage ambient humidity			35~80%RH with no dew condensation			
Atmosphere			Free of corrosive and explosive gases and dust			
Degree of protection			IEC standards IP40 or equivalent			

*1: When the speed is up, the max. load capacity will down. For details, refer to technical data 2 , table or graph of load capacity (vertical) and load capacity (horizontal).
*2: Use within the allowable moment. (Refer to page 26 for allowable moment.)

Weight

(kg)

Body size	50st	100st	150st	200st	250st	300st	350st	400st	450st	500st	550st	600st	700st
ERL2-45	1.5 (1.8)	1.6 (1.9)	1.7 (2.0)	1.8 (2.1)	1.9 (2.2)	2.0 (2.3)	2.1 (2.4)	2.2 (2.5)	2.3 (2.6)	2.5 (2.8)	—	—	—
ERL2-60	3.2 (3.8)	3.4 (4.0)	3.6 (4.2)	3.8 (4.4)	4.0 (4.6)	4.2 (4.8)	4.4 (5.0)	4.6 (5.2)	4.8 (5.4)	5.0 (5.6)	5.2 (5.8)	5.4 (6.0)	5.8 (6.4)

Note: Value in ( ) indicates product weight with brake

How to order

● Set model no. (actuator, controller, and cable)

ERL2-60E06-50BM-RXB2

Model no. / Ⓐ Body size / Ⓑ Screw lead / Ⓒ Stroke length / Ⓓ Brake / Ⓔ Origin position / Ⓕ Relay cable length / Ⓖ Controller / Ⓗ I/O cable length

Symbol	Descriptions
Ⓐ Body size	
45	Body size45
60	Body size60
Ⓑ Screw lead	
06	6mm
12	12mm

Ⓒ Stroke length

Symbol	Length	Body size 45	Body size 60
05	50mm	●	●
10	100mm	●	●
15	150mm	●	●
20	200mm	●	●
25	250mm	●	●
30	300mm	●	●
35	350mm	●	●
40	400mm	●	●
45	450mm	●	●
50	500mm	●	●
55	550mm		●
60	600mm		●
70	700mm		●

Ⓓ Brake	
N	Without brake
B	With brake

Ⓔ Origin position	
M	Motor side origin
F	Opposite motor side origin

Ⓕ Relay cable length	
N0	None
S1	Fixing cable length 1m
S3	Fixing cable length 3m
S5	Fixing cable length 5m
SX	Fixing cable length 10m
R1	Moving cable length 1m
R3	Moving cable length 3m
R5	Moving cable length 5m
RX	Moving cable length 10m

Ⓖ Controller	
N	None *
A	EC07 Standard installation
B	EC07 DIN rail installation
C	EC63 Standard installation
D	EC63 DIN rail installation

Ⓗ I/O cable length	
N	None
2	2m
3	3m
5	5m

<Example of model number>

ERL2-60E06-50BM-RXB2

- Ⓐ Body size : 60
- Ⓑ Screw lead : 6mm
- Ⓒ Stroke length : 500mm
- Ⓓ Brake : With brake
- Ⓔ Origin position : Motor side origin
- Ⓕ Relay cable length : Movable cable 10m
- Ⓖ Controller : EC07 DIN rail installation
- Ⓗ I/O cable length : 2m

* Ⓖ If select "N" controller, Ⓗ also select "N" for I/O cable.

● Actuator model no.

ERL2-60E06-50BM-N0 N N

Ⓐ Body size / Ⓑ Screw lead / Ⓒ Stroke length / Ⓓ Brake / Ⓔ Origin position

● Controller model no.

EC 07-B

Series / Installation method

*Refer to How to order controller (page 11) for details.

● Cable model no.

• Relay cable

EC-CBLME1-S-5

Fixed/Movable / Cable length

• I/O cable

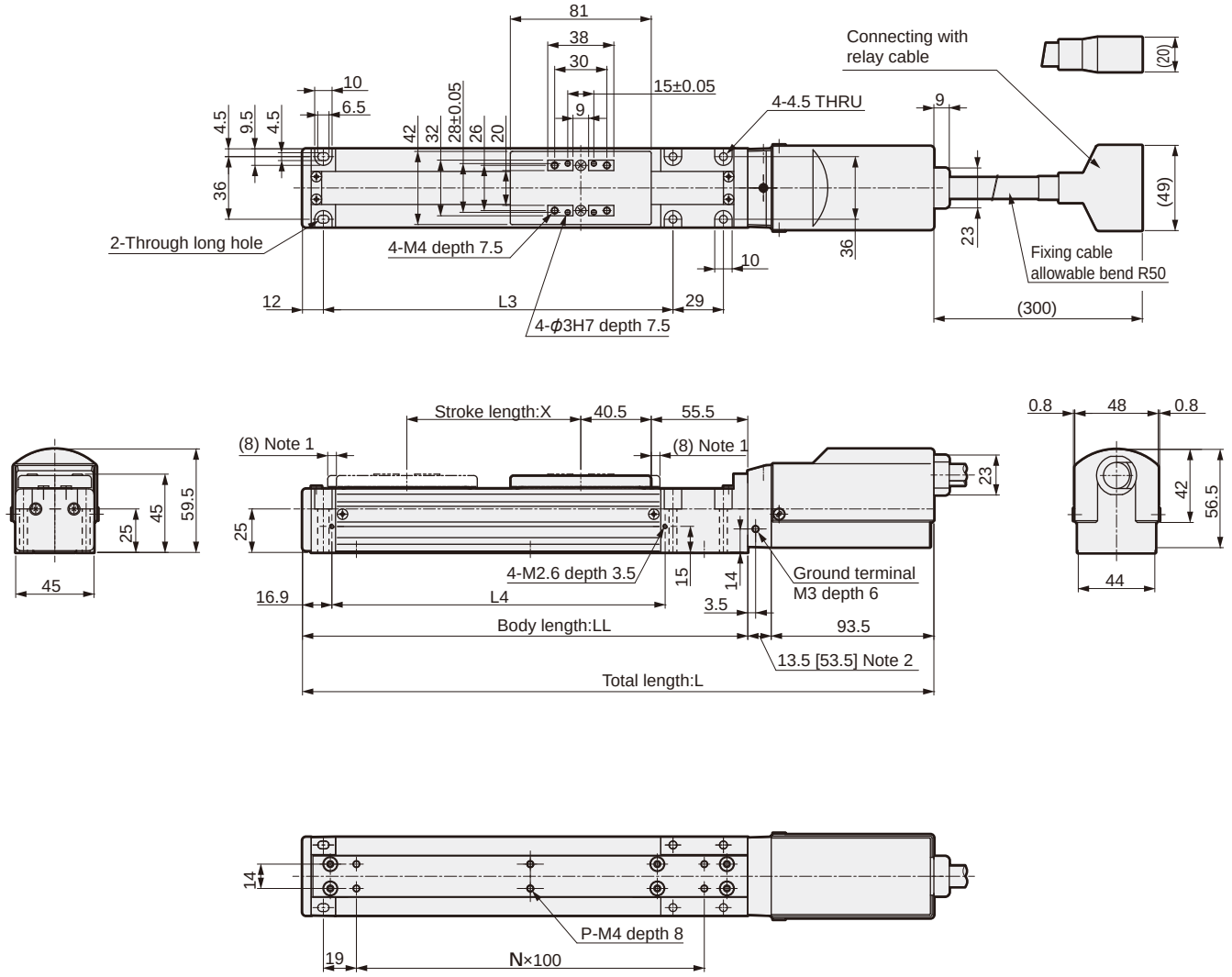
EC-CBLIF1-07-5

Controller Series / Cable length

*Refer to page 23 for details.

Dimensions

● ERL2-45

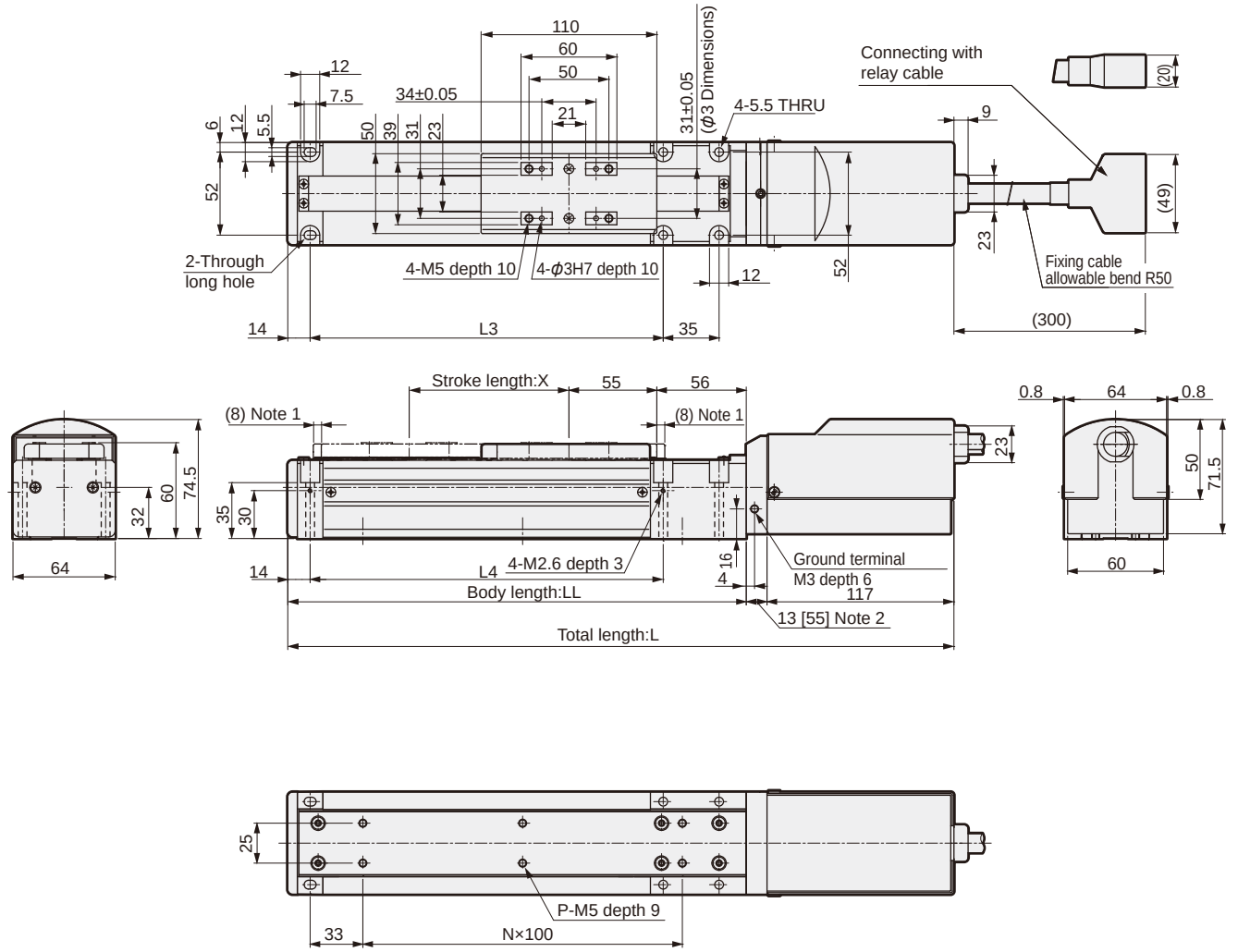


Note 1: Operation range when return to the origin
Note 2: Value in [ ] indicates dimension with brake

Stroke length	Symbol	05	10	15	20	25	30	35	40	45	50
	X (mm)	50	100	150	200	250	300	350	400	450	500
Total length L (mm)	Without brake	313	363	413	463	513	563	613	663	713	763
	With brake	353	403	453	503	553	603	653	703	753	803
Body length LL (mm)		206	256	306	356	406	456	506	556	606	656
L3 (mm)		151	201	251	301	351	401	451	501	551	601
L4 (mm)		141.6	191.6	241.6	291.6	341.6	391.6	441.6	491.6	541.6	591.6
Number of holes P		4	6	6	8	8	10	10	12	12	14
Number of set screw intervals N		1	2	2	3	3	4	4	5	5	6
Weight (kg)	Without brake	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.5
	With brake	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.8

Dimensions

● ERL2-60



Note 1: Operation range when return to the origin
Note 2: Value in [ ] indicates dimension with brake

Stroke length	Symbol	05	10	15	20	25	30	35	40	45	50	55	60	70
	X (mm)	50	100	150	200	250	300	350	400	450	500	550	600	700
Total length L (mm)	Without brake	367	417	467	517	567	617	667	717	767	817	867	917	1017
	With brake	409	459	509	559	609	659	709	759	809	859	909	959	1059
Body length LL (mm)		237	287	337	387	437	487	537	587	637	687	737	787	887
L3 (mm)		171	221	271	321	371	421	471	521	571	621	671	721	821
L4 (mm)		171	221	271	321	371	421	471	521	571	621	671	721	821
Number of holes P		4	6	6	8	8	10	10	12	12	14	14	16	18
Number of set screw intervals N		1	2	2	3	3	4	4	5	5	6	6	7	8
Weight (kg)	Without brake	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.8
	With brake	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.4

Electric actuator Rod type

ESD2 Series

Compatible functions enabling flexible combinations of controller, actuator, and cable

Air cylinder-like electric actuator

● Motor size: □42 • □56

Actuator specifications

Descriptions			ESD2-35		ESD2-45		ESD2-55	
Actuator type			Rod type					
Motor			Stepping motor					
Encoder type			Incremental type					
Drive method			Rolling ball screw Outside diameter 8mm				Rolling ball screw Outside diameter 12mm	
Motor size			□ 42				□ 56	
Screw lead		mm	6	12	6	12	6	12
Stroke length		mm	50, 100, 150		50, 100, 150, 200		50, 100, 150, 200 250, 300	
Operating speed range		mm/s	15 to 300	30 to 600	15 to 300	30 to 600	15 to 200	30 to 400
Repeatability		mm	±0.02					
Lost motion		mm	0.1 or less					
Max. load capacity *1	Horizontal	kg	33	16	33	16	67	34
	Vertical	kg	10	4	10	4	15	6.5
Max. pressure force		N	220	110	220	110	640	320
Motor power voltage			24 VDC ± 10%					
Motor part max. instantaneous current		A	2.7		2.7		4	
Brake	Type		Power-off activated electromagnetic type					
	Power voltage		24 VDC ± 10%					
	Power consumption	W	6.1				7.2	
	Holding force	N	140	70	140	70	610	305
Insulation resistance			10MΩ and over 500VDC					
Withstanding voltage			500 VAC for 1 minute					
Ambient temperature			0 to 40ºC no freezing					
Ambient humidity			35 to 80% (with no dew condensation)					
Storage ambient temperature			-10 to 50ºC no freezing					
Storage ambient humidity			35 to 80% (with no dew condensation)					
Atmosphere			Free of corrosive and explosive gases and dust					
Degree of protection			IEC standards IP40 or equivalent					

*1: When the speed is up, the max. load capacity will down. For details, refer to technical data 2 , table or graph of load capacity (vertical) and load capacity (horizontal). Do not add any external force on the rod other than rod shaft direction.

