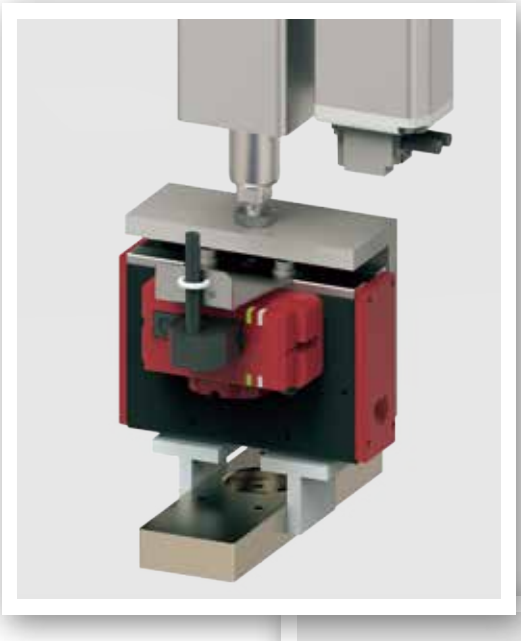
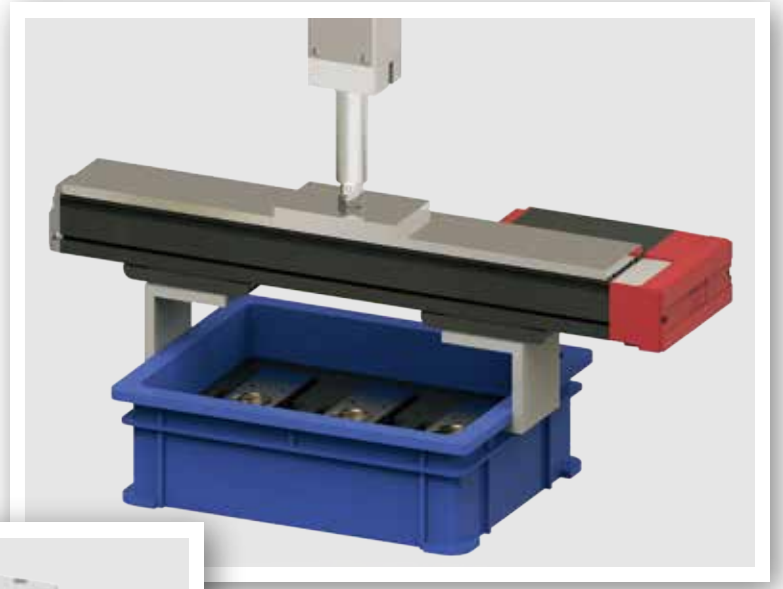
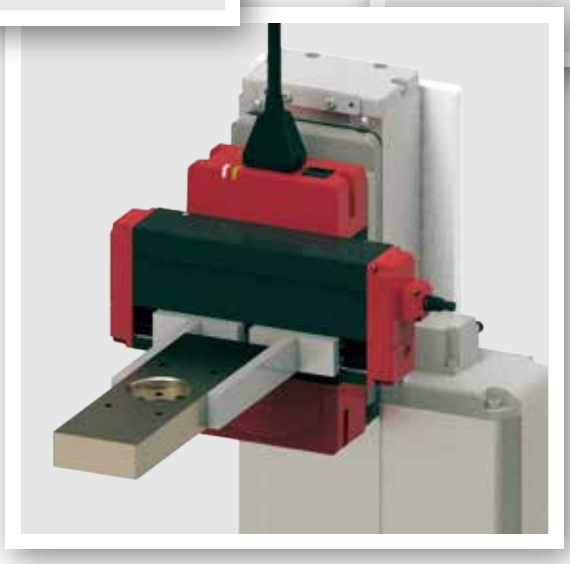
IAI
Quality and Innovation

EC-GRB□
GRC□
GRST□

ELECYLINDER® Gripper Type







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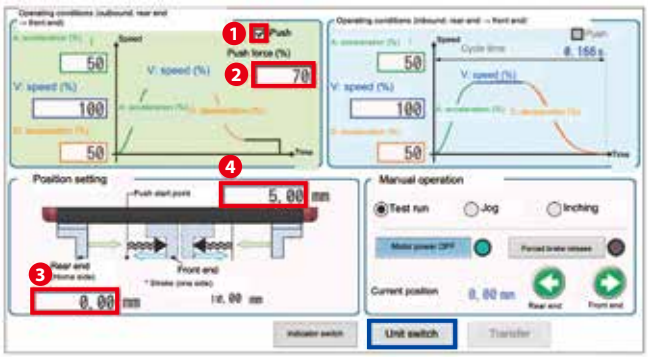
ELECYLINDER

ELECYLYNDER® GRIPPER TYPE

Easy setting

Teaching pendant [TB-03] simple data setting screen

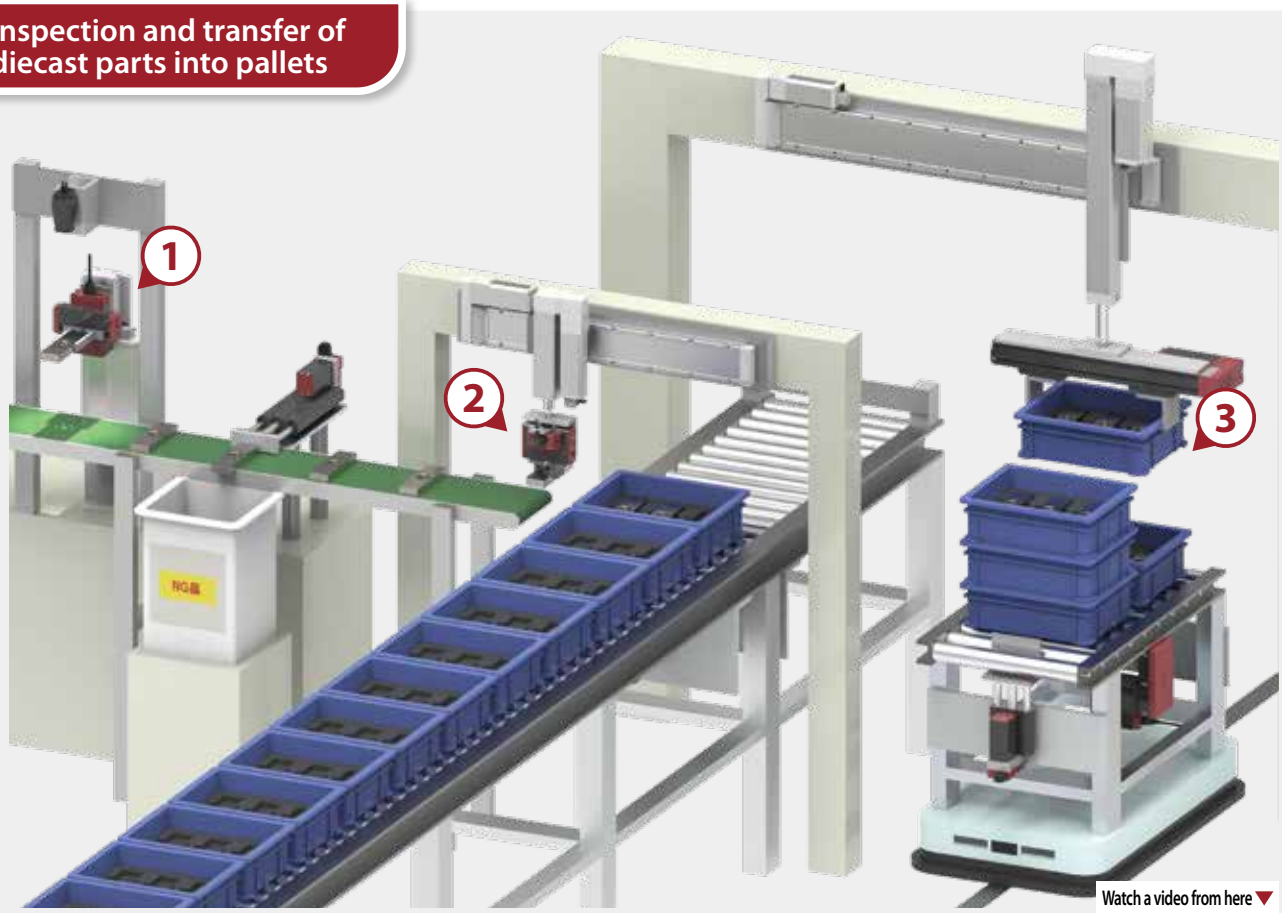


Setting complete in just 4 steps!

Step 1	Check "Push"	Gripping is done with push-motion operation.
Step 2	Set grip force	Setting by switching to Newton display (guideline value) with "**Unit switch**" is also possible.
Step 3	Set standby position	
Step 4	Set grip start point	

The precise numerical setting allows for gripping of easily deformable workpieces

Inspection and transfer of diecast parts into pallets



Watch a video from here ▼

①: Inspection of front and back of the parts using a flat gripper and rotary combined.

②: Transfer of parts to the pallet using a vertical gripper installed on the rod tip.

③: The long-stroke gripper grabs the pallets and places them on an AGV.

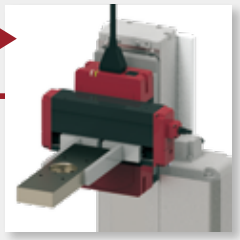
First in the industry!

Flat type and long stroke type grippers with built-in controller are newly released.

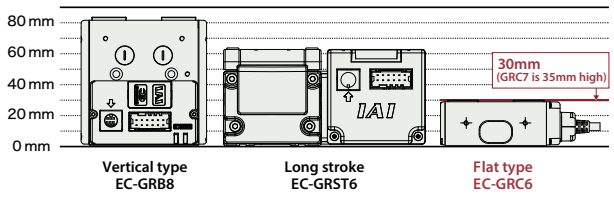
NEW

Flat type

EC-GRC



Point Low profile, with heights of 30-35mm



Point Industry-leading performance

Model	GRC6	GRC7	
Lead	M Standard	M Standard	L High-thrust force
Max. gripping force (both sides)	36N	150N	350N
Max. speed when approaching	52.5mm/s	137.5mm/s	87.5mm/s
Main unit mass	0.32/0.4kg	0.4-0.96kg	

Vertical type

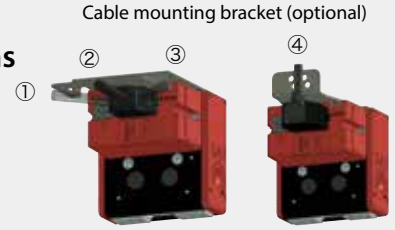
EC-GRB

Point Best suited for use in multiaxis systems

The vertical type is suitable for mounting on the Z-axis tip.

There is only one φ7.2 cable, making wiring easy.

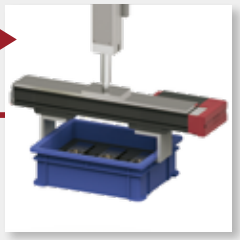
The cable mounting bracket (optional) allows for easier wiring and cable routing.



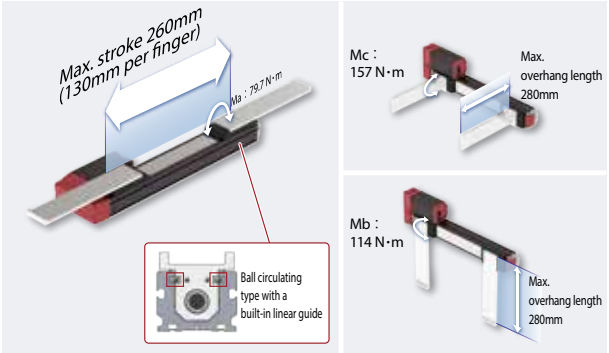
NEW

Long stroke

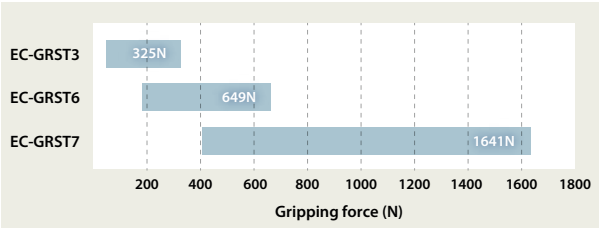
EC-GRST



Point Long stroke and high-rigidity



Point High gripping force up to 1641N (both sides)



Model Specification Items

ELECYLYNDER® Vertical gripper

*NPN specification is standard. PNP option is available.

EC - [Type] [Deceleration ratio] - [Stroke (both sides)] - [Power・I/O cable length] - [Option]

Series

Type

GRB8	82mm wide
GRB10	98mm wide
GRB13	130mm wide

Deceleration ratio

<GRB8>

M	Trapezoidal thread Lead 1.5mm Pulley Deceleration ratio 1.5	

<GRB10>

M	Trapezoidal thread Lead 1.5mm Pulley Deceleration ratio 1.15	

<GRB13>

M	Standard	Trapezoidal thread Lead 2mm Pulley Deceleration ratio 1.25
L	High thrust force	Trapezoidal thread Lead 2mm Pulley Deceleration ratio 2.5

Stroke (both sides)

<GRB8>

20	20mm (10mm per finger)

<GRB10>

30	30mm (15mm per finger)

<GRB13>

40	40mm (20mm per finger)

Power・I/O cable length

0	No cable Power・I/O connector included *
(S)1	1m
〜	〜
(S)10	10m

(every 1 m)

(S): 4-way connector cable

* A Power・I/O connector is not included if RCON-EC connection specification(ACR) is selected.

Option

Blank	Incremental encoder specification NPN specification, without option
ACR	RCON-EC connection specification *1
FST	Cable mounting bracket (front)
NM	Closed homing specification
PN	PNP specification *1
TMD2	Split motor and controller power specification *1
TST	Cable mounting bracket (top) *2
WA	Battery-less absolute Encoder specification*3
WL	Wireless communication specification
WL2	Wireless axis operation specification

*1 "PN" and "TMD2" cannot be selected when "ACR" is selected

*2 Can only be selected with the 4-way connector cable.

*3 Available only for GRB10/GRB13.

ELECYLYNDER® Flat type gripper

*NPN specification is standard. PNP option is available.

EC - [Type] [Deceleration ratio] - [Stroke (both sides)] - [Actuator cable length] - [Power・I/O cable length] - [Option]

Series

Type

GRC6	60mm wide
GRC7	70mm wide

Deceleration ratio

<GRC6>

M	Trapezoidal thread Lead 1.5mm Pulley Deceleration ratio 1.43	

<GRC7>

M	Standard	Ball screw Lead 2.5mm Pulley Deceleration ratio 1.36
L	High thrust force	Ball screw Lead 2.5mm Pulley Deceleration ratio 2.14

Stroke (both sides)

<GRC6>

20	20mm (10mm per finger)
30	30mm (15mm per finger)

<GRC7>

20	20mm (10mm per finger)
40	40mm (20mm per finger)
60	60mm (30mm per finger)
80	80mm (40mm per finger)

Actuator cable length

1	1m
〜	〜
10	10m

(every 1m)

(Note) When using an interface box, the maximum actuator cable length is 9m.

Power・I/O cable length

0	No cable Power・I/O connector included *
(S)1	1m
〜	〜
(S)9	9m

(every 1m)

(S): 4-way connector cable

* Choose "0" if RCON-EC connection specification (ACR) is selected. Power・I/O cable is not included.

(Note) Select the cable so that the total length with the actuator cable is 10m or less.

Option

Blank	Incremental encoder specification NPN specification, without option
ACR	RCON-EC connection specification *1, *4
B	With brake *2
CJB	Cable exit orientation (bottom)
CJL	Cable exit orientation (left)
CJR	Cable exit orientation (right)
CJT	Cable exit orientation (top)
G1/G5	Specified grease specification *3
MJF1	Finger attachment mounting jig (Open/close direction screw hole)
MJF2	Finger attachment mounting jig (Side screw hole)
MJF3	Finger attachment mounting jig (Open/close direction through hole)
NM	Closed homing specification
PN	PNP specification *1
TMD2	Split motor and controller power specification *1
WA	Battery-less absolute Encoder specification
WL	Wireless communication specification *4
WL2	Wireless axis operation specification *4

*1 When "ACR" is selected, "PN" and "TMD2" cannot be selected.

*2 Can only be selected with the 40/60/80 strokes of the GRC7.

*3 Can only be selected with the GRC7.

*4 When "ACR" is selected, "WL" and "WL2" cannot be selected. (For wireless communication, an interface box and cable must be ordered separately.)

ELECYLYNDER® Long Stroke gripper (EC-GRST3) *NPN specification is standard. PNP option is available.

EC - [ ] [ ] - [ ] - [ ] - [ ] - [ ]

Series / Type / Deceleration ratio / Stroke (both sides) / Actuator cable length / Power・I/O cable length / Option

Type		
GRST3	35mm wide	

Deceleration ratio		
M	Standard	Ball screw Lead 2.5mm Pulley Deceleration ratio 1.05
L	High thrust force	Ball screw Lead 2.5mm Pulley Deceleration ratio 1.64

Stroke (both sides)	
50	50mm (25mm per finger)
100	100mm (50mm per finger)
150	150mm (75mm per finger)
200	200mm (100mm per finger)

Actuator cable length	
1	1m
〜	〜
10	10m

(every 1m)

(Note) When using an interface box, the maximum actuator cable length is 9m.

Power・I/O cable length	
0	No cable Power・I/O connector included *
(S)1	1m
〜	〜
(S)9	9m

(every 1m)

(S): 4-way connector cable

* Choose "0" if RCON-EC connection specification (ACR) is selected. Power・I/O cable is not included.

(Note) Select the cable so that the total length with the actuator cable is 10m or less.

Option	
Blank	Incremental encoder specification NPN specification, without option
ACR	RCON-EC connection specification *1, *2
B	With brake
CJB	Cable exit orientation (bottom)
CJL	Cable exit orientation (left)
CJR	Cable exit orientation (right)
G1/G5	Specified grease specification
MJF	Finger attachment mounting jig
NM	Closed homing specification
PN	PNP specification *1
TMD2	Split motor and controller power specification*1
WA	Battery-less absolute Encoder specification
WL	Wireless communication specification *2
WL2	Wireless axis operation specification *2

*1 When "ACR" is selected, "PN" and "TMD2" cannot be selected.

*2 When "ACR" is selected, "WL" and "WL2" cannot be selected.
(For wireless communication, an interface box and a cable must be ordered separately.)

ELECYLYNDER® Long Stroke gripper (EC-GRST6/GRST7)

*NPN specification is standard. PNP option is available.

EC - [ ] [ ] - [ ] - [ ] - [ ] - [ ]

Series / Type / Deceleration ratio / Stroke (both sides) / Power・I/O cable length / Option

Type	
GRST6	63mm wide
GRST7	73mm wide

<GRST6>

Deceleration ratio		
M	Standard	Ball screw Lead 3mm Pulley Deceleration ratio 1
L	High thrust force	Ball screw Lead 3mm Pulley Deceleration ratio 1.44

<GRST7>

Deceleration ratio		
M	Standard	Ball screw Lead 4mm Pulley Deceleration ratio 1
L	High thrust force	Ball screw Lead 4mm Pulley Deceleration ratio 1.5

<GRST6>

Stroke (both sides)	
180	180mm (90mm per finger)
230	230mm (115mm per finger)

<GRST7>

Stroke (both sides)	
210	210mm (105mm per finger)
260	260mm (130mm per finger)

Power・I/O cable length	
0	No cable Power・I/O connector included *
(S)1	1m
〜	〜
(S)10	10m

(every 1m)

(S): 4-way connector cable

* A Power・I/O connector is not included if RCON-EC connection specification(ACR) is selected.

Option	
Blank	Incremental encoder specification NPN specification, without option
ACR	RCON-EC connection specification *1
B	With brake
G1/G5	Specified grease specification
ML	Motor side-mounted (left) *2
MR	Motor side-mounted (right) *2
NM	Closed homing specification
PN	PNP specification *1
SR	Slider roller specification
TMD2	Split motor and controller power specification *1
WA	Battery-less absolute Encoder specification
WL	Wireless communication specification
WL2	Wireless axis operation specification

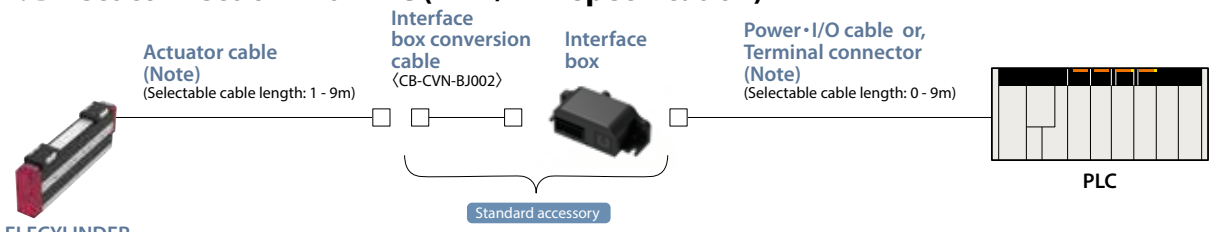
*1 "PN" and "TMD2" cannot be selected when "ACR" is selected

*2 "ML" or "MR" must be specified in the model number.

Connection method with PLC

Three methods for the connection of EC-GRC6/GRC7/GRST3 and the PLC are as shown below.

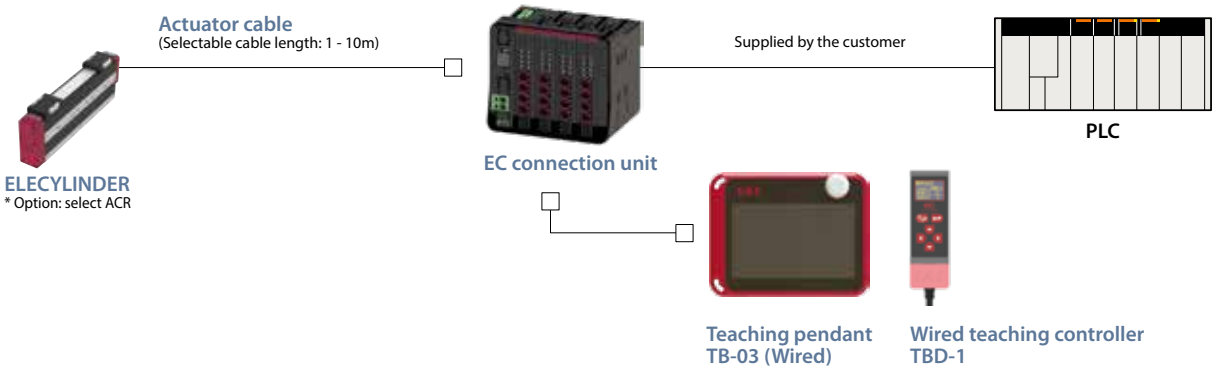
1. Direct connection with PLC (NPN/PNP specification)



* The specification of the interface box varies depending on the options selected. Refer to P.48 for details.

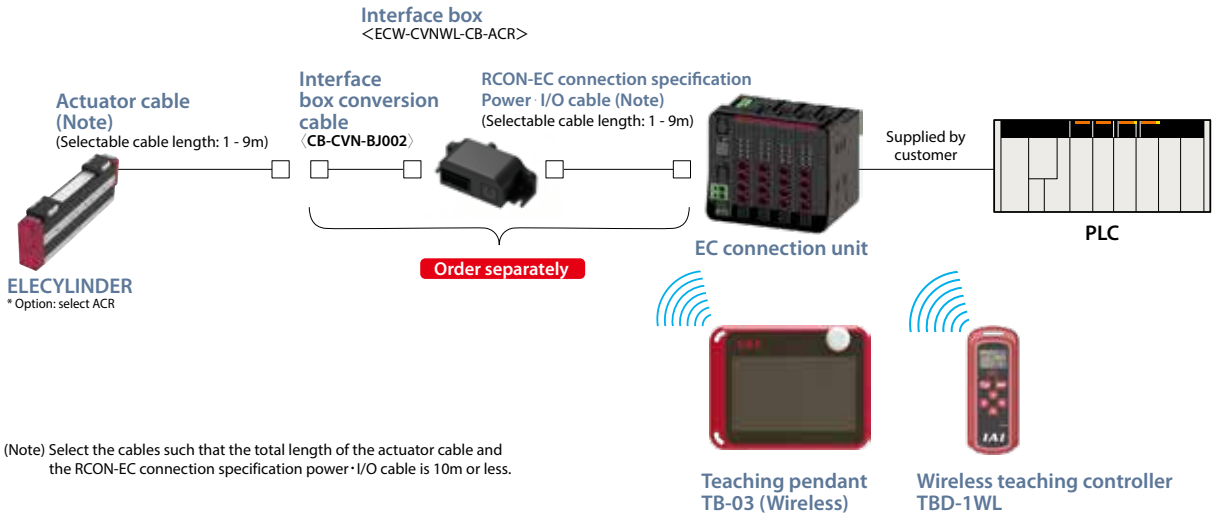
(Note) Select the cables such that the total length of the actuator cable and power・I/O cable (In case of the terminal connector, the cable that the customer supplies) is 10m or less.

2. When connecting to PLC via EC connection unit (RCON-EC connection specification) [Wired connection of the teaching pendant]



3. When connecting to PLC via EC connection unit (RCON-EC connection specification) [Teaching pendant is connected wirelessly]

The configuration below shows the part numbers for the wireless communication specification (WL). For the wireless axis operation specification (WL2), contact IAI.



