

IAI

Quality and Innovation

ELECYLINDER®

EC-S2/RR2



www.intelligentactuator.com

NEW!

Ultra-compact

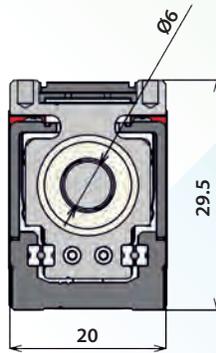
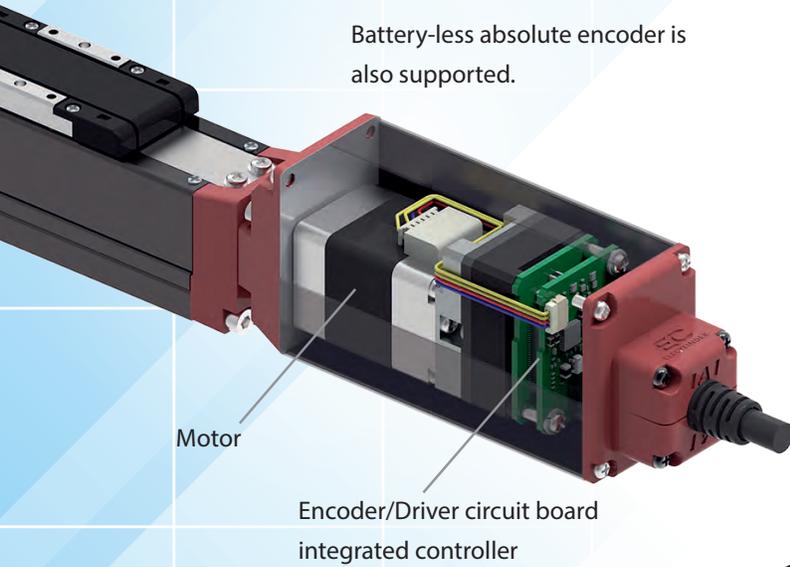


ELECYLINDER®

Built-in controller

Battery-less absolute encoder is also supported.

Max speed 300mm/s



<Slider/Radial Cylinder>

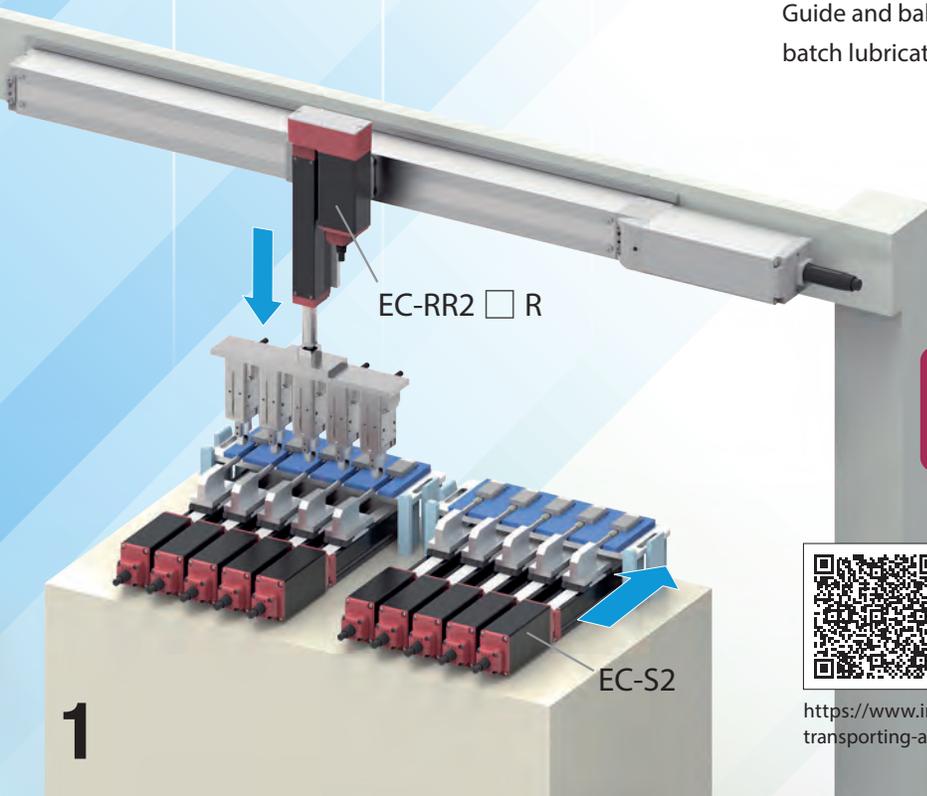
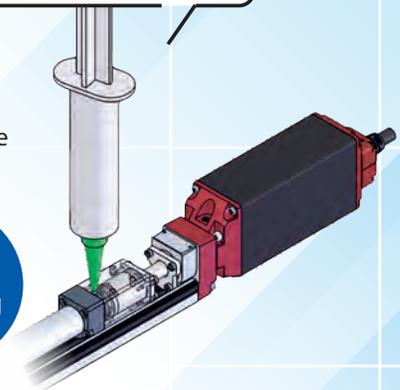
Built-in linear guide manufactured in-house
φ6 ball circulating type screw keeps speed from decreasing even at maximum stroke 300mm.

Simple grease lubrication!

<Radial Cylinder>

Guide and ball screw can be batch lubricated.

Patent pending



Application example

Resin gear transport and press-fit to motor

In this process, gears are press-fitted to the small motor set on the resin pallet.

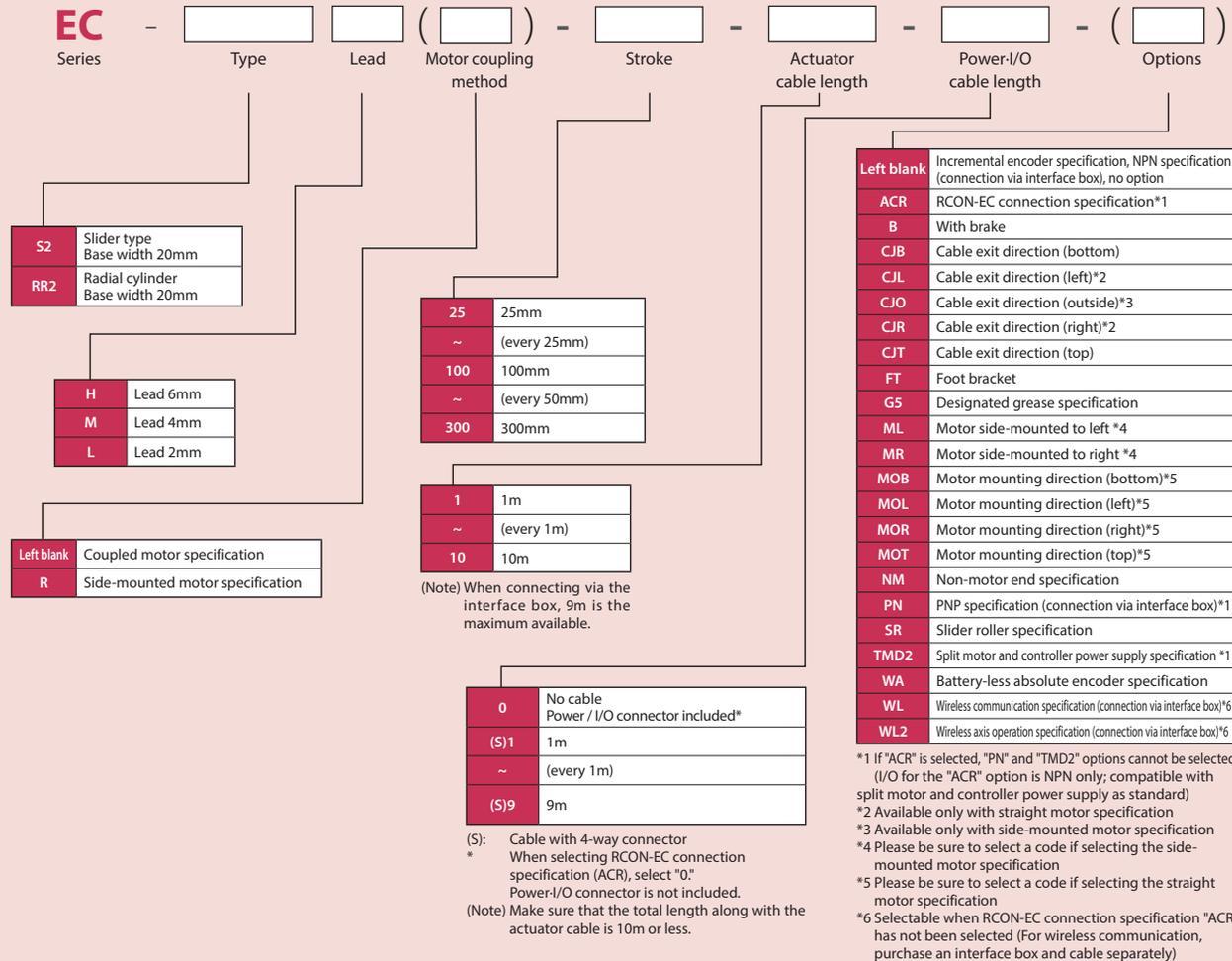


Video here

<https://www.intelligentactuator.com/application-example-2024-ec-transporting-a-resin-gear-and-press-fitting/>

Model Specification Items

ELECYLINDER®



Specification Tables

Slider

Type	Model	Lead		Stroke (mm) and max speed (mm/s)							Max. payload (kg)		Reference Page
		Model	mm	*Length of band = Stroke; *Numbers in band = Maximum speed by stroke							Horizontal	Vertical	
				25	50	75	100	150	200	250			
Coupled motor	S2	H-	6	300							0.75	0.5	5
		M-	4	200							1.5	0.75	
		L-	2	100							3	1.5	
Side-mounted motor	S2 □ R	H-	6	300							0.75	0.5	9
		M-	4	200							1.5	0.75	
		L-	2	100							3	1.5	

Radial cylinder

Type	Model	Lead		Stroke (mm) and max speed (mm/s)							Max. push force (N)	Max. payload (kg)		Reference Page
		Model	mm	*Length of band = Stroke; *Numbers in band = Maximum speed by stroke								Horizontal	Vertical	
				25	50	75	100	150	200	250				
Coupled motor	RR2	H-	6	300				240		165	15	1	0.325	13
		M-	4	200				160		110	23	2	0.625	
		L-	2	100				80		55	47	4	1.25	
Side-mounted motor	RR2 □ R	H-	6	300				240		165	15	1	0.325	17
		M-	4	200				160		110	23	2	0.625	
		L-	2	100				80		55	47	4	1.25	

Automatic Servo OFF Function

The automatic servo OFF function can be set with the PC teaching software (IA-OS) or teaching pendant (TB-02/03).

When the automatic servo OFF function is set, the servo will turn OFF automatically after positioning complete, after stopping, or after a certain amount of time (lag time).

The servo automatically turns ON when the next movement command is input, executing positioning operation.

Because there is no holding current when stopped, power consumption can be reduced.

Mounting Orientation

		Mounting orientation			
Series	Type	Table mounted	Vertical mounting (*1)	Side mounted	Invert mounted
EC	S2/S2□R	○	○	△ (*2)	△ (*2)
	RR2/RR2□R	○	○	○	○

*1 For vertical mounting, motor top installation is recommended.

*2 While side and ceiling mount orientations are possible, this may cause slack or misalignment in the stainless steel sheet.

Continued use in these orientations can cause the stainless steel sheet to break. Inspect it daily and adjust the sheet if any slack or misalignment is found.

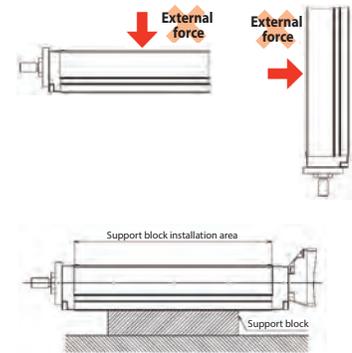
Precautions for Installation

<Sliders/Radial Cylinders>

- Keep the body installation surface and workpiece mounting surface accuracy within 0.05mm/m. Poor accuracy will increase the sliding resistance of the slider and may cause a malfunction.
- The body bottom base mounting surface and left side (viewed from the motor opposite side) are the reference surfaces for slider running accuracy. When running accuracy is required, mount with these surfaces as reference.

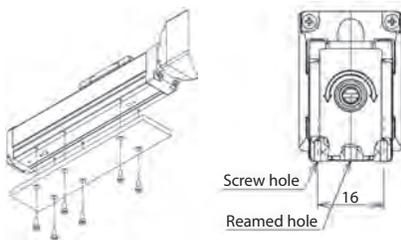
<Radial Cylinders>

- Do not allow external force to be applied to the body. (Do not apply radial load or moment load.)
- When applying radial load or moment load to the rod, secure the entire base mounting surface.
- When installing with the front bracket screw holes, support the body by installing a support block for the base mounting surface. If using a support block, it is recommended either to use an optional foot bracket or to keep the block (aluminum alloy, etc.) close against the body. The installation position should be on the frame motor side.
- A support block is strongly recommended in order to avoid vibration generated due to the installation environment, which may lead to abnormal operation or damage to parts.