Weight

(kg)

Body size	50st	100st	150st	200st	250st	300st
ESD2-35	1.3 (1.7)	1.5 (1.9)	1.6 (2.0)	—	—	—
ESD2-45	1.7 (2.1)	2.0 (2.4)	2.2 (2.6)	2.5 (2.9)	—	—
ESD2-55	3.0 (3.7)	3.4 (4.1)	3.8 (4.5)	4.1 (4.8)	4.5 (5.2)	4.9 (5.6)

Note: Value in ( ) indicates product weight with brake

How to order

● Set model no. (actuator, controller, and cable)

ESD2-55E12-05NF-S1A2F

Model no. / Ⓐ Body size / Ⓑ Screw lead / Ⓒ Stroke length / Ⓓ Brake / Ⓔ Origin position / Ⓕ Relay cable length / Ⓖ Controller / Ⓗ I/O cable length / Ⓘ Mounting bracket

Symbol	Descriptions
Ⓐ Body size	
35	Body size35
45	Body size45
55	Body size55
Ⓑ Screw lead	
06	6mm
12	12mm

Ⓒ Stroke length

Symbol	Length	Body size		
		35	**45**	**55**
05	50mm	●	●	●
10	100mm	●	●	●
15	150mm	●	●	●
20	200mm		●	●
25	250mm			●
30	300mm			●

Ⓓ Brake	
N	Without brake
B	With brake
Ⓔ Origin position	
M	Motor side origin
F	Opposite motor side origin
Ⓕ Relay cable length	
N0	None
S1	Fixing cable 1m
S3	Fixing cable 3m
S5	Fixing cable 5m
SX	Fixing cable 10m
R1	Movable cable 1m
R3	Movable cable 3m
R5	Movable cable 5m
RX	Movable cable 10m
Ⓖ Controller	
N	None
A	EC07 Standard installation
B	EC07 DIN rail installation
C	EC63 Standard installation
D	EC63 DIN rail installation
Ⓗ I/O cable length	
N	None *
2	2m
3	3m
5	5m
Ⓘ Mounting bracket	
N	None
L	Foot bracket enclosed
F	Flange bracket enclosed
S	Spacer (Body size 35, 55 only)

<Example of model number>

ESD2-55E12-05NF-S1A2F

Ⓐ Body size	: 55
Ⓑ Screw lead	: 12mm
Ⓒ Stroke length	: 50mm
Ⓓ Brake	: Without brake
Ⓔ Origin position	: Opposite motor side origin
Ⓕ Relay cable length	: Fixing cable1m
Ⓖ Controller	: EC07 Standard installation
Ⓗ I/O cable length	: 2m
Ⓘ Mounting bracket	: Flange bracket enclosed

* Ⓖ If select "N" controller, Ⓗ also select "N" for I/O cable.

● Actuator model no.

ESD2-55E12-05NF-N0 N N

Ⓐ Body size / Ⓑ Screw lead / Ⓒ Stroke length / Ⓓ Brake / Ⓔ Origin position

● Controller model no.

EC07-B

Series / Installation method

*Refer to How to order controller (page 11) for details.

● Cable model no.

• Relay cable

EC-CBLME1-S-5

Fixed/Movable / Cable length

• I/O cable

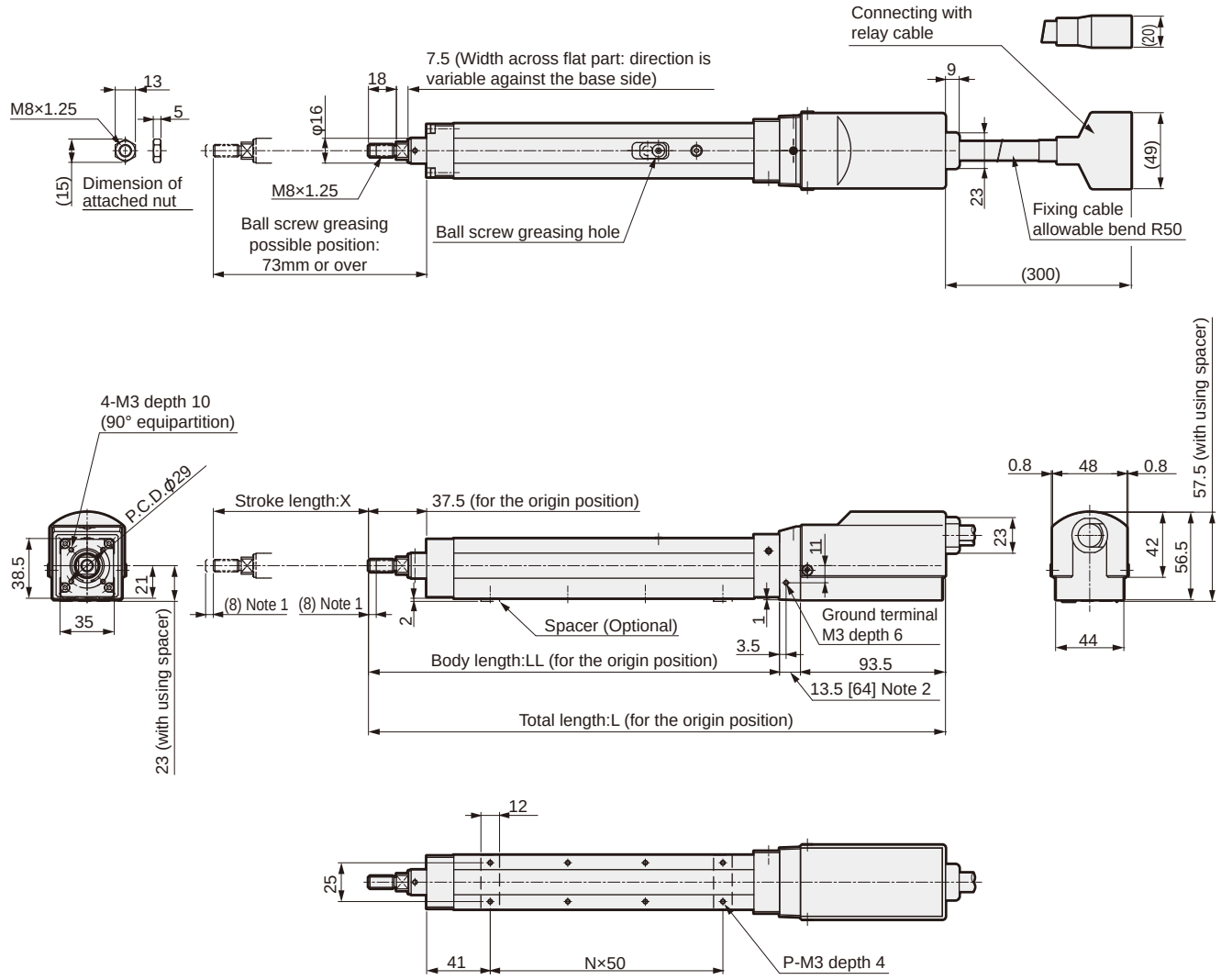
EC-CBLIF1-07-5

Controller series / Cable length

*Refer to page 23 for details.

Dimensions

● ESD2-35

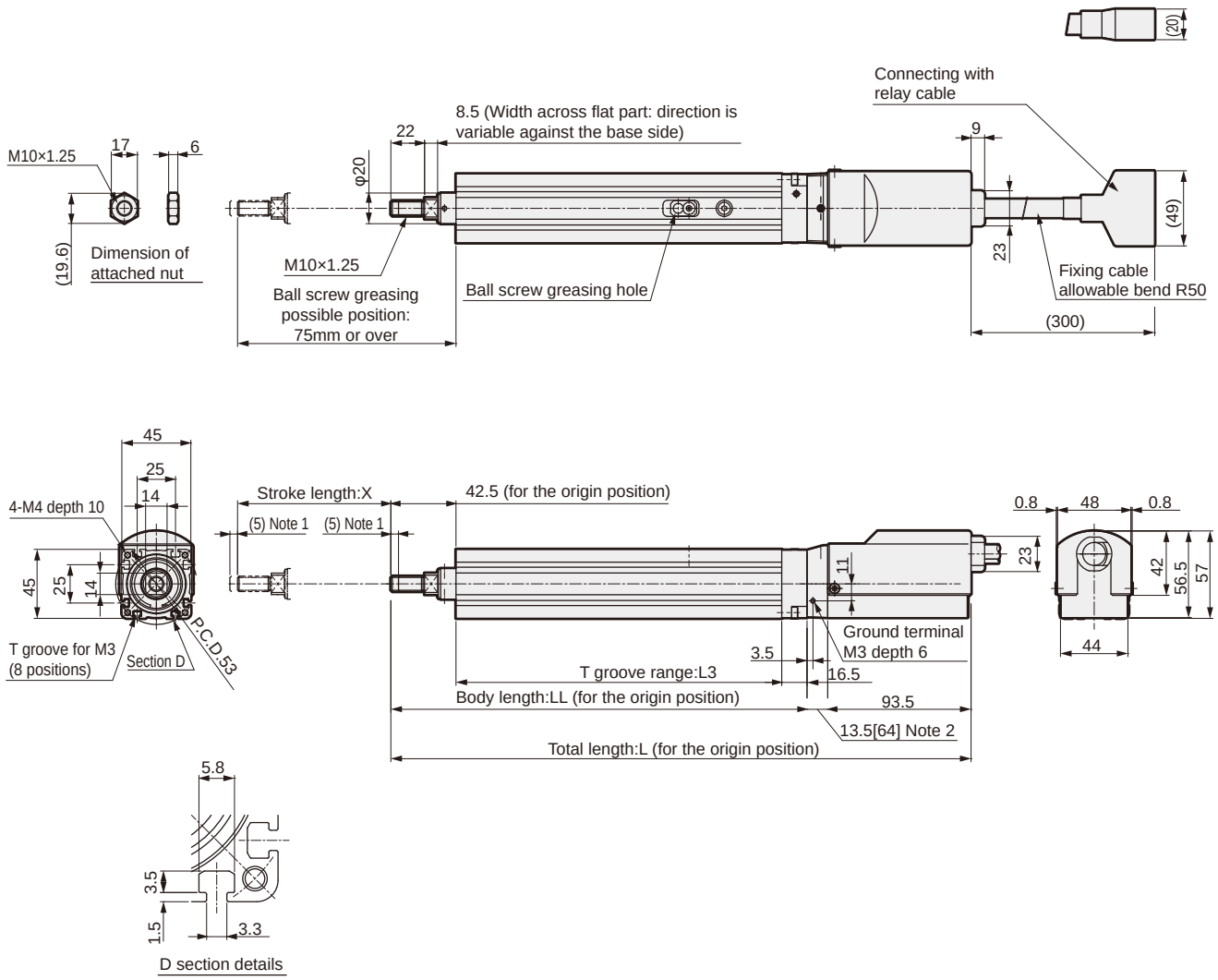


Note 1: Operation range when return to the origin
Note 2: Value in [ ] indicates dimension with brake

Stroke length	Symbol	05	10	15
	X (mm)	50	100	150
Total length L (mm)	Without brake	322	372	422
	With brake	372.5	422.5	472.5
Body length LL (mm)		215	265	315
Number of holes P		6	8	10
Number of set screw intervals N		2	3	4
Weight (kg)	Without brake	1.3	1.5	1.6
	With brake	1.7	1.9	2.0

Dimensions

● ESD2-45

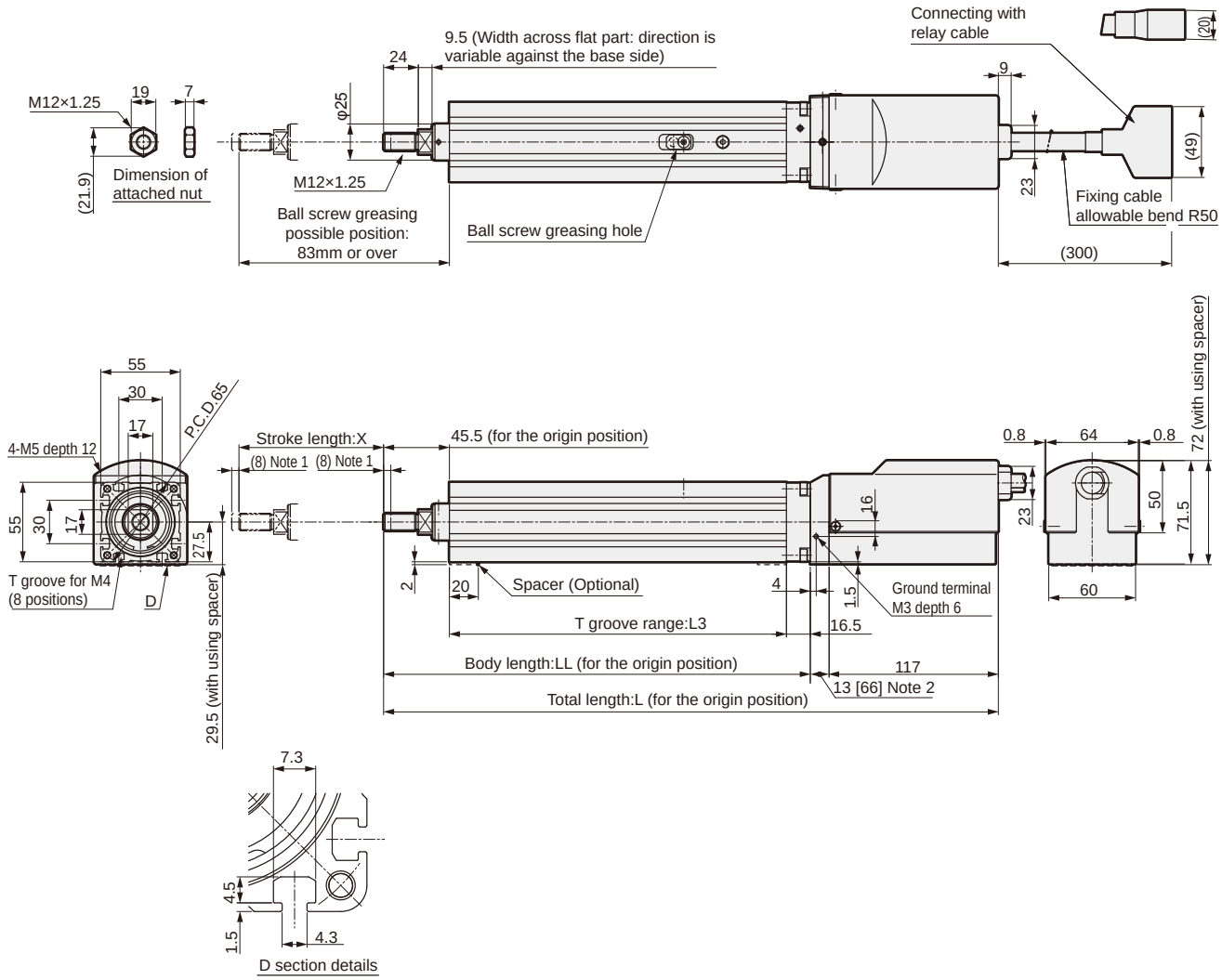


Note 1: Operation range when return to the origin
Note 2: Value in [ ] indicates dimension with brake

Stroke length	Symbol	05	10	15	20
	X (mm)	50	100	150	200
Total length L (mm)	Without brake	328.5	378.5	428.5	478.5
	With brake	379	429	479	529
Body length LL (mm)		221.5	271.5	321.5	371.5
T groove range L3 (mm)		162.5	212.5	262.5	312.5
Weight (kg)	Without brake	1.7	2.0	2.2	2.5
	With brake	2.1	2.4	2.6	2.9

Dimensions

● ESD2-55



Note 1: Operation range when return to the origin
Note 2: Value in [ ] indicates dimension with brake

Stroke length	Symbol	05	10	15	20	25	30
	X (mm)	50	100	150	200	250	300
Total length L (mm)	Without brake	375	425	475	525	575	625
	With brake	428	478	528	578	628	678
Body length LL (mm)		245	295	345	395	445	495
T groove range L3 (mm)		183	233	283	333	383	433
Weight (kg)	Without brake	3.0	3.4	3.8	4.1	4.5	4.9
	With brake	3.7	4.1	4.5	4.8	5.2	5.6