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

Specifications

Type		Deceleration ratio	Stroke (both sides) (mm) and maximum speed at approach (mm/s) * Belt = Stroke, *Numbers in the belt = Maximum speed													Max. gripping force (both sides) N	Reference page
			20	30	40	50	60	80	100	150	180	200	210	230	260		
Vertical type	GRB8	M	45													28	P11
	GRB10	M		95												100	P15
	GRB13	M			120											150	P19
		L			60											360	
NEW Flat type	GRC6	M	52.5													36	P23
	GRC7	M	137.5		137.5		137.5									150	P27
		L	87.5		87.5		87.5									350	
NEW Long stroke	GRST3	M				175			175			175				125	P31
		L				107			107			107				325	
	GRST6	M									225			225		449	P35
		L									156			156		649	
	GRST7	M											175		175	1094	P39
		L											117		117	1641	

Auto servo OFF function

"Auto servo OFF function" can be set up using the PC teaching software (IA-OS) or teaching pendant (TB-02/03).

When the auto servo OFF function is activated, the servo is automatically turned off after a fixed time has passed since the gripper has completed its last move.

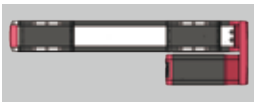
When the next command is entered, the servo will be automatically turned ON and the gripper will move to the specified position.

Since there is no holding current when the actuator is stopped, power consumption is reduced.

When the brake option is selected, the auto servo OFF function can be used to maintain the gripping force until the brake is activated after the power is turned off. (However, this does not guarantee that the workpiece will not be dropped.)

Mounting Orientation

○: Mounting possible

	Mounting orientation			
				
Type	**Horizontal flat mount**	**Vertical mount**	**Horizontal side mount**	**Horizontal ceiling mount**
GRB□	○	○	○	○
GRC□	○	○	○	○
GRST□	○	○	○*1	○*1

*1 Horizontal side mount and horizontal ceiling mount may cause sagging or misalignment of the stainless sheet in particular.
Continued use of the product with sagging or misalignment may cause breakage or failure of the stainless sheet.
Carry out daily inspections and adjust the stainless sheet if sagging or misalignment occurs.

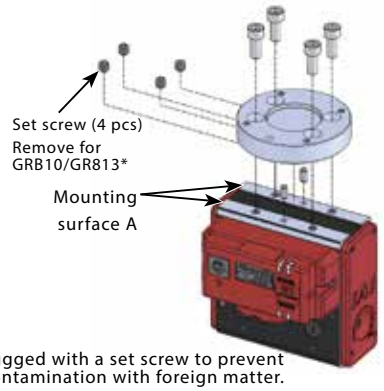
Precautions on mounting

The flatness of the mounting surface of the main unit and the workpiece should be within 0.05 mm/m.
Poor flatness increases the sliding resistance of the fingers and may cause operation failures.

Mounting Method

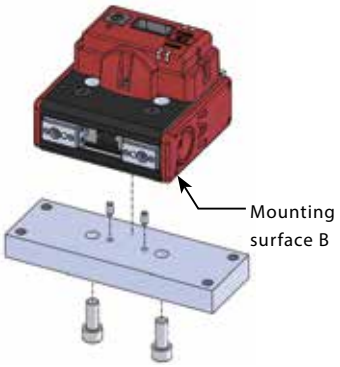
■Mounting of the Main Unit (GRB8/GRB10/GRB13)

Mounting surface A, screw hole fixed

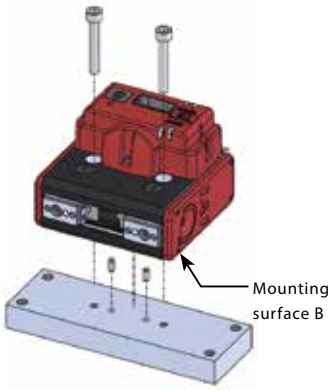


*Plugged with a set screw to prevent contamination with foreign matter.

Mounting surface B, screw hole fixed

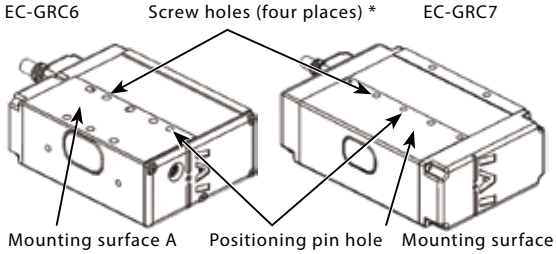


Mounting surface B, through hole fixed



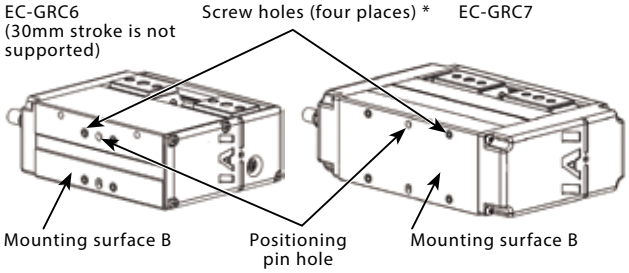
■Mounting of the Main Unit (GR6/GR7)

Mounting surface A, screw hole fixed



* Plugged with a set screw to prevent contamination with foreign matter. (EC-GR7 only)

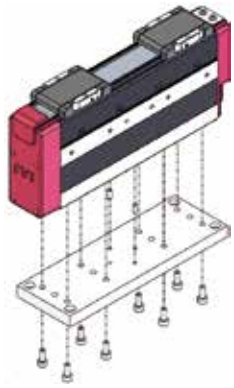
Mounting surface B, screw hole fixed



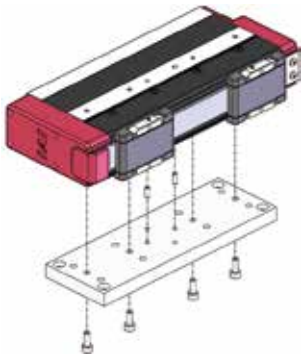
* Plugged with a set screw to prevent contamination with foreign matter.

■Mounting of the main unit (GRST3)

Bottom surface screw hole fixed

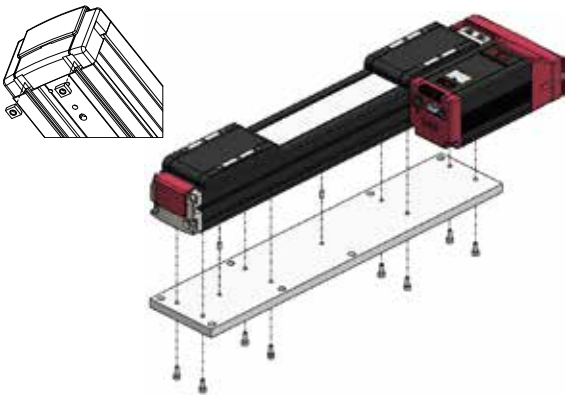


Side surface screw hole fixed



■Mounting of the main unit（GRST6/GRST7)

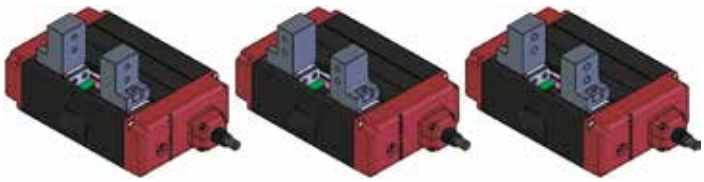
On the main unit bottom surface, there are T-slots for mounting Square nuts (accessories) can be inserted into the T-slot and bolted from the back side.



■Mounting of the finger attachment (GRC6/GRC7/GRST3)

For EC-GRC6/GRC7/GRST3, an optional finger attachment is available. Refer to P.44 for details.

EC-GRC6/GRC7

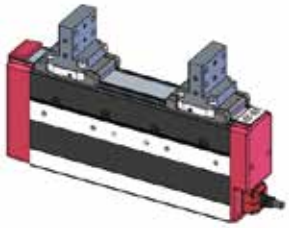


Opening orientation screw holes (Model: MJF1)

Side surface screw holes (Model: MJF2)

Open/Close orientation through holes (Model: MJF3)

EC-GRST3



Compatible with the open/close orientation / Side surface mounting (Model: MJF)

Selection process

Step 1
Confirmation of required grip force and conveyable workpiece weight

Step 2
Confirmation of grip point distance

Step 3
Confirmation of external force applied to finger

Step 1 Confirmation of required grip force and conveyable workpiece weight

When gripping the workpiece with friction force derived from grip force, the required grip force is calculated as below.

(1) For normal conveyance

F: Grip force (N): Total value of each finger's push force
μ: Static friction coefficient between finger attachment and workpiece
W: Weight [N] = mg
m: Workpiece mass (kg)
g: Gravitational acceleration (= 9.8m/s²)

- Conditions under which workpiece will not fall when gripped statically

$$F\mu > mg \qquad F > \frac{mg}{\mu}$$

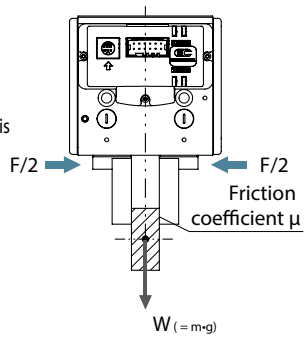
- For instance, in case of the safety factor of 2, the required gripping force for transfer is

$$F > \frac{mg}{\mu} \times 2 \text{ (safety ratio)}$$

* A typical safety factor is 2 - 5 (guideline)

- At friction coefficient μ0.1 to 0.2

$$F > \frac{mg}{0.1 \sim 0.2} \times 2 = (10 \sim 20) \times mg$$



For normal workpiece conveyance (guideline)

Required grip force ▶ at least 10 to 20x the workpiece weight (W)
Conveyable workpiece weight W ▶ At most 1/10 to 1/20 the grip force

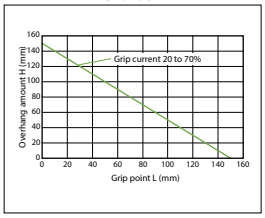
(2) When high acceleration/deceleration or impact force is applied while moving the workpiece

In addition to gravity, even stronger inertial force operates on the workpiece.
In such cases, select a model with a larger safety factor (guideline: 5 to 10).

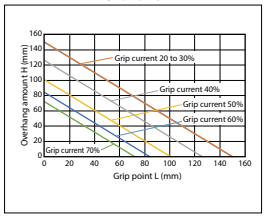
Step 2 Confirmation of grip point distance

The distance (L, H) from the finger attachment surface to the gripping point should be within the range shown in the graph of "Confirmation of grip point distance" on each product specification page.
Attempting to use the gripper outside of the limited range will cause excess moments on the sliders and interior mechanisms, which will decrease operation life.

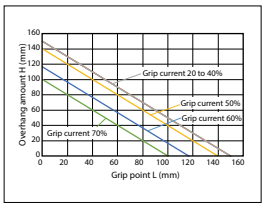
EC-GRB8M



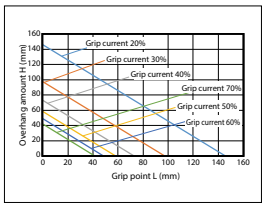
EC-GRB10M



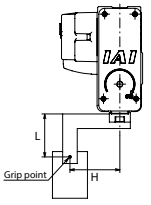
EC-GRB13M



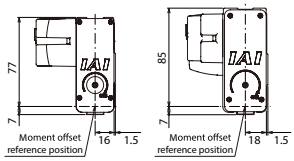
EC-GRB13L



<Distance to grip point>



<Moment offset reference position>



EC-GRB8 EC-GRB10/13

Even with the grip point distance within the limit range, keep the finger attachments as small and lightweight as possible.
A longer or heavier finger may cause performance deterioration or damage the internal guides due to inertial force and bending moments during motion.

Step 3 Confirmation of external force applied to finger

(1) Vertical allowable load

Check that the vertical allowable load applied to each finger does not exceed the allowable value.

(2) Allowable load moment

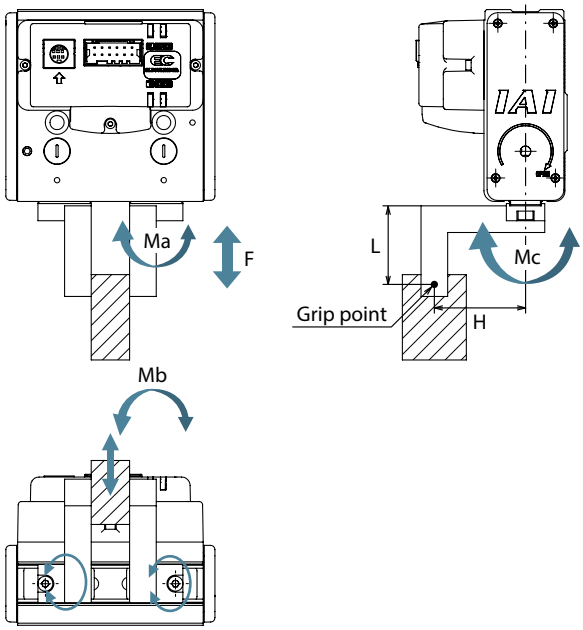
Calculate Ma and Mc with L and Mb with H. Check that the moment applied to each finger does not exceed the maximum allowable load moment.

- Allowable external force with moment load applied to each finger

$$\text{Vertical allowable load F (N)} > \frac{\text{Maximum allowable load moment (N•m)}}{\text{L or H (mm)} \times 10^{-3}}$$

Calculate the vertical allowable load F (N) for both L and H.

Confirm that the external force applied to the finger does not exceed the calculated vertical allowable load F (N) (the smaller value of L and H).



Model	Vertical allowable load F (N)	Maximum allowable load moment (N•m)		
		Ma	Mb	Mc
EC-GRB8	598	3.60	3.60	10.2
EC-GRB10	598	3.60	3.60	10.2
EC-GRB13	898	7.52	7.52	15.3
EC-GRC6	20ST: 398 30ST: 498	20ST: 2.61 30ST: 3.60	20ST: 2.61 30ST: 3.60	20ST: 8.50 30ST: 10.2
EC-GRC7	20ST: 498 Other than 20ST: 798	20ST: 3.60 Other than 20ST: 7.52	20ST: 3.60 Other than 20ST: 7.52	20ST: 10.2 Other than 20ST: 15.3
EC-GRST3	810	9.9	14.2	17.2
EC-GRST6	1800	48.5	69.3	97.1
EC-GRST7	2330	79.7	114.0	157.0

1. The allowable value above is a static value. 2. Indicates the allowable value for one finger.

*The load point above indicates the position where the load is applied to the finger.
The position varies depending on the load type.
- Load due to grip force: Grip point
- Load due to gravity: Center of mass
- Inertial force when moving or centrifugal force when rotating: Center of mass

Load moment is the total value calculated for each load type.

*When calculating the external force, please make sure to take into consideration all of the causes of force on the gripper sliders, including: the fingers, the workpiece weight, inertial forces due to acceleration/deceleration while in motion, and centrifugal forces if the gripper is being rotated.

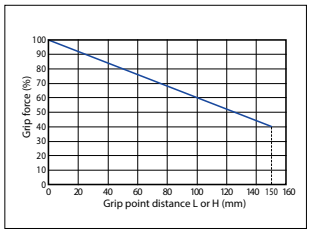
Guidelines for Grip Point Distance and Grip Force

1. Graph shows grip force of grip point distance when maximum grip force is set to 100%.

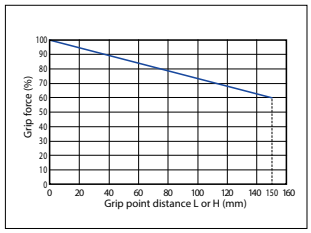
2. Grip point distance refers to the distance (L or H) from the finger attachment mounting surface to the grip point.

3. Grip force varies by size. Consider this as a guideline.

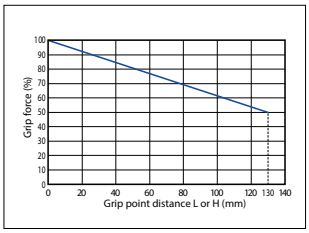
EC-GRB8M



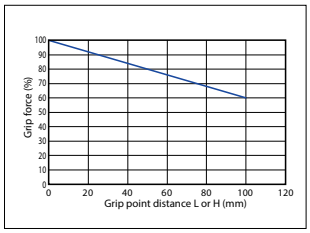
EC-GRB10M/13M/13L



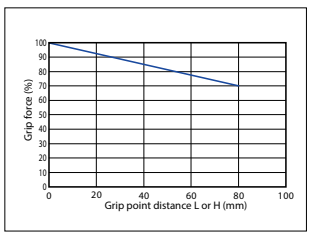
EC-GRC6M



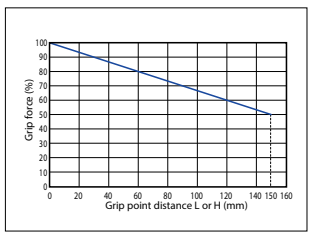
EC-GRC7M



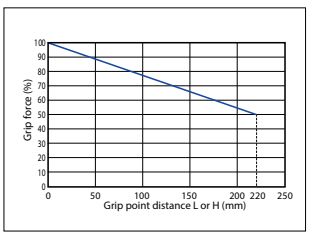
EC-GRC7L



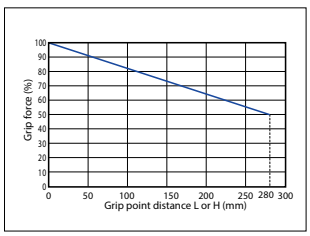
EC-GRST3M/3L



EC-GRST6M/6L



EC-GRST7M/7L



EC-GRB8

Slider | 2-Finger | Body Width 80 mm | 24v Stepper Motor

Model Specification Items

EC	-	GRB8	M	-	20	-		-	
Series		Type	Deceleration ratio		Stroke		Power • I/O cable length		Option
			M: Trapezoidal screw, Lead 1.5mm, Pulley deceleration ratio 1.5		20: 20mm (10mm per finger)		Refer to Power • I/O cable length below		Refer to Option below

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Stroke

Stroke (mm)	EC-GRB8
20	✓

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

Name	Option code	Reference page
RCON-EC connection specification (Note 1)	**ACR**	43
Cable mounting bracket (front)	**FST**	43
Closed homing specification	**NM**	45
PNP specification	**PN**	45
Split motor and controller power supply specification	**TMD2**	46
Cable mounting bracket (top) (Note 2)	**TST**	45
Wireless communication specification	**WL**	46
Wireless axis operation specification	**WL2**	46

(Note 1) 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.
(Note 2) Can only be selected with the 4-way connector cable.

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads) CB-EC-PWBIO□□□-RB supplied	RCON-EC connection specification (Note 4) (with connectors on both ends) CB-REC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 3)	✓
1 ~ 3	1 ~ 3m	✓	✓
4 ~ 5	4 ~ 5m	✓	✓
6 ~ 7	6 ~ 7m	✓	✓
8 ~ 10	8 ~ 10m	✓	✓

(Note 3) Only terminal block connector is included. Please refer to P. 53 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads) CB-EC2-PWBIO□□□-RB supplied	RCON-EC connection specification (Note 5) (with connectors on both ends) CB-REC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓	✓
S4 ~ S5	4 ~ 5m	✓	✓
S6 ~ S7	6 ~ 7m	✓	✓
S8 ~ S10	8 ~ 10m	✓	✓

(Note 5) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.
(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.
(3) When gripping the workpiece, be sure to use push-motion operation.
(4) The workpiece grip force will be maintained via self-lock even during power cutoffs. (However, this does not guarantee that the workpiece will not be dropped.) To move the slider fingers during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.

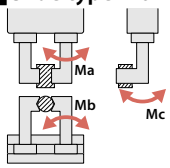
Main Specifications

Item		Description
Lead	Trapezoidal screw lead (mm)	1.5
	Pulley deceleration ratio	1.5
Grip operation	Max. grip force (N) (both sides)	28
	Max. speed during grip operation (mm/s) (per finger)	5
Approach operation	Max. speed (mm/s) (per finger)	45
	Min. speed (mm/s) (per finger)	5
	Rated acceleration/deceleration (G) (per finger)	0.3
	Max. acceleration/deceleration (G) (per finger)	0.3
Brake	Brake specification	-
	Brake holding force (kgf)	-
Stroke (per finger)	Min. stroke (mm) (per finger)	10
	Max. stroke (mm) (per finger)	10

Item	Description
Drive system	Trapezoidal screw φ8
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.2mm or less
Linear guide	Limited guide
Static allowable moment	Ma: 3.60N•m
	Mb: 3.60N•m
	Mc: 10.2N•m
Vertical allowable load (Note 6)	598N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	-
Vibration/shock resistance	4.9m/s²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□20) (Power capacity: maximum 1A)
Encoder type	Incremental (no setting for battery-less absolute option)
Number of encoder pulses	800 pulse/rev

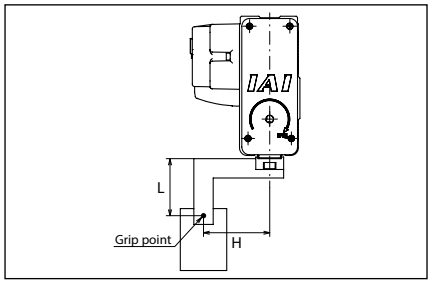
(Note 6) Use at a load exceeding the value above could reduce operation life or lead to damage.

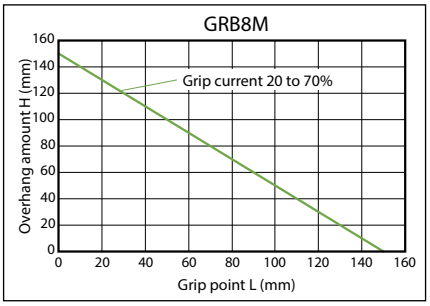
Slide type moment direction



Confirmation of Grip Point Distance

Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.

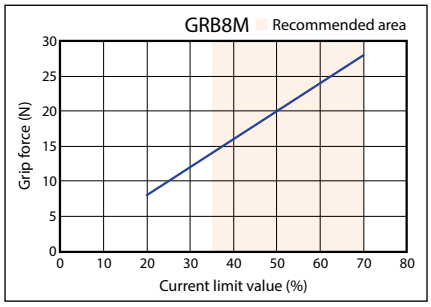




(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip Force

Correlation diagram between grip force and current limit value

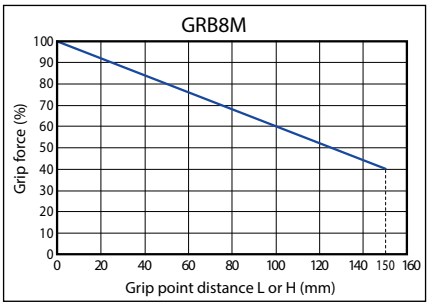


(Note) Total value of both fingers when grip point distance (L, H) is 0.

(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).

(Note) For gripping (pushing), the speed is fixed at 5mm/s.

Guidelines for grip point distance and grip force



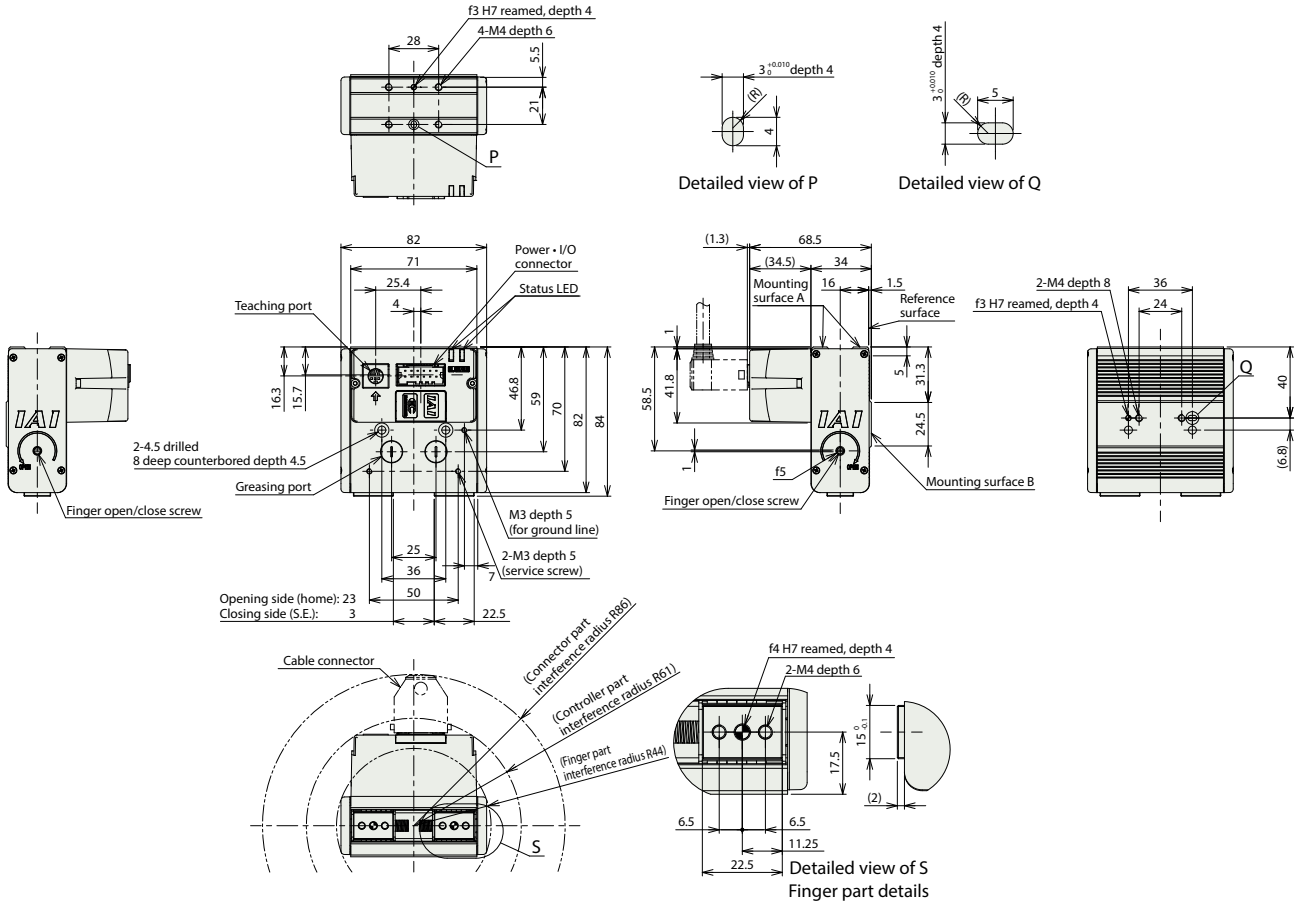
(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

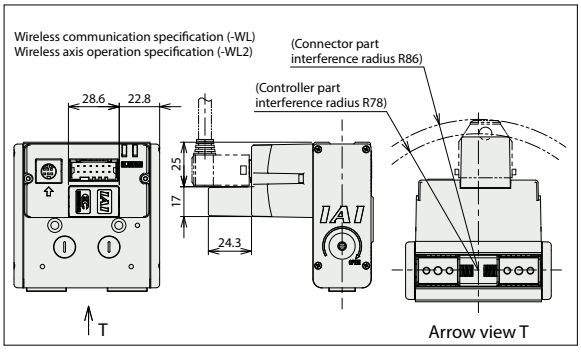
Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).

