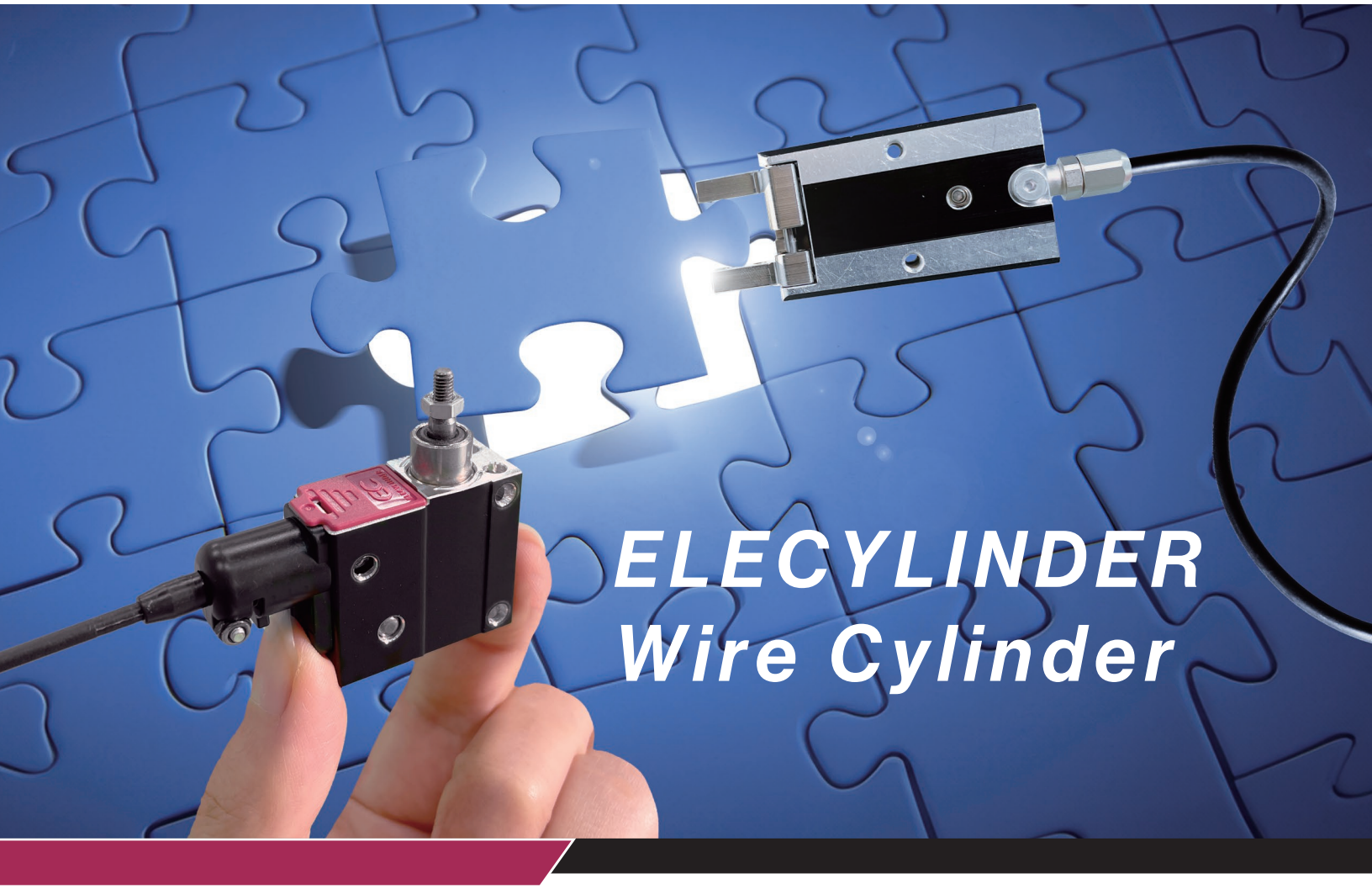
IAI
Quality and Innovation

ELECYLINDER®
Wire Cylinder

EC-WER1
EC-WEGR2



www.intelligentactuator.com

The final piece in the full-motorization puzzle

ELECYLINDER® Wire Cylinder

POINT 01

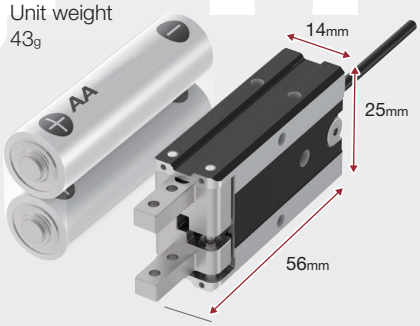
Motorized and yet tiny

We want motorized equipment, but it's so big...

Created based on customer requests like this

Rod Type
Unit weight
10 stroke: 32g
20 stroke: 48g

Gripper Type
Unit weight
43g



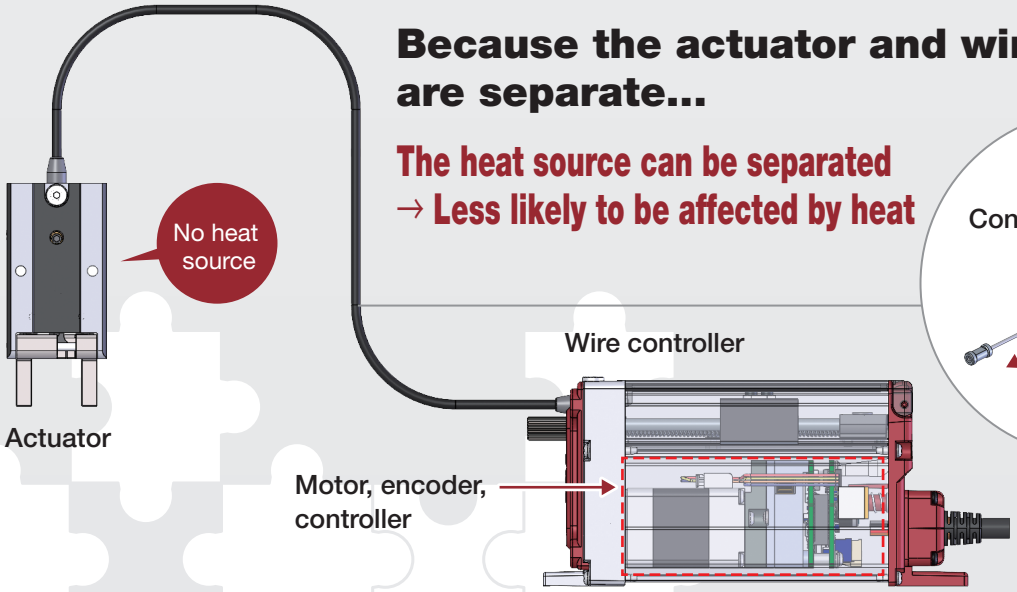
Size/specs equivalent to small-diameter air cylinder (cylinder I.D. Ø6 ~ 8)

No speed controller, switch, or air tube required, **saving even more space**

ELECYLINDER/Wire Cylinder

POINT 02

An industry first! New drive system Patented

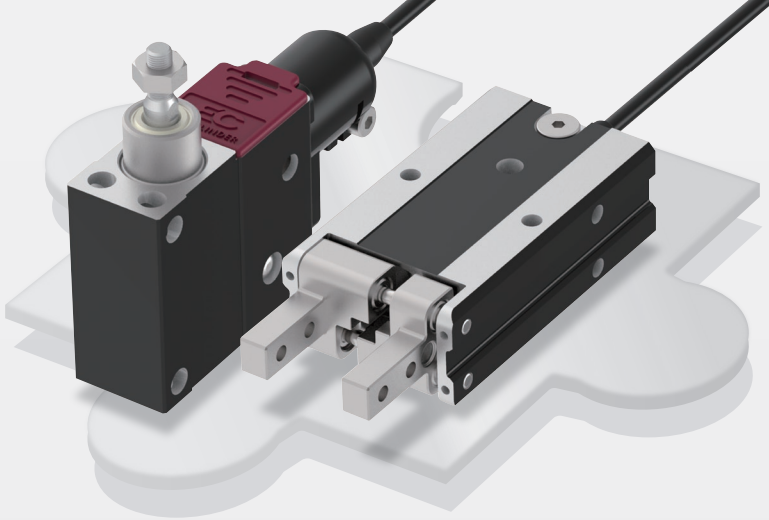


Because the actuator and wire controller are separate...

The heat source can be separated
→ Less likely to be affected by heat

Wire controllers enable adjustment of

Position | **Speed** | **Acceleration/Deceleration** | **Push force/Grip force**



ELECYLINDER

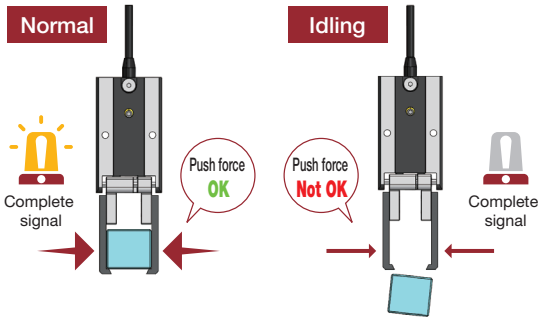
EC-WER1
EC-WEGR2

POINT **03** What motorization can do

Numerical setting is possible: **Simple & Accurate**

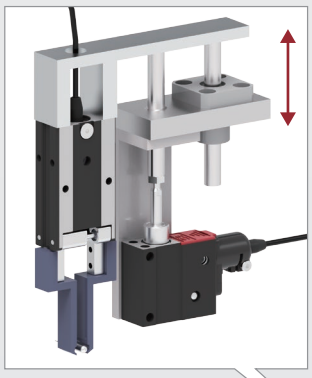
Wireless/wired teaching pendant TB-03

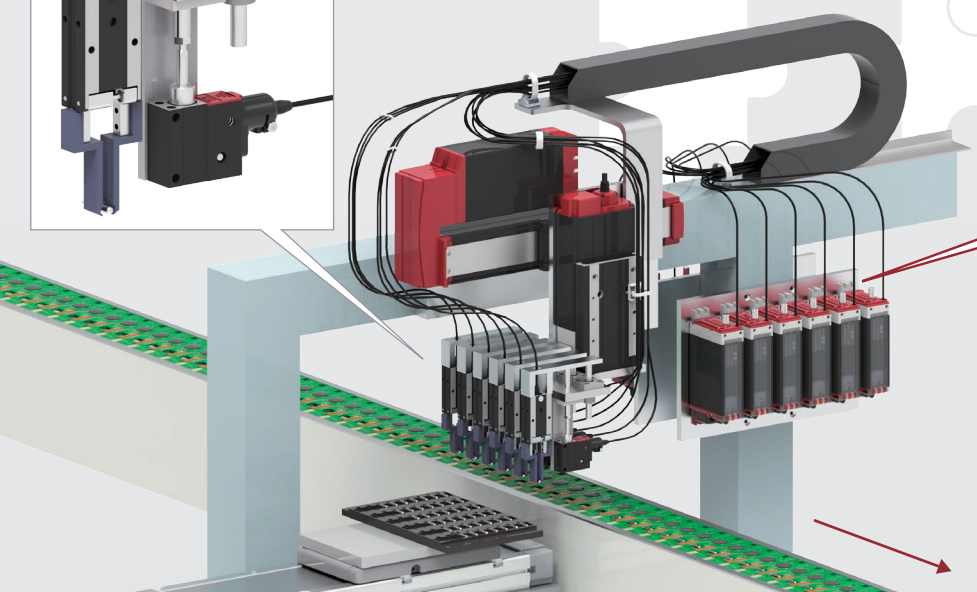
Setting the push terminal position **enables push (grip) complete / idling decision**



Application Examples | Watch circuit board assembly process

Small and lightweight, multiple axes can be installed together at a robot tip





[Operation description]

Rod type raise/lower motion and gripper type grip motion are combined to pick & place parts (quartz).

Up to 16 wire controllers can also be installed in close proximity

Video here ▶

intelligentactuator.com/wire-cylinder-video1

Model Specification Items

ELECYLINDER® Wire Cylinder

NPN specification is standard. PNP option is available.

EC - [Type] [Drive specifications] - [Stroke] - [Control wire length] - [Actuator cable length] - [Power·I/O cable length] - ([Options])

Series: EC

Type

<Rod Type>

WER1	Wire rod body width 13mm

<Gripper Type>

WEGR2	Wire gripper body width 25mm

Drive specifications

<Rod Type>

SA	Single-action specification

<Gripper Type>

EG	Single-action O.D. grip specification
IG	Single-action I.D. grip specification

Stroke

<Rod Type>

10	10mm
20	20mm

<Gripper Type>

4	4mm (One side 2 mm)

Control wire length

05	0.5m
↓	↓
30	3m

(every 0.5m)

Actuator cable length

1	1m
↓	↓
10	10m

(every 1m)

(Note) When connecting via the interface box, 9m is the maximum.

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

(every 1m)

(S): Cable with 4-way connector

*When selecting RCON-EC connection specification (ACR), select "0." Power·I/O cable and power·I/O connector are not included.

(Note) Make sure that the total length along with the actuator cable is 10m or less.