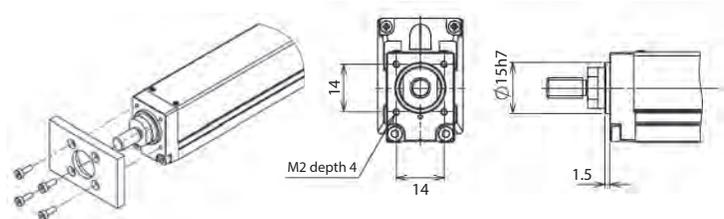


Mounting Method

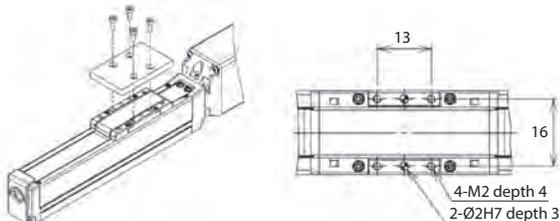
- Using the base bottom surface screw hole (Sliders/Radial Cylinders)



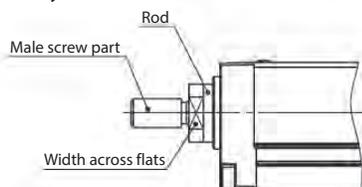
- Using the front bracket screw hole (Radial Cylinders)



- Mounting the payload (Sliders)

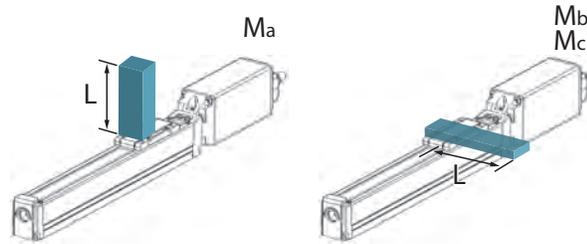


- (Radial Cylinders)



Overhang Load Length

This is the approximate offset at which the actuator can operate smoothly even when the workpiece or bracket is offset from the slider. Vibration or other factors could cause failure if the approximate length is greatly exceeded. Use the product within the guideline length.



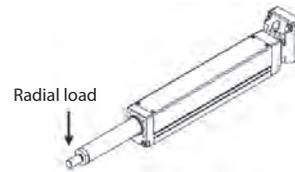
Radial Load Acting on the Rod

Radial cylinders have a linear guide built into the body, so that radial and moment loads can be applied to the rod. The allowable radial and moment loads must meet the following three conditions.

1. The radial load acting on the rod must not exceed the allowable value.

Type	Rod tip static allowable radial load	Rod tip dynamic allowable radial load (*1)
RR2 □ (R)	20N	10N

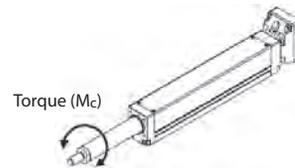
(*1) Value at a standard rated operation life of 5,000km.



2. The torque (Mc) acting on the rod must not exceed the allowable value.

Type	Rod tip static Allowable torque	Rod tip dynamic allowable torque (*2)
RR2 □ (R)	1.5N·m	1.5N·m

(*2) Value at a standard rated operation life of 5,000km.



3. The uniform load acting on the rod must not exceed the allowable value.

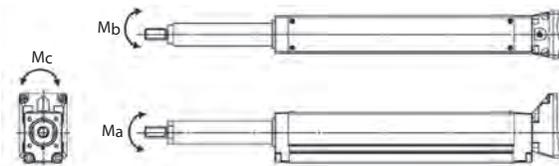
The uniform load is obtained by the following formula.

$$\text{Uniform load} = Ma \cdot Ka + Mb \cdot Kb + Mc \cdot Kc$$

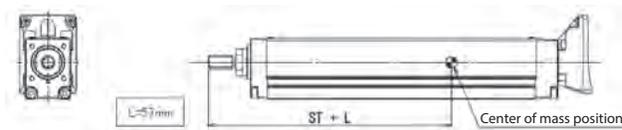
Type	Static allowable uniform load	Dynamic allowable uniform load (*3)	Uniform load coefficient		
			Ka	Kb	Kc
RR2 □ (R)	570N	550N	297/m	208/m	186/m

(*3) Value at a standard rated operation life of 5,000km.

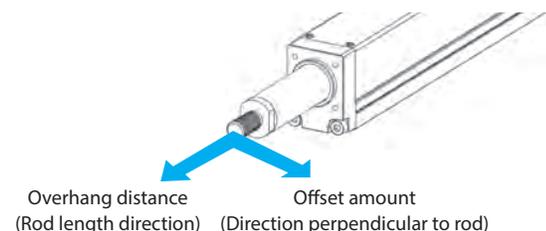
Ma, Mb, Mc: Moment load



Moment offset reference position



(Caution) Ensure that the radial load applied to the rod does not exceed the allowable offset amount and allowable overhang distance.



Type	Allowable offset amount	Allowable overhang distance
RR2 □ (R)	50mm	50mm

·Operating conditions should be moderated if abnormal vibration or noise is observed, even if the radial load and torque are within allowable values.
 ·The center mass location of the attached object should not exceed 1/2 the offset amount or overhang distance.

EC-S2

Simple
Dust-
proof

Coupled
Motor

Body Width
20
mm

24V
Stepper
Motor

Model Specification Items

EC	S2						
Series	Type	Lead	Stroke	Actuator cable length	Power · I/O cable length	Options	
	H 6mm M 4mm L 2mm		25 25mm ↓ 100 100mm (every 25mm) ↓ 100 100mm ↓ 300 300mm (every 50mm)	See Actuator Cable Length table below	See Power · I/O Cable Length table below	See Options table below	

*NPN specification is standard. PNP option is available.



(Note) The photo above is for motor installed on top (MOT).

CE

RoHS
10

Horizontal

Vertical

Side

Ceiling

Selection Notes

- (1) "Main Specifications" displays the payload's maximum value. Please refer to "Table of Payload by Speed/Acceleration" for more details.
- (2) If performing push-motion operations, refer to the "Correlation Diagrams between Push Force and Current Limit." The push forces listed are only reference values. Please refer to P. 25 for applicable notes.
- (3) Pay close attention to the mounting orientation. Please refer to P. 3 for details.
- (4) Reference value of the overhang load length is under 50mm in the Ma, Mb, and Mc directions. Please refer to the explanation on P. 4 for the overhang load length.
- (5) The center mass location of the attached object should be less than 1/2 of the overhang distance. Operating conditions should be moderated if abnormal vibration or noise is observed, even if the overhang distance and load moment are within allowable values.

By Stroke

Stroke (mm)	EC-S2	
	RCON-EC connection specification (Note 1)	NPN/PNP specification (Note 2)
25	✓	✓
50	✓	✓
75	✓	✓
100	✓	✓
150	✓	✓
200	✓	✓
250	✓	✓
300	✓	✓

(Note 1) Be sure to select "ACR" as the option.
 (Note 2) Interface box and conversion cable are included.

Options * Please check the Options reference pages to confirm each option.

Name	Option code	Reference page
RCON-EC connection specification (Note 3) (Note 5)	ACR	21
Brake	B	21
Cable exit direction (bottom)	CJB	21
Cable exit direction (left)	CJL	21
Cable exit direction (right)	CJR	21
Cable exit direction (top)	CJT	21
Foot bracket	FT	21
Designated grease specification	G5	21
Motor mounting direction (bottom) (Note 4)	MOB	22
Motor mounting direction (left) (Note 4)	MOL	22
Motor mounting direction (right) (Note 4)	MOR	22
Motor mounting direction (up) (Note 4)	MOT	22
Non-motor end specification	NM	22
PNP specification (Note 3)	PN	22
Slider roller part specification	SR	22
Split motor and controller power supply specification (Note 3)	TMD2	22
Battery-less absolute encoder specification	WA	22
Wireless communication specification (Note 5)	WL	22
Wireless axis operation specification (Note 5)	WL2	22

(Note 3) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected. Also, interface box and conversion cable are not included.
 (Note 4) Be sure to fill in one of the symbols for the Option field in the Model Specification Items.
 (Note 5) If the RCON-EC connection specification (ACR) is selected, the wireless communication specification (WL) and wireless axis operation specification (WL2) cannot be selected. For wireless communication with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power · I/O cable. Please refer to P. 26 for details. Please contact our sales department for the wireless axis operation specification (WL2).

Options Sold Separately

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	30
RCON-EC connection specification power · I/O cable (Standard connector cable)	CB-REC-PWBIO□□□-RB	30
RCON-EC connection specification power · I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	30
RCON-EC connection specification Interface box for split motor and controller power supply (Wireless specification)	ECW-CVNWL-CB-ACR	30

(Note) The power · I/O cable is a robot cable. Indicate the cable length in □□□. (for example, 010 = 1m)

Actuator Cable Length

Cable code	Cable length
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m (Note 6)

(Note 6) When connecting via the interface box, 9m is the maximum available.
 (Note) Make sure that the total length along with the power · I/O cable is 10m or less.
 (Note) Robot cable.

Power · I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC-PWBIO□□□-RB supplied
0	Without cable	✓ (Note 7)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 7) Only terminal block connector is included. When selecting RCON-EC connection specification (ACR) option, select "0." Terminal block connector is not included.
 (Note) Robot cable.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓
S4 ~ S5	4 ~ 5m	✓
S6 ~ S9	6 ~ 9m	✓

(Note) Robot cable.

Main Specifications

Item		Description			
Lead	Ball screw lead (mm)	6	4	2	
Horizontal	Payload	Max. payload (kg)	0.75	1.5	3
		Max. speed (mm/s)	300	200	100
	Speed / acceleration / deceleration	Min. speed (mm/s)	8	5	3
		Rated acceleration/deceleration (G)	0.3	0.3	0.3
		Max. acceleration/deceleration (G)	0.3	0.3	0.3
Vertical	Payload	Max. payload (kg)	0.5	0.75	1.5
		Max. speed (mm/s)	300	200	100
	Speed / acceleration / deceleration	Min. speed (mm/s)	8	5	3
		Rated acceleration/deceleration (G)	0.3	0.3	0.3
		Max. acceleration/deceleration (G)	0.3	0.3	0.3
Push	Max. push force (N)	15	23	47	
	Max. push speed (mm/s)	20	20	5	
Brake	Brake specification	Non-excitation actuating solenoid brake			
	Brake holding force (kgf)	0.5	0.75	1.5	
Stroke	Min. stroke (mm)	25	25	25	
	Max. stroke (mm)	300	300	300	
	Stroke pitch (mm) 25 ~ 100ST	25	25	25	
	Stroke pitch (mm) 100 ~ 300ST	50	50	50	

Item	Description
Drive system	Ball screw φ6mm rolled C10
Positioning repeatability	±0.02mm
Lost motion	- (notation not available due to 2-point positioning function)
Base	Dedicated aluminum extruded material (A6063SS-T6 equivalent), black alumite treatment
Linear guide	Linear motion infinite circulating type
Allowable static moment	Ma: 1.43 N-m
	Mb: 2.04N-m
	Mc: 2.29N-m
Allowable dynamic moment (Note 8)	Ma: 0.50 N-m
	Mb: 0.72 N-m
	Mc: 0.81 N-m
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Ingress protection	IP20
Vibration & shock resistance	4.9m/s ²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□□20) (Power capacity: Max. 1.1A)
Encoder type	Incremental/battery-less absolute
Number of encoder pulses	16384 pulse/rev

(Note 8) Based on the standard rated operation life of 5,000km. Operation life varies according to operating and mounting conditions. Please contact IAI for more details operational life.

Slider Type Moment Direction

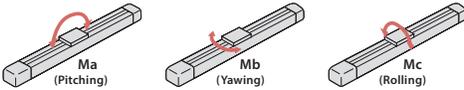


Table of Payload by Speed/Acceleration

Standard grease specification The unit for payload is kg.

Lead 6

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	0.75	0.5
50	0.75	0.5
100	0.75	0.5
150	0.75	0.5
200	0.75	0.5
250	0.75	0.5
300	0.75	0.5

Lead 4

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	1.5	0.75
50	1.5	0.75
100	1.5	0.75
150	1.5	0.75
200	1.5	0.75

Lead 2

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	3	1.5
25	3	1.5
50	3	1.5
75	3	1.5
100	3	1.5

For environmental temperatures of 5°C or lower, use at the following speeds or below.

- Lead 6: 250mm/s or lower
- Lead 4: 150mm/s or lower
- Lead 2: 75mm/s or lower

Food grade grease specification The unit for payload is kg.

Lead 6

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	0.75	0.5
50	0.75	0.5
100	0.75	0.5
150	0.75	0.5
200	0.75	0.5
250	0.75	0.5
300	0.75	0.5

Lead 4

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	1.5	0.75
50	1.5	0.75
100	1.5	0.75
150	1.5	0.75
200	1.5	0.5

Lead 2

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	3	1.5
25	3	1.5
50	3	1
75	3	1
100	3	1

For environmental temperatures of 15°C or lower, use at the following speeds or below.