S.E: Stroke end





Mass

Item	Description
Mass	0.51kg

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

EC-GRB10

Slider | 2-Finger | Body Width 100 mm | 24v Stepper Motor

Model Specification Items

EC - GRB10 - M - 30 - [ ] - [ ]

Series	Type	Deceleration ratio		Stroke		Power • I/O cable length	Option
EC	GRB10	M	Trapezoidal screw Lead 1.5mm Pulley deceleration ratio 1.15	30	30mm (15mm per finger)	Refer to Power • I/O cable length below	Refer to Option below

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Stroke

Stroke (mm)	EC-GRB10
30	✓

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

Name	Option code	Reference page
RCON-EC connection specification (Note 1)	**ACR**	43
Cable mounting bracket (front)	**FST**	43
Closed homing specification	**NM**	45
PNP specification	**PN**	45
Split motor and controller power supply specification	**TMD2**	46
Cable mounting bracket (top) (Note 2)	**TST**	45
Battery-less absolute encoder specification	**WA**	46
Wireless communication specification	**WL**	46
Wireless axis operation specification	**WL2**	46

(Note 1) 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.
(Note 2) Can only be selected with the 4-way connector cable.

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection specification (Note 4) (with connectors on both ends)
		CB-EC-PWBIO□□□-RB supplied	CB-REC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 3)	✓
1 ~ 3	1 ~ 3m	✓	✓
4 ~ 5	4 ~ 5m	✓	✓
6 ~ 7	6 ~ 7m	✓	✓
8 ~ 10	8 ~ 10m	✓	✓

(Note 3) Only terminal block connector is included. Please refer to P. 53 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection specification (Note 5) (with connectors on both ends)
		CB-EC2-PWBIO□□□-RB supplied	CB-REC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓	✓
S4 ~ S5	4 ~ 5m	✓	✓
S6 ~ S7	6 ~ 7m	✓	✓
S8 ~ S10	8 ~ 10m	✓	✓

(Note 5) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.
(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.
(3) When gripping the workpiece, be sure to use push-motion operation.
(4) The workpiece grip force will be maintained via self-lock even during power cutoffs. (However, this does not guarantee that the workpiece will not be dropped.) To move the slider fingers during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.

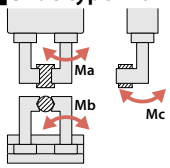
Main Specifications

Item		Description
Lead	Trapezoidal screw lead (mm)	1.5
	Pulley deceleration ratio	1.15
Grip operation	Max. grip force (N) (both sides)	100
	Max. speed during grip operation (mm/s) (per finger)	5
Approach operation	Max. speed (mm/s) (per finger)	95
	Min. speed (mm/s) (per finger)	5
	Rated acceleration/deceleration (G) (per finger)	0.3
	Max. acceleration/deceleration (G) (per finger)	0.3
Brake	Brake specification	-
	Brake holding force (kgf)	-
Stroke (per finger)	Min. stroke (mm) (per finger)	15
	Max. stroke (mm) (per finger)	15

Item	Description
Drive system	Trapezoidal screw φ 8
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.2mm or less
Linear guide	Limited guide
Static allowable moment	Ma: 3.60N•m
	Mb: 3.60N•m
	Mc: 10.2N•m
Vertical allowable load (Note 6)	598N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	-
Vibration/shock resistance	4.9m/s²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□28) (Power capacity: maximum 2A)
Encoder type	Incremental (standard) /battery-less absolute (option)
Number of encoder pulses	800 pulse/rev

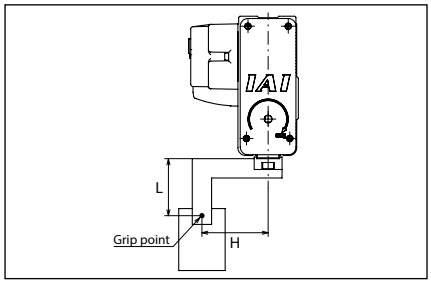
(Note 6) Use at a load exceeding the value above could reduce operation life or lead to damage.

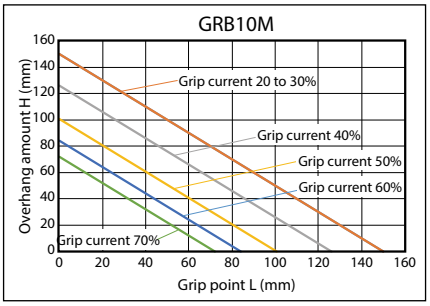
Slide type moment direction



Confirmation of Grip Point Distance

Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.

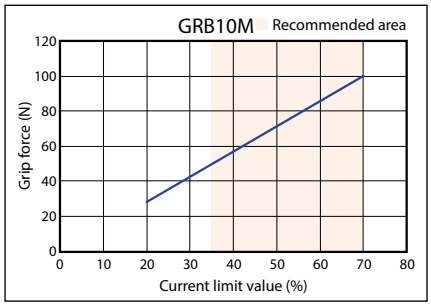




(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip Force

Correlation diagram between grip force and current limit value

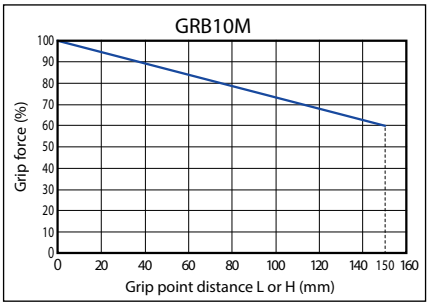


(Note) Total value of both fingers when grip point distance (L, H) is 0.

(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).

(Note) For gripping (pushing), the speed is fixed at 5mm/s.

Guidelines for grip point distance and grip force



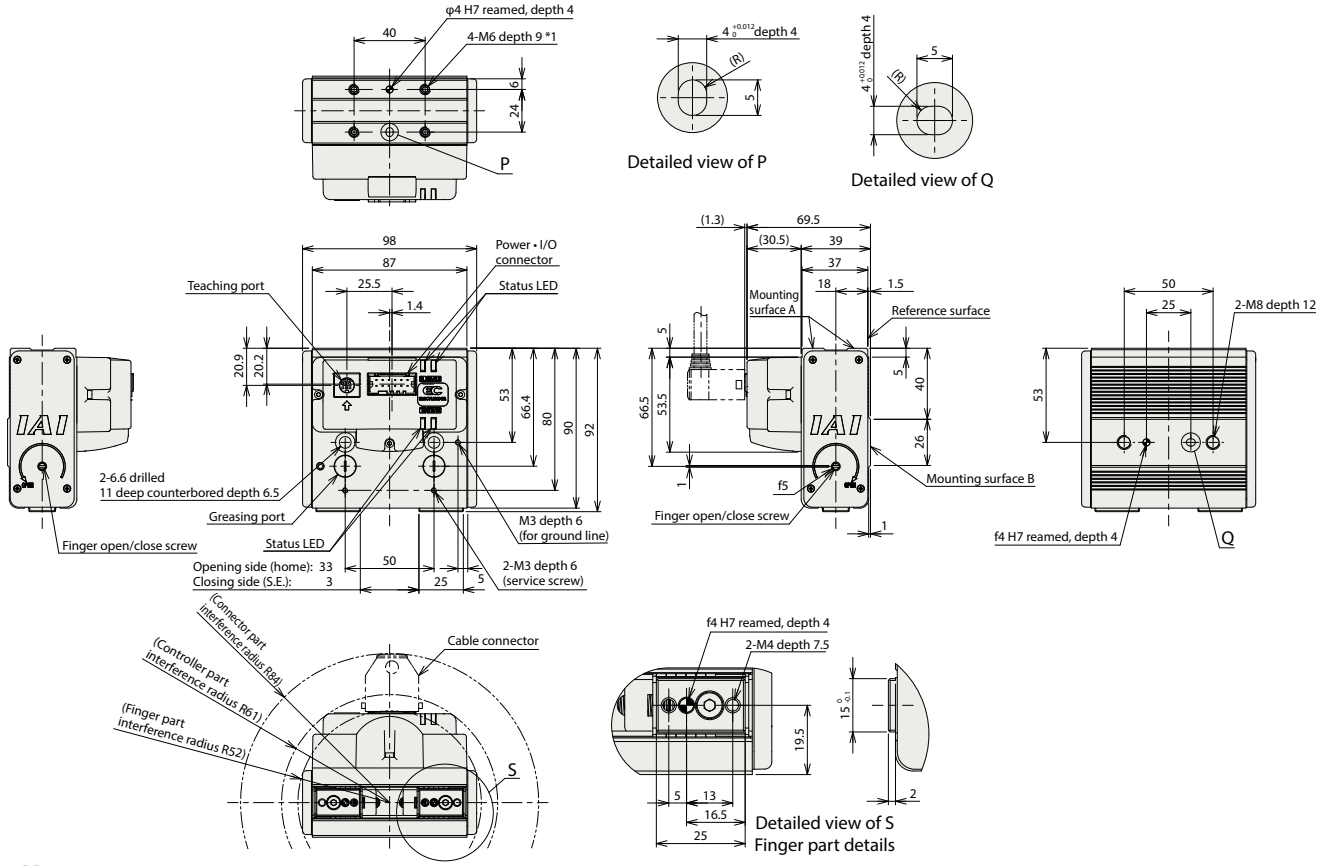
(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

*1 Plugged with a set screw to prevent contamination with foreign matter. Remove when using mounting surface A.
(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).

S.E: Stroke end



Mass

Item	Description
Mass	0.69kg

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

EC-GRB13

Slider | 2-Finger | Body Width 130 mm | 24v Stepper Motor

Model Specification Items

EC - GRB13 - [ ] - 40 - [ ] - [ ]

Series	Type	Deceleration ratio			Stroke		Power • I/O cable length	Option
EC	GRB13	M	Standard	Trapezoidal screw Lead 2mm Pulley deceleration ratio 1.25	40	40mm (20mm per finger)	Refer to Power • I/O cable length below	Refer to Option below
		L	High thrust	Trapezoidal screw Lead 2mm Pulley deceleration ratio 2.50				

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Stroke

Stroke (mm)	EC-GRB13
40	✓

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

Name	Option code	Reference page
RCON-EC connection specification (Note 1)	**ACR**	43
Cable mounting bracket (front)	**FST**	43
Closed homing specification	**NM**	45
PNP specification	**PN**	45
Split motor and controller power supply specification	**TMD2**	46
Cable mounting bracket (top) (Note 2)	**TST**	45
Battery-less absolute encoder specification	**WA**	46
Wireless communication specification	**WL**	46
Wireless axis operation specification	**WL2**	46

(Note 1) 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.
(Note 2) Can only be selected with the 4-way connector cable.

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection specification (Note 4) (with connectors on both ends)
		CB-EC-PWBIO□□□-RB supplied	CB-REC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 3)	✓
1 ~ 3	1 ~ 3m	✓	✓
4 ~ 5	4 ~ 5m	✓	✓
6 ~ 7	6 ~ 7m	✓	✓
8 ~ 10	8 ~ 10m	✓	✓

(Note 3) Only terminal block connector is included. Please refer to P. 53 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection specification (Note 5) (with connectors on both ends)
		CB-EC2-PWBIO□□□-RB supplied	CB-REC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓	✓
S4 ~ S5	4 ~ 5m	✓	✓
S6 ~ S7	6 ~ 7m	✓	✓
S8 ~ S10	8 ~ 10m	✓	✓

(Note 5) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.
(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.
(3) When gripping the workpiece, be sure to use push-motion operation.
(4) The workpiece grip force will be maintained via self-lock even during power cutoffs. (However, this does not guarantee that the workpiece will not be dropped.) To move the slider fingers during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.

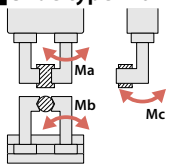
Main Specifications

Item		Description	
Deceleration ratio		M	L
Lead	Trapezoidal screw lead (mm)	2	2
	Pulley deceleration ratio	1.25	2.50
Grip operation	Max. grip force (N) (both sides)	150	360
	Max. speed during grip operation (mm/s) (per finger)	5	5
Approach operation	Max. speed (mm/s) (per finger)	120	60
	Min. speed (mm/s) (per finger)	5	5
	Rated acceleration/deceleration (G) (per finger)	0.3	0.3
	Max. acceleration/deceleration (G) (per finger)	0.3	0.3
Brake	Brake specification	-	-
	Brake holding force (kgf)	-	-
Stroke (per finger)	Min. stroke (mm) (per finger)	20	20
	Max. stroke (mm) (per finger)	20	20

Item	Description
Drive system	Trapezoidal screw φ10
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.2mm or less
Linear guide	Limited guide
Static allowable moment	Ma: 7.52 N•m
	Mb: 7.52 N•m
	Mc: 15.3 N•m
Vertical allowable load (Note 6)	898N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	-
Vibration/shock resistance	4.9m/s²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□28) (Power capacity: maximum 2A)
Encoder type	Incremental (standard) /battery-less absolute (option)
Number of encoder pulses	800 pulse/rev

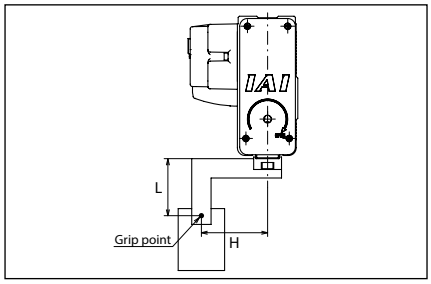
(Note 6) Use at a load exceeding the value above could reduce operation life or lead to damage.

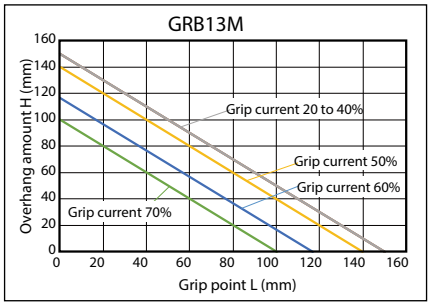
Slide type moment direction

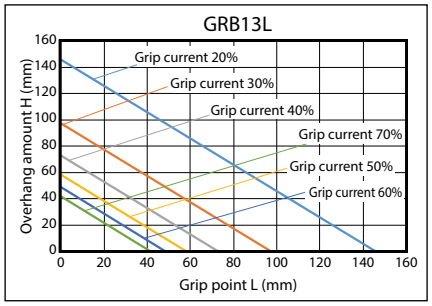


Confirmation of Grip Point Distance

Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.



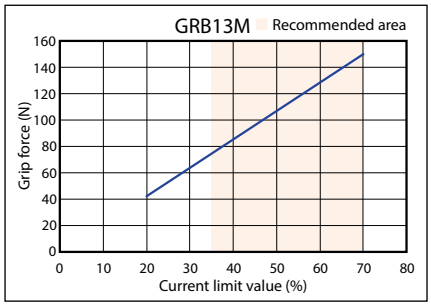


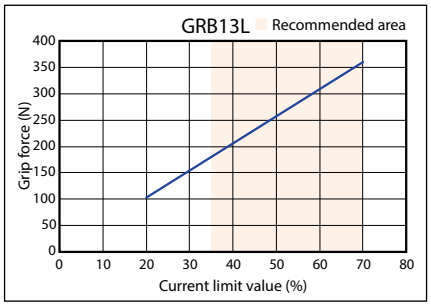


(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip Force

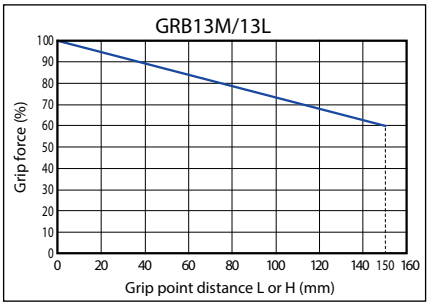
Correlation diagrams between grip force and current limit value





(Note) Total value of both fingers when grip point distance (L, H) is 0.
(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).
(Note) For gripping (pushing), the speed is fixed at 5mm/s.

Guidelines for grip point distance and grip force



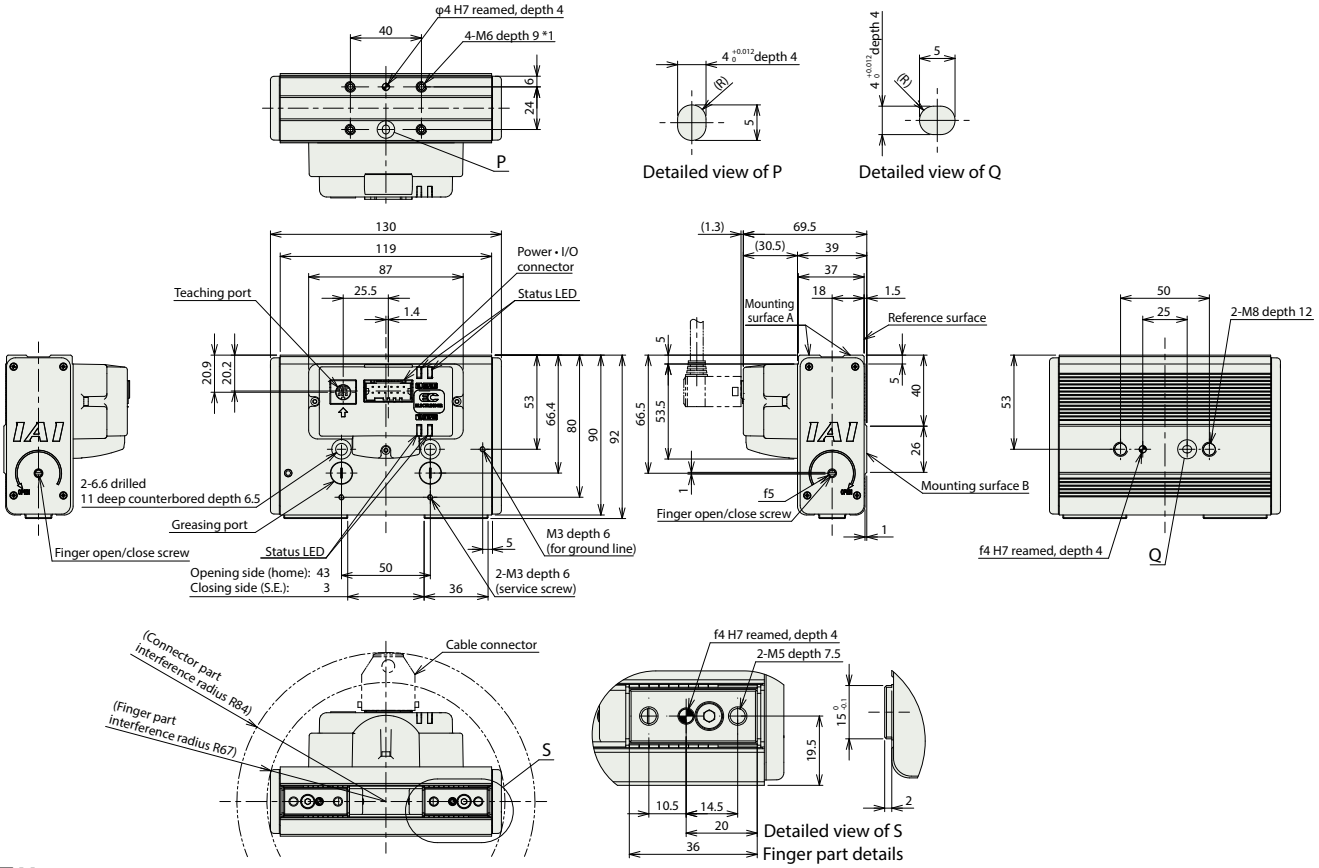
(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

*1 Plugged with a set screw to prevent contamination with foreign matter. Remove when using mounting surface A.
(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).

S.E: Stroke end



Mass

Item	Description
Mass	0.99kg

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

EC-GRC6

Slider | 2-Finger | Body Width 60 mm | 24v Stepper Motor

Model Specification Items

EC - GRC6 - M - [ ] - [ ] - [ ] - [ ]

Series	Type	Deceleration ratio	Stroke	Actuator cable length	Power • I/O cable length	Option
EC	GRC6	M: Trapezoidal screw, Lead 1.5mm, Pulley deceleration ratio 1.43	20: 20mm (10mm per finger) 30: 30mm (15mm per finger)	Refer to the actuator cable length table below	Refer to Power • I/O cable length below	Refer to Option below

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Stroke

Stroke (mm)	EC-GRC6	
	RCON-EC connection specification (Note 1)	NPN/PNP specification
20	✓	✓
30	✓	✓

(Note 1) Make sure to select "ACR" option.

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

Name	Option code	Reference page
RCON-EC connection specification (Note 3) (Note 4)	**ACR**	43
Cable exit orientation (bottom)	**CJB**	43
Cable exit orientation (left)	**CJL**	43
Cable exit orientation (right)	**CJR**	43
Cable exit orientation (top)	**CJT**	43
Finger attachment mounting jig (Open/close direction screw hole)	**MJF1**	44
Finger attachment mounting jig (Side surface screw hole)	**MJF2**	44
Finger attachment mounting jig (Open/close direction through hole)	**MJF3**	44
Closed homing specification	**NM**	45
PNP specification (Note 3)	**PN**	45
Split motor and controller power specification	**TMD2**	46
Battery-less absolute encoder specification	**WA**	46
Wireless communication specification (Note 4)	**WL**	46
Wireless axis operation specification (Note 4)	**WL2**	46

(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. The interface box and conversion cable are not included.

(Note 4) 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 (WL) with RCON-EC connection, an interface box, conversion cable and power•I/O cable should be ordered separately. Refer to P5 for details. For the wireless axis operation specification (WL2), contact one of IAI representatives.

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

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	54
RCON-EC connection specification power•I/O cable (Standard connector cable)	CB-REC-PWBIO□□□-RB	57
RCON-EC connection specification power•I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	57
Interface box for Split motor and controller power specification of RCON-EC connection (Wireless specification)	ECW-CVNWL-CB-ACR	54

(Note) Power•I/O cable is a robot cable.
Specify the cable length in□□□. (Ex. 010=10m)

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.

(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.

(3) When gripping the workpiece, be sure to use push-motion operation.

(4) The workpiece grip force will be maintained via self-lock even during power cutoffs. (However, this does not guarantee that the workpiece will not be dropped.) To move the slider fingers during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.

Actuator cable length

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

(Note 5) When connection is via the interface box, the maximum is 9m.
(Note) Select the cable so that the total length with the actuator cable is 10m or less.
(Note) Robot cable is standard

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads) CB-EC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 6)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 6) Only the terminal connector is included. * Choose "0" if optional RCON-EC connection specification (ACR) is selected. Power•I/O cable is not included. Refer to P53 for details.
(Note) Robot cable is standard

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 is standard

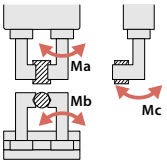
Main Specifications

Item		Description
Lead	Trapezoidal screw lead (mm)	1.5
	Pulley deceleration ratio	1.43
Grip operation	Max. grip force (N) (both sides)	36
	Max. speed during grip operation (mm/s) (per finger)	5
Approach operation	Max. speed (mm/s) (per finger)	52.5
	Min. speed (mm/s) (per finger)	10
	Rated acceleration/deceleration (G) (per finger)	0.3
	Max. acceleration/deceleration (G) (per finger)	0.3
Brake	Brake specification	-
	Brake holding force (kgf)	-
Stroke (per finger)	Min. stroke (mm) (per finger)	10
	Max. stroke (mm) (per finger)	15

Item	Description
Drive system	Timing belt + both sides trapezoidal sliding screw
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.2mm or less
Linear guide	Limited guide
Static allowable moment	Ma : <20st> 2.61 N·m <30st> 3.60 N·m
	Mb : <20st> 2.61 N·m <30st> 3.60 N·m
	Mc : <20st> 8.50 N·m <30st> 10.2 N·m
Vertical allowable load (Note 7)	<20st> 398N <30st> 498N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	IP20
Vibration/shock resistance	4.9m/s²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□20) (Power capacity: maximum 1A)
Encoder type	Incremental (standard) /battery-less absolute (option)
Number of encoder pulses	16384 pulse/rev

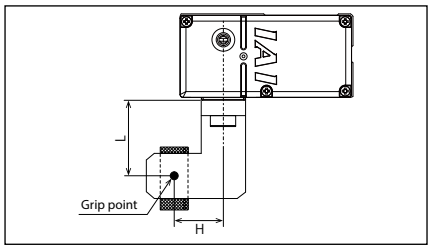
(Note 7) Use at a load exceeding the value above could reduce operation life or lead to damage.

