CKD

Electric Actuator

(MOTORLESS TYPE, COMPATIBLE WITH SERVO MOTORS)

EBS-L Series

EBR-L Series

INSTRUCTION MANUAL

SM-A07528-A/7

- Be sure to read this manual carefully and thoroughly before using this product.
- Pay extra attention to the instructions concerning safety.
- After reading this manual, keep it in a safe and convenient place.

CKD株式会社

Introduction

Thank you for purchasing our “**EBS-L Series**” and/or “**EBR-L Series Electric Actuator**.” This Instruction Manual describes basic instructions on operation, including mounting and usage, so that the product can perform at its full potential. Please read them carefully and use the product correctly. Keep this Instruction Manual in a safe place where it will not get lost.

Specifications and appearance described in this manual may be changed without prior notice.

- This product is intended for people who have basic knowledge of materials, wiring, electricity, mechanism, etc. CKD is not responsible for accidents caused by the selection and use of the product by persons without knowledge or sufficient training.
- Since our customers use this product for a very wide range of applications, CKD cannot keep track of all of them. Depending on the application and usage, the product may fail to demonstrate the best performance due to fluid, wiring or other conditions, or it may lead to an accident. It is the customer's responsibility to check the specifications of the product and decide how to use it according to the intended use.

For Safe Operation

When designing and manufacturing equipment using this product, it is obligatory to manufacture safe equipment. To do so, ensure that the mechanism of the equipment and the system that controls it electrically are safe.

In order to use our products safely, it is important to appropriately select, use, handle and maintain them.
To secure product safety, make sure to observe warnings and precautions described in this Instruction Manual.

This product incorporates many functions and mechanisms to ensure safety. However, mishandling of the product by a customer may lead to accidents. To avoid such accidents,

Before using the product, read this Instruction Manual carefully for proper operation.

Precautions are ranked into 3 categories: “DANGER,” “WARNING” and “CAUTION” in order to clearly indicate the level of potential hazard.

⚠ DANGER	If mishandled, dangerous situations leading to fatal or serious injuries may occur and there is a high degree of emergency.
⚠ WARNING	If mishandled, dangerous situations leading to fatal or serious injuries may occur.
⚠ CAUTION	If mishandled, dangerous situations leading to minor injuries or damage to property may occur.

Note that even some precautions described as “CAUTION” may lead to serious results depending on a situation.
All of them contain important information, so be sure to follow them.

In addition, general precautions and usage tips are indicated with the following icon.

	Provides general precautions and tips.

Precautions on Product

⚠ DANGER

Do not use this product for the following purposes.

- Medical equipment related especially to sustainment and control of human life and body
- Mechanical devices and mechanisms designed for the purpose of moving or transporting people
- Critical security parts in mechanical devices

⚠ WARNING

Be sure to use the product within product specifications.

Precautions on Disposal

⚠ CAUTION

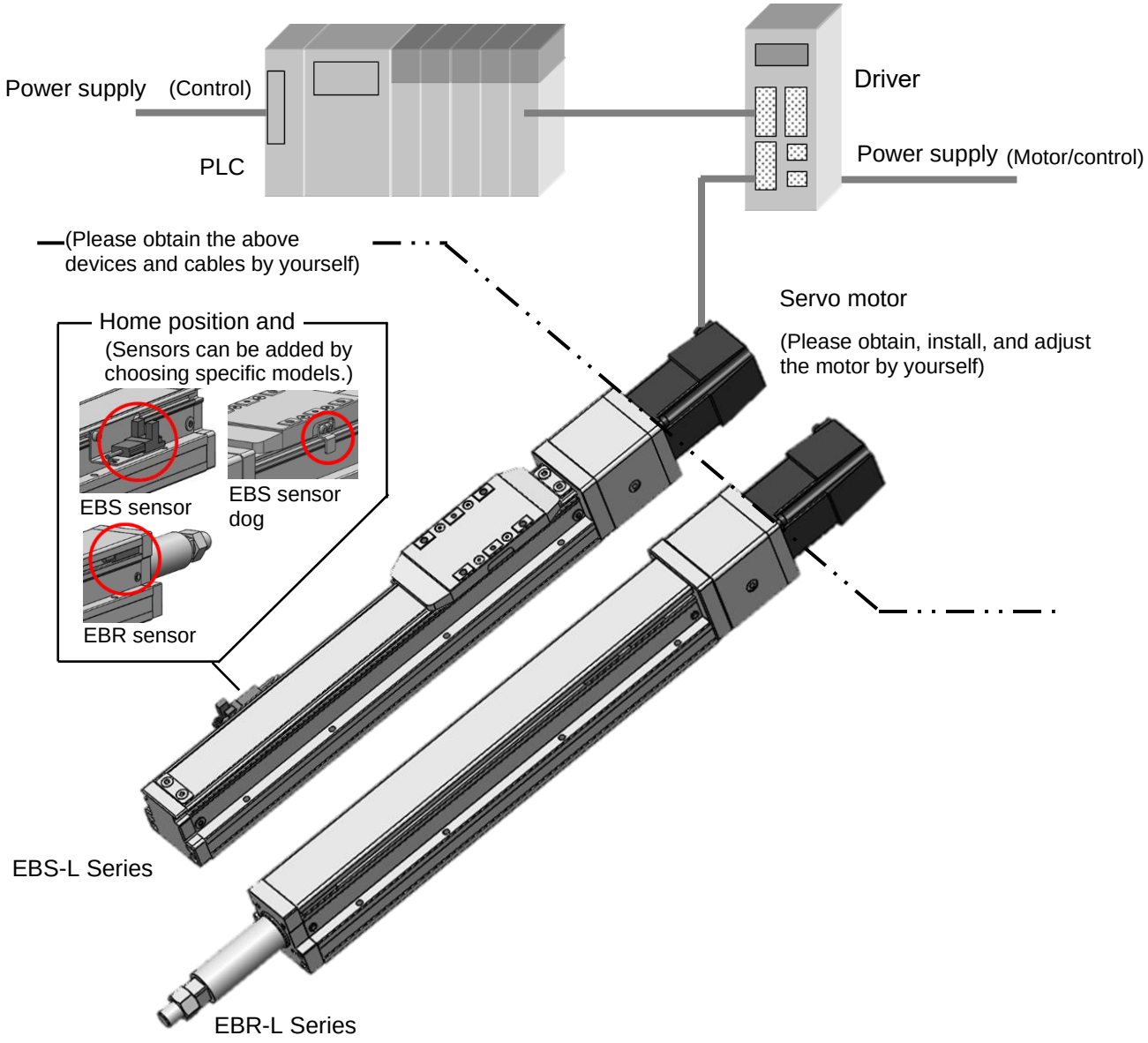
When disposing of this product, follow the Waste Disposal and Public Cleansing Law, and make sure to have it disposed of by a specialized waste disposer.

Table of Contents

1. Product Overview

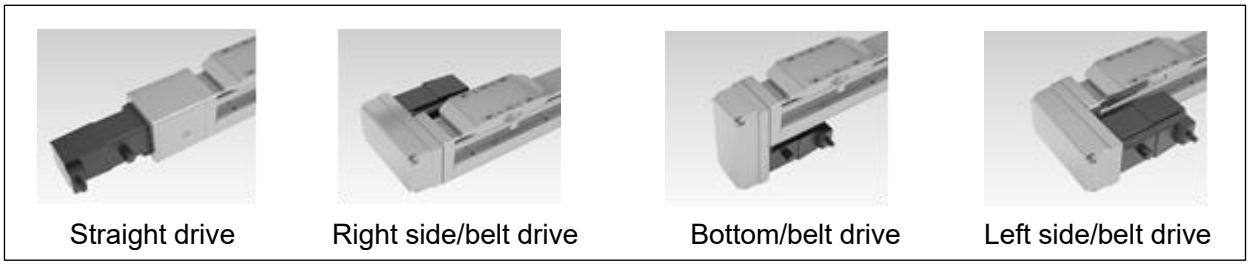
1.1 System Overview

1.1.1 System Configuration



Motor installation method

Four models available for different installation positions



1.2 Model Code

1.2.1 EBS-L Series (compatible with servo motors)

EBS - 05 L E - 02 0300 N NN - M 1 N N

A B C D E F G H I J

Symbol	Description
A:	Body size (mm)
04	Body width: 44 mm
05	Body width: 54 mm
08	Body width: 82 mm
12	Body width: 120 mm
B:	Motor
L	Without
C:	Motor installation direction (See Table 1 in the next section)
E	Straight drive
R	Right side/belt drive
D	Bottom/belt drive
L	Left side/belt drive
D:	Thread lead (See Table 2 in the next section)
02	2mm
05	5mm
06	6mm
10	10mm
12	12mm
20	20mm
32	32mm
E:	Stroke length (See Table 2 in the next section)
0050 to 1250	50 to 1250 mm (50 mm pitch)
F:	Brake
N	Without
G:	Specifications of the installed motor (See Table 3 in the next section)
M	For details on specifications of the installed motor, see the table left.
Y	
P	
F	
H:	Motor size (See Table 1 in the next section)
H	50W
1	100W
2	200W
4	400W
I:	Home position sensor (See Note 1)
N	Without
C	With
J:	Limit sensor (See Note 1)
N	Without
B	With