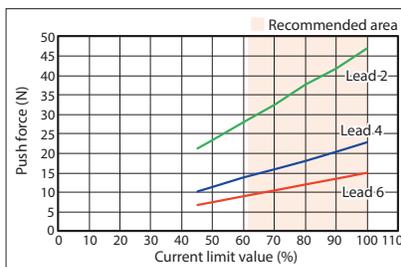
- Lead 6: 250mm/s or lower
- Lead 4: 150mm/s or lower
- Lead 2: 75mm/s or lower

Stroke and Max. Speed

Lead (mm)	25 to 100 (every 25mm)	100 to 300 (every 50mm)
6	300	
4	200	
2	100	

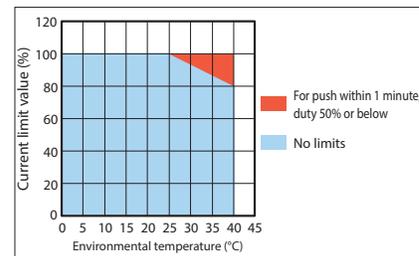
(Unit: mm/s)

Correlation Diagrams between Push Force and Current Limit



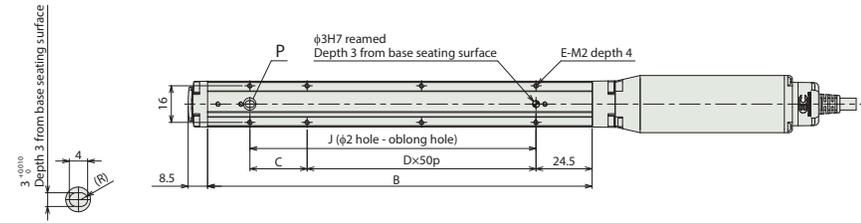
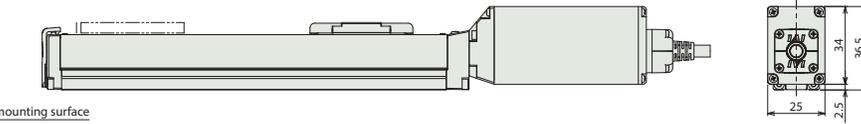
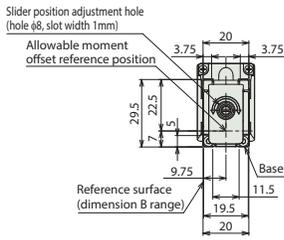
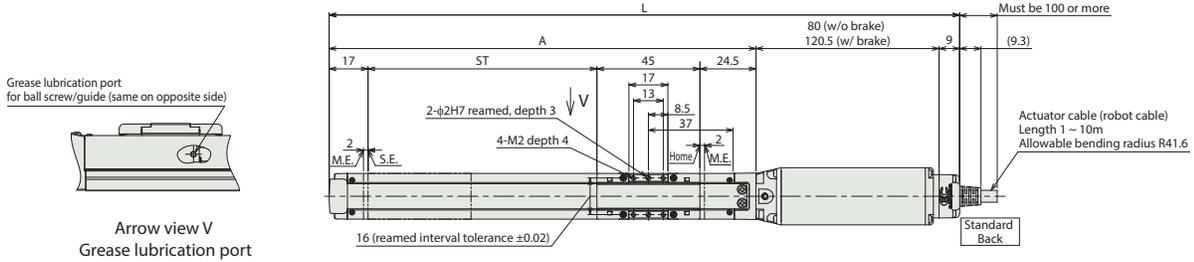
Cautions for push-motion operation

For high-thrust push-motion operation in high-temperature environments, use within the limit values in the graph.

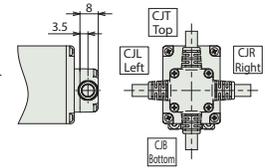


(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
 (Note) Fix the cable so that its base does not move.
 The cable can be disconnected and replaced. (Connected with connector inside cable box)
 The cable exit direction (option) can be changed by changing the cable box direction.
 (Note) The figures below are for motor installed on top (MOT).

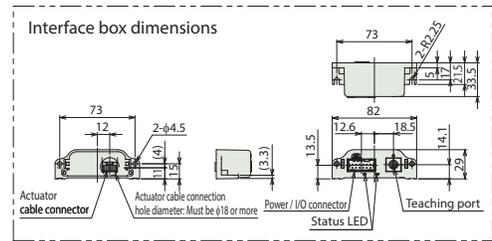
ST: Stroke
 M.E: Mechanical end
 S.E: Stroke end



Detailed view of P
 Base oblong hole details



Cable exit direction (option)



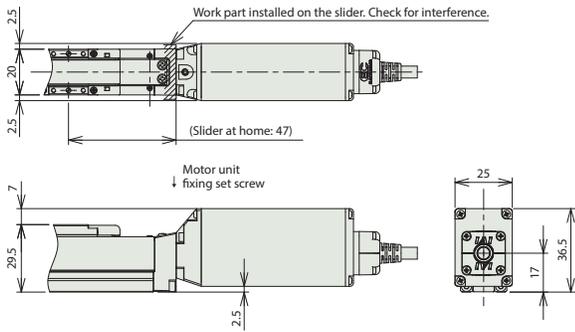
■ Dimensions by Stroke

L	Stroke	25	50	75	100	150	200	250	300
	Without brake	200.5	225.5	250.5	275.5	325.5	375.5	425.5	475.5
With brake	241	266	291	316	366	416	466	516	
A	111.5	136.5	161.5	186.5	236.5	286.5	336.5	386.5	
B	93	118	143	168	218	268	318	368	
C	0	25	0	25	25	25	25	25	
D	1	1	2	2	3	4	5	6	
E	4	6	6	8	10	12	14	16	
J	50	75	100	125	175	225	275	325	

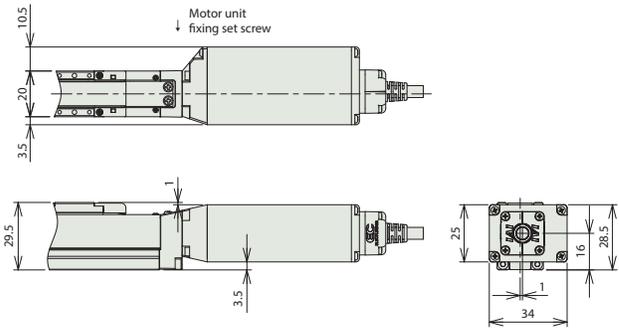
■ Mass by Stroke

Mass (kg)	Stroke	25	50	75	100	150	200	250	300
	Without brake	0.31	0.32	0.34	0.35	0.39	0.42	0.45	0.48
With brake	0.39	0.40	0.42	0.43	0.46	0.50	0.53	0.56	

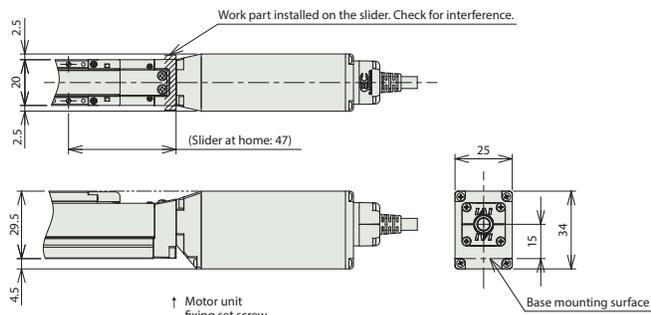
Motor mounting direction (option)



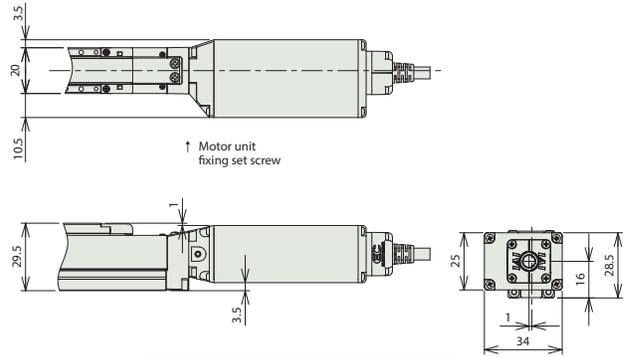
Motor mounting direction (top): MOT



Motor mounting direction (right): MOR



Motor mounting direction (bottom): MOB



Motor mounting direction (left): MOL

Applicable Controllers

(Note) EC Series products are equipped with a built-in controller. Please refer to P.27 for details on built-in controllers.

EC-S2 R

Simple
Dust-
proof

Side-mounted
Motor

Body Width
20
mm

24v
Stepper
Motor

Model Specification Items

EC - **S2** **R**

Series	Type	Lead	Specifications
	H	6mm	R Side-mounted motor
	M	4mm	
	L	2mm	

Stroke

25	25mm
100	100mm (every 25mm)
100	100mm
300	300mm (every 50mm)

Actuator cable length

See Actuator Cable Length table below

Power · I/O cable length

See Power · I/O Cable Length table below

Options

See Options table below

*NPN specification is standard. PNP option is available.



(Note) The photo above is motor side-mounted to left (ML).



Selection Notes



- (1) "Main Specifications" displays the payload's maximum value. Please refer to "Table of Payload by Speed/Acceleration" for more details.
- (2) If performing push-motion operations, refer to the "Correlation Diagrams between Push Force and Current Limit." The push forces listed are only reference values. Please refer to P. 25 for applicable notes.
- (3) Pay close attention to the mounting orientation. Please refer to P. 3 for details.
- (4) Reference value of the overhang load length is under 50mm in the Ma, Mb, and Mc directions. Please refer to the explanation on P. 4 for the overhang load length.
- (5) The center mass location of the attached object should be less than 1/2 of the overhang distance. Operating conditions should be moderated if abnormal vibration or noise is observed, even if the overhang distance and load moment are within allowable values.

By Stroke

Stroke (mm)	EC-S2 R	
	RCON-EC connection specification (Note 1)	NPN/PNP specification (Note 2)
25	✓	✓
50	✓	✓
75	✓	✓
100	✓	✓
150	✓	✓
200	✓	✓
250	✓	✓
300	✓	✓

- (Note 1) Be sure to select "ACR" as the option.
 (Note 2) Interface box and conversion cable are included.

Options * Please check the Options reference pages to confirm each option.

Name	Option code	Reference page
RCON-EC connection specification (Note 3) (Note 5)	ACR	21
Brake	B	21
Cable exit direction (bottom)	CJB	21
Cable exit direction (outside)	CJO	21
Cable exit direction (top)	CJT	21
Foot bracket	FT	21
Designated grease specification	G5	21
Motor side-mounted to left (Note 4)	ML	21
Motor side-mounted to right (Note 4)	MR	21
Non-motor end specification	NM	22
PNP specification (Note 3)	PN	22
Slider roller part specification	SR	22
Split motor and controller power supply specification (Note 3)	TMD2	22
Battery-less absolute encoder specification	WA	22
Wireless communication specification (Note 5)	WL	22
Wireless axis operation specification (Note 5)	WL2	22

- (Note 3) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected. Also, interface box and conversion cable are not included.
 (Note 4) Be sure to fill in one of the symbols for the Option field in the Model Specification Items.
 (Note 5) If the RCON-EC connection specification (ACR) is selected, the wireless communication specification (WL) and wireless axis operation specification (WL2) cannot be selected. For wireless communication with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power · I/O cable. Please refer to P. 26 for details. Please contact our sales department for the wireless axis operation specification (WL2).

Options Sold Separately

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	30
RCON-EC connection specification power · I/O cable (Standard connector cable)	CB-REC-PWBIO□□□-RB	30
RCON-EC connection specification power · I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	30
RCON-EC connection specification Interface box for split motor and controller power supply (Wireless specification)	ECW-CVNWL-CB-ACR	30

- (Note) The power · I/O cable is a robot cable.
 Indicate the cable length in □□□. (for example, 010 = 1m)

Actuator Cable Length

Cable code	Cable length
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m (Note 6)

- (Note 6) When connecting via the interface box, 9m is the maximum available.
 (Note) Make sure that the total length along with the power · I/O cable is 10m or less.
 (Note) Robot cable.

Power · I/O Cable Length

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC-PWBIO□□□-RB supplied
0	Without cable	✓ (Note 7)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

- (Note 7) Only terminal block connector is included. When selecting RCON-EC connection specification (ACR) option, select "0." Terminal block connector is not included.
 Please refer to P. 29 for details.

(Note) Robot cable.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓
S4 ~ S5	4 ~ 5m	✓
S6 ~ S9	6 ~ 9m	✓

(Note) Robot cable.

Main Specifications

Item		Description			
Lead	Ball screw lead (mm)	6	4	2	
Horizontal	Payload	Max. payload (kg)	0.75	1.5	3
		Max. speed (mm/s)	300	200	100
	Speed / acceleration / deceleration	Min. speed (mm/s)	8	5	3
		Rated acceleration/deceleration (G)	0.3	0.3	0.3
		Max. acceleration/deceleration (G)	0.3	0.3	0.3
Vertical	Payload	Max. payload (kg)	0.5	0.75	1.5
		Max. speed (mm/s)	300	200	100
	Speed / acceleration / deceleration	Min. speed (mm/s)	8	5	3
		Rated acceleration/deceleration (G)	0.3	0.3	0.3
		Max. acceleration/deceleration (G)	0.3	0.3	0.3
Push	Max. push force (N)	15	23	47	
	Max. push speed (mm/s)	20	20	5	
Brake	Brake specification	Non-excitation actuating solenoid brake			
	Brake holding force (kgf)	0.5	0.75	1.5	
Stroke	Min. stroke (mm)	25	25	25	
	Max. stroke (mm)	300	300	300	
	Stroke pitch (mm) 25 ~ 100ST	25	25	25	
	Stroke pitch (mm) 100 ~ 300ST	50	50	50	

Item	Description
Drive system	Ball screw φ6mm rolled C10
Positioning repeatability	±0.02mm
Lost motion	- (notation not available due to 2-point positioning function)
Base	Dedicated aluminum extruded material (A6063SS-T6 equivalent), black alumite treatment
Linear guide	Linear motion infinite circulating type
Allowable static moment	Ma: 1.43 N-m
	Mb: 2.04N-m
	Mc: 2.29N-m
Allowable dynamic moment (Note 8)	Ma: 0.50 N-m
	Mb: 0.72 N-m
	Mc: 0.81 N-m
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Ingress protection	IP20
Vibration & shock resistance	4.9m/s ²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□20) (Power capacity: Max. 1.1A)
Encoder type	Incremental/battery-less absolute
Number of encoder pulses	16384 pulse/rev

(Note 8) Based on the standard rated operation life of 5,000km. Operation life varies according to operating and mounting conditions. Please contact IAI for more details operational life.

Slider Type Moment Direction

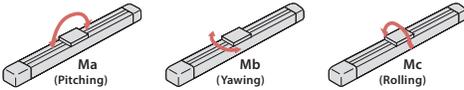


Table of Payload by Speed/Acceleration

Standard grease specification The unit for payload is kg.