MEMO

Controller

EC07·EC63

- Compatible actuators: ERL2•ESD2

Features

- Compact, light weight and thin (Body width 35mm)
- Can be set without manual
- Perfect installation compatibility with actuator
- PC software available

How to order

EC 07 - B

Ⓐ Series

Ⓑ Installation method

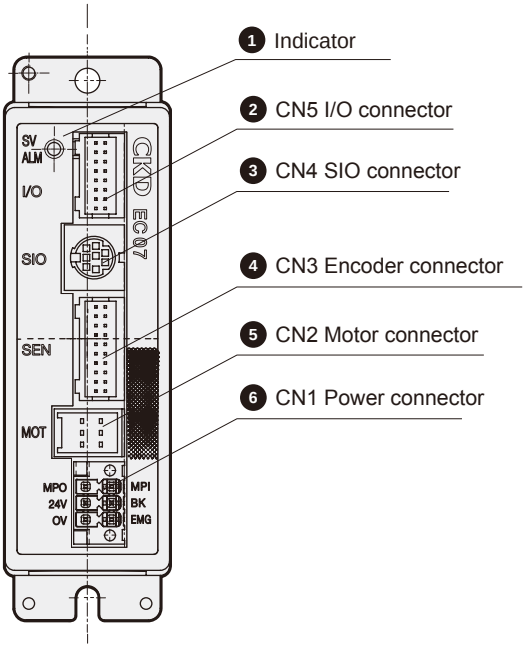
Symbol	Descriptions
Ⓐ Series	
07	7 point
63	63 point
Ⓑ Installation method	
A	EC07 Standard installation
B	EC07 DIN rail installation
C	EC63 Standard installation
D	EC63 DIN rail installation

Specifications

Descriptions		Series	
		EC07	EC63
Applicable motor size		□42, □56	
Setting method		With teaching pendant or PC software	
Control mode		Solenoid valve mode (Single 2 position, double 2 position, double 3-position) Simple mode (3 point) Standard mode (7 point)	Solenoid valve mode (Single 2 position, double 2 position, double 3-position) Simple mode (7 point) Standard mode (63 point)
Body light		Green: Motor energizing (de-energizing while flashing) / Red: alarm	
Input no.		7 points (photo coupler insulation)	10 points (photo coupler insulation)
No. of output points		7 points (photo coupler insulation)	12 points (photo coupler insulation)
Motor power voltage		24 VDC ± 10%	
Motor part max. instantaneous current		□42: 2.7A, □56: 4A	
Control power source voltage		24 VDC ± 10%	
Control section current consumption		300mA or less (includes ETP2 current consumption)	
Brake	Power voltage	24 VDC ± 10%	
	Power consumption	Refer to the specifications for each actuator	
Insulation resistance		100 MΩ and over at 500 VDC	
Withstanding voltage		1000 VAC for one minute	
Ambient temperature		0 to 40ºC no freezing	
Ambient humidity		35 to 80% (with no dew condensation)	
Storage ambient temperature		-10 to 50ºC no freezing	
Storage ambient humidity		35 to 80% (with no dew condensation)	
Atmosphere		Free of corrosive and explosive gases and dust	
Degree of protection		IEC standards IP30 equivalent	
Weight		Approx. 150g (Standard installation) Approx. 180g (DIN rail installation)	Approx. 180g (Standard installation) Approx. 210g (DIN rail installation)

Panel description

● EC07



1 Indicator
Green: Motor energizing (de-energizing while flashing)
Red: alarm

2 I/O connector
Input/output the control signal by connecting external control devices (PLC, etc.).

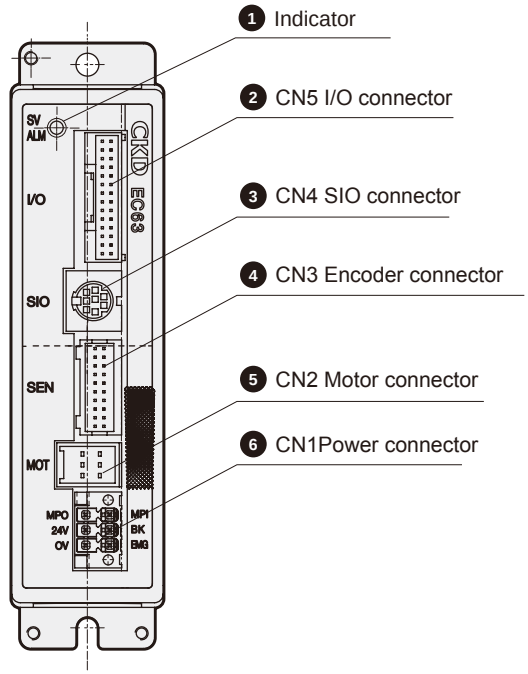
3 SIO connector
Connect the PC and the teaching pendant, set the parameters, and carry out manual operations.

4 Encoder connector
Connect relay cable and input the encoder signal.

5 Motor connector
Connect relay cable and output power signal to motor.

6 Power connector
Input 24VDC control power and motor power to the controller.

● EC63

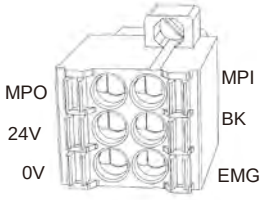


Power connector: CN1 *Power plug is enclosed.

CN1 List of power connector terminals (manufactured by PHOENIX CONTACT DFMC 1.5/3-STF-3.5)

Terminal name	Function name	Functional explanation
BK	Brake Release	Apply 24 VDC to release brake.
MPI	Motor power shutoff	MPI and MPO is connected with jumper wire in standard. By shutting it off, motor power is shut off.
MPO	Motor power shutoff	
24V	Common power (+)	Input 24 VDC common for motor power and control power.
0V	Common power (−)	Connect 0 VDC common for motor power, control power, releasing brake, emergency stop input.
EMG	Emergency Stop Input	Connect the b-contact emergency stop switch, then input 24 VDC.

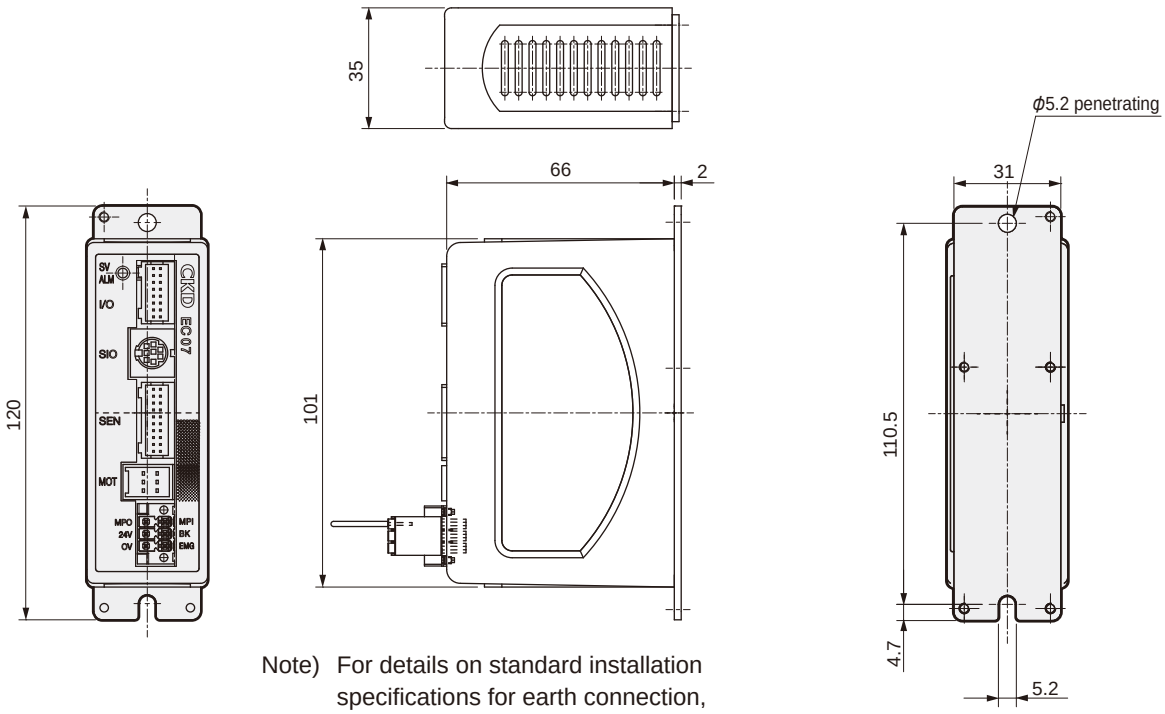
CN1 power plug



Dimensions

● EC07

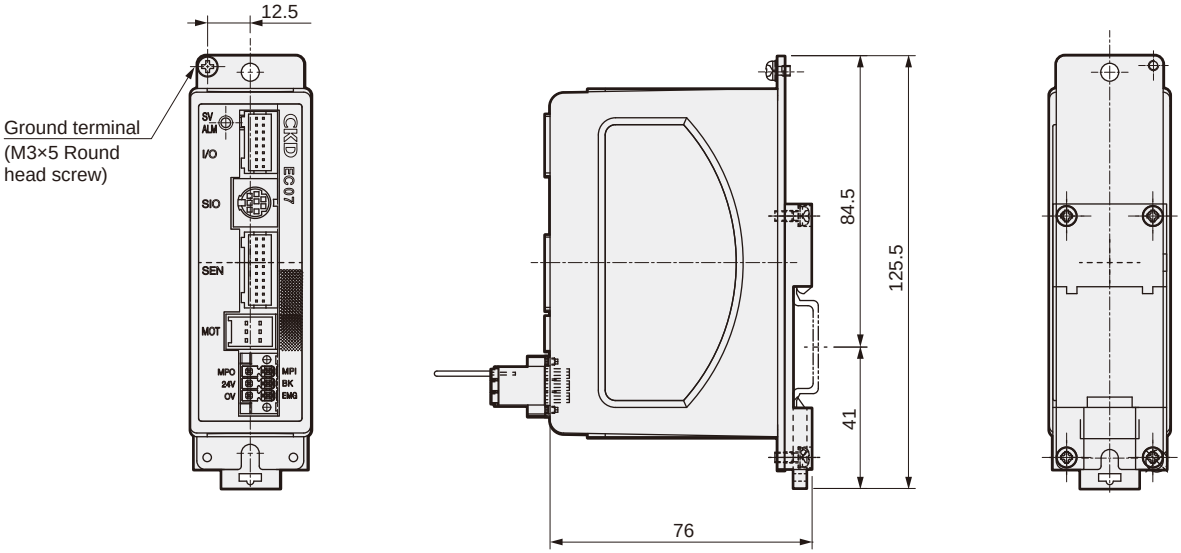
[A: Standard installation]



Note) For details on standard installation specifications for earth connection, please refer to the instruction manual.

[B: DIN rail installation]

*It is possible to mount on DIN rail



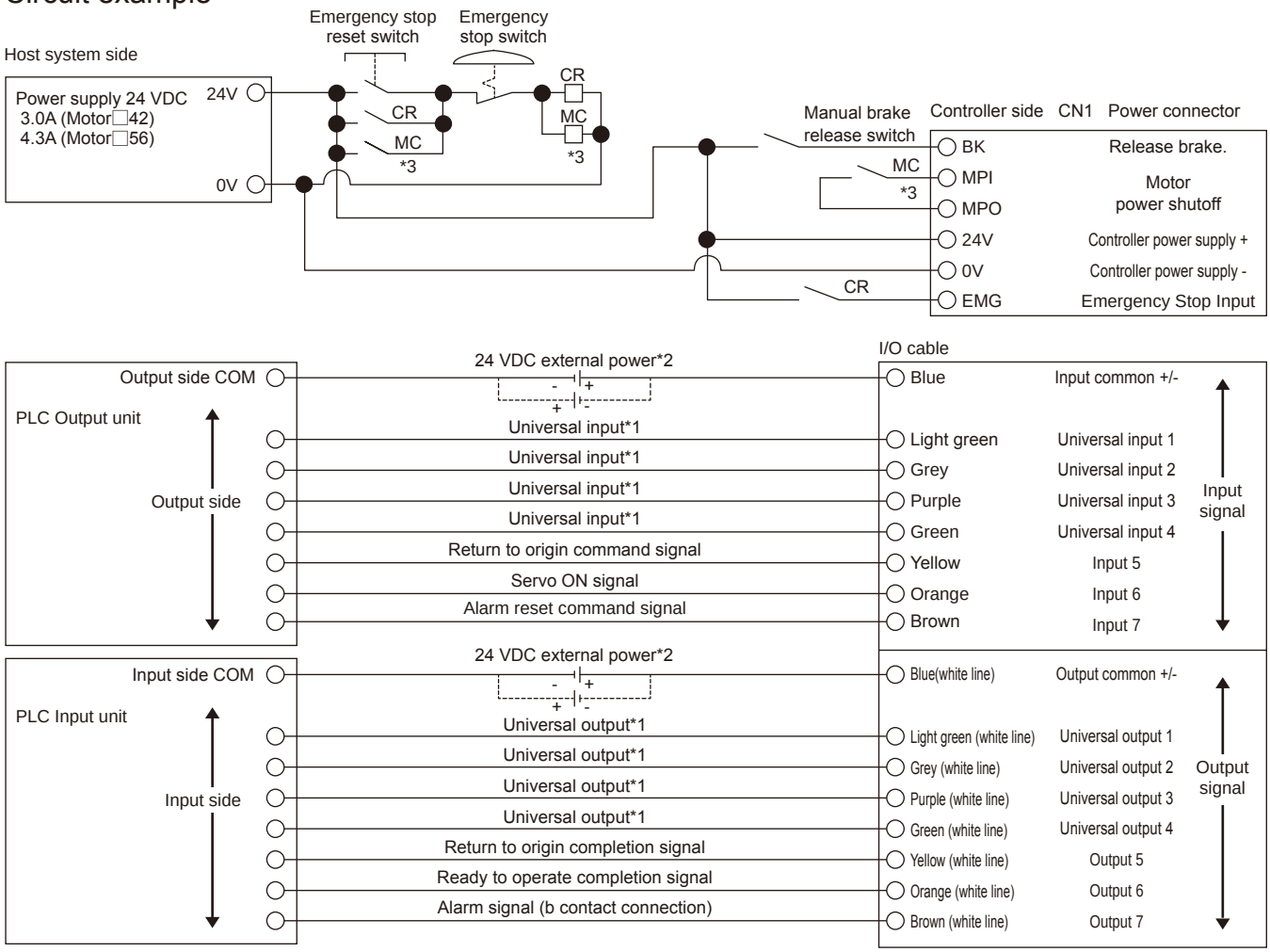
● EC07

Wiring

I/O cable specification

Descriptions	Specifications
Type	20-core cabtyre cord (UL94V-0)
Sheath material	Polyvinyl chloride
Sheath diameter	ϕ8.4
Sheath color	Gray
Conductor	0.2mm^2 (AWG24) annealed copper wire
Length of stripped lead wire (reference)	Approximate 7 mm from lead wire end

Circuit example



⚠ Note:
Check once more before turning the product on to prevent incorrect wiring.
*1: Refer to table below for details on the Universal I/O.
*2: External power supply (24 VDC) is required for both input/output. Input/output COM is available for both + and –.
*3: To shut off the motor drive power supply externally due to the safety category issue, connect the contact like electromagnetic switch between MPI and MPO terminals.