G: Specifications of the installed motor

Manufacturer	50W	100W	200W	400W
MITSUBISHI ELECTRIC	M	M	M	M
DELTA ELECTRONICS	M	M	M	M
SANYO DENKI	M	M	M	M
YASUKAWA ELECTRIC	Y	Y	Y	Y
KEYENCE	Y	Y	Y	Y
PANASONIC	P	P	P	P
OMRON	M	M	P	P
Fuji Electric Co., Ltd.	M	M	M	M
FANUC	F	F	F	-
Bosch Rexroth AG.	P	P	P	P
Rockwell Automation, Inc	M	M	M	M
SIEMENS AG	M	M	M	M

Note 1) The home position sensor and limit sensors are used together.
If either is "without," also select "without" for the other.

[FP series]

For food manufacturing processes

EBS - 05 L E - 02 0300 N NN - M 1 N N - U -FP1

A B C D E F G H I J K

Symbol	Description
K:	Anti-rust treatment
N	Non
U	Yes

[P4 series]

Compatible with secondary batteries

EBS - 05 - L E - 02 0300 N NN - M 1 N N - U - P4

A B C D E F G H I J K

Symbol	Description
K:	Anti-rust treatment
N	Non
U	Yes

Table 1: (C) Motor installation direction and (H) motor size

Model	(C) Motor installation direction				(H) Motor size			
	Straight drive	Right side/belt drive	Bottom/ belt drive	Left side/belt drive	H <50 W>	1 <100 W>	2 <200 W>	4 <400 W>
EBS - 04L	○	○	○	○	○	-	-	-
EBS - 05L	○	○	○	○	-	○	-	-
EBS - 08L	○	○	○	○	-	-	○	-
EBS - 12L	○	○	○	○	-	-	-	○

Table 2: (D) Thread lead and (E) stroke length

Model	(D) Thread lead (mm)							(E) Stroke length (mm)
	2	5	6	10	12	20	32	(50 mm pitch)
EBS - 04L	-	-	○	-	○	-	-	50-500
EBS - 05L	○	○	-	○	-	○	-	50-800
EBS - 08L	-	○	-	○	-	○	-	50-1100
EBS - 12L	-	○	-	○	-	○	○	50-1250

Table 3: (G) Specifications of the installed motor and recommended motor model No. and (H) motor size

(G) Specifications of the installed motor		(H) Motor size			
Symbol	Manufacturer	H <50 W>	1 <100 W>	2 <200 W>	4 <400 W>
M	MITSUBISHI ELECTRIC	HG-KR053	HG-KR13	HG-KR23	HG-KR43
		HK-KT053W	HK-KT13W	HK-KT23W	HK-KT43W
M	DELTA ELECTRONICS	ECMA-C1040F	ECMA-C10401	ECMA-C10602	ECMA-C10604
M	SANYO DENKI	R2□A04005	R2□A04010	R2□A06020	R2□A06040
Y	YASUKAWA ELECTRIC	SGMJV-A5	SGMJV-01	SGMJV-02	SGMJV-04
		SGM7J-A5	SGM7J-01	SGM7J-02	SGM7J-04
Y	KEYENCE	SV-□005	SV-□010	SV-□020	SV-□040
		SV2-□005	SV2-□010	SV2-□020	SV2-□040
P	PANASONIC	MSMD5A	MSMD01	MSMD02	MSMD04
		MSMF5A	MSMF01	MSMF02	MSMF04
M	OMRON	R88M-K05030	R88M-K10030	-	-
		R88M-1M05030	R88M-1M10030	-	-
P		-	-	R88M-K20030	R88M-K40030
		-	-	R88M-1M20030	R88M-1M40030
M	Fuji Electric Co., Ltd.	GYS500D7-□B2□	GYS101D7-□B2□	GYS201D7-□B2□	GYS401D7-□B2□
		-	-	GYB201D7-□B2□	GYB401D7-□B2□
P	Bosch Rexroth AG.	MSM019A	MSM019B	MSM031B	MSM031C
M	Rockwell Automation, Inc	TLP-A046-005-DKA□2	TLP-A046-010-DKA□2	TLP-A070-020-DKA□2	TLP-A070-040-DKA□2
M	SIEMENS AG *2	1FK2102-0AG0	1FK2102-1AG0	1FK2203-2AG0	1FK2203-4AG0

*1 For other motor manufacturers and models, contact us.

*2 This servo motor is a product that falls under item 7 (8) of the Appended Table 1 of the Export Trade Control Order. (As of January 2021)

- This product has no motor.
- Please obtain, install, and adjust the motor and driver by yourself.

1.2.2 EBR-L Series (compatible with servo motors)

EBR - 05 L E - 00 - 02 0050 N NN - M 1 N N

A B C D E F G H I J

Symbol	Description
A:	Body size (mm)
04	Body width: 44 mm
05	Body width: 54 mm
08	Body width: 82 mm
12	Body width: 120 mm
B:	Motor
L	Without
C:	Motor installation direction (See Table 1 in the next section)
E	Straight drive
R	Right side/belt drive
D	Bottom/belt drive
L	Left side/belt drive
D:	Thread lead (See Table 2 in the next section)
02	2mm
05	5mm
06	6mm
10	10mm
12	12mm
20	20mm
32	32mm
E:	Stroke length (See Table 2 in the next section)
0050 to 0800	50 to 800 mm (50 mm pitch)
F:	Brake
N	Without
G:	Specifications of the installed motor (See Table 3 in the next section)
M	For details on specifications of the installed motor, see the table left.
Y	
P	
F	
H:	Motor size (See Table 1 in the next section)
H	50W
1	100W
2	200W
4	400W
I:	Home position sensor (See Note 1)
N	Without
C	With
J:	Limit sensor (See Note 1)
N	Without
B	With

G: Specifications of the installed motor

Manufacturer	50W	100W	200W	400W
MITSUBISHI ELECTRIC	M	M	M	M
DELTA ELECTRONICS	M	M	M	M
SANYO DENKI	M	M	M	M
YASUKAWA ELECTRIC	Y	Y	Y	Y
KEYENCE	Y	Y	Y	Y
PANASONIC	P	P	P	P
OMRON	M	M	P	P
Fuji Electric Co., Ltd.	M	M	M	M
FANUC	F	F	F	-
Bosch Rexroth AG.	P	P	P	P
Rockwell Automation, Inc	M	M	M	M
SIEMENS AG	M	M	M	M

Note 1) The home position sensor and limit sensors are used together.
If either is “without,” also select “without” for the other.

[FP series]

For food manufacturing processes

EBR - 05 L E - 00 - 02 0050 N NN - M 1 N N - FP1

A B C D E F G H I J

[P4 series]

Compatible with secondary batteries

EBR - 05 L E - 00 - 02 0050 N NN - M 1 N N - P4

A B C D E F G H I J

Table 1: (C) Motor installation direction and (H) motor size

Model	(C) Motor installation direction				(H) Motor size			
	Straight drive	Right side/belt drive	Bottom/belt drive	Left side/belt drive	H <50 W>	1 <100 W>	2 <200 W>	4 <400 W>
EBR - 04L	○	○	○	○	○	-	-	-
EBR - 05L	○	○	○	○	-	○	-	-
EBR - 08L	○	○	○	○	-	-	○	-
EBR - 12L	○	○	○	○	-	-	-	○

Table 2: (D) Thread lead and (E) stroke length

Model	(D) Thread lead (mm)							(E) Stroke length (mm)
	2	5	6	10	12	20	32	(50 mm pitch)
EBR - 04L	-	-	○	-	○	-	-	50-400
EBR - 05L	○	○	-	○	-	○	-	50-400
EBR - 08L	-	○	-	○	-	○	-	50-700
EBR - 12L	-	○	-	○	-	○	○	50-800

Table 3: (G) Specifications of the installed motor and recommended motor model No. and (H) motor size

