CKD

SM-612458-A

INSTRUCTION MANUAL

ELECTRIC ACTUATOR

ECS Series

Food manufacturing processes

ECS FP Series

Compatible with Secondary Battery

ECS P4 Series

- 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.

7th Edition
CKD Corporation

For Safe Operation of This Product

(Be sure to read before using)

Make sure to read this instruction manual, catalog, technical data, and any attached documents thoroughly before installation, operation, maintenance, and inspection of the product to ensure its proper use.
This product is designed and manufactured as a general industrial machine device/part. It must be handled by individuals having sufficient knowledge about equipment and safety. CKD is not responsible for any accidents caused by individuals without such knowledge or arising from mishandling of the product. Since our customers use this product for a very wide range of applications, CKD cannot keep track of all of them. Depending on the conditions of use, the product may fail to provide the best performance or may lead to accidents. Therefore, before deciding how to use the product, examine the product specifications and usage to see whether they meet your application and usage.
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 use.**
In addition to the handling precautions described in the text of this manual, cautions should also be exercised on the following precautions.

The precautions below are for safety and proper use of the product to prevent possible damage to human life or assets.

In this instruction manual, the safety precautions are ranked as “DANGER,” “WARNING,” and “CAUTION.” Note that even some precautions described as “WARNING” or “CAUTION” may lead to serious results depending on a situation.
In any case, important information is described. Read them carefully and take good care when handling the product.
Keep this instruction manual in a safe and convenient place where it can be quickly accessed and read whenever necessary, and please be sure to deliver the manual to the end user.
To secure product safety, make sure to observe each precaution described under “DANGER,” “WARNING,” and “CAUTION.”

DANGER	If mishandled, dangerous situations leading to fatal or serious injuries may occur and there is a high degree of emergency (urgency) to a warning.
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.

DANGER

Do not use this product for the following applications:

- Medical equipment related 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

<Installation>

- 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 water drops, oil drops, and such away from the product. They may cause fire or product failure.
- Make sure to 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.

<Maintenance/Inspection/Repair>

- Wiring work and inspections must be performed by a specialized technician.
- Perform wiring work after installing the product. Failure to do so may result in an electric shock.
- Do not operate the product with wet hands. Doing so may result in an electric shock.

WARNING

- Use the product within its specifications.

<Design/Selection/Installation>

- Install a protection cover in case of possible danger to the operator. Do not enter the operating range of the product when it is ready to operate. The product may move suddenly and lead to injury.
  Take appropriate countermeasures that prevent damage to human body by the moving part of the product.
- 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.
- Consider the operation status when the machine is reactivated after emergency stop or abnormal stop. The machine must be designed so that reactivation causes no damage to the operator or equipment.
- Install the product indoors and keep it away from humid places. Current leakage or fire may occur in places where the product is exposed to rainwater or humidity (85% or more, or dew condensation).
- Operate and store the product in conditions without dew condensation by observing operating and storage temperatures.
  (Storage temperature: -10°C to 50°C, storage humidity: 35% to 80%, operating temperature: 0°C to 40°C, operating humidity: 35% to 80%)
  Failure to do so may result in errors or shorter life of the product. Ventilate the place if the heat is trapped there.
- Install the product in a place where it is not exposed to direct sunlight, dust, heat generating element and where there are no corrosive gas, explosive gas, flammable gas, and flammables. This product is not designed to be resistant to chemical substances.
  Failure to do so may result in damage or malfunction of the product, or the cause of explosion or ignition.
- Attach the product to nonflammable items. Attachment of the product directly to or near flammable items could cause fire.
- Perform D-class grounding (with ground resistance of 100 ohms or less) with the product. In the event of current leakage, there is a possibility of an electric shock and product malfunction.
- Do not use the product under shock or vibration conditions.
- Consider the possibility of a failure in the installed motor. Take appropriate measures so that no damage will occur to the operator or equipment even if the power source fails.

- Do not damage, apply undue stress to, place heavy objects on, or tuck cables of the systems related to the product. Doing so may lead to poor conduction or an electric shock.
- In case of putting the product in a place temporarily, place the product horizontally.
- Do not get on or place objects on the packaging.

<Operation>

- Before supplying power to the installed motor, always confirm safety of its operating range. Carelessly supplying power to it may lead to an electric shock or injury.
- Do not touch or come into contact with the product body during operation and immediately after it stops operating. Doing so may result in burns.
- Do not get on or place objects 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 setting the position of the installed motor, make sure that it is safe if the actuator runs.

<Maintenance/Inspection/Repair>

- If an abnormal condition develops in the product, such as generating heat, smoke, odor, noise, or vibration, immediately turn the power off. Failure to do so may cause product breakdown or fire due to continued flow of current.

⚠ CAUTION

<Design/Selection/Installation>

- Properly design and wire the product with attention to safety by referring to the instruction manuals of the motor/control to be installed on the product.
- When wiring the motor/control to be installed on the product, route the power cables so that they avoid any areas with a large electric current and strong magnetic field and do not share the same conduit with, as well as run along, the (multi-conductor) cables for a large motor not for this product; this is to prevent the influence of magnetic induction noise. Also be careful of the inverter power supply used in robots and of the wiring section (do not share the cables or conduit). Ground the frame for the inverter power supply and always provide the inverter output connectors with a filter.
- Select a motor power supply that can supply more power than required by the installed products. Insufficient capacity can cause product malfunction. (Refer to the instruction manuals of the motor/control installed by the customer.)
- When turning on the power of the motor/control installed on the product, the origin position may be detected. If there is an external stopper or a holding mechanism (such as a break), the product may detect an unintended position as the origin point. Take care on the location of an external stopper and such so that the origin position is definitely detected after the power is turned on.
- 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 degradation in strength due to performance degradation, product malfunction, and rust formation.
- Do not use the product in a place where dew condensation can occur due to rapid change in ambient temperature.
- Do not install the product in places subject to strong vibration or impact. Doing so may result in malfunction.
- The flatness of the mounting surface where the product is installed should be 0.05 mm/200 mm or less, and do not give twist or bending force to the product.
- When installing the product on the mounting surface, tighten the screws with proper torque.
  M4: 1.5 N•m, M5: 3.0 N•m, M6: 5.2 N•m, M8: 12.5 N•m, M10: 24.5 N•m
- When installing the product in an environment where cleanliness is required, fully perform downflow and clean the place to ensure a clean environment.

- This product is manufactured in conformity with the related standards. Never attempt to disassemble or modify the product.
- Do not use the product in an extremely low dew point environment.
  In an extremely low dew point environment, deterioration of resin and grease may accelerate, and lubrication performance and durability may decrease.
- The motor mounting direction (left, right, bottom) types cause wear powder on the timing belt. Please be careful when you use it at the installation place and above the workpiece.
- 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.

<Operation>

- Use the product so that the slider does not hit the stroke end. During return-to-origin movement, do not let the product hit the mechanical stopper, etc. while it is performing any operation other than the pressing action. Ball screws will be damaged and may cause malfunction.
- During return-to-origin movement, do not apply an external force to the product. The origin point may be recognized incorrectly.
- The recommended servomotors have a gain adjustment function to control vibrations. Adjust the gain and operate the product under vibration-controlled conditions. If the product is operated under vibration/resonance conditions, the product life may be shortened.
- If the servomotor is turned off with gravity and inertial force applied, the work piece may continue to move or drop. Such operation must be performed in an equilibrium state with no gravity or inertial force, or after conforming safety.
- 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.
- Durability varies depending on transport load or environment. Sufficient settings for the allowable load/moment are required. Do not apply load exceeding the allowance to the product.
- Do not apply pressure to the air intake. Doing so may scatter lubricating grease and shorten product life.
- The required amount of air intake of the product varies by model. Use the product with the appropriate air intake according to the model.

ECS-05	ECS-06	ECS-10	ECS-12	ECS-14	ECS-17	ECS-22
30 Nl/min or less	40 Nl/min or less	50 Nl/min or less	50 Nl/min or less	60 Nl/min or less	80 Nl/min or less	100 Nl/min or less

<Maintenance/Inspection/Repair>

- Conduct a daily inspection to make sure that the product works properly.
- Grease in the grade for food (NSF H1) is used in FP series. Do not mix it with other grease.
- Special grease for low dew point environments is used in P4 series.
  Do not mix it with other greases.
- Grease lubrication is at intervals of three months or approximately 100 km travel.
  However it varies depending on the use conditions, such as noise or vibration. Perform it as required.
  If the product has not been used for 1 month or more, conduct a trial run before starting work.
- When disposing of this product, follow the Law on Waste Disposal and Cleaning, and make sure to have it disposed of by a specialized waste disposer.
- Before performing maintenance, inspection, or repair, always stop the power supply to the product. Call attention to the others around you so that they do not turn the power on, or operate carelessly by a third party.
- Specify the maintenance conditions in the equipment instruction manual. Product functions may deteriorate significantly due to usage, use environment, or maintenance of the equipment. This may result in failure to ensure safety.

Warranty Clause

Term of Warranty and Scope of Warranty are as follows.

1) Term of Warranty
   The period of warranty for the product specified herein is one year from the date of delivery. (However, the number of hours in operation per day shall be within eight hours. In addition, in the case where the device reaches the service life within one year, the term of warranty is only within that period.)

2) Scope of Warranty
   If the product becomes defective for reasons attributable to CKD during the above period of warranty, CKD will promptly repair the product without any charge to customer.
   However, following circumstances are excluded from this warranty:
   (1) Operation under conditions and in environments deviating from that described in the product specifications
   (2) Faulty maintenance and improper use such as negligence
   (3) Damage caused by reasons attributable to anything other than the delivered product
   (4) Operation of the product in any unintended manner
   (5) Modifications in structure, performance, specifications, etc. without involvement of CKD, and repairs performed by an unauthorized party after delivery
   (6) Damage that could have been avoided if the customer equipment, into which the product is incorporated, had functions, structure, etc. generally accepted in the industry
   (7) Damage caused by reasons unforeseen at the level of technology available at the time of delivery
   (8) Damage caused by external factors such as fire, earthquake, flood, lightning, other acts of nature, terrestrial disaster, pollution, salt, gas, and abnormal voltage.
   Please note that this warranty covers 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.

3) Warranty for Product Exported Outside Japan
   (1) CKD will repair any product returned to our factory or to a company or a factory designated by CKD.
   Work and expense involved in returning the product are not covered under the warranty.
   (2) The repaired product will be packed according to domestic packing specification and delivered to a location inside Japan designated by the customer.

4) 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.

Table of Contents

1. Introduction

Thank you for purchasing our「ECS Series」「ECS-FP Series」、「ECS-P4 Series」Electric Actuator.

This instruction manual describes basic instructions on operation so that「ECS Series」「ECS-FP Series」、「ECS-P4 Series」Electric Actuator can perform at its full potential.

Please read this instruction manual thoroughly before using the product to ensure its proper use.

Please keep this instruction manual in a safe place where it will not get lost.

Precautions:

This product has no motor.

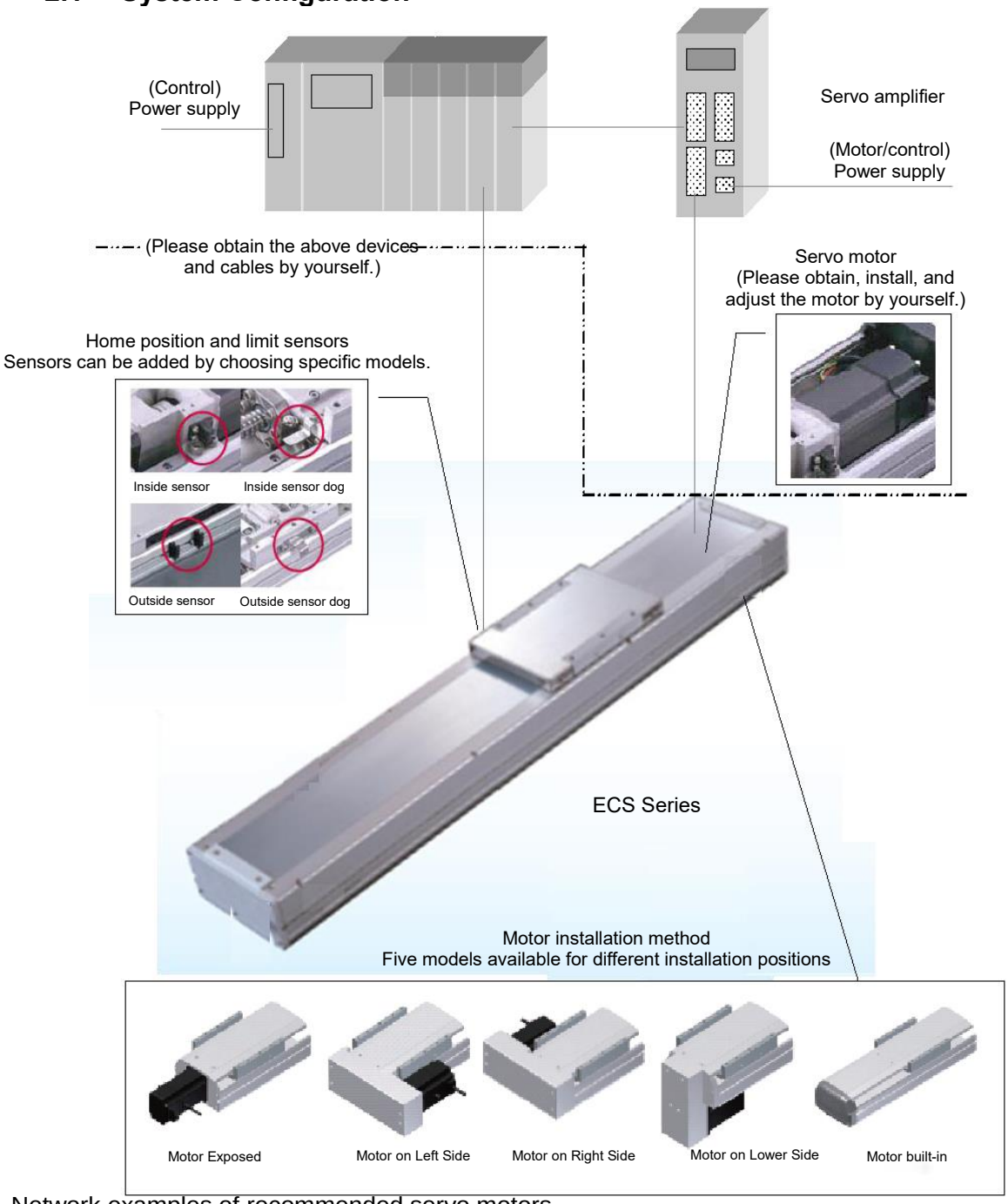
Please obtain, install, and adjust the motor and driver by yourself.

