IAI
Quality and Innovation

GB

Simple-to-use ELECYLINDER
with Built-in Controller
Wide Slider Standard Type

EC WS10/12

Battery-less Absolute Encoder
No Battery,
No Maintenance, No Homing,
No Going Back to Incremental.

EC ELECYLINDER

Simple & Wireless
Operation

2 Position Actuator

www.elecylinder.de

2-point positioning | Built-in controller

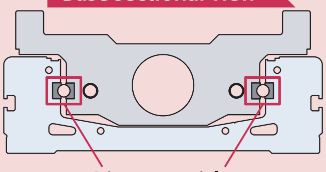
EleCylinder Wide Slider Type

1 Supports high moment loads

With a built-in ball circulating type linear guide housed in a wide body, it is able to handle high moment loads in the pitch (Ma), yaw (Mb), and roll (Mc) directions.

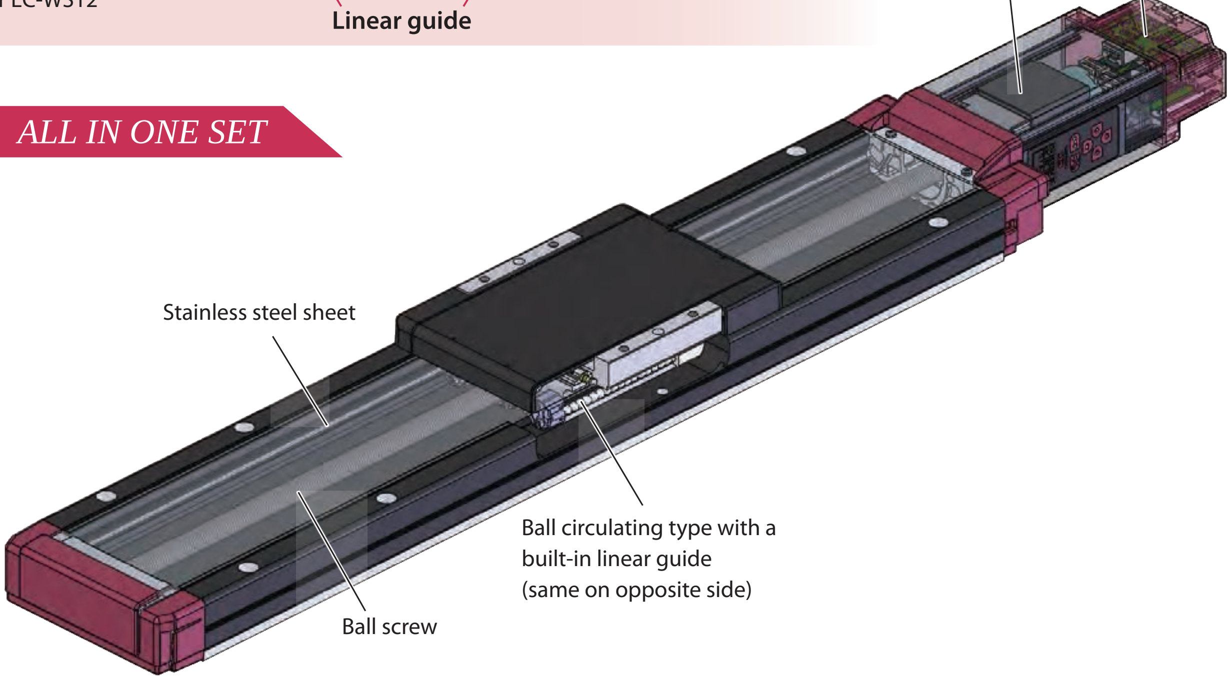
Dynamic allowable moment
Ma:77N•m
Mb:77N•m
Mc:176N•m
*For EC-WS12

Base sectional view



Use as linear guide integrated with base for high rigidity

ALL IN ONE SET



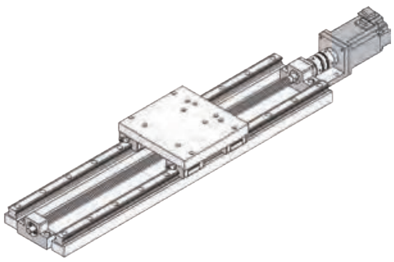
Example with built-in linear motion unit

=> Several parts, lots of work

- Motor
- Ball screw
- 2 linear guides
- Guide block
- Coupling
- Bearing
- Plate
- ⋮

\+

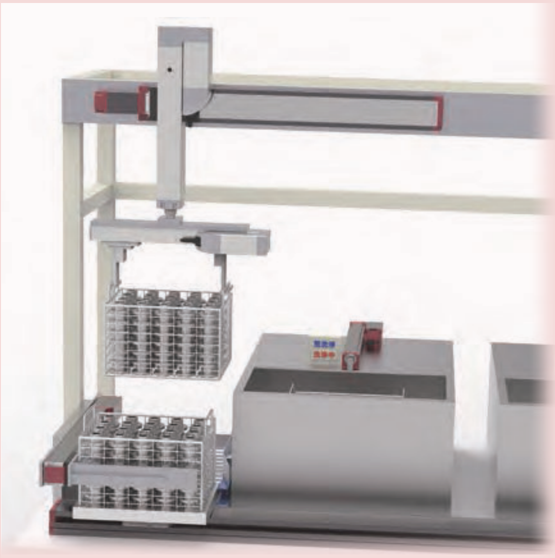
- Design
- Assembly
- Servo adjustment
- ⋮



Introducing the high rigidity wide slider type
to the popular EleCylinder Series

2 Ideal for applications with large overhang loads

(Example) System to transfer parts to a washer



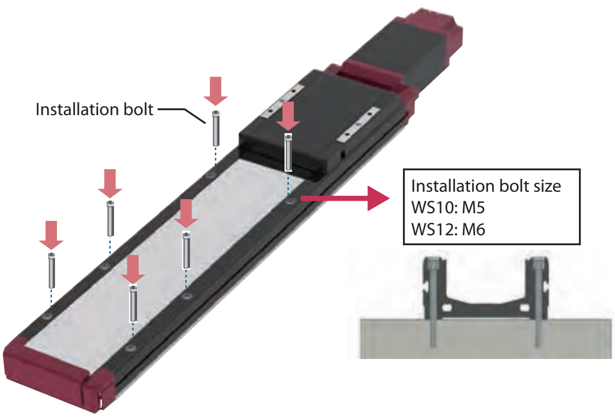
The high moment rigidity supports large overhang loads.
The acceleration, speed, and deceleration can be set individually, making it possible to control runout caused by vibration and reduce the cycle time.

▼ Wide slider type specifications overview

Body width	100,120mm
Body height	46, 54mm
Stroke	50 to 800mm
Payload	Horizontal: Up to 62kg Vertical: Up to 13.5kg
Speed	4 ~ 1000mm/s
Positioning repeatability	±0.05mm
Overhang load length (approximate)	WS10: 400mm or less WS12: 500mm or less

3 Can be bolted from the top

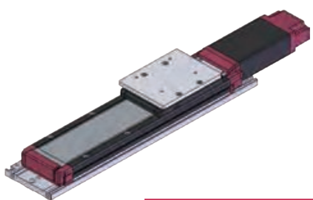
Can be mounted from the top, without having to remove the stainless steel sheet.



4 Simple greasing

Grease can be added from both sides of the slider, without having to remove the stainless steel sheet or attached objects from the slider.

5 Options to support rodless air cylinders



Plates can be mounted to support mounting to an air cylinder.

Details on P. 11, 13

Model Specification Items

EleCylinder

EC – [Type] [Lead] – [Stroke] – [Power / I/O cable length] – [Options]

Series / Type / Lead / Stroke / Power / I/O cable length / Options

Type

WS10	Wide slider 100mm width
WS12	Wide slider 120mm width

Lead

<WS10>		<WS12>	
S	Lead 20mm	S	Lead 24mm
H	Lead 12mm	H	Lead 16mm
M	Lead 6mm	M	Lead 8mm
L	Lead 3mm	L	Lead 4mm

Stroke

<WS10>		<WS12>	
50	50mm	50	50mm
≀	≀	≀	≀
500	500mm	800	800mm

(Every 50mm)

Power / I/O cable length

0	Without cable Power I/O connector included (Note)
(S)1	1m
≀	≀
(S)10	10m

(Every 1m)

(S): 4-way connector cable

(Note) A power I/O connector is not included if RCON-EC connection specification (ACR) is selected

Options

Blank	Incremental encoder specification NPN specification, no options
ACR	RCON-EC connection specification*1
B	Brake
CS	Air cylinder mounting plate
G5	Designated grease specification
NM	Non-motor end specification
PN	PNP specification*1
TMD2	Split motor and controller power supply specification*1
WA	Battery-less absolute encoder specification
WL	Wireless communication specification
WL2	Wireless axis operation specification

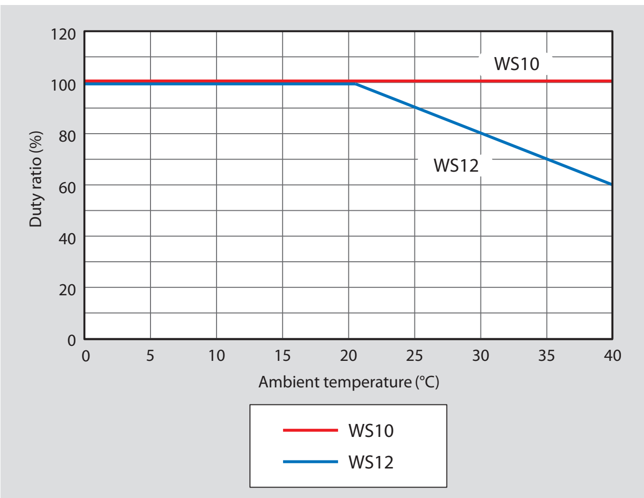
*1 "PN" and "TMD2" cannot be selected if "ACR" is selected

Duty Ratio

EC-WS10 can be operated at a duty ratio of 100%. (ambient temperature 0 ~ 40°C).

