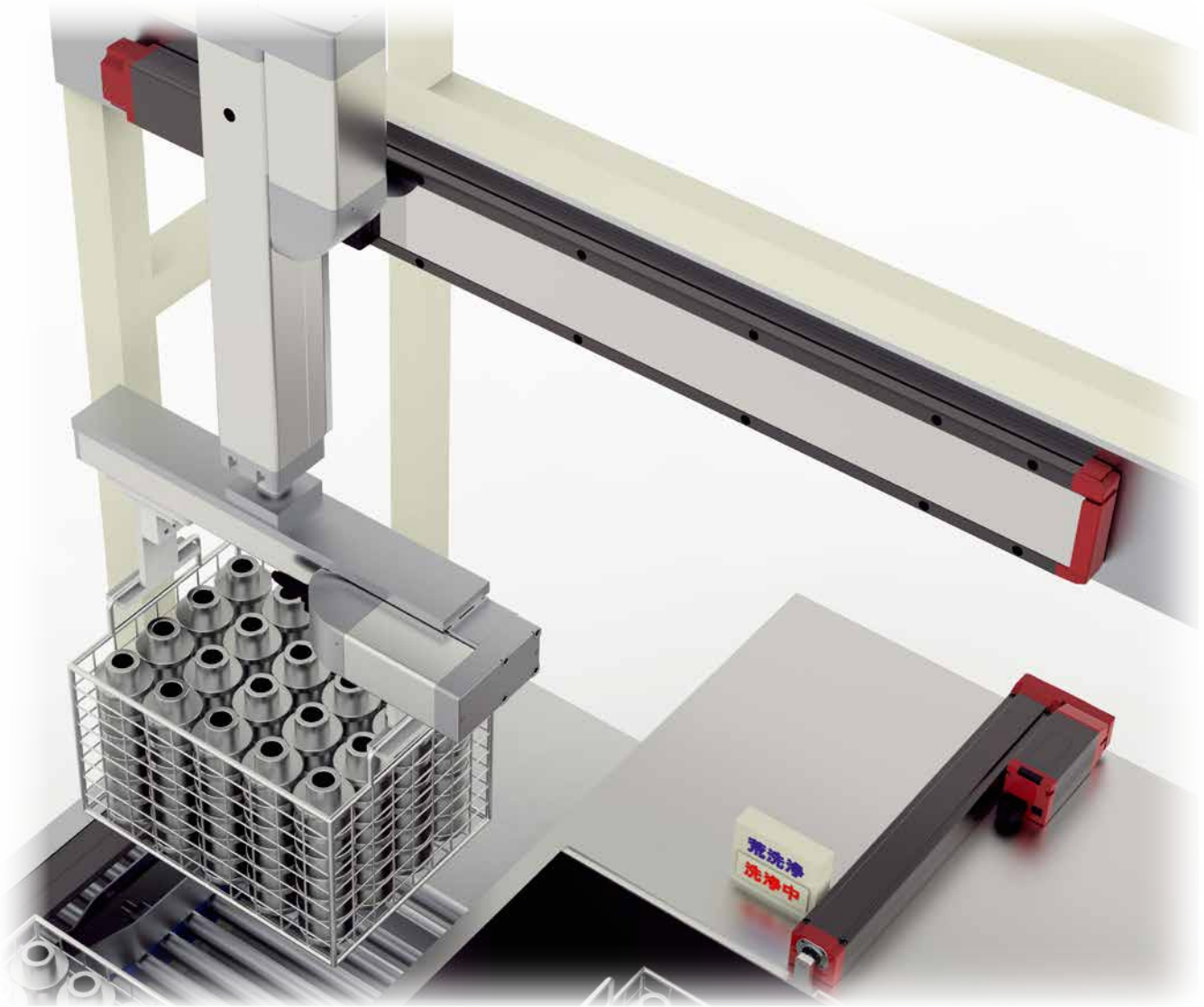
IAI
Quality and Innovation

ELECYLINDER®
# Wide Slider Type

# EC-(D)WS10(□R)
# (D)WS12(□R)

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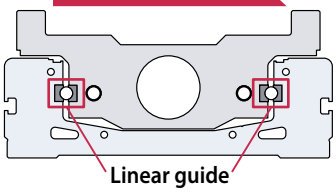
ELECYLINDER

# Wide Slider Type

## Supports High Load Moment and Large Overhang

The wide body is equipped with a built-in ball circulating type linear guide. It is most suitable to heavy workpieces and large overhang applications.

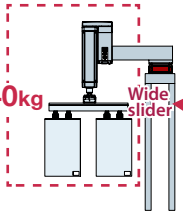
**Base sectional view**




**A linear guide integrated with the base is used.**
→It achieves high rigidity.

**Because heavy workpieces can be overhung, the equipment can be made smaller.**

Dynamic allowable moment
**Mc 176**N·m
(Rolling direction)

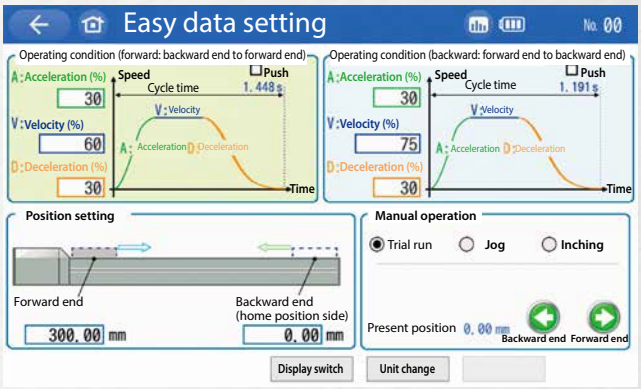






▲ Transfer of corrugated cardboard boxes
X-axis: EC-EWS12M-600

In addition…



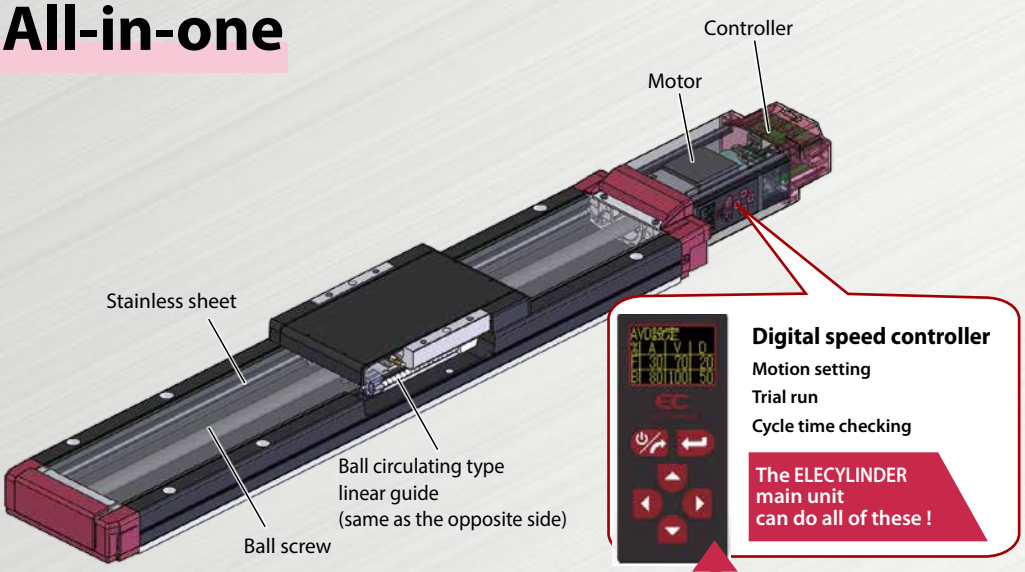

Since AVD (Acceleration, Velocity and Deceleration) can be individually set up, vibration will be suppressed and cycle times can be shortened.