Power·I/O cable length

Options

Left blank	Incremental encoder specification, NPN specification (connection via interface box), no option
ACR	RCON-EC connection specification*1
CJL	Cable exit direction (left)
CJR	Cable exit direction (right)
CJT	Cable exit direction (top)
MF	3 position mode specification
NFA	Tip adapter (internal thread)*2
PN	PNP specification (connection via interface box)*1
TMD2	Split motor and controller power supply specification (connection via interface box)*1
WA	Battery-less absolute encoder specification
WL	Wireless communication specification (connection via interface box)*3
WL2	Wireless axis operation specification (connection via interface box)*3

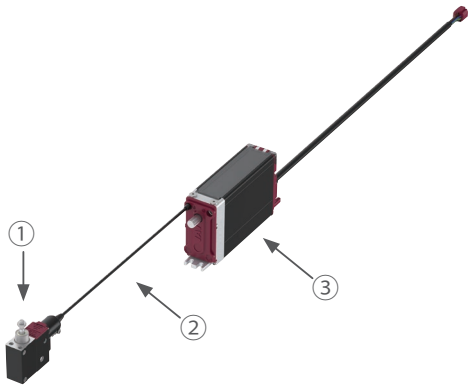
*1 If "ACR" is selected, "PN" and "TMD2" options cannot be selected (I/O for the "ACR" option is NPN only; compatible with split motor and controller power supply as standard)

*2 Only rod type available

*3 Selectable when RCON-EC connection specification "ACR" has not been selected (For wireless communication, refer to P.22)

The model number above is a set model number composed of ① actuator unit, ② control wire, and ③ wire controller. Please refer to P.17 for individual model numbers.

①	Actuator
②	Control wire
③	Wire controller (With actuator cable)



Specification Tables

Wire Rod

Type	Stroke (mm) and max. speed (mm/s) *Length of band = Stroke; *Numbers in band = Maximum speed by stroke		Max. push force (N)	Max. payload (kg)		Reference Page
	Speed	10 / 20		Horizontal	Vertical	
WER1	Set value	100	12.29 *1	0.75	0.25	P.7
	Actual speed	91 / 87				

*1 Reference values with current limit value 100%, stroke end, wire routing length 1m, bending angle 360°, bending radius 25.

Wire Gripper

Type	Stroke (both sides) (mm) and max. speed at approach (mm/s) *Length of band = Stroke; *Numbers in band = Maximum speed		Max. grip force (both sides) (N)	Reference Page
	Speed	4		
WEGR2	Set value	100	10 *2	P.11
	Actual speed	100		

*2 Total values for both fingers with current limit value 100%, open/close stroke center, grip point distance L = 23mm, wire routing length 1m, bending angle 360°, bending radius 25.

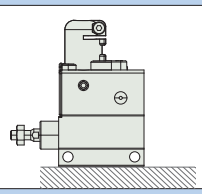
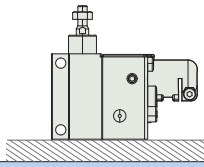
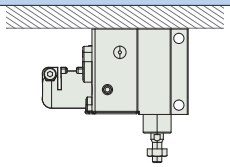
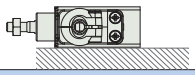
Automatic Servo OFF Function

The automatic servo OFF function can be set with the PC teaching software (IA-OS) or teaching pendant (TB-02/03).
When the automatic servo OFF function is set, the servo will turn OFF automatically after positioning complete, after stopping, or after a certain amount of time (lag time).
The servo automatically turns ON when the next movement command is input, executing positioning operation.
Power consumption can be reduced, because there is no holding current when stopped.

Mounting Orientation

Wire Rod

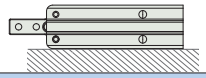
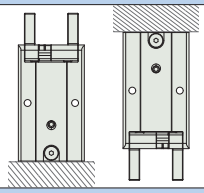
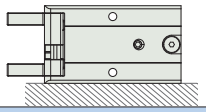
○: Can be mounted △: Can be mounted with certain conditions

Mounting orientation			
			
Horizontal table mounting	Vertical mounting (rod upward)	Vertical mounting (rod downward)	Horizontal side mounting
○	○	△ (*1)	○

*1 Because the rod pull-in operation uses spring recoil, push-motion operation is possible but use for transport is not.

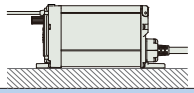
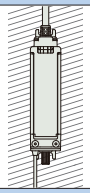
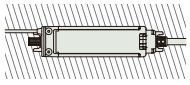
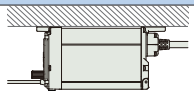
Wire Gripper

○: Can be mounted

Mounting orientation		
		
Horizontal table mounting	Vertical mounting	Horizontal side mounting
○	○	○

Wire Controller

○: Can be mounted

Mounting orientation			
			
Horizontal table mounting	Vertical mounting	Horizontal side mounting	Horizontal ceiling mounting
○	○	○	○

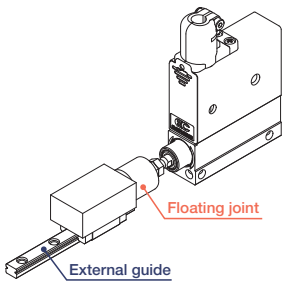
Precautions for Mounting

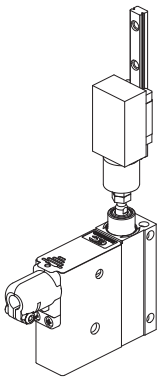
Keep the body installation surface and workpiece mounting surface flatness within 0.05mm/m.
When the flatness does not meet the value above, the sliding resistance will increase and may cause a malfunction.

Precautions for use with guide (wire rod)

For large lateral loads on the rod tip, use an external guide.
Use a floating joint for the rod and external guide
and make sure there is no shaft center deviation (twisting).

Stroke (mm)	10	20
Allowable lateral load (N)	0.81	0.62

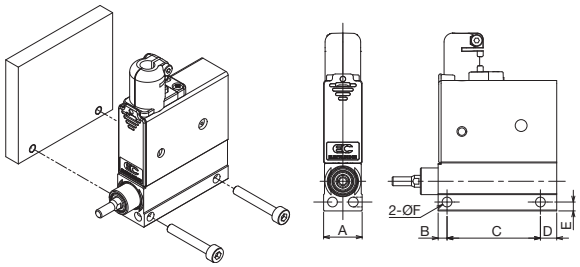




Mounting Method

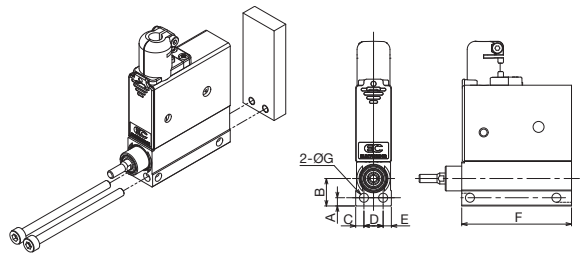
Wire Rod

Fixing via body side surface



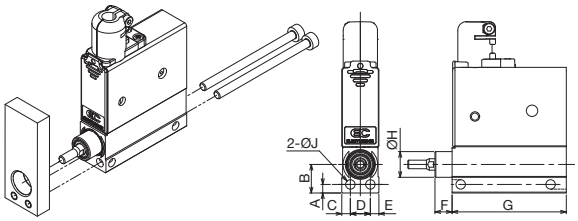
Stroke	Bolt size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
10	M3	13	3	21.5	3	3	3.3
20				31.5	5	5	

Fixing via body back surface



Stroke	Bolt size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
10	M3	3	10	3	7	3	27.5	3.3
20							40	

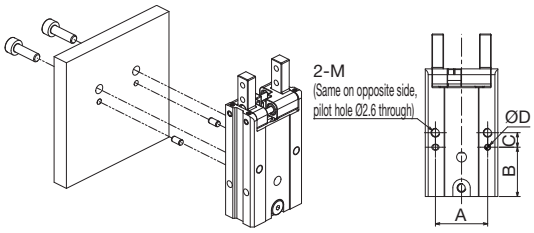
Fixing via body front surface



Stroke	Bolt size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	J (mm)
10	M3	3	10	3	7	3	6	27.5	9 h9	3.3
20								40		

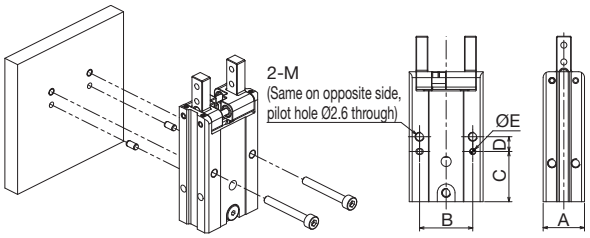
Wire Gripper

Fixing via body back surface: Mounting using screw holes



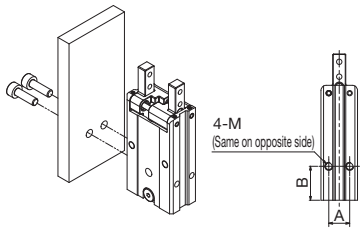
A (mm)	B (mm)	C (mm)	D (mm)	M (mm)
18	17	5	2 $H7^{+0.010}_{0}$ depth 2	M3 depth 6

Fixing via body front surface: Mounting using through holes



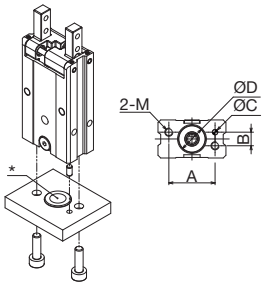
Bolt size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
M2.5	14	18	17	5	2 $H7^{+0.010}_{0}$ depth 2

Fixing via body side surface: Mounting using screw holes



A (mm)	B (mm)	M (mm)
8	13	M3 depth 6

Fixing via body bottom surface: Mounting using screw holes



A (mm)	B (mm)	C (mm)	D (mm)	M (mm)
17	5	2 $H7^{+0.010}_{0}$ depth 3	10 $H7^{+0.015}_{0}$ depth 1	M3 depth 6

*For control wire mounting, a relief shape (Ø8 or above) is required.

EC-WER1

Wire | Body Width 10 mm | 24V Stepper Motor

Model Specification Items

NPN specification is standard. PNP option is available.

EC - WER1 SA - [ ] - [ ] - [ ] - [ ] - [ ]

Series	Type	Drive specifications	Stroke	Control wire length	Actuator cable length	Power · I/O cable length	Options
		SA: Single-action specification	10: 10mm 20: 20mm	Control wire length below	Actuator cable length below	Power · I/O cable length below	See options below

*Set model number composed of the actuator unit, control wire, and wire controller.

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Stroke

Stroke (mm)	EC-WER1 Single-action specification	
	RCON-EC connection specification (Note 1)	NPN/PNP specification (Note 2)
10	✓	✓
20	✓	✓

(Note 1) Be sure to select "ACR" as the option.
(Note 2) Interface box and conversion cable are included.
(Note) Please refer to P. 15 for details on wire controllers. Please refer to the separate table for control wire length, cable length, etc.

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**	19
Cable exit direction (left)	**CJL**	19
Cable exit direction (right)	**CJR**	19
Cable exit direction (top)	**CJT**	19
3 position mode specification	**MF**	19
Tip adapter (internal thread)	**NFA**	19
PNP specification (Note 3)	**PN**	19
Split motor and controller power supply specification (Note 3)	**TMD2**	19
Battery-less absolute encoder specification	**WA**	19
Wireless communication specification (Note 4)	**WL**	19
Wireless axis operation specification (Note 4)	**WL2**	20

(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. Additionally, 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 with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power · I/O cable. Refer to P. 22 for details. Please contact our sales department for the wireless axis operation specification (WL2).

Options sold separately

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	20
RCON-EC connection specification Power · I/O cable (standard connector cable)	CB-REC-PWBIO□□□-RB	29
RCON-EC connection specification Power · I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	29
RCON-EC connection specification Split motor and controller power supply Interface box (wireless specification)	ECW-CVNWL-CB-ACR	20

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

Selection Notes

(1) Wire controller and control wire are included. Refer to P. 15 for details.
(2) There is no rotation stop mechanism, so add a rotation stop mechanism such as a guide to the rod tip if needed when in use.
(3) For the control wire connection precautions, see P.18.
(4) When connecting the ELECYLINDER to a PLC, there are three possible connection methods. Refer to P. 22 for details.

Control wire length

Wire code	Wire length
05	0.5m
10	1.0m
15	1.5m
20	2.0m
25	2.5m
30	3.0m

(Note) Included with the body.

Actuator cable length

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

(Note 5) When connecting via the interface box, 9m is the maximum length available.
(Note) Make sure that the total length along with the power · I/O 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	Without cable	✓ (Note 6)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 6) Only power · I/O connector is included. Refer to P. 26 for details.
(Note) Robot cable is standard.