For details on how to install the motor properly, refer to this instruction manual.

For details on how to adjust the motor, refer to the instruction manual of the motor you prepared.

2. Product Specifications

2.1 System Configuration



Network examples of recommended servo motors

	General-purpose	SSCNET	CC-Link	MECHATRO LINK-II	MECHATRO LINK-III	Device NET	Ether CAT	Ether Net/IP
MITSUBISHI ELECTRIC	○	○	○					
DELTA ELECTRONICS	○						○	
SANYO DENKI	○						○	
YASUKAWA ELECTRIC	○			○	○	○		
KEYENCE	○			○				
PANASONIC	○							
OMRON	○			○			○	
FANUC	○							○
Bosh Rexroth AG	○							○
Rockwell Automation	○							○
SIEMENS	○							○

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

2.2 Specifications

[Applicable motor size: 100 W]

Item			Model													
			ECS-05			ECS-06			ECS-10				ECS-12			
Ball screw diameter		(mm)	12			12			16				16			
Ball screw precision grade			C7													
Thread lead		(mm)	2	5	10	2	5	10	5	10	16	20	5	10	16	20
Repeatability		(mm)	±0.02													
Max. load capacity *1	Horizontal	(kg)	10	10	5	30	30	15	50	30	22	18	50	30	22	18
	Vertical	(kg)	7	3	1.5	15	10	5	12	8	5	3	12	8	5	3
Max. speed *2		(mm/s)	100	250	500	100	250	500	250	500	800	1000	250	500	800	1000
Stroke length *3		(mm)	50 to 800			50 to 800			50 to 1050				50 to 1050			
Thrust		(N)	825	330	165	854	341	170	341	170	106	85	341	170	106	85
Operating ambient temperature		(°C)	0 to 40 (Without condensation or freezing)													
Operating ambient humidity		(%)	35 to 85 (Without condensation or freezing)													
Storage ambient temperature		(°C)	-10 to 50 (Without condensation or freezing)													
Storage ambient humidity		(%)	35 to 85 (Without condensation or freezing)													

[Applicable motor size: 200 W]

Item			Model			
			ECS-14			
Ball screw diameter		(mm)	16			
Ball screw precision grade			C7			
Thread lead		(mm)	5	10	16	20
Repeatability		(mm)	±0.02			
Max. load capacity *1	Horizontal	(kg)	95	75	44	35
	Vertical	(kg)	27	18	7	6
Max. speed *2		(mm/s)	250	500	800	1000
Stroke length *3		(mm)	50 to 1050			
Thrust		(N)	683	341	213	174
Operating ambient temperature		(°C)	0 to 40 (Without condensation or freezing)			
Operating ambient humidity		(%)	35 to 85 (Without condensation or freezing)			
Storage ambient temperature		(°C)	-10 to 50 (Without condensation or freezing)			
Storage ambient humidity		(%)	35 to 85 (Without condensation or freezing)			

*1: The maximum load capacity is a value when the acceleration and deceleration time is the recommended value (0.2 sec).
The thrust force and maximum load capacity are estimated values on the assumption that the installed motor outputs the rated torque.
When using the product hung from the ceiling, calculate the motor max. load capacity by dividing the horizontal load capacity by 3.

*2: The maximum speed is an estimated value on the assumption that the installed motor outputs the power at 3000 rpm.
The maximum speed varies depending on the stroke length.

*3: The stroke pitch is 50.

[Applicable motor size: 400 W]

Item			Model							
			ECS-14				ECS-17			
Ball screw diameter		(mm)	16				20			
Ball screw precision grade			C7							
Thread lead		(mm)	5	10	16	20	5	10	20	40
Repeatability		(mm)	±0.02							
Max. load capacity *1	Horizontal	(kg)	110	88	48	40	120	110	75	35
	Vertical	(kg)	33	22	10	8	40	30	14	7
Max. speed *2		(mm/s)	250	500	800	1000	250	500	1000	2000
Stroke length *3		(mm)	50 to 1050				50 to 1250			
Thrust		(N)	1388	694	433	347	1388	694	347	174
Operating ambient temperature		(°C)	0 to 40 (Without condensation or freezing)							
Operating ambient humidity		(%)	35 to 85 (Without condensation or freezing)							
Storage ambient temperature		(°C)	-10 to 50 (Without condensation or freezing)							
Storage ambient humidity		(%)	35 to 85 (Without condensation or freezing)							

[Applicable motor size: 750 W]

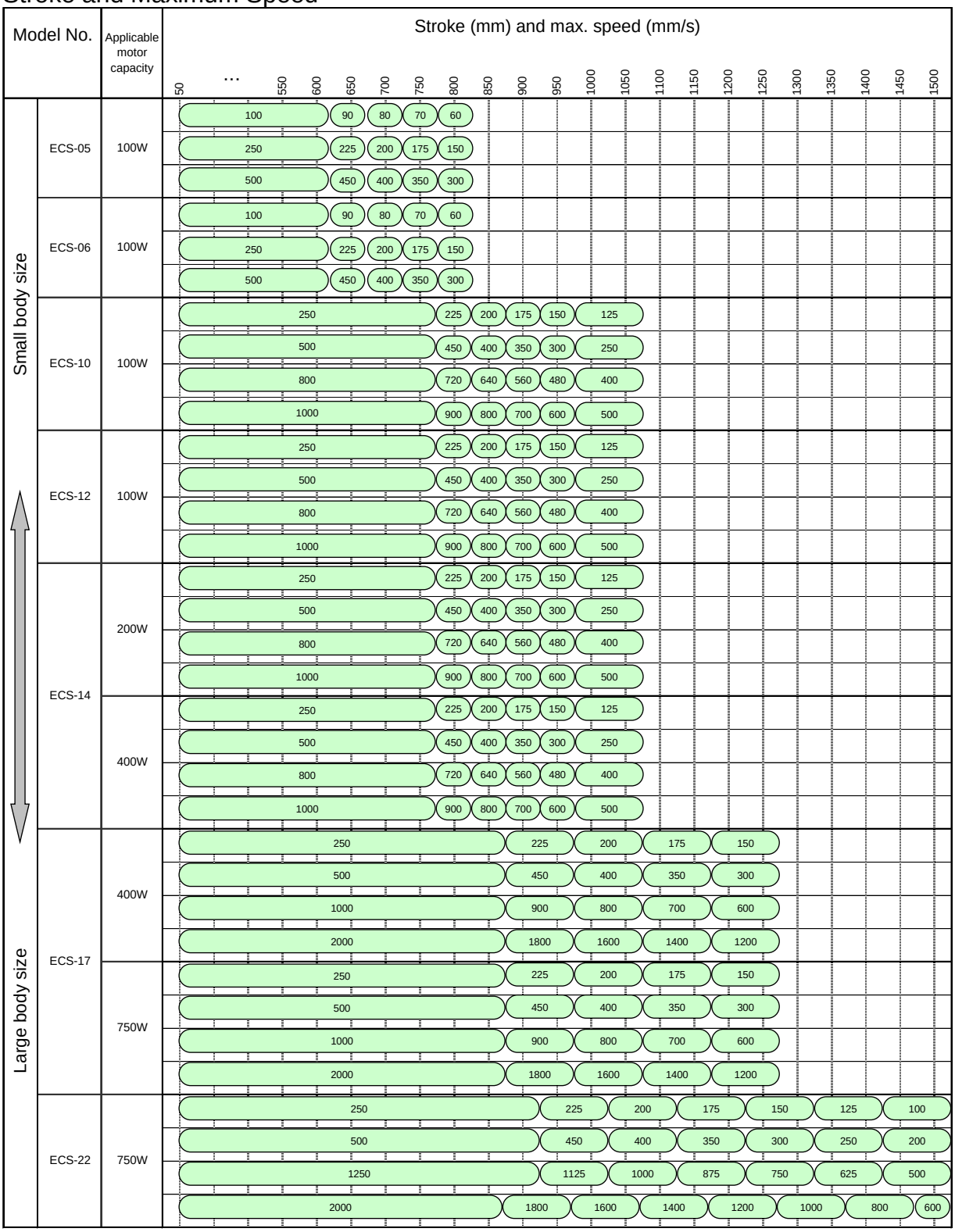
Item			Model							
			ECS-17				ECS-22			
Ball screw diameter		(mm)	20				25			20
Ball screw precision grade			C7							
Thread lead		(mm)	5	10	20	40	5	10	25	40
Repeatability		(mm)	±0.02							
Max. load capacity *1	Horizontal	(kg)	120	120	83	50	150	150	120	60
	Vertical	(kg)	50	40	25	10	55	45	20	10
Max. speed *2		(mm/s)	250	500	1000	2000	250	500	1250	2000
Stroke length *3		(mm)	50 to1250				50 to1500			
Thrust		(N)	2100	1050	525	260	2100	1050	420	260
Operating ambient temperature		(°C)	0 to 40 (Without condensation or freezing)							
Operating ambient humidity		(%)	35 to 85 (Without condensation or freezing)							
Storage ambient temperature		(°C)	-10 to 50 (Without condensation or freezing)							
Storage ambient humidity		(%)	35 to 85 (Without condensation or freezing)							

*1: The maximum load capacity is a value when the acceleration and deceleration time is the recommended value (0.2 sec).
The thrust force and maximum load capacity are estimated values on the assumption that the installed motor outputs the rated torque.
When using the product hung from the ceiling, calculate the motor max. load capacity by dividing the horizontal load capacity by 3.

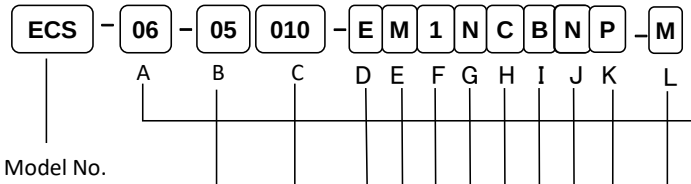
*2: The maximum speed is an estimated value on the assumption that the installed motor outputs the power at 3000 rpm.

*3: The stroke pitch is 50.

Stroke and Maximum Speed



2.3 Model Variation



Symbol	Description
A:	Body size (mm)
05	Width 51 × height 54
06	Width 65 × height 56
10	Width 102 × height 78.5
12	Width 102 × height 82.5
14	Width 135 × height 91
17	Width 170 × height 107
22	Width 220 × height 138
B:	Thread lead (See Table 1 in the next section)
02	2 mm
05	5 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
40	40 mm
C:	Stroke length (See Table 1 in the next section)
005 to150	50 mm to 1500 mm (50-mm pitch) Indication is 1/10
D:	Motor installation method (See Table 2 in the next section)
E	Motor Exposed
D	Motor on Lower Side
L	Motor on Left Side
R	Motor on Right Side
B	Motor built-in*
E:	Specifications of the installed motor (See Table 3 in the next section)
M, Y, P, F	For details on specifications of the installed motor, see the table below
F:	Motor size (See Table 2 in the next section)
1	100 W
2	200 W
4	400 W
8	750 W
G:	Brake
N	Without
B	With brake*1
H:	Home position sensor (1 pc, see Table 4 in the next section)
N	Without
A	Inside: Motor side
B	Inside: Opposite side to motor
C	Outside: Motor side (Installed at shipment)
D	Outside: Opposite side to motor (Installed at shipment)
I:	Limit sensor (2 pcs, see Table 4 in the next section)
N	Without
A	Inside
B	Outside (Installed at shipment)
J:	Grease nipple (See Table 5 in the next section)
N	None (body mounting direction: standard)
D	None (body mounting direction: bottomside)
R	Clockwise
L	Counterclockwise
K:	Positioning pin hole (See Table 6 in the next section)
N	None
P	Yes
L:	Magnet slider type (See Table 6 in the next section)*2
N	Standard
P	Adopted

<Example of model number>
ECS-06-05010-EM1BCBNP-M

A) Body size: Width 65 x height 54 mm
B) Thread lead: 5 mm
C) Stroke length: 100 mm
D) Motor installation method: Motor Exposed
E) Manufacturer of the installed motor: MITSUBISHI ELECTRIC
F) Motor size 100 W
G) Brake: Without
H) Home position sensor: Outside: Motor side
I) Limit sensor: Outside
J) Grease nipple: None(body mounting direction: standard)
K) Positioning pin hole: YES
L) Magnet slider type : Adopted

*1 Except when the motor installation method is "B (Motor built-in type)," the actuator is the same as that when the brake is "without." For “G (Brake),” select “N” in any case.

*2 ECS-05/06 is a magnet slider type.