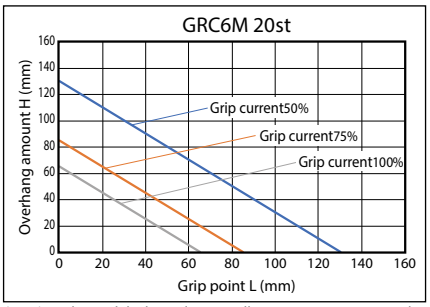
Slide type moment direction

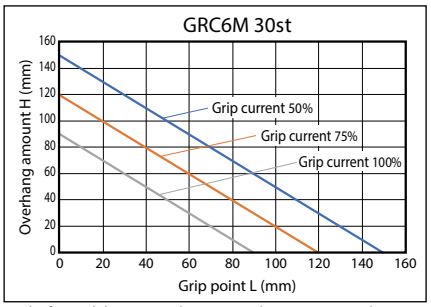


Confirmation of Grip Point Distance

Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.



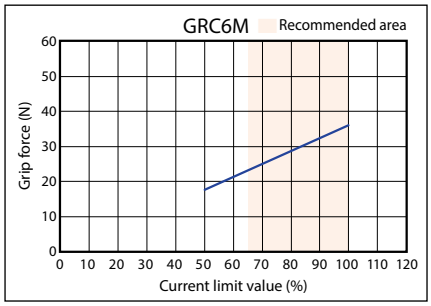




(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

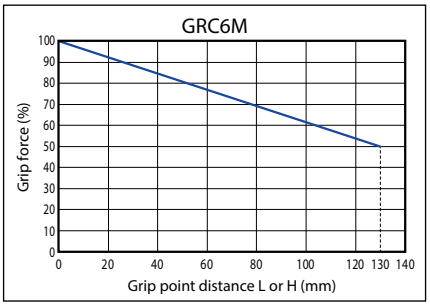
Grip Force

Correlation diagram between grip force and current limit value



(Note) Total value of both fingers when grip point distance (L, H) is 0.
(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).
(Note) For gripping (pushing), the speed is fixed at 5mm/s.

Guidelines for grip point distance and grip force



(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

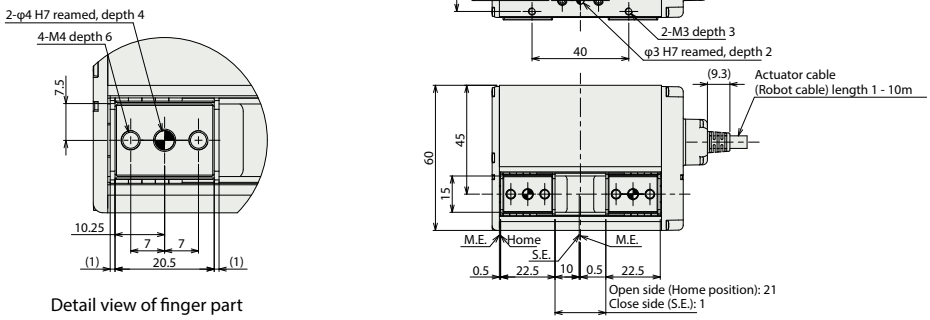
Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

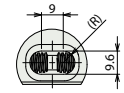
■20 Stroke

*1 Plugged with a set screw to prevent contamination with foreign matter. Remove when using mounting surface.
*1 Pay attention to the bolt length being used for mounting, because if the bolt is deeper than the depth shown in the drawing, it may interfere with internal parts.
(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).
(Note) Secure the cable so that the base of the cable does not move.
The cable can be disconnected and replaced. (Attached to a connector in the cable box)
The cable exit orientation (optional) can be changed by changing the direction of the cable box.

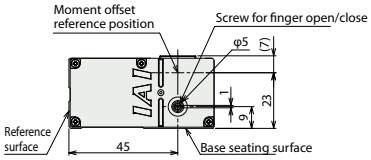
M.E.: Mechanical end
S.E.: Stroke end

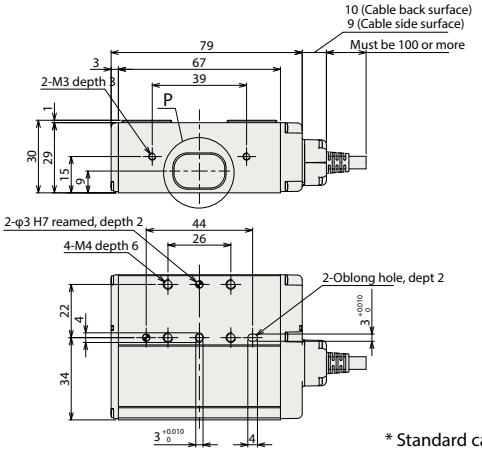


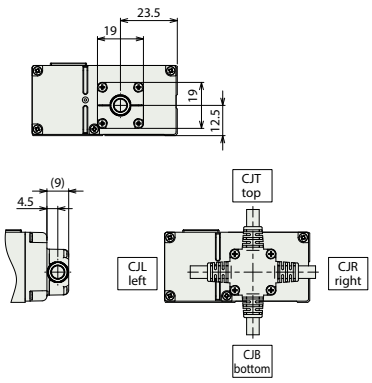
Detail view of finger part



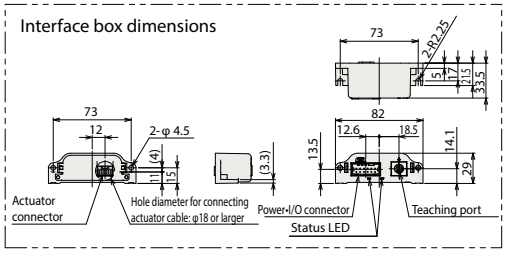
Detail view of P
Grease port







Cable exit orientation (option)
* Standard cable exit orientation is out from the back surface



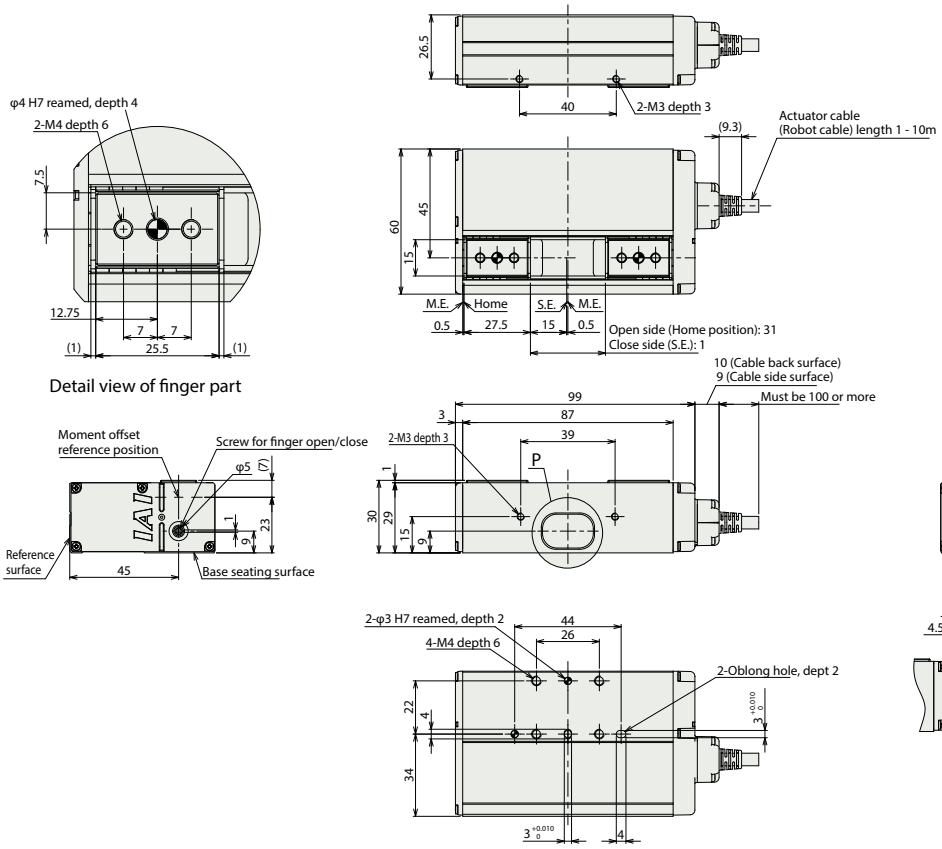
■Mass

Item	Description
Mass	0.32kg

■ 30 Stroke

(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).
(Note) Secure the cable so that the base of the cable does not move.
The cable can be disconnected and replaced. (Attached to a connector in the cable box)
The cable exit orientation (optional) can be changed by changing the direction of the cable box.

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



■ Mass

Item	Description
Mass	0.40kg

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

EC-GRC7

Slider | 2-Finger | Body Width 70 mm | 24v Stepper Motor

Model Specification Items

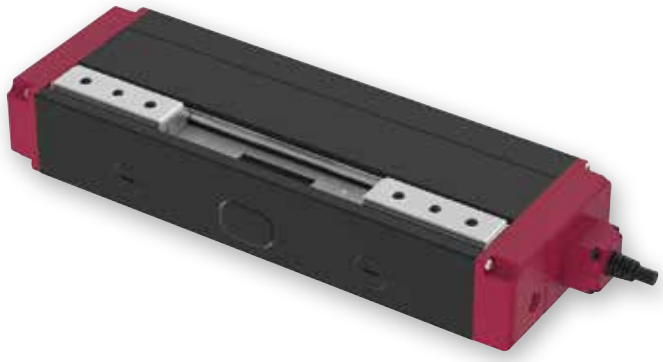
EC - GRC7 - [ ] - [ ] - [ ] - [ ] - [ ]

Series	Type	Deceleration ratio			Stroke		Actuator cable length	Power • I/O cable length	Option
		M	Standard	Ball screw Lead 2.5mm Pulley deceleration ratio 1.36	20	20mm (10mm per finger)	Refer to the actuator cable length table below	Refer to Power • I/O cable length below	Refer to Option below
		L	High-thrust force	Ball screw Lead 2.5mm Pulley deceleration ratio 2.14	40	40mm (20mm per finger)			
					60	60mm (30mm per finger)			
					80	80mm (40mm per finger)			

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling



Stroke

Stroke (mm)	EC-GRC7	
	RCON-EC connection specification (Note 1)	NPN/PNP specification
20	✓	✓
40	✓	✓
60	✓	✓
80	✓	✓

(Note 1) Make sure to select "ACR" option.

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

Name	Option code	Reference page
RCON-EC connection specification (Note 3) (Note 4)	**ACR**	43
Brake (Note 5)	**B**	43
Cable exit orientation (bottom)	**CJB**	43
Cable exit orientation (left)	**CJL**	43
Cable exit orientation (right)	**CJR**	43
Cable exit orientation (top)	**CJT**	43
Specified grease specification	**G1/G5**	43
Finger attachment mounting jig (Open/close direction screw hole)	**MJF1**	44
Finger attachment mounting jig (Side surface screw hole)	**MJF2**	44
Finger attachment mounting jig (Open/close direction through hole)	**MJF3**	44
Closed homing specification	**NM**	45
PNP specification (Note 3)	**PN**	45
Split motor and controller power specification	**TMD2**	46
Battery-less absolute encoder specification	**WA**	46
Wireless communication specification (Note 4)	**WL**	46
Wireless axis operation specification (Note 4)	**WL2**	46

(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. The interface box and conversion cable are not included.
(Note 4) 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 (WL) with RCON-EC connection, an interface box, conversion cable and power•I/O cable should be ordered separately. Refer to P5 for details. For the wireless axis operation specification (WL2), contact one of IAI representatives.
(Note 5) Cannot be selected for 20 Stroke.

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.
(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.
(3) When gripping the workpiece, be sure to use push-motion operation.
(4) The workpiece grip force will be maintained via self-lock even during power cutoffs. (However, this does not guarantee that the workpiece will not be dropped.) To move the slider fingers during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.

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

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	54
RCON-EC connection specification power•I/O cable (Standard connector cable)	CB-REC-PWBIO□□□-RB	57
RCON-EC connection specification power•I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	57
Interface box for Split motor and controller power specification of RCON-EC connection (Wireless specification)	ECW-CVNWL-CB-ACR	54

(Note) Power•I/O cable is a robot cable.
Specify the cable length in□□□. (Ex. 010=10m)

Actuator cable length

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

(Note 6) When connection is via the interface box, the maximum length is 9m.
(Note) Select the cable so that the total length with the actuator cable is 10m or less.
(Note) Robot cable is standard

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)
		CB-EC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 7)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 7) Only the terminal connector is included. * Choose "0" if optional RCON-EC connection specification (ACR) is selected. Power•I/O cable is not included. Refer to P53 for details.
(Note) Robot cable is standard

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 is standard

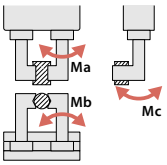
Main Specifications

Item		Description	
Deceleration ratio		M	L
Lead	Ball screw lead (mm)	2.5	2.5
	Pulley deceleration ratio	1.36	2.14
Grip operation	Max. grip force (N) (both sides)	150	350
	Max. speed during grip operation (mm/s) (per finger)	20	20
Approach operation	Max. speed (mm/s) (per finger)	137.5	87.5
	Min. speed (mm/s) (per finger)	10	10
	Rated acceleration/deceleration (G) (per finger)	0.3	0.3
	Max. acceleration/deceleration (G) (per finger)	0.3	0.3
Brake	Brake specification (Mass: 0.2kg)	non-exciting electromagnetic brake	
	Brake-holding force (N) (both sides)	107	175
Stroke (per finger)	Min. stroke (mm) (per finger)	10	10
	Max. stroke (mm) (per finger)	40	40

Item	Description
Drive system	Timing belt + both sides trapezoidal sliding screw
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.1mm or less
Linear guide	Limited guide
Static allowable moment	Ma : <20st> 3.60 N·m <40/60/80st> 7.52 N·m
	Mb : <20st> 3.60 N·m <40/60/80st> 7.52 N·m
	Mc : <20st> 10.2 N·m <40/60/80st> 15.3 N·m
Vertical allowable load (Note 8)	<20st> 498N <40/60/80st> 798N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	IP20
Vibration/shock resistance	4.9m/s²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□28) (Power capacity: maximum 2A)
Encoder type	Incremental (standard) /battery-less absolute (option)
Number of encoder pulses	16384 pulse/rev

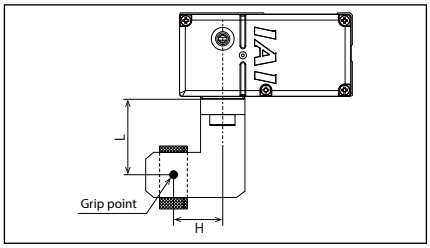
(Note 8) Use at a load exceeding the value above could reduce operation life or lead to damage.

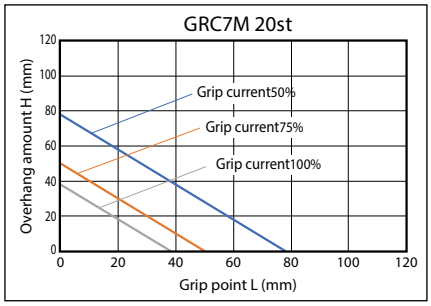
Slide type moment direction

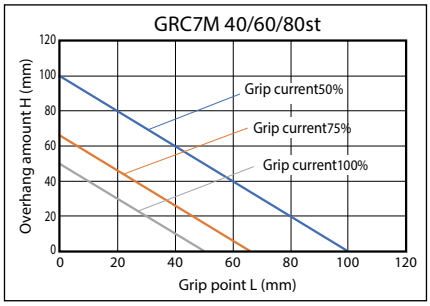


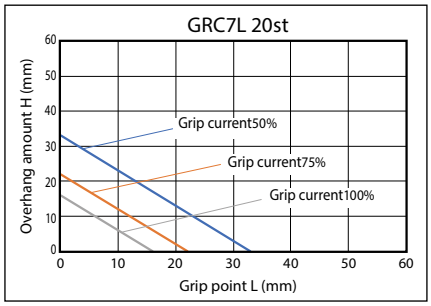
Confirmation of Grip Point Distance

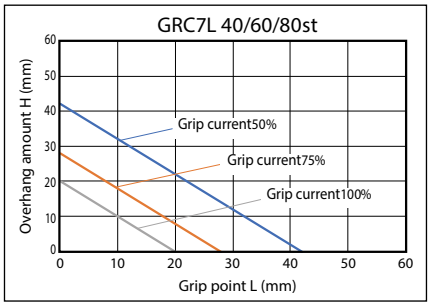
Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.







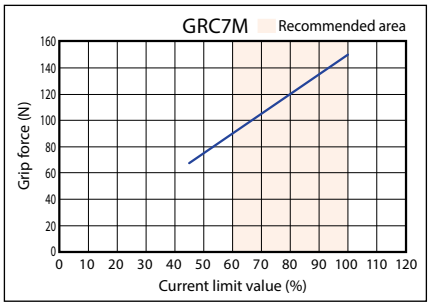


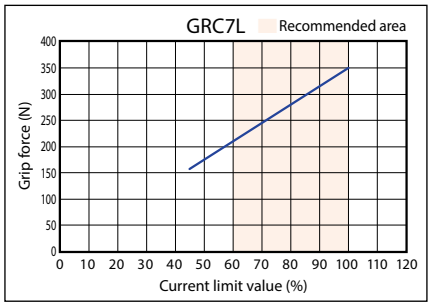


(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip Force

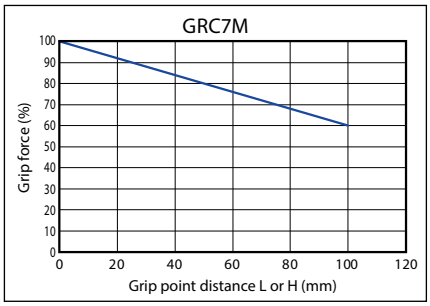
Correlation diagram between grip force and current limit value

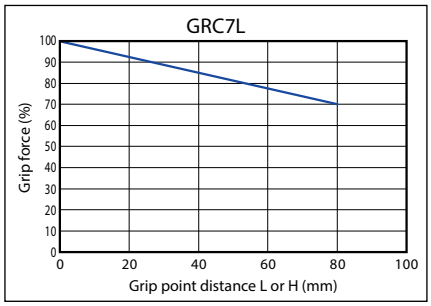




(Note) Total value of both fingers when grip point distance (L, H) is 0.
(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).
(Note) For gripping (pushing), the speed is 20mm/s. When the approach speed is 20mm/s or less, gripping is carried out at the approach speed.

Guidelines for grip point distance and grip force





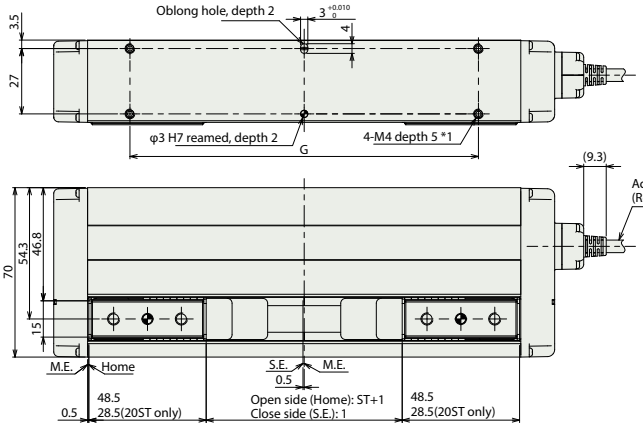
(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

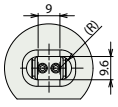
Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

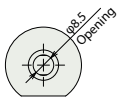
*1 Plugged with a set screw to prevent contamination with foreign matter. Remove when using mounting surface.
*1 Pay attention to the bolt length being used for mounting, because if the bolt is deeper than the depth shown in the drawing, it may interfere with internal parts.
(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).
(Note) Secure the cable so that the base of the cable does not move.
The cable can be disconnected and replaced. (Attached to a connector in the cable box)
The cable exit orientation (optional) can be changed by changing the direction of the cable box.

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

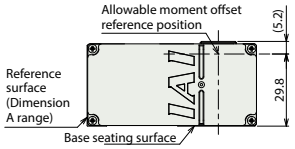


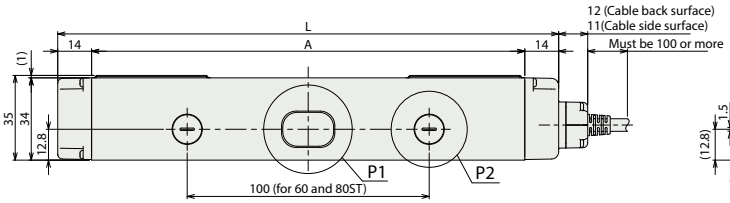


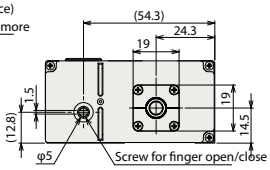
Detail view of P1
Grease port 1

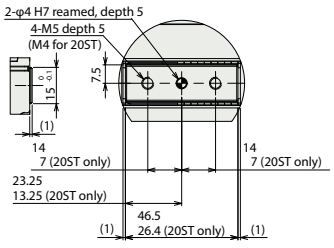


Detail view of P2
Grease port 2
(60 and 80ST only)

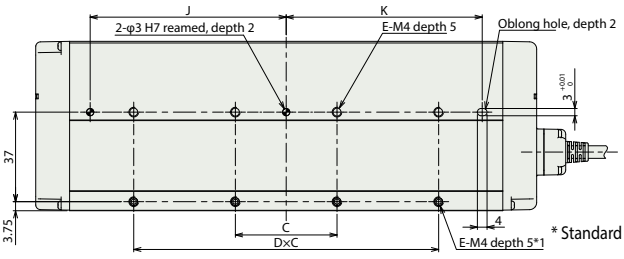


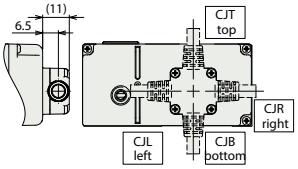




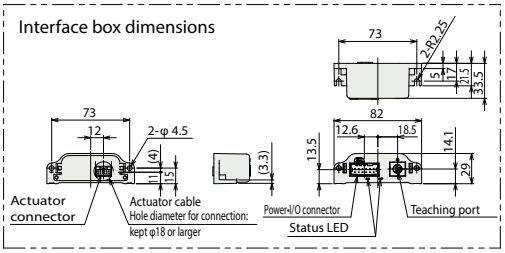


Detail view of finger part





Cable exit orientation (option)
* Standard cable exit orientation is out from the back surface.



Dimensions by stroke

Stroke	20	40	60	80
L	107	167	187	207
A	79	139	159	179
C	36	66	36	42
D	0	0	3	3
E	2	2	4	4
G	46	84	122	144
J	37	51	65	81
K	37	51	65	81

Mass by stroke

Stroke			20	40	60	80
Mass (kg)	GRC7M	Without brake	0.40	0.65	0.69	0.73
		With brake	-	0.80	0.85	0.88
	GRC7L	Without brake	0.58	0.73	0.77	0.81
		With brake	-	0.88	0.92	0.96

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

EC-GRST3

Simple dust-proof | Slider | 2-Finger | Body Width 40 mm | 24v Stepper Motor

Model Specification Items

EC - GRST3 - [ ] - [ ] - [ ] - [ ] - [ ]

Series	Type	Deceleration ratio			Stroke		Actuator cable length	Power • I/O cable length	Option
		M	Standard	Ball screw Lead 2.5mm Pulley deceleration ratio 1.05	50	50mm (25mm per finger)	Refer to the actuator cable length table below	Refer to Power • I/O cable length below	Refer to Option below
		L	High-thrust force	Ball screw Lead 2.5mm Pulley deceleration ratio 1.64	100	100mm (50mm per finger)			
					150	150mm (75mm per finger)			
					200	200mm (100mm per finger)			

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Stroke

Stroke (mm)	EC-GRST3	
	RCON-EC connection specification (Note 1)	NPN/PNP specification
50	✓	✓
100	✓	✓
150	✓	✓
200	✓	✓

(Note 1) Make sure to select "ACR" option.

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

Name	Option code	Reference page
RCON-EC connection specification (Note 3) (Note 4)	**ACR**	43
Brake	**B**	43
Cable exit orientation (bottom)	**CJB**	43
Cable exit orientation (left)	**CJL**	43
Cable exit orientation (right)	**CJR**	43
Specified grease specification	**G1/G5**	43
Finger attachment mounting jig	**MJF**	44
Closed homing specification	**NM**	45
PNP specification (Note 3)	**PN**	45
Split motor and controller power specification	**TMD2**	46
Battery-less absolute encoder specification	**WA**	46
Wireless communication specification (Note 4)	**WL**	46
Wireless axis operation specification (Note 4)	**WL2**	46

(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. The interface box and conversion cable are not included.
(Note 4) 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 (WL) with RCON-EC connection, an interface box, conversion cable and power•I/O cable should be ordered separately. Refer to P5 for details. For the wireless axis operation specification (WL2), contact one of IAI representatives.