▲ Easy data setting screen
* The "Unit Change" enables display of the actual units (speed: mm/s and acceleration: G).

Positioning of two points | Built-in controller

Wide Type

# All-in-one




All necessary functions for a single axis are built-in including controller and teaching functions.

Designing, start up and adjustment times can be shortened.

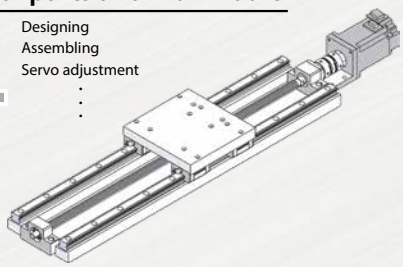
Example of in-house manufacturing a direct-acting unit

⇒ **Greater number of parts and man-hours**

Motor
Ball screw
Two linear guides
Guide block
Coupling
Bearing
Plate
⋮

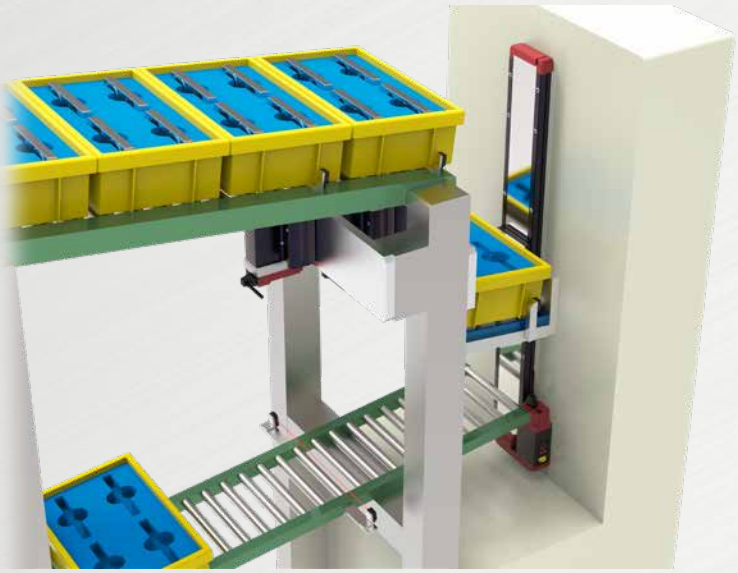
\+

Designing
Assembling
Servo adjustment
⋮



# Side mounted motor type

**NEW** The side mounted motor type is suitable for limited space in the longitudinal direction.



▲ Lifter transfer of parts container boxes
Z-axis: EC-DWS12MR-800

**Wide slider type ELECYLINDER product page to view the demo video:**

## Model Specification Items

### ELECYLINDER® Wider Slider Type

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

Series | Digital speed controller | Type | Lead | Specification | Stroke | Power / I/O cable length | Options

**Digital speed controller**

| | |
|---|---|
| Blank | Without digital speed controller |
| D | With digital speed controller |

**Type**

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

**Lead**

<(D)WS10>

| | |
|---|---|
| S | Lead 20mm |
| H | Lead 12mm |
| M | Lead 6mm |
| L | Lead 3mm |

<(D)WS12>

| | |
|---|---|
| S | Lead 24mm |
| H | Lead 16mm |
| M | Lead 8mm |
| L | Lead 4mm |

**Specification**

| | |
|---|---|
| Blank | Motor straight |
| R | Side mounted motor |

**Stroke**

<(D)WS10>

| | |
|---|---|
| 50 | 50mm |
| ≀ | ≀ |
| 500 | 500mm |

<(D)WS12>

| | |
|---|---|
| 50 | 50mm |
| ≀ | ≀ |
| 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 |
| DL | Digital speed controller installation direction (left)*2 |
| DR | Digital speed controller installation direction (right)*2 |
| G1/G5 | Designated grease specification*3 |
| ML | Motor side mounted to the left*4 |
| MR | Motor side mounted to the right*4 |
| NM | Non-motor end specification |
| PN | PNP specification*1 |
| SR | Slider part roller specification |
| TMD2 | Split motor and controller power supply specification |
| 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

*2 Please be sure to select a code if selecting the specification with digital speed controller

*3 For the side mounted motor specification, G1 cannot be selected

*4 Selection is possible (and required) only for the side mounted motor specification

## Table of Specifications

| Specification | Type | Lead | | Stroke (mm) and max. speed (mm/s) * Band length=stroke *Numbers in band = Max. speed by stroke, Numbers in < > are when used vertically. | | | | | | | | | | | | | | | | Max. payload | | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Model | mm | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | Horizontal | Vertical | |
| Motor straight | (D)WS10 | S | 20 | 900 | | | | | | 800 | 700 | 600 | 480 | | | | | | | 4 | — | P7 |
| | | H | 12 | 640 | | | | | 560 | 480 | 400 | 320 | 280 | | | | | | | 15 | — | |
| | | M | 6 | 400 <360> | | | | 360 | 270 | 210 | 180 | 140 | 120 | | | | | | | 25 | 4 | |
| | | L | 3 | 160 | | | | | 135 | 110 | 80 | 70 | 60 | | | | | | | 44 | 7 | |
| | (D)WS12 | S | 24 | 1000 | | | | | | | | 900 | 800 | 700 | 580 | 500 | 460 | 400 | 360 | 10 | — | P11 |
| | | H | 16 | 720 | | | | | | 640 | 580 | 500 | 420 | 360 | 320 | 280 | 240 | 220 | 200 | 20 | — | |
| | | M | 8 | 420 <360> | | | | | 360 | 280 | 250 | 220 | 190 | 170 | 150 | 130 | 110 | 90 | 85 | 40 | 8 | |
| | | L | 4 | 210 | | | | | 180 | 140 | 125 | 110 | 95 | 85 | 75 | 65 | 55 | 50 | 45 | 62 | 13.5 | |
| Side mounted motor | (D)WS10□R | S | 20 | 900 | | | | | | 800 | 700 | 600 | 480 | | | | | | | 4 | — | P15 |
| | | H | 12 | 640 | | | | | 560 | 480 | 400 | 320 | 280 | | | | | | | 15 | — | |
| | | M | 6 | 400 <320> | | | | 360 <320> | 270 | 210 | 180 | 140 | 120 | | | | | | | 25 | 4 | |
| | | L | 3 | 135 | | | | | | 110 | 80 | 70 | 60 | | | | | | | 44 | 7 | |
| | (D)WS12□R | S | 24 | 1000 | | | | | | | | 900 | 800 | 700 | 580 | 500 | 460 | 400 | 360 | 10 | — | P19 |
| | | H | 16 | 720 | | | | | | 640 | 580 | 500 | 420 | 360 | 320 | 280 | 240 | 220 | 200 | 20 | — | |
| | | M | 8 | 420 <280> | | | | | 360 <280> | 280 | 250 | 220 | 190 | 170 | 150 | 130 | 110 | 90 | 85 | 40 | 8 | |
| | | L | 4 | 210 <140> | | | | | 180 <140> | 140 | 125 | 110 | 95 | 85 | 75 | 65 | 55 | 50 | 45 | 62 | 13.5 | |

## Energy saving setting

ELECYLINDER® can select enable/disable of the "Energy saving" in parameter (No. 8).