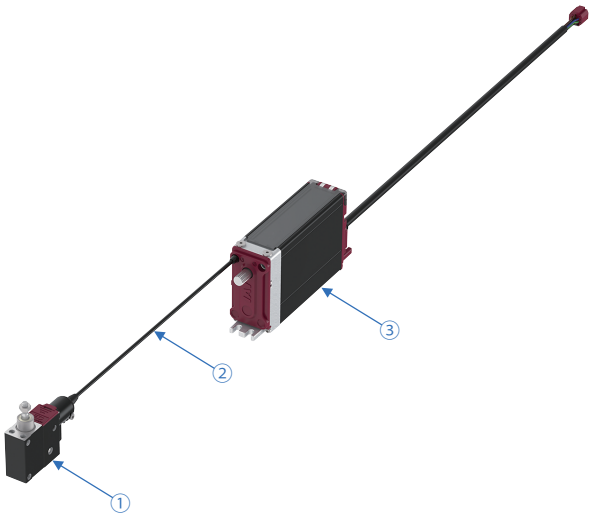
4-way connector cable

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.

Device configuration

The control wire and wire controller are included with the actuator.
The wire controller, with built-in motor, encoder, and controller, moves the control wire (inner wire) to operate the actuator.
The wire controller adjusts position, speed, acceleration/deceleration, and push force. Refer to P. 15 for details.



①	Actuator
②	Control wire
③	Wire controller (With actuator cable)

Main Specifications

Item			Description	
Stroke		Stroke (mm)	10	20
Horizontal	Payload	Max. payload (kg)	0.75	0.75
	Speed	Max. speed (mm/s) (set value) (Note 7)	100	100
		Max. speed (mm/s) (actual speed) (Note 7)	91	87
		Min. speed (mm/s)	5	5
	Acceleration/ deceleration	Rated acceleration/deceleration (G)	0.3	0.3
		Max. acceleration/deceleration (G)	0.3	0.3
Vertical (Note 8)	Payload	Max. payload (kg)	0.25	0.25
	Speed	Max. speed (mm/s) (set value) (Note 7)	100	100
		Max. speed (mm/s) (actual speed) (Note 7)	91	87
		Min. speed (mm/s)	5	5
	Acceleration/ deceleration	Rated acceleration/deceleration (G)	0.3	0.3
		Max. acceleration/deceleration (G)	0.3	0.3
Push		Max. push force (N) (Note 9)	11.5	12.29
		Max. push speed (mm/s) (set value) (Note 7)	20	20
		Max. push speed (mm/s) (actual speed) (Note 7)	18	17
Spring recoil (Rod tension force)		Spring load at backward end (N)	1.8	1.8
		Spring load at forward end (N)	4.36	4.36

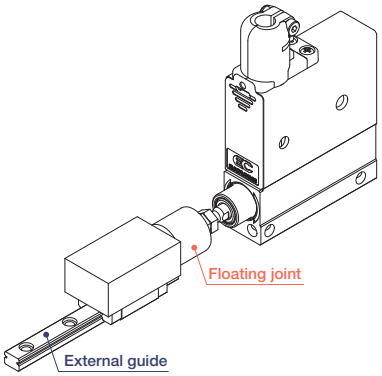
(Note 7) The values set to the wire controller (command values) and the actual rod speed differ.
(Note 8) When the rod faces downward, because the rod pull-in operation uses spring recoil, push-motion operation is possible but use for transport is not.
(Note 9) Reference values with current limit value 100%, stroke end, wire routing length 1m, bending angle 360°, bending radius 25.

Item	Description
Drive mechanism	Control wire + cam mechanism + compression spring
Operation system	Single-action
Positioning repeatability	±0.01mm (pressure) / ±0.3mm (non-pressure) / ±0.05mm (backward end spring recovery)
Lost motion	0.35mm/0.7mm/1mm/1.3mm or below (wire bending angle 0°/180°/360°/540°)
Operation life	10 million reciprocal motions (wire controller)
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (no condensation)
Storage temperature	0 to 50°C (0 to 60°C also possible if for one month or less)
Ingress protection	IP20
Vibration & shock resistance	4.9m/s^2
Overseas standards	CE marking, RoHS directive

(Note) Operation life varies according to operating, mounting, and lubrication conditions.
(Note) Depending on the usage environment, mounting orientation, operating conditions, and so on, the base oil may separate from the grease and leak outside the actuator. Protect peripheral devices as needed from negative effects caused by adhered base oil.

Rod tip load

Keep lateral loads on the rod tip at or below the loads in the table. Otherwise, rod malfunctions or shortened life may result.
For large lateral loads on the rod tip, use an external guide.
Use a floating joint for the rod and external guide and make sure there is no shaft center deviation (twisting).



Stroke (mm)	10	20
Allowable lateral load (N)	0.81	0.62

By operating conditions

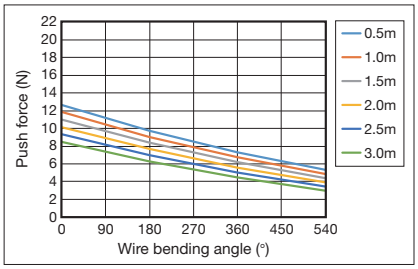
For conveyance applications, if the wire bending angle is within a range below 540°, the Main Specifications specification values can be fulfilled.
For push-motion operation, the push force varies according to the wire length and bending angle. Please refer to Push Force below for more information.

Push force

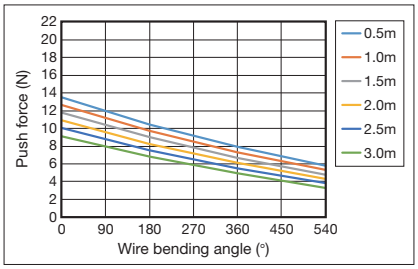
The push force varies according to the wire length and bending angle. Please check with the graph below.
Also, the wire cylinder uses wire motive force in the rod exit direction and a spring in the rod pull-in direction, so push in the rod exit direction.

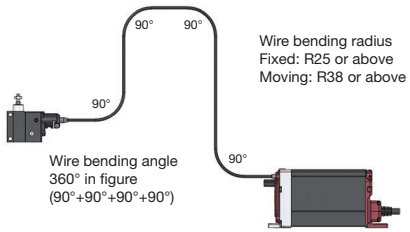
■ Push force according to wire length and bending angle

10 stroke



20 stroke





(Note) Push force values with current limit value 70%, stroke end, and wire bending radius R25.
(Note) The push force can be adjusted by changing the current limit value from 70 through 100%.
Calculate the increased push force at approximately 0.8N for each 5% increase from 70% in the current limit value.

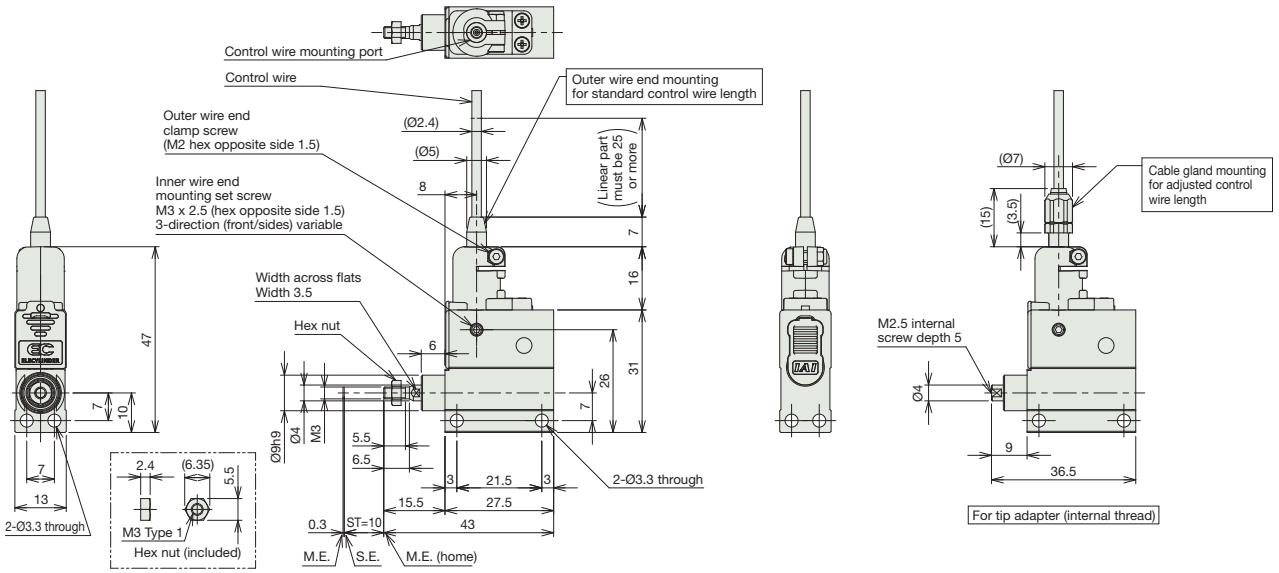
Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

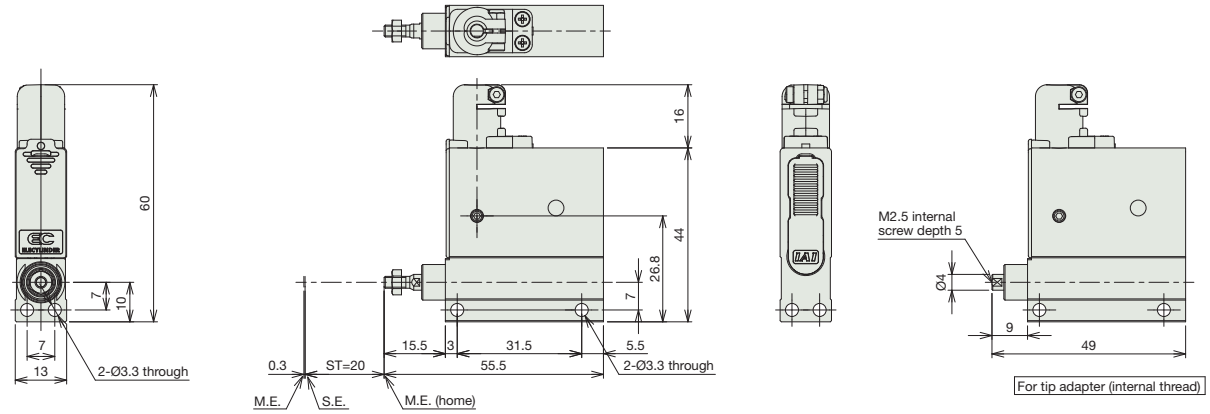
(Note) Fix the control wire with a cable tie, etc., to avoid tension, bending, or twisting (rotation) loads, etc.
(Note) For the control wire connection precautions, see P.18.

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

■10 stroke



■20 stroke



■Mass by Stroke

Stroke	10	20
Mass	32g	48g

Applicable Controllers

(Note) The controller is built into the wire controller (included). Refer to P. 24 for details on built-in controllers.

EC-WEGR2

Wire | Slider | 2-Finger | Body Width 20 mm | 24V Stepper Motor

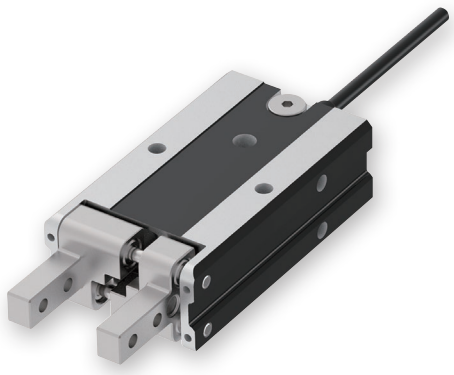
Model Specification Items

NPN specification is standard. PNP option is available.

EC - WEGR2 [ ] - 4 - [ ] - [ ] - [ ] - [ ]

Series	Type	Drive specifications	Stroke	Control wire length	Actuator cable length	Power · I/O cable length	Options
EC	WEGR2	EG: Single-action O.D. grip specification IG: Single-action I.D. grip specification	4: 4mm (One side 2 mm)	Control wire length below	Actuator cable length below	Power · I/O cable length below	See options below

*Set model number composed of the actuator unit, control wire, and wire controller.



CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Stroke

Stroke (mm)	EC-WEGR2 Single-action O.D. grip/I.D. grip specification	
	RCON-EC connection specification (Note 1)	NPN/PNP specification (Note 2)
4	✓	✓

(Note 1) Be sure to select "ACR" as the option.
(Note 2) Interface box and conversion cable are included.
(Note) Please refer to P. 15 for details on wire controllers. Please refer to the separate table for control wire length, cable length, etc.

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**	19
Cable exit direction (left)	**CJL**	19
Cable exit direction (right)	**CJR**	19
Cable exit direction (top)	**CJT**	19
3 position mode specification	**MF**	19
PNP specification (Note 3)	**PN**	19
Split motor and controller power supply specification (Note 3)	**TMD2**	19
Battery-less absolute encoder specification	**WA**	19
Wireless communication specification (Note 4)	**WL**	19
Wireless axis operation specification (Note 4)	**WL2**	20

(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. Additionally, 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 with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power · I/O cable. Refer to P. 22 for details. Please contact our sales department for the wireless axis operation specification (WL2).