(E) Specifications of the installed motor

Manufacturer	100 W	200 W	400 W	750 W
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	P	P	P
HUJI ELECTRIC	M	M	M	M
DENSO WAVE	M	M	M	—
FANUC	F	F	F	F
Bosh Rexroth	P	P	P	P
Rockwell Automation	M	M	M	M
SIEMENS	M	M	M	M

[FP series]

(AtoL : Refer to P12 2.3 Model Variation.)

[P4 series]

(AtoL : Refer to P12 2.3 Model Variation.)

Table 1: (B) Thread lead and (C) stroke length

Model	(B) Thread lead (mm)							(C) Stroke length (mm)
	2	5	10	16	20	25	40	(50 mm pitch)
ECS - 05	○	○	○	-	-	-	-	50-800
ECS - 06	○	○	○	-	-	-	-	50-800
ECS - 10	-	○	○	○	○	-	-	50-1050
ECS - 12	-	○	○	○	○	-	-	50-1050
ECS - 14	-	○	○	○	○	-	-	50-1050
ECS - 17	-	○	○	-	○	-	○	50-1250
ECS - 22	-	○	○	-	-	○	○	50-1500

Table 2: (D) Motor installation method and (F) motor size

Model	(D) Motor installation method					(F) Motor size			
	Motor built-in	Motor Exposed	Motor on Lower Side	Motor on Right Side	Motor on Left Side	100W	200W	400W	750W
ECS - 05	-	○	○	○	○	○	-	-	-
ECS - 06	-	○	○	○	○	○	-	-	-
ECS - 10	○	○	○	○	○	○	-	-	-
ECS - 12	○*2	○	○	○	○	○	-	-	-
ECS - 14	○	○	○	○	○	-	○	○	-
ECS - 17	○*1	○	○	○	○	-	-	○	○*1
ECS - 22	○	○	○	○	○	-	-	-	○

*1: The 750W motors cannot be used for the Motor built-in structure.
*2 For details on installation of an OMRON servomotor, contact us.

Table 3: (E) Motor manufacturer and recommended motor model No./rated output

(E) Manufacturer	Motor (without brake)	Motor (with brake)	Rated output
MITSUBISHI ELECTRIC	HG-KR13	HG-KP13B	100W
	HG-KR23	HG-KP23B	200W
	HG-KR43	HG-KP43B	400W
	HG-KR73	HG-KP73B	750W
YASUKAWA ELECTRIC	SGMJV-01ADA21	SGMJV-01ADA2C	100W
	SGMJV-02ADA21	SGMJV-02ADA2C	200W
	SGMJV-04ADA21	SGMJV-04ADA2C	400W
	SGMJV-08ADA21	SGMJV-08ADA2C	750W
PANASONIC	MSMD012G1A	MSMD012G1B	100W
	MSMD022G1A	MSMD022G1B	200W
	MSMD042G1A	MSMD042G1B	400W
	MSMD082G1A	MSMD082G1B	750W
OMRON	R88M-K10030H	R88M-K10030H-B	100W
	R88M-K20030□	R88M-K20030□-B	200W
	R88M-K40030□	R88M-K40030□-B	400W
	R88M-K75030H	R88M-K75030H-B	750W
KEYENCE	SV-M010□□	SV-B010□□	100W
	SV-M020□□	SV-B020□□	200W
	SV-M040□□	SV-B040□□	400W
	SV-M075□□	SV-B075□□	750W

(E) Manufacturer	Motor (without brake)	Motor (with brake)	Rated output
*1 DELTA ELECTRONICS	ECMA-C10401ES	ECMA-C10401FS	100W
	ECMA-C10602ES	ECMA-C10602FS	200W
	ECMA-C10604ES	ECMA-C10604FS	400W
	ECMA-C10807ES	ECMA-C10807FS	750W
SANYO DENKI	R2AA04010FX	R2AA04010FC	100W
	R2AA06020FX	R2AA06020FC	200W
	R2AA06040HX	R2AA06040HC	400W
	-	-	750W
*2 FANUC	A06B-0112-B1	A06B-0112-B4	100W
	A06B-2115-B1	A06B-2115-B4	200W
	A06B-2116-B1	A06B-2116-B4	400W
	A06B-2063-B1	A06B-2063-B4	750W
*2 Bosch Rexroth AG	MSM019B□□□□□0	MSM019B□□□□□1	100W
	MSM031B□□□□□0	MSM031A□□□□□1	200W
	MSM031C□□□□□0	MSM031A□□□□□1	400W
	MSM041B□□□□□0	MSM041B□□□□□1	750W
*2 Rockwell Automation	TLP-A046-010-DKA□2	TLP-A046-010-DKA□4	100W
	TLP-A070-020-DKA□2	TLP-A070-020-DKA□4	200W
	TLP-A070-040-DKA□2	TLP-A070-040-DKA□4	400W
	TLP-A090-075-DKA□2	TLP-A090-075-DKA□4	750W
*2 SIEMENS	1FK2102-1AG0	1FK2102-1AG1	100W
	1FK2203-2AG0	1FK2203-2AG1	200W
	1FK2203-4AG0	1FK2203-4AG1	400W
	1FK2204-5AK0	1FK2204-5AK1	750W

*1 The servo motors, ECMA series (with brakes) manufactured by DELTA ELECTRONICS cannot be used for the built-in structure.

*2 Not compatible with “built-in installation”.

*3: For other motor manufacturers, models and details, contact us.

Table 4: (H) Home position sensor and (I) limit sensor

Model	(H) Home position sensor (1 pc)					(I) Limit sensor (2 pcs)		
	None *1	Inside		Outside		None *1	Inside	Outside
		Motor side	Opposite side to motor	Motor side	Opposite side to motor			
ECS - 05	○	-	-	○	○	○	-	○
ECS - 06	○	-	-	○	○	○	-	○
ECS - 10	○	○	○ *2	○	○	○	○ *2	○
ECS - 12	○	○ *3	○	○	○	○	○ *3	○
ECS - 14	○	○	○	○	○	○	○	○
ECS - 17	○	○	○	○	○	○	○	○
ECS - 22	○	○	○	○	○	○	○	○

*1: The home position sensor and limit sensors are used together. If either is “without,” select “without” for the other.
Example: A combination of the home position sensor “without” and the limit sensor “with (inside/outside)” is not available.
*2: For ETS-10, a combination of the home position sensor “B (inside/opposite side to motor)” and the limit sensor “A (inside)” is not available.
Example: ETS-10-*-*BA* --- This cannot be selected as a model number.
*3: For ETS-12, when the motor installation direction is “R (right side installation)” or “L (left side installation),” a combination of the home position sensor “A (inside/motor side)” and the limit sensor “A (inside)” is not available.
Example: ETS-12-*-*R/L*AA* ---This cannot be selected as a model number.
*4: In the case of sensor inside installation, the positions of the sensor dog and sensor cannot be changed at the customer.
In the case of sensor outside installation, the positions of the sensor dog and sensor can be changed at the customer.

Table 5: (J) Motor installation direction and Grease nipple

Model	J Grease nipple				
	B Motor built-in	E Motor Exposed	D Motor on Lower Side	R Motor on Right Side	L Motor on Left Side
ECS-05/06	For N only (Body installation direction: Standard)				
ECS-10 to 22	N/R/L			N/L	N/R

*1: For ECS-05 and 06, no grease nipples can be installed.
*2: For ECS-10 to 22, this is an instruction for grease nipple installation options. "N": None, "R": Right Side, "L": Left Side shall be selected.
*3: If you want to use the home position sensor, limit sensor and grease nipple in the same direction, contact us.

Table 6: (K) Positioning pin hole

Model	(K) Positioning pin hole
ETS - 05 to 22	N/P

Precautions:

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

3. How to Install Motor/Sensors

3.1 Accessories

<Basic type>

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

Model No.	Installed motor	Motor size	Screw size	Quantity
ECS-05 ECS-06 ECS-10 ECS-12	M	100 W	M4	2
	Y		M4	2
	P		M3	4
	F		M4	2
ECS-14	M	200 W 400 W	M5	4
	Y		M5	4
	P		M4	4
	F		M5	4
ECS-17	M	400 W	M5	4
	Y		M5	4
	P		M4	4
	F		M5	4
	M	750 W	M6	4
	Y		M6	4
	P		M5	4
	F		M6	4
ECS-22	M	750 W	M6	4
	Y		M6	4
	P		M5	4
	F		M6	4

<Variations in motor installation directions>

Model No.	Accessory name	Quantity
E (Motor Exposed) B (Motor built-in)	Coupling (To be installed to shipped product)	1
R (Motor on Right Side) L (Motor on Left Side) D (Motor on Lower Side)	Pulley	1
	Belt	1

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

Sensor installation direction	Shipment configuration	Quantity
Inside sensor	To be fixed to shipped product	3 *2
Outside sensor	Attached at shipment *3	

*1: The shipment configuration of home position and limit sensors varies by installation (inside/outsi

*2: If "without" is selected for either of home position or limit sensor, the other will be "without."
The sensor dog and sensor (ECS-10 and ECS-12) are shipped when "without" is selected.

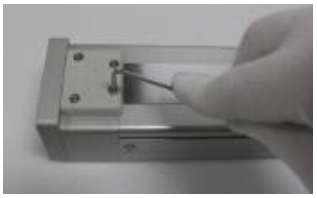
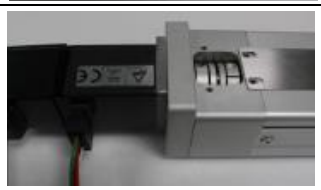
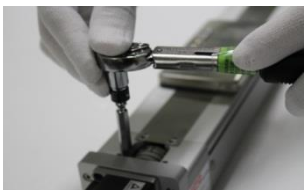
*3: The sensor-mounting screws are also attached.

3.2 How to Install Motor

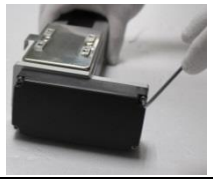
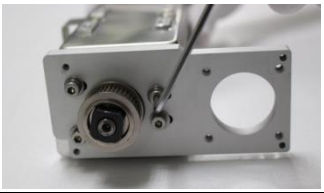
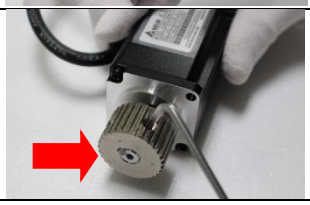
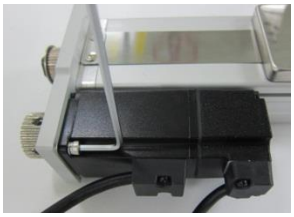
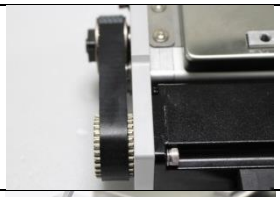
CAUTION:

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.

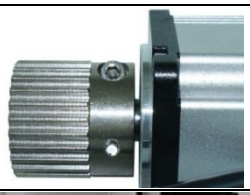
<Motor type: ECS, Motor installation direction: E (Motor Exposed) (Photos show ECS-05)>

Order	Procedure	Description
(1)	Remove the four mounting bolts of the cover on the coupling.	
(2)	Loosen the coupling-fixing bolt on the motor side.	
(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.)	
(4)	Slightly tighten the four screws diagonally, and then gradually tighten the screws further to fix the motor.	
(5)	Tighten the motor shaft and the coupling.	
(6)	Tighten the four mounting bolts of the cover on the coupling.	
(7)	The motor installation is completed.	

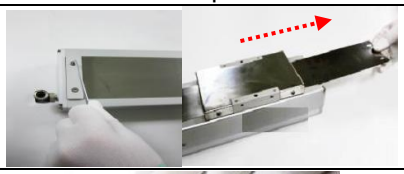
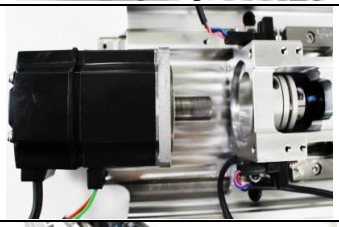
<Motor type: ECS-05 & ECS-06, Motor installation direction: R (Motor on Right Side), L (Motor on Left Side)>

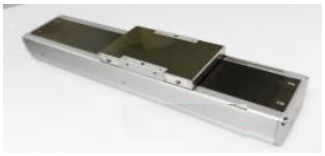
Order	Procedure	Description
(1)	Remove the four mounting bolts fixing the belt cover and the motor plate.	 
(2)	Loosen the four mounting bolts of the motor plate.	
(3)	Remove the attachments (belt and pulley). Mount the pulley on the motor shaft.	
(4)	Align the pulley with the endpoint of the motor shaft, and then tighten the two pulley-fixing bolts. Note: Align the end of the pulley with the end of the motor shaft.	
(5)	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.) Temporarily tighten the four screws in a crisscross pattern, and then gradually give final tightening to the screws to fix the motor.	
(6)	Loop the belt over the smaller pulley. Then loop the belt over the larger pulley. Adjust the belt position at the center of the pulley.	
(7)	While adjusting the motor plate, adjust the belt tension appropriately, and then tighten the motor plate-mounting bolts.	
(8)	Check the belt tension with the belt tension meter. For details on the belt tension, see page 23.	
(9)	Attach the belt cover. The motor installation is completed.	