(G) Specifications of the installed motor		(H) Motor size			
Symbol	Manufacturer	H〈50W〉	1〈100W〉	2〈200W〉	4〈400W〉
M	MITSUBISHI ELECTRIC	HG-KR053	HG-KR13	HG-KR23	HG-KR43
		HK-KT053W	HK-KT13W	HK-KT23W	HK-KT43W
M	DELTA ELECTRONICS	ECMA-C1040F	ECMA-C10401	ECMA-C10602	ECMA-C10604
M	SANYO DENKI	R2□A04005	R2□A04010	R2□A06020	R2□A06040
Y	YASUKAWA ELECTRIC	SGMJV-A5	SGMJV-01	SGMJV-02	SGMJV-04
		SGM7J-A5	SGM7J-01	SGM7J-02	SGM7J-04
Y	KEYENCE	SV-□005	SV-□010	SV-□020	SV-□040
		SV2-□005	SV2-□010	SV2-□020	SV2-□040
P	PANASONIC	MSMD5A	MSMD01	MSMD02	MSMD04
		MSMF5A	MSMF01	MSMF02	MSMF04
M	OMRON	R88M-K05030	R88M-K10030	-	-
		R88M-1M05030	R88M-1M10030	-	-
P		-	-	R88M-K20030	R88M-K40030
		-	-	R88M-1M20030	R88M-1M40030
M	Fuji Electric Co., Ltd.	GYS500D7-□B2□	GYS101D7-□B2□	GYS201D7-□B2□	GYS401D7-□B2□
		-	-	GYB201D7-□B2□	GYB401D7-□B2□
P	Bosch Rexroth AG.	MSM019A	MSM019B	MSM031B	MSM031C
M	Rockwell Automation, Inc	TLP-A046-005-DKA□2	TLP-A046-010-DKA□2	TLP-A070-020-DKA□2	TLP-A070-040-DKA□2
M	SIEMENS AG *2	1FK2102-0AG0	1FK2102-1AG0	1FK2203-2AG0	1FK2203-4AG0

*1 For other motor manufacturers and models, contact us.

*2 This servo motor is a product that falls under item 7 (8) of the Appended Table 1 of the Export Trade Control Order. (As of January 2021)

- This product has no motor.
- Please obtain, install, and adjust the motor and driver by yourself.

1.3 Specifications

1.3.1 Specifications

[Slider type]

Item			Model												
			EBS-04L		EBS-05L				EBS-08L			EBS-12L			
Applicable motor size			50W		100W				200W			400W			
Ball screw diameter		(mm)	ø10		ø12				ø16			ø16			
Stroke length *1		(mm)	50 to 500		50 to 800				50 to 1100			50 to 1250			
Thread lead		(mm)	6	12	2	5	10	20	5	10	20	5	10	20	32
Max. load capacity *2	Horizontal	(kg)	20	12	30	30	15	10	50	30	12	110	88	40	30
	Vertical	(kg)	5	2	10	10	5	2.5	15	8	2.5	33	22	10	8
Max. speed *3		(mm/s)	300	600	100	250	500	1000	250	500	1000	250	500	1000	1600
Rated thrust *2		(N)	141	71	854	341	170	85	683	341	174	1388	694	347	218
Repeatability		(mm)	±0.01												
Lost motion (mm)		(mm)	0.1 or less												
Static allowable load		(N)	1030		1168				2781			8310			
Static allowable moment		(N·m)	MP:62 MY:62 MR:92		MP:103 MY:103 MR:144				MP:203 MY:203 MR:336			MP:606 MY:606 MR:1168			
Operating ambient temperature		(ºC)	0 to 40 (without condensation or freezing)												
Operating ambient humidity		(%)	35 to 80 (without condensation or freezing)												
Storage ambient temperature		(ºC)	-10 to 50 (without condensation or freezing)												
Storage ambient humidity		(%)	35 to 80 (without condensation or freezing)												

[Guide built-in rod type]

Item			Model												
			EBR-04L		EBR-05L				EBR-08L			EBR-12L			
Applicable motor size			50W		100W				200W			400W			
Ball screw diameter		(mm)	ø10		ø12				ø16			ø16			
Stroke length *1		(mm)	50 to 400		50 to 400				50 to 700			50 to 800			
Thread lead		(mm)	6	12	2	5	10	20	5	10	20	5	10	20	32
Max. load capacity *2	Horizontal	(kg)	20	12	30	30	15	10	50	30	12	110	88	40	30
	Vertical	(kg)	5	2	10	10	5	2.5	15	8	2.5	33	22	10	8
Max. speed *3		(mm/s)	300	600	100	250	500	1000	250	500	1000	250	500	1000	1600
Rated thrust *2		(N)	141	71	854	341	170	85	683	341	174	1388	694	347	218
Repeatability		(mm)	±0.01												
Lost motion (mm)		(mm)	0.1 or less												
Operating ambient temperature		(ºC)	0 to 40 (without condensation or freezing)												
Operating ambient humidity		(%)	35 to 80 (without condensation or freezing)												
Storage ambient temperature		(ºC)	-10 to 50 (without condensation or freezing)												
Storage ambient humidity		(%)	35 to 80 (without condensation or freezing)												

*1: The stroke pitch is 50 mm.

*2: The thrust force and maximum load capacity are the allowable values of the actuator body, and the actual thrust force and load capacity may be limited by the motor used by the customer.

*3: The maximum speed is an estimated value on the assumption that the motor installed by the customer outputs a rotational speed of 3,000 rpm.

Stroke and Maximum Speed

	Model No.	Applicable motor size	Thread lead (mm)	Stroke (mm) and max. speed (mm/s)
Slider	EBS-04L	50W	6	300 (50 … 500) — 1.70 seconds
			12	600 (50 … 500) — 0.89 seconds
	EBS-05L	100W	2	100 (50 … 500) — 90 — 80 — 70 — 60 — 13.34 seconds
			5	250 (50 … 500) — 225 — 200 — 175 — 150 — 5.35 seconds
			10	500 (50 … 500) — 450 — 400 — 350 — 300 — 2.70 seconds
			20	1000 (50 … 500) — 900 — 800 — 700 — 600 — 1.39 seconds
	EBS-08L	200W	5	250 (50 … 700) — 225 — 200 — 175 — 150 — 125 — 100 — 75 — 50 — 22.01 seconds
			10	500 (50 … 700) — 450 — 400 — 350 — 300 — 250 — 200 — 150 — 100 — 11.01 seconds
			20	1000 (50 … 700) — 900 — 800 — 700 — 600 — 500 — 400 — 300 — 200 — 5.52 seconds
	EBS-12L	400W	5	250 (50 … 700) — 225 — 200 — 175 — 150 — 140 — 130 — 120 — 110 — 100 — 90 — 80 — 15.63 seconds
			10	500 (50 … 700) — 450 — 400 — 350 — 325 — 300 — 275 — 250 — 225 — 200 — 175 — 150 — 8.35 seconds
			20	1000 (50 … 700) — 900 — 800 — 700 — 650 — 600 — 550 — 500 — 450 — 400 — 350 — 300 — 4.20 seconds
			32	1600 (50 … 700) — 1450 — 1300 — 1150 — 1050 — 950 — 850 — 750 — 650 — 550 — 450 — 350 — 3.61 seconds
Guide built-in rod	EBR-04L	50W	6	300 — 250 — 1.63 seconds
			12	600 — 510 — 0.84 seconds
	EBR-05L	100W	2	100 — 85 — 4.71 seconds
			5	250 — 200 — 2.02 seconds
			10	500 — 400 — 1.04 seconds
			20	1000 — 850 — 0.56 seconds
	EBR-08L	200W	5	250 — 200 — 3.52 seconds
			10	500 — 400 — 1.79 seconds
			20	1000 — 850 — 0.91 seconds
	EBR-12L	400W	5	250 — 200 — 4.02 seconds
			10	500 — 400 — 2.04 seconds
			20	1000 — 850 — 1.03 seconds
			32	1600 — 1350 — 0.73 seconds

- The thrust force and maximum load capacity are the allowable values of the actuator body, and the actual thrust force and load capacity may be limited by the motor used by the customer.
- The maximum speed is an estimated value on the assumption that the motor installed by the customer outputs a rotational speed of 3,000 rpm.
- ⏱ indicates the positioning time. This is on the assumption that the longest stroke is operated at horizontal setting, maximum speed, and maximum acceleration/deceleration. Note that this is not the value at the maximum load capacity.

2. Installation

⚠DANGER

Do not operate the product where there are hazardous materials such as combustibles, flammables, and explosives.
The product may ignite, catch fire, or explode.

Keep the product from being exposed to water or oil.
They may cause fire, current leakage or product failure. Do not use oil droplets or oil mist.

Securely hold and lock the product (including workpieces) when installing the product.
The operator could be injured due to falling, dropping, or abnormal operation of the product.