Options sold separately

Name	Model	Reference page
Interface box conversion cable	CB-CVN-BJ002	20
RCON-EC connection specification Power · I/O cable (Standard connector cable)	CB-REC-PWBIO□□□-RB	29
RCON-EC connection specification Power · I/O cable (4-way connector cable)	CB-REC2-PWBIO□□□-RB	29
RCON-EC connection specification For split motor and controller power supply Interface box (Wireless specification)	ECW-CVNWL-CB-ACR	20

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

Selection Notes

(1) Wire controller and control wire are included. Refer to P. 15 for details.
(2) When gripping the workpiece, be sure to use push-motion operation.
(3) The workpiece grip force will be maintained via self-lock mechanism even during power cutoffs. (However, this does not guarantee that the workpiece will not fall.) To release the workpiece being gripped during a power cutoff, rotate the wire controller manual operation knob.
(4) For the control wire connection precautions, see P.18.
(5) When connecting the ELECYLINDER to a PLC, there are three possible connection methods. Refer to P. 22 for details.

Control wire length

Wire code	Wire length
05	0.5m
10	1.0m
15	1.5m
20	2.0m
25	2.5m
30	3.0m

(Note) Included with the body.

Actuator cable length

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

(Note 5) When connecting via the interface box, 9m is the maximum length available.
(Note) Make sure that the total length along with the power · I/O 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	Without cable	✓ (Note 6)
1 ~ 3	1 ~ 3m	✓
4 ~ 5	4 ~ 5m	✓
6 ~ 9	6 ~ 9m	✓

(Note 6) Only power · I/O connector is included. Refer to P. 26 for details.
(Note) Robot cable is standard.

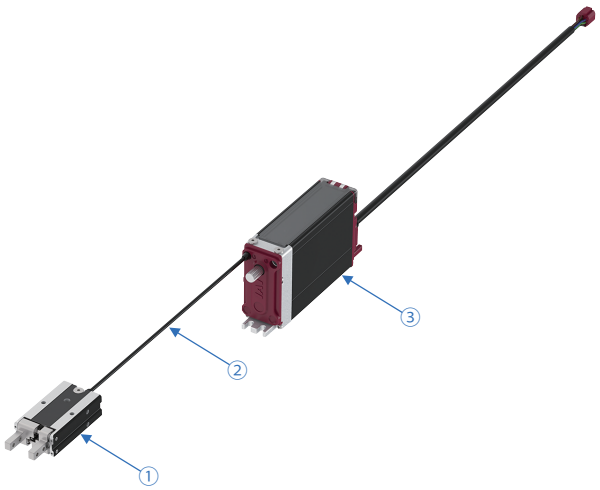
4-way connector cable

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.

Device configuration

The control wire and wire controller are included with the actuator.
The wire controller, with built-in motor, encoder, and controller, moves the control wire (inner wire) to operate the actuator.
The wire controller adjusts position, speed, acceleration/deceleration, and grip force. Refer to P. 15 for details.



①	Actuator
②	Control wire
③	Wire controller (With actuator cable)

Main Specifications

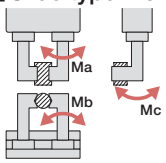
Item		Description
Grip operation	Max. grip force (N) (both sides) (Note 7)	10
	Max. speed during grip operation (mm/s) on both sides (set value) (Note 8)	20
	Max. speed during grip operation (mm/s) on both sides (actual speed) (Note 8)	20
Approach operation	Max. speed (mm/s) on both sides (set value) (Note 8)	100
	Max. speed (mm/s) on both sides (actual speed) (Note 8)	100
	Min. speed (mm/s) on both sides (set value) (Note 8)	5
	Min. speed (mm/s) on both sides (actual speed) (Note 8)	5
	Rated acceleration/deceleration (G) on both sides	0.3
	Max. acceleration/deceleration (G) on both sides	0.3
Stroke	Open/close stroke (mm) (both sides) (set value) (Note 8)	4
	Open/close stroke (mm) (both sides) (actual open/close amount) (Note 8)	4

(Note 7) Total values for both fingers with current limit value 100%, open/close stroke center, grip point distance L = 23, wire routing length 1m, bending angle 360°, bending radius 25.
(Note 8) Values set to the wire controller (command values) and the finger actual speed and actual open/close amount (reference values).

Item	Description
Grip mechanism	Control wire + cam mechanism
Release mechanism	Compression spring + cam mechanism
Operation system	Single-action
Positioning repeatability (Note 9)	±0.01mm
Lost motion (Note 10)	0.35mm/0.7mm/1mm/1.3mm or below (wire bending angle 0°/180°/360°/540°)
Backlash (one-side finger)	0.5mm or less
Operation frequency	120c.p.m.
Body	Dedicated aluminum extruded material (A6063SS-T5), black alumite treatment
Guide	Sintered oil-impregnated bearing
Allowable static moment	Ma: 0.38N·m
	Mb: 0.38N·m
	Mc: 0.74N·m
Vertical allowable load (Note 11)	132N
Operation life	10 million reciprocal motions (wire controller)
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (no condensation)
Storage temperature	0 to 50°C (0 to 60°C also possible if for one month or less)
Ingress protection	IP20
Vibration & shock resistance	4.9m/s^2
Overseas standards	CE marking, RoHS directive

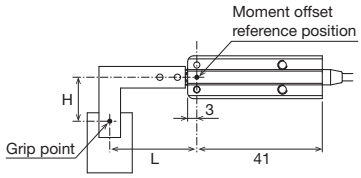
(Note 9) Positioning repeatability in grip operation. Not positioning repeatability in release operation.
(Note 10) Lost motion reference values at wire bending angles of 180°, 360°, and 540°.
(Note 11) Use at a load exceeding the value above could reduce operation life or lead to damage.
(Note) Depending on the usage environment, mounting orientation, operating conditions, and so on, the base oil may separate from the grease and leak outside the actuator. Protect peripheral devices as needed from negative effects caused by adhered base oil.

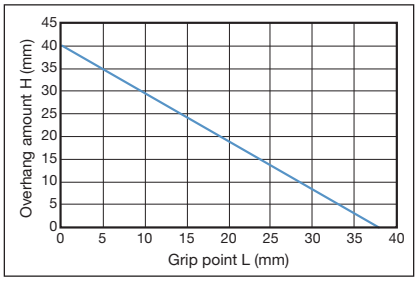
Slide type moment direction



Confirmation of grip point distance

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



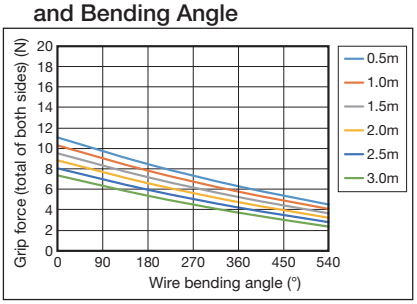


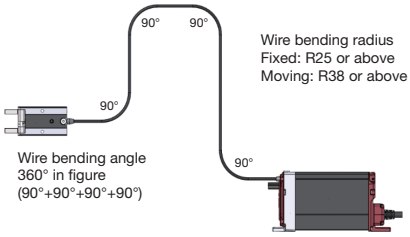
(Note) Use beyond the limited range will cause excess moment to operate on the finger sliding part and interior mechanisms, negatively affecting operation life.

Grip force

The grip force varies according to the wire length and bending angle. Please check with the graph below.

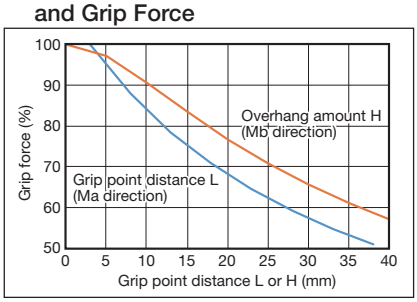
■ Grip Force According to Wire Length and Bending Angle





(Note) Total values (guidelines) for grip force of both fingers with current limit value 70%, open/close stroke center, grip point distance L = 23, and wire bending radius R25.
(Note) The grip force can be adjusted by changing the current limit value from 70 through 100%. Calculate the increased grip force at approximately 0.7N for each 5% increase from 70% in the current limit value.
(Note) For gripping (pushing), the speed is fixed at 20mm/s.

■ Guidelines for Grip Point Distance and Grip Force

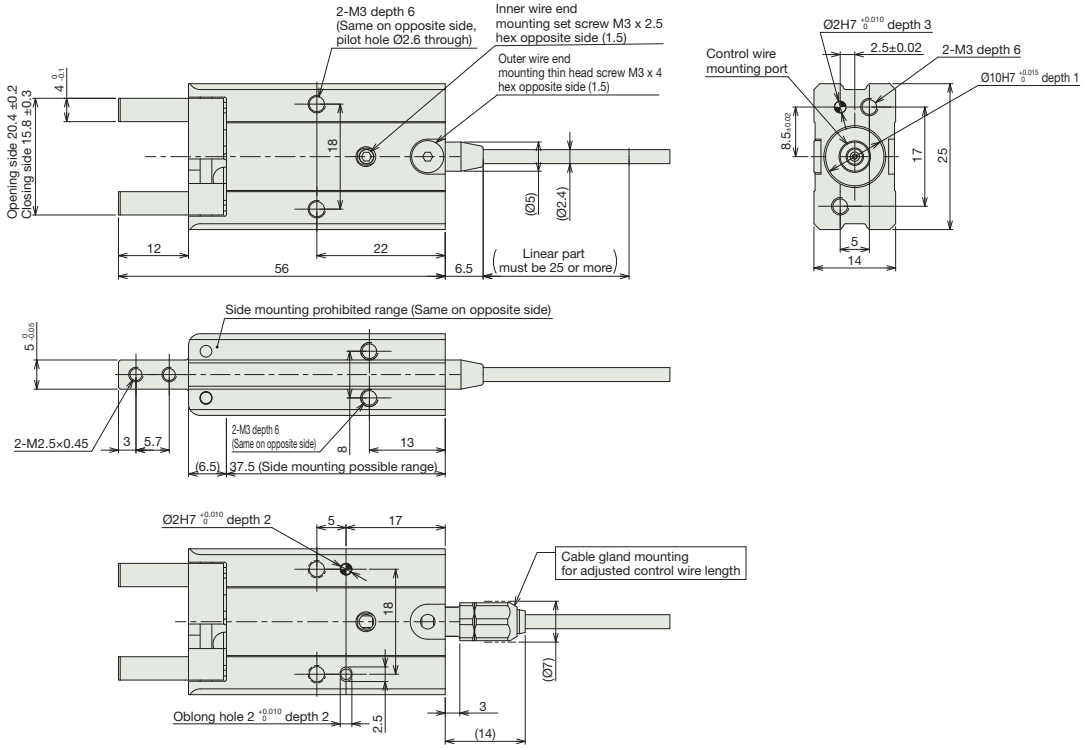


(Note) Shows grip force of overhang position when maximum grip force is set to 100%. The results may differ due to the rigidity of the finger attachment used.

Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

(Note) Fix the control wire with a cable tie, etc., to avoid tension, bending, or twisting (rotation) loads, etc.
(Note) When mounting the body with the base surface, relief holes for the control wires are required.
(Note) For the control wire connection precautions, see P.18.



Mass

Item	Description
Mass	43g

Applicable Controllers

(Note) The controller is built into the wire controller (included). Refer to P. 24 for details on built-in controllers.

Wire Controller (Accessory)

The motor, encoder, and controller which drive the actuator are built into the wire controller.
Up to 16 units can be aligned in close proximity.
Please refer to P.17 for single item model numbers.