EC-WS12 requires a restricted duty ratio. Please see below.

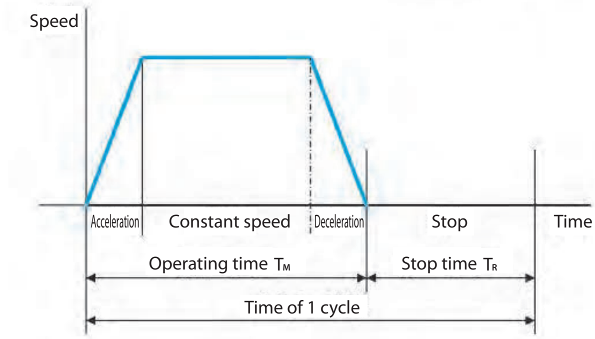
■ Ambient temperature and duty ratio



[Duty ratio]
The duty ratio is the operating rate shown as the actuator's operating time during one cycle, expressed as a percentage.

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

D: Duty ratio
T_M: Operating time (including push-motion operation)
T_R: Stop time



Precautions for installation

● Mounting orientation

○: Can be mounted

		Mounting orientation			
					
Series	Type	Horizontal mounting on flat surface	Vertical mounting	Horizontal mounting to side	Horizontal mounting suspended
EC	WS10	○	○ *1 *2 *3 *4	○ *3 *5	○ *3 *5
	WS12				

*1 When mounting vertically, make sure to install the motor on the top.
Installing with the motor on the bottom could cause grease to separate and base oil to leak into the motor, which could cause controller or motor encoder failure.
It is therefore not recommended to install the motor on the bottom side.
*2 If installing with the motor on the top, attach a cap to the teaching port.
It could cause failure if foreign matter becomes clogged.
*3 Not supported when selecting the air cylinder mounting plate (CS) option.
*4 Lead S and H are not supported.
*5 Installing the product horizontal to side or horizontal suspended may cause slack or misalignment in the stainless steel sheet.
Continuing to use it this way could cause the stainless steel sheet to break. Please inspect it daily and adjust the sheet if any slack or misalignment is found.

● Keep the body installation surface and parts mounting surface flatness within 0.05mm/m.
Uneven flatness will increase the sliding resistance of the slider and may cause a malfunction.

Push-motion operation

Push-motion operation is a function that keeps the slider pushed up against a part, as with an air cylinder.
Please check the usage instructions and precautions below prior to use.

[Precautions]

- **If pushing with a slider type, the dynamic allowable moment of the guide will need to be taken into consideration.**

[Torque adjustment]

- **The torque during a push-motion operation can be adjusted by changing the "Torque (%)" on EleCylinder.**
- **Please check the torque for the applicable model in the "Correlation between torque and current limit" on the production specification page, and select a model that matches your conditions.**

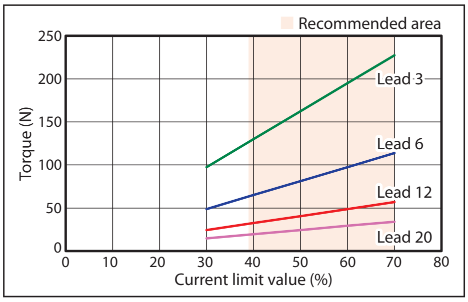
[Lead selection method]

Select a lead with the desired torque in the recommended current limit value range (the colored area in the graph).

Lead 6 would be appropriate for the "EC-WS10 type" shown in the figure to the right if a torque of 100N is desired. Selecting lead 3 would limit the adjustment range.

(Example)

EC-WS10



<Correlation between Torque and Current Limit>

⚠ Caution

- **The "correlation between torque and current limit" show lower guidelines for torque for each current limit value.**
- **Individual differences in the motor and variations in machine operation may cause the torque lower limit to be exceeded by around 40%, even if the current limit value is the same.**
This is especially true when the current limit value is 30% or lower, and the torque lower limit could be exceeded by 40% or more.

EC-WS10

Wide Slider | Simple Dust-proof | Coupled Motor | Body Width 100 mm | 24v Pulse Motor

■ Model Specification Items

EC - [Type][Lead] - [Stroke] - [Power / I/O cable length] - [Options]

Series	Type		Lead		Stroke		Power / I/O cable length	Options
EC	WS10	Standard	S	20mm	50	50mm	See power / I/O cable length below	See options below
			H	12mm	~	~		
			M	6mm	500	500mm		
			L	3mm		(Every 50mm)		

CE RoHS 10

Horizontal Vertical Side Ceiling

POINT Selection Notes

(1) "Main Specifications" displays the payload's maximum value. If the energy-saving setting is enabled, the main specifications will change. Please refer to "Table of Payload by Speed/Acceleration" for details.
(2) If performing push-motion operations, refer to the "Correlation between Torque and Current Limit" diagram. The torques listed are only reference values. Please refer to P. 110 of the EleCylinder Catalog V10 for precautions.
(3) Pay close attention to the installation orientation. Please refer to P. 4 for details.
(4) Reference value of the overhang load length is under 400mm in the Ma, Mb, and Mc directions. Please refer to the figure on P. 32 of the EleCylinder Catalog V10 for overhang load lengths.
(5) The center of gravity of the attached object should be less than 1/2 of the overhang distance. Even when the overhang distance and load moment are within the allowable range, the operating conditions should be moderated, if some normal vibration or noise is observed.
(6) The "H" and "S" leads cannot be vertically mounted.

Power / I/O cable length

■ Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection specification (Note 1) (with connectors on both edges)
0	No cable	Terminal block supplied (Note 2)	CB-REC-PWBIO□□□-RB supplied
1 ~ 3	1 ~ 3m	CB-EC-PWBIO□□□-RB supplied	
4 ~ 5	4 ~ 5m		
6 ~ 7	6 ~ 7m		
8 ~ 10	8 ~ 10m		

(Note 1) If RCON-EC connection specification (ACR) is selected as an option.
(Note 2) Only terminal block connector is included. Please refer to P. 16 for details.
(Note) Robot cable is standard.

■ 4-way connector cable

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

(Note 1) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

Options

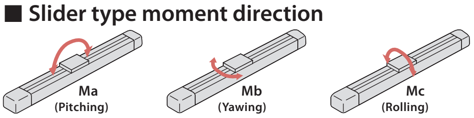
Name	Option code	Reference page
RCON-EC connection specification (Note 1)	**ACR**	11
Brake	**B**	11
Air cylinder mounting plate	**CS**	11
Designated grease specification	**G5**	12
Non-motor end specification	**NM**	12
PNP specification	**PN**	12
Split motor and controller power supply specification	**TMD2**	12
Battery-less absolute encoder specification	**WA**	12
Wireless communication specification	**WL**	12
Wireless axis operation specification	**WL2**	12

(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.

Main Specifications

Item			Description			
Lead		Ball screw lead (mm)	20	12	6	3
Horizontal	Payload	Max. payload (kg) (energy-saving disabled)	4	15	25	44
		Max. payload (kg) (energy-saving enabled)	4	15	25	40
	Speed / acceleration/ deceleration	Max. speed (mm/s)	900	640	400	160
		Min. speed (mm/s)	25	15	8	4
		Rated acceleration/deceleration (G)	0.3	0.3	0.3	0.3
		Max. acceleration/deceleration (G)	1	1	0.5	0.3
Vertical	Payload	Max. payload (kg) (energy-saving disabled)	-	-	4	7
		Max. payload (kg) (energy-saving enabled)	-	-	4	7
	Speed / acceleration/ deceleration	Max. speed (mm/s)	-	-	360	160
		Min. speed (mm/s)	-	-	8	4
		Rated acceleration/deceleration (G)	-	-	0.3	0.3
		Max. acceleration/deceleration (G)	-	-	0.5	0.3
Push		Max. push force (N)	34	57	114	228
		Max. push speed (mm/s)	25	20	20	20
Brake		Brake specification	Non-excitation actuating solenoid brake			
		Brake holding force (kgf)	-	-	4	7
Stroke		Min. stroke (mm)	50	50	50	50
		Max. stroke (mm)	500	500	500	500
		Stroke pitch (mm)	50	50	50	50

■ Slider type moment direction



Item	Description
Driving system	Ball screw, ø10mm, rolled C10
Positioning repeatability	±0.05mm
Lost motion	N/A (two-point positioning function; cannot be represented)
Base	Dedicated aluminum extruded material (A6063SS-T6 equivalent), black alumite treatment
Linear guide	Linear motion infinite circulating type
Static allowable moment	Ma:172N•m
	Mb:172N•m
	Mc:436N•m
Dynamic allowable moment (Note 1)	Ma:44.7N•m
	Mb:44.7N•m
	Mc:113N•m
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (Non-condensing)
Degree of protection	IP20
Vibration & shock resistance	4.9m/s^2
Overseas standards	CE marking, RoHS directive
Motor type	Pulse motor
Encoder type	Incremental/battery-less absolute
Number of encoder pulses	800 pulse/rev

(Note 1) Based on the standard rated operation life of 5000km. Operation life varies according to operating and mounting conditions. Please refer to service life on P. 33 of the EleCylinder Catalog V10.