<Motor type:ECS-10 - 22, Motor installation direction:
R (Motor on Right Side), L (Motor on Left Side), D (Motor on Lower Side)>

Order	Procedure	Photographic description
(1)	Remove the four mounting bolts fixing the belt cover and the motor plate.	
(2)	Loosen the four mounting bolts of the motor plate.	
(3)	Remove the attachments (belt and pulley). Check the condition of the pulley. (Align the inside slot with the outside slot.)	
(4)	Mount the pulley on the motor shaft. Provide clearance between the pulley and the motor shaft.	
(5)	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.)	
(6)	Loop the belt over the smaller pulley. Then loop the belt over the larger pulley. Adjust the belt position at the center of the pulley.	
(7)	Adjust the motor-mounting bolts to adjust the belt tension. Check the belt tension with the belt tension meter. For details on the belt tension, see page 23.	
(8)	Attach the belt cover.	
(9)	The motor installation is completed.	

<Motor type: ECS-10-22, Motor installation direction: B (Motor Built-in/Motor Exposed)
(Photos show ECS-10)>

Order	Procedure	Description
(1)	Remove the steel belt bracket. Slide the front end of the steel belt not to deform it.	
(2)	Remove the two fixing bolts and the one flat-head screw of the motor cover.	
(3)	Remove the motor plate-fixing bolts, and loosen the two coupling-fixing bolts 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)	Slightly tighten the four screws diagonally, and then gradually tighten the screws further to fix the motor.	
(6)	Tighten the motor shaft and the coupling.	
(7)	Attach the steel belt bracket. Pass the cable through the harness holder, and then attach it to the top cover.	 
(8)	Attach the motor cover, put the steel belt back to the original position, and then tighten the fixing bolts.	 

(9)	The motor installation is completed.	

Belt tension for belt-drive type motors

Model No.	Belt tension (N)
ECS-05	12～17
ECS-06	12～17
ECS-10	32～42
ECS-12	32～42
ECS-14	60～75
ECS-17	122～137
ECS-22	122～137

Tightening torque when engaging motor shaft with pulley

Screw Size	Tightening torque (N·m)
M3	1.7±10%
M4	3.7±10%
M5	6.7±10%
M6	9.7±10%

Tightening torque when engaging motor shaft with coupling

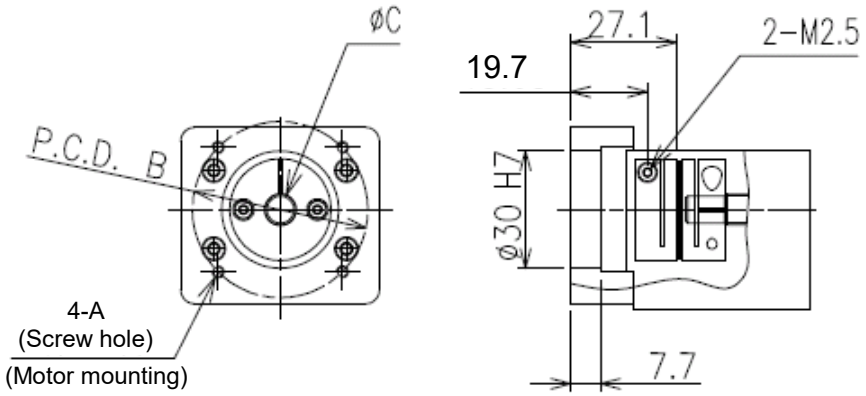
Model No.	Screw size	Tightening torque N•m
ECS-05	M2.5	0.4 to 0.5
ECS-06	M2.5	0.4 to 0.5
ECS-10	M3	1.5 to 1.9
ECS-12	M3	1.5 to 1.9
ECS-14	M3	1.5 to 1.9
ECS-17	M4	3.4 to 4.1
ECS-22	M5	7.0 to 8.5

Tightening torque of motor-mounting screws

Model No.	Installed motor	Motor size	Screw size	Tightening torque (N·m)
ECS-05 ECS-06 ECS-10 ECS-12	M	100W	M4	1.5
	Y		M4	1.5
	P		M3	0.7
	F		M4	1.5
ECS-14	M	200W 400W	M5	3.0
	Y		M5	3.0
	P		M4	1.5
	F		M5	3.0
ECS-17	M	400W	M5	3.0
	Y		M5	3.0
	P		M4	1.5
	F		M5	3.0
	M	750W	M6	5.0
	Y		M6	5.0
	P		M5	3.0
	F		M6	5.0
ECS-22	M	750 W	M6	5.0
	Y		M6	5.0
	P		M5	3.0
	F		M6	5.0

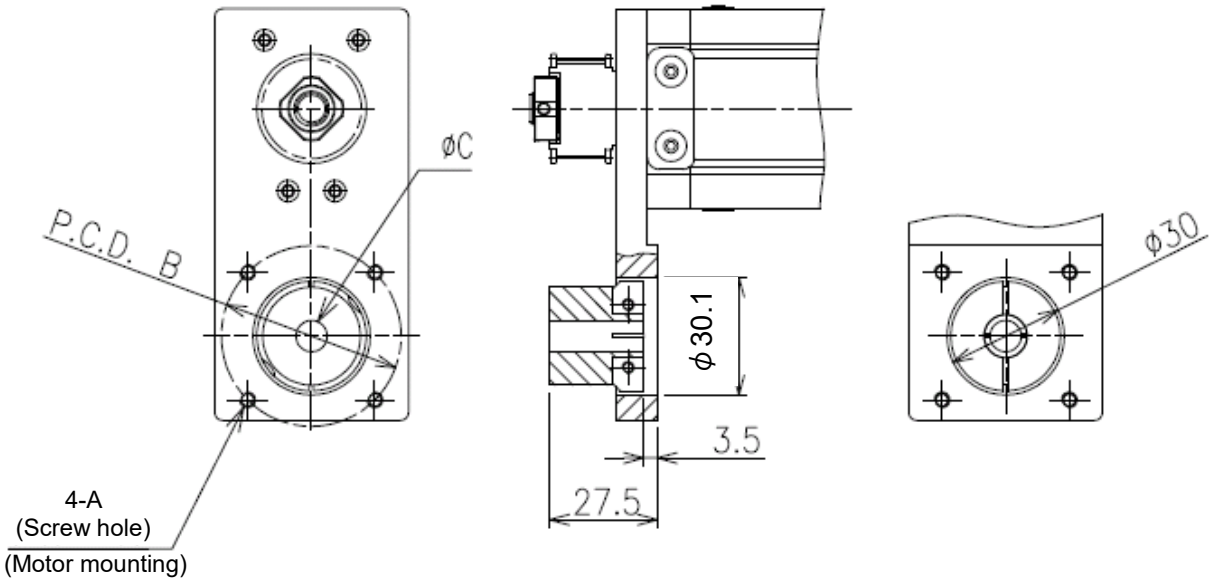
3.3 Dimensions of Motor Attachment

[ECS-05-E]



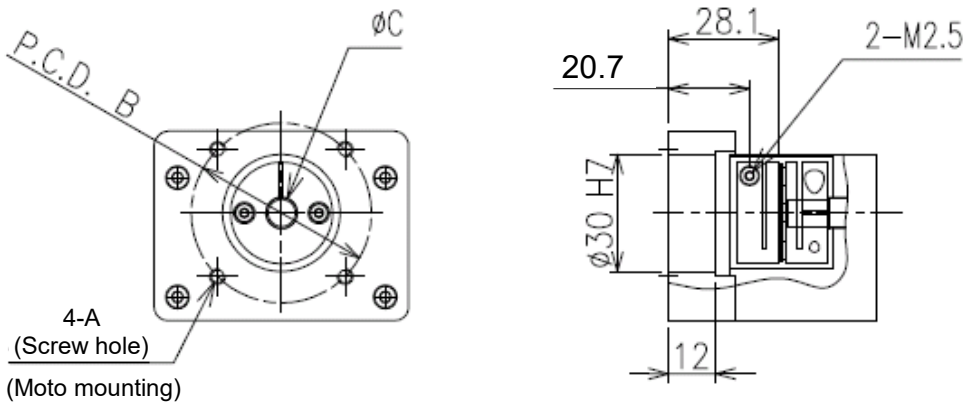
ECS-05-E					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L12
Y	100W	M4	Φ46	Φ8	4-M4×L12
P	100W	M3	Φ45	Φ8	4-M3×L12
F	100W	M4	Φ46	Φ8	4-M4×L12

[ECS-05-R/L/D]



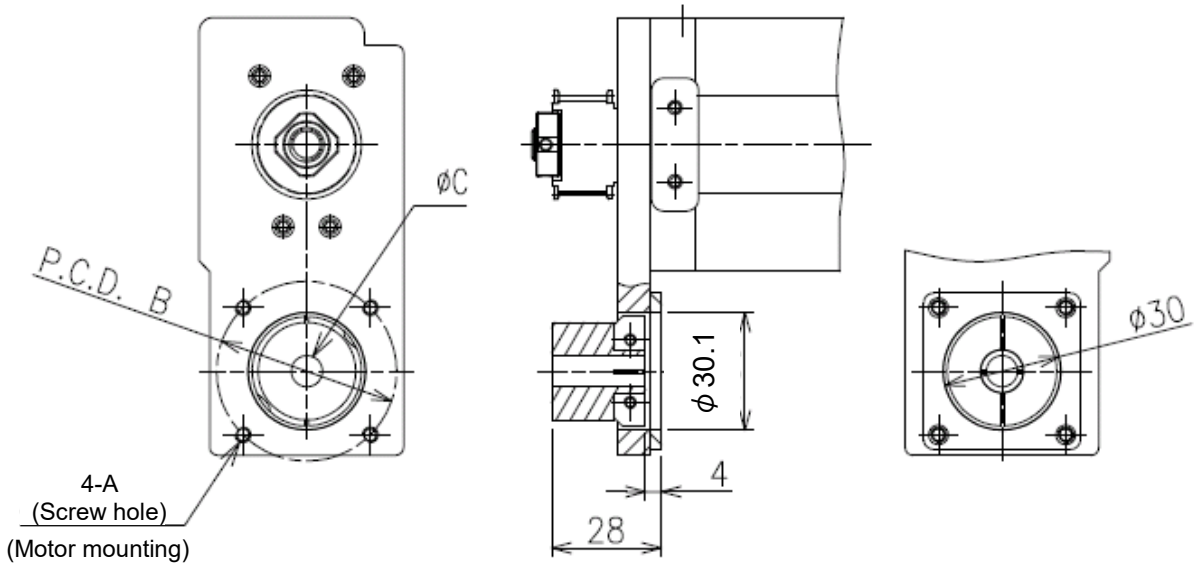
ECS-05-R/L/D					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L12
Y	100W	M4	Φ46	Φ8	4-M4×L12
P	100W	M3	Φ45	Φ8	4-M3×L12
F	100W	M4	Φ46	Φ8	4-M4×L12

[ECS-06-E]



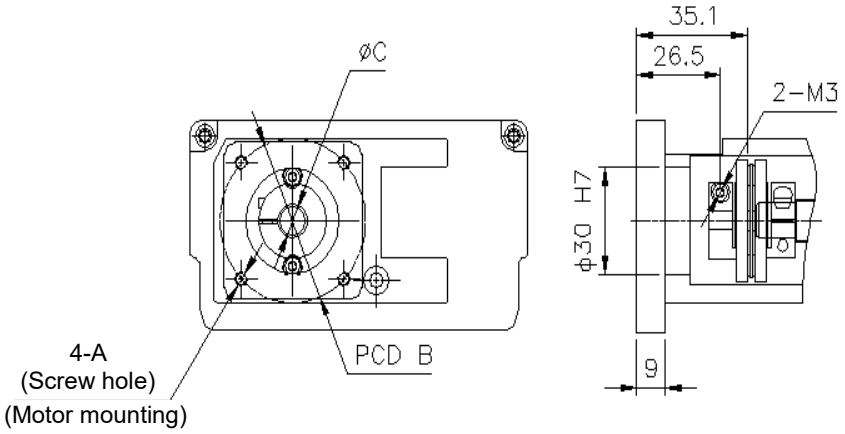
ETS-06-E					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L12
Y	100W	M4	Φ46	Φ8	4-M4×L12
P	100W	M3	Φ45	Φ8	4-M3×L12
F	100W	M4	Φ46	Φ8	4-M4×L12

[ECS-06-R/L/D]



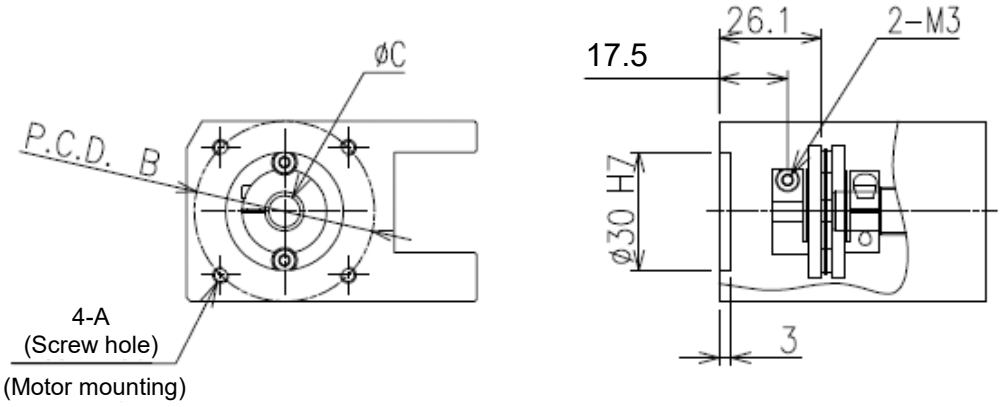
ECS-06-R/L/D					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L12
Y	100W	M4	Φ46	Φ8	4-M4×L12
P	100W	M3	Φ45	Φ8	4-M3×L12
F	100W	M4	Φ46	Φ8	4-M4×L12

[ECS-10-E]