**Enable setting reduces power capacity by up to approx. 40% compared with the disable setting.**
**However, the max. speed, max. acceleration/deceleration and payload will become smaller than that for the disable setting.**
**Disable setting increases max. speed, max. acceleration/deceleration and payload compared with the enabled setting.**
**Refer to the "Payload Table by Speed and Acceleration" and "Stroke and max. Speed" table of each product's specification page.**

**The product is set to disabled for shipment.**

Setting for shipment

| Mode | Parameter name/ description | Features |
|---|---|---|
| Power mode | Energy saving disabled | High specification |
| Energy saving mode | Energy saving enabled | High energy saving effect |

## Mounting orientation

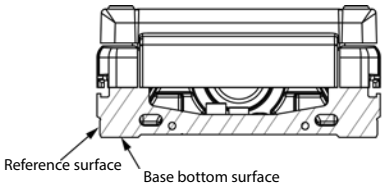
○: Can be mounted

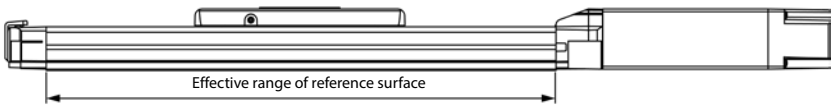
| Series | Type | Horizontal mounting on flat surface | Vertical mounting | Horizontal mounting to side | Horizontal mounting suspended |
|---|---|---|---|---|---|
| EC | (D)WS10(□R) | ○ | ○ *1 *2 *3 *4 | ○ *3 *5 | ○ *3 *5 |
| | (D)WS12(□R) | | | | |

*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.

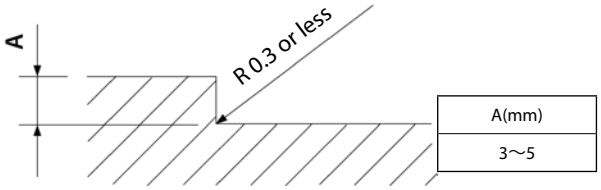
## Precautions for installation

- 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.
- The bottom surface and the left side (when viewed from the opposite side of the motor) of the main body base are the reference surfaces for the slider travel accuracy.




When mounting using the side surface as reference, machining of the surfaces should be done according to the drawing below.



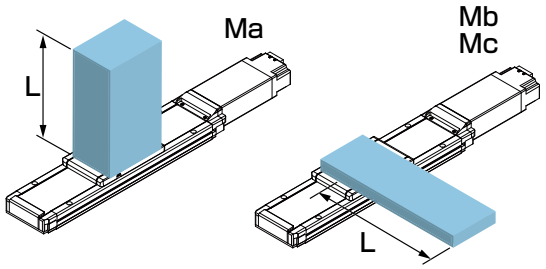

| A(mm) |
|---|
| 3～5 |

## Overhang load length

This is the guideline of offset lengths for smooth operations of the actuator, when a workpiece or a bracket is mounted offset from the actuator slider.

If the offset length greatly exceeds the guideline, it may cause failure due to vibration and the like.

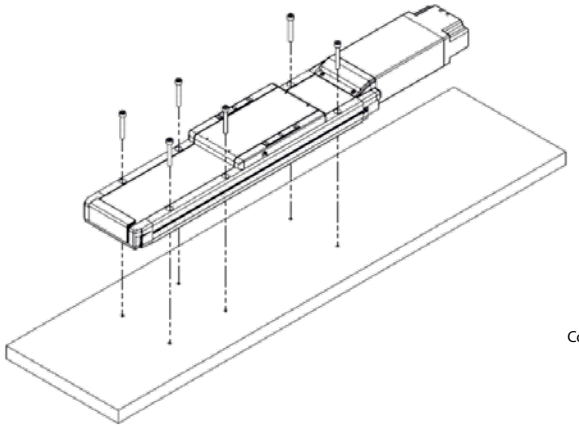
Use the actuator within the guideline for the offset length.



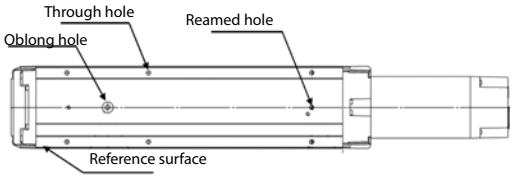
# Mounting method

## Using the through holes on the base

There are some through holes on the base so that it can be fixed from the top.

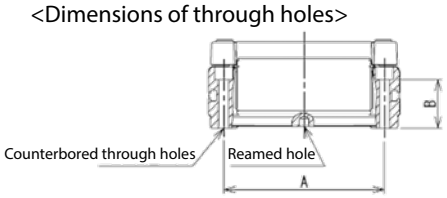


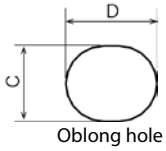
<Dimensions of the reamed hole and the oblong hole positions>




* Refer to the "Dimensions" in respective product pages for the details of the positions.

<Dimensions of through holes>



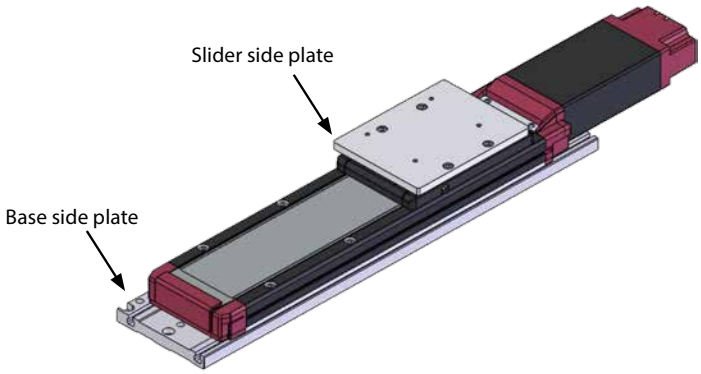

| Type | Bolt size | Counterbored through holes (mm) | A (mm) | B (mm) | Reamed hole (mm) | Oblong hole (mm) |
|---|---|---|---|---|---|---|
| (D)WS10(□R) | M5 | φ5.5 through φ9.5 deep counterbored, depth 6.5 | 84 | 25.5 | φ5H7 Depth 5 | C : 5 $^{+0.0012}_{0}$ D : 6,depth 5 |
| (D)WS12(□R) | M6 | φ6.6 through φ11deep counterbored, depth 6.5 | 103 | 30 | φ6H7 Depth 6 | C : 6 $^{+0.0012}_{0}$ D : 7,dept 6 |

## Using the air cylinder compatible plate

When the optional "air cylinder compatible mounting plate (type: CS)" is selected, mounting plates on the slider and base sides are included.

The mounting holes, positions and main body height can be aligned with some types of rod-less air cylinders (*)

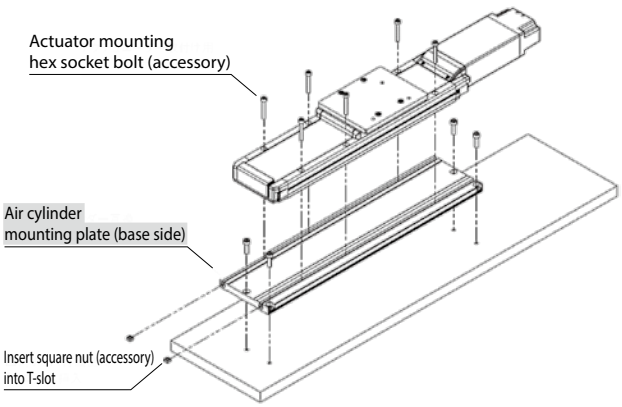
* Contact IAI representatives for details.