The driver power supply and the I/O circuit power supply should be selected after carefully reading the catalogs and instruction manuals of the manufacturer of the motors used.
Connecting the product directly to the AC power source may cause fire, explosion, or damage.

In accordance with "JIS B 9960-1: 2019 Safety of machinery -- Electrical equipment of machines -- Part 1: General requirements," install overcurrent protection equipment (circuit breakers or circuit protectors, etc.) on the primary power supply side of wiring.

> Reference: Excerpt from JIS B 9960 -1: 2019 "7.2.1 General"
> Overcurrent protection shall be provided if the circuit current in the machine (electrical device) may exceed the rated value of the component or the current carrying capacity of the conductor, whichever is smaller. Rated values or set values to be selected are specified in 7.2.10.

⚠WARNING

Do not mount the product on flammable materials.
Attachment of the product directly to or near flammable items could cause fire.

Design the safety circuit/device so that the product's movement causes no damage to the operator or equipment if the machine stops due to emergency stop, power outage, or other system errors.

Perform D-class grounding (with ground resistance of 100 ohms or less) with the product.
In the event of current leakage, there is a fear of an electric shock and product malfunction.

Check the wiring of the product in this instruction manual and make sure that there is no mis-wiring or loosening of the connector. Also, check the insulation of the wiring.
Avoid contact with other circuits, ground fault, and poor insulation between terminals. The product may be damaged by overcurrent. It may cause fire or product failure.

The wiring which is not used should be insulated.
Otherwise malfunction, failure or electric shock may result.

Do not damage or stress cables and do not put heavy objects on cables or pinch them.
Doing so may lead to poor conduction or an electric shock.

Install the emergency stop button in a location where it is easy to operate.
Use a structure and wiring in which the emergency stop button is not automatically reset and cannot be reset carelessly.
When an emergency stop is performed, it may take several seconds to stop depending on the moving speed and load.

Mount the product indoors and keep it away from humid places.
Current leakage or fire may occur in places where the product is exposed to water or humidity (80% or more, or dew condensation).

Do not use or store in places with strong electromagnetic waves, ultraviolet rays or radioactivity.
Otherwise failure or malfunction may result.

Consider the possibility of power source failure.
Take appropriate measures so that no damage or breakage will occur to the operator or equipment even if the power source fails.

Consider the operation status when the machine is reactivated after emergency stop or abnormal stop.

Design a safe controller if it is necessary to reset the actuator to the starting position.

Since it has a built-in precision machine, do not overturn, vibrate or give an impact to it during transportation.
Otherwise the parts may be damaged.

If the actuator is used in a non-horizontal installation, use an actuator with a brake.
If the actuator is not equipped with a brake, injury or damage to workpieces may occur due to falling of the moving parts when the servo is OFF (including emergency stops and alarms) or the power is OFF.

Do not hold the moving parts or cables of the product during transportation or installation.
Doing so may result in injury or disconnection.

⚠CAUTION

The wiring shall be such that inductive noise is not applied.

- Avoid places where large currents or strong magnetic fields are generated.
- Do not use the same piping or wiring (by multi-core cable) as other large motor power lines than this product.
- Do not use the same piping or wiring as the inverter power supply used for robots, etc., but provide frame grounding for the power supply and a filter for the output connectors.

Do not use the product in an environment where strong magnetic field is generated.
Doing so may result in a malfunction.

Separate the power supply to the output part of the product from the power supply to the dielectric load which generates surge such as solenoid valves and relays.
If a power supply is shared, a surge current may be applied to the output, causing damage.
If a separate power supply is not available, connect a surge absorber directly and in parallel to all dielectric loads.

Do not perform a withstand voltage test or an insulation resistance test on the equipment to which the product is attached.
A capacitor is connected between the circuit and the metal body to prevent static electricity damage to the control board built in this product. Therefore, the product may be damaged if the tests described above are performed with the device to which this product is attached. If testing is required as a device, remove this product before performing the test.

If electrical welding is performed on the equipment to which this product is attached, remove all the F.G. (frame grounding) connections of this product before performing electrical welding.
If electrical welding is performed with the F.G. connection installed, the product may be damaged by welding current, excessive high voltage during welding, or surge voltage.

Select a power supply that can supply more power than required by the installed products.
Insufficient capacity can cause product malfunction.

Do not disassemble the product.

Do not bend the fixed cable repeatedly.
If bending repeatedly, use a flexible cable.

Fix the flexible cable so that it does not move easily.

When an external stopper or a holding mechanism (brake, etc.) is installed, arrange it so as not to affect the detection of the home position.
The home position is detected when the power is turned ON. If the detection operation is inhibited by an external stopper or a holding mechanism, an unintended position may be recognized as the home position.

Do not use the product in a place where it is exposed to ultraviolet radiation and atmospheres containing corrosive gas or salt.
Doing so may cause performance degradation, product malfunction, and degradation in strength due to rust formation.

Do not install the product in places subject to strong vibration or impact.
If strong vibration or impact is transmitted to the product, malfunction may occur.

Do not use the product in a place where dew condensation can occur due to rapid change in ambient temperature.

Note that the customer is responsible for checking the compatibility of our product with the system, machine, and device to be used by the customer.

Do not use other cables than dedicated cables to connect the product.
Doing so may result in failure or unexpected accident.

Do not hold the moving parts or cables of the product during transportation or installation.
Doing so may result in injury or disconnection.

Secure a space necessary for maintenance and inspection.
Inadequate maintenance and inspection may result in equipment shutdown, damage, or personal injury.

⚠ CAUTION

When transporting and installing the product, ensure the safety of workers by securely supporting it with lifts and supports or by multiple workers.
Install the product so that no twisting or bending force is applied to it.
Before the gain adjustment is performed, securely fix the actuator body to a rigid housing or the like, and securely fix a jig or the like.
When using locating pin holes, use pins that are sized to not be press-fitted.
Due to press-fit load, there is a risk of damage, distortion, or loss of accuracy of the guide.

2.1 Installation Environment

- Check the ambient temperature and atmosphere of the product specifications for product storage and operation.
- Use the product in a place where the ambient temperature is 0 to 40°C. Ventilate the place if the heat is trapped there.
- Install the product in a place where there are no dust, corrosive gas, explosive gas, flammable gas, and flammables, avoiding places exposed to direct sunlight or near a heat generating element. This product is not designed to be resistant to chemical substances.
- Mount the actuator on a smooth surface.
- Installing the actuator on a surface with dents, even if the surface is flat, may result in damage or malfunction of the product.

2.2 Unpacking

- When transporting or handling the product, be careful not to drop or otherwise give a shock to the product.
- A heavy package shall not be carried by one person alone.
- When placing the product in a static position, place it horizontally.
- Never get on the package.
- Do not place heavy objects that deform the package or objects that concentrate the load on the package.
- When unpacking the actuator from the package, hold the body part and pick it up.
- Do not apply an external force to every part of the actuator.

- Make sure that the product model number you ordered is the same as the one shown on the product.
- Check that there is no damage on the outside of the product.

2.3 Installation Method

2.3.1 Accessories

<Basics>

Motor-mounting bolt (common to all motor installation directions)

Model No.	Specifications of the installed motor	Motor size	Size	Quantity
EBS-04L EBR-04L	M	H <50W>	M4	4
	Y		M4	4
	P		M3	4
	F		M4	4
EBS-05L EBR-05L	M	1 <100W>	M4	4
	Y		M4	4
	P		M3	4
	F		M4	4
EBS-08L EBR-08L	M	2 <200W>	M5	4
	Y		M5	4
	P		M4	4
	F		M5	4
EBS-12L EBR-12L	M	4 <400W>	M5	4
	Y		M5	4
	P		M4	4

<Per motor installation direction>

Model No.	Accessory name	Quantity
E (Straight drive)	Coupling (To be installed to shipped product)	1
R (Right side/belt drive) D (Bottom/belt drive) L (Left side/belt drive)	Timing belt	1
	Pulley	1

<When home position/limit sensors are selected *1>

Model No.	Sensor type	Manufacturer and model No.	Shipment configuration	Quantity
EBS-04L EBS-05L EBS-08L EBS-12L	Optical	OMRON EE-SX674	Installed at shipment *2	3
EBR-04L EBR-05L EBR-08L EBR-12L	Magnetic	KITA KT-32N-2M	Installed at shipment	3

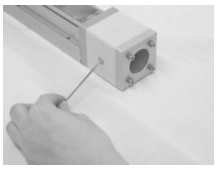
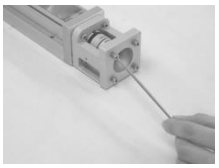
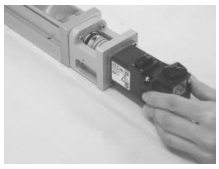
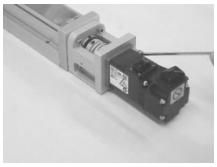
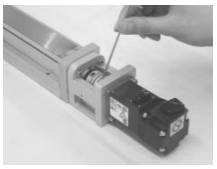
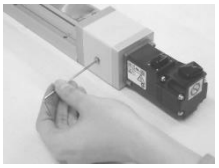
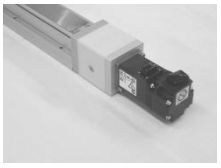
*1: The home position sensor and limit sensors are used together. If either is “without,” the other also becomes “without.”