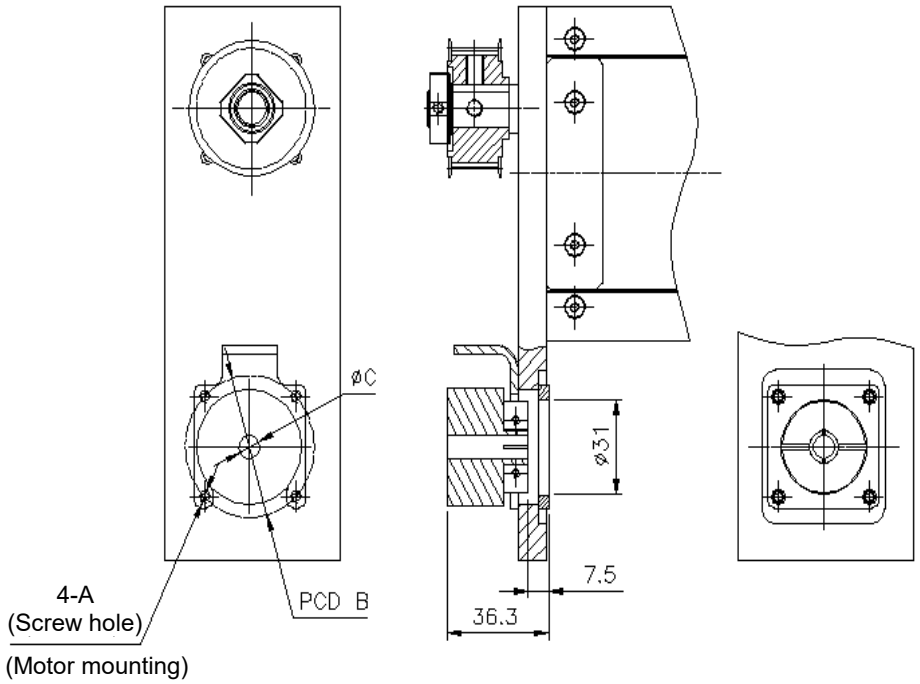
ECS-10-E					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L10
Y	100W	M4	Φ46	Φ8	4-M4×L10
P	100W	M3	Φ45	Φ8	4-M3×L10
F	100W	M4	Φ46	Φ8	4-M4×L10

[ECS-10-B]



ECS-10-B					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L10
Y	100W	M4	Φ46	Φ8	4-M4×L10
P	100W	M3	Φ45	Φ8	4-M3×L10

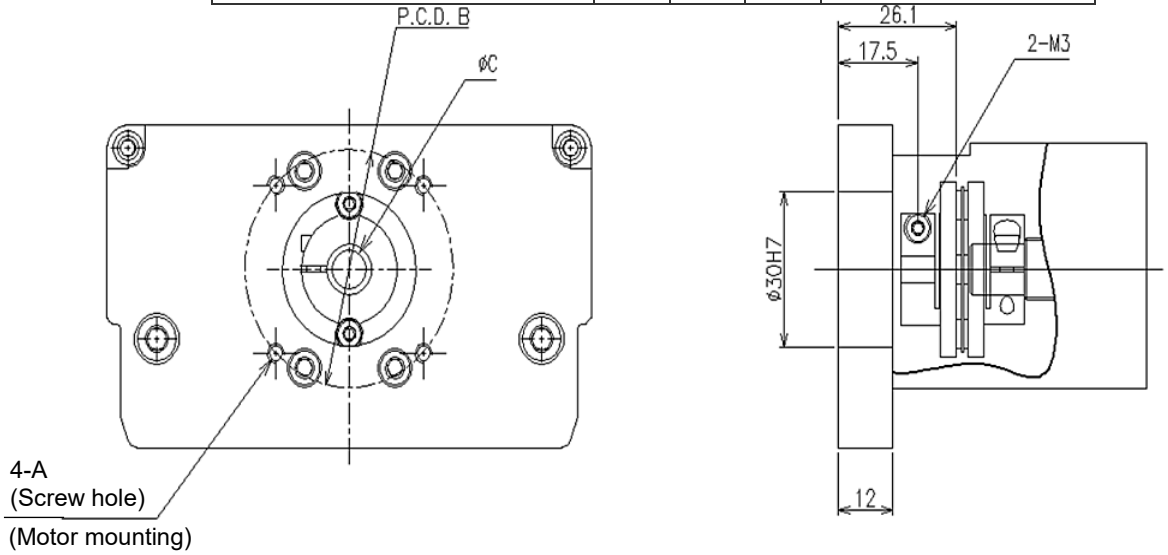
[ECS-10-R/L/D]



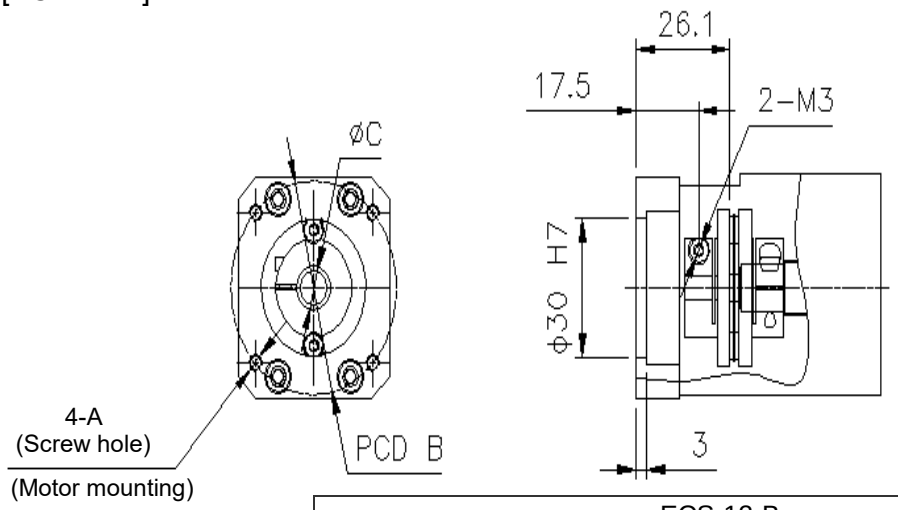
ECS-10-R/L/D					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L16
Y	100W	M4	Φ46	Φ8	4-M4×L16
P	100W	M3	Φ45	Φ8	4-M3×L16
F	100W	M4	Φ46	Φ8	4-M4×L16

[ECS-12-E]

ECS-12-E					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L16
Y	100W	M4	Φ46	Φ8	4-M4×L16
P	100W	M3	Φ45	Φ8	4-M3×L16
F	100W	M4	Φ46	Φ8	4-M4×L16

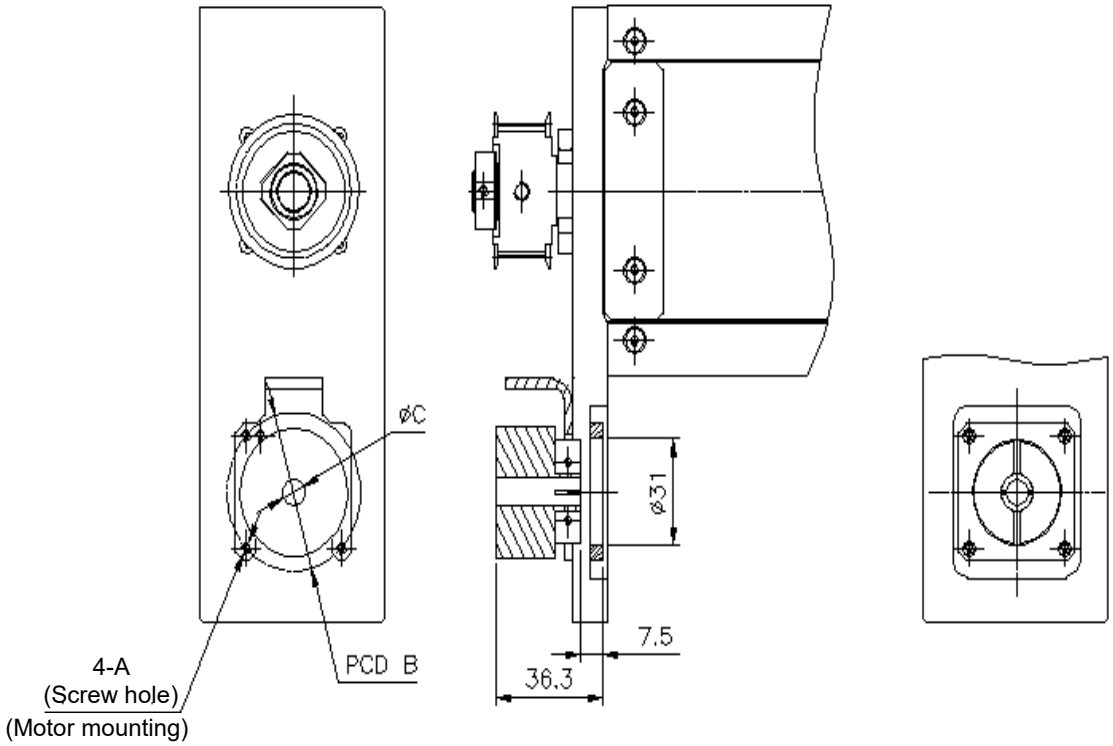


[ECS-12-B]



ECS-12-B					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L16
Y	100W	M4	Φ46	Φ8	4-M4×L16
P	100W	M3	Φ45	Φ8	4-M3×L16

[ECS-12-R/L/D]



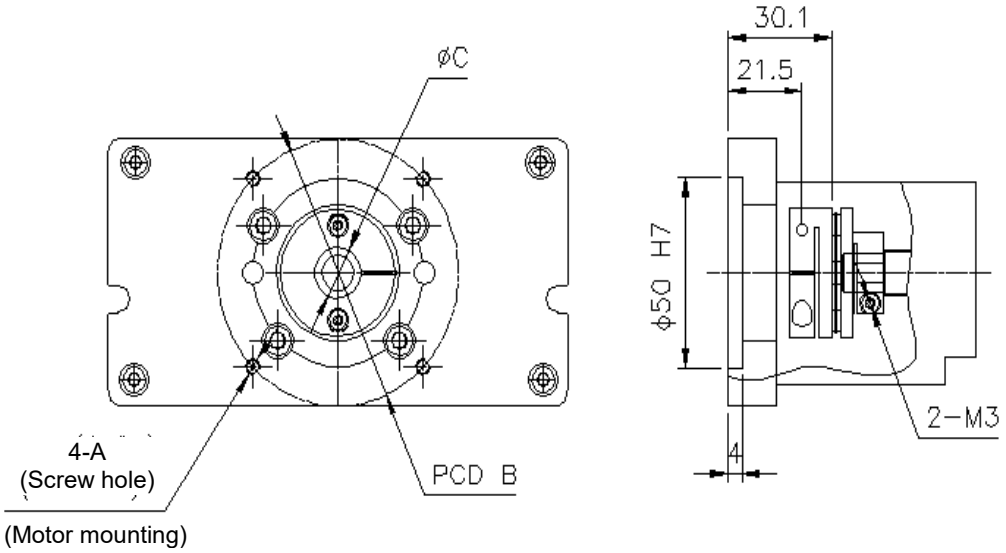
ECS-12-R/L/D					
Motor		A	B	C	Motor mounting screws
M	100W	M4	Φ46	Φ8	4-M4×L16
Y	100W	M4	Φ46	Φ8	4-M4×L16
P	100W	M3	Φ45	Φ8	4-M3×L16
F	100W	M4	Φ46	Φ8	4-M4×L16

[ECS-14-E]

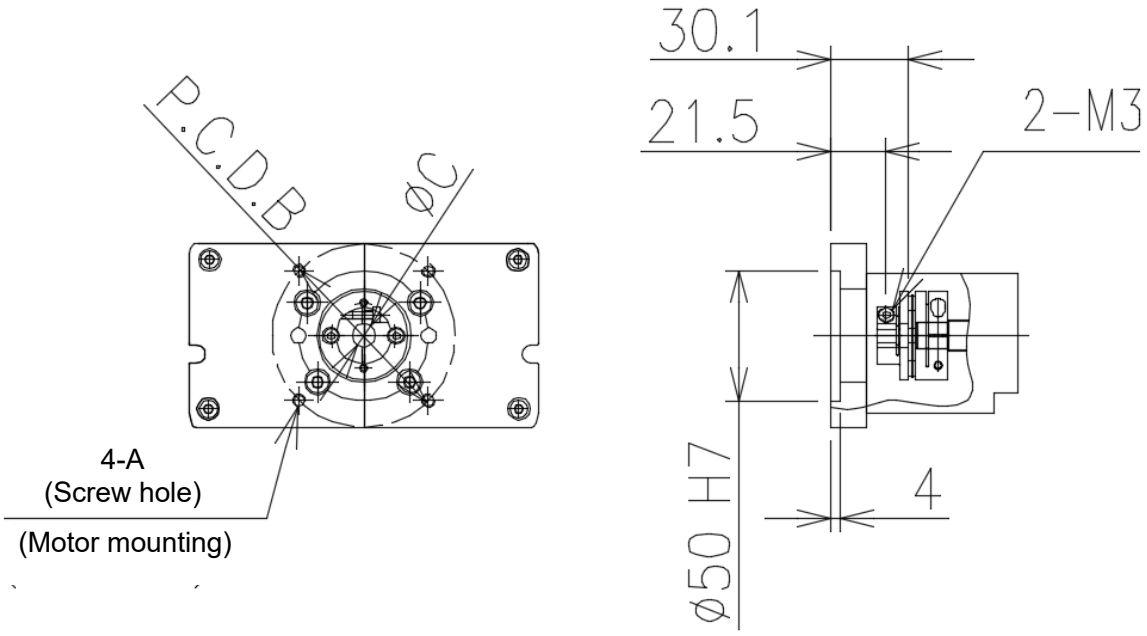
ECS-14-E					
Motor		A	B	C	Motor mounting screws
M	200W	M5	Φ70	Φ14	4-M5×L18
Y	200W	M5	Φ70	Φ14	4-M5×L18
P	200W	M4	Φ70	Φ11	4-M4×L18
F*	200W	M5	Φ70	Φ9	4-M5×L16
M	400W	M5	Φ70	Φ14	4-M5×L18
Y	400W	M5	Φ70	Φ14	4-M5×L18
P	400W	M4	Φ70	Φ14	4-M4×L18
F*	400W	M5	Φ70	Φ14	4-M5×L18

*For the FANUC 200W motor mounting part, refer to F specification.
For the FANUC 400W motor mounting part, refer to M / Y / P specifications.