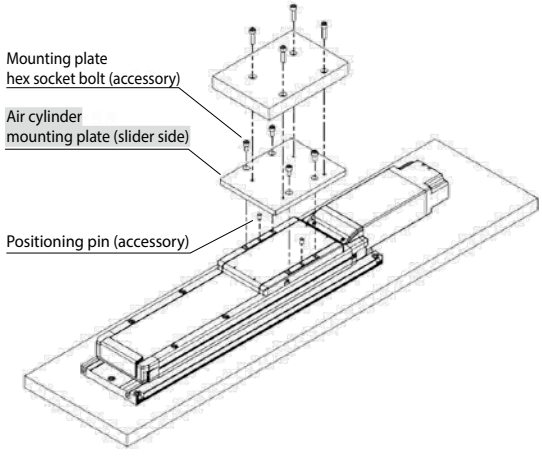

### Notes

- When optional "air cylinder compatible mounting plate (CS)" is selected, the payload will be reduced by 1 kg.
- Vertical, side and ceiling mounting are not possible.

<Body mounting>




<Transported object mounting>



# EC-WS10
# EC-DWS10

<With digital speed controller>

Simple Dust-proof | Coupled Motor | Body Width 100 mm | 24v Stepper Motor

## ■ Model Specification Items

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

| Series |
|---|
| EC |

| Type | |
|---|---|
| WS10 | Standard |
| DWS10 | Digital speed controller |

| Lead | |
|---|---|
| S | 20mm |
| H | 12mm |
| M | 6mm |
| L | 3mm |

| Stroke | |
|---|---|
| 50 | 50mm |
| ↓ | ↓ |
| 500 | 500mm (Every 50mm) |

| Power • I/O cable length |
|---|
| See power • I/O cable length below |

| Options |
|---|
| See options below |


EC-WS10 EC-DWS10

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

## ■ Stroke

| Stroke (mm) | WS10 | DWS10 | Stroke (mm) | WS10 | DWS10 |
|---|---|---|---|---|---|
| **50** | ○ | ○ | **300** | ○ | ○ |
| **100** | ○ | ○ | **350** | ○ | ○ |
| **150** | ○ | ○ | **400** | ○ | ○ |
| **200** | ○ | ○ | **450** | ○ | ○ |
| **250** | ○ | ○ | **500** | ○ | ○ |

## ■ Options

| Name | Option code | Reference page |
|---|---|---|
| RCON-EC connection specification (Note 1) | **ACR** | 23 |
| Brake | **B** | 23 |
| Air cylinder mounting plate | **CS** | 23 |
| Digital speed controller installation direction (left) (Note 2) | **DL** | 24 |
| Digital speed controller installation direction (right) (Note 2) | **DR** | 24 |
| Designated grease specification (Note 3) | **G1/G5** | 25 |
| Non-motor end specification | **NM** | 25 |
| PNP specification | **PN** | 25 |
| Slider part roller specification | **SR** | 25 |
| Split motor and controller power supply specification | **TMD2** | 25 |
| Battery-less absolute encoder specification | **WA** | 25 |
| Wireless communication specification | **WL** | 25 |
| Wireless axis operation specification | **WL2** | 25 |

(Note 1) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected.
(Note 2) Available only for DWS10. Be sure to enter a model in the options section of the model number.
(Note 3) When using Lead 3 in a vertical mount, the max. speed is 110mm/s if the specified grease specification (G1) is selected.

**POINT Selection Notes**

(1) The maximum speed decreases as the stroke becomes longer due to the dangerous number of rotation of the ball screw. Confirm the maximum speed, referring to the "Stroke and Max. Speed" of the desired stroke.
(2) "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.
(3) If performing push-motion operations, refer to the "Correlation between Torque and Current Limit" diagram. The torques listed are only reference values. Refer to P. 26 for precautions.
(4) Pay close attention to the installation orientation. Please refer to P. 5 for details.
(5) The "H" and "S" leads cannot be vertically mounted.
(6) Reference value of the overhang load length is under 400mm in the Ma, Mb, and Mc directions. Refer to descriptions about the overhang length on P. 5.
(7) 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 abnormal vibration or noise is observed.

## ■ Power · I/O cable length

### ■ Standard connector cable

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

(Note 4) Only terminal block connector is included. Please refer to P. 31 for details.
(Note 5) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

### ■ 4-way connector cable

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

(Note 6) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

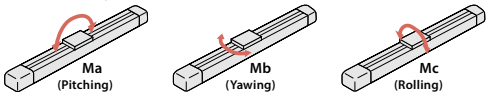
## Main Specifications

| 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 |

| Item | Description |
|---|---|
| Driving system | Ball screw, φ10mm, rolled C10 |
| Positioning repeatability | ±0.05mm |
| Lost motion | — (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 6) | 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 | Stepper motor(□35) |
| Encoder type | Incremental/battery-less absolute |
| Number of encoder pulses | 800 pulse/rev |

(Note 6) Assumes a standard rated life of 5,000km. The operational life will vary depending on operation and installation conditions.
Confirm the operational life on P. 1-244 of the General Catalog 2021.

### ■ Slider type moment direction




## Table of Payload by Speed/Acceleration * The product is set to disabled for shipment. Refer to P. 4 for details.

### ■ 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 |

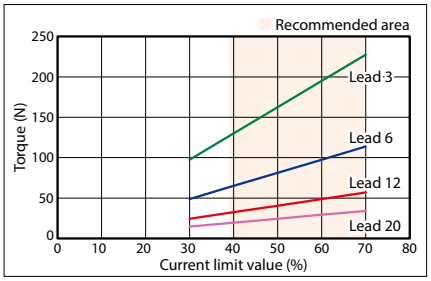
## Stroke and Max Speed

| 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



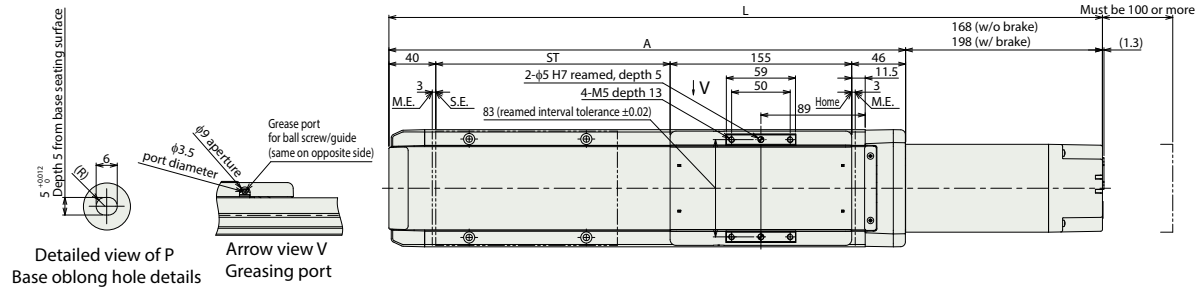
## Dimensions

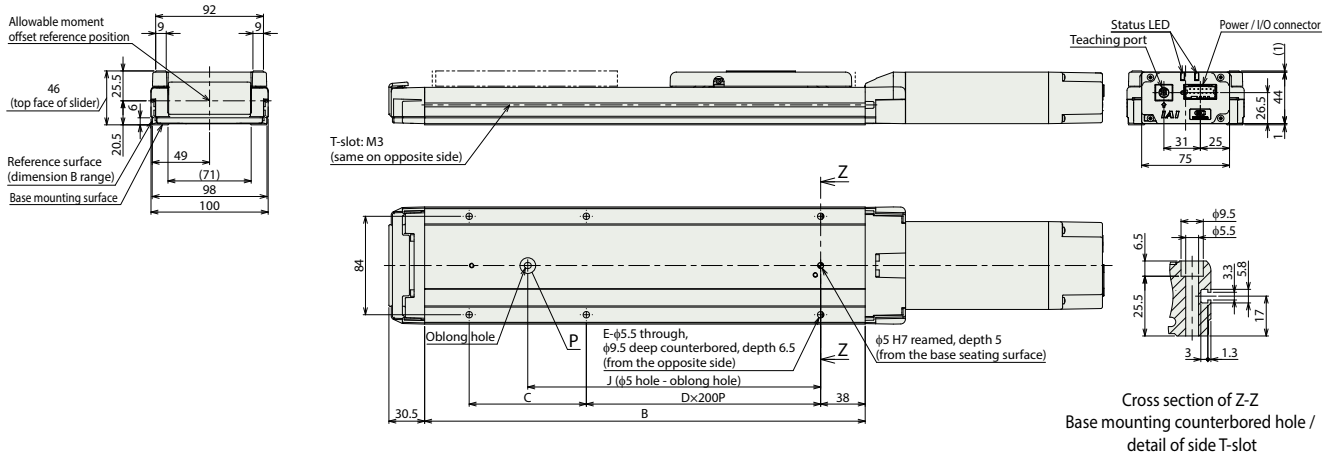
CAD drawings can be downloaded from our website.
www.intelligentactuator.com