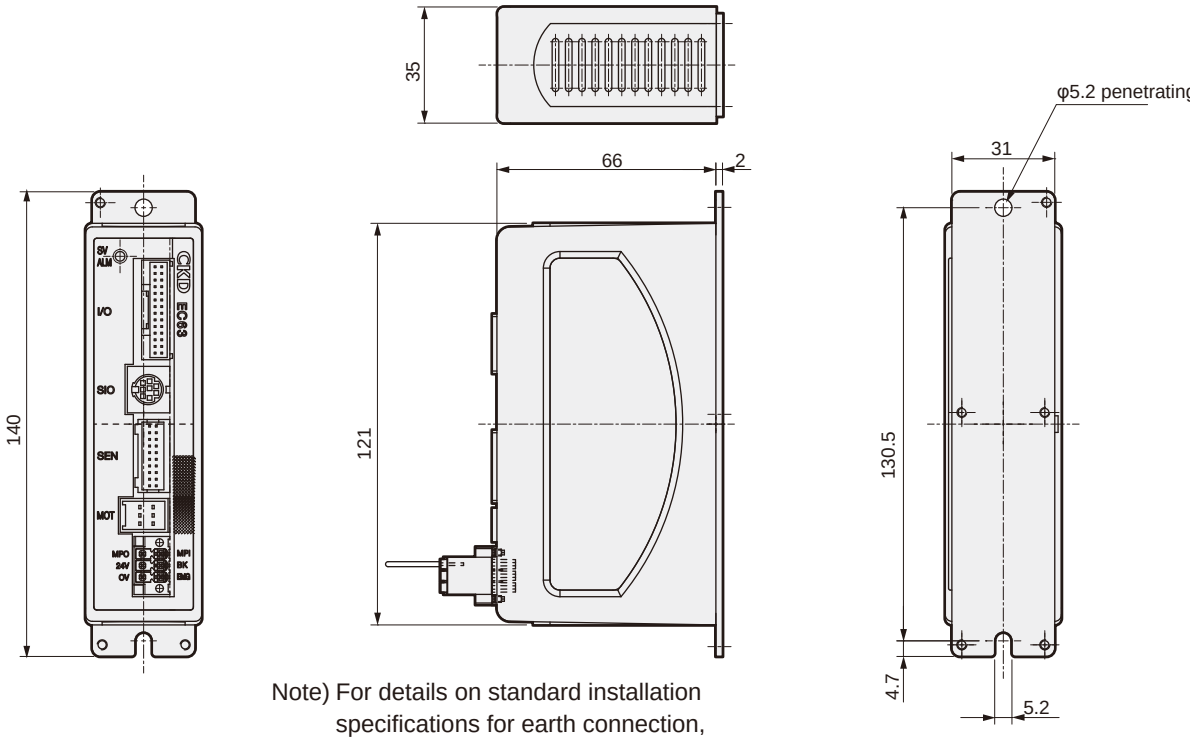
Lay out of general purpose I/O

Control mode	Standard mode	Simple mode	Solenoid valve mode		
	7 point	3 points	Double 2-position	Double 3-position	Single
Universal input 1	Point moving start	Point 1 moving start	Solenoid valve moving command 1	Solenoid valve moving command 1	
Universal input 2	Point selection bit 2	Point 2 moving start	Solenoid valve moving command 2	Solenoid valve moving command 2	Solenoid valve moving command
Universal input 3	Point selection bit 1	Point 3 moving start			
Universal input 4	Point selection bit 0				
Universal output 1	Point moving done	Point 1 moving done	Point 1 moving done	Point 1 moving done	Point 1 moving done
Universal output 2	Point confirmation bit 2	Point 2 moving done	Point 2 moving done	Point 2 moving done	Point 2 moving done
Universal output 3	Point confirmation bit 1	Point 3 moving done	Switch 1 output	Switch 1 output	Switch 1 output
Universal output 4	Point confirmation bit 0		Switch 2 output	Switch 2 output	Switch 2 output

Dimensions

● EC63

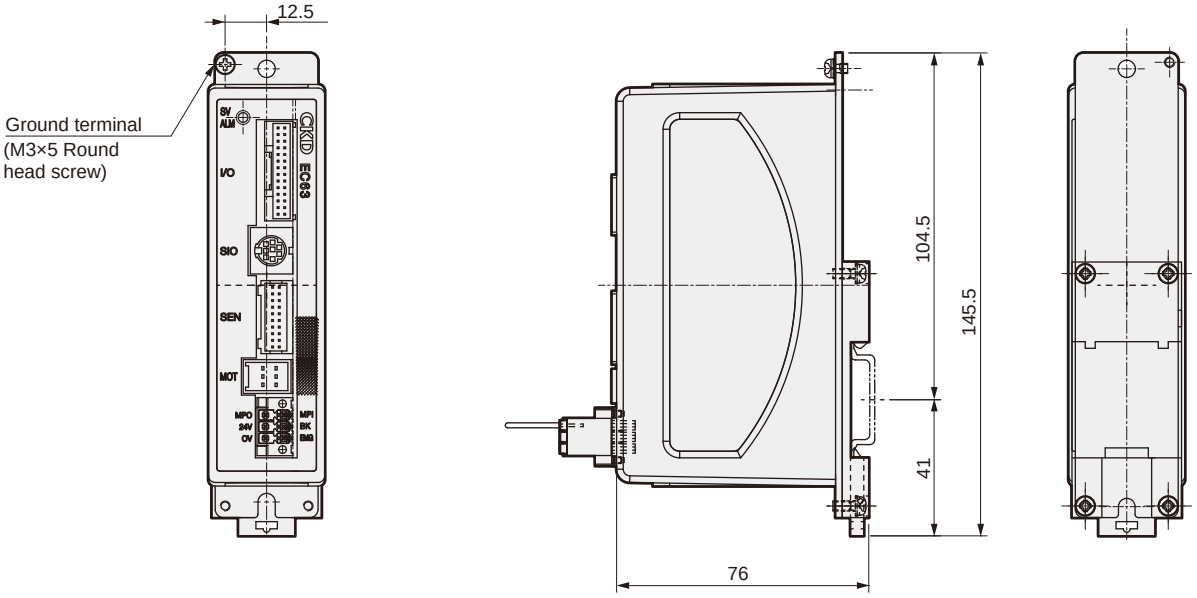
[C: Standard installation]



Note) For details on standard installation specifications for earth connection, please refer to the instruction manual.

[D: DIN rail installation]

*It is possible to mount on DIN rail



● EC63

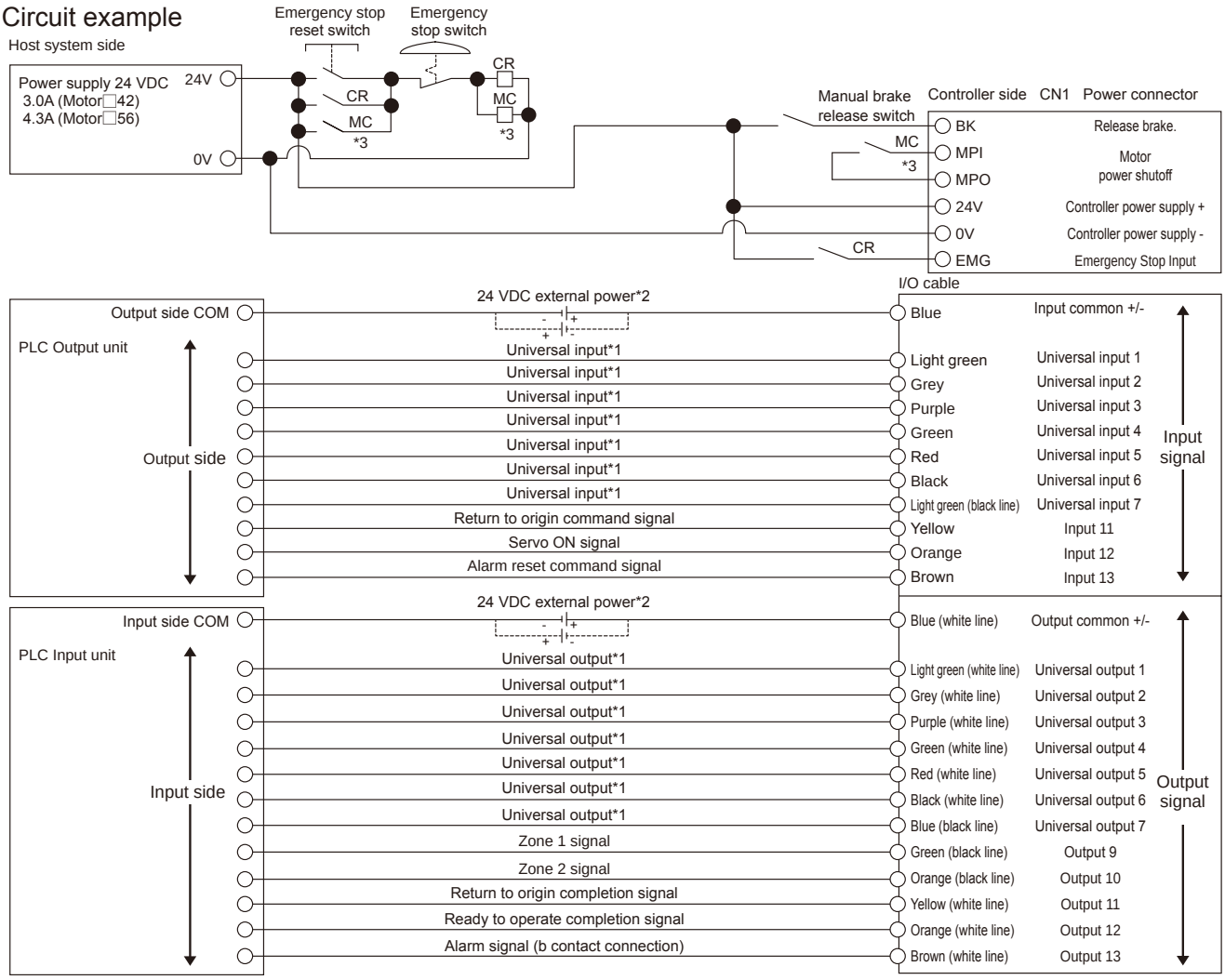
Wiring

I/O cable specification

Descriptions	Specifications
Type	28-core cabtyre cord (UL94V-0)
Sheath material	Polyvinyl chloride
Sheath diameter	ϕ8.8

Descriptions	Specifications
Sheath color	Gray
Conductor	0.2mm^2 (AWG24) annealed copper wire
Length of stripped lead wire (reference)	Approximate 7 mm from lead wire end

Circuit example



Note:
Check once more before turning the product on to prevent incorrect wiring.
*1: Refer to table below for details on the Universal I/O. *2: External power supply (24 VDC) is required for both input/output. Input/output COM is available for both + and –.
*3: To shut off the motor drive power supply externally due to the safety category issue, connect the contact like electromagnetic switch between MPI and MPO terminals.

Lay out of general purpose I/O

Control mode	Standard mode 63 point	Simple mode 7 point	Solenoid valve mode		
			Double 2-position	Double 3-position	Single
Universal input1	Point moving start	Point 1 moving start	Solenoid valve moving command 1	Solenoid valve moving command 1	
Universal input2	Point selection bit 5	Point 2 moving start	Solenoid valve moving command 2	Solenoid valve moving command 2	Solenoid valve moving command
Universal input3	Point selection bit 4	Point 3 moving start			
Universal input4	Point selection bit 3	Point 4 moving start			
Universal input5	Point selection bit 2	Point 5 moving start			
Universal input6	Point selection bit 1	Point 6 moving start			
Universal input7	Point selection bit 0	Point 7 moving start			
Universal output1	Point moving done	Point 1 moving done	Point 1 moving done	Point 1 moving done	Point 1 moving done
Universal output2	Point confirmation bit 5	Point 2 moving done	Point 2 moving done	Point 2 moving done	Point 2 moving done
Universal output3	Point confirmation bit 4	Point 3 moving done	Switch 1 output	Switch 1 output	Switch 1 output
Universal output4	Point confirmation bit 3	Point 4 moving done	Switch 2 output	Switch 2 output	Switch 2 output
Universal output5	Point confirmation bit 2	Point 5 moving done			
Universal output6	Point confirmation bit 1	Point 6 moving done			
Universal output7	Point confirmation bit 0	Point 7 moving done			

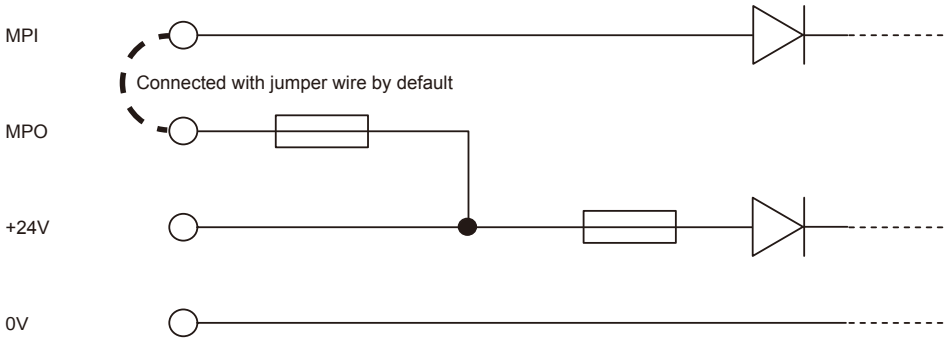
Power supply circuit

Power specifications

Descriptions	Specifications
Power voltage	24 VDC ± 10%
Max. instantaneous current*	ERL2-45/ESD2-35, 45: 3.0A ERL2-60/ESD2-55: 4.3A

*: Includes when teaching pendant is connected.

Power supply circuit

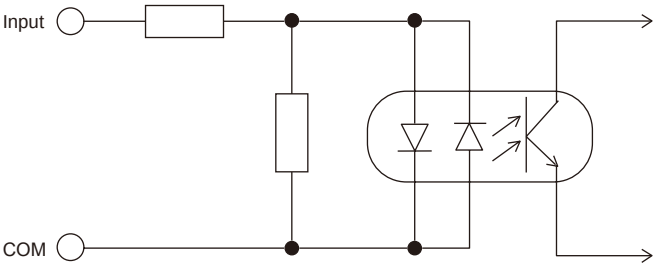


I/O circuit

Input specification

Descriptions	Specifications
Input no.	7 point (EC07) 10 point (EC63)
Input voltage	24 VDC ± 10%
Input current	3mA/1 points
Input current when turned ON	2mA (MIN)
Input current when turned OFF	0.5mA (MAX)

Input circuit



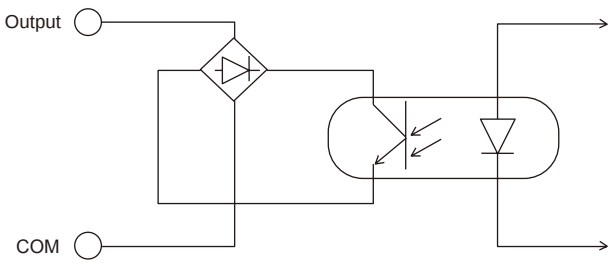
The input is non-polar.
(For input COM, either of + or – can be used.)

Output specifications

Descriptions	Specifications
No. of output points	7 point (EC07): 12 point (EC63)
Load voltage	24 VDC ± 10%
Load current	10 mA or less/1 point
Internal voltage drop	6V or less (under 25ºC)*1
Leakage current	10μA
Output short-circuit protection circuit	Selected
Connecting load	PLC

*1: At 40ºC, it is 6V or less with 9mA load current.

Output circuit



Output is non-polar.
(COM is available for both + and –.)