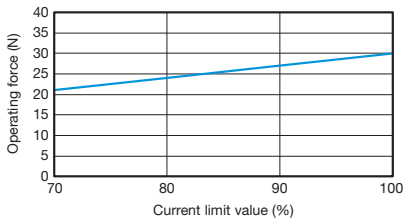
Horizontal Vertical Side Ceiling

Main Specifications

Item		Description			
		No designated model (max. stroke setting)	EC-WER1SA-10	EC-WER1SA-20	EC-WEGR2
Wire operation Speed / acceleration/ deceleration	Max. speed (mm/s)	100			
	Min. speed (mm/s)	5			
	Rated acceleration/ deceleration (G)	0.3			
	Max. acceleration/ deceleration (G)	0.3			
Wire operating force Tension (push) operation	Max. tension (push) thrust force (N)	30			
	Max. tension (push) speed (mm/s)	20			
Stroke	Stroke (mm)	30	17.15	29.4	10.05
Operating amount accuracy	Min. feed amount (mm)	0.01			
	Positioning repeatability (mm)	±0.05			
	Lost motion (mm)	0.2			

Item	Description
Drive system	Lead screw (Ø4 lead 2)
Motor/ Lead screw joint	Timing belt (deceleration ratio 1:1)
Wire operation load	30N (1 wire, current limit value 100%)
Operation life	10 million reciprocal motions
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (no condensation)
Ingress protection	IP20
Vibration & shock resistance	4.9m/s^2
Overseas standards	CE marking, RoHS directive
Motor type	Stepper motor (□20) (Power capacity: Max. 1.25A)
Encoder type	Incremental (standard) / battery-less absolute (option)
Number of encoder pulses	16384pulse/rev

Wire operating force (guideline)



Precautions

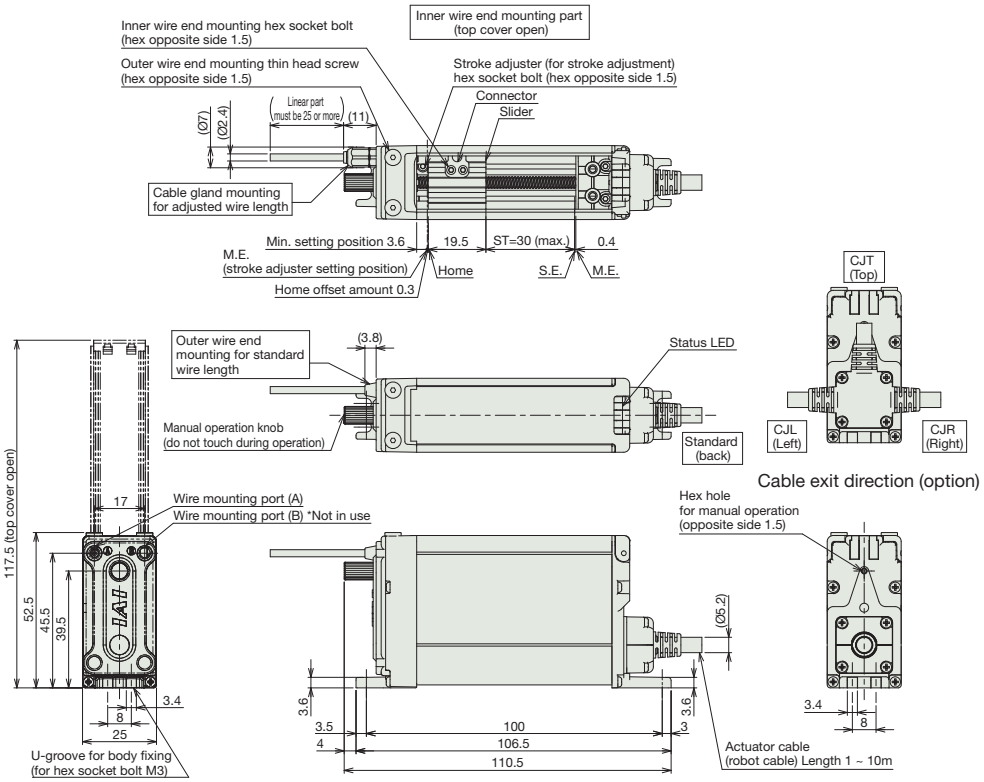
- Because of the self-lock function, the wire controller cannot operate in reverse from the actuator output side. With the servo turned OFF, rotate the wire controller manual operation knob to operate the wires.
- The wire controller slider stroke operation range is adjusted for each connected actuator. Use with the wrong combination will lead to inner wire buckling, breaking, decreased output load, insufficient stroke, etc.
- When purchasing as a single item, the specifications are without designated model numbers. Set to the stroke adjuster setting position for the actuator to be connected before connecting the wires.

Dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

(Note) When mounting the control wire, turn the power OFF before opening the top cover.
(Note) Fix the control wire with a cable tie, etc., to avoid tension, bending, or twisting (rotation) loads, etc.

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



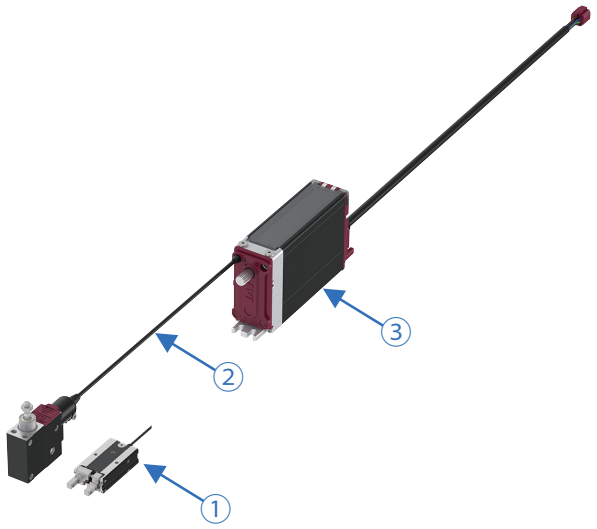
Connected cylinder	No designated model (max. stroke setting)	EC-WER1SA-10	EC-WER1SA-20	EC-WEGR2
Stroke adjuster setting position	3.6	16.45	4.2	23.55
Stroke	30	17.15	29.4	10.05

Mass

Item	Description
Mass	190g

Wire Cylinder Individual device model

The control wire and wire controller are included with the actuator.
Purchase as a single item for maintenance is also possible.



①: Actuator body

Rod Type

■ Model Specification Items

WDA - EC - WER1SA - [ ] (-NFA)

Stroke	
10	10mm
20	20mm

Options	
NFA	Tip internal thread specification

■ Stroke

Stroke (mm)	EC-WER1SA Single-action specification
10	✓
20	✓

*Tip adapter (internal thread) specifications are the same.

Gripper Type

■ Model Specification Items

WDA - EC - WEGR2□ - 4

Drive specifications	
EG	Single-action O.D. grip specification
IG	Single-action I.D. grip specification

Stroke	
4	4mm (One side 2 mm)

■ Stroke

Stroke (mm)	EC-WEGR2□ Single-action O.D. grip/I.D. grip specification
4	✓

②: Control wire

■ Model Specification Items

CW - EC - A - [ ]

Type	
For single-action	

Control wire length	
05	0.5m
10	1.0m
15	1.5m
20	2.0m
25	2.5m
30	3.0m

■ Control wire length

Wire code	Wire length
05	0.5m
10	1.0m
15	1.5m
20	2.0m
25	2.5m
30	3.0m

③: Wire controller (with actuator cable)

■ Model Specification Items

WC - EC - S - [ ] - [ ] - [ ]

Type	
For single-action	

Actuator cable length	
Actuator cable length below	

Power · I/O cable length	
Power · I/O cable length below	

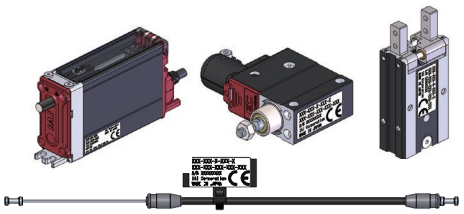
Options	
See options below	

*Please refer to the actuator pages for details.

Note: If the RCON-EC connection specification (Model: ACR) is not selected as an option, an interface box and conversion cable will be included.

Control wire connection

The control wire is shipped detached from the actuator and wire controller.
Connect the control wire with caution as follows.



Precautions for control wire connection

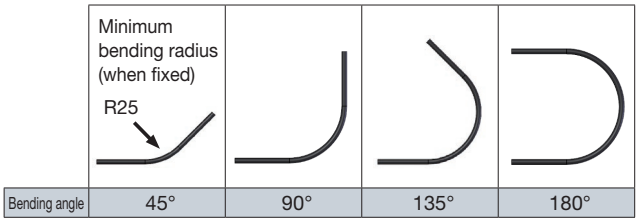
· The control wire has no directionality. Either end can be connected to the actuator or the wire controller.

· Plan the equipment layout so as to keep the control wire bending angle small.
A larger angle will lead to decreased output or malfunctions.

· Keep the control wire bending radius (when fixed) at R25 or above.
For dynamic bending, use R38 or above. The wire is usable for U-shaped dynamic bending, but cannot be used if twisted.

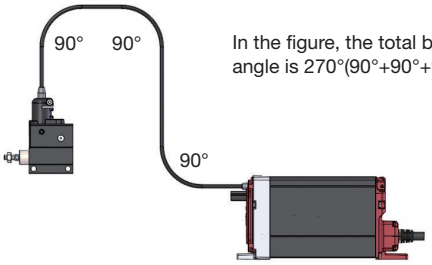
· Fix the control wire lightly with a cable tie, etc., to avoid tension, bending, or twisting (rotation) loads.

Approach to wire bending angle

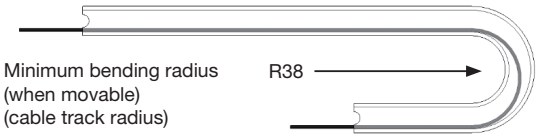


Approach to wire total bending angle

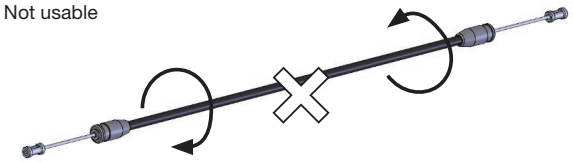
This value is the total of all the bending angles in the control wire.



Wire dynamic bend

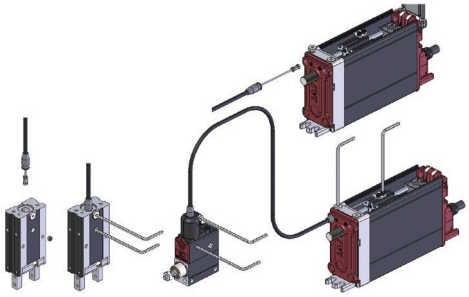


Wire dynamic twist/swivel



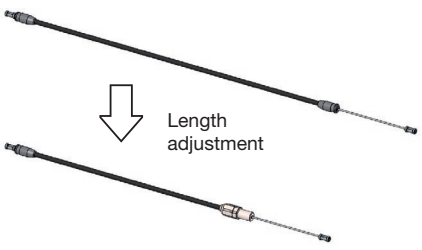
Wire mounting method

The control wire can be mounted with a single hex wrench (opposite side 1.5mm).
Please refer to the instruction manual for details of the mounting procedure.

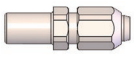


Wire length adjustment

When routing the wire into equipment, if the wire is longer than required, do not coil it in order to adjust the length.
We recommend adjusting the length in order to achieve connection without increasing the wire bending angle.
Please refer to the instruction manual for details of the length adjustment procedure.



Length adjustment parts must be purchased separately.



Outer wire end
[EC-OWE]

Inner wire end
[EC-IWE]

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)

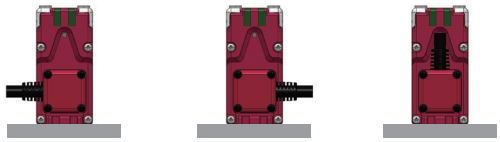
Model **ACR** Applicable models All models

Description This option should be selected to connect over an R-unit to a field network.
*If this option is selected, the power supply must be a split motor and controller power supply and the input/output specification must be NPN. Therefore, it cannot be selected with the TMD2 or PN options.

Cable exit direction

Model **CJL / CJR / CJT** Applicable models All models

Description The exit direction of the wire controller actuator cable can be changed among left side, right side, and top.



Left side: CJL Right side: CJR Top: CJT

3 position mode specification

Model **MF** Applicable models All models

Description This option enables 3-point positioning (intermediate stop).

Tip adapter (internal thread)

Model **NFA** Applicable models EC-WER1

Description This option changes the screw used for one-bolt mounting of jigs, etc., on the rod tip to an internal thread.
Customers cannot change the screws after shipping. Refer to the product page for dimensions.

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

Model **PN** Applicable models All models

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

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

Model **TMD2** Applicable models All models

Description This option includes an actuator operation stop input. Select this option to allow shutting down the actuator drive power only.
Refer to P. 25 for more information on wiring.

Battery-less absolute encoder specification

Model **WA** Applicable models All models

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

Wireless communication specification

Model **WL** Applicable models All models

Description This option enables support for wireless communication. Specifying this option enables wireless communication with the TB-03 teaching pendant and 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.

Single-item options

RCON-EC connection specification
Split motor and controller power supply interface box (wireless supported)

Model **ECW-CVNWL-CB-ACR**

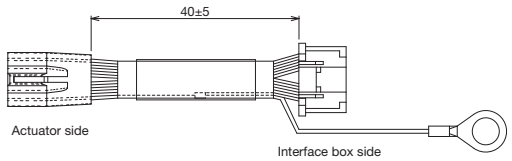
Description Required when connecting to the EC connection unit and using wireless teaching.

*For wireless communication specification (WL).
Wireless axis operation specification (WL2) is a special specification.
Please contact our sales department.

Interface box conversion cable

Model **CB-CVN-BJ002**

Description Cable connecting the actuator cable and the interface box.



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

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-S(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(VP5)	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

Duty ratio

The duty ratio is the operating rate shown as the actuator's operating time during one cycle, expressed as a percentage (%).

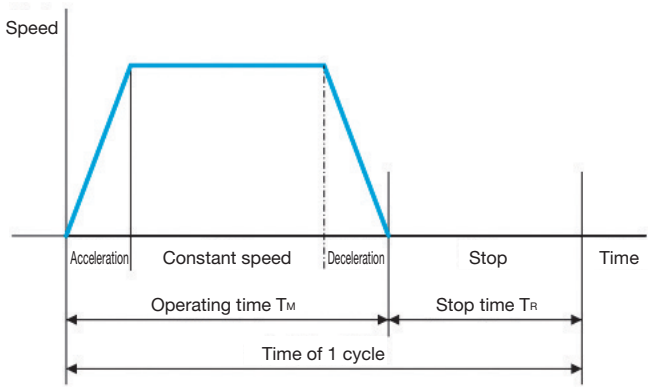
The ELECYLINDER Wire Cylinder can be operated at 100% of its duty ratio.