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

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	54
RCON-EC connection specification power•I/O cable (Standard connector cable)	CB-REC-PWBIO□□□-RB	57
RCON-EC connection specification power•I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	57
Interface box for Split motor and controller power specification of RCON-EC connection (Wireless specification)	ECW-CVNWL-CB-ACR	54

(Note) Power•I/O cable is a robot cable.
Specify the cable length in□□□. (Ex. 010=10m)

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.
(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.
(3) When gripping the workpiece, be sure to use push-motion operation.
(4) Duty must be restricted depending on the ambient operating temperature. Refer to P46 for details.
(5) Pay close attention to the installation orientation. Refer to P7 for details.
(6) The workpiece grip force will be maintained via self-lock even during power cutoffs. (However, this does not guarantee that the workpiece will not be dropped.) To move the slider fingers during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.

Actuator cable length

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

(Note 5) When connection is via the interface box, the maximum length is 9m.
(Note) Select the cable so that the total length with the actuator cable is 10m or less.
(Note) Robot cable is standard

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads) CB-EC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 6)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 6) Only the terminal connector is included. * Choose "0" if optional RCON-EC connection specification (ACR) is selected. Power•I/O cable is not included. Refer to P53 for details.
(Note) Robot cable is standard

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 is standard

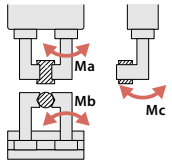
Main Specifications

Item		Description	
Deceleration ratio		M	L
Lead	Ball screw lead (mm)	2.5	2.5
	Pulley deceleration ratio	1.05	1.64
Grip operation	Max. grip force (N) (both sides)	125	325
	Max. speed during grip operation (mm/s) (per finger)	20	20
Approach operation	Max. speed (mm/s) (per finger)	175	107
	Min. speed (mm/s) (per finger)	10	10
	Rated acceleration/deceleration (G) (per finger)	0.3	0.3
	Max. acceleration/deceleration (G) (per finger)	0.3	0.3
Brake	Brake specification	non-exciting electromagnetic brake	
	Brake-holding force (N) (both sides)	131	206
Stroke (per finger)	Min. stroke (mm) (per finger)	25	25
	Max. stroke (mm) (per finger)	100	100

Item	Description
Drive system	Coupled left and right handed ball screws φ8mm, Rolled C10
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.3mm or less
Base	Dedicated aluminum extruded material (equivalent to A6063SS-T5) Black alumite treated
Linear guide	Direct-acting infinite circulation type
Static allowable moment	Ma : 9.9 N·m
	Mb : 14.2 N·m
	Mc : 17.2 N·m
Vertical allowable load (Note 7)	810N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	IP20
Vibration/shock resistance	4.9m/s²
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□28) (Power capacity: maximum 2A)
Encoder type	Incremental (standard) /battery-less absolute (option)
Number of encoder pulses	16384 pulse/rev

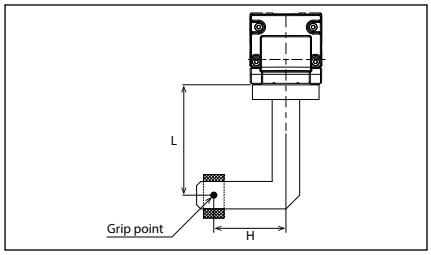
(Note 7) Use at a load exceeding the value above could reduce operation life or lead to damage.

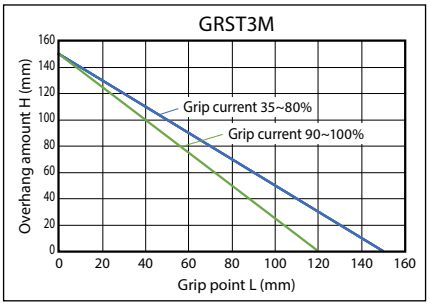
Slide type moment direction

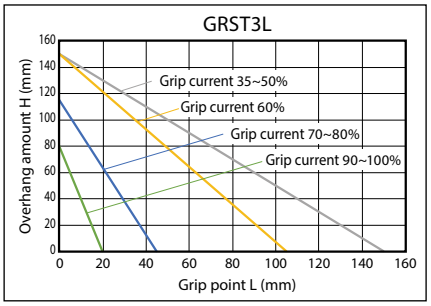


Confirmation of Grip Point Distance

Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.



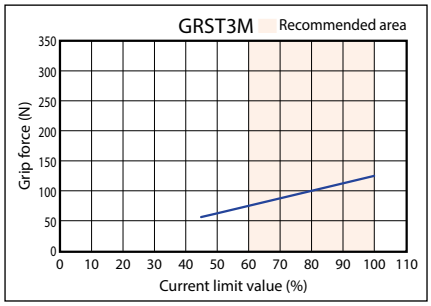


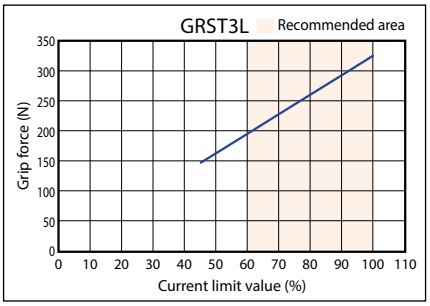


(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip Force

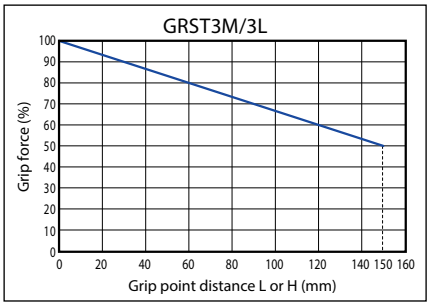
Correlation diagram between grip force and current limit value





(Note) Total value of both fingers when grip point distance (L, H) is 0.
(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).
(Note) For gripping (pushing), the speed is 20mm/s. When the approach speed is 20mm/s or less, gripping is carried out at the approach speed.

Guidelines for grip point distance and grip force



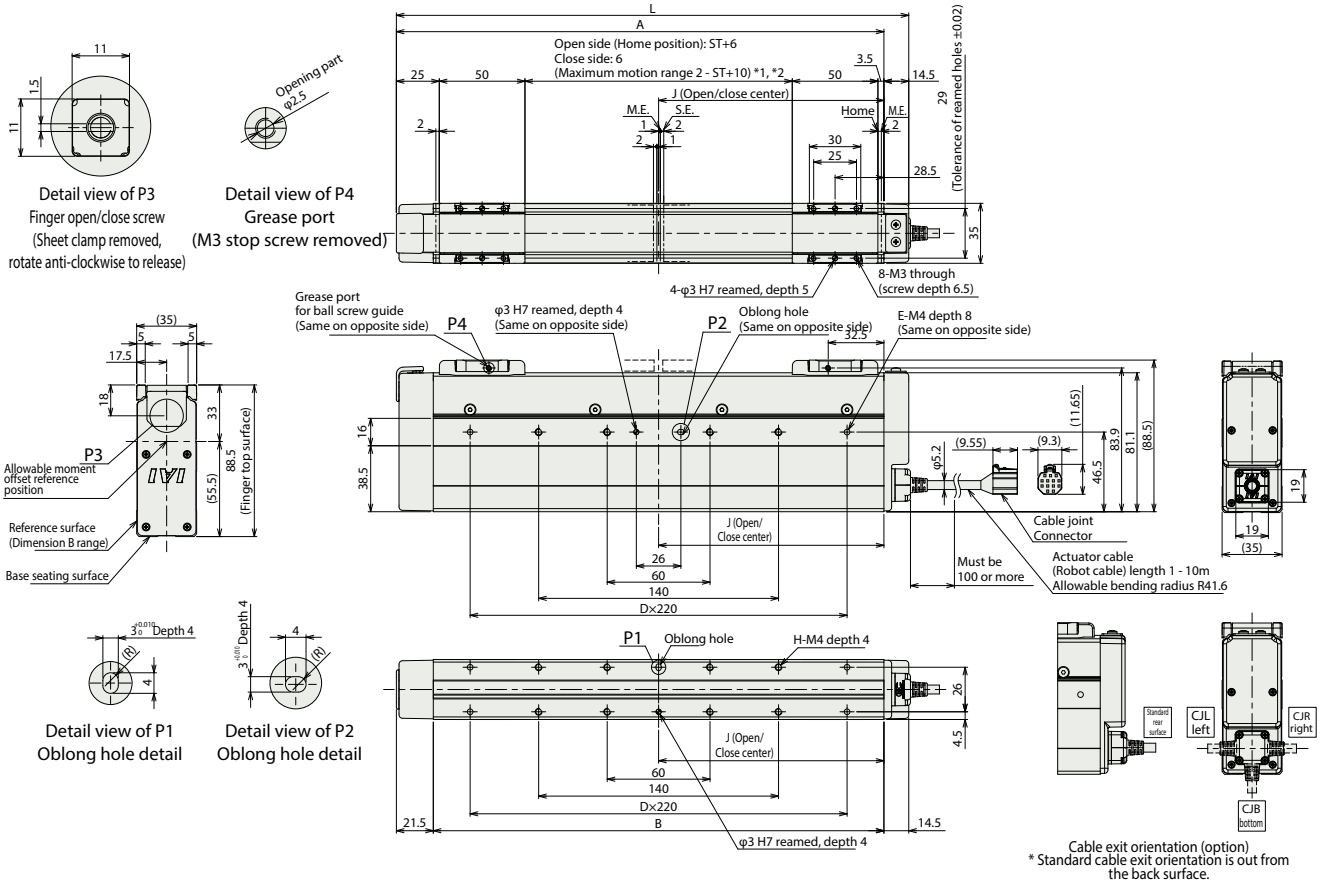
(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

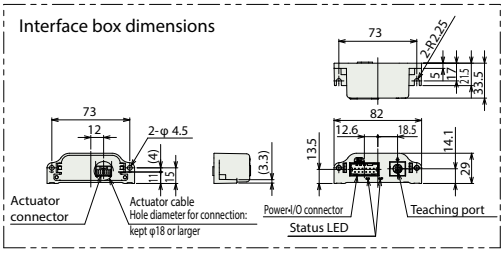
Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

*1 Plugged with a set screw to prevent contamination with foreign matter. Remove when using mounting surface.
*1 Pay attention to the bolt length being used for mounting, because if the bolt is deeper than the depth shown in the drawing, it may interfere with internal parts.
(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).
(Note) Secure the cable so that the base of the cable does not move.
The cable can be disconnected and replaced. (Attached to a connector in the cable box)
The cable exit orientation (optional) can be changed by changing the direction of the cable box.

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





Dimensions by stroke

Stroke	50	100	150	200
L	199	249	299	349
A	184.5	234.5	284.5	334.5
B	163	213	263	313
D	0	0	1	1
E	4	4	6	6
H	8	8	12	12
J	81.5	106.5	131.5	156.5

Mass by stroke

Stroke			50	100	150	200
Mass (kg)	GRST3M	Without brake	1.0	1.1	1.3	1.4
		With brake	1.2	1.3	1.5	1.6
	GRST3L	Without brake	1.1	1.2	1.3	1.5
		With brake	1.3	1.4	1.5	1.7

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

EC-GRST6

Simple dust-proof | Slider | 2-Finger | Side-mounted motor | Body Width 60 mm | 24v Stepper Motor

Model Specification Items

EC - GRST6 - [ ] - [ ] - [ ] - [ ] - [ ]

Series	Type	Deceleration ratio			Stroke		Actuator cable length	Power • I/O cable length	Option
EC	GRST6	M	Standard	Ball screw Lead 3mm Pulley deceleration ratio 1	180	180mm (90mm per finger)	Refer to the actuator cable length table below	Refer to Power • I/O cable length below	Refer to Option below
		L	High-thrust force	Ball screw Lead 3mm Pulley deceleration ratio 1.44	230	230mm (115mm per finger)			

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

(Note) The above picture shows the side-mounted motor to the left (ML).

Stroke

Stroke (mm)	EC-GRST6
180	✓
230	✓

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

Name	Option code	Reference page
RCON-EC connection specification (Note 1)	**ACR**	43
Brake	**B**	43
Specified grease specification	**G1/G5**	43
Side-mounted motor to the left (Note 2)	**ML**	45
Side-mounted motor to the right (Note 2)	**MR**	45
Closed homing specification	**NM**	45
PNP specification (Note 1)	**PN**	45
Slider part roller specification	**SR**	45
Split motor and controller power specification	**TMD2**	46
Battery-less absolute encoder specification	**WA**	46
Wireless communication specification	**WL**	46
Wireless axis operation specification	**WL2**	46

(Note 1) 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.
(Note 2) Make sure to specify either "ML" or "MR" in the correct location in the actuator model number.

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection cable (Note 4) (with connectors on both ends)
		CB-EC-PWBIO□□□-RB supplied	CB-REC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 3)	✓
1 ~ 3	1 ~ 3m	✓	✓
4 ~ 5	4 ~ 5m	✓	✓
6 ~ 7	6 ~ 7m	✓	✓
8 ~ 10	8 ~ 10m	✓	✓

(Note 3) Only the terminal connector is included. Refer to P53 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection cable (Note 4) (with connectors on both ends)
		CB-EC2-PWBIO□□□-RB supplied	CB-REC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓	✓
S4 ~ S5	4 ~ 5m	✓	✓
S6 ~ S7	6 ~ 7m	✓	✓
S8 ~ S10	8 ~ 10m	✓	✓

(Note 5) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.
(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.
(3) When gripping the workpiece, be sure to use push-motion operation.
(4) Duty must be restricted depending on the ambient operating temperature. Refer to P46 for details.
(5) Pay close attention to the installation orientation. Refer to P7 for details.
(6) This model does not have the self-lock mechanism. If a holding mechanism is required, select the brake option. By using the automatic servo OFF function, the gripping force can be maintained until the brake is activated after the power is turned off. (However, this does not guarantee that the workpiece will not be dropped.) To release the workpiece being gripped during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.
(7) This actuator cannot be used with "Power-saving mode".

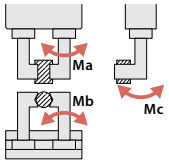
Main Specifications

Item		Description	
Deceleration ratio		M	L
Lead	Ball screw lead (mm)	3	3
	Pulley deceleration ratio	1.00	1.44
Grip operation	Max. grip force (N) (both sides)	449	649
	Max. speed during grip operation (mm/s) (per finger)	20	20
Approach operation	Max. speed (mm/s) (per finger)	225	156
	Min. speed (mm/s) (per finger)	10	10
	Rated acceleration/deceleration (G) (per finger)	0.3	0.3
	Max. acceleration/deceleration (G) (per finger)	1	1
Brake	Brake specification	non-exciting electromagnetic brake	
	Brake-holding force (N) (both sides)	308	445
Stroke (per finger)	Min. stroke (mm) (per finger)	90	90
	Max. stroke (mm) (per finger)	115	115

Item	Description
Drive system	Coupled left and right handed ball screws φ10mm, Rolled C10
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.3mm or less
Base	Dedicated aluminum extruded material (equivalent to A6063SS-T5) Black alumite treated
Linear guide	Direct-acting infinite circulation type
Static allowable moment	Ma : 48.5 N·m
	Mb : 69.3 N·m
	Mc : 97.1 N·m
Vertical allowable load (Note 6)	1800N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	IP20
Vibration/shock resistance	4.9m/s^2
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□42) (Power capacity: maximum 4.2A)
Encoder type	Incremental (standard) /battery-less absolute (option)
Number of encoder pulses	800 pulse/rev

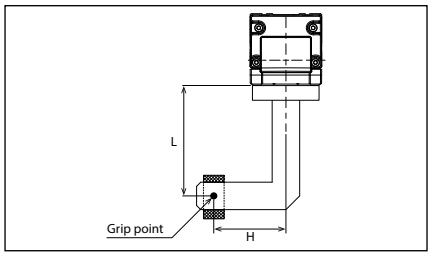
(Note 6) Use at a load exceeding the value above could reduce operation life or lead to damage.

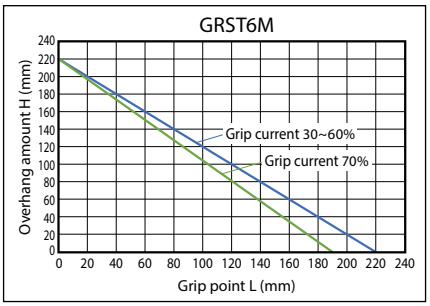
Slide type moment direction

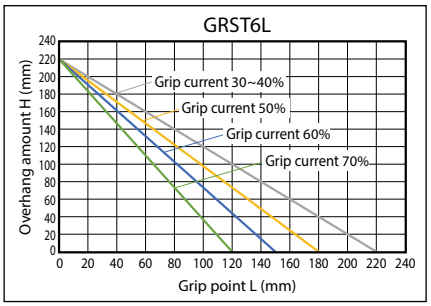


Confirmation of Grip Point Distance

Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.



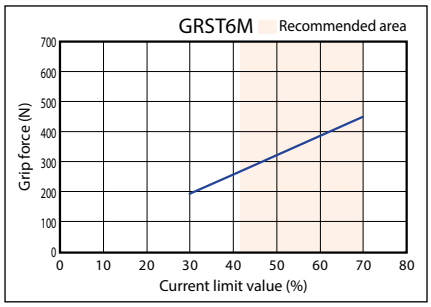


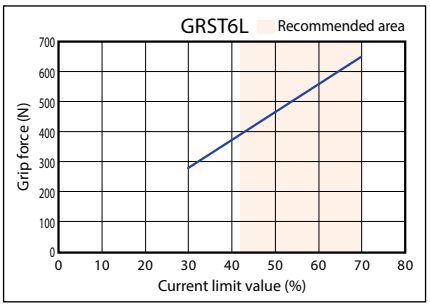


(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip Force

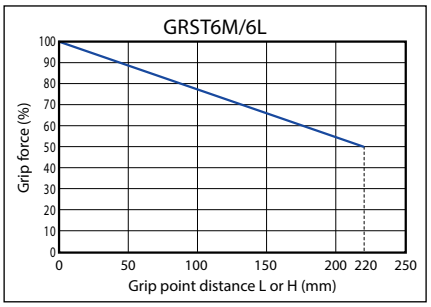
Correlation diagram between grip force and current limit value





(Note) Total value of both fingers when grip point distance (L, H) is 0.
(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).
(Note) For gripping (pushing), the speed is 20mm/s. When the approach speed is 20mm/s or less, gripping is carried out at the approach speed.

Guidelines for grip point distance and grip force



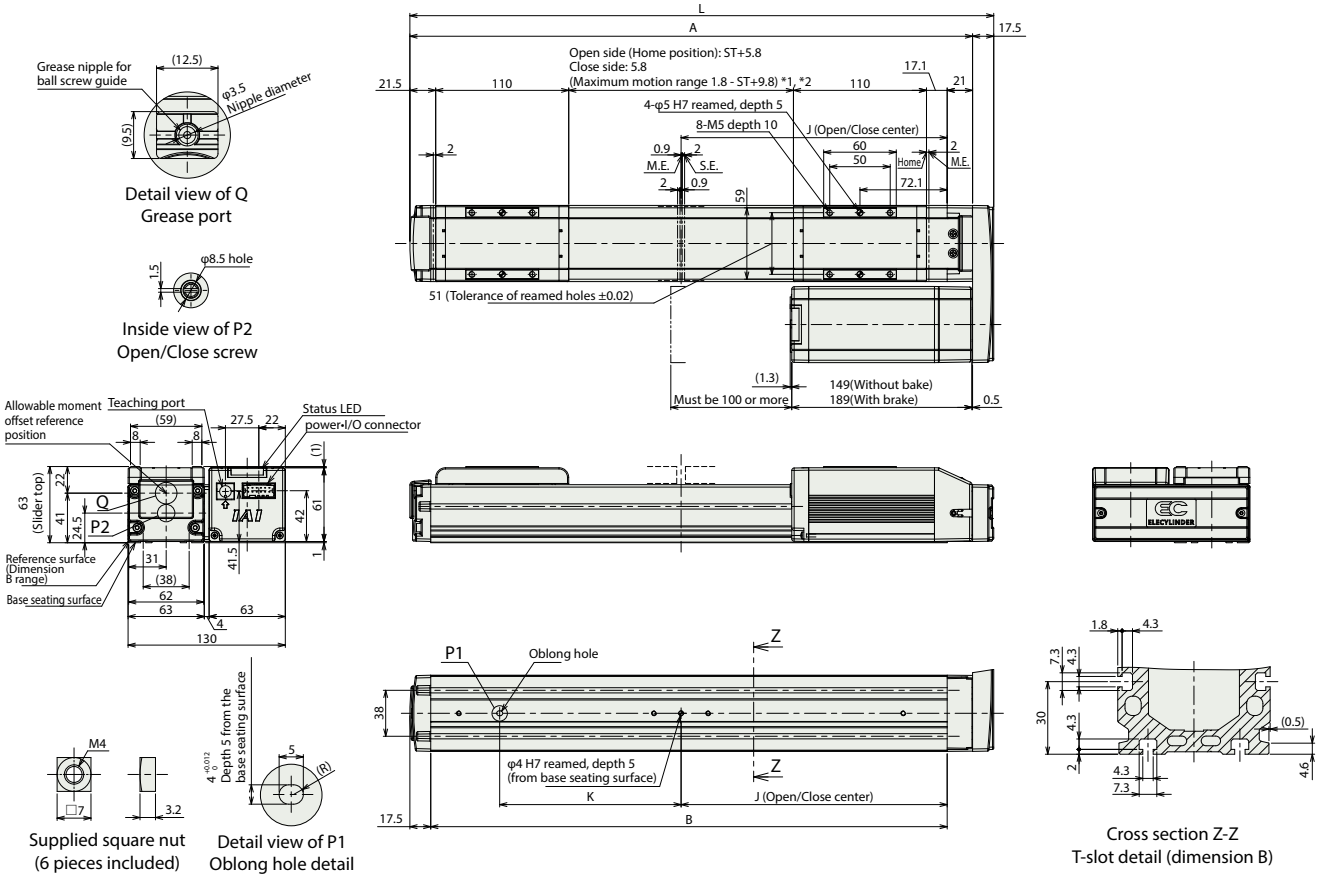
(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

*1 When the sliders are returning to their home positions, please be careful of interference with surrounding objects, as they will travel until they reach the M.E.
*2 Both sliders move in opposite directions at the same time.
(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).
(Note) Square nuts come with six nut holders.
(Note) The drawings below are for the side-mounted motor to the left (ML).

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



Dimensions by stroke

Stroke	180	230
L	483	533
A	465.5	515.5
B	427	477
J	220	245
K	150	175

Mass by stroke

Stroke			180	230
Mass (kg)	GRST6M	Without brake	3.5	3.7
		With brake	3.7	3.9
	GRST6L	Without brake	3.6	3.8
		With brake	3.8	4.0

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

EC-GRST7

Simple dust-proof | Slider | 2-Finger | Side-mounted motor | Body Width 70 mm | 24v Stepper Motor

Model Specification Items

EC - GRST7 - [ ] - [ ] - [ ] - [ ] - [ ]

Series	Type	Deceleration ratio			Stroke		Actuator cable length	Power • I/O cable length	Option
		M	Standard	Ball screw Lead 4mm Pulley deceleration ratio 1	210	210mm (105mm per finger)	Refer to the actuator cable length table below	Refer to Power • I/O cable length below	Refer to Option below
		L	High-thrust force	Ball screw Lead 4mm Pulley deceleration ratio 1.5	260	260mm (130mm per finger)			

***NPN specification is standard. PNP option is available.**

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

(Note) The above picture shows the side-mounted motor to the left (ML).

Stroke

Stroke (mm)	EC-GRST7
210	✓
260	✓

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

Name	Option code	Reference page
RCON-EC connection specification (Note 1)	**ACR**	43
Brake	**B**	43
Specified grease specification	**G1/G5**	43
Side-mounted motor (left) (Note 2)	**ML**	45
Side-mounted motor (right) (Note 2)	**MR**	45
Closed homing specification	**NM**	45
PNP specification (Note 1)	**PN**	45
Slider part roller specification	**SR**	45
Split motor and controller power specification	**TMD2**	46
Battery-less absolute encoder specification	**WA**	46
Wireless communication specification	**WL**	46
Wireless axis operation specification	**WL2**	46

(Note 1) 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.
(Note 2) Make sure to specify either "ML" or "MR" in the correct location in the actuator model number.

Power • I/O Cable Length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection cable (Note 4) (with connectors on both ends)
		CB-EC-PWBIO□□□-RB supplied	CB-REC-PWBIO□□□-RB supplied
0	No cable	✓ (Note 3)	✓
1 ~ 3	1 ~ 3m	✓	✓
4 ~ 5	4 ~ 5m	✓	✓
6 ~ 7	6 ~ 7m	✓	✓
8 ~ 10	8 ~ 10m	✓	✓

(Note 3) Only the terminal connector is included. Refer to P53 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection cable (Note 4) (with connectors on both ends)
		CB-EC2-PWBIO□□□-RB supplied	CB-REC2-PWBIO□□□-RB supplied
S1 ~ S3	1 ~ 3m	✓	✓
S4 ~ S5	4 ~ 5m	✓	✓
S6 ~ S7	6 ~ 7m	✓	✓
S8 ~ S10	8 ~ 10m	✓	✓

(Note 5) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard

POINT Selection Notes

(1) The maximum open/close speed in the Main Specifications represents the operation speed for one side. The relative operation speed is twice the value.
(2) The maximum grip force in the Main Specifications is the total of the grip force of both fingers when the grip point distance and overhang distance are both 0. For the workpiece weight which can actually be conveyed, refer to the Confirmation of Grip Point Distance table below.
(3) When gripping the workpiece, be sure to use push-motion operation.
(4) Duty must be restricted depending on the ambient operating temperature. Refer to P46 for details.
(5) Pay close attention to the installation orientation. Refer to P7 for details.
(6) This model does not have the self-lock mechanism. If a holding mechanism is required, select the brake option. By using the automatic servo OFF function, the gripping force can be maintained until the brake is activated after the power is turned off. (However, this does not guarantee that the workpiece will not be dropped.) To release the workpiece being gripped during a power cutoff, turn the open/close screw on the side, or remove the finger attachment to release the workpiece.
(7) This actuator cannot be used with "Power-saving" mode.