## ■ 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




## ■ 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 |

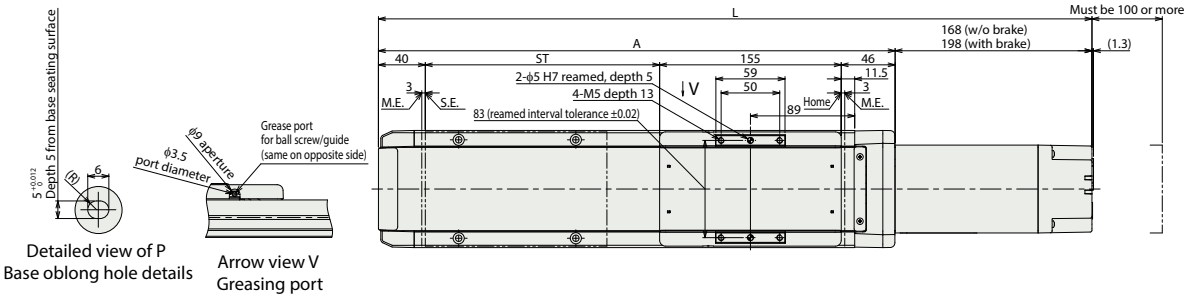
## ■ Mass by stroke

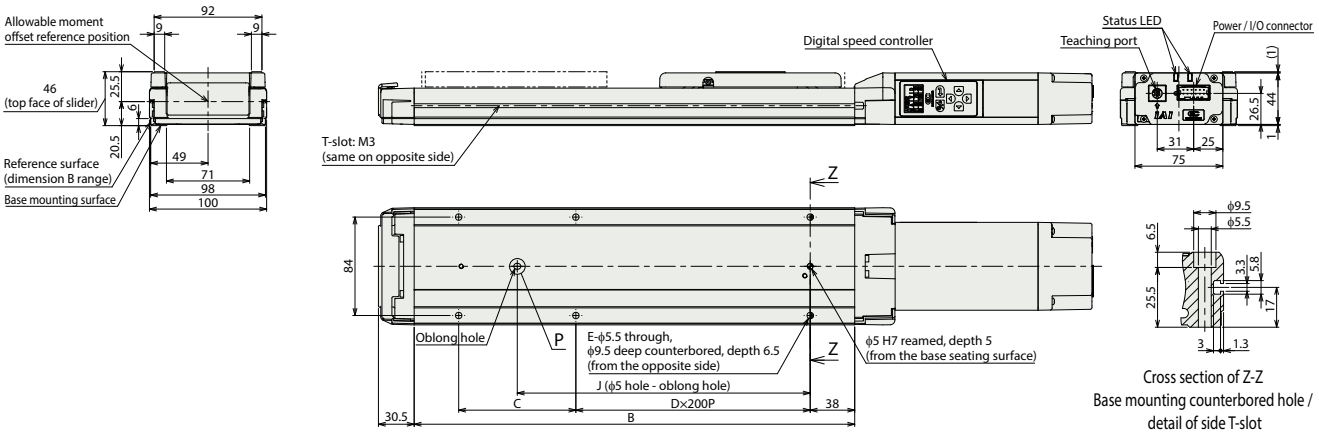
| Stroke | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mass (kg) | Without brake | 2.7 | 2.9 | 3.2 | 3.4 | 3.7 | 3.9 | 4.2 | 4.4 | 4.7 | 4.9 |
| | With brake | 2.8 | 3.1 | 3.3 | 3.5 | 3.8 | 4.1 | 4.3 | 4.5 | 4.8 | 5.0 |

## ■ EC-DWS10 <with digital speed controller>

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The figures below are for digital speed controller installation direction left (DL). These would be reversed for digital speed controller installation direction right (DR).

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




## ■ 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 |

## ■ Applicable controllers

(Note) EC Series products are equipped with a built-in controller. Please refer to P. 30 for details on built-in controllers.

# EC-WS12
# EC-DWS12

<With digital speed controller>

Simple Dust-proof | Coupled Motor | Body Width 120 mm | 24v Stepper 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 |
| | DWS12 | Digital speed controller | H | 16mm | ↕ | ↕ | | |
| | | | M | 8mm | 800 | 800mm (Every 50mm) | | |
| | | | L | 4mm | | | | |


EC-WS12 EC-DWS12

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

## ■ Stroke

| Stroke (mm) | WS12 | DWS12 | Stroke (mm) | WS12 | DWS12 |
|---|---|---|---|---|---|
| **50** | ○ | ○ | **450** | ○ | ○ |
| **100** | ○ | ○ | **500** | ○ | ○ |
| **150** | ○ | ○ | **550** | ○ | ○ |
| **200** | ○ | ○ | **600** | ○ | ○ |
| **250** | ○ | ○ | **650** | ○ | ○ |
| **300** | ○ | ○ | **700** | ○ | ○ |
| **350** | ○ | ○ | **750** | ○ | ○ |
| **400** | ○ | ○ | **800** | ○ | ○ |

## ■ Options

| Name | Option code | Reference page |
|---|---|---|
| RCON-EC connection specification (Note 1) | **ACR** | 23 |
| Brake | **B** | 23 |
| Air cylinder mounting plate | **CS** | 23 |
| Digital speed controller installation direction (left) (Note 2) | **DL** | 24 |
| Digital speed controller installation direction (right) (Note 2) | **DR** | 24 |
| Designated grease specification | **G1/G5** | 25 |
| Non-motor end specification | **NM** | 25 |
| PNP specification | **PN** | 25 |
| Slider part roller specification | **SR** | 25 |
| Split motor and controller power supply specification | **TMD2** | 25 |
| Battery-less absolute encoder specification | **WA** | 25 |
| Wireless communication specification | **WL** | 25 |
| Wireless axis operation specification | **WL2** | 25 |

(Note 1) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected.
(Note 2) Available only for DWS12. Be sure to enter a model in the options section of the model number.

POINT Selection Notes

(1) The maximum speed decreases as the stroke becomes longer due to the dangerous number of rotation of the ball screw. Confirm the maximum speed, referring to the "Stroke and Max. Speed" of the desired stroke.
(2) "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.
(3) If performing push-motion operations, refer to the "Correlation between Torque and Current Limit" diagram. The torques listed are only reference values. Refer to P. 26 for precautions.
(4) The duty ratio is to be limited depending on the ambient operating temperature. Refer to P. 26 for precautions.
(5) Pay close attention to the installation orientation. Please refer to P. 5 for details.
(6) The "H" and "S" leads cannot be vertically mounted.
(7) Push-motion operations are unavailable for the "S" lead.
(8) Reference value of the overhang load length is under 400mm in the Ma, Mb, and Mc directions. Refer to descriptions about the overhang length on P. 5.
(8) 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 abnormal vibration or noise is observed.