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

D: Duty ratio

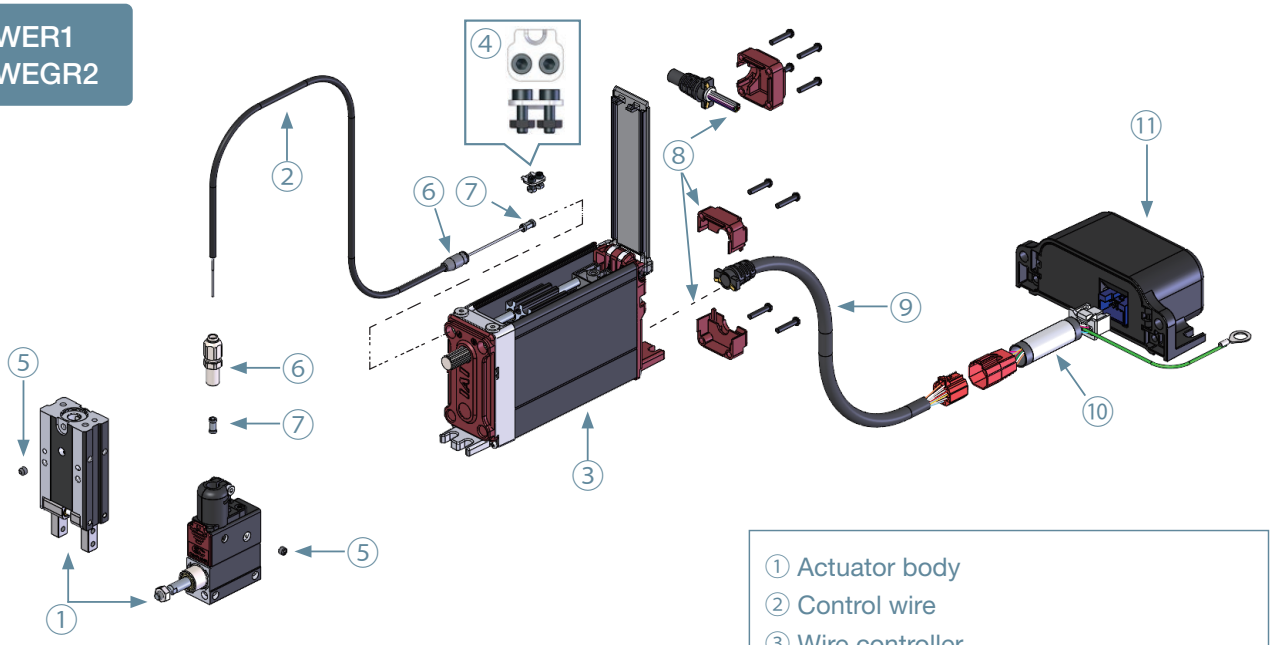
T_M: Operating time (including push-motion operation)

T_R: Stop time



Maintenance Parts (Actuator)

WER1
WEGR2



① Actuator body
② Control wire
③ Wire controller
④ Control wire fastener
⑤ Control wire set screw
⑥ Outer wire end
⑦ Inner wire end
⑧ Actuator cable mounting box
⑨ Actuator cable assembly
⑩ Interface box conversion cable
⑪ Interface box

① -1 Actuator body (Rod type)

Model
WDA-EC-WER1SA- ○○ (-NFA)

*○○ indicates stroke (10: 10mm, 20: 20mm)
*For tip adapter (internal thread) specification, add "-NFA" to the end of the model number.

① -2 Actuator body (Gripper type)

Model
WDA-EC-WEGR2 ○○ -4

*○○ indicates drive specification (EG: O.D. grip, IG: I.D. grip)

② Control wire

Model
CW-EC-A- ○○

*○○ indicates wire length (05: 0.5m, 10: 1m, 15: 1.5m, 20: 2m, 25: 2.5m, 30: 3m)

③ Wire controller

Model
WC-EC-S- ○○ - □□ -(option)

*○○ indicates actuator cable length (1~10: 1~10m)
*□□ indicates power · I/O cable length (0: No cable, 1~9: 1~9m)
*Please refer to product specification pages for option details.

④ Control wire fastener (Included parts: Set of parts including screws and nuts)

Model
EC-CWF

⑤ Control wire set screw (M3 x 2.5 set screw)

Model
EC-SSW3

⑥ Outer wire end

Model
EC-OWE

(1 pc)

⑦ Inner wire end

Model
EC-IWE

(1 pc)

⑧ Actuator cable mounting box (Included parts: Screws)

Cable exit direction	Model
Back	EC-CASBR-SLTGD3
Side	EC-CASBS-SLTGD3

⑨ Actuator cable assembly (Robot cable)

Model
CB-EC-GRBP8-MPA ○○○ -AS

*○○○ indicates cable length
Max. 10m (max. 9m when passing through interface box)

⑩ Interface box conversion cable

Model
CB-CVN-BJ002

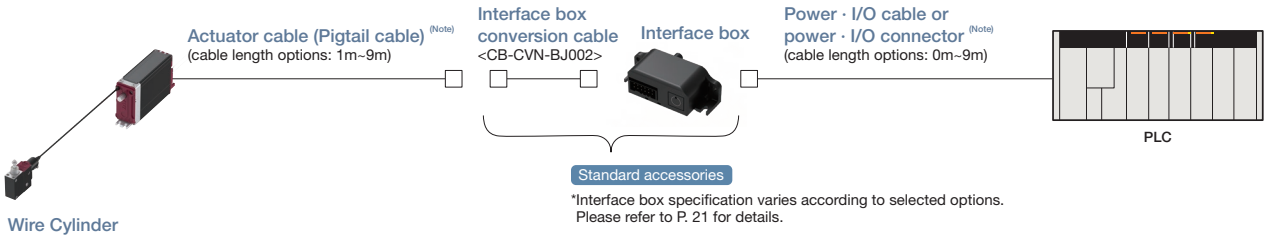
⑪ Interface box

Wireless	I/O	Model		
		Standard	When selecting TMD2	When selecting ACR
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	

Connection Pattern

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

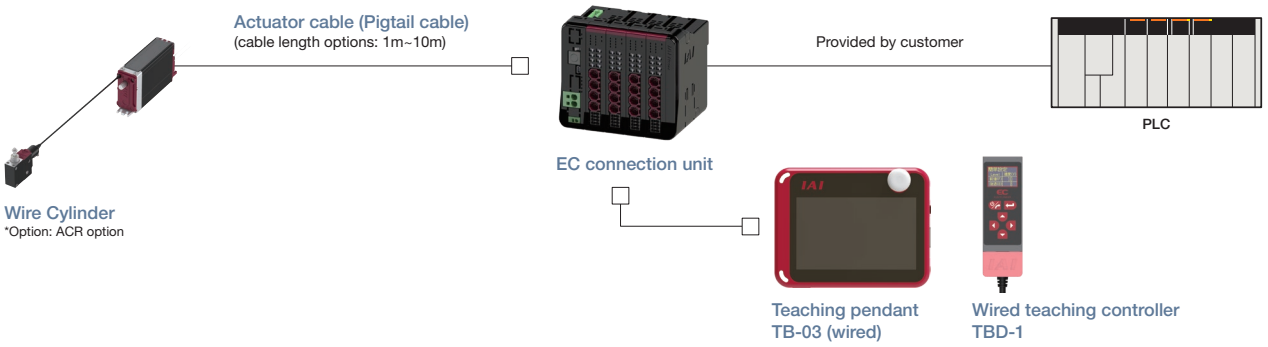
1. Direct connection to PLC (NPN/PNP specification)



*Interface box specification varies according to selected options. Please refer to P. 21 for details.

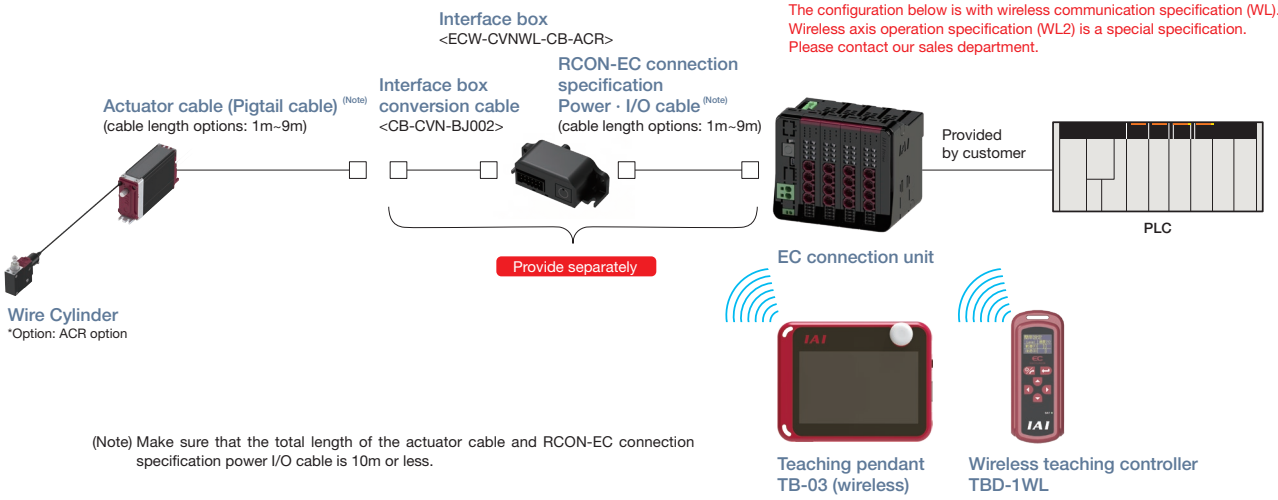
(Note) Make sure that the total length of the actuator cable and power · I/O cable (provided by the customer when using a power · I/O connector) is 10 m or less.

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



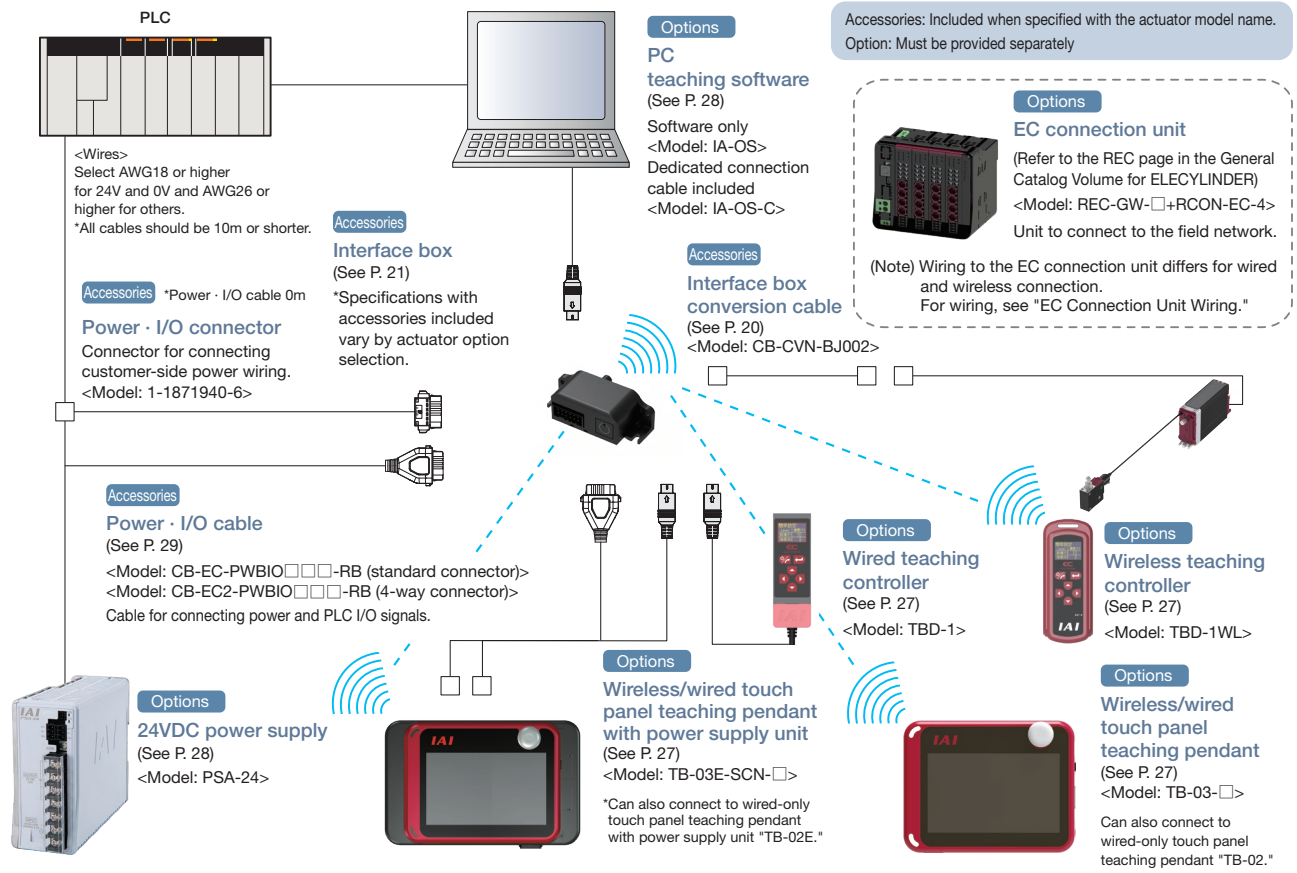
3. Connection to PLC through an EC connection unit (RCON-EC connection specification) [Wireless connection to teaching pendant]

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



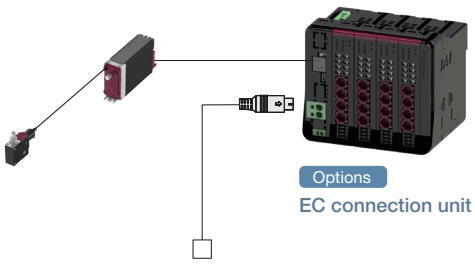
(Note) Make sure that the total length of the actuator cable and RCON-EC connection specification power I/O cable is 10m or less.