（M・Y・P specification）

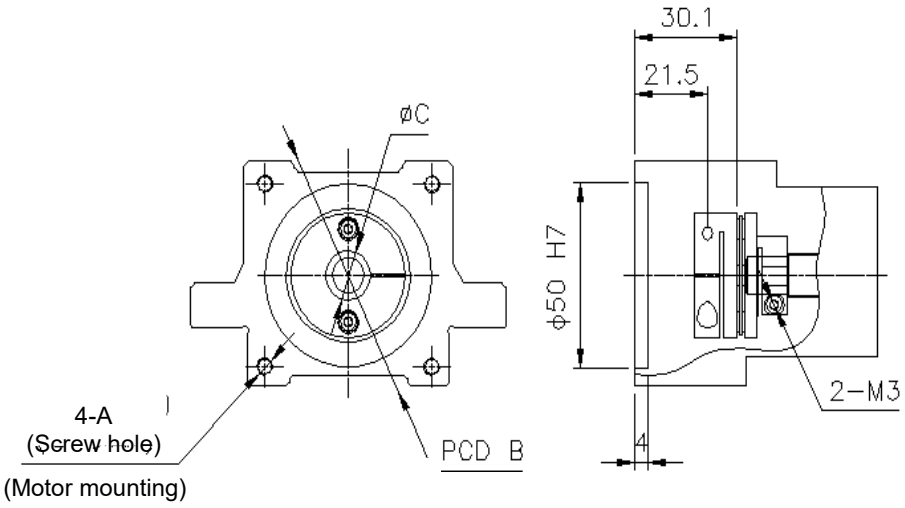


（F specification）

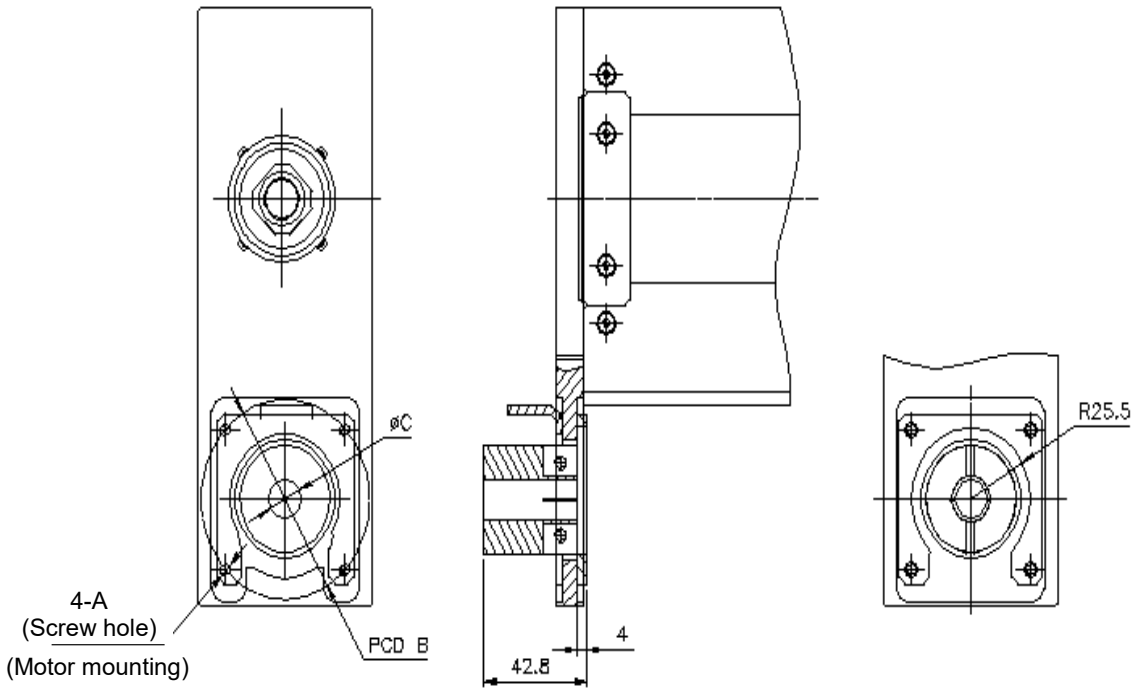


[ECS-14-B]

ECS-14-B					
Motor		A	B	C	Motor mounting screws
M	200W	M5	Φ70	Φ14	4-M5×L18
Y	200W	M5	Φ70	Φ14	4-M5×L18
P	200W	M4	Φ70	Φ11	4-M4×L18
M	400W	M5	Φ70	Φ14	4-M5×L18
Y	400W	M5	Φ70	Φ14	4-M5×L18
P	400W	M4	Φ70	Φ14	4-M4×L18



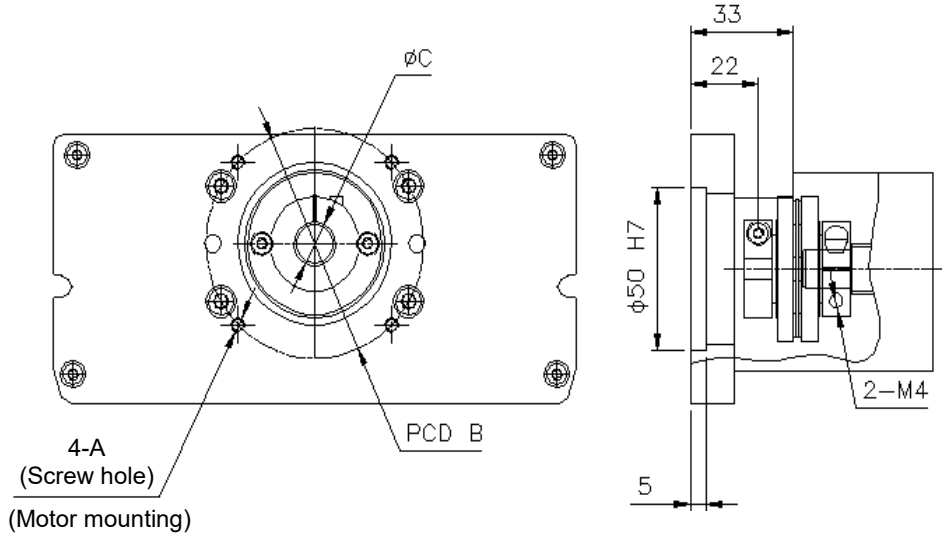
[ECS-14-R/L/D]



ECS-14-R/L/D					
Motor		A	B	C	Motor mounting screws
M	200W	M5	Φ70	Φ14	4-M5×L18
Y	200W	M5	Φ70	Φ14	4-M5×L18
P	200W	M4	Φ70	Φ11	4-M4×L18
F	200W	M5	Φ70	Φ9	4-M5×L18
M	400W	M5	Φ70	Φ14	4-M5×L18
Y	400W	M5	Φ70	Φ14	4-M5×L18
P	400W	M4	Φ70	Φ14	4-M4×L18
F	400W	M5	Φ70	Φ14	4-M5×L18

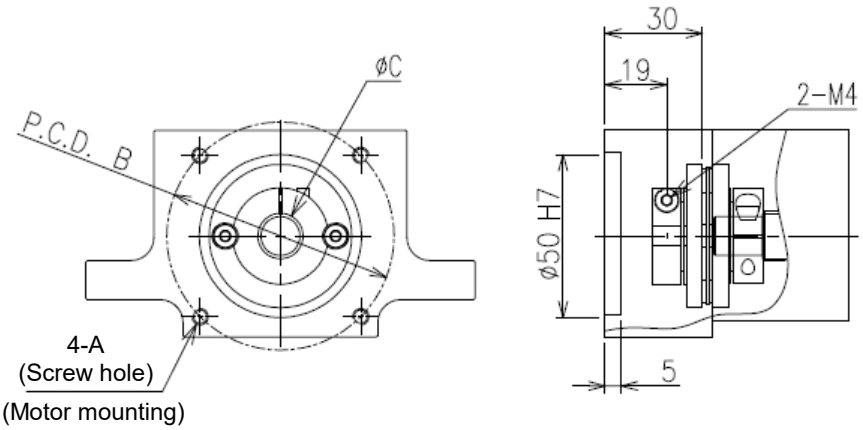
[ECS-17-E (400W)]

ECS-17-E (400W)					
Motor		A	B	C	Motor mounting screws
M	400W	M5	Φ70	Φ14	4-M5×L18
Y	400W	M5	Φ70	Φ14	4-M5×L18
P	400W	M4	Φ70	Φ14	4-M4×L18
F	400W	M5	Φ70	Φ14	4-M5×L18

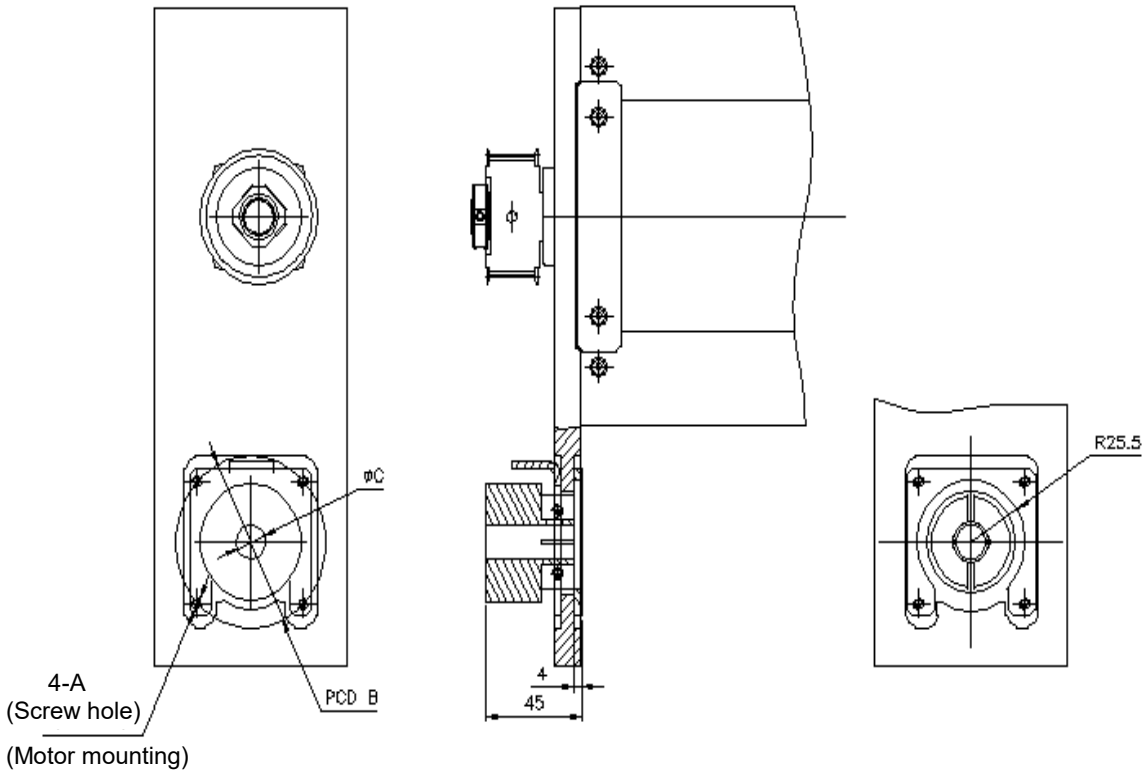


[ECS-17-B (400W)]

ECS-17-B (400W)					
Motor		A	B	C	Motor mounting screws
M	400W	M5	Φ70	Φ14	4-M5×L18
Y	400W	M5	Φ70	Φ14	4-M5×L18
P	400W	M4	Φ70	Φ14	4-M4×L18



[ECS-17-R/L/D (400W)]

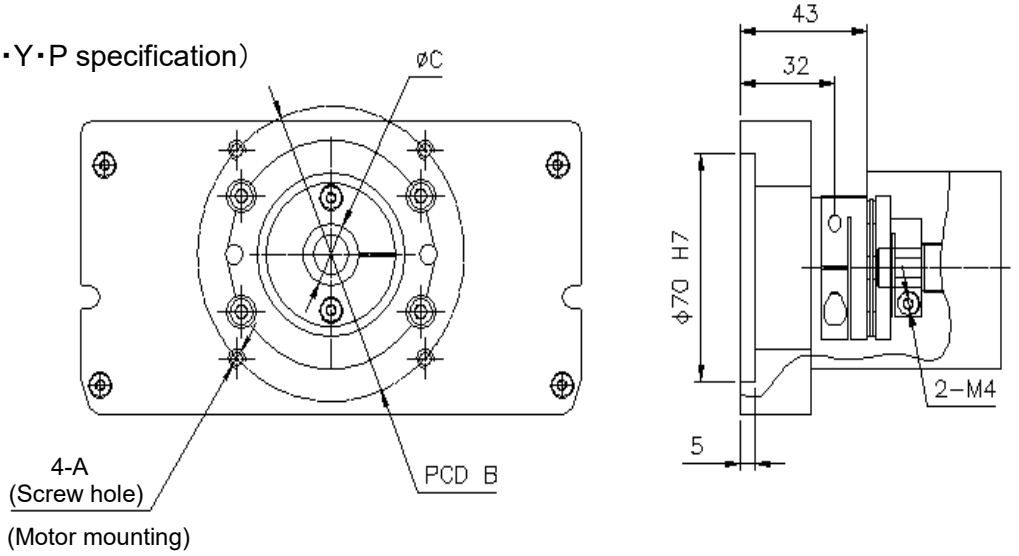


ECS-17-R/C/D (400W)					
Motor		A	B	C	Motor mounting screws
M	400W	M5	Φ70	Φ14	4-M5×L18
Y	400W	M5	Φ70	Φ14	4-M5×L18
P	400W	M5	Φ70	Φ14	4-M4×L18
F	400W	M5	Φ70	Φ14	4-M5×L18