MEMO

Teaching pendant

ETP2

● Common controller for EC07/EC63

RoHS

Features

- Easy teaching
- No dedicated power supply required
- Can be used with conventional models
  Available to use in the same way for EC controller

How to order

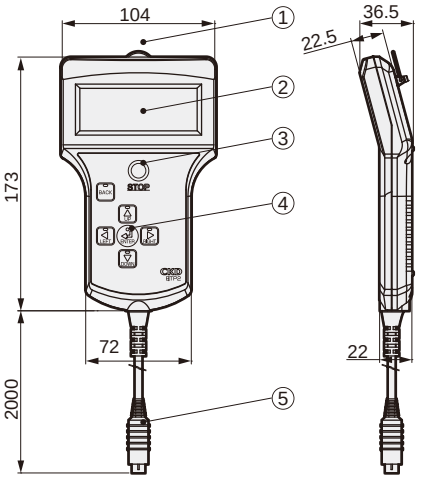
ETP2 - 2

Model no. Cable length

Specifications

Descriptions	ETP2
Indicator	20 character × 4 line (LCD)
Input keys	7 keys (Stop key: 1, operation key: 6)
Cable length	2m
Connecting controller	EC07, EC63
Applicable actuator	ERL2/ESD2 Series
Ambient temperature	0 to 40ºC no freezing
Ambient humidity	35~80ºCRH (with no dew condensation)
Storage ambient temperature	−10 to 50ºC no freezing
Storage ambient humidity	35~80ºCRH (with no dew condensation)
Atmosphere	Free of corrosive and explosive gases and dust
Degree of protection	IEC standards IP40 or equivalent
Weight	Approx. 140g (excluding cable)

Dimensions and name/ functions of each section



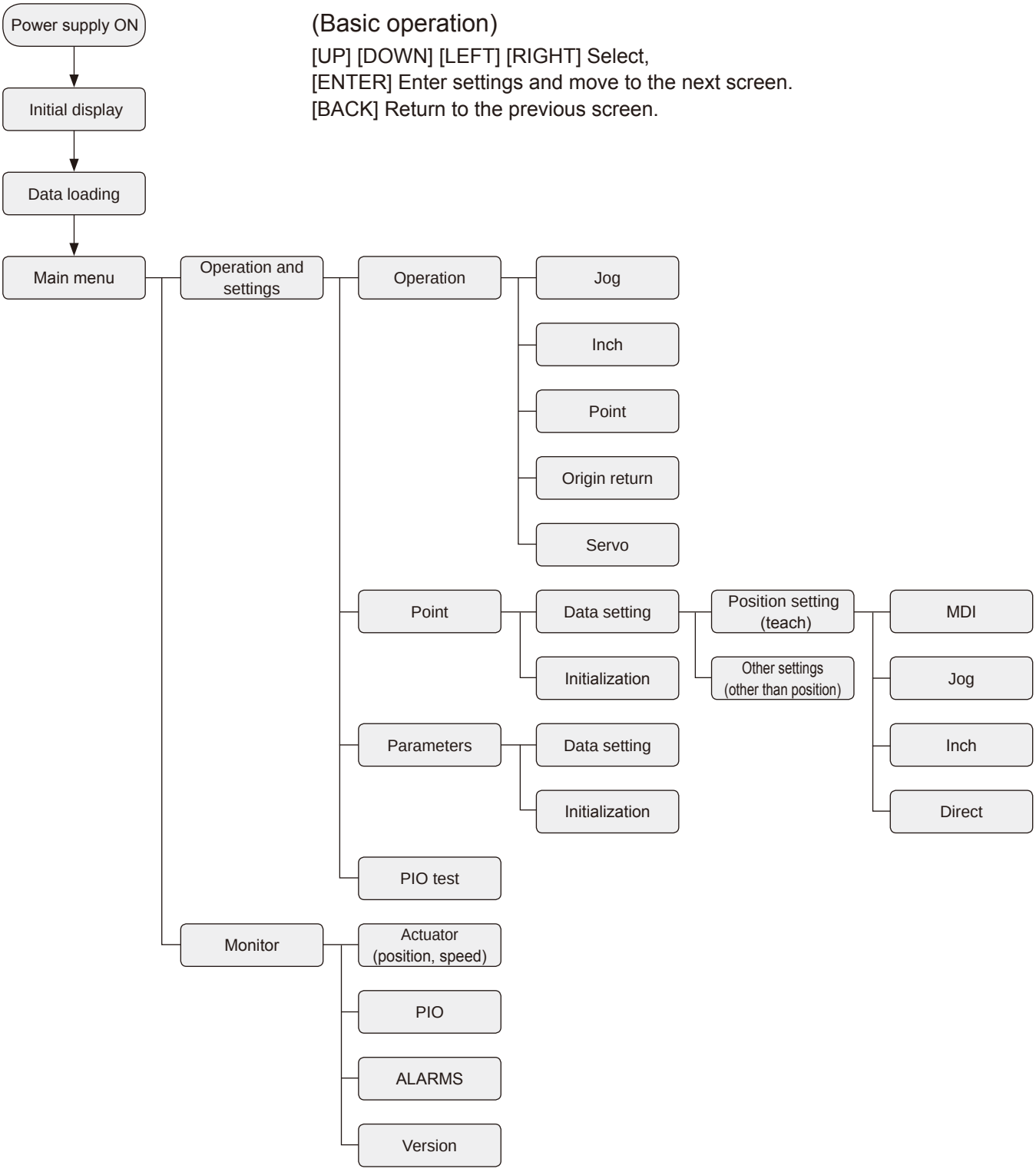
No	Name			Function
①	Hook			Hook for suspending product.
②	LCD			20 character × 4 line display.
③	Stop key	STOP	[STOP]	Used to stop an actuator.
④	Operation key	UP	[UP]	Use for various operations. LED of operable key is lit.
		DOWN	[DOWN]	
		LEFT	[LEFT]	
		RIGHT	[RIGHT]	
		BACK	[BACK]	
		ENTER	[ENTER]	
⑤	Connector			Connect to the controller.

Function list

Menu					Descriptions
Main	Sub-1	Sub-2	Sub-3	Sub-4	
Operation and settings	Operation	Jog			Sets speed, and performs jog operation.
		Inch			Sets speed and pitch and performs inching operation.
		Point			Select the point number, and move the point.
		Origin return			Carry out origin return.
		Servo			Turns the servo ON or OFF.
	Point	Data setting	Position setting (teach)	MDI	Set the point data (position) with key input.
				Jog	Set the point data (position) with jog input.
				Inch	Set the point data (position) with inching input.
				Direct	Set the point data (position) with actual machine position.
			Other settings (other than position)		Set the point data (width of positioning, mode, speed, acceleration, deceleration, pushing down current, pressing down speed, and pressing down distance).
		Data initialization			Resets point data to default.
	Parameters	Data setting			Set parameter data.
		Data initialization			Resets parameter data to default.
	PIO test				Displays the input signals, and ON/OFF the output signals mandatorily.
Monitor	Actuator (position, speed)				Displays the current position and speed.
	PIO				Displays the input/output signal for I/O connector.
	ALARMS				Display current alarm and past 10 alarms.
	Version				Displays version for teaching pendant and controller.

Operation diagram

The following is the structure of the operation using the teaching pendant.



(Basic operation)

[UP] [DOWN] [LEFT] [RIGHT] Select,
[ENTER] Enter settings and move to the next screen.
[BACK] Return to the previous screen.

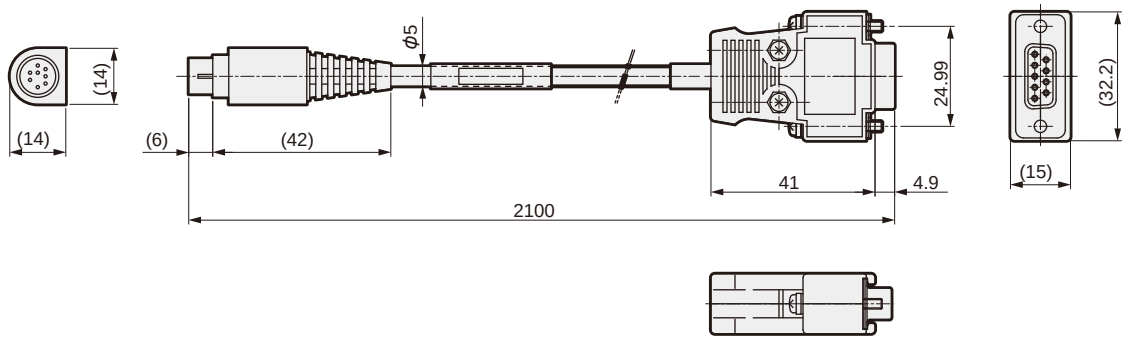
Refer to the instruction manual for details.

EC07/EC63 Related parts model number table

●Related parts

Part name	Model no.
PC communication cable	EC-CBLPC1

PC communication cable
Model no.: EC-CBLPC1



● Noise filter

Product	Model no.
Noise filter for power supply (single phase 15A)	AX-NSF-NF2015A-OD
Surge protector	AX-NSF-RAV-781BXZ-4

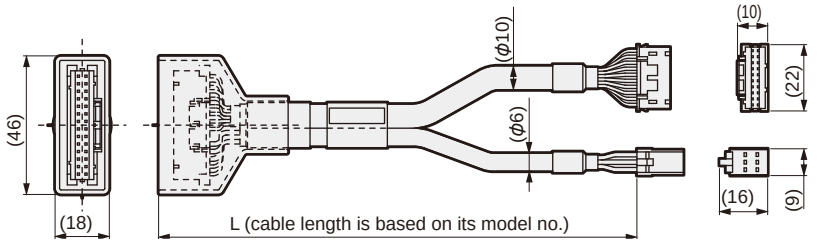
(Note 1) The parts listed on this page can be purchased from CKD.
(Note 2) When using for products with European standards (CE marking), a surge protector is required.
Refer to the instruction manual for details.

MEMO

Cable

● Motor/encoder relay cable (fixed)

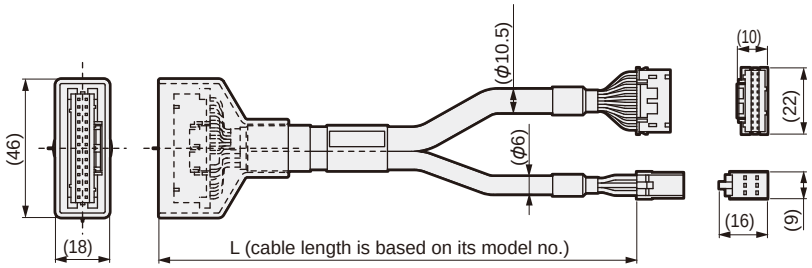
1m, 3m, 5m, 10m



Model no.	Cable length (L)
EC-CBLME1-S-1	1m
EC-CBLME1-S-3	3m
EC-CBLME1-S-5	5m
EC-CBLME1-S-X	10m

● Motor/encoder relay cable (movable)

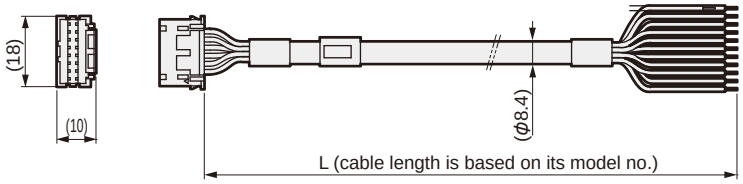
1m, 3m, 5m, 10m



Model no.	Cable length (L)
EC-CBLME1-R-1	1m
EC-CBLME1-R-3	3m
EC-CBLME1-R-5	5m
EC-CBLME1-R-X	10m

● I/O cable (for EC07)

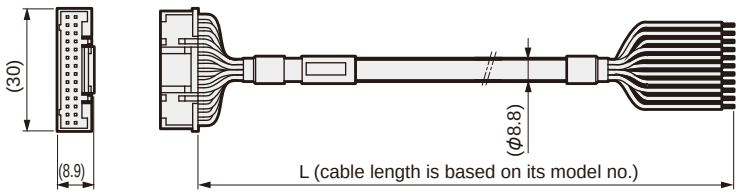
2m, 3m, 5m



Model no.	Cable length (L)
EC-CBLIF1-07-2	2m
EC-CBLIF1-07-3	3m
EC-CBLIF1-07-5	5m

● I/O cable (for EC63)

2m, 3m, 5m



Model no.	Cable length (L)
EC-CBLIF1-63-2	2m
EC-CBLIF1-63-3	3m
EC-CBLIF1-63-5	5m

⚠ Safety precautions

- When the cable needs to be bent repeatedly, fix the cable sheath near the actuator connector.
- When connecting the cable, insert the connector securely to the back. Firmly tighten the connector's set screws and fixing screws.
- Do not modify the cable by cutting or extending it. Failure to observe this could result in faults or malfunctions.
- For cable length L, refer to the cable lengths in "How to order".

Option (bracket)

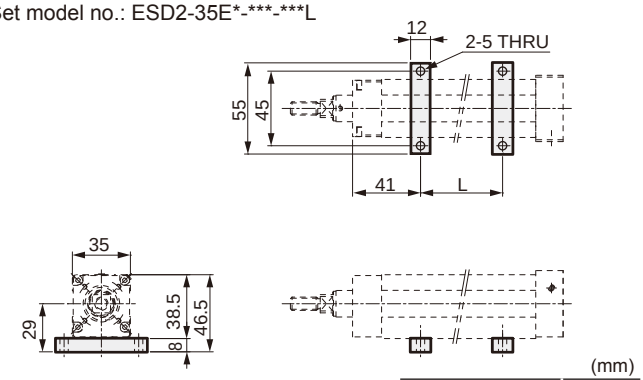
Kits in below will be enclosed to the product, for with bracket.

● Option: LB

Foot kit model no.: ESD-[Body size]-LB

Dimension of with foot fitting

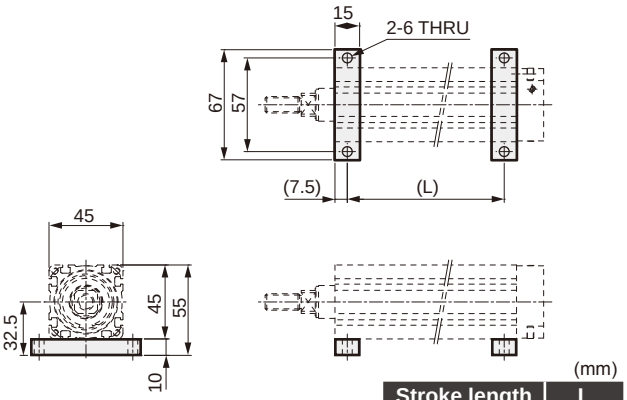
Set model no.: ESD2-35E*-***-***L



(mm)

Stroke length	L
50	100
100	150
150	200

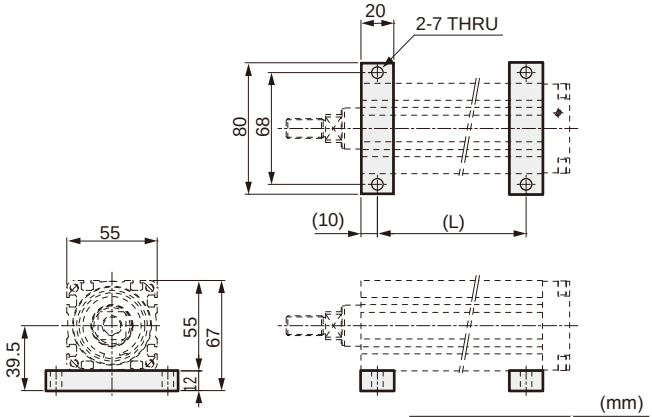
Set model no.: ESD2-45E*-***-***L



(mm)

Stroke length	L
50	147.5
100	197.5
150	247.5
200	297.5

Set model no.: ESD2-55E*-***-***L



(mm)

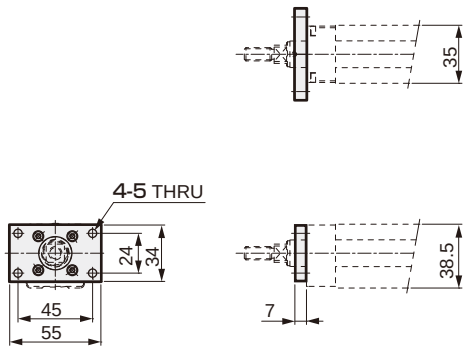
Stroke length	L
50	163
100	213
150	263
200	313
250	363
300	413

● Option: FA

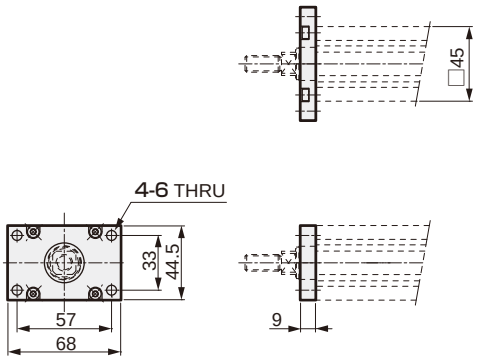
Flange kit model no.: ESD-[Body size]-FA

Dimension of with flange fitting

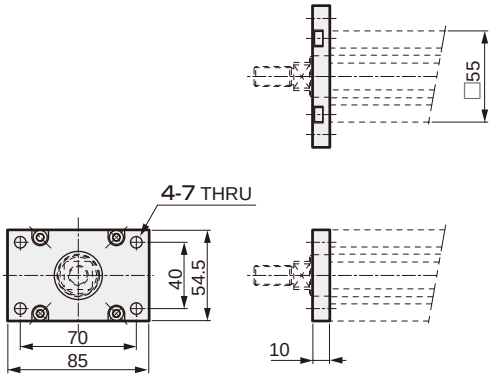
Set model no.: ESD2-35E*-***-***F



Set model no.: ESD2-45E*-***-***F



Set model no.: ESD2-55E*-***-***F



● Option: SP

Spacer kit model no.: ESD-[$\frac{35}{55}$]-SP

Set model no.: ESD2-[$\frac{35}{55}$]E*-***-***S

*Refer to pages 7, 9 for dimensions of with spacer fitting.