*2: The sensor-mounting screws are also attached.

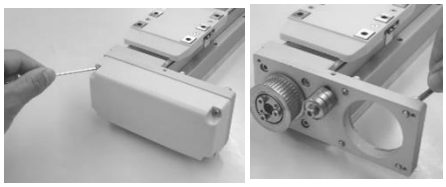
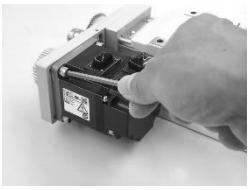
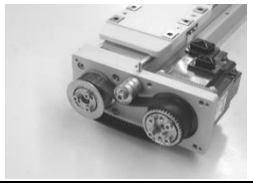
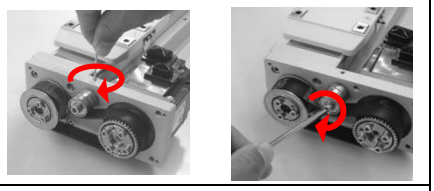
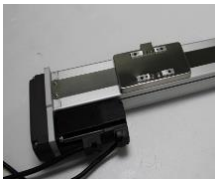
2.3.2 Motor Installation Method

- Installing and adjusting a motor requires expertise and technical skills. The work may be hazardous for individuals not having such expertise.
- Before work, always power down the motor and sensors. Failure to do so may damage the product.

<Body Size: 04 to 12 Motor installation direction: E (straight drive)>

Order	Procedure	Description
(1)	Remove the two mounting bolts of the cover on the coupling and remove the cover on the coupling.	
(2)	Remove the four motor mounting bolts.	
(3)	Loosen the coupling-fixing bolt on the motor side.	
(4)	Check that there is no foreign object on the mounting surface, and then install the motor. (Pay attention to the position of the motor cable.)	
(5)	After temporarily tightening the four motor mounting bolts, further tighten them diagonally to fix the motor.	
(6)	Tighten the coupling-fixing bolt on the motor side.	
(7)	Install the cover on the coupling and tighten the two mounting bolts of the cover.	
(8)	The motor installation is completed.	

<Body Size: 04 to 12
Motor installation direction: R (right side/belt drive), L (left side/belt drive), D (bottom/belt drive)>

Order	Procedure	Description
(1)	Remove the four mounting bolts fixing the belt cover and the four mounting bolts of the motor plate.	
(2)	Take out the supplied parts (belt and pulley). Mount the pulley on the motor shaft and tighten the pulley mounting bolt. Ensure a clearance between the pulley and the motor.	
(3)	Check that there is no foreign object on the mounting surface, and then install the motor. (Pay attention to the position of the motor cable.) After temporarily tightening the four motor mounting bolts, further tighten them diagonally to fix the motor.	
(4)	Loop the belt over the smaller pulley, and then loop the belt over the larger pulley. Adjust the belt position at the center of the pulley.	
(5)	Adjust the tension roller position adjusting bolt to adjust the belt tension appropriately. After the adjustment is done, tighten the tension roller-fixing bolt.	
(6)	Check the belt tension with the belt tension meter. For details on the belt tension, see page 16.	
(7)	Install the belt cover and tighten the four belt cover mounting bolts. The motor installation is completed.	

Belt tension for belt-drive type motors

Model No.	Belt tension (N)
EBS-04L EBR-04L	12 to 17
EBS-05L EBR-05L	12 to 17
EBS-08L EBR-08L	32 to 42
EBS-12L EBR-12L	32 to 42

Tightening torque of motor pulley

Screw size	Tightening torque (N･m)
M2.5	0.5±10%
M3	1.7±10%
M4	3.7±10%

Model No.	Screw size	Tightening torque (N･m)
EBS-08L EBR-08L	M5	7.0±10%
EBS-12L EBR-12L	M4	3.7±10%

Tightening torque when engaging motor shaft with coupling

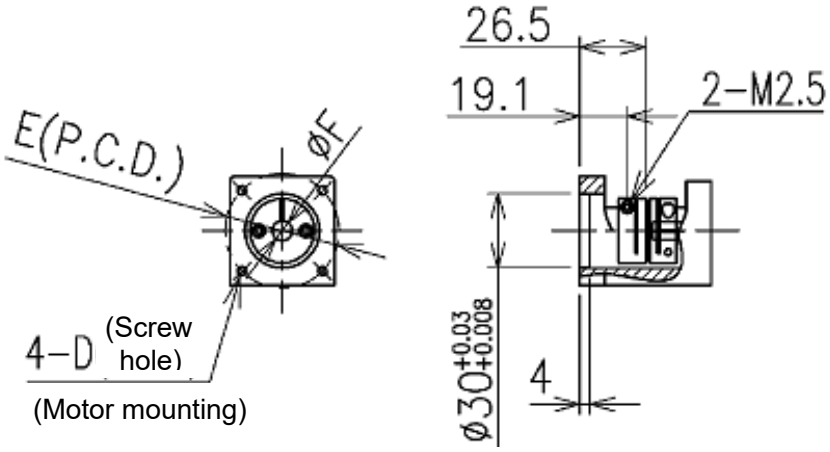
Model No.	Screw size	Tightening torque (N･m)
EBS-04L EBR-04L	M2.5	0.4 to 0.5
EBS-05L EBR-05L	M2.5	0.4 to 0.5
EBS-08L EBR-08L	M3	1.5 to 1.9
EBS-12L EBR-12L	M3	1.5 to 1.9

Tightening torque of motor-mounting bolt

Model No.	Specifications of the installed motor	Motor size	Size	Tightening torque (N･m)
EBS-04L EBR-04L	M	H <50W>	M4	1.5
	Y		M4	1.5
	P		M3	0.7
	F		M4	1.5
EBS-05L EBR-05L	M	1 <100W>	M4	1.5
	Y		M4	1.5
	P		M3	0.7
	F		M4	1.5
EBS-08L EBR-08L	M	2 <200W>	M5	3.0
	Y		M5	3.0
	P		M4	1.5
	F		M5	3.0
EBS-12L EBR-12L	M	4 <400W>	M5	3.0
	Y		M5	3.0
	P		M4	1.5

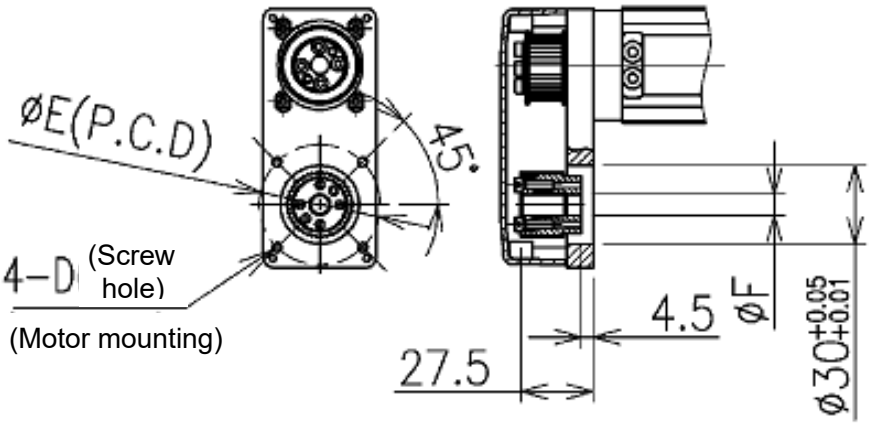
2.3.3 Dimensions of Motor Attachment

[EBS/R-04LE]