System Configuration

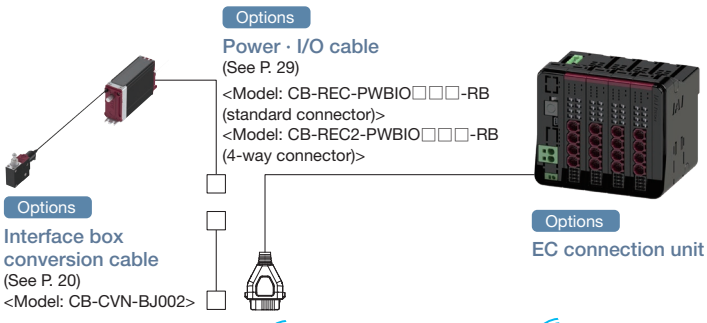


EC Connection Unit Wiring

(For teaching pendant wired connection)



(For teaching pendant wireless connection)



List of Accessories

■ Power · I/O Cable, Connectors

[Standard connector]

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

*For MF option specification, add "-MF" to the end of the model number.

[4-way connector]

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

Basic Controller Specifications (Wire Controller)

Specification item			Specification content
Number of controlled axes			1 axis
Power supply voltage			24VDC ±10%
Power capacity (Includes control power 0.3A)			Rated 0.95A, max. 1.25A (with RCON connected: rated 0.65A, max. 0.95A)
Generated heat (at duty ratio 100%)			3W
Inrush current (Note 1)			2A
Momentary power failure resistance			Max. 500μs
Motor size			□20
Motor rated current			0.65A
Motor control system			Weak field-magnet vector control
Supported encoders			Incremental/battery-less absolute (16384 pulse/rev)
SIO			RS-485 1ch (Modbus protocol compliant)
PIO	Input specification	No. of inputs	3 points (forward, backward, alarm clear)
		Input voltage	24VDC ±10%
		Input current	5mA per circuit
		Leakage current	Max. 1mA/1 point
		Isolation method	Non-isolated
	Output specification	No. of outputs	3 points (forward complete, backward complete, alarm) *For MF option, "intermediate stop complete" is added for 4 points
		Output voltage	24VDC ±10%
		Output current	50mA/1 point
		Residual voltage	2V or less
		Isolation method	Non-isolated
Data setting, input method			PC teaching software, Touch panel teaching pendant, Wireless Teaching Controller, Wired Teaching Controller
Data retention memory			Position and parameters are saved in non-volatile memory (no limit to number of rewrites)
LED display	Controller status display		Servo ON (green light ON) / Alarm (red light ON) / Initializing when power comes ON (orange light ON) / Minor failure alarm (green/red alternately blinking) / Teaching mode: Stop from teaching (red light ON) / Servo OFF (light OFF) / Automatic servo OFF (green blinking)
	Wireless status display		Initializing wireless hardware, without wireless connection, or connecting from TP board (light OFF) Connecting through wireless (green blinking) / Wireless hardware error (red blinking) / Initializing when power comes ON (orange light ON)
Predictive maintenance/preventative maintenance			When the number of movements or operation distance has exceeded the set value or an overload warning occurs, the LED (right side) blinks alternately green and red. *Only when configured in advance
Ambient operating temperature			0 to 40°C
Ambient operating humidity			5%RH ~ 85%RH (no condensation or freezing)
Operating ambience			No corrosive gas or excessive dust
Insulation resistance			500VDC 10MΩ
Electric shock protection mechanism			Class 1 basic insulation
Cooling method			Natural air cooling

(Note 1) 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.

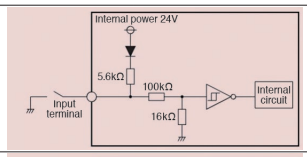
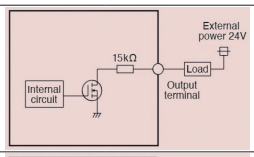
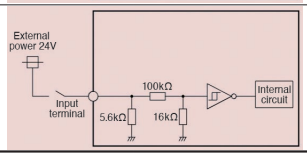
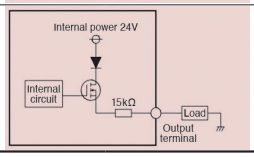
Solenoid Valve Method

ELECYLINDER products normally use a double solenoid method.

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

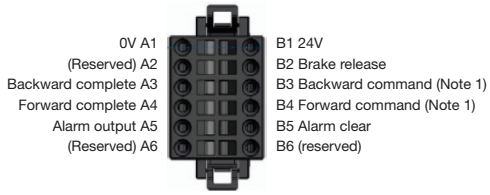
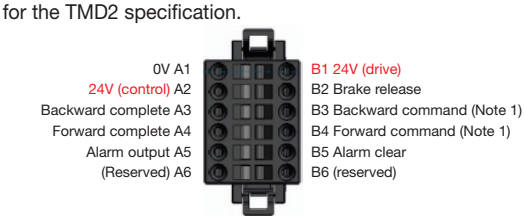
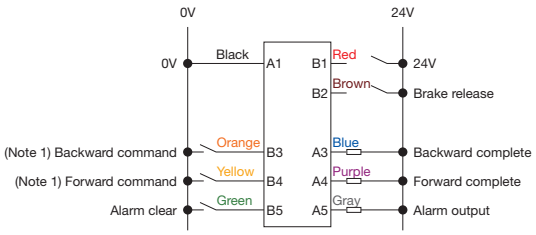
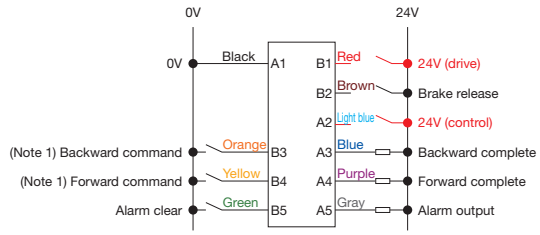
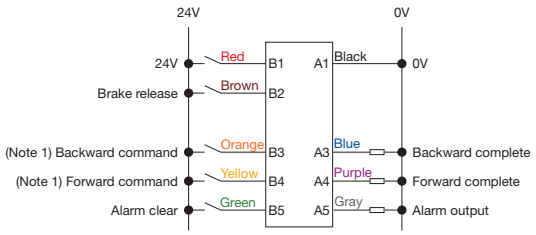
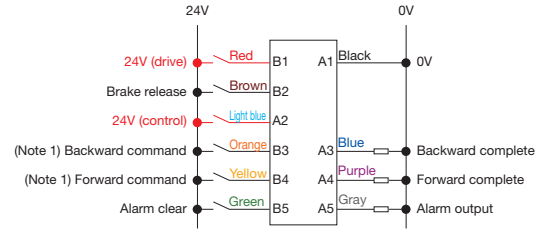
<Caution>
Operation cannot be performed using the single solenoid method when operating connected to RCON-EC.
For MF option specification, the solenoid valve method cannot be changed.

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			Drive power and control power are separate for the TMD2 specification. 
I/O logic	NPN		
	PNP		

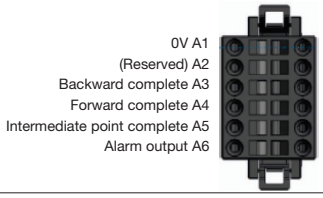
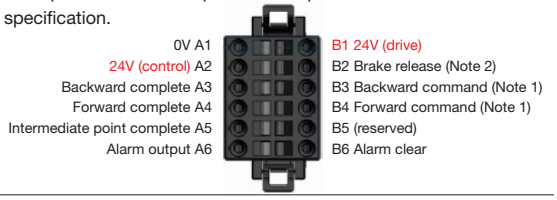
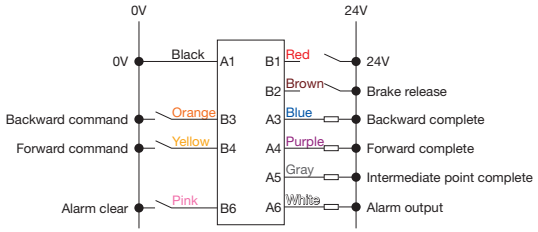
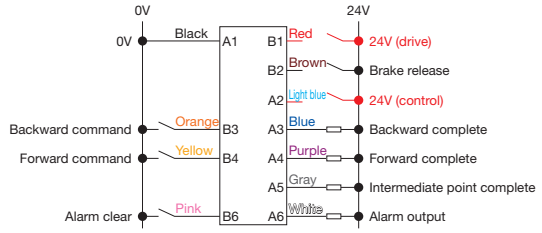
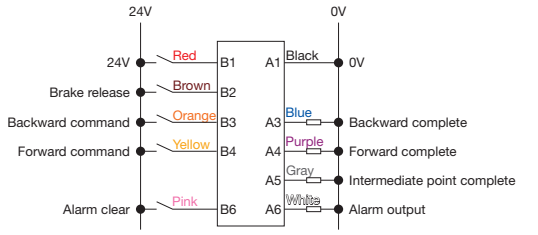
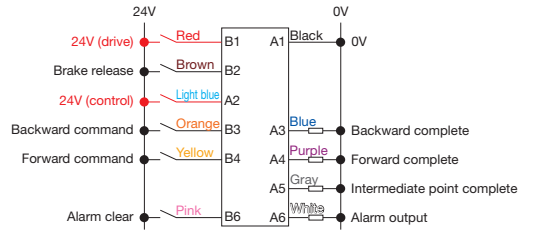
(Note 1) Switching to the single solenoid method will change B3 to "forward/backward command" and B4 to "unused."

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 clear	RES	Alarm clear
A3	Backward complete	LS0/PE0	Backward complete/push complete
A4	Forward complete	LS1/PE1	Forward complete/push complete
A5	Alarm	*ALM	Alarm detection (b-contact)
B2	Brake release	BKRLS	Forced brake release (*not supported for this product)
B1 (Note 2)	24V	24V	24V input
A1	0V	0V	0V input
A2 (Note 2)	(24V)	(24V)	24V input

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

I/O Signal Wiring Diagram [For 3 position mode specification (option model number: MF)]

I/O		Standard specification	Split motor and controller power supply specification (option model: TMD2)
Power · I/O connector			Drive power and control power are separate for the TMD2 specification. 
I/O logic	NPN		
	PNP		

(Note 1) Simultaneous input of B3 and B4 results in intermediate point travel.

(Note 2) The brake is automatically released simultaneously with servo ON. Wire only for manual forced brake release upon servo OFF.

I/O Signal Table [For 3 position mode specification (option model number: MF)]

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
B6	Alarm clear	RES	Alarm clear
A3	Backward complete	LS0/PE0	Backward complete/push complete
A4	Forward complete	LS1/PE1	Forward complete/push complete
A5	Intermediate point complete	LS2/PE2	Intermediate point complete
A6	Alarm clear	*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) Simultaneous input of B3 and B4 results in intermediate point travel.

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

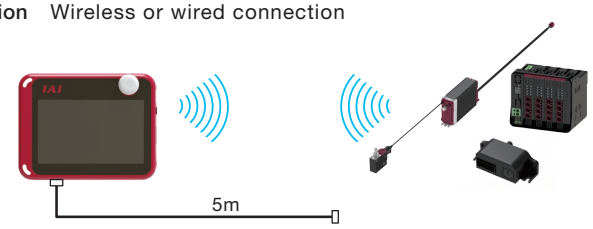
Options

Wireless/wired touch panel teaching pendant

Features This teaching device supports wireless connections. Start point/end point/AVD (acceleration/velocity/deceleration) 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	24VDC±10%
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C (no condensation or freezing)
Ambient operating humidity	5-85% RH (no condensation or freezing)
Ingress protection	IPX0
Mass	Approx. 485g (body) + approx. 175g (battery)
Charging method	Wired connection with dedicated adapter/controller
Wireless connection	Bluetooth4.2 class2

Wireless teaching controller

Features Start point/end point/AVD (acceleration/velocity/deceleration) input and jog operation can be easily performed from a distance. (ELECYLINDER with wireless option only)

Model **TBD-1WL-□**

Configuration Wireless connection

Specifications

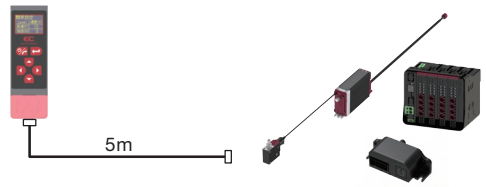
Power input voltage range	5.9VDC (5.7~6.3V) [supplied from dedicated AC adapter]
Ambient operating temperature	0 to 40°C (no condensation or freezing)
Ambient operating humidity	5-85% RH (no condensation or freezing)
Ingress protection	IPX0
Mass	Approx. 115g (including battery weight 55g)
Charging method	Dedicated adapter
Wireless connection	Bluetooth4.2 class2

Wired teaching controller

Features Start point/end point/AVD (acceleration/velocity/deceleration) input and jog operation can be easily performed. Usable with all ELECYLINDER models thanks to connector connection.