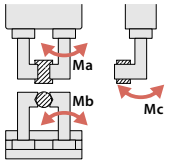
Main Specifications

Item		Description	
Deceleration ratio		M	L
Lead	Ball screw lead (mm)	4	4
	Pulley deceleration ratio	1.00	1.50
Grip operation	Max. grip force (N) (both sides)	1094	1641
	Max. speed during grip operation (mm/s) (per finger)	20	20
Approach operation	Max. speed (mm/s) (per finger)	175	117
	Min. speed (mm/s) (per finger)	10	10
	Rated acceleration/deceleration (G) (per finger)	0.3	0.3
	Max. acceleration/deceleration (G) (per finger)	1	1
Brake	Brake specification	non-exciting electromagnetic brake	
	Brake-holding force (N) (both sides)	785	1178
Stroke (per finger)	Min. stroke (mm) (per finger)	105	105
	Max. stroke (mm) (per finger)	130	130

Item	Description
Drive system	Coupled left and right handed ball screws φ12mm, Rolled C10
Positioning repeatability	±0.05mm
Lost motion	- (notation not available due to 2-point positioning function)
Backlash (per finger)	0.3mm or less
Base	Dedicated aluminum extruded material (equivalent to A6063SS-T5) Black alumite treated
Linear guide	Direct-acting infinite circulation type
Static allowable moment	Ma : 79.7 N·m
	Mb : 114.0 N·m
	Mc : 157.0 N·m
Vertical allowable load (Note 6)	2330N
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (no condensation)
Degree of protection	IP20
Vibration/shock resistance	4.9m/s^2
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□56) (Power capacity: maximum 4.2A)
Encoder type	Incremental (standard) /battery-less absolute (option)
Number of encoder pulses	800 pulse/rev

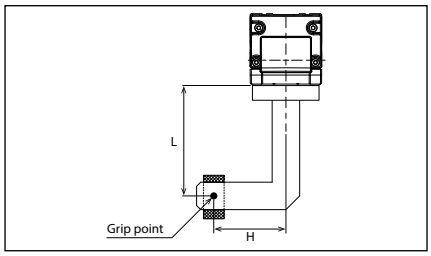
(Note 6) Use at a load exceeding the value above could reduce operation life or lead to damage.

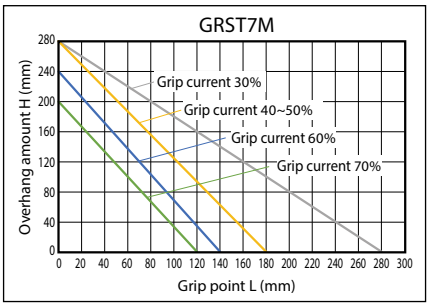
Slide type moment direction

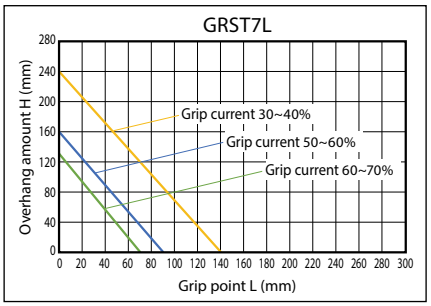


Confirmation of Grip Point Distance

Use with distance (L, H) from finger (jaw) mounting surface to grip point within the range in the graph.



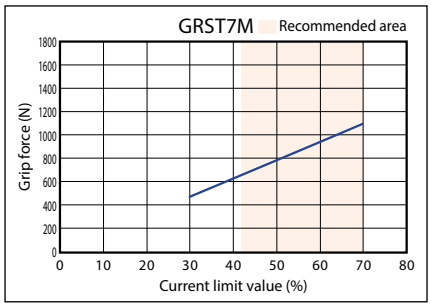


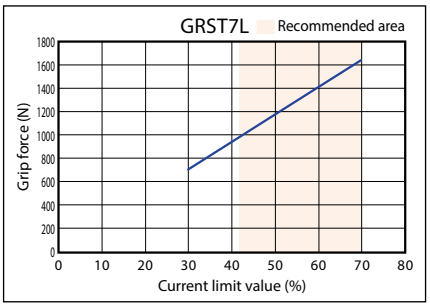


(Note) Use beyond the limited range will cause excessive moment loading on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip Force

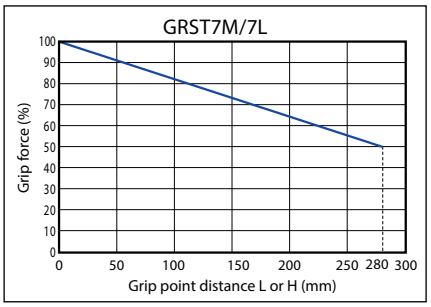
Correlation diagram between grip force and current limit value





(Note) Total value of both fingers when grip point distance (L, H) is 0.
(Note) These are reference values. There is a potential variation of 0 to 60%, in particular if the current limit values are set outside of the recommended range (colored part of the graph).
(Note) For gripping (pushing), the speed is 20mm/s. When the approach speed is 20mm/s or less, gripping is carried out at the approach speed.

Guidelines for grip point distance and grip force



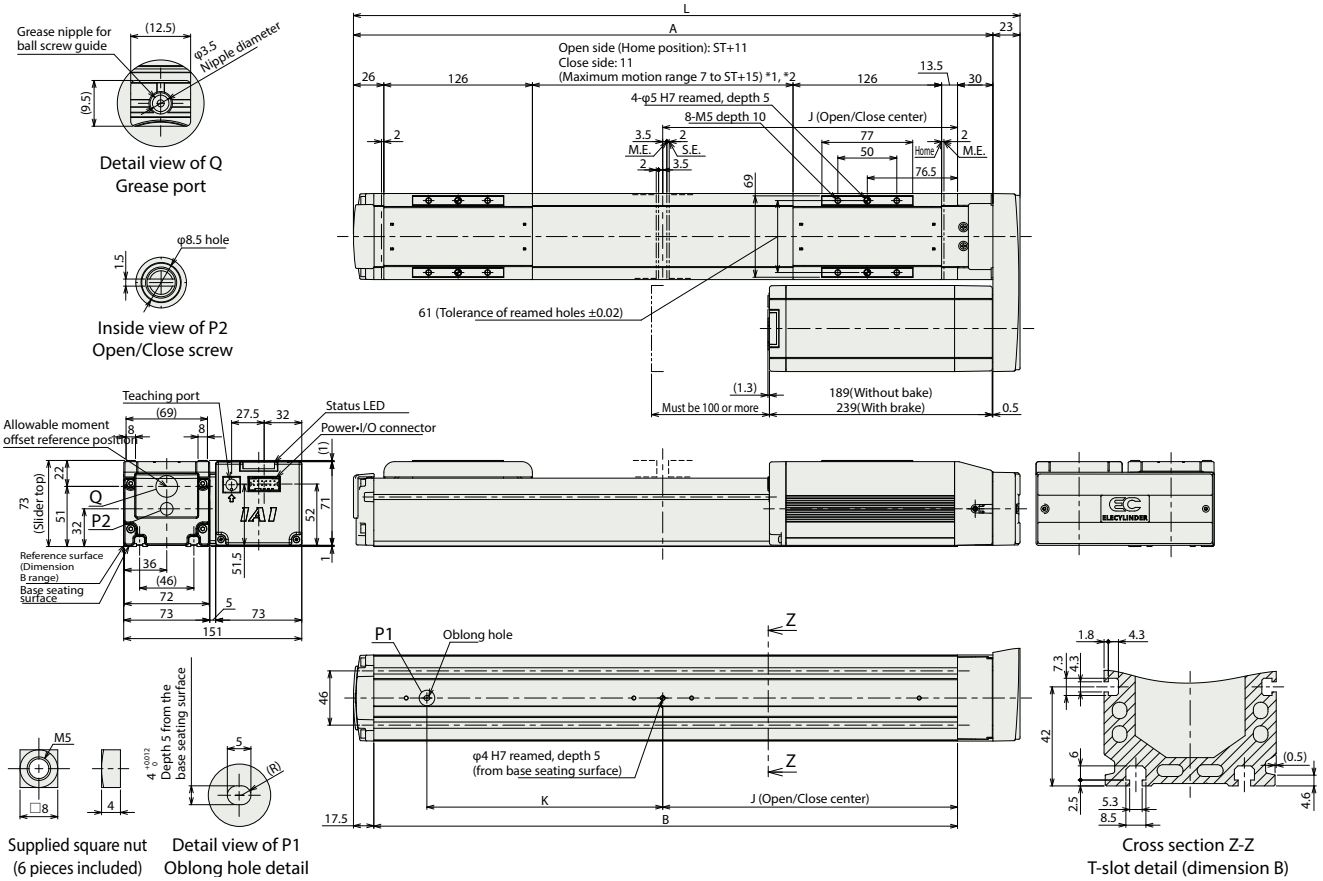
(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

*1 When the sliders are returning to their home positions, please be careful of interference with surrounding objects, as they will travel until they reach the M.E.
*2 Both sliders move in opposite directions at the same time.
(Note) The opening side is home as standard. To set the closing side as home, designate the option (model: NM).
(Note) Square nuts come with six nut holders.
(Note) The drawings below are for the side-mounted motor to the left (ML).

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



Supplied square nut (6 pieces included)

Detail view of P1 Oblong hole detail

Cross section Z-Z T-slot detail (dimension B)

Dimensions by stroke

Stroke	210	260
L	565.5	615.5
A	542.5	592.5
B	495	545
J	250	275
K	200	225

Mass by stroke

Stroke			210	260
Mass (kg)	GRST7M	Without brake	6.5	6.7
		With brake	6.7	6.9
	GRST7L	Without brake	6.5	6.7
		With brake	6.7	6.9

Applicable Controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P. 52 for details on built-in controllers.

Options

RCON-EC connection spec.

* TMD2 and PN options cannot be selected at the same time (ACR option includes split motor and controller power spec.)

Model ACR **Applicable models** All models

Description This option is for connecting to field networks via RCON-EC.
This option provides split motor and controller power specification. The input/output specification must be NPN. This option cannot be ordered with the PN or TMD2 options.

Brake

Model B **Applicable models** EC-GRC7(40,60,80mm strokes) / GRST3 /GRST6 / GRST7

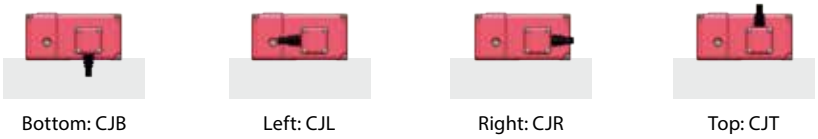
Description This option holds the fingers in place whenever the servo or power are OFF.

Cable exit orientation

Model CJB / CJL / CJR / CJT **Applicable models** EC-GRC6 / GRC7 / GRST3 (CJT is not supported)

Description The exit orientation of the actuator cable can be changed to top, bottom, left and right.

* The following pictures are for EC-GRC.



Bottom: CJB | Left: CJL | Right: CJR | Top: CJT

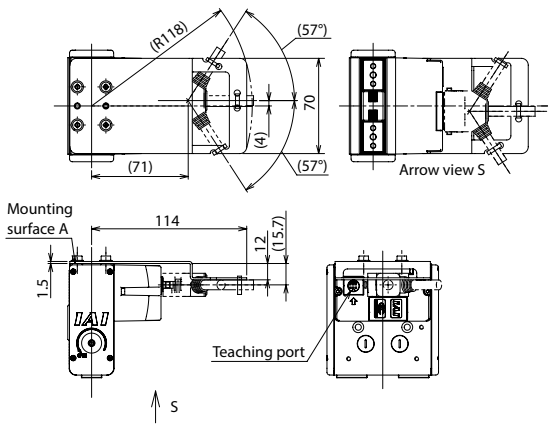
Cable mounting bracket (front)

Model FST **Applicable models** EC-GRB8 / GRB10 / GRB13

Description This is a bracket used to secure the cable near the connector with a cable tie. The teaching port can be accessed even with the bracket mounted (However, if the cable exit direction is towards the teaching port, access to the teaching port will not be possible due to interference). *Not assembled before shipment. Refer to the drawings for mounting instructions. When mounting the gripper using surface A, make sure to also secure the cable mounting bracket as well.

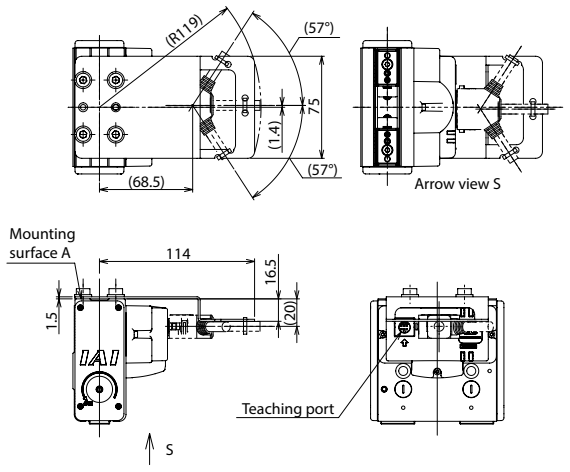
EC-GRB8 | EC-GRB10 EC-GRB13

EC-GRB8 Individual model number EC-FST-GRB8
(Individual weight: 0.1kg / Material: Stainless steel)



Accessories other than the bracket
- Flange head hex bolts (stainless steel): M4 x 6 (4 pcs)
- Cable tie (1 pc)

EC-GRB10/GRB13 Individual model number EC-FST-GRB1013
(Individual weight: 0.11kg / Material: Stainless steel)



Accessories other than the bracket
- Flange head hex bolts (stainless steel): M6 x 10 (4 pcs)
- Cable tie (1 pc)

Specified grease specification

Model G1 / G5 **Applicable models** EC-GRC7 / GRST3 / GRST6 / GRST7

Description The grease applied to the actuator ball screw and linear guide will be changed to low-dust grease for cleanroom environment (Kuroda C grease) for the G1, and to food machine grease (White Alcom grease) for the G5.

Finger attachment mounting jig

Model **MJF / MJF1 / MJF2 / MJF3** **Applicable models** EC-GRC6 / GRC7 / GRST3

Description This jig is for mounting the finger attachment on sliders (Assembled before shipment).

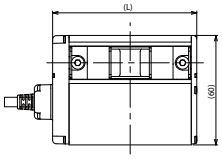
EC-GRC6

Single unit model MJF1: EC-MJF1-GRC6
MJF2: EC-MJF2-GRC6
MJF3: EC-MJF3-GRC6

(Single unit mass: 0.02kg x 2 pieces, Material: aluminum)

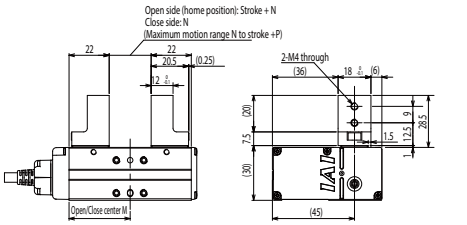
◆Components
Adaptor: 2 pieces
Bolt with hexagonal hole: 2 pieces
Parallel pin: 2 pieces

(2 pieces / set)

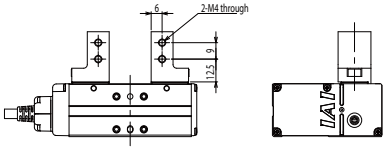


Stroke (mm)	20	30
L	79	99
M	33.5	43.5
N	3	8
P	4	9

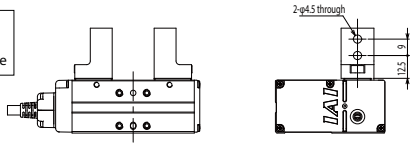
MJF1
Open/Close direction screw hole



MJF2
Side screw hole



MJF3
Open/Close direction through hole



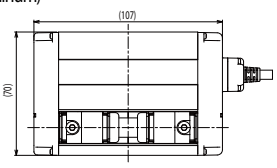
EC-GRC7 20mmStroke

Single unit model MJF1: EC-MJF1-GRC7L
MJF2: EC-MJF2-GRC7L
MJF3: EC-MJF3-GRC7L

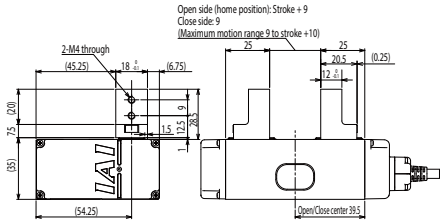
(Single unit mass: 0.02kg x 2 pieces, Material: aluminum)

◆Components
Adaptor: 2 pieces
Bolt with hexagonal hole: 2 pieces
Parallel pin: 2 pieces

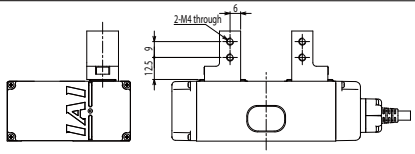
(2 pieces / set)



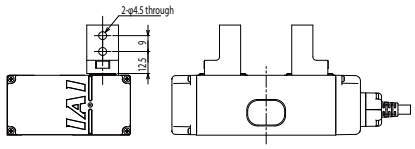
MJF1
Open/Close direction screw hole



MJF2
Side screw hole



MJF3
Open/close direction through hole



EC-GRC7 40, 60, 80mm strokes

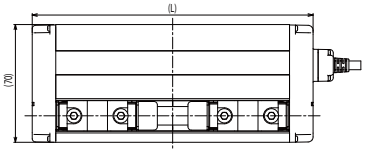
Single unit model MJF1: EC-MJF1-GRC7T
MJF2: EC-MJF2-GRC7T
MJF3: EC-MJF3-GRC7T

(Single unit mass: 0.03kg x 2 pieces, Material: aluminum)

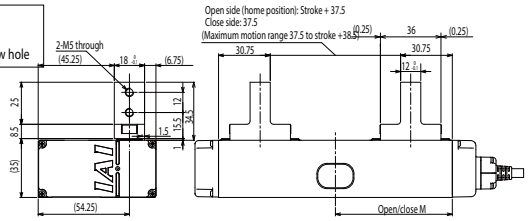
◆Components
Adaptor: 2 pieces
Bolt with hexagonal hole: 4 pieces
Parallel pin: 2 pieces

(2 pieces / set)

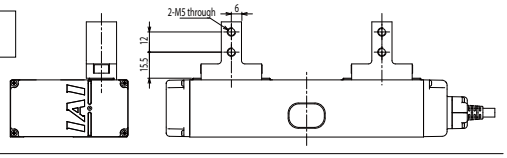
Stroke (mm)	40	60	80
L	167	187	207
M	69.5	79.5	89.5



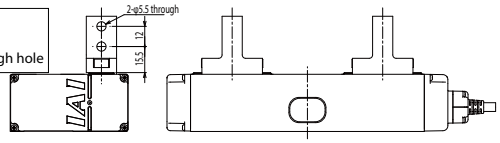
MJF1
Open/close direction screw hole



MJF2
Side screw hole



MJF3
Open/Close direction through hole



EC-GRST3

Single unit model EC-MJF-GRST3

(Single unit mass: 0.05kg x 2 pieces/ Material: aluminum)

(2 pieces / set)

◆Components
Adaptor: 2 pieces
Bolt with hexagonal hole: 8 pieces
Parallel pin: 4 pieces

Refer to the instruction manual for details.

Options

Side-mounted motor orientation

Model **ML / MR** Applicable models **EC-GRST6 / GRST7**

Description This code specifies the orientation of the side-mounted motor. ML indicates side-mounted to the left and MR to the right.
* One of these codes must be specified in the model number.

Closed homing specification

Model **NM** Applicable models **All models**

Description The home position is normally set to the finger opening side. This option is for setting the home position on the other side in order to accommodate variations in equipment layout, etc. (Because the home position is adjusted to the factory default for shipping, when changing the home position after delivery the product must be returned to IAI for adjustment.)

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

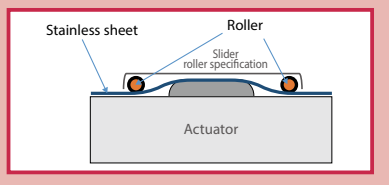
Model **PN** Applicable models **All models**

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

Slider roller specification

Model **SR** Applicable models **EC-GRST6 / GRST7**

Description The slider mechanism of the standard specification will be changed to the roller type which is same as that for the cleanroom specification.

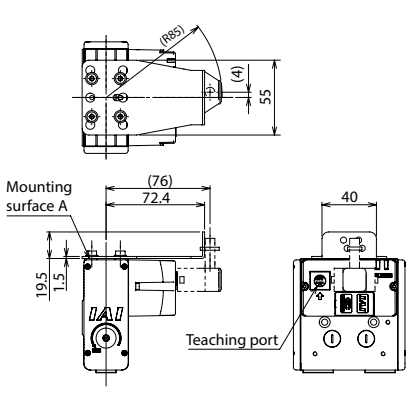


Cable mounting bracket (top)

Model **TST** Applicable models **EC-GRB8 / GRB10 / GRB13**

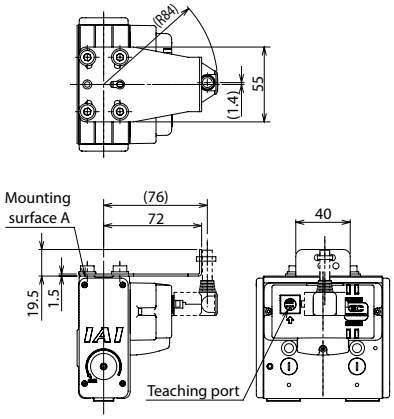
Description This is a bracket used to secure the cable near the connector with a cable tie. The teaching port can be accessed even with the fixing bracket mounted. *Can only be using with the 4-way connector cable. *Not assembled before shipment. Refer to the drawings for mounting instructions. When mounting the gripper using surface A, make sure to also secure the cable mounting bracket as well.

EC-GRB8 Individual model number EC-TST-GRB8
(Individual weight: 0.06kg / Material: Stainless steel)



Accessories other than the bracket
- Flange head hex bolts (stainless steel): M4 x 6 (4 pcs)
- Cable tie (1 pc)

EC-GRB10/GRB13 Individual model number EC-TST-GRB1013
(Individual weight: 0.06kg / Material: Stainless steel)



Accessories other than the bracket
- Flange head hex bolts (stainless steel): M6 x 10 (4 pcs)
- Cable tie (1 pc)

Split motor and controller specification

*Cannot be selected with the ACR option, as the ACR option has split motor and controller power by default.

Model **TMD2** Applicable models **All models**

Description This option includes an actuator operation stop input.
Select this option to allow shutting down the actuator motor power only.
Please refer to P. 53 for more information on wiring.

Battery-less absolute encoder specification

Model **WA** Applicable models **All models (except for EC-GRB8)**

Description The EC grippers use an incremental gripper by default.
Specifying this option puts in a built-in battery-less absolute encoder instead.

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 the 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. Please contact IAI for this.

Duty ratio

The duty ratio refers to the operating rate expressed as percentage (%) of the actuator operating during one cycle.