Table of Payload by Speed/Acceleration

■ Energy-saving setting disabled
The unit for payload is kg. If blank, operation is not possible.

Lead 20

Orientation	Horizontal			
Speed (mm/s)	Acceleration (G)			
	0.3	0.5	0.7	1
0	4	3.5	3	2
320	4	3.5	3	2
480	4	3.5	3	2
600	4	3.5	3	2
700	4	2.5	2	1.5
800	3	2	1.5	1
900		1	1	

Lead 12

Orientation	Horizontal			
Speed (mm/s)	Acceleration (G)			
	0.3	0.5	0.7	1
0	15	11	9	6
160	15	11	9	6
280	15	11	9	6
320	15	10	8	5
400	12	8	6	4
480	10	6.5	5	3
560	8	5	4	2
640	6	4	2	

Lead 6

Orientation	Horizontal		Vertical	
Speed (mm/s)	Acceleration (G)			
	0.3	0.5	0.3	0.5
0	25	20	4	3.5
140	25	20	4	3.5
180	25	20	4	3.5
220	25	20	4	3.5
270	20	15	4	3
320	15	9	3	2
360	11	6	2	1
400	7	3		

Lead 3

Orientation	Horizontal	Vertical
Speed (mm/s)	Acceleration (G)	
	0.3	0.3
0	44	7
60	44	7
80	44	7
110	40	7
135	37	7
160	30	2

■ Energy-saving setting enabled
The unit for payload is kg. If blank, operation is not possible.

Lead 20

Orientation	Horizontal	
Speed (mm/s)	Acceleration (G)	
	0.3	0.7
0	4	3
320	4	3
480	4	3
600	4	2
700	2.5	1
800	1	

Lead 12

Orientation	Horizontal	
Speed (mm/s)	Acceleration (G)	
	0.3	0.7
0	15	7
160	15	7
280	13	6
320	11	5
400	8	3.5
480	5	2
560	3	

Lead 6

Orientation	Horizontal	Vertical
Speed (mm/s)	Acceleration (G)	
	0.3	0.3
0	25	4
140	25	4
180	20	4
220	15	3
270	10	1.5
320	4	

Lead 3

Orientation	Horizontal	Vertical
Speed (mm/s)	Acceleration (G)	
	0.3	0.3
0	40	7
60	40	7
80	40	7
110	35	4.5
135	25	1.5

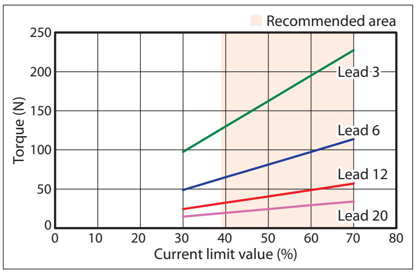
Stroke and maximum speed

Lead (mm)	Energy-saving setting	50 ~ 200 (Every 50mm)	250 (mm)	300 (mm)	350 (mm)	400 (mm)	450 (mm)	500 (mm)
20	Disabled	900			800	700	600	480
	Enabled	800				700	600	480
12	Disabled	640		560	480	400	320	280
	Enabled	560			480	400	320	280
6	Disabled	400 <360>	360	270	210	180	140	120
	Enabled	320 <270>		270	210	180	140	120
3	Disabled	160		135	110	80	70	60
	Enabled	135			110	80	70	60

(Unit: mm/s)

(Note) Values in brackets < > are for vertical use.

Correlation between torque and current limit



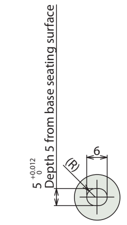
Dimensions

CAD drawings can be downloaded from our website.
www.elecylinder.de
2D CAD 3D CAD

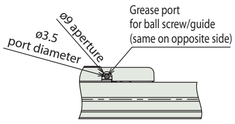
■ EC-WS10

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.

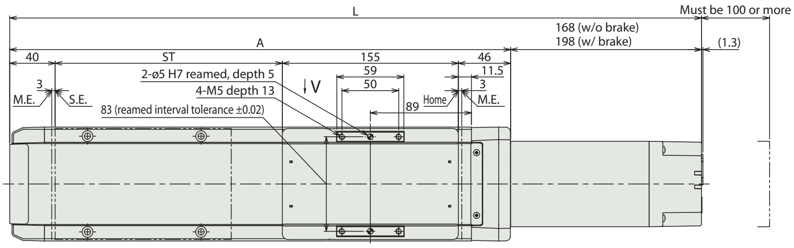
ST: Stroke
M.E: Mechanical end
S.E: Stroke end

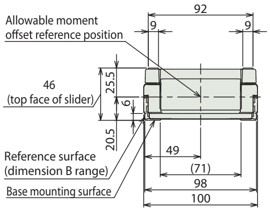


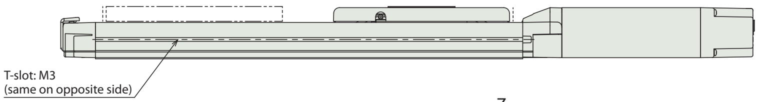
Detailed view of P
Base oblong hole details

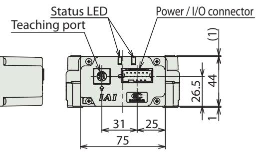


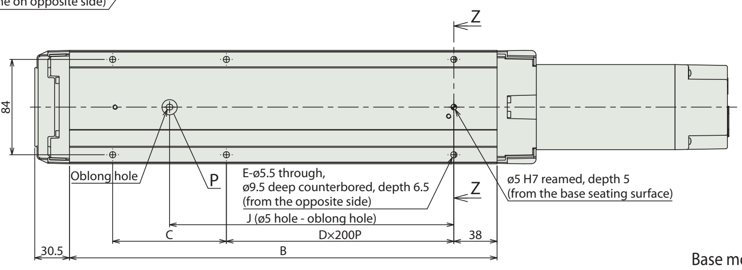
Arrow view V
Greasing port

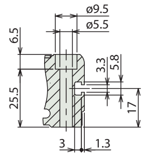












Cross section of Z-Z
Base mounting counterbored hole / detail of side T-slot

■ Dimensions by stroke

Stroke		50	100	150	200	250	300	350	400	450	500
L	Without brake	459	509	559	609	659	709	759	809	859	909
	With brake	489	539	589	639	689	739	789	839	889	939
A		291	341	391	441	491	541	591	641	691	741
B		226	276	326	376	426	476	526	576	626	676
C		150	200	50	100	150	200	50	100	150	200
D		0	0	1	1	1	1	2	2	2	2
E		4	4	6	6	6	6	8	8	8	8
J		100	150	200	250	300	350	400	450	500	550

■ Mass by stroke

Stroke		50	100	150	200	250	300	350	400	450	500
Mass (kg)	Without brake	2.7	2.9	3.2	3.4	3.7	3.9	4.2	4.4	4.7	4.9
	With brake	2.8	3.1	3.3	3.5	3.8	4.1	4.3	4.5	4.8	5.0

EC-WS12

Wide Slider | Simple Dust-proof | Coupled Motor | Body Width 120 mm | 24v Pulse Motor

■ Model Specification Items

EC	-			-		-		-	
Series	-	Type	Lead	-	Stroke	-	Power / I/O cable length	-	Options
		WS12 Standard	S 24mm		50 50mm		See power / I/O cable length below		See options below
			H 16mm		~ ~				
			M 8mm		800 800mm				
			L 4mm		(Every 50mm)				

CE RoHS 10

Horizontal Vertical Side Ceiling

POINT Selection Notes

(1) "Main Specifications" displays the payload's maximum value. If the energy-saving setting is enabled, the main specifications will change. Please refer to "Table of Payload by Speed/Acceleration" for details.
(2) If performing push-motion operations, refer to the "Correlation between Torque and Current Limit" diagram. The torques listed are only reference values. Please refer to P. 110 of the EleCylinder Catalog V10 for precautions.
(3) Duty must be restricted depending on the ambient operating temperature. Please refer to P. 3 for details.
(4) Pay close attention to the installation orientation. Please refer to P. 4 for details.
(5) Reference value of the overhang load length is under 500mm in the Ma, Mb, and Mc directions. Please refer to the figure on P. 32 of the EleCylinder Catalog V10 for overhang load lengths.
(6) The center of gravity of the attached object should be less than 1/2 of the overhang distance. Even when the overhang distance and load moment are within the allowable range, the operating conditions should be moderated, if some normal vibration or noise is observed.
(7) The "H" and "S" leads cannot be vertically mounted.
(8) Push-motion operations are unavailable for the "S" lead.