STEP-1 Load capacity confirmation

Load capacity changes according to installation attitude and transferring speed.
Select size and lead referring to technical data 1 and 2.

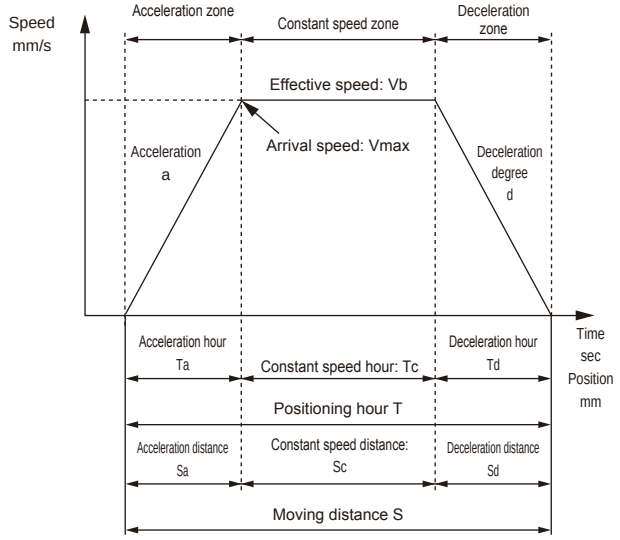
STEP-2 Tact time confirmation

Check if the tact time of selected product is suitable for required tact, according to the examples below.

Speed/acceleration setting range

Motor size	Lead (mm)	Speed (mm/s)	Acceleration (m/s^2)
□42	6	15 to 300	1.0 to 3.0
	12	30 to 600	1.0 to 3.0
□56	6	15 to 200	1.0 to 3.0
	12	30 to 400	1.0 to 3.0

Setting tact time of general transfer operation

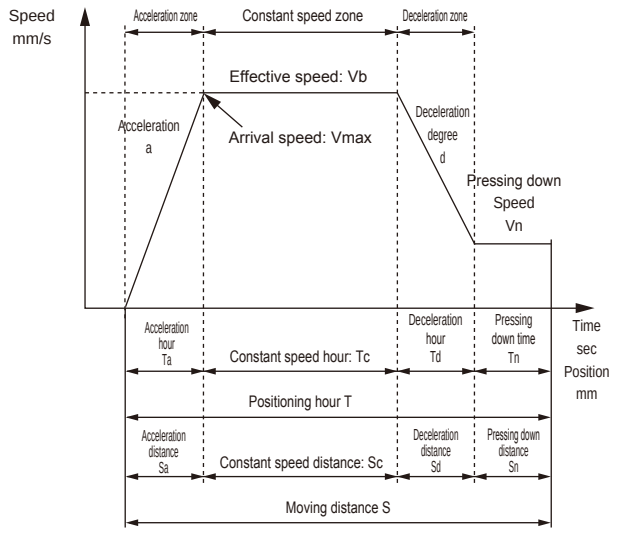


	Descriptions	Symbol	Unit	Remarks
Set value	Setting speed	V	mm/s	*1
	Setting acceleration	a	mm/s^2	*2
	Setting deceleration degree	d	mm/s^2	*2
	Moving distance	S	mm	
Calculated value	Arrival speed	Vmax	mm/s	$=(2\times a\times d\times S/(a+d))^{1/2}$
	Effective speed	Vb	mm/s	V and Vmax. (smaller one)
	Acceleration hour	Ta	s	=Vb/a
	Deceleration hour	Td	s	=Vb/d
	Constant speed hour	Tc	s	=Sc/Vb
	Acceleration distance	Sa	mm	$=(a\times Ta^2)/2$
	Deceleration distance	Sd	mm	$=(d\times Td^2)/2$
	Constant speed distance	Sc	mm	=S-(Sa+Sd)
	Positioning hour	T	s	=Ta+Tc+Td

*1•It may not reach the configured speed depending on the stroke and acceleration. Compare by using Vmax and setting speed.

*2•The unit for acceleration/deceleration setting using the teaching pendant is m/s^2. Be careful when setting.

Setting tact time of pressing down operation



	Descriptions	Symbol	Unit	Remarks
Set value	Setting speed	V	mm/s	*1
	Setting acceleration	a	mm/s^2	*2
	Setting deceleration degree	d	mm/s^2	*2
	Moving distance	S	mm	
	Pressing downSpeed	Vn	mm/s	
	Pressing down distance	Sn	mm	
Calculated value	Arrival speed	Vmax	mm/s	$=(2\times a\times d\times(S-Sn+Vn^2/2/d)/(a+d))^{1/2}$
	Effective speed	Vb	mm/s	V and Vmax. (smaller one)
	Acceleration hour	Ta	s	=Vb/a
	Deceleration hour	Td	s	=(Vb-Vn)/d
	Constant speed hour	Tc	s	=Sc/Vb
	Pressing downTime	Tn	s	=Sn/Vn
	Acceleration distance	Sa	mm	$=(a\times Ta^2)/2$
	Deceleration distance	Sd	mm	=((Vb+Vn)×Td)/2
	Constant speed distance	Sc	mm	=S-(Sa+Sd+Sn)
	Positioning hour	T	s	=Ta+Tc+Td+Tn

*1•It may not reach the configured speed depending on the stroke and acceleration. Compare by using Vmax and setting speed.

*2•The unit for acceleration/deceleration setting using the teaching pendant is m/s^2. Be careful taken when setting.

STEP-3 Allowable moment confirmation

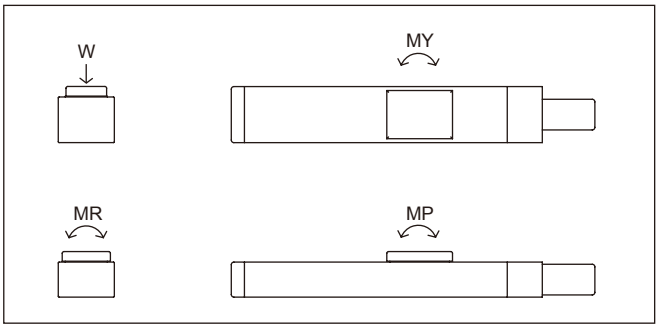
3-1 Confirming static allowable moment

Confirm that set acceleration doesn't exceed the allowable moment in a, d (m/s^2) (comply with the formula below).

$$M'_T=\frac{W'}{W'max}+\frac{MR'}{MR'max}+\frac{MP'}{MP'max}+\frac{MY'}{MY'max}<1$$

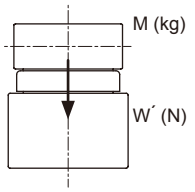
M'_T : combination of moment (must be less than 1)
W' : vertical load (N)
MR' : rolling moment (N·m)
MP' : pitching moment (N·m)
MY' : yawing moment (N·m)

● Slider type: core of slider part



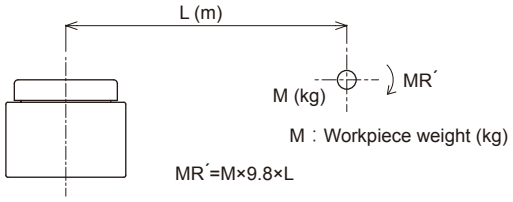
		W´max (N)	MR´max (N·m)	MP´max (N·m)	MY´max (N·m)
Allowable static load	ERL2-45	1450	31	12	12
	ERL2-60	2000	58	25.7	25.7

● Vertical load W´ (N)

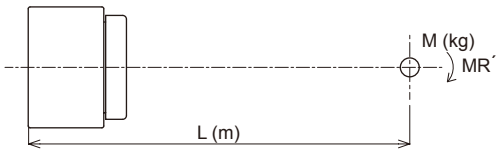


M : Workpiece weight (kg)
W´=M×9.8

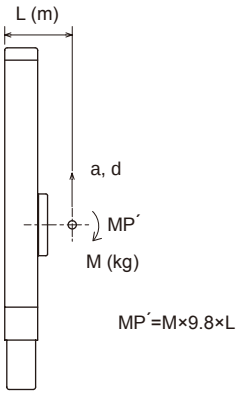
● Rolling moment MR´ (N·m)



M : Workpiece weight (kg)
MR´=M×9.8×L

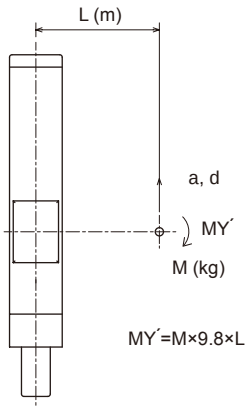


● Pitching moment MP´ (N·m)



MP´=M×9.8×L

● Yawing moment MY´ (N·m)



MY´=M×9.8×L

3-2 Allowable moment confirmation when operates

Confirm that actual moment is less than allowable moment. (satisfies the following formula)

$$M_T = \frac{W}{Wmax} + \frac{MR_1 + MR_2}{MRmax} + \frac{MP_1 + MP_2 + MP_3}{MPmax} + \frac{MY_1 + MY_2 + MY_3}{MYmax} < 1$$

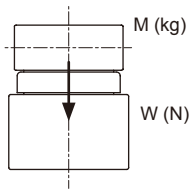
M_T : combination of moment (must be less than 1)
W : vertical load (N)
MR : rolling moment (N·m)
MP : pitching moment (N·m)
MY : yawing moment (N·m)

* The moment load used at the time of operation must take account of the all moments depending on the circumstances.

Allowable load during operation

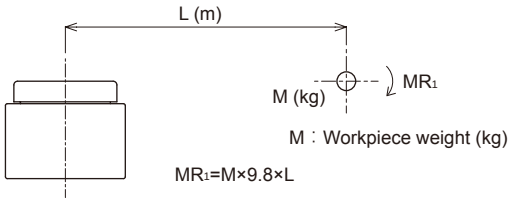
	Installation attitude	Wmax (N)	MRmax (N·m)	MPmax (N·m)	MYmax (N·m)
ERL2-45	Horizontal	98	11.1	4.4	4.4
	Vertical	–	12.3	4.9	4.9
ERL2-60	Horizontal	294	27.5	8	8
	Vertical	–	33.7	9.8	9.8

● Vertical load W (N)

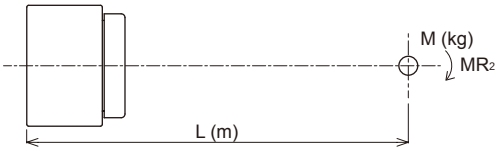


M : Workpiece weight (kg)
W = M×9.8

● Rolling moment MR (N·m)

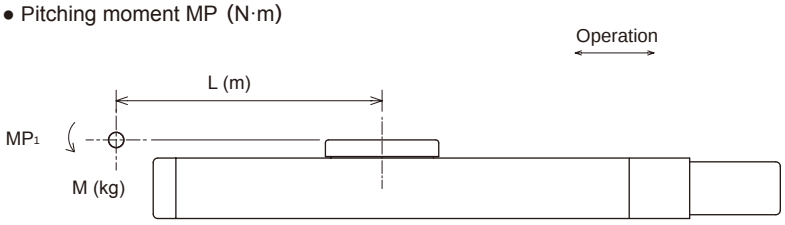


M : Workpiece weight (kg)
$MR_1 = M \times 9.8 \times L$

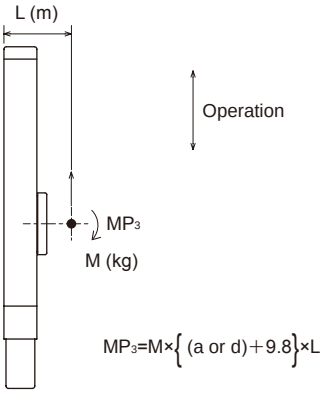


$MR_2 = M \times 9.8 \times L$

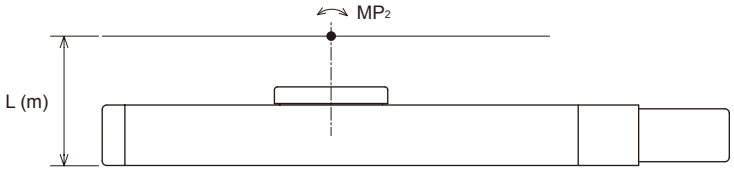
● Pitching moment MP (N·m)



M : workpiece weight (kg)
$MP_1=M\times9.8\times L$



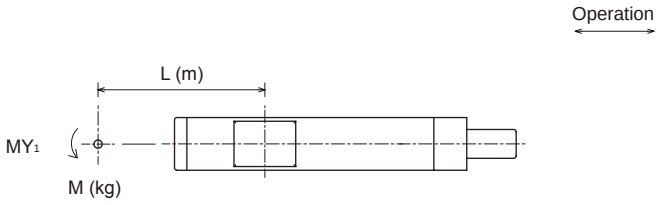
$MP_3=M\times\{(a \text{ or } d)+9.8\}\times L$



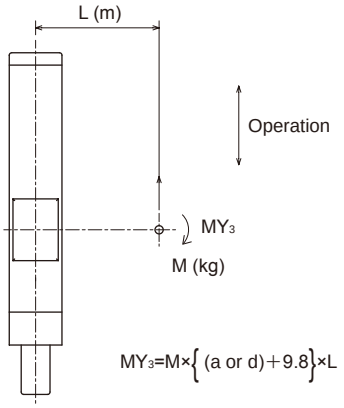
M : workpiece weight (kg)

$MP_2=M\times(a \text{ or } d)\times L$

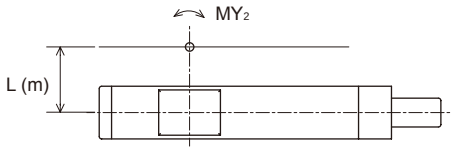
● Yawing moment MY (N·m)