Model **TBD-1**

Configuration Wired connection



Specifications

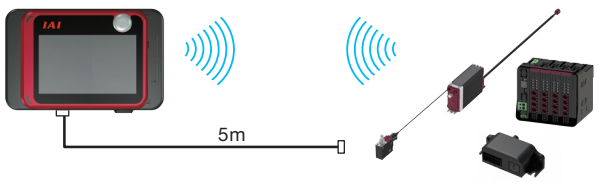
Rated voltage	24VDC ±10% [supplied from controller]
Power consumption	1.44W or less (60mA or less)
Ambient operating temperature	0 to 40°C (no condensation or freezing)
Ambient operating humidity	5-85% RH (no condensation or freezing)
Ingress protection	IP20
Mass	21g (body) + 184g (body integrated cable 5m)

Wired/wireless touch panel teaching pendant with power supply unit

Features Because the TB-03 has a drive power supply unit, brake release, test runs, and data setting are possible even before electrical wiring work takes place.

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

Configuration Wireless or wired connection



Specifications

Rated input voltage	Single-phase 100~230VAC ±10%
Input current (Under rated I/O conditions in ambient temperature of 25°C)	1.4Atyp.(100VAC) 0.6Atyp.(230VAC)
Frequency range	50/60Hz ±5%
Power capacity (Under rated I/O conditions in ambient temperature of 25°C)	141VA (100VAC) 145VA (230VAC)
Output voltage	24VDC ±10%
Mass	Approx. 740g
Cooling method	Natural air cooling

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

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

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

Please contact IAI for the current supported versions.

Configuration

PC software
(Download Only)

Your dedicated cable
CB-SEL-USB030
RCB-CV-USB
CB-RCA-SIO050

Model

IA-OS-C (with an external device communication cable + USB conversion adapter + USB cable)

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

Please contact IAI for the current supported versions.

Configuration

PC software
(Download Only)

USB conversion adapter
RCB-CV-USB

3m

USB cable
CB-SEL-USB030

5m

External device communication cable
CB-RCA-SIO050

24V power

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

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

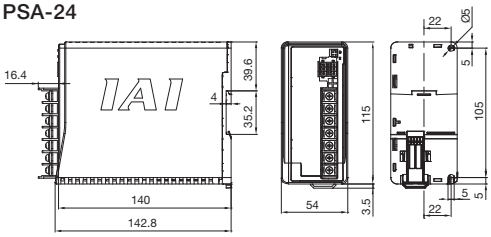
Specifications

Item	Specifications	
	100VAC input	200VAC input
Power input voltage range	100VAC ~ 230VAC ±10%	
Input power supply current	3.9A or less	1.9A or less
Power capacity	Without fan: 250VA With fan: 390VA	Without fan: 280VA With fan: 380VA
Inrush current*1	Without fan: 17A (typ) With fan: 27.4A (typ)	Without fan: 34A (typ) With fan: 54.8A (typ)
Generated heat	33W (204W continuous rated) 54W (300W continuous rated)	23W (204W continuous rated) 37W (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 more	90% or more
Parallel connection*3	Up to 5 units	

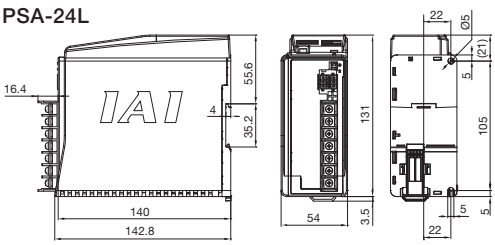
*1 The pulse width of flowing inrush current is less than 5ms.
*2 In order to enable parallel operation, this power supply can vary the output voltage according to the load. The power supply unit is therefore for use with IAI controllers only.
*3 Parallel connection cannot be used under the following conditions.
- Parallel connection of PSA-24 (specification without fan) and PSA-24L (specification with fan)
- Parallel connection with a power supply unit other than this power supply
- Parallel connection with PS-24

External Dimensions

PSA-24



PSA-24L



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

Maintenance Parts (Cables)

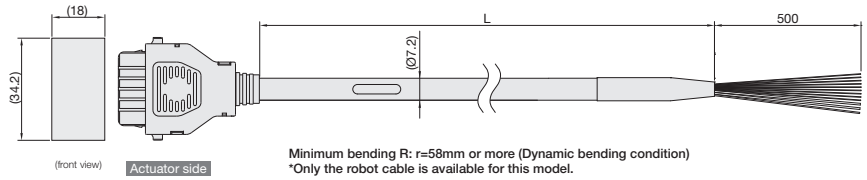
When placing an order for a replacement cable after purchasing a product, please use the model name shown below.

■ 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, 4-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, extension cable)	CB-REC-PWBIO□□□-RB-JY
Power · I/O cable (RCON-EC connection specification, 4-way connector)	CB-REC2-PWBIO□□□-RB

Model CB-EC-PWBIO □□□ -RB

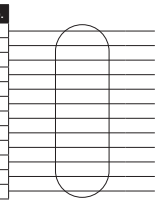
*Please indicate the cable length (L) in □□□ .
1m ~ 10m supported (for example, 030 = 3m)



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

1-1871940-6

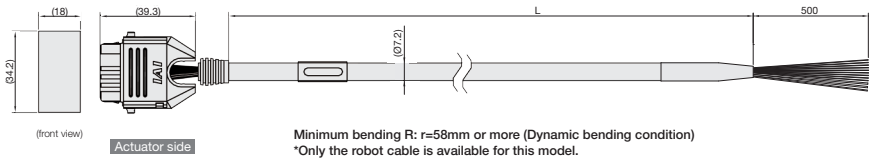
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V	B1
Light blue (AWG22)	(Reserved) (Note 1)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	IN3	B6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
White (AWG26)	OUT3	A6
Brown (AWG26)	BKRLS	B2



(Note 1) 24V (control) when split motor and controller power supply specification (TMD2) is selected.
(Note 2) Green/Yellow and light gray wires are not in use. (Already cut within contraction tube)

Model CB-EC2-PWBIO □□□ -RB

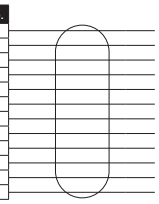
*Please indicate the cable length (L) in □□□ .
1m ~ 10m supported (for example, 030 = 3m)



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

1-1871940-6

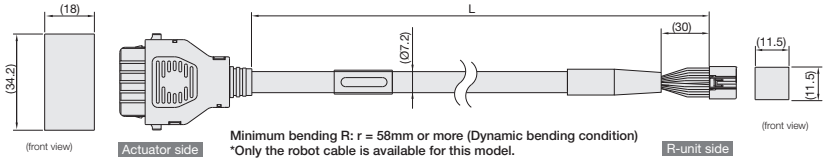
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V	B1
Light blue (AWG22)	(Reserved) (Note 1)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	IN3	B6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
White (AWG26)	OUT3	A6
Brown (AWG26)	BKRLS	B2



(Note 1) 24V (control) when split motor and controller power supply specification (TMD2) is selected.
(Note 2) Green/Yellow and light gray wires are not in use. (Already cut within contraction tube)

Model CB-REC-PWBIO □□□ -RB

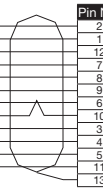
*Please indicate the cable length (L) in □□□ .
1m ~ 10m supported (for example, 030 = 3m)



Minimum bending R: r = 58mm or more (Dynamic bending condition)
*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
Green/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

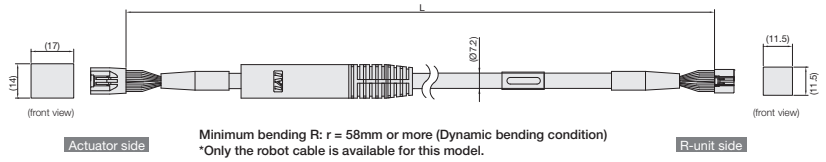


DF62E-13S-2.2C(18)

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+	Green/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)

Model CB-REC-PWBIO □□□ -RB-JY

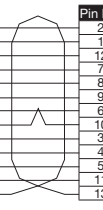
*Please indicate the cable length (L) in □□□ .
0.5m, 1m~9m supported (for example, 030 = 3m)



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

DF62B-13EP-2.2C(18)

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

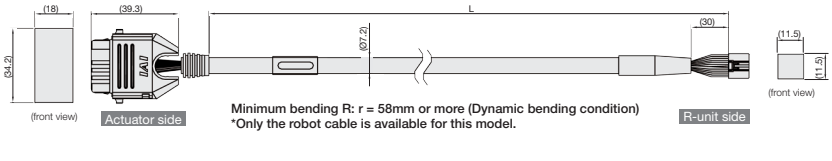


DF62E-13S-2.2C(18)

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+	Green/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)

Model CB-REC2-PWBIO □□□ -RB

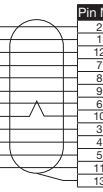
*Please indicate the cable length (L) in □□□ .
1m ~ 10m supported (for example, 030 = 3m)



Minimum bending R: r = 58mm or more (Dynamic bending condition)
*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
Green/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)

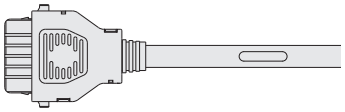
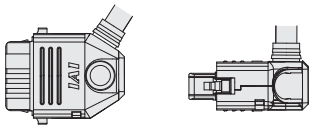
Pin No.	Signal name	Color
2	0V	Black (AWG22)
1	24V(MP)	Red (AWG22)
12	24V(CP)	Light blue (AWG22)
7	OUT0	Orange (AWG26)
8	OUT1	Yellow (AWG26)
9	OUT2	Green (AWG26)
6	SD+	Green/Yellow (AWG26)
10	SD-	Light gray (AWG26)
3	IN0	Blue (AWG26)
4	IN1	Purple (AWG26)
5	IN2	Gray (AWG26)
11	BKRLS	Brown (AWG26)
13	FG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

Maintenance Parts (Cables)

4-way connector cable

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

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

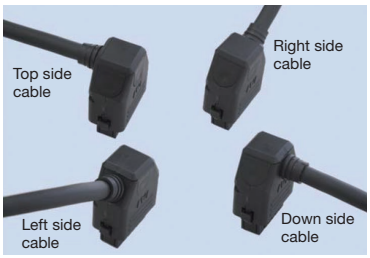
	Standard connector (actuator side)	4-way connector (actuator side)
External view		
User wiring specification	CB-EC-PWBIO□□□-RB	CB-EC2-PWBIO□□□-RB
RCON-EC connection specification	CB-REC-PWBIO□□□-RB	CB-REC2-PWBIO□□□-RB

■ How to Order

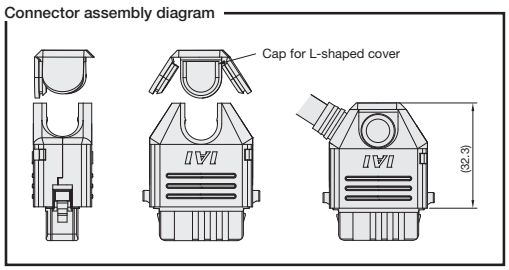
The cable length may be from 1m to 10m long.
The length can be specified in 1m units.

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

■ Assembly Method



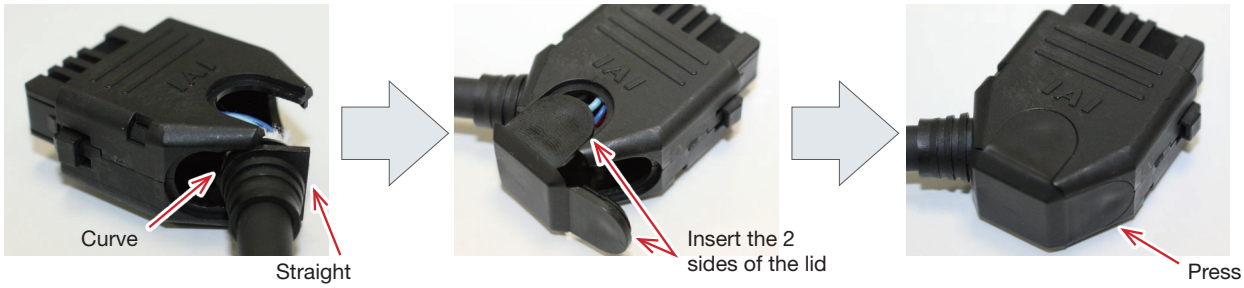
Cable direction can be set to any of 4 directions



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. CE0420-1A (2025OCT)

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