Power / I/O cable length

■ Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)	RCON-EC connection specification (Note 1) (with connectors on both edges)
0	No cable	Terminal block supplied (Note 2)	
1 ~ 3	1 ~ 3m	CB-EC-PWBIO□□□-RB supplied	CB-REC-PWBIO□□□-RB supplied
4 ~ 5	4 ~ 5m		
6 ~ 7	6 ~ 7m		
8 ~ 10	8 ~ 10m		

(Note 1) If RCON-EC connection specification (ACR) is selected as an option.
(Note 2) Only terminal block connector is included. Please refer to P. 16 for details.
(Note) Robot cable is standard.

■ 4-way connector cable

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

(Note 1) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

Options

Name	Option code	Reference page
RCON-EC connection specification (Note 1)	**ACR**	11
Brake	**B**	11
Air cylinder mounting plate	**CS**	11
Designated grease specification	**G5**	12
Non-motor end specification	**NM**	12
PNP specification	**PN**	12
Split motor and controller power supply specification	**TMD2**	12
Battery-less absolute encoder specification	**WA**	12
Wireless communication specification	**WL**	12
Wireless axis operation specification	**WL2**	12

(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.

Main Specifications

Item			Description			
Lead		Ball screw lead (mm)	24	16	8	4
Horizontal	Payload	Max. payload (kg) (energy-saving disabled)	10	20	40	62
		Max. payload (kg) (energy-saving enabled)	8	15	30	50
	Speed / acceleration/ deceleration	Max. speed (mm/s)	1000	720	420	210
		Min. speed (mm/s)	30	20	10	5
		Rated acceleration/deceleration (G)	0.3	0.3	0.3	0.3
		Max. acceleration/deceleration (G)	1	1	0.5	0.3
Vertical	Payload	Max. payload (kg) (energy-saving disabled)	-	-	8	13.5
		Max. payload (kg) (energy-saving enabled)	-	-	8	13.5
	Speed / acceleration/ deceleration	Max. speed (mm/s)	-	-	360	210
		Min. speed (mm/s)	-	-	10	5
		Rated acceleration/deceleration (G)	-	-	0.3	0.3
		Max. acceleration/deceleration (G)	-	-	0.5	0.3
Push		Max. push force (N)	-	84	168	337
		Max. push speed (mm/s)	-	20	20	20
Brake		Brake specification	Non-excitation actuating solenoid brake			
		Brake holding force (kgf)	-	-	8	13.5
Stroke		Min. stroke (mm)	50	50	50	50
		Max. stroke (mm)	800	800	800	800
		Stroke pitch (mm)	50	50	50	50

Item	Description
Driving system	Ball screw, ø12mm, rolled C10
Positioning repeatability	±0.05mm
Lost motion	N/A (two-point positioning function; cannot be represented)
Base	Dedicated aluminum extruded material (A6063SS-T6 equivalent), black alumite treatment
Linear guide	Linear motion infinite circulating type
Static allowable moment	Ma:328N•m
	Mb:328N•m
	Mc:751N•m
Dynamic allowable moment (Note 1)	Ma:77.0N•m
	Mb:77.0N•m
	Mc:176N•m
Ambient operating temperature, humidity	0 ~ 40°C, 85%RH or less (Non-condensing)
Degree of protection	IP20
Vibration & shock resistance	$4.9m/s^2$
Overseas standards	CE marking, RoHS directive
Motor type	Pulse motor
Encoder type	Incremental/battery-less absolute
Number of encoder pulses	800 pulse/rev

(Note 1) Based on the standard rated operation life of 5000km. Operation life varies according to operating and mounting conditions. Please refer to service life on P. 33 of the EleCylinder Catalog V10.

■ Slider type moment direction

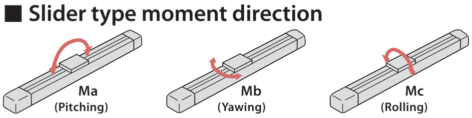


Table of Payload by Speed/Acceleration

■ Energy-saving setting disabled

The unit for payload is kg. If blank, operation is not possible.

Lead 24

Orientation	Horizontal			
Speed (mm/s)	Acceleration (G)			
	0.3	0.5	0.7	1
0	10	8	6	4
360	10	8	6	4
460	10	8	6	3.5
500	10	7.5	5.5	3.5
580	10	6.5	4.5	3
640	10	6	4	2.5
700	9	5	3.5	2
800	7.5	4.5	3	1.5
900	6	3	2	
1000		1.5		

Lead 16

Orientation	Horizontal			
Speed (mm/s)	Acceleration (G)			
	0.3	0.5	0.7	1
0	20	14	9	7
280	20	14	9	7
320	20	14	9	6
360	20	14	8.5	5.5
420	20	12	7	5
460	18	11	6.5	4.5
500	16	10	6	4
580	13	8	4.5	3
640	11	6	3.5	2
720	7	4	2	

Lead 8

Orientation	Horizontal		Vertical	
Speed (mm/s)	Acceleration (G)			
	0.3	0.5	0.3	0.5
0	40	30	8	7.5
140	40	30	8	7.5
160	40	30	8	7.5
190	40	30	8	7.5
220	40	25	7	6
250	35	20	6	5
280	30	16	5	4
320	22	12	4	3
360	15	9	3	2
420	8	5		

Lead 4

Orientation	Horizontal	Vertical
Speed (mm/s)	Acceleration (G)	
	0.3	0.3
0	62	13.5
65	62	13.5
75	62	13.5
95	62	13.5
110	62	13.5
125	55	13.5
140	50	11
160	42	9
180	35	7
210	20	3

■ Energy-saving setting enabled

The unit for payload is kg. If blank, operation is not possible.

Lead 24

Orientation	Horizontal	
Speed (mm/s)	Acceleration (G)	
	0.3	0.7
0	8	5
360	8	5
460	8	4
500	7.5	3.5
580	6.5	3
640	5	2.5
700	4	1.5
800	1.5	

Lead 16

Orientation	Horizontal	
Speed (mm/s)	Acceleration (G)	
	0.3	0.7
0	15	7
280	15	7
320	15	7
360	13	6
420	11	5
460	10	4.5
500	8	3
580	5	1.5
640	3	

Lead 8

Orientation	Horizontal	Vertical
Speed (mm/s)	Acceleration (G)	
	0.3	0.3
0	30	8
140	30	8
160	30	8
190	25	6.5
220	20	4.5
250	16	3
280	12	2
320	8	

Lead 4

Orientation	Horizontal	Vertical
Speed (mm/s)	Acceleration (G)	
	0.3	0.3
0	50	13.5
65	50	13.5
75	50	13.5
95	50	11
110	40	8
125	32	6
140	25	4
160	15	2

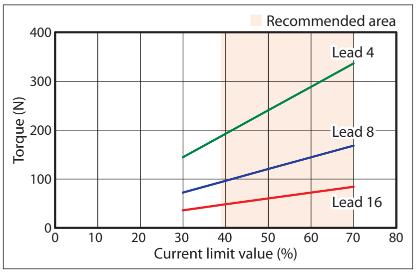
Stroke and maximum speed

<table>
<tr><th>Lead (mm)</th><th>Energy-saving setting</th><th>50 ~ 250 (Every 50mm)</th><th>300 (mm)</th><th>350 (mm)</th><th>400 (mm)</th><th>450 (mm)</th><th>500 (mm)</th><th>550 (mm)</th><th>600 (mm)</th><th>650 (mm)</th><th>700 (mm)</th><th>750 (mm)</th><th>800 (mm)</th></tr>
<tr><td rowspan="2">24</td><td>Disabled</td><td colspan="4">1000</td><td>900</td><td>800</td><td>700</td><td>580</td><td>500</td><td>460</td><td>400</td><td>360</td></tr>
<tr><td>Enabled</td><td colspan="6">800</td><td>700</td><td>580</td><td>500</td><td>460</td><td>400</td><td>360</td></tr>
<tr><td rowspan="2">16</td><td>Disabled</td><td colspan="2">720</td><td>640</td><td>580</td><td>500</td><td>420</td><td>360</td><td>320</td><td>280</td><td>240</td><td>220</td><td>200</td></tr>
<tr><td>Enabled</td><td colspan="3">640</td><td>580</td><td>500</td><td>420</td><td>360</td><td>320</td><td>280</td><td>240</td><td>220</td><td>200</td></tr>
<tr><td rowspan="2">8</td><td>Disabled</td><td>420 <360></td><td>360</td><td>280</td><td>250</td><td>220</td><td>190</td><td>170</td><td>150</td><td>130</td><td>110</td><td>90</td><td>85</td></tr>
<tr><td>Enabled</td><td colspan="2">320 <280></td><td>280</td><td>250</td><td>220</td><td>190</td><td>170</td><td>150</td><td>130</td><td>110</td><td>90</td><td>85</td></tr>
<tr><td rowspan="2">4</td><td>Disabled</td><td>210</td><td>180</td><td>140</td><td>125</td><td>110</td><td>95</td><td>85</td><td>75</td><td>65</td><td>55</td><td>50</td><td>45</td></tr>
<tr><td>Enabled</td><td colspan="2">160</td><td>140</td><td>125</td><td>110</td><td>95</td><td>85</td><td>75</td><td>65</td><td>55</td><td>50</td><td>45</td></tr>
</table>

(Unit: mm/s)

(Note) Values in brackets < > are for vertical use.