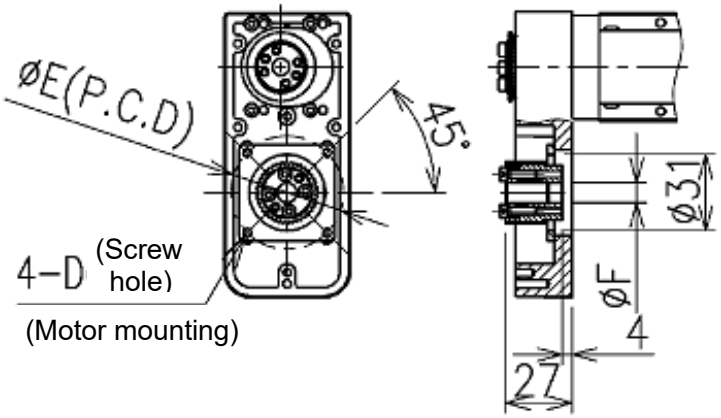
Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M4	ø46	ø8	4-M4×L12
Y	M4	ø46	ø8	4-M4×L12
P	M3	ø45	ø8	4-M3×L12
F	M4	ø46	ø8	4-M4×L12

[EBS-04LR/D/L]



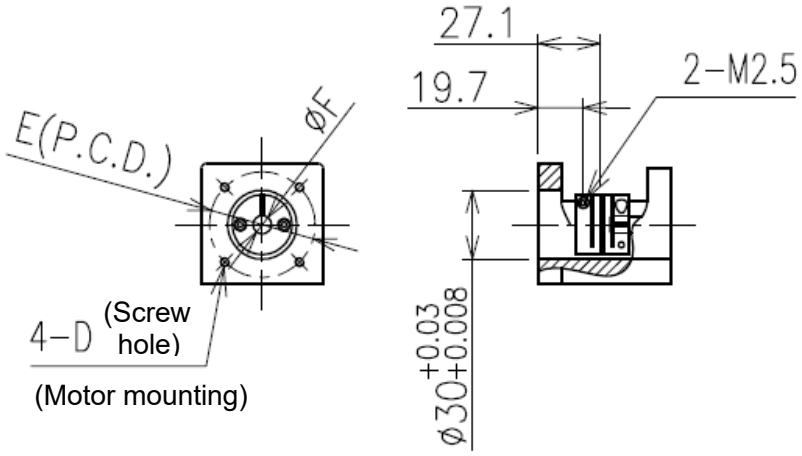
Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M4	ø46	ø8	4-M4×L12
Y	M4	ø46	ø8	4-M4×L12
P	M3	ø45	ø8	4-M3×L12
F	M4	ø46	ø8	4-M4×L12

[EBR-04LR/D/L]



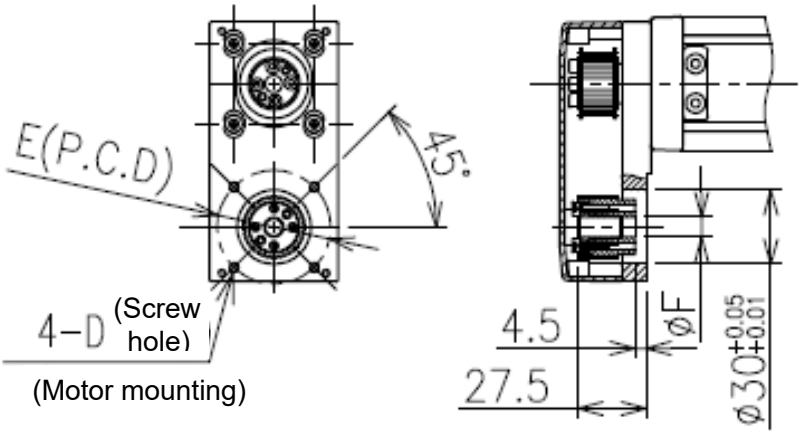
Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M4	ø46	ø8	4-M4×L12
Y	M4	ø46	ø8	4-M4×L12
P	M3	ø45	ø8	4-M3×L12
F	M4	ø46	ø8	4-M4×L12

[EBS/R-05LE]



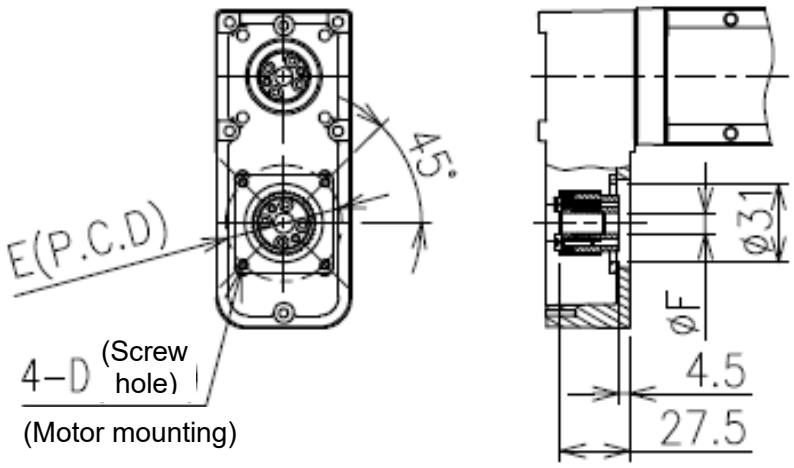
Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M4	ø46	ø8	4-M4×L12
Y	M4	ø46	ø8	4-M4×L12
P	M3	ø45	ø8	4-M3×L12
F	M4	ø46	ø8	4-M4×L12

[EBS-05LR/D/L]



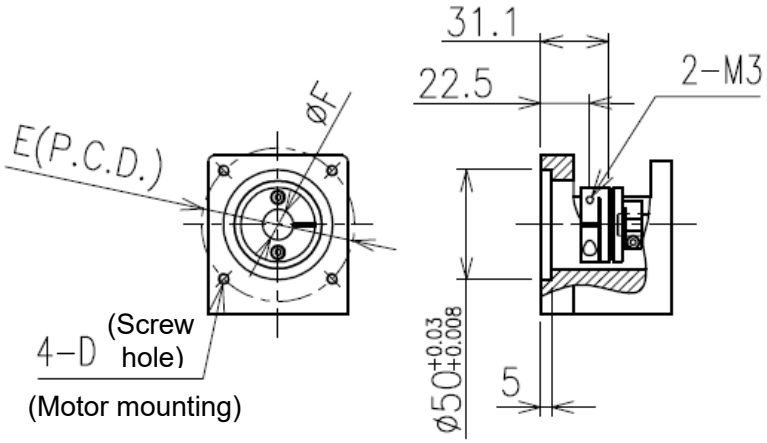
Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M4	ø46	ø8	4-M4×L12
Y	M4	ø46	ø8	4-M4×L12
P	M3	ø45	ø8	4-M3×L12
F	M4	ø46	ø8	4-M4×L12

[EBR-05LR/D/L]

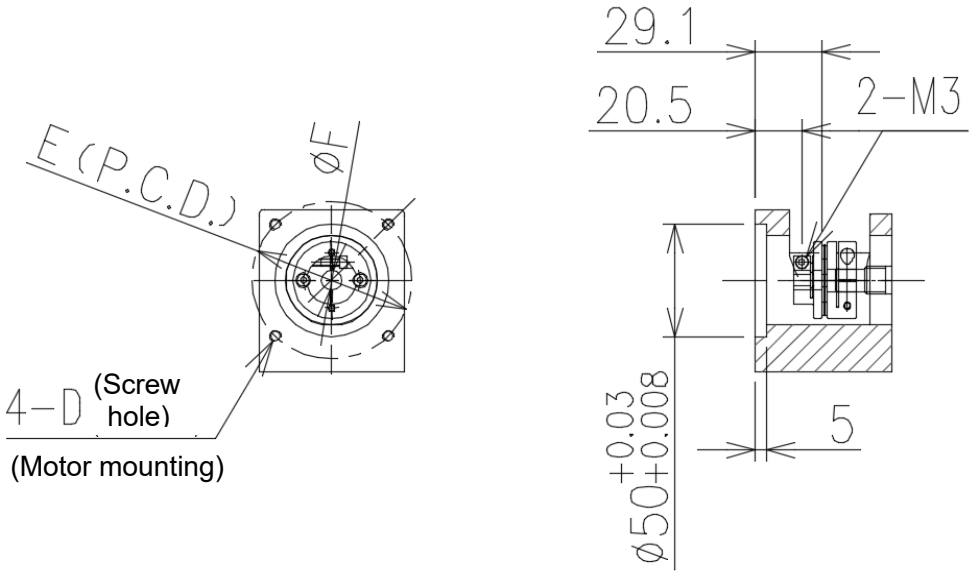


Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M4	ø46	ø8	4-M4×L12
Y	M4	ø46	ø8	4-M4×L12
P	M3	ø45	ø8	4-M3×L12
F	M4	ø46	ø8	4-M4×L12

[EBS/R-08LE] (Specifications of the installed motor: M, Y, P)