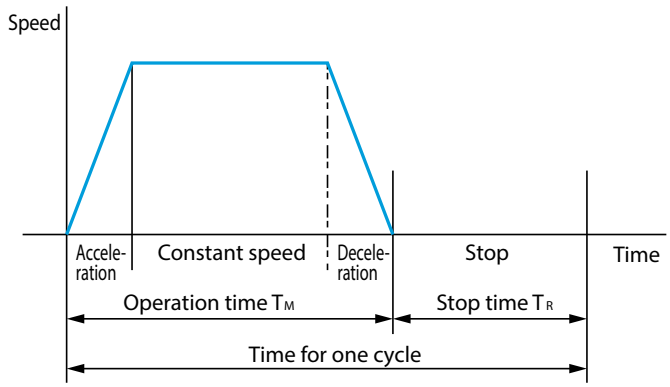
The EC-GRB/GRC types can operate at 100% duty ratio.
There is a limitation on the duty ratio for the EC-GRST type as shown below.
Operations at the maximum speed and acceleration/deceleration are also as shown below.

$$D = \frac{T_M}{T_M + T_R} \times 100(\%)$$

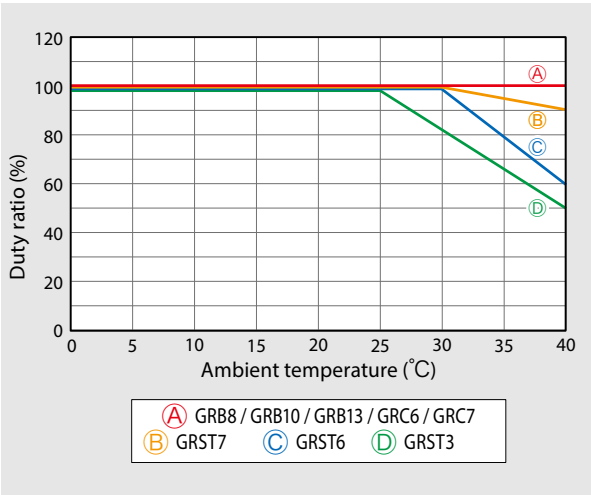
D : Duty ratio

T_M: Operating time (including push force time)

T_R: Stop time

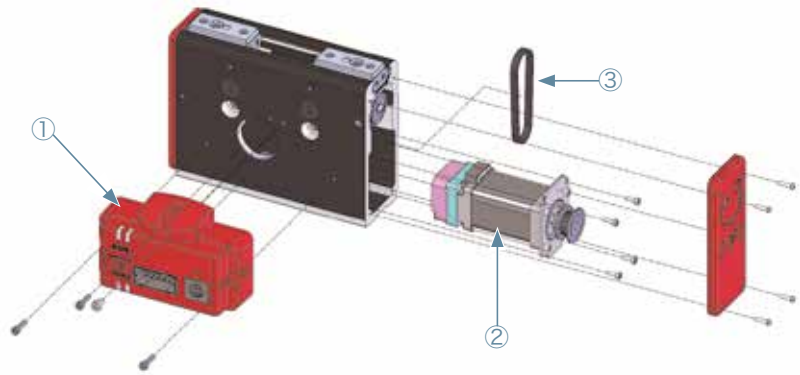


■ Correlation between ambient temperature and the duty ratio



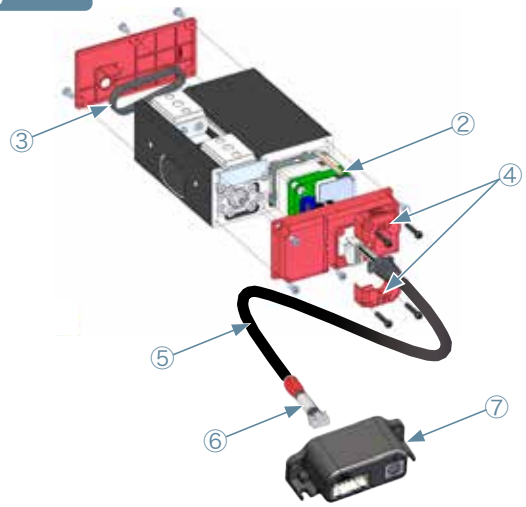
Maintenance parts

EC-GRB8 / GRB10 / GRB13



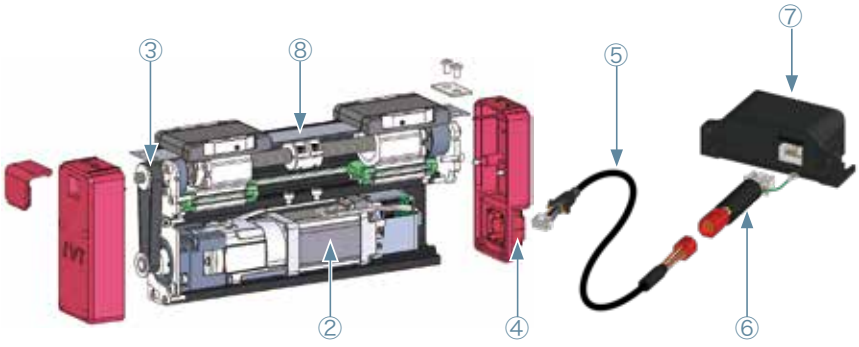
① Controller cover Assy
② Motor unit
③ Timing belt

EC-GRC6 / GRC7



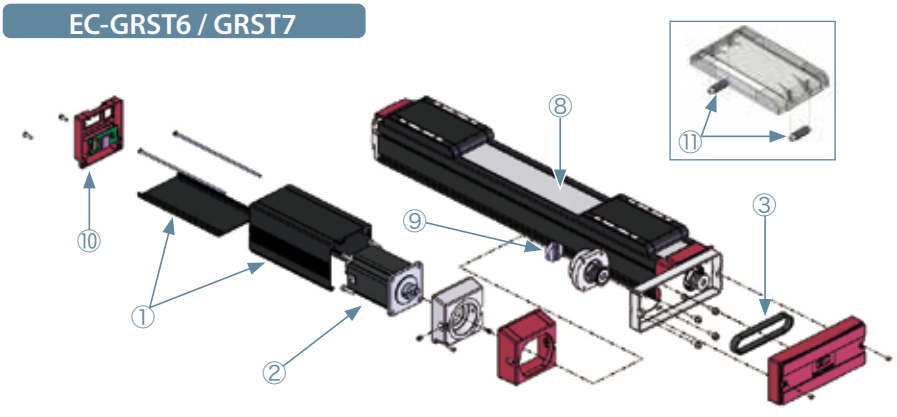
② Motor unit
③ Timing belt
④ Actuator cable mounting box
⑤ Actuator cable Assy
⑥ Interface box conversion cable
⑦ Interface box

EC-GRST3



② Motor unit
③ Timing belt
④ Actuator cable mounting box
⑤ Actuator cable Assy
⑥ Interface box conversion cable
⑦ Interface box
⑧ Stainless sheet

EC-GRST6 / GRST7



① Motor cover Assy
② Motor unit
③ Timing belt
⑧ Stainless sheet
⑨ Coupling spacer
⑩ End cover Assy
⑪ Slider roller Assy

The number in the table correspond to those in the schematic drawings.
(Note) Mounting screws are not included in the maintenance parts (except for ④). For modifications, contact IAI.

①-1 Controller cover Assy

Type	I/O	Wireless	Model		
			Standard	When TMD2 is selected	When ACR is selected
GRB8	NPN	No	CCA-EC-GRB8	CCA-EC-GRB8-TMD2	CCA-EC-GRB8-ACR
		WL	CCA-EC-GRB8-WL	CCA-EC-GRB8-TMD2-WL	CCA-EC-GRB8-ACR-WL
		WL2	CCA-EC-GRB8-WL2	CCA-EC-GRB8-TMD2-WL2	CCA-EC-GRB8-ACR-WL2
	PNP	No	CCA-EC-GRB8-P	CCA-EC-GRB8-P-TMD2	
		WL	CCA-EC-GRB8-P-WL	CCA-EC-GRB8-P-TMD2-WL	
		WL2	CCA-EC-GRB8-P-WL2	CCA-EC-GRB8-P-TMD2-WL2	
GRB10 GRB13	NPN	No	CCA-EC-GRB1013	CCA-EC-GRB1013-TMD2	CCA-EC-GRB1013-ACR
		WL	CCA-EC-GRB1013-WL	CCA-EC-GRB1013-TMD2-WL	CCA-EC-GRB1013-ACR-WL
		WL2	CCA-EC-GRB1013-WL2	CCA-EC-GRB1013-TMD2-WL2	CCA-EC-GRB1013-ACR-WL2
	PNP	No	CCA-EC-GRB1013-P	CCA-EC-GRB1013-P-TMD2	
		WL	CCA-EC-GRB1013-P-WL	CCA-EC-GRB1013-P-TMD2-WL	
		WL2	CCA-EC-GRB1013-P-WL2	CCA-EC-GRB1013-P-TMD2-WL2	

①-2 Motor cover Assy

[Model configuration] Base model - (when ACR selected) - (when TMD2 selected) - (when WL2 selected)

Type	Brake	I/O	Base model code	RCON-EC connection specification *	Split motor and controller power specification *	Wireless axis operation specification
				Model: ACR	Model: TMD2	Model: WL2
GRST6	No	NPN	MWB-EC-SR6	ACR (I/O is for NPN only)	TMD2	WL2
		PNP	MWB-EC-SR6-P			
	Yes	NPN	MWB-EC-SR6-B			
		PNP	MWB-EC-SR6-B-P			
GRST7	No	NPN	MWB-EC-SR7			
		PNP	MWB-EC-SR7-P			
	Yes	NPN	MWB-EC-SR7-B			
		PNP	MWB-EC-SR7-B-P			

* Same when the wireless communication specification (Model WL) is selected.
(Note) Does not include the wireless communication board

② Motor unit

Type	Encoder	Deceleration ratio	Brake	Model
GRB8	Incremental	M	No	EC-MUGRB8
GRB10	Incremental	M		EC-MUGRB10
	Battery-less absolute	M		EC-MUGRB10-WA
GRB13	Incremental	M		EC-MUGRB13M
		L		EC-MUGRB13L
	Battery-less absolute	M		EC-MUGRB13M-WA
		L		EC-MUGRB13L-WA
GRC6	Incremental	M	No	EC-MUGRST6
	Battery-less absolute			EC-MUGRST6-WA
GRC7 GRST3	Incremental	M	No	EC-MUGR37
			Yes	EC-MUGR37-B
		L	No	EC-MUGR37S
			Yes	EC-MUGR37S-B
	Battery-less absolute	M	No	EC-MUGR37-WA
			Yes	EC-MUGR37-WA-B
		L	No	EC-MUGR37S-WA
			Yes	EC-MUGR37S-WA-B
GRST6	Incremental	Common for M/L	No	EC-MUSR6
			Yes	EC-MUSR6-B
	Battery-less absolute		No	EC-MUSR6-WA
			Yes	EC-MUSR6-WA-B
GRST7	Incremental		No	EC-MUR7
			Yes	EC-MUGRST7-B
	Battery-less absolute		No	EC-MUR7-WA
			Yes	EC-MUGRST7-WA-B

③ Timing belt

Type	Deceleration ratio	Model
GRB8	M	TB-EC-GRB8
GRB10	M	TB-EC-GRB10
GRB13	M	TB-EC-GRB13M
	L	TB-EC-GRB13L
GRC6	M	TB-EC-GRC6
GRC7	M	TB-EC-GRC7M
	L	TB-EC-GRC7L
GRST3	M	TB-EC-GRST3M
	L	TB-EC-GRST3L
GRST6	M	TB-EC-SRR6R
	L	TB-EC-GRST6L
GRST7	M	TB-EC-SRR7R
	L	TB-EC-GRST7L

④ Actuator cable mounting box

Type	Cable exit orientation	Model
GRC6/GRC7 GRST3	Rear surface	EC-CASBR-SLTGD3
	Side surface	EC-CASBS-SLTGD3

(Accessory: screws)

⑤ Actuator cable Assy

Type	Internal wiring method	Model
GRC6/GRC7 GRST3	Junction connection	CB-EC-GR367-MPA○○○-AS
	Motor direct	CB-EC-GR367D-MPA○○○-AS

* ○○○ indicates cable length.
* Motor direct… GRC6M/GRC7L 20mm stroke
GRC7L with brake 40mm stroke

⑥ Interface box conversion cable

Type	Model
GRC6/GRC7 GRST3	CB-CVN-BJ002

⑧ Stainless sheet

Type	Model
GRST3	ST-EC-GRST3-○○○
GRST6	ST-EC-S6D-○○○
GRST7	ST-EC-S7D-○○○

* ○○○ indicates stroke.

⑦ Interface box

Type	Wireless	I/O	Model		
			Standard	When TMD2 is selected	When ACR is selected
GRC6 GRC7 GRST3	No	NPN	ECW-CVN-CB	ECW-CVN-CB-TMD2	
		PNP	ECW-CVP-CB	ECW-CVP-CB-TMD2	
	WL/WL2	NPN	ECW-CVNWL-CB	ECW-CVNWL-CB-TMD2	ECW-CVNWL-CB-ACR
		PNP	ECW-CVPWL-CB	ECW-CVPWL-CB-TMD2	

⑨ Coupling spacer

Type	Model
GRST6	CPG-EC-SR6
GRST7	CPG-EC-SR7

⑩ End cover Assy

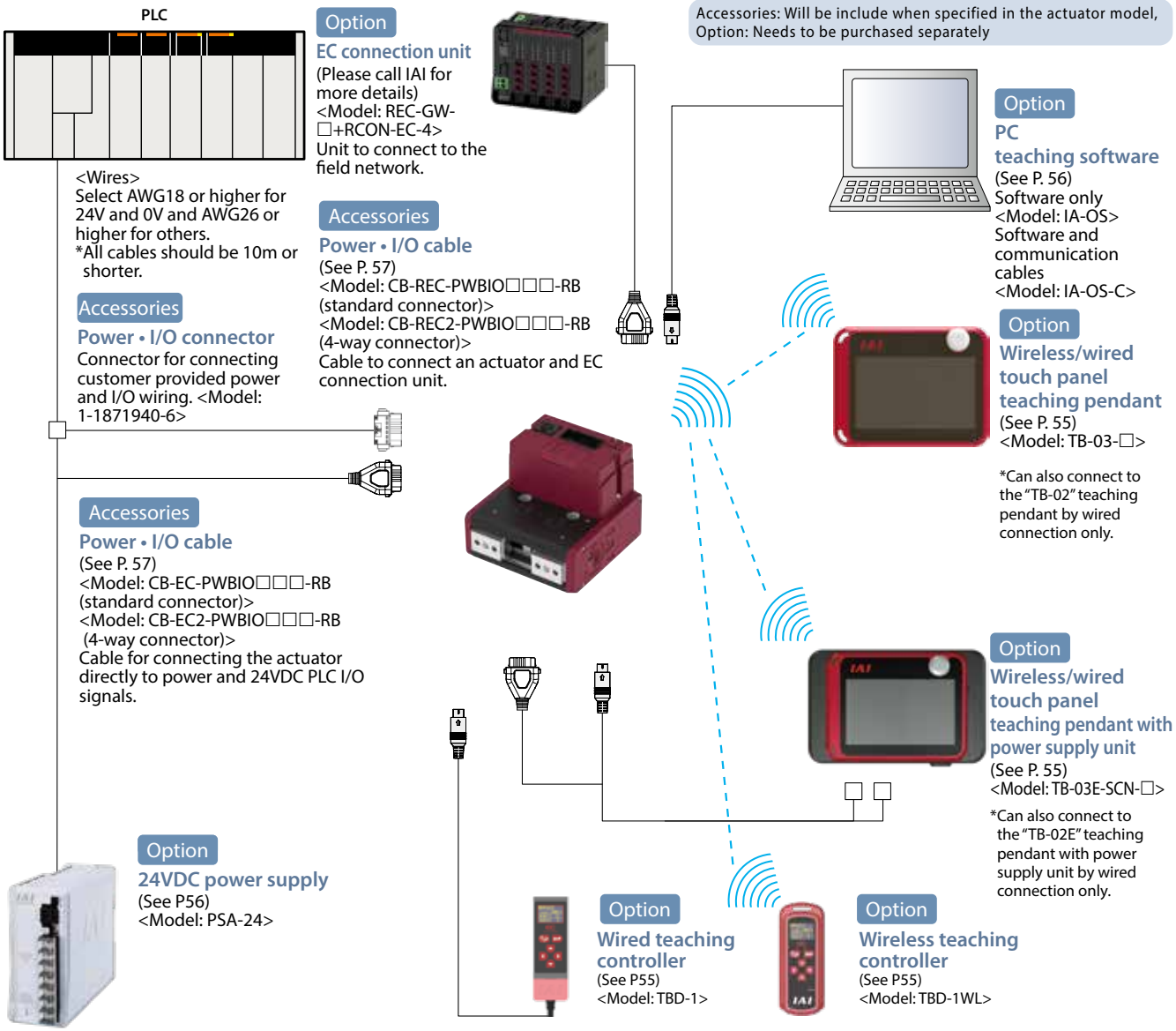
Type	Model
GRST6	EWB-EC-SR6
GRST7	EWB-EC-SR7

(Note) Comes with the wireless communication board cable.
For non-wireless communication specification, contact one of IAI representatives.

⑪ Slider roller Assy

Type	Model
GRST6 GRST7	EC-SR-S467

System configuration [EC-GRB8 / GRB10 / GRB13 / GRST6 / GRST7]



List of Accessories [EC-GRB8 / GRB10 / GRB13 / GRST6 / GRST7]

■ Power • I/O cable and connector

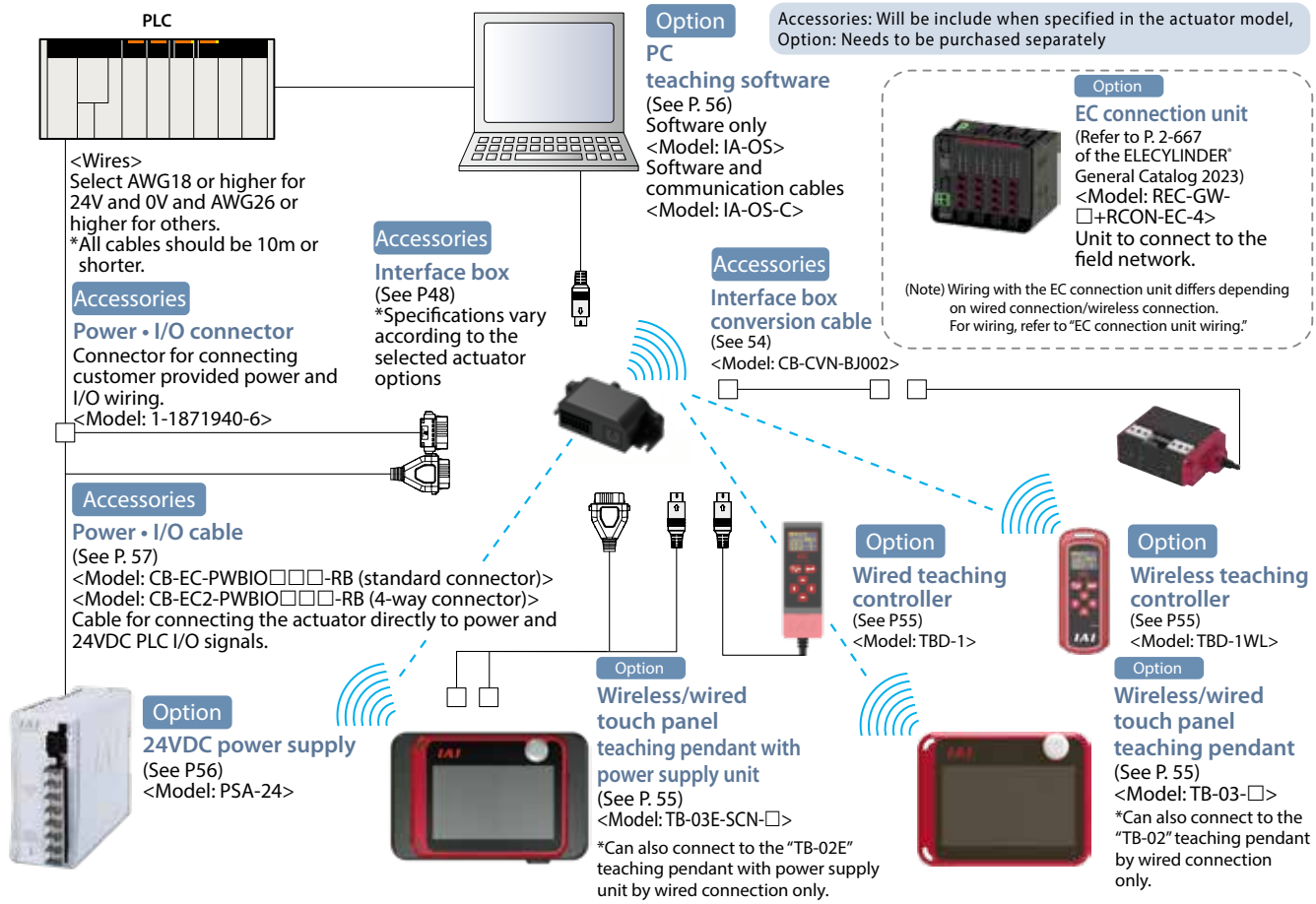
[Standard connector]

Product category		Accessories
Power • I/O cable length (specified in actuator model number)	RCON-EC connection specification (ACR)	
0	Not selected	Power • I/O connector (1-1871940-6)
	Selected	—
1 ~ 10	Not selected	Power • I/O cable (CB-EC-PWBIO☐☐☐-RB)
	Selected	Power • I/O cable (CB-REC-PWBIO☐☐☐-RB)

[4-way connector]

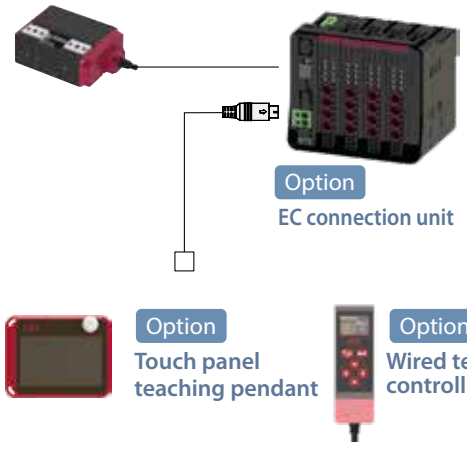
Product category		Accessories
Power • I/O cable length (specified in actuator model number)	RCON-EC connection specification (ACR)	
S1 ~ S10	Not selected	Power • I/O cable (CB-EC2-PWBIO☐☐☐-RB)
	Selected	Power • I/O cable (CB-REC2-PWBIO☐☐☐-RB)

System configuration [EC-GRC6 / GRC7 / GRST3]



EC connection unit wiring

(wired connection)



(wireless connection)

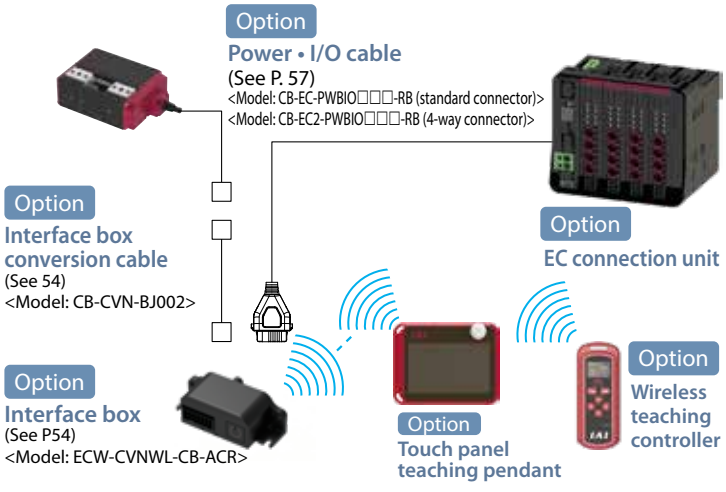


Table of accessories [EC-GRC6 / GRC7 / GRST3]

■ Power • I/O cable and connector

[Standard connector]

Classification		Accessories
Power • I/O cable length (specified in actuator model number)	RCON-EC connection specification (ACR)	
0	Not selected	Power • I/O connector (1-1871940-6)
	Selected	-
1 ~ 9	Not selected	Power • I/O cable (CB-EC-PWBIO□□□-RB)

[4-way connector]

Classification		Accessories
Power • I/O cable length (specified in actuator model number)	RCON-EC connection specification (ACR)	
S1 ~ S9	Not selected	Power • I/O cable (CB-EC2-PWBIO□□□-RB)

Table of connectability for ELECYLINDER and teaching tools

■ ELECYLINDER single unit

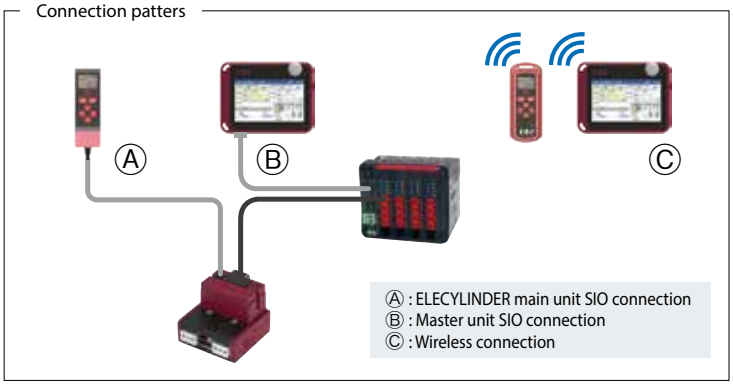
○: Connection/Operation possible

Teaching tool			Connection/Operation possibility	Priority order (When connected simultaneously)
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 ELECYLINDER is of the wireless connection specification (WL or WL2 is suffixed to the option code).
*2 Trial operations are not possible when connected with WL specification, but possible when connected with WL2 specification.

■ When ELECYLINDER is connected to REC/RCON/RSEL (RCON-EC-4 connection).

Connection patters



○ : Connection/Operation possible, △ : Connection/Operation partially possible, X: Connection/Operation impossible

Teaching tool			Connection patters	Auto (during automatic operation)		Manual	
				Connection/Operation possibility	Priority order (when simultaneous connection)	Connection/Operation possibility	Priority order (when simultaneous connection)
Wired connection	TB-02/03		Ⓐ	×		×	
			Ⓑ	△ *3	1	○	1
	Wired teaching controller (TBD-1)		Ⓐ	×		×	
			Ⓑ	×		×	
Wireless connection	TB-03		Ⓒ	△ *1 *3	2	○ *1 *2	2
	Wireless teaching controller (TBD-1WL)		Ⓒ	△ *1 *4	2	○ *1 *2	2

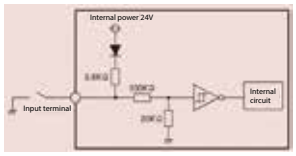
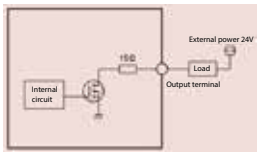
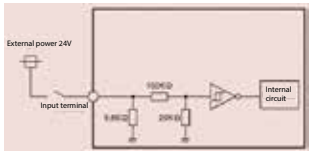
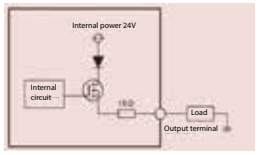
*1 Connectable only when ELECYLINDER is of the wireless connection specification (WL or WL2 is suffixed to the option code).
*2 Trial operations are not possible when connected with WL specification, but possible when connected with WL2 specification.
*3 Only monitoring is possible (operations are not possible).
*4 Setting of speed and acceleration/deceleration and operation are possible. Position edits and trial operations are not possible.