Lead 6

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	0.75	0.5
50	0.75	0.5
100	0.75	0.5
150	0.75	0.5
200	0.75	0.5
250	0.75	0.5
300	0.75	0.5

Lead 4

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	1.5	0.75
50	1.5	0.75
100	1.5	0.75
150	1.5	0.75
200	1.5	0.75

Lead 2

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	3	1.5
25	3	1.5
50	3	1.5
75	3	1.5
100	3	1.5

For environmental temperatures of 5°C or lower, use at the following speeds or below.

- Lead 6: 250mm/s or lower
- Lead 4: 150mm/s or lower
- Lead 2: 75mm/s or lower

Food grade grease specification The unit for payload is kg.

Lead 6

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	0.75	0.5
50	0.75	0.5
100	0.75	0.5
150	0.75	0.5
200	0.75	0.5
250	0.75	0.5
300	0.75	0.5

Lead 4

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	1.5	0.75
50	1.5	0.75
100	1.5	0.75
150	1.5	0.75
200	1.5	0.5

Lead 2

Orientation Speed (mm/s)	Horizontal	Vertical
	Acceleration (G) 0.3	0.3
0	3	1.5
25	3	1.5
50	3	1
75	3	1
100	3	1

For environmental temperatures of 15°C or lower, use at the following speeds or below.

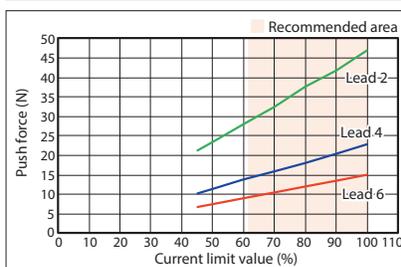
- Lead 6: 250mm/s or lower
- Lead 4: 50mm/s or lower
- Lead 2: 50mm/s or lower

Stroke and Max. Speed

Lead (mm)	25 to 100 (every 25mm)	100 to 300 (every 50mm)
6	300	
4	200	
2	100	

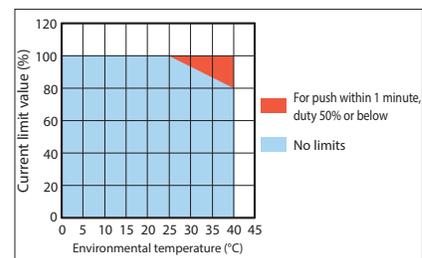
(Unit: mm/s)

Correlation Diagrams between Push Force and Current Limit



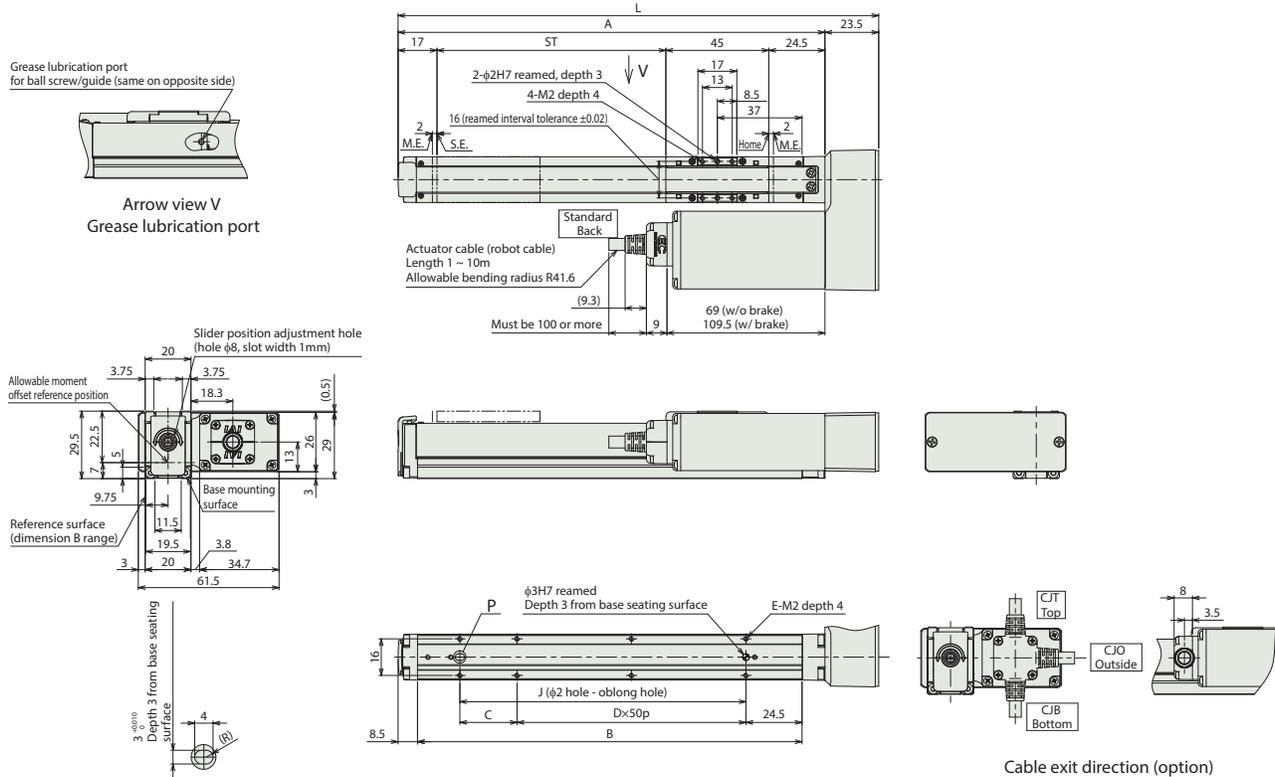
Cautions for push-motion operation

For high-thrust push-motion operation in high-temperature environments, use within the limit values in the graph.

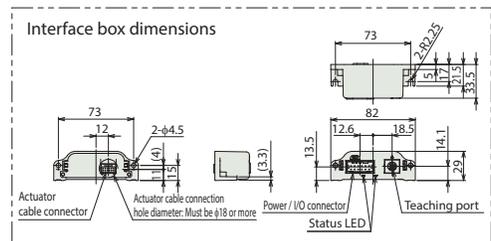


(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
 (Note) Fix the cable so that its base does not move.
 The cable can be disconnected and replaced. (Connected with connector inside cable box)
 The cable exit direction (option) can be changed by changing the cable box direction.
 (Note) The figure below is the motor side-mounted to left (ML).

ST: Stroke
 M.E: Mechanical end
 S.E: Stroke end



Detailed view of P
 Base oblong hole details



■ Dimensions by Stroke

Stroke	25	50	75	100	150	200	250	300
L	135	160	185	210	260	310	360	410
A	111.5	136.5	161.5	186.5	236.5	286.5	336.5	386.5
B	93	118	143	168	218	268	318	368
C	0	25	0	25	25	25	25	25
D	1	1	2	2	3	4	5	6
E	4	6	6	8	10	12	14	16
J	50	75	100	125	175	225	275	325

■ Mass by Stroke

Stroke	25	50	75	100	150	200	250	300
Mass (kg)	Without brake	0.35	0.36	0.38	0.40	0.43	0.49	0.52
	With brake	0.42	0.44	0.46	0.47	0.50	0.57	0.60

Applicable Controllers

(Note) EC Series products are equipped with a built-in controller. Please refer to P.27 for details on built-in controllers.



EC-RR2

Coupled Motor Body Width **20 mm** 24V Stepper Motor

Model Specification Items

EC - RR2

Series	Type	Lead	Stroke	Actuator cable length	Power - I/O cable length	Options
		H 6mm M 4mm L 2mm	25 25mm ↓ 100 100mm (every 25mm) ↓ 100 100mm ↓ 300 300mm (every 50mm)	See Actuator Cable Length table below	See Power - I/O Cable Length table below	See Options table below

*NPN specification is standard. PNP option is available.



(Note) The photo above is for motor installed on top (MOT).

Radial Load Specification Radial Cylinder®

Horizontal Vertical Side Ceiling

- Selection Notes**
- (1) The maximum speed varies depending on the stroke. Be sure to check the maximum speed of the desired stroke in "Stroke and Max. Speed."
 - (2) "Main Specifications" displays the payload's maximum value. Please refer to "Table of Payload by Speed/Acceleration" for more details.
 - (3) Radial cylinders are equipped with a built-in guide. Please refer to P. 4 for details on the radial load applied to rods.
 - (4) The value of the horizontal payload assumes that there is an external guide.
 - (5) If performing push-motion operations, refer to the "Correlation Diagrams between Push Force and Current Limit." The push forces listed are only reference values.
 - (6) Pay close attention to the mounting orientation. Please refer to P. 3 for details.

By Stroke

Stroke (mm)	EC-RR2	
	RCON-EC connection specification (Note 1)	NPN/PNP specification (Note 2)
25	✓	✓
50	✓	✓
75	✓	✓
100	✓	✓
150	✓	✓
200	✓	✓
250	✓	✓
300	✓	✓

(Note 1) Be sure to select "ACR" as the option.
(Note 2) Interface box and conversion cable are included.

Options * Please check the Options reference pages to confirm each option.

Name	Option code	Reference page
RCON-EC connection specification (Note 3) (Note 5)	ACR	21
Brake	B	21
Cable exit direction (bottom)	CJB	21
Cable exit direction (left)	CJL	21
Cable exit direction (right)	CJR	21
Cable exit direction (top)	CJT	21
Foot bracket	FT	21
Designated grease specification	G5	21
Motor mounting direction (bottom) (Note 4)	MOB	22
Motor mounting direction (left) (Note 4)	MOL	22
Motor mounting direction (right) (Note 4)	MOR	22
Motor mounting direction (up) (Note 4)	MOT	22
Non-motor end specification	NM	22
PNP specification (Note 3)	PN	22
Split motor and controller power supply specification (Note 3)	TMD2	22
Battery-less absolute encoder specification	WA	22
Wireless communication specification (Note 5)	WL	22
Wireless axis operation specification (Note 5)	WL2	22

(Note 3) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected. Also, interface box and conversion cable are not included.
(Note 4) Be sure to fill in one of the symbols for the Option field in the Model Specification Items.
(Note 5) If the RCON-EC connection specification (ACR) is selected, the wireless communication specification (WL) and wireless axis operation specification (WL2) cannot be selected. For wireless communication with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power - I/O cable. Please refer to P. 26 for details. Please contact our sales department for the wireless axis operation specification (WL2).

Options Sold Separately

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	30
RCON-EC connection specification power - I/O cable (Standard connector cable)	CB-REC-PWBIO□□□-RB	30
RCON-EC connection specification power - I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	30
RCON-EC connection specification Interface box for split motor and controller power supply (Wireless specification)	ECW-CVNWL-CB-ACR	30

(Note) The power - I/O cable is a robot cable. Indicate the cable length in □□□. (for example, 010 = 1m)

Actuator Cable Length

Cable code	Cable length
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m (Note 6)

(Note 6) When connecting via the interface box, 9m is the maximum available.
(Note) Make sure that the total length along with the power - I/O cable is 10m or less.
(Note) Robot cable.

Power - I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC-PWBIO□□□-RB supplied
0	Without cable	✓ (Note 7)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 7) Only terminal block connector is included. When selecting RCON-EC connection specification (ACR) option, select "0." Terminal block connector is not included.
(Note) Robot cable.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓
S4 ~ S5	4 ~ 5m	✓
S6 ~ S9	6 ~ 9m	✓

(Note) Robot cable.

Main Specifications

Item		Description			
Lead	Ball screw lead (mm)	6	4	2	
Horizontal	Payload	Max. payload (kg)	1	2	4
	Speed / acceleration/ deceleration	Max. speed (mm/s)	300	200	100
		Min. speed (mm/s)	8	5	3
		Rated acceleration/deceleration (G)	0.3	0.3	0.3
	Max. acceleration/deceleration (G)	0.3	0.3	0.3	
Vertical	Payload	Max. payload (kg)	0.325	0.625	1.25
	Speed / acceleration/ deceleration	Max. speed (mm/s)	300	200	100
		Min. speed (mm/s)	8	5	3
		Rated acceleration/deceleration (G)	0.3	0.3	0.3
	Max. acceleration/deceleration (G)	0.3	0.3	0.3	
Push	Max. push force (N)	15	23	47	
	Max. push speed (mm/s)	20	20	5	
Brake	Brake specification	Non-excitation actuating solenoid brake			
	Brake holding force (kgf)	0.325	0.625	1.25	
Stroke	Min. stroke (mm)	25	25	25	
	Max. stroke (mm)	300	300	300	
	Stroke pitch (mm) 25 ~ 100ST	25	25	25	
	Stroke pitch (mm) 100 ~ 300ST	50	50	50	

Item	Description
Drive system	Ball screw $\phi 6$ mm rolled C10
Positioning repeatability	± 0.02 mm
Lost motion	- (notation not available due to 2-point positioning function)
Linear guide	Linear motion infinite circulating type
Rod	$\phi 12$ mm Material: Aluminum, white alumite treatment
Rod non-rotation precision (Note 8)	0°
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Ingress protection	IP20
Vibration & shock resistance	4.9m/s ²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□20) (Power capacity: Max. 1.1A)
Encoder type	Incremental/battery-less absolute
Number of encoder pulses	16384 pulse/rev

(Note 8) Displacement angle in the rod rotational direction when no load is applied.

Table of Payload by Speed/Acceleration

Standard grease specification The unit for payload is kg.

Lead 6

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	1	0.325
50	1	0.325
100	1	0.325
150	1	0.325
200	1	0.325
250	1	0.325
300	1	0.325

Lead 4

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	2	0.625
50	2	0.625
100	2	0.625
150	2	0.625
200	2	0.625

Lead 2

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	4	1.25
25	4	1.25
50	4	1.25
75	4	1.25
100	4	1.25

For environmental temperatures of 5°C or lower, use at the following speeds or below.

- Lead 6: 250mm/s or lower
- Lead 4: 150mm/s or lower
- Lead 2: 75mm/s or lower

Food grade grease specification The unit for payload is kg.