## ■ Power・I/O cable length

### ■ Standard connector cable

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

(Note 3) Only terminal block connector is included. Please refer to P. 31 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

### ■ 4-way connector cable

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

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

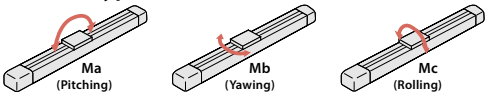
## Main Specifications

| 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, φ12mm, rolled C10 |
| Positioning repeatability | ±0.05mm |
| Lost motion | — (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 6) | 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 | Stepper motor(□42) |
| Encoder type | Incremental/battery-less absolute |
| Number of encoder pulses | 800 pulse/rev |

(Note 6) Assumes a standard rated life of 5,000km. The operational life will vary depending on operation and installation conditions.
Confirm the operational life on P. 1-244 of the General Catalog 2021.

### Slider type moment direction




## Table of Payload by Speed/Acceleration * The product is set to disabled for shipment. Refer to P. 4 for details.

### 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 |

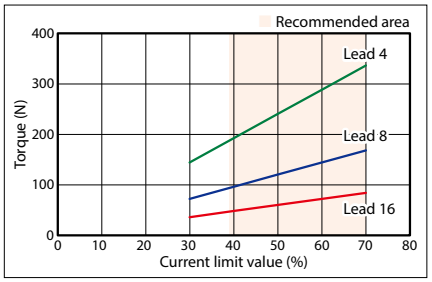
## Stroke and Max Speed

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

(Unit: mm/s)

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

## Correlation between torque and current limit



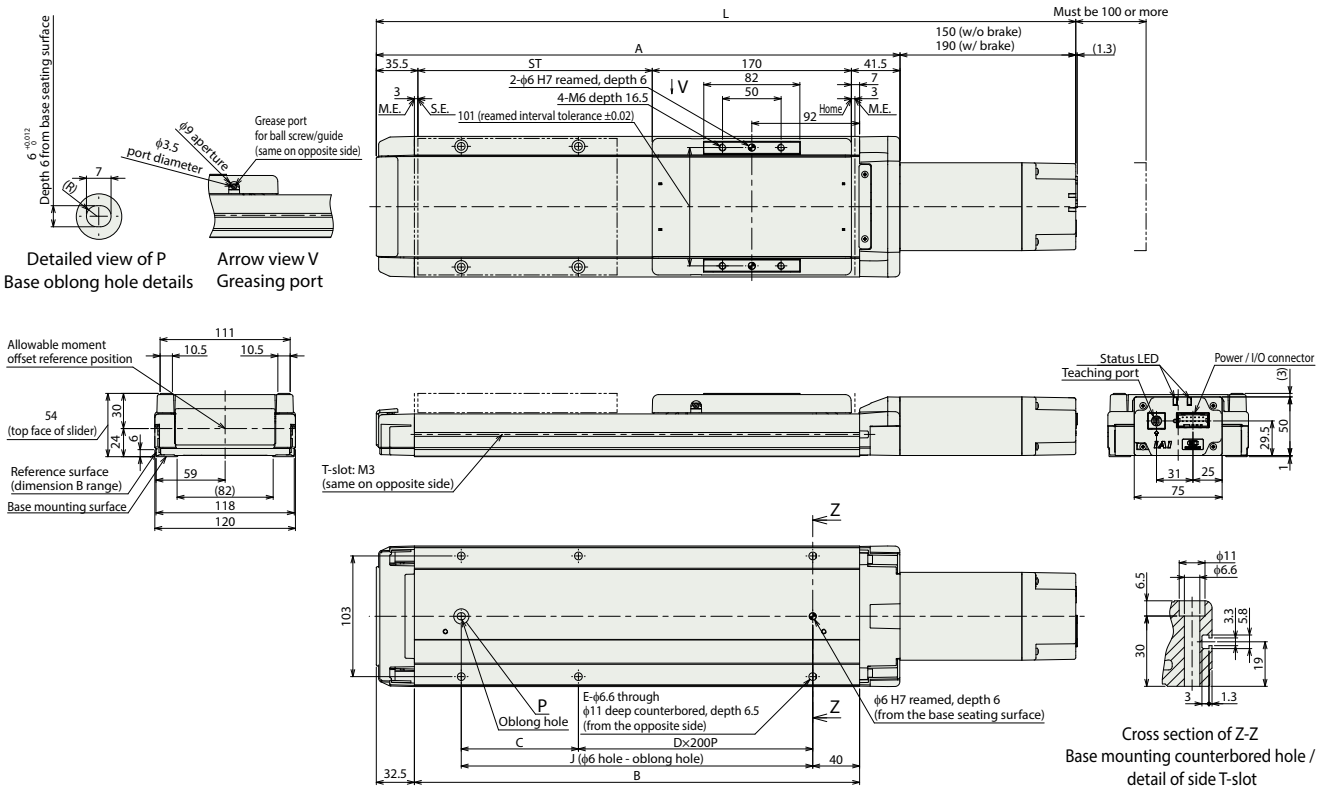
## Dimensions

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

## 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 |

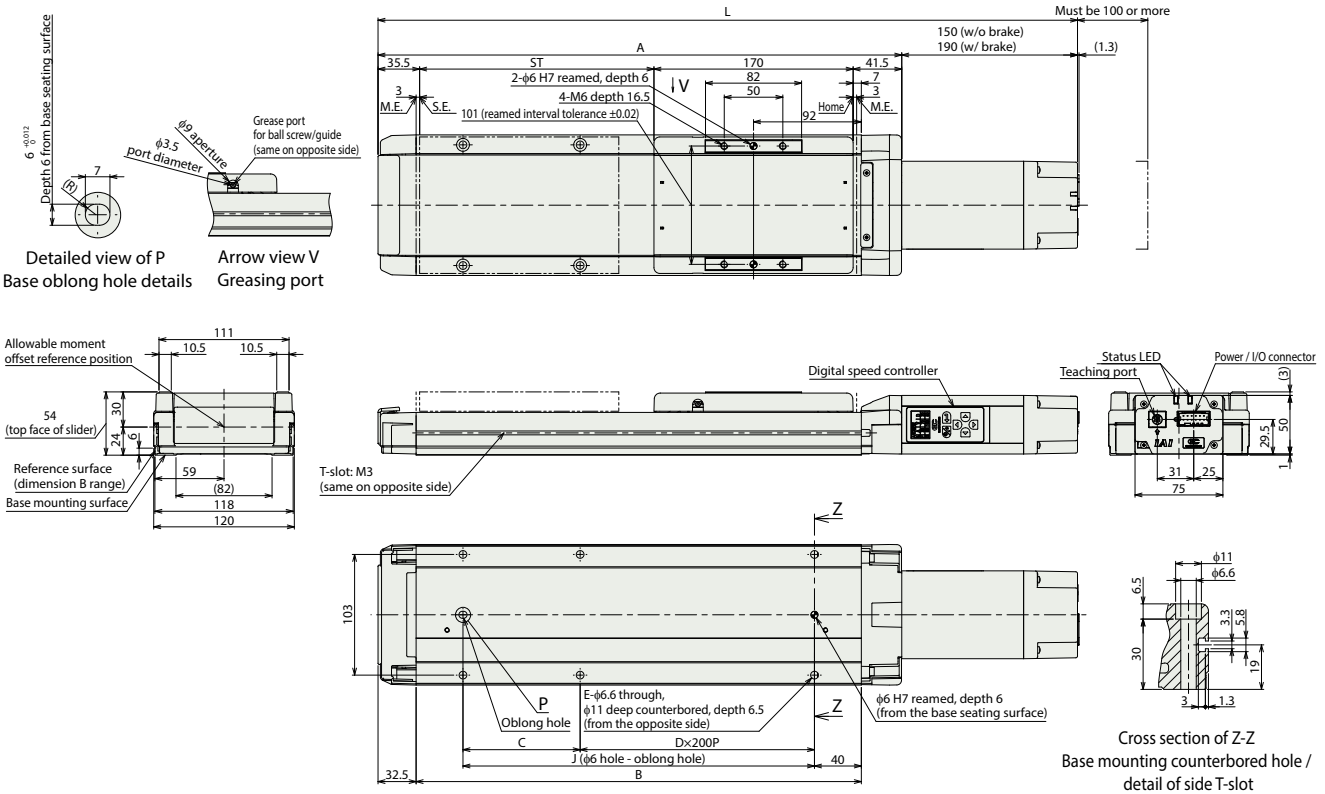
## Mass by stroke

| 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 |

## ■ EC-DWS12 <with digital speed controller>

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The figures below are for digital speed controller installation direction left (DL). These would be reversed for digital speed controller installation direction right (DR).