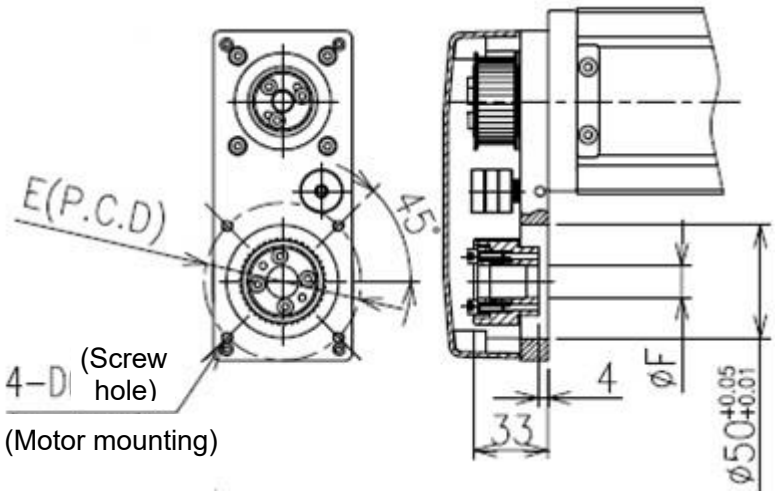


[EBS/R-08LE] (Specifications of the installed motor: F)

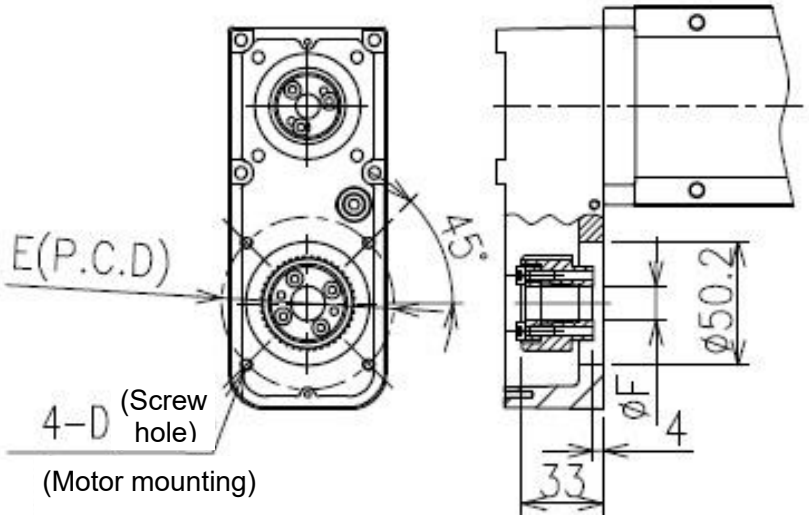


Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M5	ø70	ø14	4-M5×L18
Y	M5	ø70	ø14	4-M5×L18
P	M4	ø70	ø11	4-M4×L18
F	M5	ø70	ø9	4-M5×L16

[EBS-08LR/D/L]

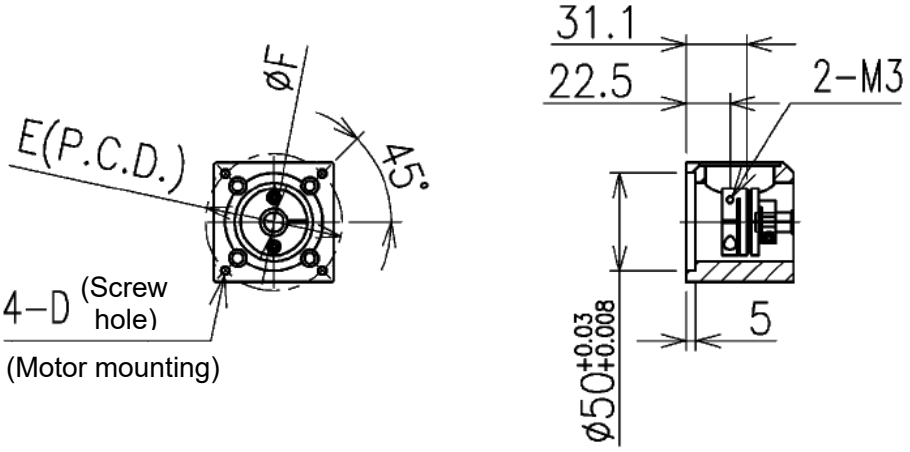


[EBR-08LR/D/L]

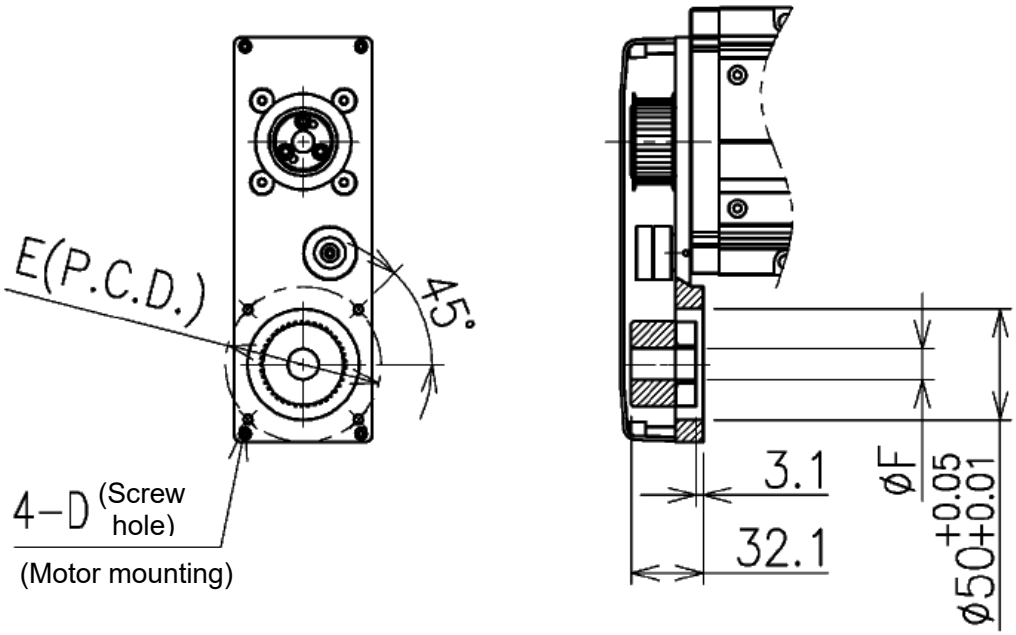


Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M5	ø70	ø14	4-M5×L18
Y	M5	ø70	ø14	4-M5×L18
P	M4	ø70	ø11	4-M4×L18
F	M5	ø70	ø9	4-M5×L16

[EBS/R-12LE]



[EBS/R-12LR/D/L]



Specifications of the installed motor	D	E	F	Motor mounting bolt
M	M5	ø70	ø14	4-M5×L18
Y	M5	ø70	ø14	4-M5×L18
P	M4	ø70	ø14	4-M4×L18

2.3.4 Installation of Main Body and Transfers

- The flatness of the mounting surface where the actuator is installed should be 0.05 mm/200 mm or less, and do not give twist or bending force to the product. Installing the actuator on an uneven surface may result in damage or malfunction of the product.
- When installing the product on the mounting surface, tighten the screws with the following proper torque:

M3	0.7 N·m
M4	1.5 N·m
M5	3.0 N·m
M6	5.2 N·m
M8	12.5 N·m

- The flatness of the mounting surface where the transfer to be attached to the product should be 0.05 mm/200 mm or less, and do not give twist or bending force to the product.
- Use the product within the specified transport load, allowable moment, and overhang amount.

3. How to Use

3.1 Precautions on Use

⚠WARNING

Ensure the safety of the operating range of the device before supplying electricity to the product.
Carelessly supplying power to it may lead to an electric shock or injury.

Do not enter the operating range when the product is ready to operate.
The product may move suddenly and lead to injury. Fingers may be caught between the motor and slider.

Do not touch or come into contact with the product body during operation or immediately after it stops operating.
Doing so may result in burns.

Do not put yourself or anything on the product.
Doing so may cause falling accidents, product turnover, injury due to drops, product breakdown, product malfunction due to damage, loss of control, and others.

Take appropriate measures so that no damage will occur to human body or equipment even if the power source fails.

Before operating the product from a position from which the actuator is not visible, make sure that it is safe if the actuator runs.

When the timing belt is abnormal, immediately stop the operation and replace the timing belt. In particular, it is very dangerous if the timing belt is broken when it is used vertically, so replace it early.
Check the teeth side and the side surface of the timing belt for wear, swelling, longitudinal tearing of the teeth, and check the back of the timing belt for cracking, softening or partial cutting.

⚠CAUTION

Do not operate the moving part of the product or decelerate rapidly by an external force.
The regenerative current may cause product malfunction or breakdown.