Lead 6

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	1	0.325
50	1	0.325
100	1	0.325
150	1	0.325
200	1	0.325
250	1	0.325
300	1	0.325

Lead 4

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	2	0.625
50	2	0.625
100	2	0.625
150	2	0.5
200	2	0.5

Lead 2

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	4	1.25
25	4	1.25
50	4	1.25
75	4	1
100	4	1

For environmental temperatures of 15°C or lower, use at the following speeds or below.

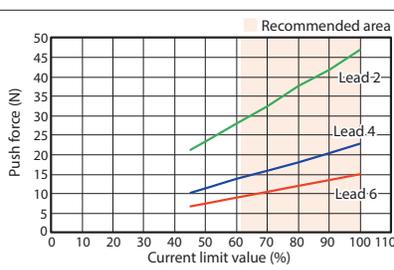
- Lead 6: 200mm/s or lower
- Lead 4: 100mm/s or lower
- Lead 2: 75mm/s or lower

Stroke and Max. Speed

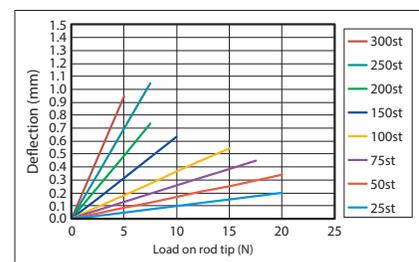
Lead (mm)	25 to 100 (every 25mm)	100 to 200 (every 50mm)	250 (mm)	300 (mm)
	6	300		240
4		200	160	110
2		100	80	55

(Unit: mm/s)

Correlation Diagrams between Push Force and Current Limit

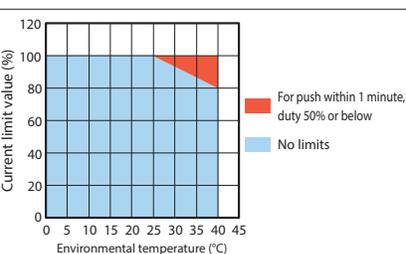


Rod Deflection (Reference Values)



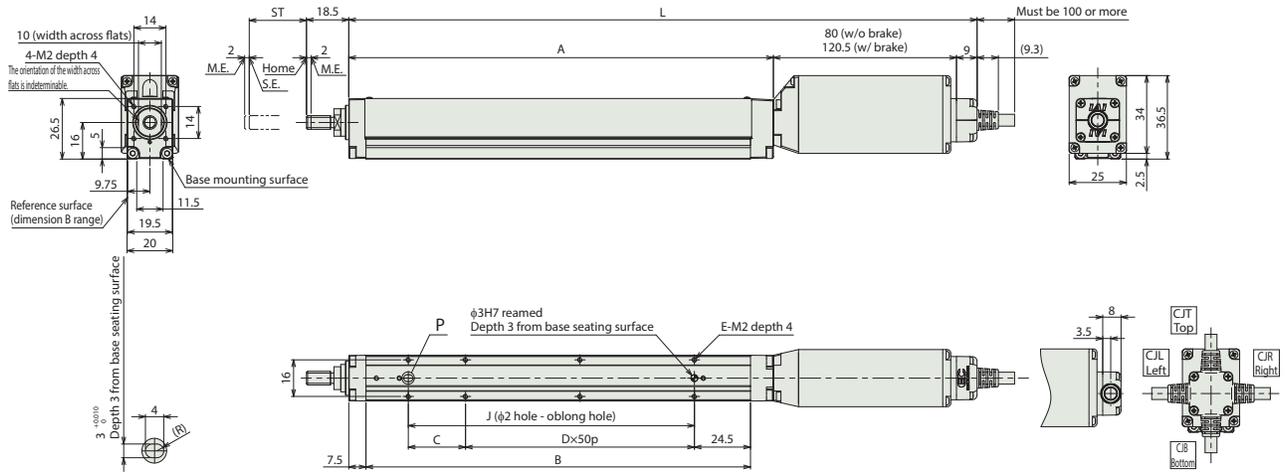
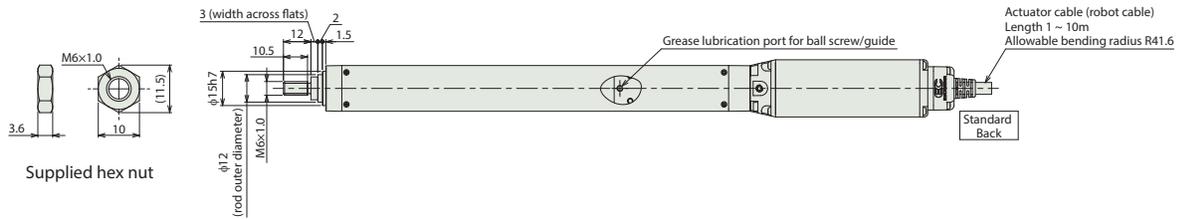
Cautions for push-motion operation

For high-thrust push-motion operation in high-temperature environments, use within the limit values in the graph.



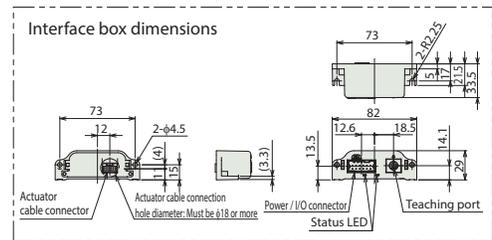
- (Note) When the rod is returning to its home position, please be mindful of possible interference from nearby objects, as it will travel until it reaches the M.E.
- (Note) The figures below are for motor installed on top (MOT).
- (Note) Fix the cable so that its base does not move.
- The cable can be disconnected and replaced. (Connected with connector inside cable box)
- The cable exit direction (option) can be changed by changing the cable box direction.
- (Note) The width across flats direction cannot be changed.

ST: Stroke
M.E: Mechanical end
S.E: Stroke end



Detailed view of P
Base oblong hole details

Cable exit direction (option)



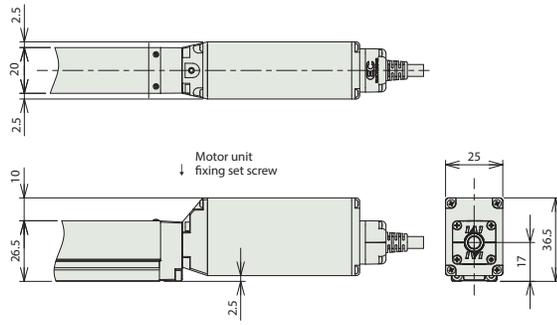
Dimensions by Stroke

Stroke		25	50	75	100	150	200	250	300
L	Without brake	199.5	224.5	249.5	274.5	324.5	374.5	424.5	474.5
	With brake	240	265	290	315	365	415	465	515
A		110.5	135.5	160.5	185.5	235.5	285.5	335.5	385.5
B		93	118	143	168	218	268	318	368
C		0	25	0	25	25	25	25	25
D		1	1	2	2	3	4	5	6
E		4	6	6	8	10	12	14	16
J		50	75	100	125	175	225	275	325

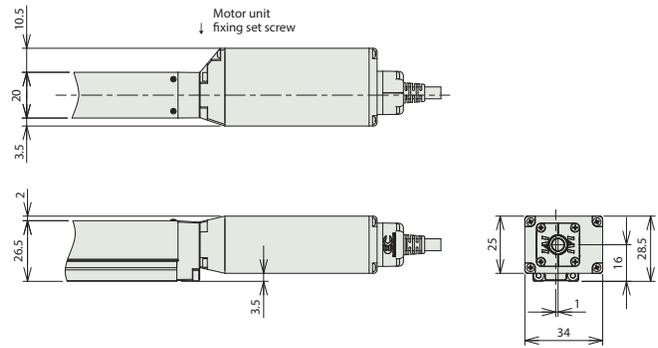
Mass by Stroke

Stroke		25	50	75	100	150	200	250	300
Mass (kg)	Without brake	0.31	0.33	0.35	0.38	0.42	0.46	0.51	0.55
	With brake	0.39	0.41	0.43	0.45	0.50	0.54	0.58	0.63

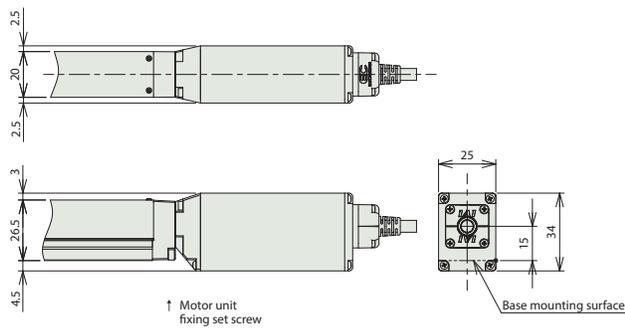
Motor mounting direction (option)



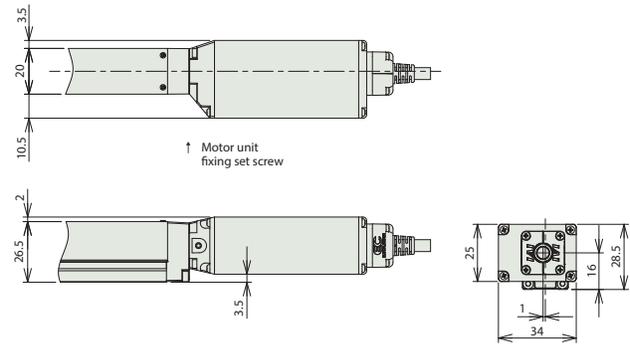
Motor mounting direction (top): MOT



Motor mounting direction (right): MOR



Motor mounting direction (bottom): MOB



Motor mounting direction (left): MOL

Applicable Controllers

(Note) EC Series products are equipped with a built-in controller. Please refer to P.27 for details on built-in controllers.

EC-RR2 R



Body Width
20 mm

24V
Stepper
Motor

Model Specification Items

EC	-	RR2	<input type="text"/>	R	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>
Series	Type	Lead	Specifications	Stroke	Actuator cable length	Power · I/O cable length	Options					
		H 6mm M 4mm L 2mm	R Side-mounted motor	25 25mm ↓ 100 100mm (every 25mm) ↓ 100 100mm ↓ 300 300mm (every 50mm)	See Actuator Cable Length table below	See Power · I/O Cable Length table below	See Options table below					

*NPN specification is standard. PNP option is available.



(Note) The photo above is motor side-mounted to left (ML).

Radial Load Specification Radial Cylinder*



Selection Notes



- (1) The maximum speed varies depending on the stroke. Be sure to check the maximum speed of the desired stroke in "Stroke and Max. Speed."
- (2) "Main Specifications" displays the payload's maximum value. Please refer to "Table of Payload by Speed/Acceleration" for more details.
- (3) Radial cylinders are equipped with a built-in guide. Please refer to P. 4 for details on the radial load applied to rods.
- (4) The value of the horizontal payload assumes that there is an external guide.
- (5) If performing push-motion operations, refer to the "Correlation Diagrams between Push Force and Current Limit." The push forces listed are only reference values.
- (6) Pay close attention to the mounting orientation. Please refer to P. 3 for details.

By Stroke

Stroke (mm)	EC-RR2 R	
	RCON-EC connection specification (Note 1)	NPN/PNP specification (Note 2)
25	✓	✓
50	✓	✓
75	✓	✓
100	✓	✓
150	✓	✓
200	✓	✓
250	✓	✓
300	✓	✓

(Note 1) Be sure to select "ACR" as the option.
(Note 2) Interface box and conversion cable are included.

Options * Please check the Options reference pages to confirm each option.

Name	Option code	Reference page
RCON-EC connection specification (Note 3) (Note 5)	ACR	21
Brake	B	21
Cable exit direction (bottom)	CJB	21
Cable exit direction (outside)	CJO	21
Cable exit direction (top)	CJT	21
Foot bracket	FT	21
Designated grease specification	G5	21
Motor side-mounted to left (Note 4)	ML	21
Motor side-mounted to right (Note 4)	MR	21
Non-motor end specification	NM	22
PNP specification (Note 3)	PN	22
Split motor and controller power supply specification (Note 3)	TMD2	22
Battery-less absolute encoder specification	WA	22
Wireless communication specification (Note 5)	WL	22
Wireless axis operation specification (Note 5)	WL2	22

- (Note 3) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected. Also, interface box and conversion cable are not included.
- (Note 4) Be sure to fill in one of the symbols for the Option field in the Model Specification Items.
- (Note 5) If the RCON-EC connection specification (ACR) is selected, the wireless communication specification (WL) and wireless axis operation specification (WL2) cannot be selected. For wireless communication with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power · I/O cable. Please refer to P. 26 for details. Please contact our sales department for the wireless axis operation specification (WL2).

Options Sold Separately

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	30
RCON-EC connection specification power · I/O cable (Standard connector cable)	CB-REC-PWBIO <input type="text"/> <input type="text"/> -RB	30
RCON-EC connection specification power · I/O cable (4-way connector cable)	CB-REC2-PWBIO <input type="text"/> <input type="text"/> -RB	30
RCON-EC connection specification Interface box for split motor and controller power supply (Wireless specification)	ECW-CVNWL-CB-ACR	30

(Note) The power · I/O cable is a robot cable. Indicate the cable length in . (for example, 010 = 1m)

Actuator Cable Length

Cable code	Cable length
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m (Note 6)

(Note 6) When connecting via the interface box, 9m is the maximum available.
(Note) Make sure that the total length along with the power · I/O cable is 10m or less.
(Note) Robot cable.

Power · I/O Cable Length

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC-PWBIO <input type="text"/> <input type="text"/> -RB supplied
0	Without cable	✓ (Note 7)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 7) Only terminal block connector is included. When selecting RCON-EC connection specification (ACR) option, select "0." Terminal block connector is not included.
(Note) Robot cable.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC2-PWBIO <input type="text"/> <input type="text"/> -RB supplied
S1 ~ S3	1 ~ 3m	✓
S4 ~ S5	4 ~ 5m	✓
S6 ~ S9	6 ~ 9m	✓

(Note) Robot cable.