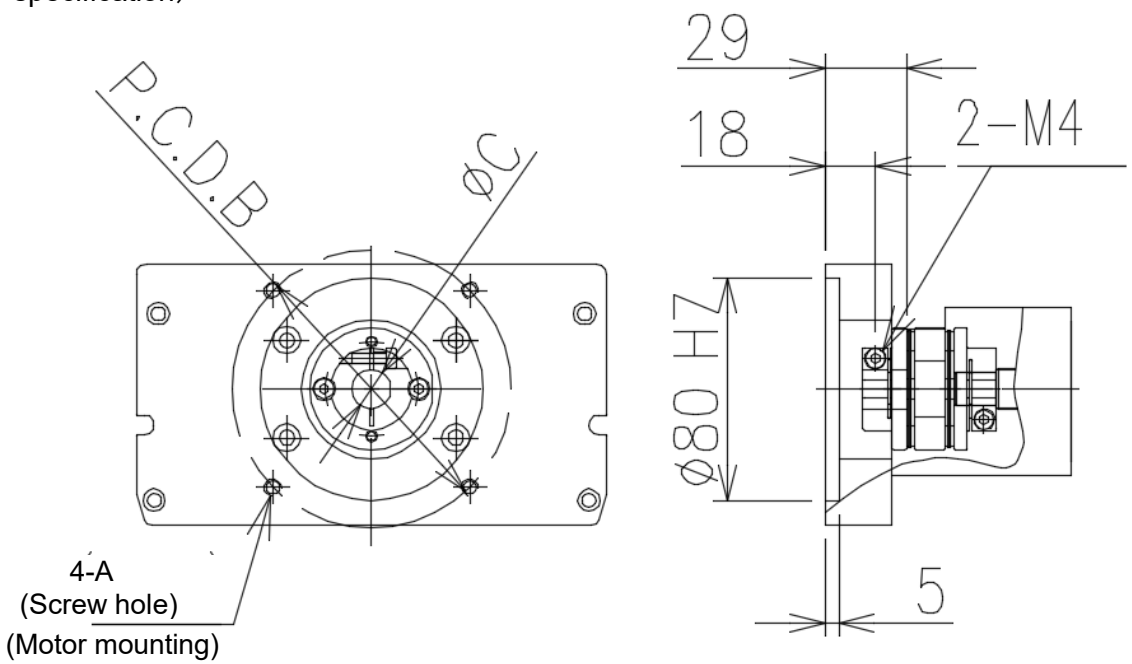
[ECS-17-E (750W)]

ECS-17-E (750W)					
Motor		A	B	C	Motor mounting screws
M	750W	M6	Φ90	Φ19	4-M6×L20
Y	750W	M6	Φ90	Φ19	4-M6×L20
P	750W	M5	Φ90	Φ19	4-M5×L20
F	750W	M6	Φ100	Φ14	4-M6×L20

（M・Y・P specification）



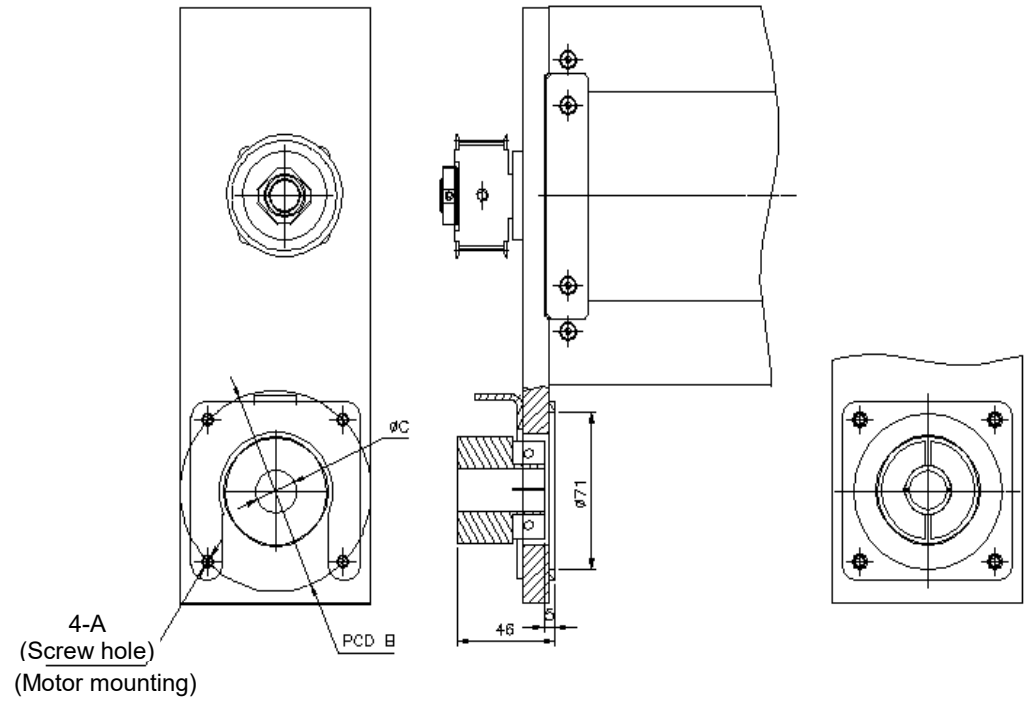
（F specification）



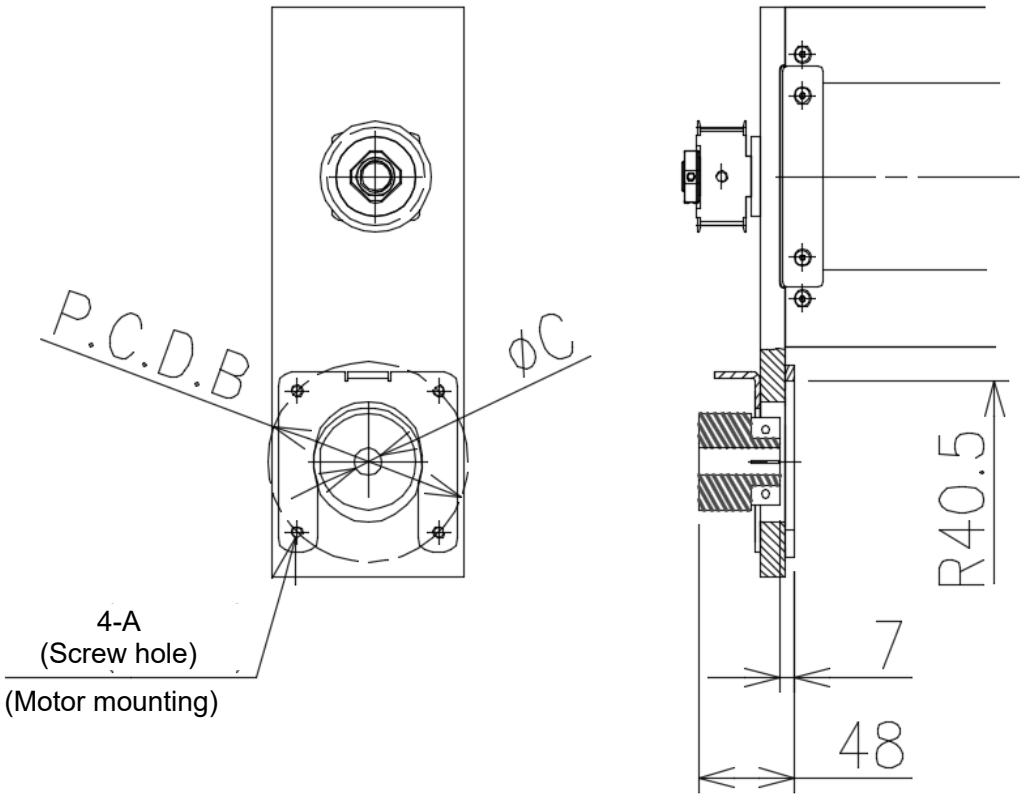
[ECS-17-R/L/D (750W)]

ECS-17-R/L/D (750W)					
Motor		A	B	C	Motor mounting screws
M	750W	M6	Φ90	Φ19	4-M6×L24
Y	750W	M6	Φ90	Φ19	4-M6×L24
P	750W	M5	Φ90	Φ19	4-M5×L24
F	750W	M6	Φ100	Φ14	4-M6×L24

（M･Y･P specification）



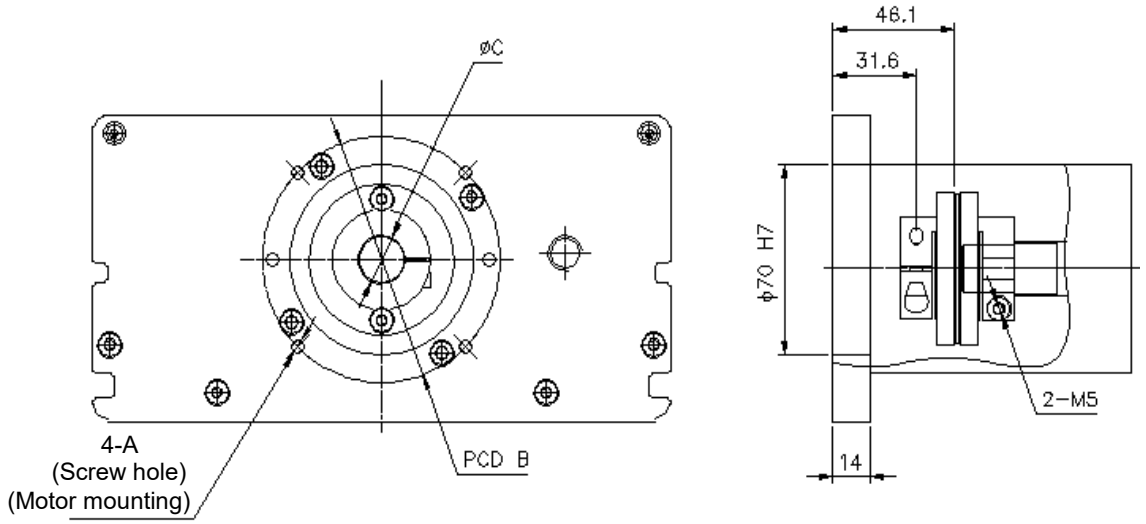
（F specification）



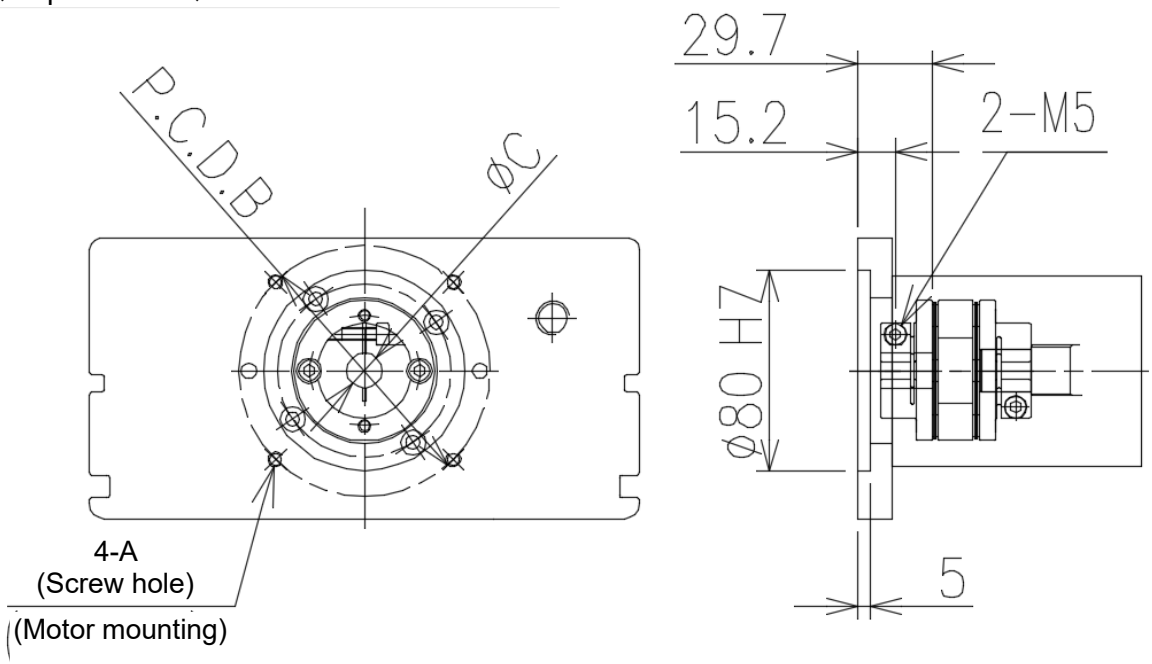
[ECS-22-E]