Correlation between torque and current limit



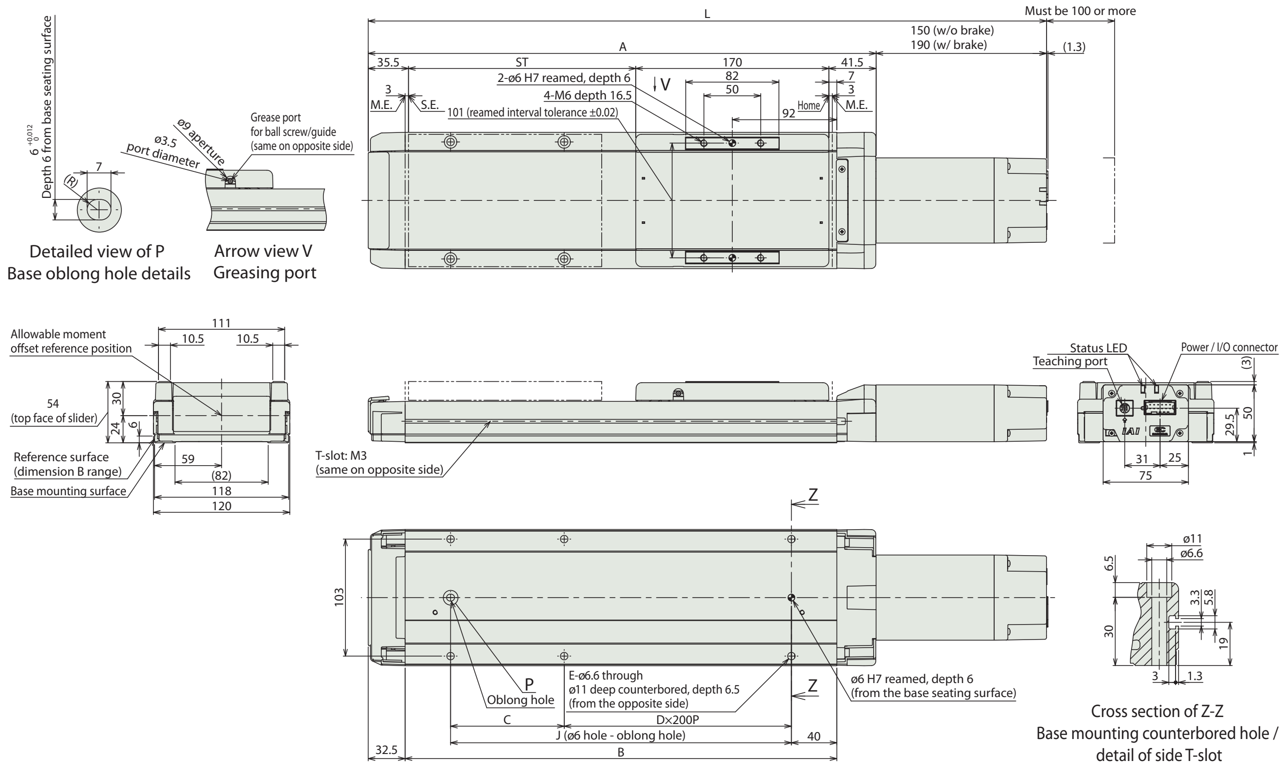
Dimensions

CAD drawings can be downloaded from our website. **www.elecylinder.de** 2D CAD 3D CAD

■ EC-WS12

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.

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



■ Dimensions by stroke

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	Without brake	447	497	547	597	647	697	747	797	847	897	947	997	1047	1097	1147	1197
	With brake	487	537	587	637	687	737	787	837	887	937	987	1037	1087	1137	1187	1237
A		297	347	397	447	497	547	597	647	697	747	797	847	897	947	997	1047
B		230	280	330	380	430	480	530	580	630	680	730	780	830	880	930	980
C		150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
D		0	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4
E		4	4	6	6	6	6	8	8	8	8	10	10	10	10	12	12
J		150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900

■ Mass by stroke

Stroke		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Mass (kg)	Without brake	3.4	3.7	4.1	4.5	4.8	5.2	5.5	5.9	6.2	6.6	6.9	7.3	7.6	8.0	8.4	8.7
	With brake	3.7	4.0	4.4	4.7	5.1	5.5	5.8	6.2	6.5	6.9	7.2	7.6	7.9	8.3	8.6	9.0

EleCylinder Series Options

RCON-EC connection specification *Cannot be selected with the TMD2 and PN options (the ACR option includes the split motor and controller power supply specification)

Model ACR

Description This option should be selected to connect over an R-unit to a field network.

Brake

Model B

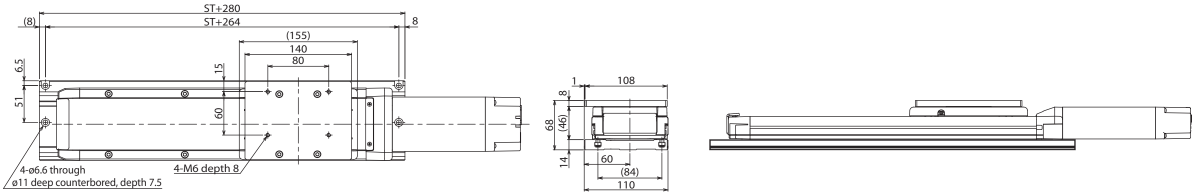
Description This mechanism stops the slider from moving when the power or servo is turned off.

Air cylinder mounting plates

Model CS

Description These plates provide compatibility for mounting with some models of rodless air cylinders.
Plates can be mounted to the slider carriage and actuator base to align their heights with the slider on an air cylinder.
*Not shipped assembled. Assembly required.
(Note 1) Selecting CS will reduce the payload by 1kg. (Note 2) Cannot be side mounted, invert mounted, or vertically mounted.

EC-WS10 Individual model number
Base bracket: EC-CSB-WS10-(stroke) (material: aluminum) Slider bracket: EC-CSS-WS10 (material: carbon steel, nickel plated)



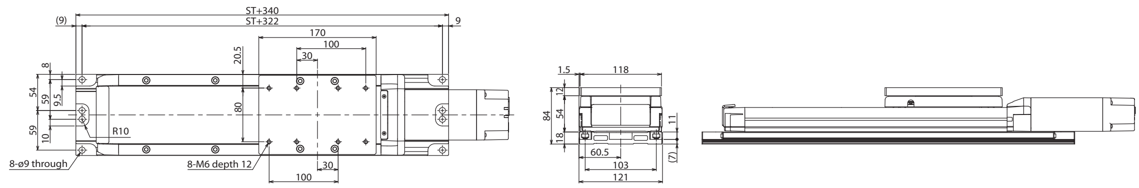
◆ Additional accessories
• Hex socket bolts (for mounting to the slider carriage): M5×10 (4 bolts)
• Parallel pin: ø5×8 type B h7 (2 pins)
• Hex socket bolts (for mounting to the actuator base): M5×35 (no. of bolts shown in following table)
• Square nuts: □8×4 M5 (no. of nuts shown in following table)

Stroke	50 ~ 100	150 ~ 300	350 ~ 500
Quantity	4	6	8

◆ Mass by stroke (plate addition)

Stroke	50	100	150	200	250	300	350	400	450	500
Added mass (kg)	2.1	2.2	2.4	2.6	2.8	2.9	3.1	3.3	3.4	3.6

EC-WS12 Individual model number
Base bracket: EC-CSB-WS12-(stroke) (material: aluminum) Slider bracket: EC-CSS-WS12 (material: aluminum)



◆ Additional accessories
• Hex socket bolts (for slider mounting): M6×15 (4 bolts)
• Parallel pin: ø6×10 type B h7 (2 pins)
• Hex socket bolts (for base mounting): M6×40 (no. of bolts shown in following table)
• Square nuts: □10×5 M6 (no. of nuts shown in following table)

Stroke	50 ~ 100	150 ~ 300	350 ~ 500	550 ~ 700	750 ~ 800
Quantity	4	6	8	10	12

◆ Mass by stroke (plate addition)

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Added mass (kg)	2.2	2.5	2.7	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.6	4.8	5.1	5.3	5.5

Designated grease specification

Model G5

Description Replaces the grease applied to the actuator ball screw and linear guide with food grade grease (White Alcom Grease).

Non-motor end specification

Model NM

Description The standard home position is set to the motor side, but this option reverses the home position to the opposite end in order to accommodate equipment variations and the facility layout.

PNP specification *Cannot be selected with ACR option, which must be the NPN specification.

Model PN

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

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

Model TMD2

Description This option provides separate power for the motor and controller.
Select this option to allow shutting down the actuator drive power only.
Please refer to P. 16 for more information on wiring.

Battery-less absolute encoder specification

Model WA

Description EC actuators use incremental encoders as a standard feature.
Specify this option to use the battery-less absolute encoder instead.

Wireless communication specification

Model WL

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

Wireless axis operation specification

Model WL2

Description Specifying WL2 allows for the product to operate wirelessly as with WL (start point, end point, and AVD adjustment), and to also perform axis travel operation tests (forward end/backward end movement, jog, and inching). However, this function is not meant to perform continuous operation. Please refer to P. 118 of the EleCylinder Catalog V10 for precautions on axis operations using a wireless connection.
(Note) WL cannot be changed to WL2, or WL2 to WL, by the customer. Please contact IAI for this.