Main Specifications				
Item		Description		
Lead	Ball screw lead (mm)	6	4	2
Horizontal	Payload	Max. payload (kg)	1	2
		Max. speed (mm/s)	300	200
	Speed / acceleration / deceleration	Min. speed (mm/s)	8	5
		Rated acceleration/deceleration (G)	0.3	0.3
Vertical	Payload	Max. payload (kg)	0.325	0.625
		Max. speed (mm/s)	300	200
	Speed / acceleration / deceleration	Min. speed (mm/s)	8	5
		Rated acceleration/deceleration (G)	0.3	0.3
Push	Max. push force (N)	15	23	
	Max. push speed (mm/s)	20	20	
Brake	Brake specification	Non-excitation actuating solenoid brake		
	Brake holding force (kgf)	0.325	0.625	1.25
Stroke	Min. stroke (mm)	25	25	25
	Max. stroke (mm)	300	300	300
	Stroke pitch (mm) 25 ~ 100ST	25	25	25
	Stroke pitch (mm) 100 ~ 300ST	50	50	50

Item		Description		
Drive system	Ball screw ϕ 6mm rolled C10			
Positioning repeatability	\pm 0.02mm			
Lost motion	- (notation not available due to 2-point positioning function)			
Linear guide	Linear motion infinite circulating type			
Rod	ϕ 12mm Material: Aluminum, white alumite treatment			
Rod non-rotation precision (Note 8)	0°			
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)			
Ingress protection	IP20			
Vibration & shock resistance	4.9m/s ²			
Overseas standards	CE marking, RoHS directive			
Motor type	Stepper motor (□20) (Power capacity: Max. 1.1A)			
Encoder type	Incremental/battery-less absolute			
Number of encoder pulses	16384 pulse/rev			

(Note 8) Displacement angle in the rod rotational direction when no load is applied.

Table of Payload by Speed/Acceleration

Standard grease specification The unit for payload is kg.

Lead 6

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	1	0.325
50	1	0.325
100	1	0.325
150	1	0.325
200	1	0.325
250	1	0.325
300	1	0.325

Lead 4

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	2	0.625
50	2	0.625
100	2	0.625
150	2	0.625
200	2	0.625

Lead 2

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	4	1.25
25	4	1.25
50	4	1.25
75	4	1.25
100	4	1.25

For environmental temperatures of 5°C or lower, use at the following speeds or below.

- Lead 6: 250mm/s or lower
- Lead 4: 150mm/s or lower
- Lead 2: 75mm/s or lower

Food grade grease specification The unit for payload is kg.

Lead 6

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	1	0.325
50	1	0.325
100	1	0.325
150	1	0.325
200	1	0.325
250	1	0.325
300	1	0.325

Lead 4

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	2	0.625
50	2	0.625
100	2	0.625
150	2	0.5
200	2	0.5

Lead 2

Orientation	Horizontal	Vertical
	Speed (mm/s)	Acceleration (G)
	0.3	0.3
0	4	1.25
25	4	1.25
50	4	1.25
75	4	1
100	4	1

For environmental temperatures of 15°C or lower, use at the following speeds or below.

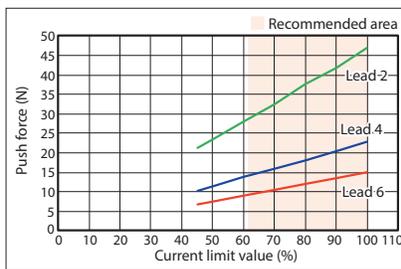
- Lead 6: 200mm/s or lower
- Lead 4: 100mm/s or lower
- Lead 2: 75mm/s or lower

Stroke and Max. Speed

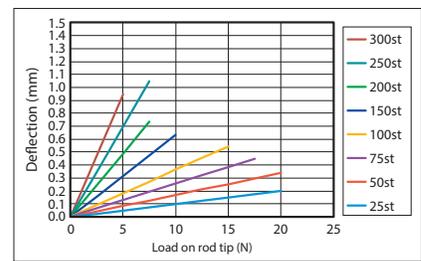
Lead (mm)	25 to 100 (every 25mm)	100 to 200 (every 50mm)	250 (mm)	300 (mm)
6	300		240	165
4	200		160	110
2	100		80	55

(Unit: mm/s)

Correlation Diagrams between Push Force and Current Limit

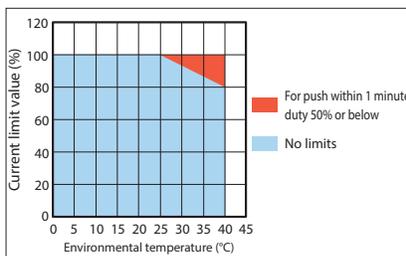


Rod Deflection (Reference Values)



Cautions for push-motion operation

For high-thrust push-motion operation in high-temperature environments, use within the limit values in the graph.

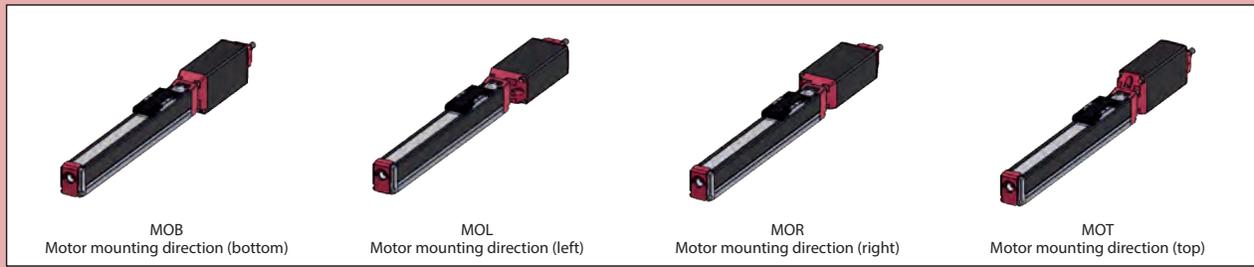




Motor mounting direction

Model MOB / MOL / MOR / MOT **Applicable models** EC-S2/RR2

Description One of four motor mounting directions can be selected: bottom, left, right, or top.
* Be sure to enter a code in the model number.



Non-motor end specification

Model NM **Applicable models** All models

Description The home position is normally set to the motor side. This option is for setting the home position on the other side in order to accommodate variations in equipment layout, etc.

PNP specification *Cannot be ordered simultaneously with the ACR option, which is NPN specification.

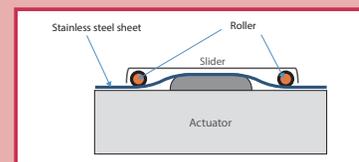
Model PN **Applicable models** All models

Description EC Series products provide NPN specification input/output for connecting external devices as standard. Specifying this option changes input/output to the PNP specification.

Slider roller part specification

Model SR **Applicable models** EC-S2/S2□R

Description The standard slider type slider structure is changed to the same roller structure as the cleanroom specification.



Split motor and controller power supply specification * Cannot be selected with the ACR option (the RCON-EC connection specification is a split motor and controller power supply specification)

Model TMD2 **Applicable models** All models

Description This option includes an actuator operation stop input. Select this option to allow shutting down the actuator drive power only. Please refer to P.29 for more information on wiring.

Battery-less absolute encoder specification

Model WA **Applicable models** All models

Description The EC series offers incremental encoder specification as standard. Specifying this option installs a built-in battery-less absolute encoder.

Wireless communication specification

Model WL **Applicable models** All models

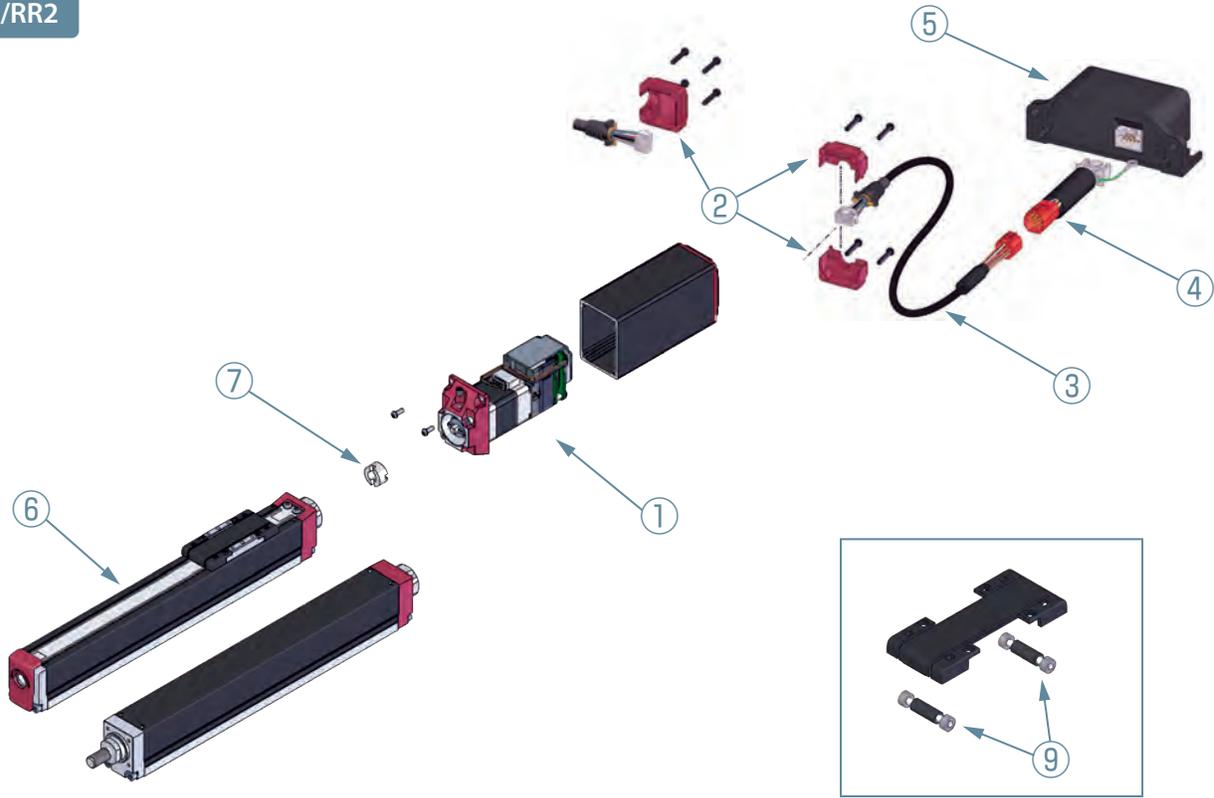
Description This option enables support for wireless communication. Specifying this option enables wireless communication with the TB-03 teaching pendant and Wireless Teaching Controller. The start point, end point, and AVD can be adjusted via wireless communication.

Wireless axis operation specification

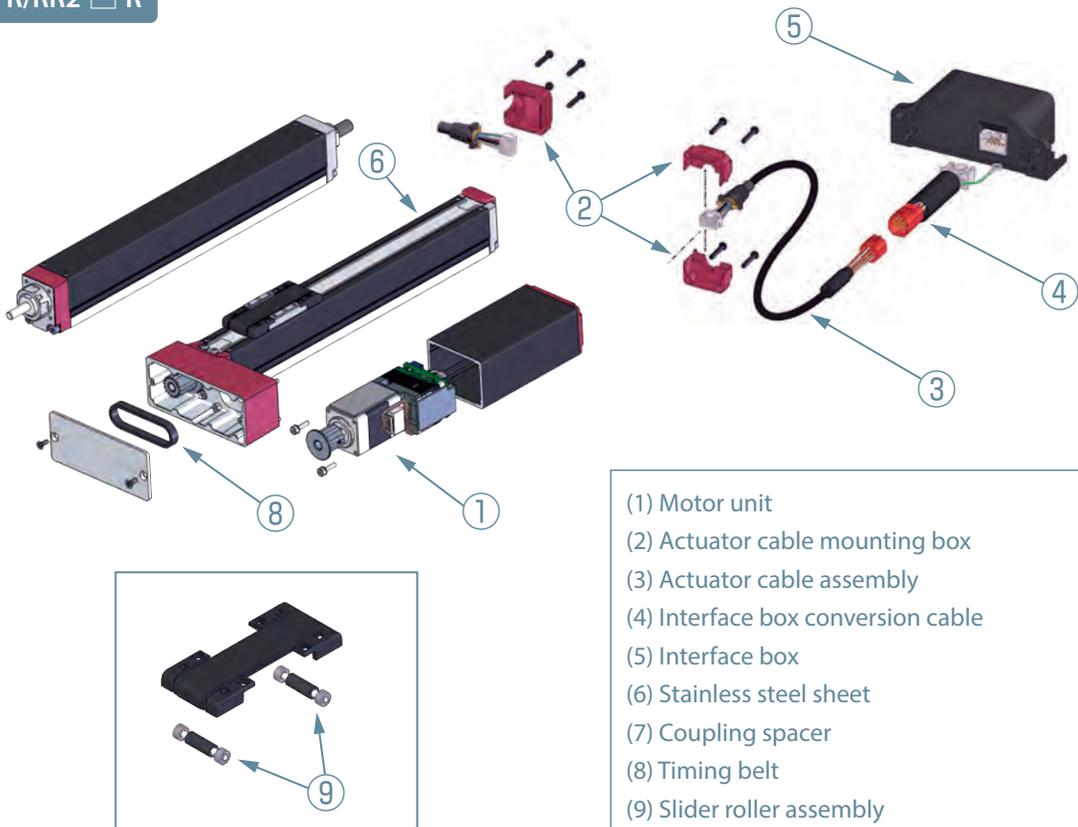
Model WL2 **Applicable models** All models

Description Specifying WL2 allows the product to operate wirelessly as with WL (start point, end point, and AVD adjustment), and also to perform axis travel operation tests (forward end/backward end movement, jog, and inching). However, this function is not meant to perform automatic operation. Please contact IAI for precautions on axis operations using a wireless connection. (Note) Customers cannot change WL to WL2, or WL2 to WL.