Do not hit the table against mechanical stoppers or the like.
The shock may damage the guides, ball screws, belt, internal stoppers, etc., and cause malfunction.

Do not make dents or scratches on the moving part.
Doing so may result in a malfunction.

Since the life of the product varies depending on the transportation load and environment, the transportation load shall be set with a sufficient margin.

Do not apply shock to the moving parts.

Do not turn the servo OFF when the product is under gravity or inertia force.
When the servo is turned OFF, the slider or rod may continue to move or fall. The operation of turning the servo OFF shall be performed in an equilibrium state with no gravity or inertial force, or after confirming safety.

Do not issue a stop command during acceleration or deceleration.
Doing so may cause a speed change (acceleration) and cause danger.

If the belt drive causes vibration, change the set speed so that vibration does not occur.
The product may vibrate even within the operating speed range depending on the operating conditions.

4. Maintenance and Inspection

⚠ WARNING

Do not perform wiring before installing the product.
Doing so may result in an electric shock.

Do not work with wet hands.
Doing so may result in an electric shock.

Do not perform wiring and inspection before 5 minutes or more have passed after the power is turned off and before the voltage is checked with a tester.
Doing so may result in an electric shock.

Do not install or remove wiring or connectors while the power is ON.
Otherwise malfunction, failure or electric shock may result.

Do not disassemble or modify the product.
Doing so may cause injury, accident, malfunction or failure.

⚠ CAUTION

Wiring and inspection shall be performed by specialized engineers.

The lead wire used for the power cable shall have a wire diameter that is sufficiently large to allow the maximum instantaneous current.
Otherwise heat generation or damage may occur during operation.

Conduct periodical inspections (two to three times a year) to make sure that the product works properly.

The standard grease supply interval is usually 100 km.
However, it depends on the operating conditions, so consider and determine the lubrication interval at the initial inspection.

If an abnormal condition occurs in the product, such as generating heat, smoke, odor, noise, or vibration, immediately turn the power OFF.
The product may be damaged or a fire may occur if the current continues to flow.

Before performing maintenance, inspection, or repair, stop the power supply to the product.
Call attention to the others around you so that they do not turn the power ON carelessly.

4.1 Periodical Inspection

In order to use the product in the optimum conditions, perform two to three periodical inspections per year.
Check the timing belt every 500 km.

4.1.1 Inspection Items

Be sure to turn off the power before performing the check items 1, 2, 3 and 4 below.

No.	Inspection Items	Inspection Methods	Treatment method
1	Check that the product mounting bolts, terminal block screws, and connectors are not loose.	Looseness inspection	Additionally tighten them.
2	Check the cables for breaks or damages.	Visual inspection	Replace the cable.
3	Check whether foreign matter is accumulated or caught in the moving parts.	Visual inspection	Clean the product. Note 1 Feed grease after cleaning.
4	Check the timing belt for scratches, cracks or swelling.	Visual inspection	Replace the timing belt.
5	Check for any vibration or noise during halts as if the product is in operation.	Sound inspection	Please contact your dealer.
6	Check whether the power supply voltage is normal.	Check by a tester	Check the power supply system and use the product within the specified power supply voltage range.

Note 1: Use a soft cloth for cleaning and make sure that no foreign object remains in the moving parts.

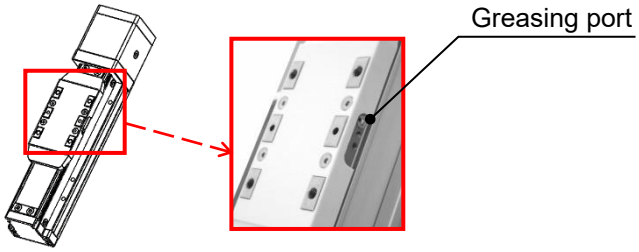
4.1.2 Greasing

• Before greasing, turn the power off.

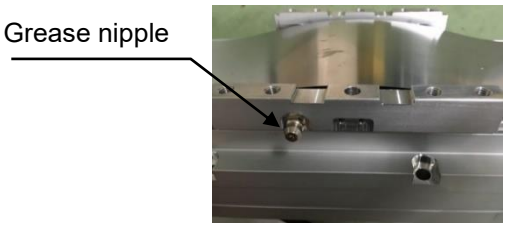
	Recommended grease
Standard series	AFEP2 (YAMABALA)
EBS-L FP Series EBR-L FP Series	Super Lube (Synco Chemical) (multipurpose grease)
EBS-L P4 Series EBR-L P4 Series	Contact your nearest CKD sales office.

Pump grease through the greasing port shown in the figure below. Grease is supplied to the linear guide and ball screw part.

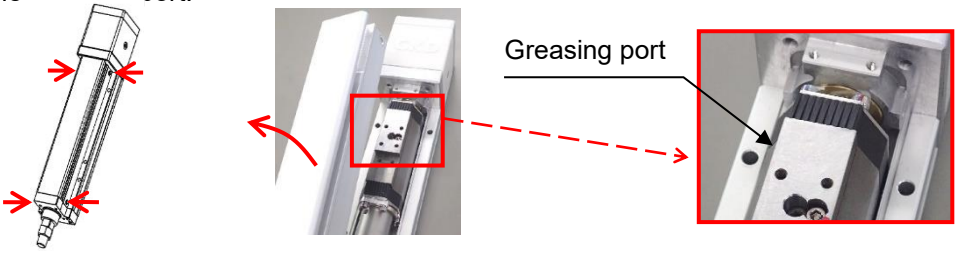
a) Slider type (Size 04 to 08)
Pump grease through the greasing port located on the slider side surface. Any disassembling of product is not necessary.



Slider type (Size 12)
Pump grease through the grease nipple on the slider part.
(The linear guide and ball screw part are greased.)



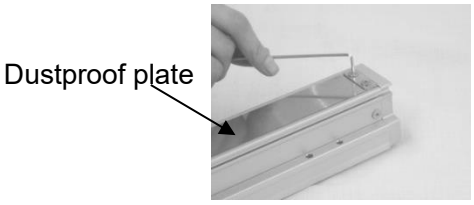
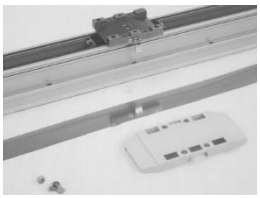
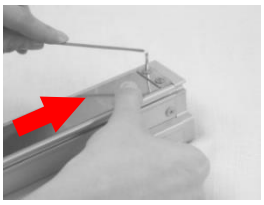
b) Guide built-in rod type (Size 04 to 08)
Loosen the four set screws on the side surface, and remove the top cover. Then, pump grease through the greasing port.



Guide built-in rod type (Size 12)
Loosen the four set screws on the top surface, and remove the top cover. Then, pump grease through the grease nipple.

4.1.3 Replacement and Adjustment of Dustproof Plate

- Before replacing or adjusting the dustproof plate, turn the power off.
- Note that the dustproof plate is easily deformed. Handle it with due care.

Order	Procedure	Photographic description
(1)	Remove the screws on the slider part.	
(2)	Remove the screws on both sides of the dustproof plate.	
(3)	Clean and replace the plate.	
(4)	When mounting the dustproof plate, stretch the plate toward both ends so that there is no warp on it, and then tighten the screws.	

5. Warranty Provision

5.1 Warranty Conditions

■ Scope of Warranty

If the product becomes defective for reasons attributable to CKD during the period of warranty indicated below, CKD will provide a replacement for the product, provide necessary replacement parts, or repair the product at no charge to the customer.
However, following circumstances are excluded from this warranty:

- Handling or use in conditions and environments other than those described in catalogs, specifications, or instruction manuals
- Damage caused by exceeding of the durability conditions (such as frequency, distance and period of time) or the product becomes defective for reasons relating to consumables
- Damage caused by reasons attributable to anything other than the product
- Operation of the product in any unintended manner
- Damage caused by modification or repair not involving CKD
- Damage caused by reasons unforeseen at the level of technology available at the time of delivery
- Damage caused by reasons not attributable to CKD, such as a natural disaster or an act of God

Please note that this warranty concerns only the delivered product itself. Any direct, indirect, or consequential damage that may arise from failure with the delivered product are not covered under this warranty.

■ Confirmation of Compatibility

Please note that the customer is responsible for checking the compatibility of our product with the system, machine, and device to be used by the customer.

■ Other

This Warranty Clause stipulates basic provisions.
If warranty information given on individual specification drawings or specification sheets differs from that given herein, priority will be given to the specification drawings and specification sheets.

5.2 Term of Warranty

The period of warranty for the product specified herein is one year from the date of delivery to the site designated by the customer.