Air cylinder mounting plates option (model: CS)

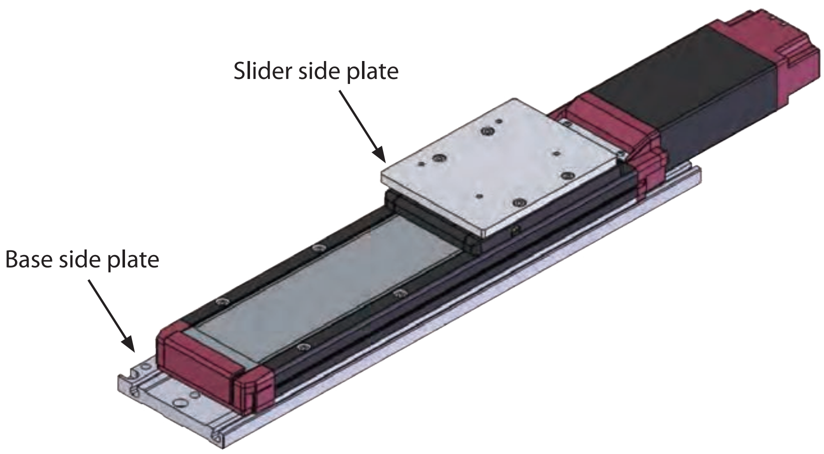
Plates to mount to the air cylinder slider and base are supplied if the "Air cylinder mounting plates option" (model: CS) is selected.

The air cylinder mounting plate (slider side) can be mounted to the slider on an air cylinder to align mounting holes on transported objects with some models of rodless air cylinders.

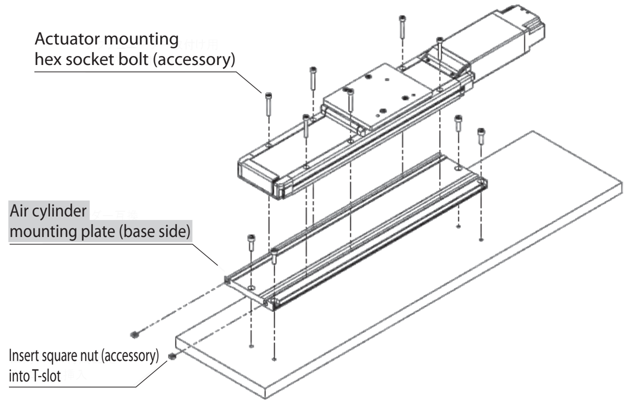
First mount the air cylinder mounting plate (base side) to the desired position on the base, and then mount EleCylinder to the T-slot on the plate.
EleCylinder can be mounted to any position for securing to the T-slot.
This will allow the position of the slider to be aligned with some models of rodless air cylinders.

Mounting plates to both the slider side and base side will also make it possible to align the body height with some models of rodless air cylinders.

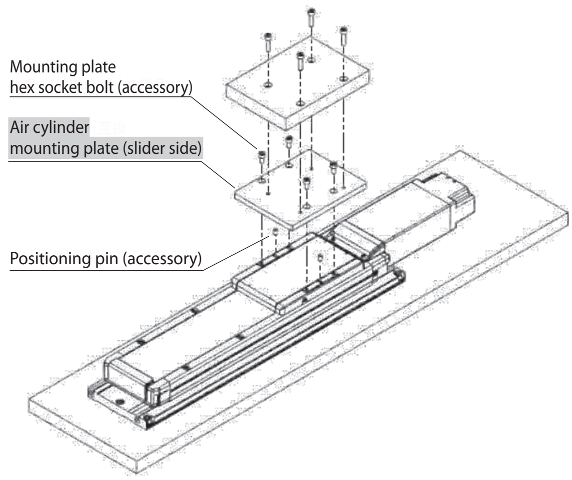
Please contact our sales department for details.



<Body mounting>

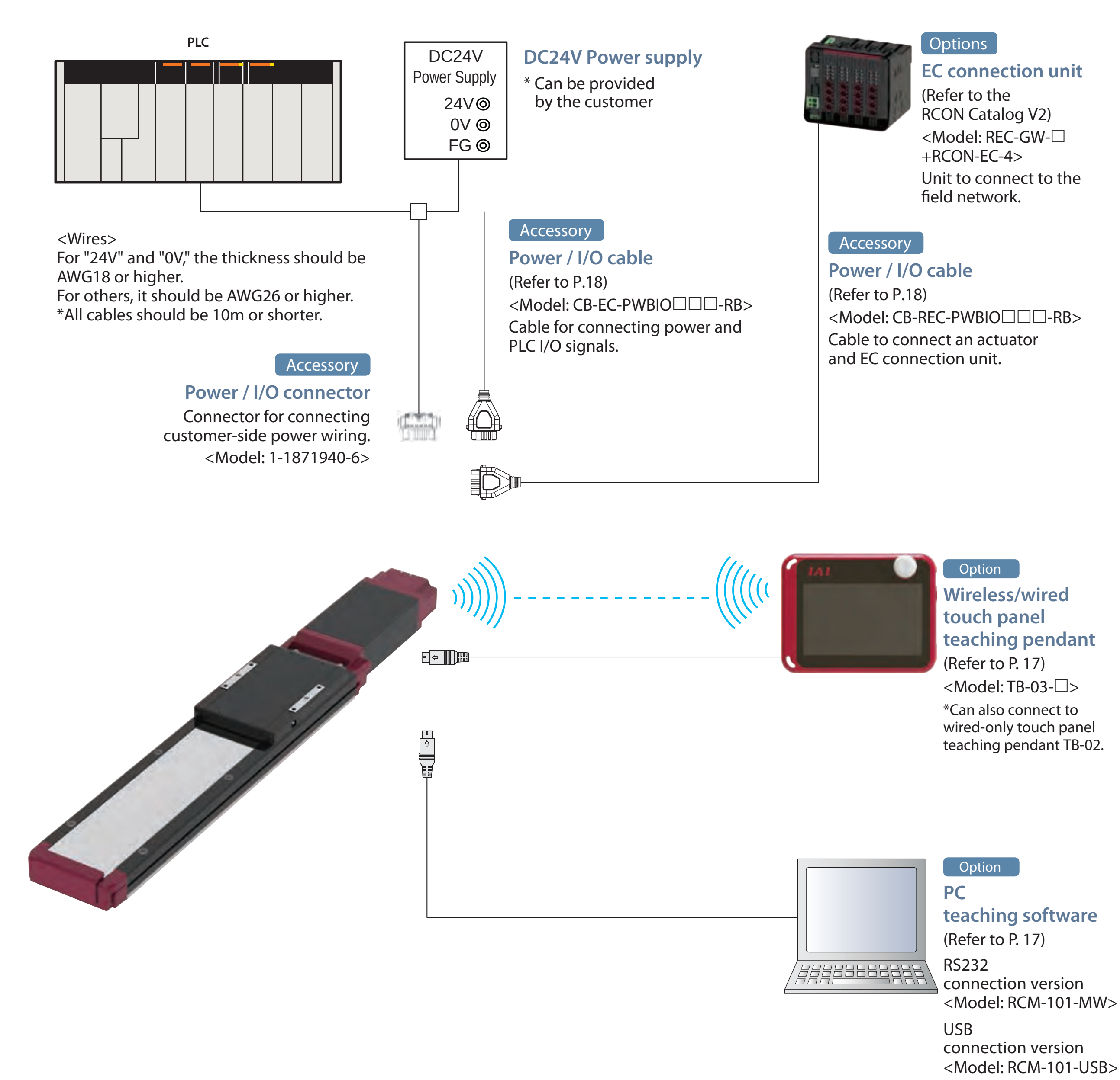


<Transported object mounting>



<Caution>
•Selecting the "Air cylinder mounting plates option (CS)" will reduce the payload by 1kg.
•Cannot be installed vertically, on its side, or from the ceiling.