S2/RR2



S2 R/RR2 R



- (1) Motor unit
- (2) Actuator cable mounting box
- (3) Actuator cable assembly
- (4) Interface box conversion cable
- (5) Interface box
- (6) Stainless steel sheet
- (7) Coupling spacer
- (8) Timing belt
- (9) Slider roller assembly

Maintenance Part Model List

We recommend the maintenance parts search system!

Please contact us about the maintenance parts.
<https://www.intelligentactuator.com/contact-form/>



The numbers in the table correspond to the numbers in the schematics.
 (Note) Mounting screws are not included with maintenance parts. Please contact our sales department before making any modifications.

(1) Motor unit

Type	Encoder	Brake	Model
S2 RR2	Incremental	None	EC-MUSRR2
		Yes	EC-MUSRR2-B
	Battery-less absolute	None	EC-MUSRR2-WA
		Yes	EC-MUSRR2-WA-B
S2 □ R RR2 □ R	Incremental	None	EC-MUSRR2R
		Yes	EC-MUSRR2R-B
	Battery-less absolute	None	EC-MUSRR2R-WA
		Yes	EC-MUSRR2R-WA-B

(2) Actuator cable mounting box (Included parts: Screws)

Type	Cable exit direction	Model
S2(□ R) RR2(□ R)	Back	EC-CASBR-SLTGD3
	Side	EC-CASBS-SLTGD3

(3) Actuator cable assembly (○○○ indicates cable length)

Type	Model
S2(□ R) RR2(□ R)	CB-EC-SRR2-MPA ○○○ -AS

*Please indicate the cable length (L) in □□□, e.g. 080 = 8m

(4) Interface box conversion cable

Type	Model
S2(□ R) RR2(□ R)	CB-CVN-BJ002

(5)-1 Interface box

Type	Wireless	I/O	Model
S2(□ R) RR2(□ R)	No	NPN	ECW-CVN-CB
		PNP	ECW-CVP-CB
	WL/WL2	NPN	ECW-CVNWL-CB
		PNP	ECW-CVPWL-CB

(5)-2 Split motor and controller power supply interface box

Type	Wireless	I/O	Model
S2(□ R) RR2(□ R)	No	NPN	ECW-CVN-CB-TMD2
		PNP	ECW-CVP-CB-TMD2
	WL/WL2	NPN	ECW-CVNWL-CB-TMD2
		PNP	ECW-CVPWL-CB-TMD2

(5)-3 RCON-EC connection specification split motor and controller power supply interface box

Type	Wireless	I/O	Model
S2(□ R) RR2(□ R)	WL/WL2	NPN/ REC	ECW-CVNWL-CB-ACR

(6) Stainless steel sheet (○○○ indicates stroke)

Type	Model
S2(□ R)	ST-EC-S2- ○○○

*Please indicate the stroke in □□□, e.g. 080 = 8m

(7) Coupling spacer

Type	Model
S2 RR2	CPG-EC-SRR2

(8) Timing belt

Type	Model
S2 □ R RR2 □ R	TB-EC-SRR2R

(9) Slider roller assembly (1-piece unit)

Type	Model
S2(□ R)	EC-SR-S2

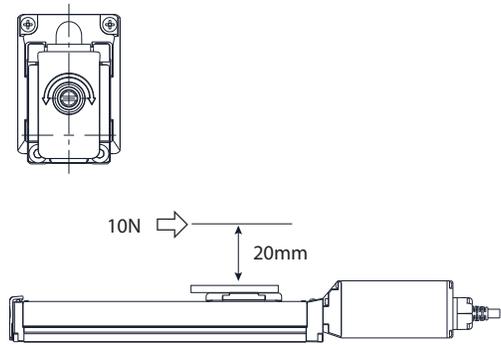
Push-Motion Operation

Notes on use of slider type actuators for push-motion operation

When performing a push-motion operation using a slider type actuator, be sure to limit the push current so that the reactive moment caused by the push force does not exceed the dynamic allowable moment (M_a , M_b) listed in the catalog.

Please refer to the figure at right, which shows the working point of the guide moment, for help with calculating the moment. When doing so, take the offset amount of the push force working point into consideration.

Please note that if excessive force which exceeds the dynamic allowable moment is applied, it may damage the guide and shorten the actuator's operation life. Please keep this in mind and select a push current that is safely within its limits.



Calculation example:

When a 10N pushing operation is performed with the EC-S2 type at the position shown in the figure at top right, the moment applied to the guide is

$$M_a = (22.5 + 20) \times 10 = 425 \text{ (N}\cdot\text{mm)}$$

$$= 0.425 \text{ (N}\cdot\text{m)}$$

The allowable dynamic moment for EC-S2 is $M_a = 0.5 \text{ (N}\cdot\text{m)}$, so the figure is acceptable as $0.425 < 0.5$.
If pushing would cause M_b moment, calculate likewise from the overhang and ensure that it is within range of the dynamic allowable moment.

List of Possible Connections for the ELECYLINDER and Teaching Tools

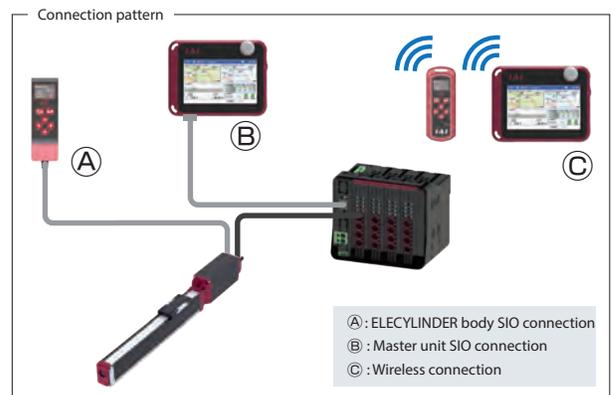
For ELECYLINDER Alone

○: Connection/operation possible

Teaching tool		Connection/operation Y/N	Priority level (simultaneous connection)
Wired connection	TB-02/03	○	1
	Wired Teaching Controller (TBD-1)	○	1
Wireless connection	TB-03	○ *1 *2	2
	Wireless Teaching Controller (TBD-1WL)	○ *1 *2	2

*1 Connectable only when the ELECYLINDER is wireless specification (options include "WL" or "WL2")
*2 Test run is possible when connecting to WL2 specification, but not with WL specification

For ELECYLINDER Connected to REC/RCON/RSEL (RCON-EC-4 connection)



○: Connection/operation possible △: Connection possible/partial operation possible x: Connection not possible

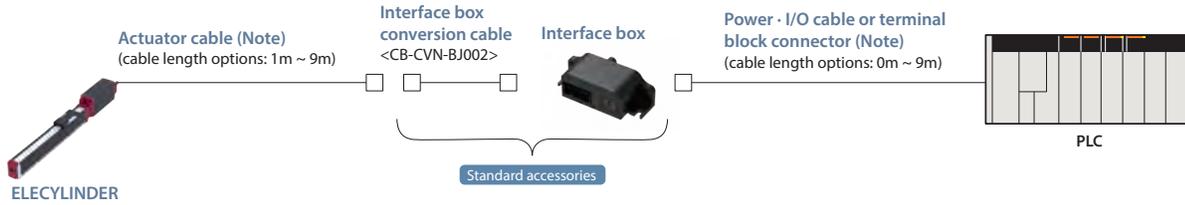
Teaching tool		Connection pattern	Auto (operating on automatic)		Manual	
			Connection/operation Y/N	Priority level (simultaneous connection)	Connection/operation Y/N	Priority level (simultaneous connection)
Wired connection	TB-02/03	○A	x	/	x	/
		○B	△ *3	1	○	1
	Wired Teaching Controller (TBD-1)	○A	x	/	x	/
		○B	x	/	x	/
Wireless connection	TB-03	○C	△ *1 *3	2	○ *1 *2	2
	Wireless Teaching Controller (TBD-1WL)	○C	△ *1 *4	2	○ *1 *2	2

*1 Connectable only when the ELECYLINDER is wireless specification (options include "WL" or "WL2")
*2 Test run is possible when connecting to WL2 specification, but not with WL specification
*3 Monitoring only (operation not possible)
*4 Speed and acceleration/deceleration can be set and operated; position editing and test run are not possible

Connection Methods

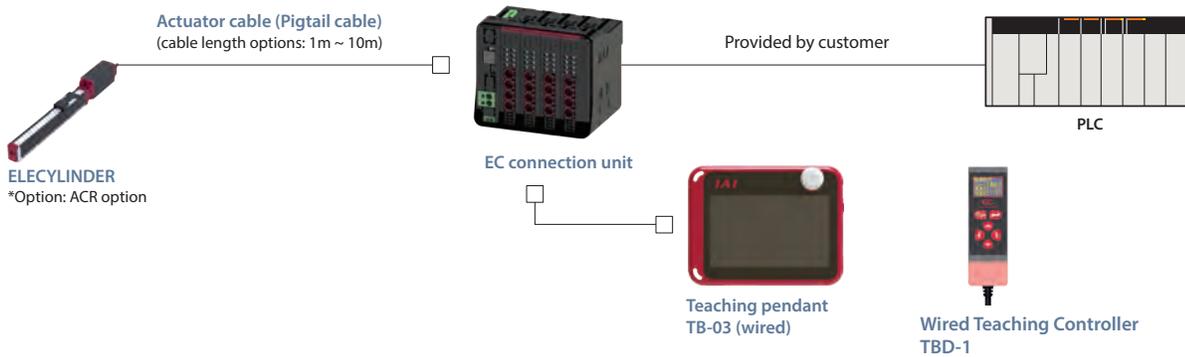
When connecting the ELECYLINDER to a PLC, there are three possible connection methods.

1. Direct connection to PLC (NPN/PNP specification)



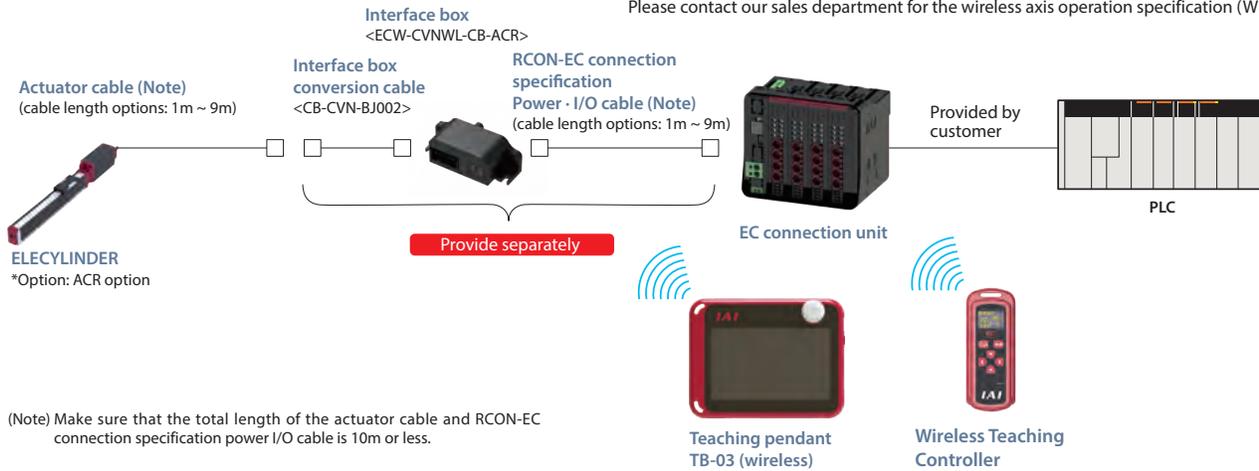
(Note) Make sure that the total length of the actuator cable and power - I/O cable (provided by the customer when using a terminal block connector) is 10 m or less.