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 |

## ■ Applicable controllers

(Note) EC Series products are equipped with a built-in controller. Please refer to P. 30 for details on built-in controllers.

# EC-WS10□R
# EC-DWS10□R <With digital speed controller>

Simple Dust-proof | Side mounted motor | Body Width 100 mm | 24v Stepper Motor

## ■ Model Specification Items

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

| Series | Type | | Lead | | Specifications | | Stroke | | Power • I/O cable length | Options |
|---|---|---|---|---|---|---|---|---|---|---|
| | WS10 | Standard | S | 20mm | R | Side mounted motor | 50 | 50mm | See power • I/O cable length below | See options below |
| | DWS10 | Digital speed controller | H | 12mm | | | ≀ | ≀ | | |
| | | | M | 6mm | | | 500 | 500mm (Every 50mm) | | |
| | | | L | 3mm | | | | | | |


Horizontal | Vertical | Side | Ceiling

**EC-WS10□R EC-DWS10□R**

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

## Stroke

| Stroke (mm) | WS10□R | DWS10□R | Stroke (mm) | WS10□R | DWS10□R |
|---|---|---|---|---|---|
| **50** | ○ | ○ | **300** | ○ | ○ |
| **100** | ○ | ○ | **350** | ○ | ○ |
| **150** | ○ | ○ | **400** | ○ | ○ |
| **200** | ○ | ○ | **450** | ○ | ○ |
| **250** | ○ | ○ | **500** | ○ | ○ |

## Options

| Name | Option code | Reference page |
|---|---|---|
| RCON-EC connection specification (Note 1) | **ACR** | 23 |
| Brake | **B** | 23 |
| Air cylinder mounting plate | **CS** | 23 |
| Designated grease specification | **G5** | 25 |
| Motor side mounted to the left (Note2) | **ML** | 25 |
| Motor side mounted to the right (Note2) | **MR** | 25 |
| Non-motor end specification | **NM** | 25 |
| PNP specification | **PN** | 25 |
| Slider part roller specification | **SR** | 25 |
| Split motor and controller power supply specification | **TMD2** | 25 |
| Battery-less absolute encoder specification | **WA** | 25 |
| Wireless communication specification | **WL** | 25 |
| Wireless axis operation specification | **WL2** | 25 |

(Note 1) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected.
(Note 2) Make sure to specify either model in the option column of the model specification items.

**POINT Selection Notes**

(1) The maximum speed decreases as the stroke becomes longer due to the dangerous number of rotation of the ball screw. Confirm the maximum speed, referring to the "Stroke and Max. Speed" of the desired stroke.
(2) "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.
(3) If performing push-motion operations, refer to the "Correlation between Torque and Current Limit" diagram. The torques listed are only reference values. Refer to P. 26 for precautions.
(4) Pay close attention to the installation orientation. Please refer to P. 5 for details.
(5) The "H" and "S" leads cannot be vertically mounted.
(6) Reference value of the overhang load length is under 400mm in the Ma, Mb, and Mc directions. Refer to descriptions about the overhang length on P. 5.
(7) 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 abnormal vibration or noise is observed.

## Power · I/O cable length

### ■ Standard connector cable

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

(Note 3) Only terminal block connector is included. Please refer to P. 31 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

### ■ 4-way connector cable

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

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

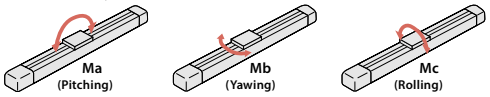
## Main Specifications

| 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) | 35 | 35 | 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) | - | - | 320 | 135 |
| | | 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) | 35 | 35 | 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 |

| Item | Description |
|---|---|
| Driving system | Ball screw, 10mm, rolled C10 |
| Positioning repeatability | ±0.05mm |
| Lost motion | — (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 6) | 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 | Stepper motor(□35) |
| Encoder type | Incremental/battery-less absolute |
| Number of encoder pulses | 800 pulse/rev |

(Note 6) Assumes a standard rated life of 5,000km. The operational life will vary depending on operation and installation conditions.
Confirm the operational life on P. 1-244 of the General Catalog 2021.