M : workpiece weight (kg)
$MY_1=M\times9.8\times L$



$MY_3=M\times\{(a \text{ or } d)+9.8\}\times L$

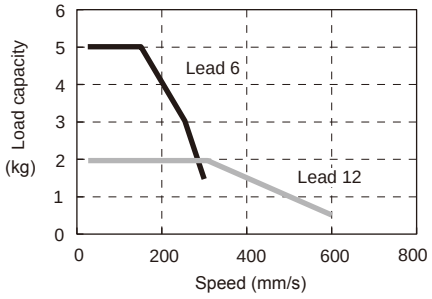
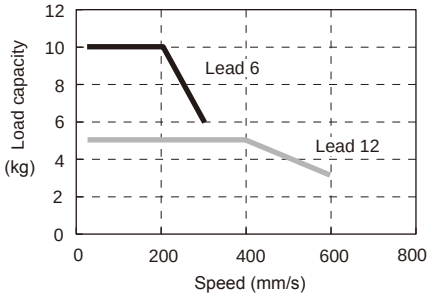
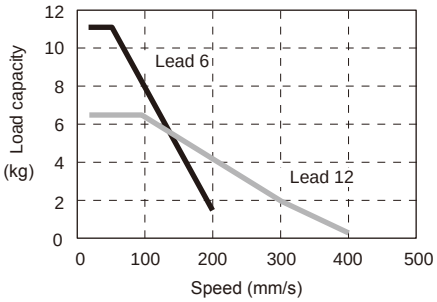
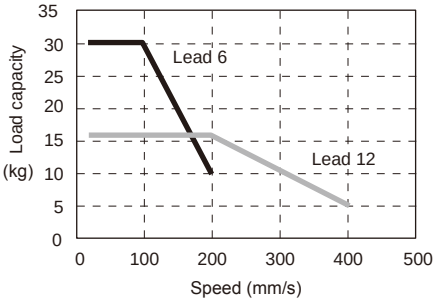
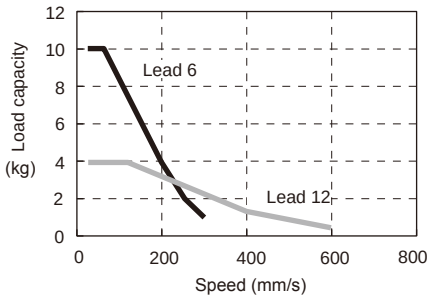
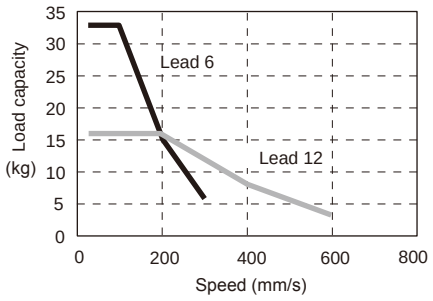
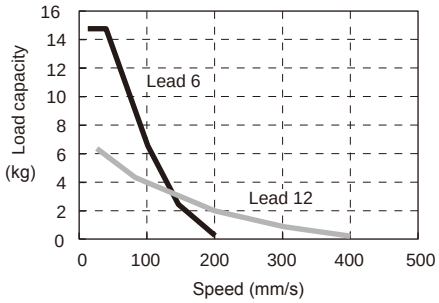
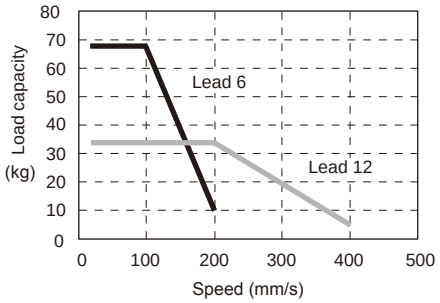


M : workpiece weight (kg)

$MY_2=M\times(a \text{ or } d)\times L$

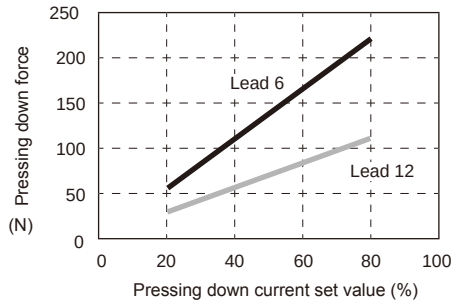
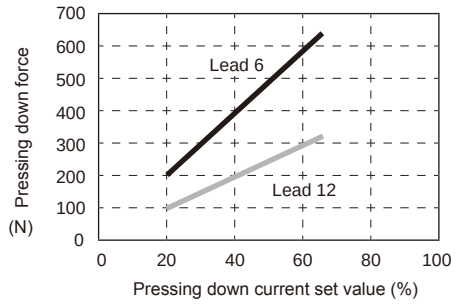
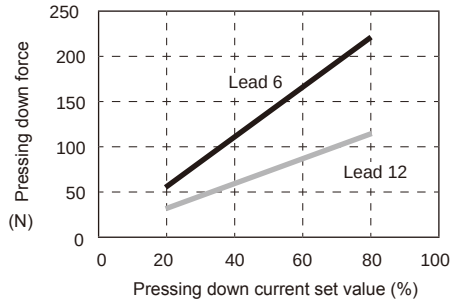
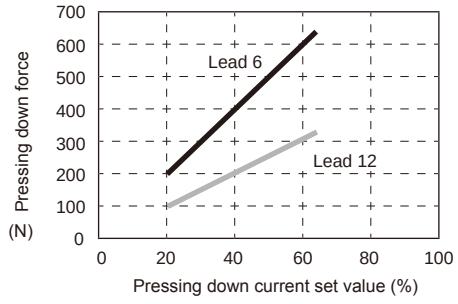
* Select the larger value of a and d.

Technical data ① Vertical load capacity and horizontal load capacity

	Vertical load capacity	Horizontal load capacity
ERL2-45		
ERL2-60		
ESD2-35, 45	 *	 *
ESD2-55	 *	 *

* For rod type (ESD2), use with guidance not lateral load to apply.

Pressing force

	Pressing force (indication)
ERL2-45	 Note: Use within the allowable moment.
ERL2-60	 Note: Use within the allowable moment.
ESD2-35, 45	
ESD2-55	

Safety precautions

Be sure to read the instructions before use

When designing and manufacturing devices using electric actuator, the manufacturer has an obligation to manufacture a safe device, and to check that the safety of the device's mechanical mechanism and the system operated by the electrical control that controls the device is secured.
Product selection, its usage and handling, as well as adequate maintenance management are important in order to safely use CKD products.
Observe warnings and precautions to ensure device safety.
In addition, use without shock applying to the moving part. Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience in handling.

2 Use within the product's specification range.

This product must be used within its stated specifications. Do not attempt to modify or additionally machine the product.
This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(If you consult CKD upon adoption and consent to CKD product specification, it will be applicable; however, safeguards should be adopted that will circumvent dangers in the event of failure.)

❶ Use for special applications including nuclear energy, railway, aircraft, marine vessel, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits or for safeguard.
❷ Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design.

4 Do not remove devices until safety is confirmed.

❶ Inspect and service the machine and devices after securing the safety of all the systems related to this product.
❷ Exercise caution as high temperature and charged parts can be present even when operation is stopped.
❸ Before starting device inspection or maintenance, turn off the device power and other powers to related devices and check leakage current.

5 Observe warnings and cautions in the instruction manual of each product.

❶ Unexpected movement may occur during robot teaching or test operation, so keep hands, etc., away from the actuator. When conducting operation with the shaft not visible, be sure before starting operation that safety is ensured even if the actuator moves.

6 To prevent electric shock, observe warnings and cautions.

❶ Do not touch the heat sink, cement resistor and motor installed in the controller.
Failure to do so may cause burn because these parts are hot.
Take sufficient time before conducting inspection and other operations.
Even immediately after the power is turned off, a high voltage is applied until the electric charge accumulated in the internal capacitor is discharged. Wait three minutes or so after turning the power off before touching these parts.
❷ Turn off the controller power source before conducting maintenance or inspection.
Electric shocks from high voltage may occur.
❸ Do not connect or disconnect connectors while power is on. Misoperation, faults, or electrical shock may occur.

7 Set up the overcurrent protection device.

In carrying out wiring to the controller, install over-current protective devices (such as wiring breaker and circuit protector) to the primary power supply for power (terminal block number L1, L2 and L3) and control (connector number CN3-24VDC) in accordance with "JIS B 9960-1:2008 Safety of machinery - Electrical equipment of machines - Part 1: General requirements".

(Excerpt from JIS B9960-1 7.2.1 General Requirements)
Overcurrent protection shall be provided where the current in a machine circuit can exceed either the rating of any component or the allowable current capacity of the conductors,whichever is the lesser value. The ratings or settings to be selected are specified in 7.2.10.

8 Unexpected accident may happen. Observe the following cautions to prevent accidents.

■ The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

⚠ DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

⚠ WARNING: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

⚠ CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Disclaimer

1 Warranty period

"Warranty Period" of this product is one (1) year from the first delivery to the place you specified.

2 Scope of warranty

In case of a fault which is proved to be the responsibility of the CKD during the above warranty period, we shall offer a replacement part or a spare part of this product free of charge or repair the part in our plant free of charge.
Note that the following faults are excluded from the warranty:

① Operation under the conditions or in the environment derailing from those specified in the product specifications.
② Failure caused by lack of attention or erroneous control.
③ Failure caused by other than the delivered product.
④ Failure caused by operation derailing from the purposes for which the product is designed.
⑤ Failure caused by modification in the structure, performance, specification or other features made by other than us after delivery, or failure caused by repairs done by other than our designated contractor.
⑥ Loss in our product assembled to your machine or equipment, which would be avoided if your machine or equipment were provided with general functions, structures or other features common in the industry.
⑦ Failure caused by reason that is unforeseeable with technology put into practical use at the time of delivery.
⑧ Failure caused by fire, earthquake, flood, lightning, or other acts of God, earth shock, pollution, salt hazard, gas Intoxication, excessive voltage, or other external causes.

The warranty mentioned here covers the discrete delivered product. Only the scope of warranty shall not cover losses induced by the failure of the delivered product

3 Warranty for exported products

(1) Products returned to the CKD factory or to a company or factory designated by CKD shall be repaired. Work and cost necessary for transportation shall not be compensated for.
(2) The repaired product shall be returned to a designated place in Japan with domestic packaging specifications. This warranty specifies basic conditions. If warranty details in individual specification drawings or specifications differ from these warranty conditions, specification drawings or specifications shall take priority.

4 Compatibility confirmation

The suitability of our products with system, machines, equipment that you are going to use, please check with your own risk.

5 Scope of service

Technician dispatch service expense is not included in the price of delivered products. We shall receive the expense separately in the following cases:
(1) Installation adjustment instruction and presence in test operation
(2) Maintenance, adjustment and repair
(3) Technical guidance and technical training (operation, program, wiring method, safety education, etc.)

Safety precautions

Always read this section before starting use

Individual precautions: Electric actuator ERL2/ESD2 Series/EC07/EC63 Controller/Teaching pendant ETP2

Design & Selection

1. Common

⚠ Danger

- Do not operate the product in flammable or explosive atmospheres.
  Doing so may create the risk of ignition and explosion.
- Keep the actuator away from drop of water or oil.
  Failure to do so may result in a fire or faulty operation.
- Make sure to hold and lock (including work pieces) when installing the product. The operator could be injured due to falling or abnormal operation of the product.
- Make sure to use DC stabilized power supply for motor or motor control, and output circuit power supplies.
  Connecting directly to AC power supply can result in fire, rupture, damage, etc.

⚠ Warning

- It may take several seconds to stop in an emergency, depending on rotation speed and load.
- In case the safety device stops the machine due to emergency stop, power outage or other system errors, the electric actuator must be designed so that its movement causes no damage to the operator and equipment.
- Provide a safeguard to prevent entry to the movable scope of electric actuator.
  In case of emergency, connect the controller's emergency stop push button switch and install it in a place facilitating operation.
  Be sure that the emergency stop push button has a structure which will not allow automatic restoration or unsafe restoration by operator.
- Use the shaft with a built-in brake when the shaft is not installed horizontally.
  If the servomotor is turned off (including emergency stop or alarm) or brakes are turned off, the actuator may fall and cause injury.
- The shaft with a built-in brake cannot completely clamp the actuator in all cases. When the slider is moved with unbalanced load during maintenance or the machine is stopped for a long time, it may not be sufficient to stop the shaft with the brakes alone for ensuring safety.
  Be sure that the equipment is in a balanced state or provide a mechanical locking mechanism.
- Install the actuator inside and keep away from humid places.
  Electrical leakage or a fire may occur in places where rainwater drips or is humid (under the conditions its humidity is more than 85% and condensation occurs). Drop of oil and oil mist should also be prohibited.
- Use and store the product under the right use/ storage temperature in atmospheres without condensation.
  Failure to do so may result in shorter life or abnormal stop of the actuator. Please ventilate if the heat is muffled.
- To prevent failure, explosion, or ignition, install the product away from direct sun, dust, flammable items, corrosive gas, explosive gas, and flammable gas. The product is not considered for chemical resistance.
  Failure to do so may result in the cause of break, explosion or ignition.
- Do not use and store the actuator in the places with strong electromagnetic waves, ultraviolet rays and radiation.
  Doing so may cause malfunction or failure.

⚠ CAUTION

- When wiring, in order to avoid induction noise being applied; do not pipe or wire with areas where large electric currents or strong magnetic fields can occur, or with large type motor power lines of those other than this unit. Use caution regarding inverter power supply and wiring sections used in robots, etc. Install a frame ground for same power source and make sure to insert a filter into output sections.
- If this product's output section and inductive loads that can generate surges (such as solenoid valves and relays) use a common power source, surge current can lead into output sections; causing damage. Therefore, separate inductive load outputs and this product's output power. If you cannot separate the power source, connect a surge absorbing element to all inductive loads directly and using a parallel configuration.

- Select a power supply for motor with enough capacity, with considering number to install. Malfunction can occur if there is not enough capacity. (Indication: □42…3.0A/installation, □56…4.3A/installation)
- Do not disassemble the product.
- Fixing cables cannot be used in applications with repeated bending. For repeated bending, use moving cables.
- Secure movable cables so that they cannot be moved easily. When securing, do not bend cables in sharp angles (min. curve radius: under 68 mm).
- As recognition of the origin position is performed when the power is on, it may recognize mistakenly an unintended position as the origin position, if there is an external stopper or retention mechanism such as the brake. In order to recognize the correct position of the origin, please pay attention on layout of external stopper etc.
- The suitability of our products with system, machines, equipment that you are going to use, please check with your own risk.

Installation & Adjustment

1. Common

⚠ Danger

- Do not enter the operating range of the actuator when the product is ready to operate. The product may move suddenly and injure.
- ERL2 Series (slider type) may catch fingers with motor part and slider when returning to the origin. Please be careful.

⚠ Warning

- Overturn, vibration, and shock should be avoided during transportation due to the integrated precision components.
  Parts could damage.
- In case of locating temporarily, place the actuator in a horizontal position.
- Do not climb on top of the product, use it as a footstool or, place any object.
- Set ambient temperature -10° to 50° and ambient humidity 35 to 80% when transporting without condensation or freezing.
  If not, failure may occur.
- Attachment to incombustible items is necessary. Direct attachment to flammable items or near the items could cause a fire.
- Make sure to perform D class grounding construction (ground resistance 100Ω or less) for the product.
  Electricity leakage can cause electric shock, malfunctions, etc.
- Securely perform wiring of this product without incorrect wiring or loose connectors while following this catalog. Check wiring insulation.
  Contact with other circuits, ground fault, and defective terminal insulation can lead to overcurrent flowing into the product; causing damage. It can cause abnormal operation and fire.
- Make sure to perform safety checks of the working range of the instrument before turning on the product's power. Off the power immediately, if the LED doesn't light even the power is on.
  Supplying the power carelessly can cause electric shock, injury, etc.
- Before restarting a machine or system, check that measures are taken so that parts do not come off.
- Make sure hands and body parts do not contact the product body during operation or immediately after stoppage.
  There is a risk of burns.
- Do not climb on top of the product, use it as a footstool or, place any object.
  That could be the causes of accidents by falling, turnover of the product, injury from falling, damage to the product, or operation errors caused by the damage.
- Even if there is a power failure, take countermeasures so as to cause no damage to human body, or to machines.
  This may results in failure to ensure safety.
- Do not damage, apply unreasonable stress, put heavy thing on, or catch cables.
  This could lead to electric shock.
- Manually moving movable parts of the product to set (direct teaching) should be done after confirming that the servo is OFF with teaching pendant.
- Direct teaching function is teaching operation to be performed while the servo is OFF. When the servo of the actuator is OFF, the moving part of the machine may move unexpectedly. In case of switching to the servo OFF, take countermeasures to make sure the safety and operate carefully.
- Before attempting to operate the actuator, please ensure that this can be carried out safely.