2. Connection to PLC through an EC connection unit (RCON-EC connection specification) [Wired connection to teaching pendant]



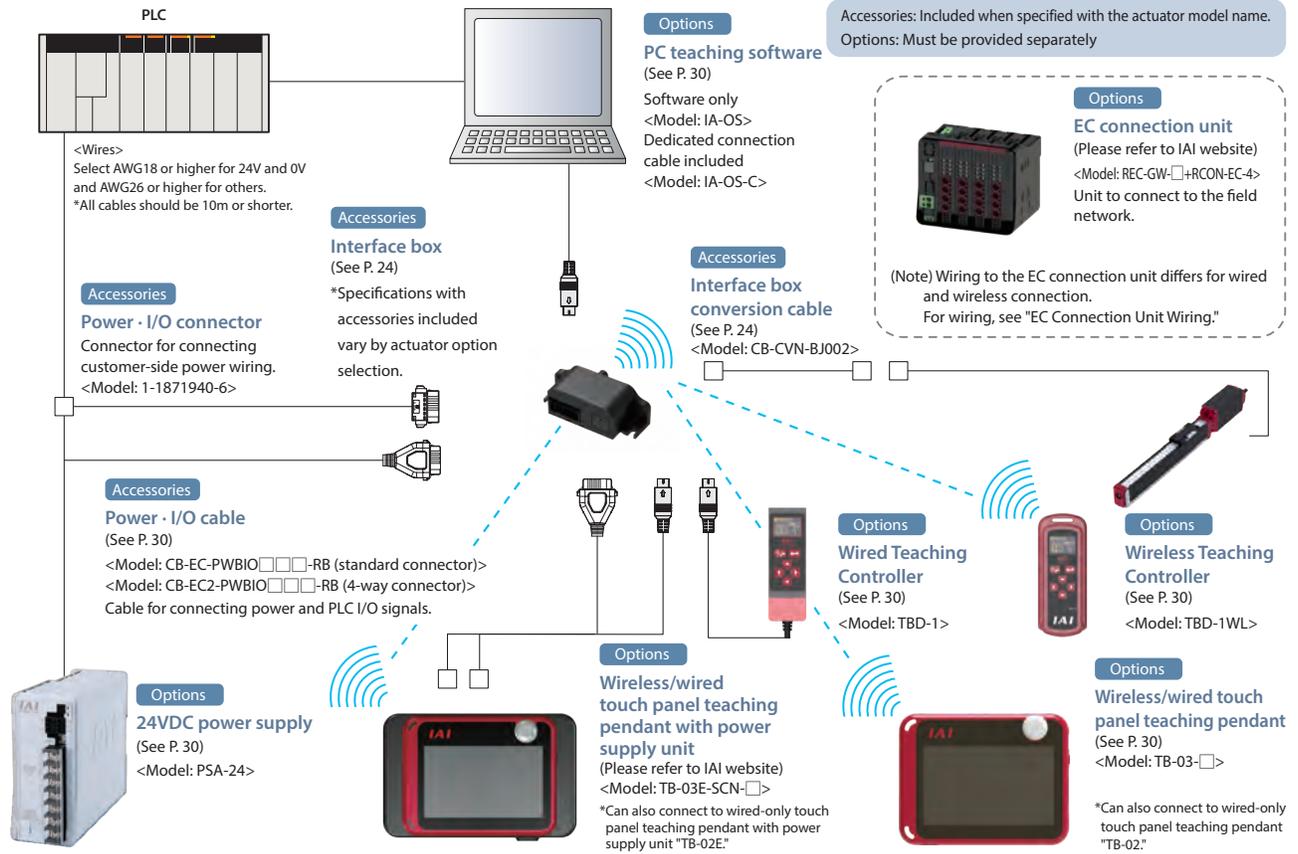
3. Connection to PLC through an EC connection unit (RCON-EC connection specification) [Wireless connection to teaching pendant]

The configuration below is with wireless communication specification (WL). Please contact our sales department for the wireless axis operation specification (WL2).



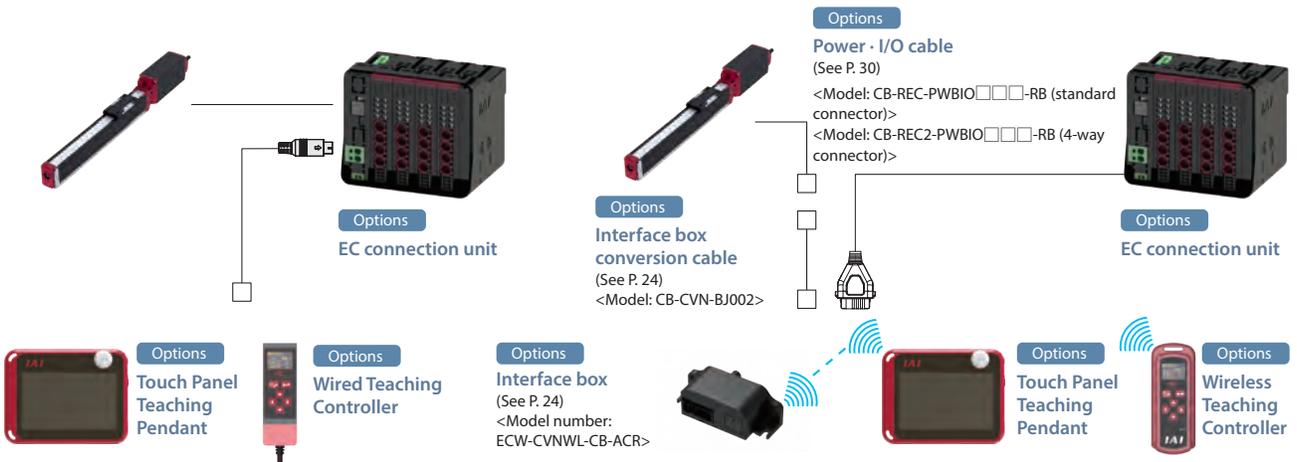
(Note) Make sure that the total length of the actuator cable and RCON-EC connection specification power I/O cable is 10m or less.

System Configuration



EC Connection Unit Wiring
(For teaching pendant wired connection)

(For teaching pendant wireless connection)



List of Accessories

■ Power · I/O Cable, Connectors

[Standard connector]

Product category		Accessories
Power · I/O cable length (selected with actuator model)	RCON-EC connection specification (ACR) selection	
0	No	Power · I/O connector (1-1871940-6)
	Yes	—
1 to 9	No	Power · I/O cable (CB-EC-PWBIO□□□-RB)

[Four-way connector]

Product category		Accessories
Power · I/O cable length (selected with actuator model)	RCON-EC connection specification (ACR) selection	
S1 ~ S9	No	Power · I/O cable (CB-EC2-PWBIO□□□-RB)

Basic Controller Specifications

Specification item		Specification content	
Number of controlled axes		1 axis	
Power supply voltage		24VDC ±10%	
Power capacity (includes control power 0.3A) (Note 1)	S2/RR2	Rated 0.95A, max. 1.25A	
Brake release power supply		24VDC ±10%, 200mA (only for external brake release)	
Generated heat (at duty ratio 100%)	S2/RR2	3W	
Inrush current (Note 2)	S2/RR2	2A	
Momentary power failure resistance		Max. 500µs	
Motor size		□20	
Motor rated current	S2/RR2	0.65A	
Motor control system		Weak field-magnet vector control	
Supported encoders		Incremental/battery-less absolute encoder	
SIO		RS-485 1ch (Modbus protocol compliant)	
PIO	Input specification	No. of inputs	3 points (forward, backward, alarm clear)
		Input voltage	24VDC ±10%
		Input current	5mA per circuit
		Leakage current	Max. 1mA/1 point
		Isolation method	Non-isolated
	Output specification	No. of outputs	3 points (forward complete, backward complete, alarm)
		Output voltage	24VDC ±10%
		Output current	50mA/1 point
		Residual voltage	2V or less
		Isolation method	Non-isolated
Data setting, input method		PC teaching software, touch panel teaching pendant, Wireless Teaching Controller, Wired Teaching Controller	
Data retention memory		Position and parameters are saved in non-volatile memory (no limit to number of rewrites)	
LED display (Note 3)	Controller status display	Servo ON (green light ON) / Alarm (red light ON) / Initializing when power comes ON (orange light ON) / Minor failure alarm (green/red alternately blinking) / Teaching mode: Stop from teaching (red light ON) / Servo OFF (light OFF) / Automatic servo OFF (green blinking)	
	Wireless status display	Initializing wireless hardware, without wireless connection, or connecting from TP board (light OFF) / Connecting through wireless (green blinking) / Wireless hardware error (red blinking) / Initializing when power comes ON (orange light ON)	
Predictive maintenance/preventative maintenance		When the number of movements or operation distance has exceeded the set value or an overload warning occurs, the LED (right side) blinks alternately green and red. *Only when configured in advance	
Ambient operating temperature		0 ~ 40°C	
Ambient operating humidity		5%RH ~ 85%RH (no condensation or freezing)	
Operating ambience		No corrosive gas or excessive dust	
Insulation resistance		500VDC 10MΩ	
Electric shock protection mechanism		Class 1 basic insulation	
Cooling method		Natural air cooling	

(Note 1) When connecting to RCON-EC, control power 0.3A is subtracted from the value.

(Note 2) Inrush current flows for approximately 5ms after the power is input. (At 40°C) Inrush current value differs depending on the impedance on the power line.

(Note 3) The body does not have an LED display. Confirm with the interface box or EC connection unit.

Solenoid Valve Method

ELECYLINDER products normally use a double solenoid method.

Change parameter No. 9 ("solenoid valve type selection") to use the single solenoid method.

<Caution>

Operation cannot be performed using the single solenoid method when operating connected to RCON-EC.

I/O (Input/Output) Specifications

I/O		Input		Output	
Specifications	Input voltage	24VDC ±10%		Load voltage	24VDC ±10%
	Input current	5mA per circuit		Maximum load current	50mA/1 point
	ON/OFF voltage	ON voltage: Min. 18VDC OFF voltage: Max. 6VDC		Residual voltage	2V or less
	Leakage current	Max. 1mA/1 point		Leakage current	Max. 0.1mA/1 point
Isolation method		Non-isolated from external circuit		Non-isolated from external circuit	
I/O logic	NPN				
	PNP				

(Note) Isolation method is non-isolated. When grounding an external device (such as a PLC) connected to ELECYLINDER, use the same ground as ELECYLINDER.

I/O Signal Wiring Diagram

I/O		Standard specification	Split motor and controller power supply specification (TMD2)
Power / I/O connector		<p>0V A1 (Reserved) A2 Backward complete A3 Forward complete A4 Alarm output A5 (Reserved) A6</p> <p>B1 24V B2 Brake release B3 Backward command (Note 1) B4 Forward command (Note 1) B5 Alarm clear B6 (reserved)</p>	<p>Drive power and control power are separate for the TMD2 specification.</p> <p>0V A1 24V (control) A2 Backward complete A3 Forward complete A4 Alarm output A5 (Reserved) A6</p> <p>B1 24V (drive) B2 Brake release B3 Backward command (Note 1) B4 Forward command (Note 1) B5 Alarm clear B6 (reserved)</p>
I/O logic	NPN	<p>(Note 1) Backward command B3 (Note 1) Forward command B4 Alarm clear B5</p>	<p>(Note 1) Backward command B3 (Note 1) Forward command B4 Alarm clear B5</p>
	PNP	<p>(Note 1) Backward command B3 (Note 1) Forward command B4 Alarm clear B5</p>	<p>(Note 1) Backward command B3 (Note 1) Forward command B4 Alarm clear B5</p>

(Note 1) Switching to the single solenoid method will change B3 to "forward/backward command" and B4 to "unused."

I/O Signal Table

Power · I/O connector pin assignment			
Pin No.	Connector nameplate name	Signal abbreviation	Function overview
B3 (Note 1)	Backward	ST0	Backward command
B4 (Note 1)	Forward	ST1	Forward command
B5	Alarm clear	RES	Alarm clear
A3	Backward complete	LS0/PE0	Backward complete/push complete
A4	Forward complete	LS1/PE1	Forward complete/push complete
A5	Alarm	*ALM	Alarm detection (b-contact)
B2	Brake release	BKRLS	Brake forced release (for brake equipped specification)
B1 (Note 2)	24V	24V	24V input
A1	0V	0V	0V input
A2 (Note 2)	(24V)	(24V)	24V input

(Note 1) Switching to the single solenoid method will change B3 to "forward/backward" and B4 to "unused." However, the power · I/O connector display will still read "B3: Backward" and "B4: Forward."
(Note 2) B1 is 24V (drive) and A2 is 24V (control) for the split motor and controller power supply specification (TMD2).

Options

Teaching pendant *For detailed specifications, please contact IAI.

Name	Model	Image
Wireless Teaching Controller	TBD-1WL-□	
Wired Teaching Controller	TBD-1	
Wireless/wired touch panel teaching pendant	TB-03-□	
Wired/wireless touch panel teaching pendant with power supply unit	TB-03E-□	

PC teaching software *For detailed specifications, please contact IAI.

Specification	Model	Image
Software only (no connection cable) * Please purchase through your distributor and a download link will be sent to your valid email address.	IA-OS	
With external device communication cable + USB conversion adapter + USB cable * Please purchase through your distributor and a download link will be sent to your valid email address.	IA-OS-C	

24V power supply *For detailed specifications, please contact IAI.

Specification	Model	Image
Without fan	PSA-24	
With fan	PSA-24L	

Power capacity calculation "Calculator" software

The calculator software is included in the IA-OS software. Just input the model number of the ELECYLINDER to be connected to confirm sufficient units for 24V power.

Maintenance Parts (Cables)

When placing an order for a replacement cable after purchasing a product, please use the model name shown below.

Type	Model	External view
Power · I/O cable (user-wired specification)	CB-EC-PWBIO□□□-RB	
Power · I/O cable (user-wired specification, four-way connector)	CB-EC2-PWBIO□□□-RB	
Power · I/O cable (RCON-EC connection specification)	CB-REC-PWBIO□□□-RB	
Power · I/O cable (RCON-EC connection specification, four-way connector)	CB-REC2-PWBIO□□□-RB	

*For assembly of the four-way connector, please contact IAI.

*Please indicate the cable length (L) in □□□, e.g. 050 = 5m



IAI America, Inc.

USA Headquarters & Western Region (Los Angeles) : 2690 W. 237th Street, Torrance, CA 90505 +1-(310) 891-6015

Midwest Branch Office (Chicago) : 110 East State Parkway, Schaumburg, Illinois 60173 +1-(847) 908-1400

Southeast Branch Office (Atlanta) : 1220 Kennestone Circle, Suite 108, Marietta, GA 30066 +1-(678) 354-9470

www.intelligentactuator.com

JAPAN Headquarters : 577-1 Obane, Shimizu-ku, Shizuoka-shi, Shizuoka, 424-0103, JAPAN

The information contained in this product brochure may change without prior notice due to product improvements.

IAI Industrieroboter GmbH

Ober der Röth 4, D-65824 Schwalbach am Taunus, Germany

IAI (Shanghai) Co., Ltd.

Rm 2-1105, Hesheng Fortune Square, South side of Beian Bridge,
Nanshi Street, Heping Qu, TianJin 300021, China

IAI Robot (Thailand) Co., Ltd.

825 Phairojkijja Tower 7th Floor, Debaratana Rd.,
Bangna Nuea, Bangna, Bangkok 10260, Thailand