ECS-22-E					
Motor		A	B	C	Motor mounting screws
M	750W	M6	Φ90	Φ19	4-M6×L16
Y	750W	M6	Φ90	Φ19	4-M6×L16
P	750W	M5	Φ90	Φ19	4-M5×L16
F	750W	M6	Φ100	Φ14	4-M6×L16

（MYP specification）

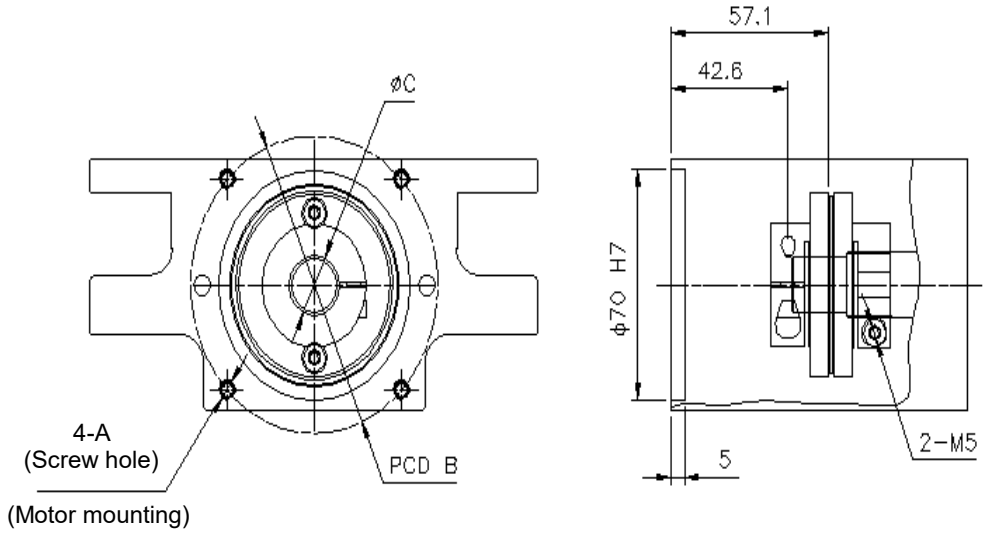


（F specification）

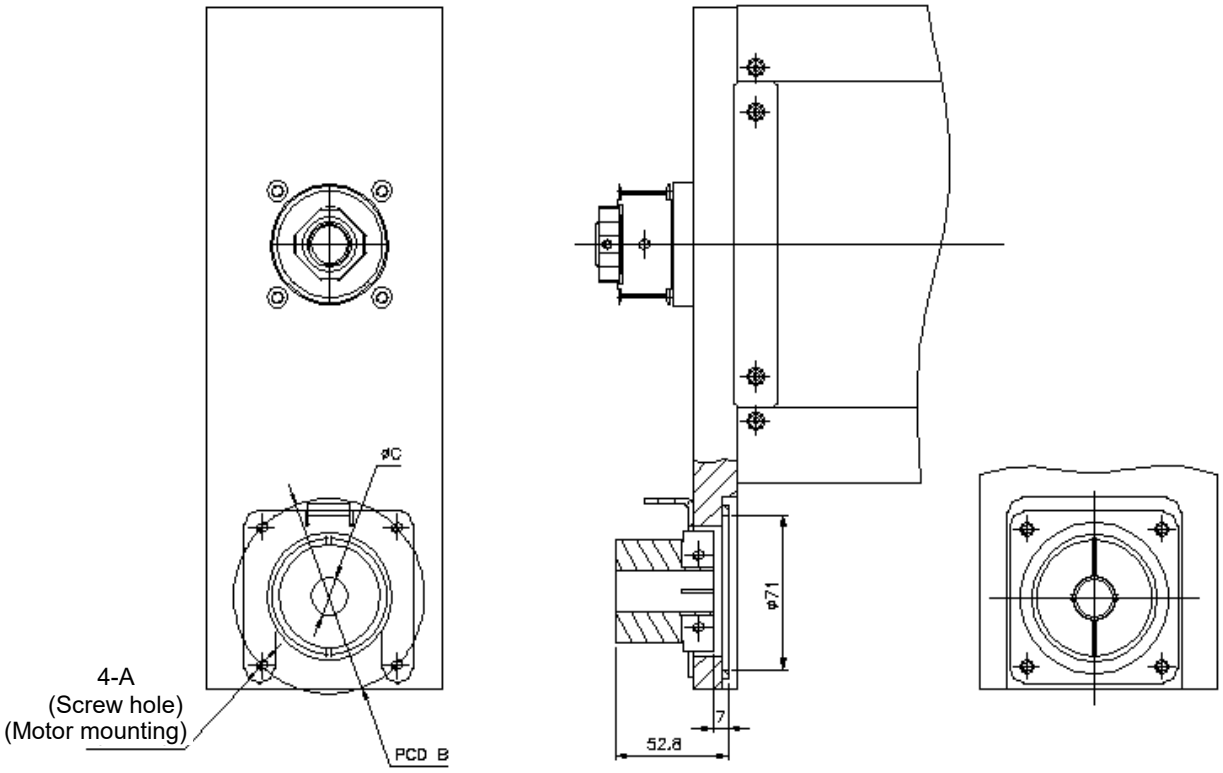


[ECS-22-B]

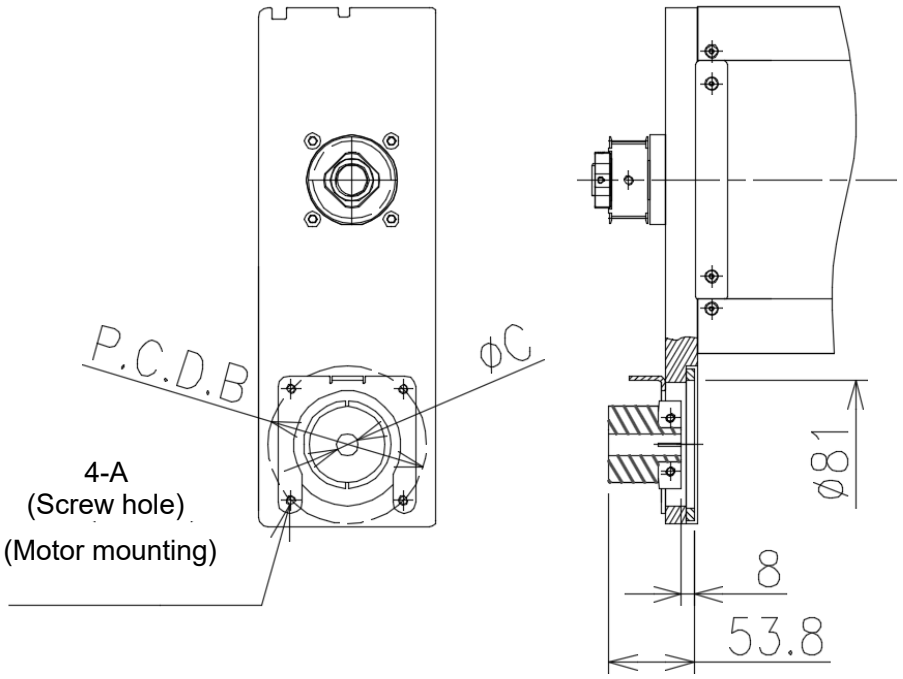
ECS-22-B					
Motor		A	B	C	Motor mounting screws
M	750W	M6	Φ90	Φ19	4-M6×L16
Y	750W	M6	Φ90	Φ19	4-M6×L16
P	750W	M5	Φ90	Φ19	4-M5×L16



[ECS-22-R/L/D]
（MYP specification）



（F specification）



ECS-22-R/L/D					
Motor		A	B	C	Motor mounting screws
M	750W	M6	Φ90	Φ19	4-M6×L24
Y	750W	M6	Φ90	Φ19	4-M6×L24
P	750W	M5	Φ90	Φ19	4-M5×L24
F	750W	M6	Φ100	Φ14	4-M6×L24

3.4 How to Install Sensors

To install the outside sensor, insert the attached nut into the sensor rail on the product body. The inside sensor, which has been fixed at the factory before shipment, cannot be adjusted.

4. Installation

4.1 Confirmation of Delivered Product

Please confirm that the delivered product is the product (model) as per order.
Also inspect the product for any transport damage and deformation.

* If you have any questions as to the descriptions on the product, do not use it. Please contact the dealer or the distributor from you purchased it immediately.

4.2 Instructions on Handling Delivered Product

4.2.1 Handling of Packed Product

- Handle the product carefully so as not to drop it and apply impact on the package.
- Do not carry a heavy package 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.

4.2.2 Handling of Unpacked Product

- When unpacking the actuator from the package, hold the body part and pick it up. Be very careful not to be injured by a sensor dog, etc.
- When carrying the actuator, be careful not to apply impact on it due to dropping, etc.
- Do not apply an external force to every part of the actuator.

4.3 Installation Environment

- Check the ambient temperature and atmosphere of the product specifications for product storage and operation.
- Do not install or use the product in a place where the product can be exposed to water or oil.
  * Doing so may result in current leakage or fire failure. Exposure to oil droplets and oil mist is also strictly prohibited.
- Use the product in a place where the operating ambient temperature is 0 to 50°C. Ventilate the place if the heat is trapped there.
- Install the product in a place where it is not exposed to direct sunlight, dust, heat generating element and where there are no corrosive gas, explosive gas, flammable gas, and flammables. This product is not designed to be resistant to chemical substances.
- Do not install the actuator in places subject to strong vibration or impact. Doing so may result in malfunction.

4.4 Installation of Product Body

- 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:

M4	1.5 N•m
M5	3.0 N•m
M6	5.2 N•m
M8	12.5 N•m
M10	24.5 N•m

4.5 Installation of Transfers

- 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.

5. Operation

Please read “Introduction” of this instruction manual thoroughly, and use the product within its specifications.
This product has no motor.
Please obtain, install, and adjust the motor and driver by yourself.
For details on how to install the motor properly, refer to this instruction manual.
For details on how to adjust the motor, refer to the instruction manual of the motor you prepared.

The recommended servomotors have a gain adjustment function to control vibration.
Adjust the gain and operate the product under vibration-controlled conditions (during operation/halts).
If the product is operated under vibration/resonance conditions, the product life may be shortened.
Set the acceleration and deceleration time during operation to 0.2 sec or greater.

6. Maintenance & Inspection

To ensure longer service life of the product, carry out the following inspections and perform maintenance as necessary.
Always turn the power off before inspection, except for items 1, 2, and 3.

Inspection Items

Inspection Items	Inspection Methods	Inspection Frequency	Corrective Actions
1. Check the product and transfers are mounted securely.	Looseness inspection	Daily	Additionally tighten them.
2. Check the cables for breaks or damages.	Visual inspection	Daily	Repair is required.
3. Check the moving parts (such as the linear guide, ball screw part, and dust-proof plate) for trapped foreign objects and for poor lubrication condition.	Visual inspection	Daily	Clean the product if necessary. *1 After cleaning, put grease at 3-month intervals or at a travel distance of approx. 100 km.*2
4. Check for any vibration or noise during halts as if the product is in operation.	Sound inspection		Adjust the gain. Repair is required.

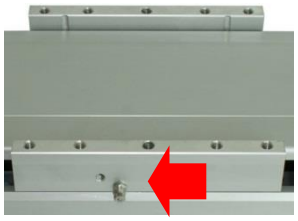
*1: Use a soft cloth for cleaning and make sure that no foreign object remains in the moving parts.
*2: For details on how to grease, see the following page.

Grease Lubrication

Before greasing, turn the power off.

	Recommended grease
Standard series	AFEP2(YAMABARA)
ECS FP series	Super Lube (Synco Chemical) (multipurpose grease)
ECS P4 series	Contact your nearest CKD sales office.

a) Model equipped with grease nipple:
Pump grease through the grease nipple on the slider part.
(The linear guide and ball screw part are greased.)

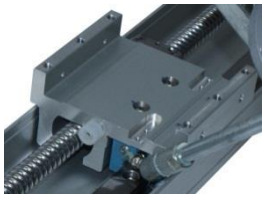


b) Model equipped with no grease nipple:
Grease the following parts (ball screw shaft/nut, linear guide rail, and linear guide block).

Ball screw shaft

Ball screw nut

Linear guide rail



Linear guide block

Replacement and Adjustment of Dust-Proof Plate

Before replacing or adjusting the dust-proof plate, turn the power off.

(1) Remove the screws on the slider part.

(2) Remove the screws on both sides of the dust-proof plate.

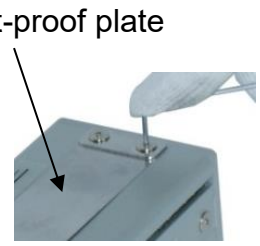
(3) Remove the plastic holding springs of the slider carefully not to lose them.

(4) Clean and replace the plate.

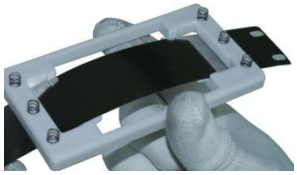
(5) When mounting the dust-proof plate, stretch the plate toward both ends so that there is no warp on it, and then tighten the screws.

* Note that the dust-proof plate is easily deformed.
Handle it carefully.

(1)

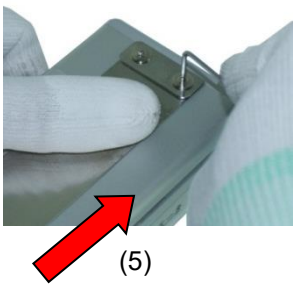


(2)



(3)

(4)



(5)

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