System Configuration



List of accessories

■ Power / I/O cables, connectors

[Standard connector]

Product category		Accessory
Power / I/O cable length (selected with actuator model)	RCON-EC connection specification (ACR) selection	
0	No	Power / I/O connector (1-1871940-6)
	Yes	—
1 ~ 10	No	Power / I/O cable (CB-EC-PWBIO□□□-RB)
	Yes	Power / I/O cable (CB-REC-PWBIO□□□-RB)

[Four-way connector]

Product category		Accessory
Power / I/O cable length (selected with actuator model)	RCON-EC connection specification (ACR) selection	
S1 ~ S10	No	Power / I/O cable (CB-EC2-PWBIO□□□-RB)
	Yes	Power / I/O cable (CB-REC2-PWBIO□□□-RB)

Basic Controller Specifications

<table>
<tr><th colspan="3">Specification item</th><th>Specification content</th></tr>
<tr><td colspan="3">Number of controlled axes</td><td>1 axis</td></tr>
<tr><td colspan="3">Power supply voltage</td><td>24VDC ±10%</td></tr>
<tr><td colspan="3">Power capacity</td><td>With energy-saving setting disabled: Rated 3.5A, max. 4.2A
With energy-saving setting enabled: Max. 2.2A</td></tr>
<tr><td colspan="3">Brake release power supply</td><td>24VDC ±10%, 200mA (only for external brake release)</td></tr>
<tr><td colspan="3">Generated heat</td><td>8W (at 100% duty)</td></tr>
<tr><td colspan="3">Inrush current (Note 1)</td><td>8.3A (with inrush current limit circuit)</td></tr>
<tr><td colspan="3">Momentary power failure resistance</td><td>Max 500μs</td></tr>
<tr><td colspan="3">Motor size</td><td>□35, □42</td></tr>
<tr><td colspan="3">Motor rated current</td><td>1.2A</td></tr>
<tr><td colspan="3">Motor control system</td><td>Weak field-magnet vector control</td></tr>
<tr><td colspan="3">Supported encoders</td><td>Incremental (800 pulse/rev), battery-less absolute encoder (800 pulse/rev)</td></tr>
<tr><td colspan="3">SIO</td><td>RS485 1ch (Modbus protocol compliant)</td></tr>
<tr><td rowspan="10">PIO</td><td rowspan="5">Input specification</td><td>No. of inputs</td><td>3 points (forward, backward, alarm clear)</td></tr>
<tr><td>Input voltage</td><td>24VDC ±10%</td></tr>
<tr><td>Input current</td><td>5mA per circuit</td></tr>
<tr><td>Leakage current</td><td>Max. 1mA per point</td></tr>
<tr><td>Isolation method</td><td>Non-isolated</td></tr>
<tr><td rowspan="5">Output specification</td><td>No. of outputs</td><td>3 points (forward complete, backward complete, alarm)</td></tr>
<tr><td>Output voltage</td><td>24VDC ±10%</td></tr>
<tr><td>Output current</td><td>50mA per point</td></tr>
<tr><td>Residual voltage</td><td>2V or less</td></tr>
<tr><td>Isolation method</td><td>Non-isolated</td></tr>
<tr><td colspan="3">Data setting, input method</td><td>PC teaching software, touch panel teaching pendant, digital speed controller</td></tr>
<tr><td colspan="3">Data retention memory</td><td>Position and parameters are saved in non-volatile memory (no limit to number of rewrites)</td></tr>
<tr><td rowspan="2">LED display</td><td colspan="2">Controller status display</td><td>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)</td></tr>
<tr><td colspan="2">Wireless status display</td><td>Initializing wireless hardware, without wireless connection, or connecting from TP board (light OFF) Connecting through wireless (green blinking) / Wireless hardware error (red blinking) / Initializing when power comes ON (orange light ON)</td></tr>
<tr><td colspan="3">Predictive maintenance/preventative maintenance</td><td>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</td></tr>
<tr><td colspan="3">Ambient operating temperature</td><td>0 ~ 40°C</td></tr>
<tr><td colspan="3">Ambient operating humidity</td><td>85% RH or less (Non-condensing or freezing)</td></tr>
<tr><td colspan="3">Operating environment</td><td>No corrosive gas and excessive dust</td></tr>
<tr><td colspan="3">Insulation resistance</td><td>500 VDC 10MΩ</td></tr>
<tr><td colspan="3">Electric shock protection mechanism</td><td>Class 1 basic insulation</td></tr>
<tr><td colspan="3">Cooling method</td><td>Natural air cooling</td></tr>
</table>

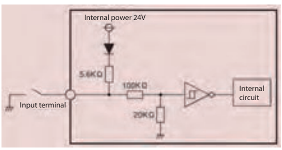
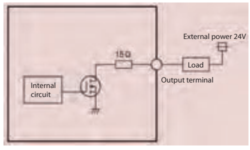
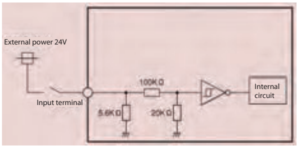
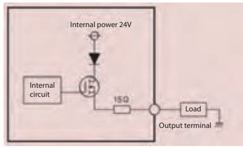
(Note 1) Inrush current flows for approximately 5ms after the power is input. (At 40°C.) Inrush current value differs depending on the impedance on the power line.

Solenoid valve method

EleCylinder products normally use a double solenoid method.
Change parameter No. 9 ("Solenoid valve type selection") to use the single solenoid method.

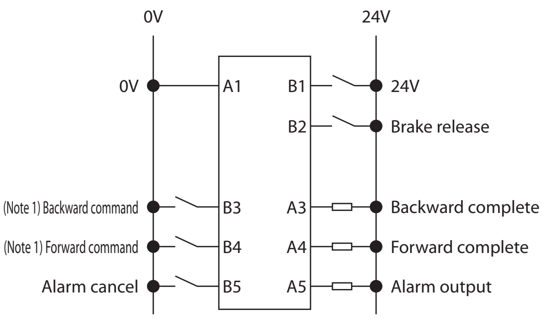
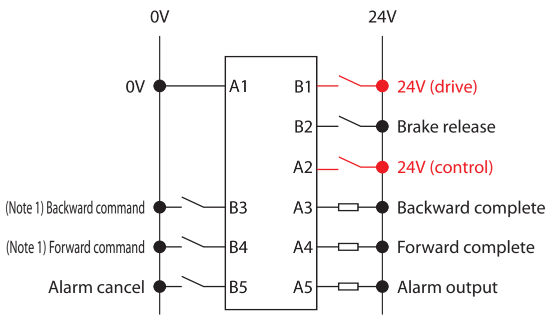
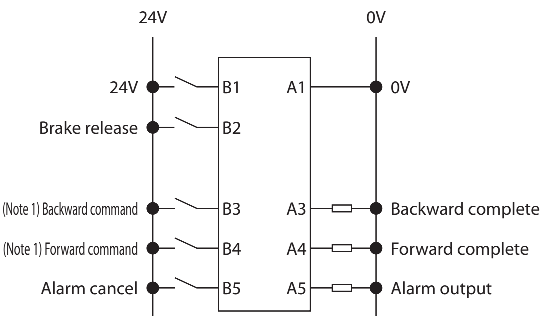
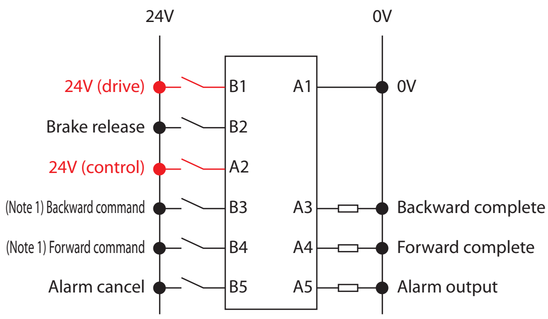
<Caution>
Operation cannot be performed using the single solenoid method when operating connected to RCON-EC.

I/O (Input/Output) Specifications

I/O		Input		Output	
Specifications		Input voltage	24VDC ±10%	Load voltage	24VDC ±10%
		Input current	5mA per circuit	Maximum load current	50mA per point
		ON/OFF voltage	ON voltage: MIN. 18VDC OFF voltage: MAX. 6VDC	Residual voltage	2V or less
		Leakage current	Max. 1mA per point	Leakage current	Max. 0.1mA per 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		0V A1 (Reserved) A2 (Note 1) Backward complete A3 (Note 1) Forward complete A4 Alarm output A5 (Reserved) A6  B1 24V B2 Brake release B3 Backward command B4 Forward command B5 Alarm cancel B6 (reserved)	0V A1 24V (control) A2 (Note 1) Backward complete A3 (Note 1) Forward complete A4 Alarm output A5 (Reserved) A6  B1 24V (drive) B2 Brake release B3 Backward command B4 Forward command B5 Alarm cancel B6 (reserved)
I/O logic	NPN		
	PNP		

(Note 1) Switching to the single solenoid method will change B3 to "Forward/Backward command" and B4 to "Unused."

I/O Signal Table

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

(Note 1) Switching to the single solenoid method will change B3 to "Forward/Backward" and B4 to "Unused".
However, the power / I/O connector display will still read "B3: Backward" and "B4: Forward."

(Note 2) B1 is 24V (drive) and A2 is 24V (control) for split motor and controller power supply specification (TMD2).

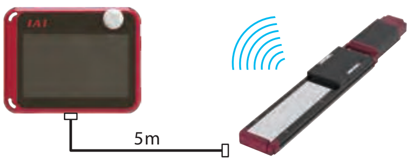
Option

Wireless/wired touch panel teaching pendant

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

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

■ Configuration Wireless or wired connection



■ **Specifications**

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 ~ 40°C
Ambient operating humidity	20 ~ 85%RH (Non-condensing)
Environmental resistance	IPX0
Mass	Approx. 485g (body) + approx. 175g (battery)
Charging method	Wired connection with dedicated adapter/controller
Wireless connection	Bluetooth4.2 class2

PC teaching software (Windows only)

■ **Features** This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

■ **Model** **RCM-101-MW** (with an external device communication cable + RS232 conversion unit)

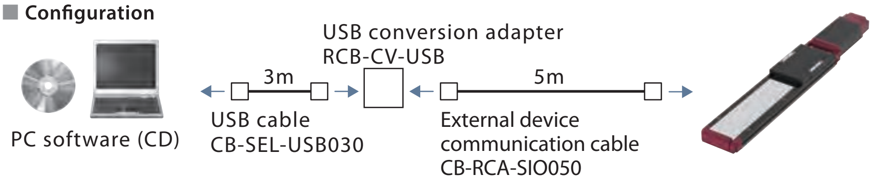
Please contact IAI for the current supported versions.