Built-in Controller Specifications

Specification item			Specification content
Number of controlled axes			1 axis
Power supply voltage			24VDC ±10%
Power capacity (Including 0.3A control current) (Note 1)		GRC6	Rated 0.95A, Maximum 1.25A (when energy-saving is enabled only)
		GRB8	Max. 1A (when energy-saving setting is enabled only)
		GRC7/GRST3	Rated 1.5A, Maximum 2A (when energy-saving is enabled only)
		GRB10/GRB13	Max. 2A (when energy-saving setting is enabled only)
		GRST6/GRST7	Rated 3.5A, Maximum 4.2A (when energy-saving is disabled only)
Brake release power			24VDC±10%, 200mA (only for external brake release)
Generated heat (at duty ratio 100%)		GRB8	2W
		GRC6	3W
		GRB10/GRB13 GRC7/GRST3	5W
		GRST6/GRST7	8W
Inrush current (Note 2)		GRB8/GRB10 GRB13/GRC6/ GRC7/GRST3	2A
		GRST6/GRST7	8.3A (there is a rush current limit circuit)
Momentary power failure resistance			Max 500µs
Motor size			□20, □28, □42, □56
Motor rated current		GRB8	0.4A
		GRC6	0.65A
		GRB10/GRB13 GRC7/GRST3 GRST6/GRST7	1.2A
Motor control system			Weak field-magnet vector control
Supported encoders			Incremental, battery-less absolute encoder
SIO			RS485 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, digital speed 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) / Operation from teaching: Stop from teaching (red light ON) / Servo OFF (light OFF)
	Wireless status display		Initializing wireless hardware, without wireless connection, or connecting from SIO port 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 and when the LED (right side) blinks alternately green and red at overload warning *Only when configured in advance
Ambient operating temperature			0 ~ 40°C
Ambient operating humidity			5%RH - 85%RH or less (no condensation or freezing)
Operating environment			No corrosive gas or excessive dust
Insulation resistance			500VDC 10MΩ
Electric shock protection mechanism			Class 1 basic insulation
Cooling method			Natural air cooling

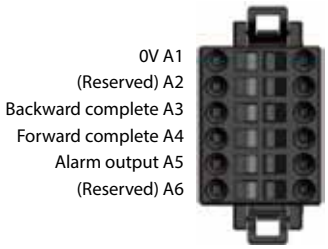
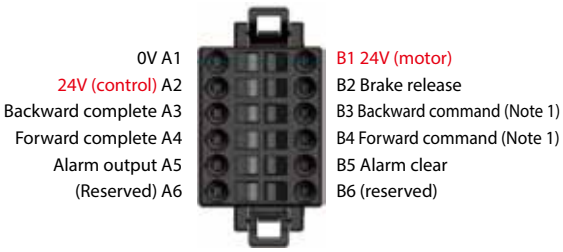
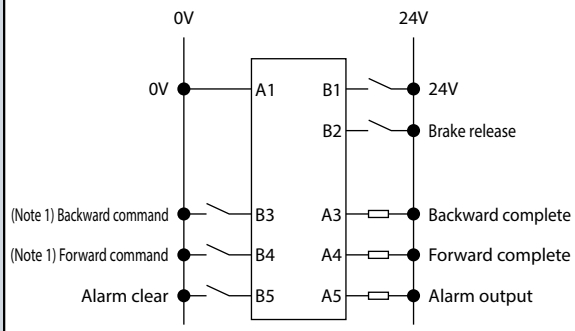
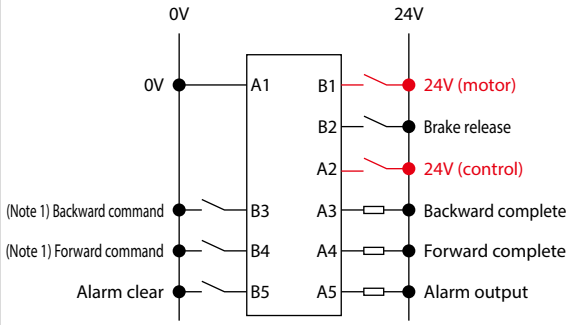
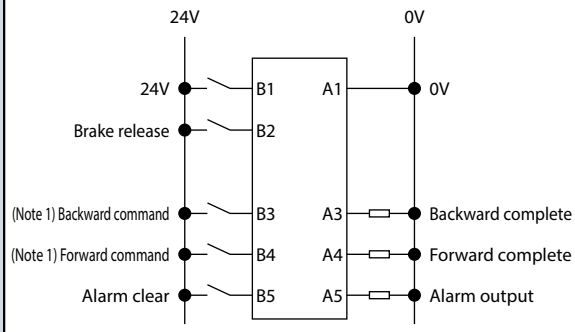
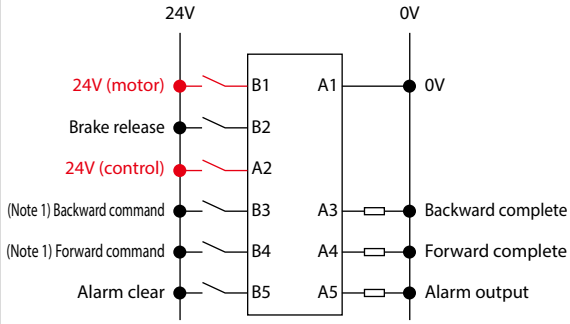
(Note 1) For RCON-EC connection, the value is subtracted by 0.3A control current.
(Note 2) The rush current flows for 5ms after power is turned on. (At 40°C) Rush current value varies depending on the resistance of the power line.
(Note 3) EC-GRC6/GRC7/GRST3 do not have an LED indicator on the main unit. The status of these units can be checked on either the interface box or EC-connection unit.

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 (option model: TMD2)
Power • I/O connector			
I/O logic	NPN		
	PNP		

(Note 1) Switching to the single solenoid mode 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 (reverse logic)
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 mode 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 (motor) and A2 is 24V (controller) for the split motor and controller power supply specification (TMD2).

Solenoid system

ELECYLINDER products are normally controlled in double solenoid mode.
Change parameter number 9 (solenoid valve type selection) to switch to single solenoid operation.

<Caution>
Operations cannot be performed in in single solenoid mode when operating connected to RCON-EC.

Options [EC-GRC6/GRC7/GRST3]

RCON-EC connection specification Interface box (supporting wireless) for split motor and controller power specification

Model **ECW-CVNWL-CB-ACR** Applicable models **EC-GRC6/GRC7/GRST3**

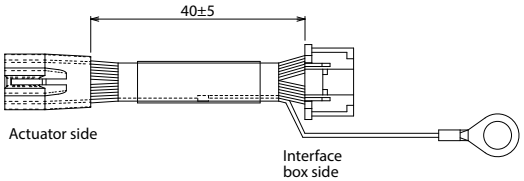
Description Necessary for connecting to the EC connection unit and also performing wireless teaching.

* Wireless communication (WL).
For wireless axis operation specification (WL2), contact one of IAI representatives.

Interface box conversion cable

Model **CB-CVN-BJ002** Applicable models **EC-GRC6/GRC7/GRST3**

Description Cable for connecting the actuator cable and interface box (0.2m).



DF62B-13EP-2.2C(18) (Hirose)

Color	Size	Signal name	No.
Yellow	AWG26	MP	1
Black	AWG26	GND	2
Pink	AWG26	IN0	3
White	AWG26	IN1	4
Purple	AWG26	SD+	6
Green	AWG26	SD-	10
Sky blue	AWG26	OUT0	7
Orange	AWG26	OUT1	8
Brown	AWG26	OUT2	9
Blue	AWG26	BKRLS	11
Gray	AWG26	CP	12
Red	AWG26	FG	13

PUDP-12V-5(JST)

No.	Signal name	Size	Color
4	MP	AWG26	Yellow
10	GND	AWG26	Black
11	sub_SD+	AWG26	Pink
9	sub_SD-	AWG26	White
7	main_SD+	AWG26	Purple
5	main_SD-	AWG26	Green
12	STOP_EXT	AWG26	Sky blue
3	rsv(VPS)	AWG26	Orange
1	rsv	AWG26	Brown
6	BK_EXT	AWG26	Blue
8	VP24	AWG26	Gray
2	FG	AWG26	Red

0.5-5

No.	Signal name	Size	Color
1	FG	AWF22	Green

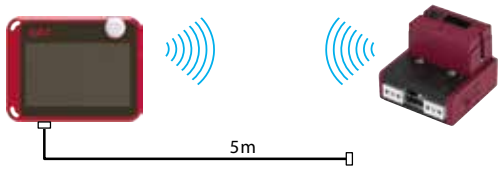
Option

Wireless/wired touch panel teaching pendant

Features This teaching device supports wireless connections.
Start point/end point/AVD input and axis operations can be performed wirelessly.

Model **TB-03-□** Please contact IAI for the current supported versions.

Configuration Wireless or wired connection



Specifications

Rated voltage	DC24V±10%
Power input voltage range	3.6W or less (150mA or less)
Operating ambient temperature	0 - 40°C(non-condensing, no frost)
Operating ambient humidity	5 - 85%RH (non-condensing, no frost)
Degree of protection	IPX0
Mass	Approx. 485g (body) + approx. 175g (battery)
Recharging method	Wired connection with dedicated adapter/controller
Wireless connection	Bluetooth4.2 class2

Wireless teaching controller (wireless digital teaching controller)

Features Start point/end point/AVD input and jog motions can be performed remotely.
(Only for the ELECYLINDER with wireless option)

Model **TBD-1WL-□**

Configuration Wireless connection

Specifications

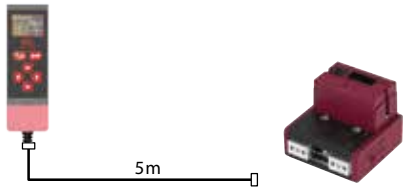
Power input voltage range	DC5.9V (5.7 - 6.3V) [Supplied from the dedicated AC adapter]
Operating ambient temperature	0 - 40°C(non-condensing, no frost)
Operating ambient humidity	5 - 85%RH (non-condensing, no frost)
Degree of protection	IPX0
Mass	Approx. 115g (including 55g battery)
Recharging method	Dedicated adapter
Wireless connection	Bluetooth4.2 class2

Wired teaching controller

Features Start point/end point/AVD input and jog motions can be performed easily.
Can be used for all ELECYLINDER models.

Model **TBD-1**

Configuration Wired connection



Specifications

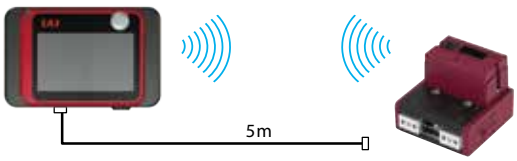
Rated voltage	24VDC±10% [supplied from the controller]
Power input voltage range	1.44W or less (60mA or less)
Operating ambient temperature	0 - 40°C(non-condensing, no frost)
Operating ambient humidity	5 - 85%RH (non-condensing, no frost)
Degree of protection	IP20
Mass	Approx. 21g (main unit) + 184g (5m main unit integrated cable)

Touch panel teaching pendant with power unit (wired and wireless connectivity available)

Features Since the TB-03 has a separate power unit and brake release, trial operation and data setting can be performed even before the machine wiring has been completed.

Model **TB-03E-□** Visit IAI website for supported versions.

Configuration Wireless or wired connection



Specifications

Rated voltage		Single-phase AC100-230V ±10%
Input current	Specified by rated input/output conditions at an ambient temperature of 25°C	1.4Atyp. (AC100V) 0.6Atyp. (AC230V)
Frequency range		50/60Hz±5%
Power capacity	Specified by rated input/output conditions at an ambient temperature of 25°C	141VA (AC100V) 145VA (AC230V)
Output voltage		DC24V±10%
Mass		Approx. 740g
Cooling system		Natural air cooling

Teaching software for PC (Windows only)

Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to shortened start-up time.

Model **IA-OS** (software only, for customers who already own a dedicated connection cable)

Please contact IAI for the current supported versions.

Configuration

PC software
(Download Only)

Customer provided, or preexisting communication cables
CB-SEL-USB030/RCB-CV-USB/
CB-RCA-SIO050

* Please purchase through your distributor and a download link will be sent to your valid email address.

Model **IA-OS-C** (with a communication cable + USB conversion adapter + USB cable)

Please contact IAI for the current supported versions.

Configuration

PC software
(Downoad Only)

USB converter
RCB-CV-USB

3m
USB cable
CB-SEL-USB030

5m
Communication cable
CB-RCA-SIO050

* Please purchase through your distributor and a download link will be sent to your valid email address.

24V power supply

Model **PSA-24** (without fan)

Model **PSA-24L** (with fan)

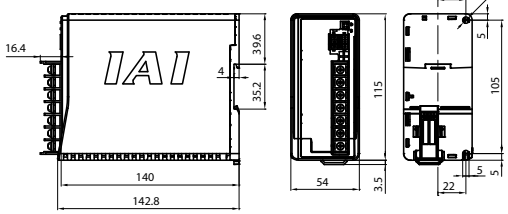
Specifications

Item	Model	
	for 100VAC input	for 200VAC input
Input voltage range	AC100V~AC230V±10%	
Input power current	3.9A or less	1.9A or less
Power capacity	Without fan: 250VA With fan: 390VA	Without fan: 280VA With fan: 380VA
Rush current *1	Without fan: 17A (typ) With fan: 27.4A (typ)	Without fan: 34A (typ) With fan: 54.8A (typ)
Generated heat	33W (at 204W continuous rated) 33W (at 300W continuous rated)	33W (at 204W continuous rated) 33W (at 330W continuous rated)
Output voltage range *2	24V±10%	
Continuous rated output	Without fan: 8.5A (204W) With fan: 13.8A (330W)	
Peak output	17A(408W)	
Efficiency	86% or higher	90% or higher
Parallel connection *3	Up to 5 units	

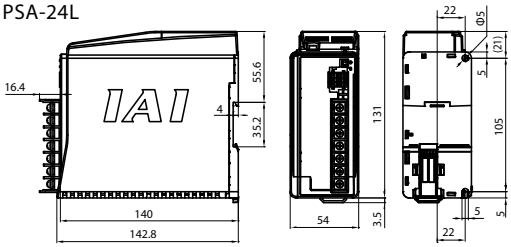
*1 The pulse width of rush current flow is 5ms or less.
*2 This power source can change output voltage according to the load to enable parallel operations. Therefore, this power unit is only for IAI controllers.
*3 Parallel connections under the following conditions are not possible.
- Parallel connection of PSA-24 (without fan) and PSA-24L (with fan).
- Parallel connection with power units other than this unit.
- Parallel connection with PS-24.

External dimensions

PSA-24



PSA-24L



Power capacity calculation "Calculator" software	Power capacity Calculator comes with the IA-OS software.

Maintenance Parts (Cable)

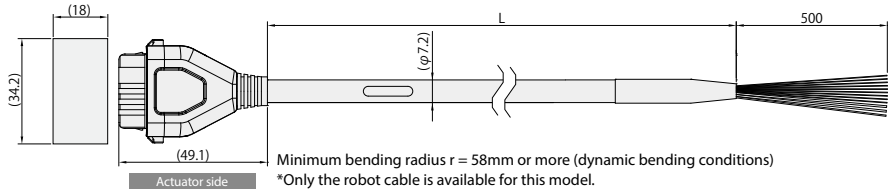
When placing an order for a replacement cable after purchasing a product, please use the model name shown below.

■ **Table of compatible cables**

Cable type	Cable model
Power • I/O cable (flying leads)	CB-EC-PWBIO□□□-RB
Power • I/O cable (flying leads, 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

Model CB-EC-PWBIO□□□-RB

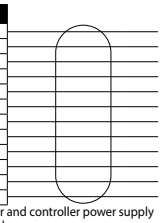
*Please indicate the cable length (L) in □□□, Up to 10m (for example. 030 = 3m)



Minimum bending radius r = 58mm or more (dynamic bending conditions)
*Only the robot cable is available for this model.

1-1871940-6

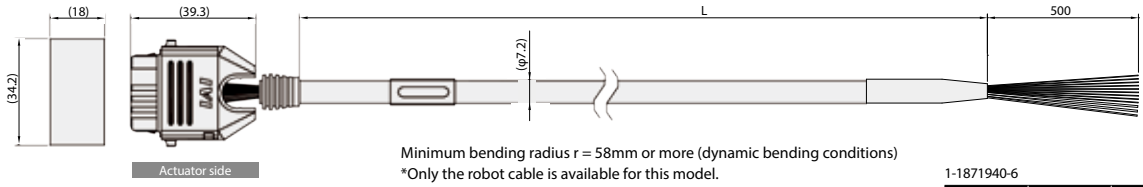
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V	B1
Light blue (AWG22)	(Reserved) (Note 1)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	(Reserved)	B6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
White (AWG26)	(Reserved)	A6
Brown (AWG26)	BKRLS	B2



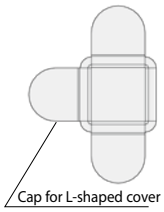
(Note 1) 24V (controller) when split motor and controller power supply specification (TMD2) are selected.
(Note 2) The yellowish green and light gray wires are not used. (cut in the shrinkable tube)

Model CB-EC2-PWBIO□□□-RB

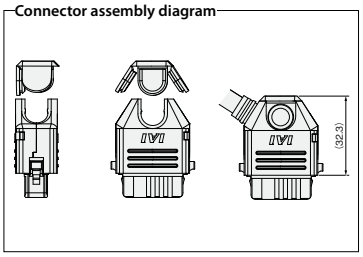
*Please indicate the cable length (L) in □□□, Up to 10m (for example. 030 = 3m)



Minimum bending radius r = 58mm or more (dynamic bending conditions)
*Only the robot cable is available for this model.

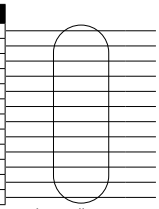


Connector assembly diagram



1-1871940-6

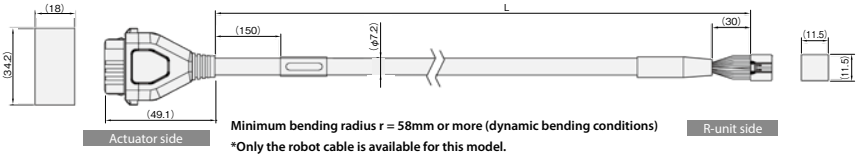
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V	B1
Light blue (AWG22)	(Reserved) (Note 1)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	(Reserved)	B6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
White (AWG26)	(Reserved)	A6
Brown (AWG26)	BKRLS	B2



(Note 1) 24V (controller) when split motor and controller power supply specification (TMD2) are selected.
(Note 2) The yellowish green and light gray wires are not used. (cut in the shrinkable tube)

Model CB-REC-PWBIO□□□-RB

*Please indicate the cable length (L) in □□□, Up to 10m(for example. 030 = 3m



Minimum bending radius r = 58mm or more (dynamic bending conditions)
*Only the robot cable is available for this model.

1-1871940-6

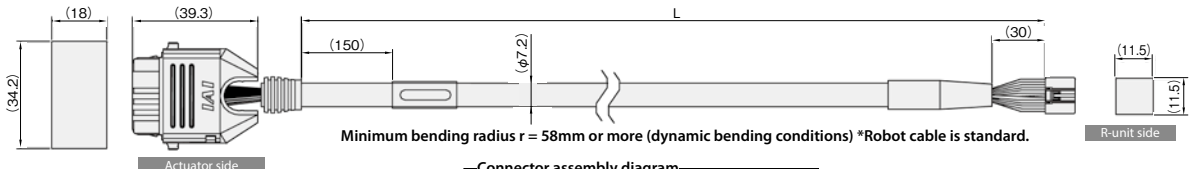
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V(MP)	B1
Light blue (AWG22)	24V(CP)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Yellowish green (AWG26)	SD+	B6
Light gray (AWG26)	SD-	A6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
Brown (AWG26)	BKRLS	B2

DF62E-13S-2.2C(18)

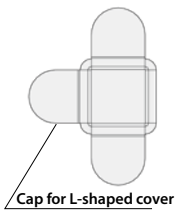
Pin No.	Signal name	Color
2	0V	Black (AWG18)
1	24V(MP)	Red (AWG18)
12	24V(CP)	Light blue (AWG22)
7	OUT0	Orange (AWG26)
8	OUT1	Yellow (AWG26)
9	OUT2	Green (AWG26)
6	SD+	Pink (AWG26)
10	SD-	White (AWG26)
3	IN0	Blue (AWG26)
4	IN1	Purple (AWG26)
5	IN2	Gray (AWG26)
11	BKRLS	Brown (AWG26)
13	FG	Green (AWG26)

Model CB-REC2-PWBIO□□□-RB

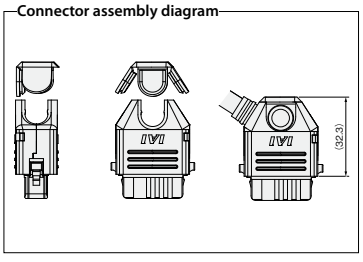
*Please indicate the cable length (L) in □□□, Up to 10m(for example. 030 = 3m



Minimum bending radius r = 58mm or more (dynamic bending conditions) *Robot cable is standard.



Connector assembly diagram



1-1871940-6

Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V(MP)	B1
Light blue (AWG22)	24V(CP)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Yellow (AWG26)	SD+	B6
Light gray (AWG26)	SD-	A6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
Brown (AWG26)	BKRLS	B2

DF62E-13S-2C(18)

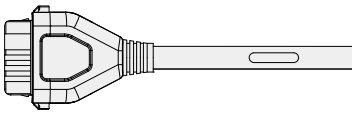
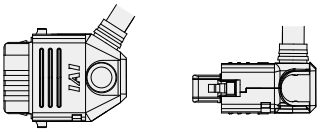
Pin No.	Signal name	Color
2	0V	Black (AWG22)
1	24V(MP)	Red (AWG22)
12	24V(CP)	Light blue (AWG22)
7	OUT0	Orange (AWG26)
8	OUT1	Yellow (AWG26)
9	OUT2	Green (AWG26)
6	SD+	Yellow (AWG26)
10	SD-	Light gray (AWG26)
3	IN0	Blue (AWG26)
4	IN1	Purple (AWG26)
5	IN2	Gray (AWG26)
11	BKRLS	Brown (AWG26)
13	FG	Green (AWG26)

Maintenance Parts (Cable)

4-way connector cable

This cable allows the connector direction of ELECYLINDER to be changed any of 4 directions.
The cable wiring for the connector is the same as that of power • I/O cable CB-EC-PWBIO□□□-RB / CB-REC-PWBIO□□□-RB.

Specify cable length in □□□.
(Ex.) 050=5m

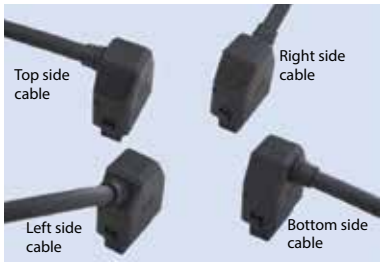
	Standard connector (actuator side)	4-way connector (actuator side)
External appearance		
Flying leads	CB-EC-PWBIO□□□-RB	CB-EC**2**-PWBIO□□□-RB
RCON-EC connection specification	CB-REC-PWBIO□□□-RB	CB-REC**2**-PWBIO□□□-RB

■Ordering method

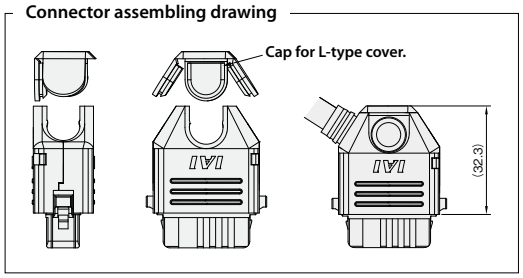
Cable length is between 1m and 10m.
Lengths can be specified in 1m increments.

(Ex.) When ordering a 4-way connector 3m/10m.
Cable length 3m : CB-EC2-PWBIO030-RB
Cable length 10m : CB-EC2-PWBIO100-RB

■Assembling method



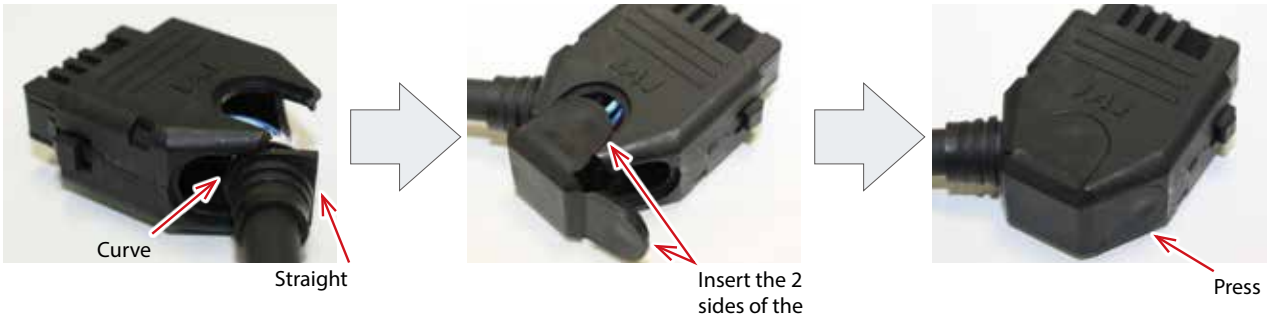
Cable exit direction can freely be selected.



(1) Insert while sliding along the groove in the desired direction from the semi-cylindrical curved portion.

(2) Confirm that the cable has been firmly inserted, and then insert the 2 sides of the lid along the groove.

(3) Finally, press the remaining side of the lid.



Catalog No. CE0284-2A (2024APR)

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