⚠ CAUTION

- During transfer or installation, do not hold the movable parts or cable section.
  It may causes injury or disconnection
- Installing the actuator in places under large vibration or impact conditions may lead to malfunction.
  Malfunction could occur.
- Do not operate the moving part of the product or decelerate rapidly by an external force.
  There is a possibility to damage or malfunction by the regenerative current.
- During home return, do not hit the mechanical stopper etc. other than the pressing action.
  Damaged feed screw may cause malfunction.
- When origin is returning, do not put external force on actuator. It may misrecognize the origin.
- Do not dent or scratch movable parts.
  Otherwise, malfunctioning may occur.
- Durability can be changed by transport load or environment. Sufficient setting for transport load etc. is required. Only the scope of warranty shall not cover losses induced by the failure of the delivered product.

2. ERL2 Series

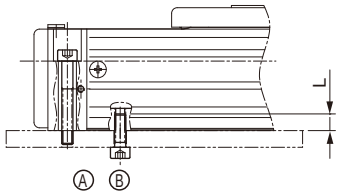
⚠CAUTION

- Do not apply an excessive moment on the slider for slider types.
  The product can be damaged or malfunction.

- For slider type, maintain parallelism of the installation mate at 0.05 mm/200 mm or less, and do not bend or apply bending force on the product.

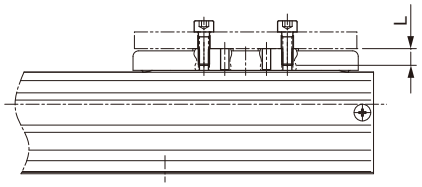
- For slider type, maintain parallelism of the slider work mate at 0.02 mm or less, and do not bend or apply bending force on the product.
  The product can be damaged or malfunction.

- Tighten the screws that attach the body, using the screws on the length of the table below with proper torque.



	Ⓐ		Ⓑ		Max. screw depth
	Applicable bolts	Tightening torque (N•m)	Applicable bolts	Tightening torque (N•m)	L (mm)
ERL2-45	M4×0.7	1.5	M4×0.7	1.5	8
ERL2-60	M5×0.8	3	M5×0.8	3	9

- Observe the following values for the bolt insertion lengths and tightening torque when installing the jig on the slider.



Mounting on slider side

	Applicable bolts	Tightening torque (N•m)	Max. screw depth L (mm)
ERL2-45	M4×0.7	1.5	7.5
ERL2-60	M5×0.8	3	10

- When mounting on the slider side, take moment load into consideration.
  Check model selection guide (pages 21 to 24).

3. ESD2 Series

⚠CAUTION

- When connecting, check that the rod's shaft center and the load movement direction are the same.
  Otherwise, feed screws could be worn or damaged.

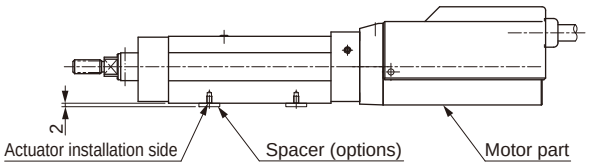
- If the external guide is used, check that it can be operated on all positions in product stroke before installation.

- Never apply the load in rotation direction at the edge of rods.
  It may result in damage of the product.

- Do not add any other external force other than rod bearing direction to the rod.

- Install guide which doesn't apply lateral load.

- On installation, fix the body firmly with hexagon socket head cap bolt etc.
  In case of installation with actuator mounting side, insert more than 4 square nuts (comply with JIS B 1163 (2001), attached to the product) in two grooves on the actuator mounting side of the product to fix firmly.



For ESD-35 and 55, motor part protrudes the actuator mounting side in a downward direction. If the motor interferes with the mounting side, use spacer (optional).

4. Teaching pendant

⚠CAUTION

- Connect the teaching pendant to the controller only when it is used. Other than that, leave it disconnected.

- Do not apply high pressure or impact against the product.
  Doing so could cause a failure.

- Do not apply an excessive force against cables or connector parts.

- Do not press LCD display and keys strongly.

During Use & Maintenance

1. Common

⚠CAUTION

- Wiring and inspection shall be conducted by specialized engineers.
- Perform wiring of the product after piping.
  This could lead to electric shock.
- Do not work with wet hands.
  This could lead to electric shock.
- Conduct wiring and inspection after more than 5 minutes has exceeded since turning the power off and after checking the voltage with a tester, etc.
  This could lead to electric shock.
- Do not install/remove wiring or connector-type items while the power is on.
  There is danger of malfunction, failure, and electric shock.
- In case of the cable extension, the lead wire to use should allow by 4A.
  Otherwise, the voltage drop may cause a malfunction, lack of thrust force, generation of heat, and shorter machine life.
- Do not connect the communication connector for this product to other devices.
  Malfunction, damage may be caused.
- Conduct a regular check 2 to 3 times in a year to make sure to work properly.
- Grease lubrication interval is usually 100km. However, it varies depending on the use conditions. It is recommended to determine the lubrication interval by the initial inspection.
- Shutdown the power immediately in case of product failure (abnormal heat, smoke, smell, sound, vibrations, etc.) It can cause product damage and fire due to continuous electrical current flow.
- When the servo is shut off (including emergency stop and alarm) in circumstances where gravity or inertia is applied, it does not stop immediately. Conduct these operations in a balanced state not subject to gravity or inertia, or confirm safety before starting.
- When performing maintenance, inspection, repair, stop the power supply to the product before. Call attention to the others around you not to turn the power on, or operate carelessly by a third party.
- In case of disposing the product, follow the low of waste disposal and public cleaning outsource to professional waste disposal service.
- For this product's integrated control board, a condenser is connected between the same circuit and metal body to prevent static electricity damage. Therefore, do not conduct withstanding voltage tests or insulation resistance tests on devices that have this product connected. Conducting such tests can damage this product. If necessary to conduct such tests for the device, please first remove/detach this product.
- When performing electrical welding, remove all frame ground connections from the product beforehand. Otherwise, the product could be damaged by extreme high voltage or serge voltage by welding currency during welding.

MEMO

Related products

Electric actuator Motorless type

Catalog No. CC-1165A, CC-1216A, CC-1217A

■ Ballscrew drive ETS Series

- Motor size: 8 types, Lead: 7 types, Motor installation direction: 5 types
- Installation of familiar motor is available
- For origin sensor limit sensor, various mounting specifications can be selected
- Stroke can be selected from 100 to 1500mm (50mm pitch).
- Max. payload is 150kg, max. speed is 2000mm/s and it accommodates a wide range of applications

■ Ballscrew drive low-dust generation specifications ECS Series

- Low dust generation achieved by ETS Series based full-cover structure and the suction port .
- Motor size: 7 types, Lead: 7 types, Motor installation direction: 5 types
- Installation of familiar motor is available
- For origin sensor limit sensor, various mounting specifications can be selected
- Stroke can be selected from 100 to 1500mm (50mm pitch).
- Max. payload is 150kg, max. speed is 2000mm/s and it accommodates a wide range of applications

■ Belt drive ETV Series

- ETS Series based belt drive type.
- Design features stroke selectable up to 100 to 3500m (50mm pitch), and max. speed of 2000m/s, long stroke and high speed.
- Motor size: 6 types, Motor installation direction: 6 types
- Installation of familiar motor is available

Electric actuator ESSD/ELCR Series

Catalog No. CC-1002A

■ Space saving

Wiring and installation space for the controller is no longer required.

■ Design pneumatically

Shaped, used, operated like pneumatic cylinder.

■ Flexible motion control

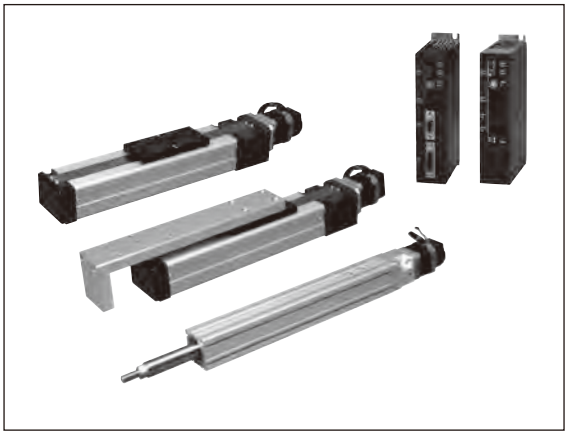
Three control modes, speed & acceleration control and positioning completion width (imposition) can be set

■ Easy teaching

Easy setting with 5 buttons. Direct configuration is available.

Electric actuator KBZ Series

Catalog No. CC-1102A



■ High tact time
Max. operation speed of 800mm/s possible

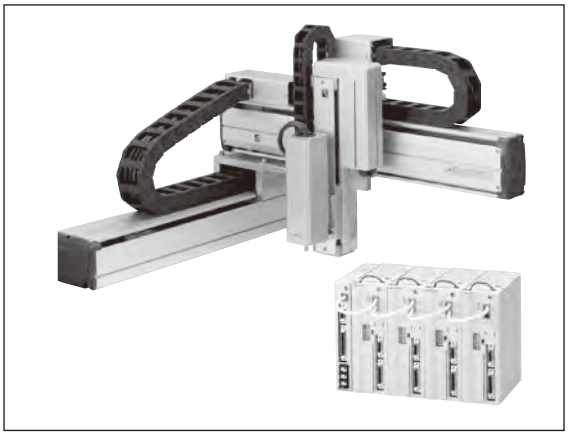
■ Servo motor
Servo motor for a compact axis. Allow to high-speed operation, quick acceleration and deceleration, and high load capacity.

■ Absolute specifications
No need for return-home routine.

■ Compact controller
Drastic downsizing.

Electric actuator KBB Series

Catalog No. CC-783A



■ High tact time
Max. 2000mm/s (timing belt drive)

■ high precision
Repeatability (ballscrew drive)

■ Absolute specifications
All models are unified to no home positioning required specifications by using long service life lithium batteries (service life: 50,000 hours)

■ High-level process by high-speed CPU
Delivered high level process performance by adopting high speed CPU

■ Various variation
7 types of ball screws, 6 timing belts
4 directions of installing position of motor are selectable for each axis

ABSODEX compact type AX6000M Series

Catalog No. CC-1148A

■ Space-saving
In addition to industry min. external dimensions, for the concentric shape (the fixed axis and the rotation axis is the same), compact machine design that saves a waste of space is possible.

■ Flexible
Operation can be realized as imagined because it has abundant program creation functions. Furthermore, it corresponds to simple operation setting such as automatic creation point specified program.

■ High reliable and maintenance free
Because of the direct-drive system (gearless), there is no need to worry about gear damage or accuracy changes through wear of the gear unit.

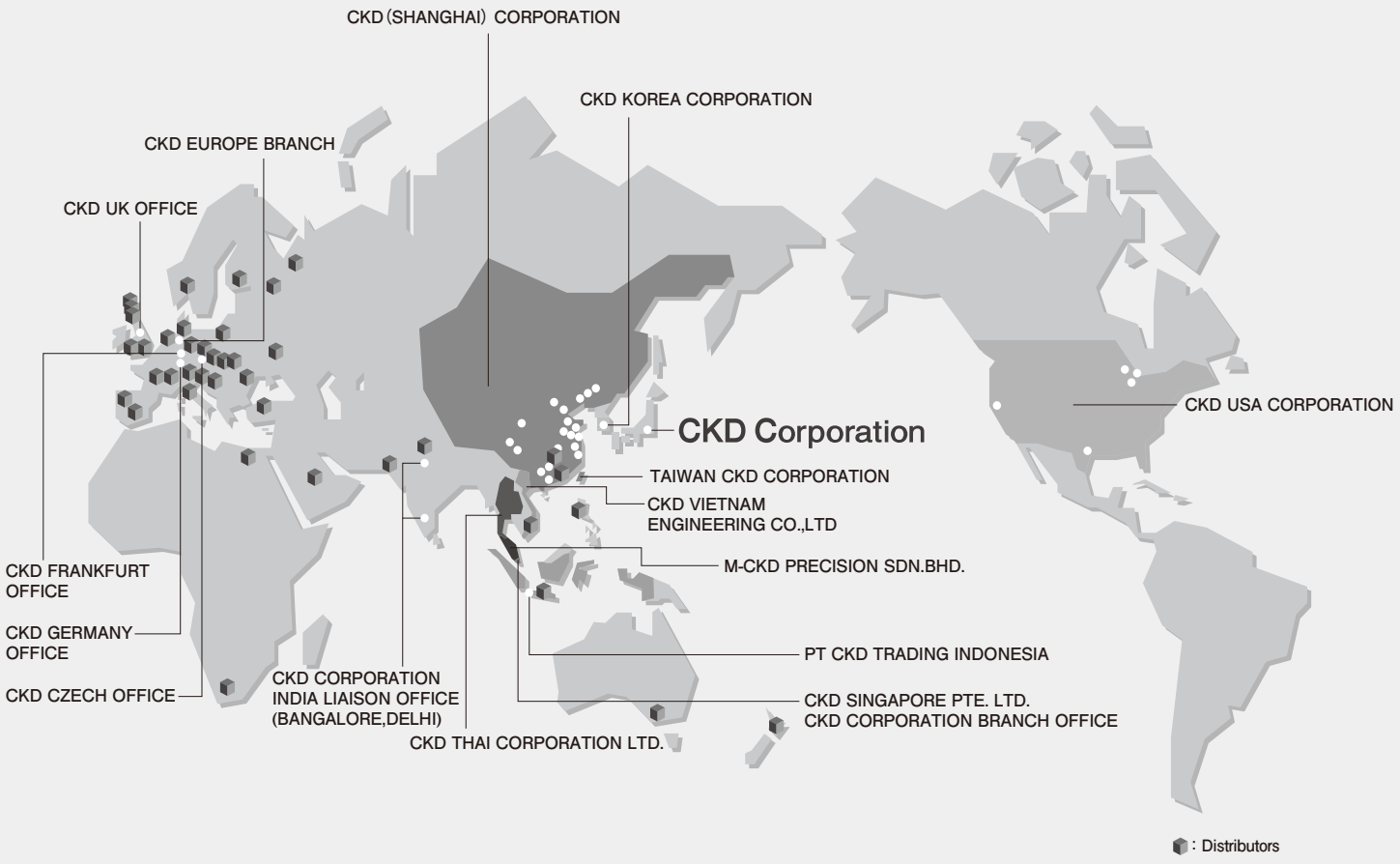
Direct drive actuator quick response type AX1000T, AX2000T, AX4000T Series

Catalog No. CC-995A

■ Various actuator
12 types of actuators are available from 6 to 1000N•m

■ 5 options for interface
5 types (Parallel I/O(NPN,PNP), CC-Link, DeviceNet, PROFIBUS-DP) are available for driver interface.

WORLD−NETWORK



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