■ **Configuration**

■ **Model** **RCM-101-USB** (with an external device communication cable + USB conversion adapter + USB cable)

Please contact IAI for the current supported versions.

■ **Configuration**



Maintenance Parts

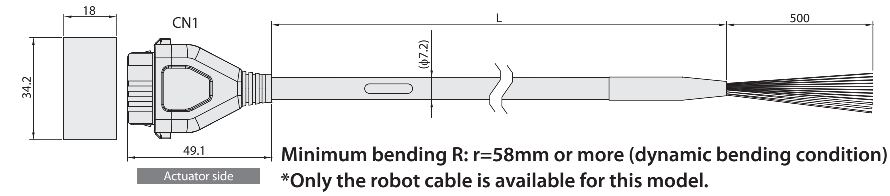
When placing an order for a replacement cable, please use the model name shown below.

■ Table of compatible cables

Cable type	Cable model
Power / I/O cable (user-wired specification)	CB-EC-PWBIO□□□-RB
Power / I/O cable (user-wired specification, four-way connector)	CB-EC2-PWBIO□□□-RB
Power / I/O cable (RCON-EC connection specification)	CB-REC-PWBIO□□□-RB
Power / I/O cable (RCON-EC connection specification, four-way connector)	CB-REC2-PWBIO□□□-RB

Model CB-EC-PWBIO□□□-RB

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



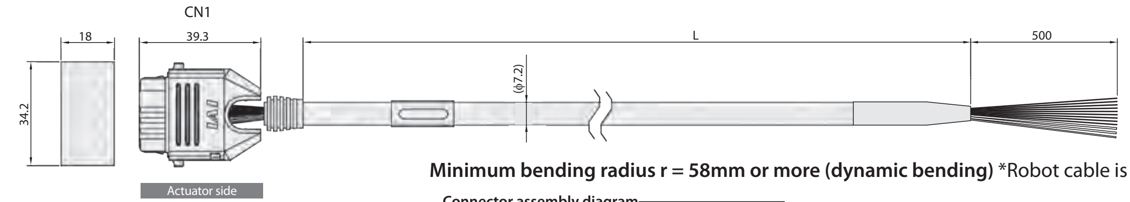
Minimum bending R: r=58mm or more (dynamic bending condition)
***Only the robot cable is available for this model.**

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

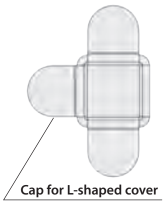
(Note 1) 24V (control) when split motor and controller power supply specification (TMD2) selected.

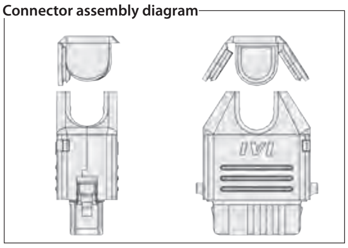
Model CB-EC2-PWBIO□□□-RB

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



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



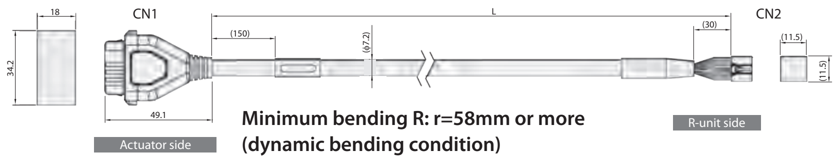


Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V	B1
Light blue (AWG22)	(Reserved) (Note 1)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	(Reserved)	B6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
White (AWG26)	(Reserved)	A6
Brown (AWG26)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

(Note 1) 24V (control) when split motor and controller power supply specification (TMD2) selected.

Model CB-REC-PWBIO□□□-RB

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

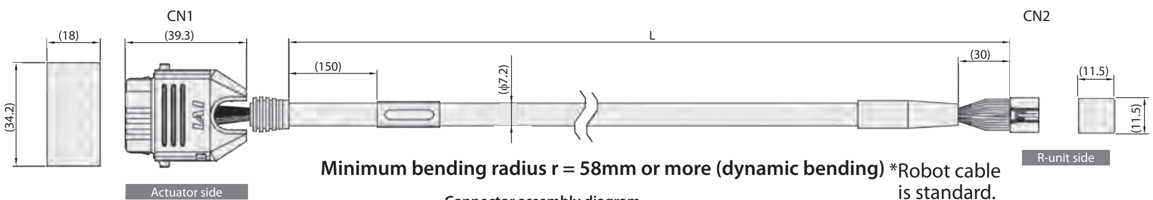


Minimum bending R: r=58mm or more (dynamic bending condition)
*Only the robot cable is available for this model.

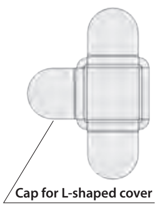
Color	Signal name	Pin No.	Pin No.	Signal name	Color
Black (AWG18)	0V	A1			
Red (AWG18)	24V(MP)	B1	1	24V(MP)	Red (AWG18)
Light blue (AWG22)	24V(CP)	A2	12	24V(CP)	Light blue (AWG22)
Orange (AWG26)	IN0	B3	7	OUT0	Orange (AWG26)
Yellow (AWG26)	IN1	B4	8	OUT1	Yellow (AWG26)
Green (AWG26)	IN2	B5	9	OUT2	Green (AWG26)
Pink (AWG26)	SD+	B6	6	SD+	Pink (AWG26)
White (AWG26)	SD-	A6	10	SD-	White (AWG26)
Blue (AWG26)	OUT0	A3	3	INO	Blue (AWG26)
Purple (AWG26)	OUT1	A4	4	IN1	Purple (AWG26)
Gray (AWG26)	OUT2	A5	5	IN2	Gray (AWG26)
Brown (AWG26)	BKRLS	B2	11	BKRLS	Brown (AWG26)
			13	FG	Green (AWG26)

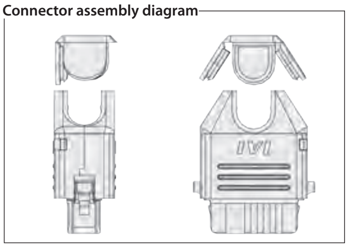
Model CB-REC2-PWBIO□□□-RB

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



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





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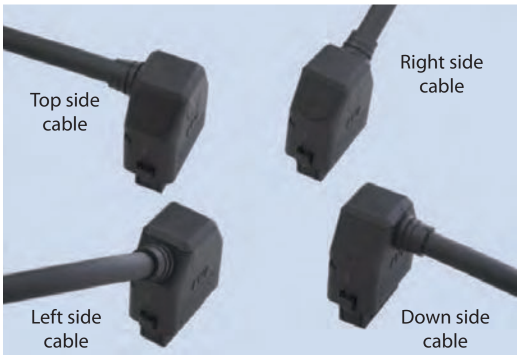
Color	Signal name	Pin No.	Pin No.	Signal name	Color
Black (AWG18)	0V	A1	2	0V	Black (AWG22)
Red (AWG18)	24V(MP)	B1	1	24V(MP)	Red (AWG22)
Light blue (AWG22)	24V(CP)	A2	12	24V(CP)	Light blue (AWG22)
Orange (AWG26)	IN0	B3	7	OUT0	Orange (AWG26)
Yellow (AWG26)	IN1	B4	8	OUT1	Yellow (AWG26)
Green (AWG26)	IN2	B5	9	OUT2	Green (AWG26)
Yellow (AWG26)	SD+	B6	6	SD+	Yellow (AWG26)
Light gray (AWG26)	SD-	A6	10	SD-	Light gray (AWG26)
Blue (AWG26)	OUT0	A3	3	INO	Blue (AWG26)
Purple (AWG26)	OUT1	A4	4	IN1	Purple (AWG26)
Gray (AWG26)	OUT2	A5	5	IN2	Gray (AWG26)
Brown (AWG26)	BKRLS	B2	11	BKRLS	Brown (AWG26)
			13	FG	Green (AWG26)

Maintenance Parts

■ Four-way connector cable

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

Model: CB-EC2-PWBIO□□□-RB



Cable direction can be set to any of 4 directions

- The wiring on the side opposite the connector is left unprepared.
- The cable length may be from 1m to 10m long. The length can be specified in 1m units.
- Example models are listed below.

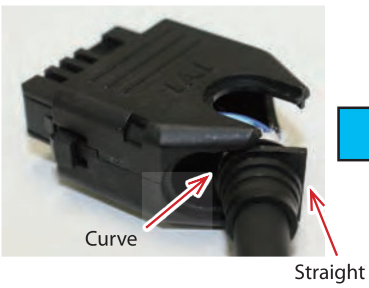
Cable length **1**m	→	CB-EC2-PWBIO**010**-RB
Cable length **3**m	→	CB-EC2-PWBIO**030**-RB
Cable length **10**m	→	CB-EC2-PWBIO**100**-RB

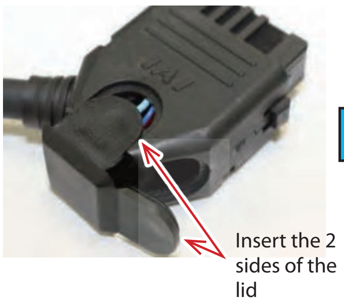
Follow the procedure below to assemble the connector in the desired direction.

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.





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