### ■ Slider type moment direction




## Table of Payload by Speed/Acceleration * The product is set to disabled for shipment. Refer to P. 4 for details.

### ■ 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 |

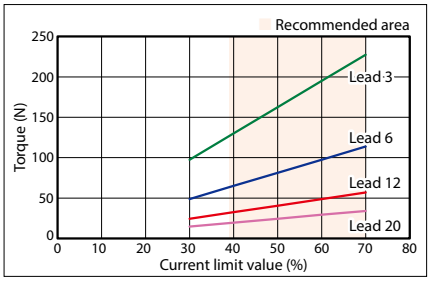
## Stroke and Max Speed

| 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



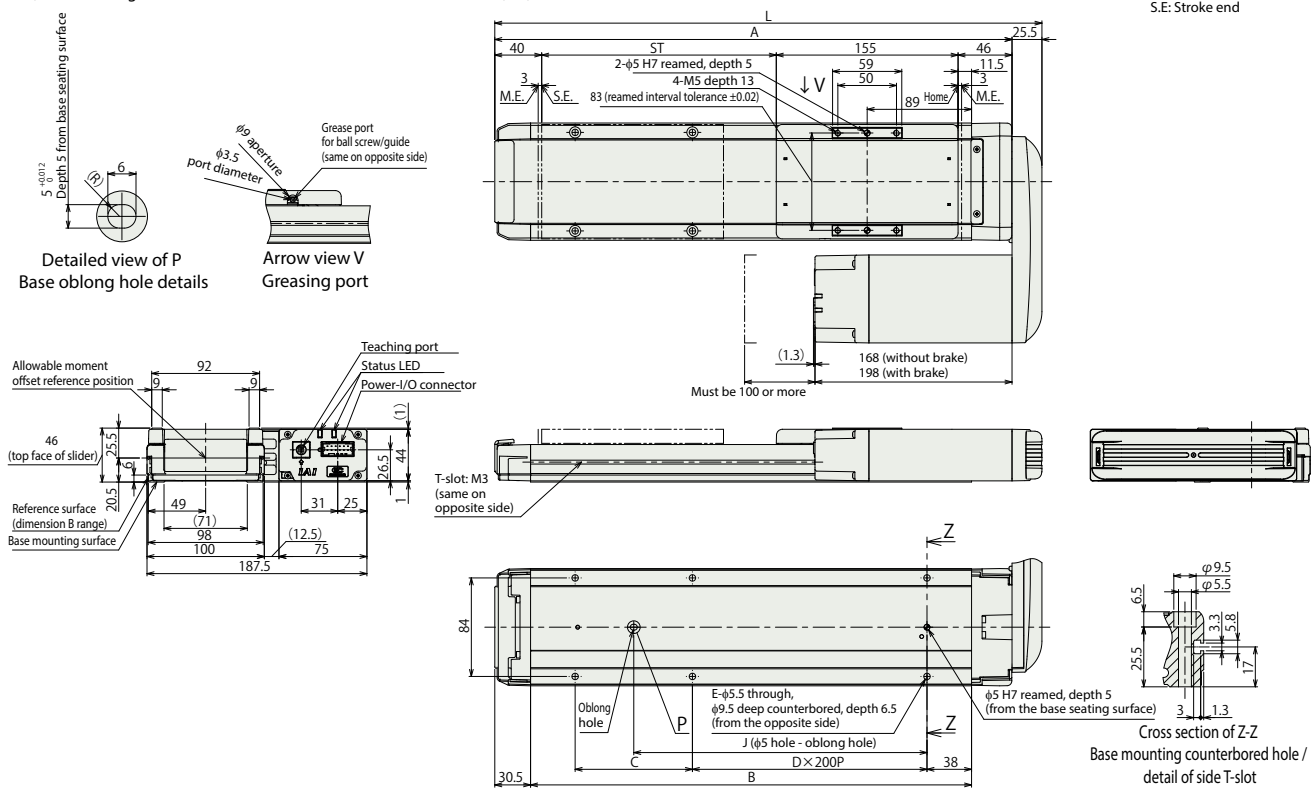
## Dimensions

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

## ■ EC-WS10□R

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The drawings below are for the motor side mounted to the left (ML).

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




## ■ Dimensions by stroke

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|
| L | 316.5 | 366.5 | 416.5 | 466.5 | 516.5 | 566.5 | 616.5 | 666.5 | 716.5 | 766.5 |
| 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 |

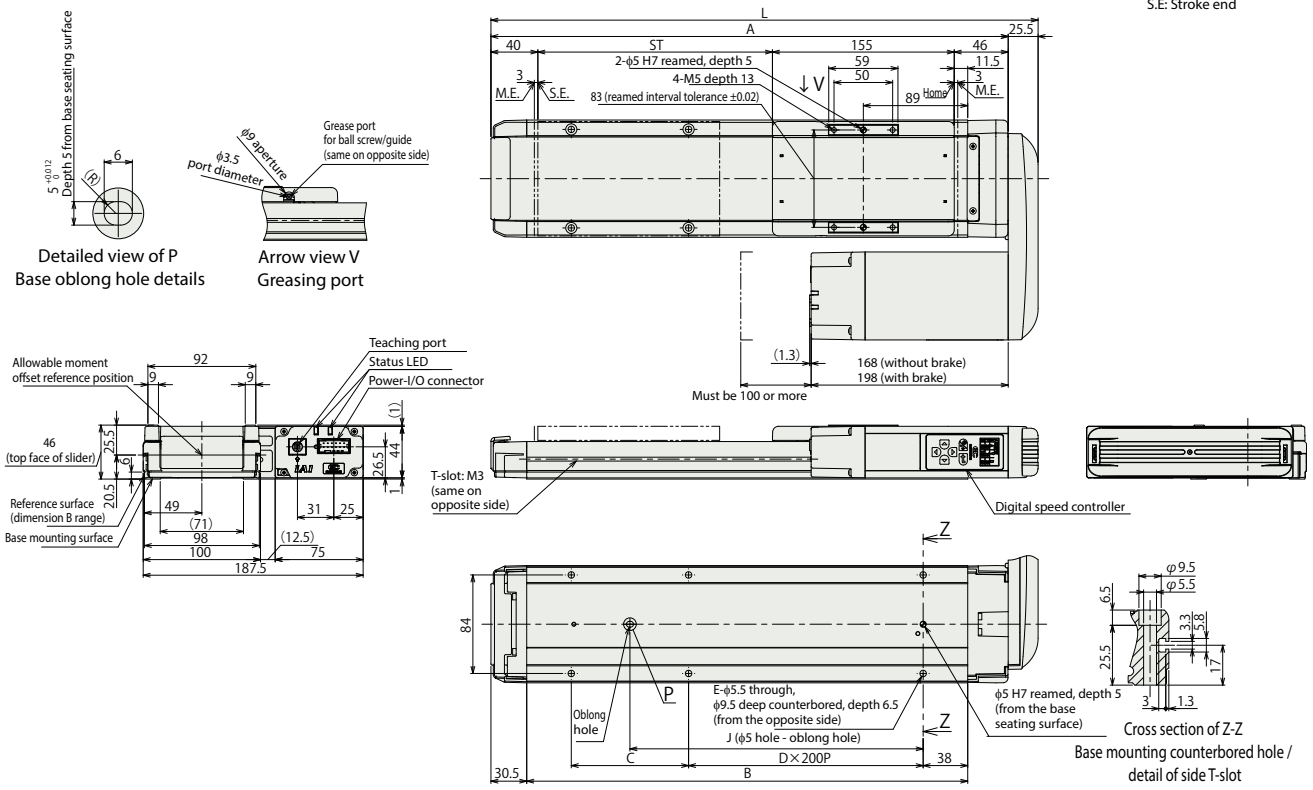
## ■ Mass by stroke

| Stroke | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mass (kg) | Without brake | 2.9 | 3.1 | 3.4 | 3.7 | 3.9 | 4.1 | 4.4 | 4.6 | 4.9 | 5.1 |
| | With brake | 3.0 | 3.3 | 3.5 | 3.8 | 4.0 | 4.3 | 4.5 | 4.8 | 5.0 | 5.3 |

## ■ EC-DWS10□R <with digital speed controller>

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The drawings below are for the motor side mounted to the left (ML).

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




## ■ Dimensions by stroke

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|
| L | 316.5 | 366.5 | 416.5 | 466.5 | 516.5 | 566.5 | 616.5 | 666.5 | 716.5 | 766.5 |
| 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 | 2.9 | 3.1 | 3.4 | 3.7 | 3.9 | 4.2 | 4.4 | 4.7 | 4.9 | 5.1 |
| | With brake | 3.0 | 3.3 | 3.5 | 3.8 | 4.1 | 4.3 | 4.5 | 4.8 | 5.0 | 5.0 |

## ■ Applicable controllers

(Note) EC Series products are equipped with a built-in controller. Please refer to P. 30 for details on built-in controllers.

# EC-WS12□R
# EC-DWS12□R <With digital speed controller>

Simple Dust-proof | Side mounted motor | Body Width 120 mm | 24v Stepper Motor

## ■ Model Specification Items

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

| Series | Type | | Lead | | Specifications | | Stroke | | Power • I/O cable length | Options |
|---|---|---|---|---|---|---|---|---|---|---|
| | WS12 | Standard | S | 24mm | R | Side mounted motor | 50 | 50mm | See power • I/O cable length below | See options below |
| | DWS12 | Digital speed controller | H | 16mm | | | ⁞ | ⁞ | | |
| | | | M | 8mm | | | 800 | 800mm (Every 50mm) | | |
| | | | L | 4mm | | | | | | |


Horizontal | Vertical | Side | Ceiling

**EC-WS12□R EC-DWS12□R**

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

## Stroke

| Stroke (mm) | WS12□R | DWS12□R | Stroke (mm) | WS12□R | DWS12□R |
|---|---|---|---|---|---|
| **50** | ○ | ○ | **450** | ○ | ○ |
| **100** | ○ | ○ | **500** | ○ | ○ |
| **150** | ○ | ○ | **550** | ○ | ○ |
| **200** | ○ | ○ | **600** | ○ | ○ |
| **250** | ○ | ○ | **650** | ○ | ○ |
| **300** | ○ | ○ | **700** | ○ | ○ |
| **350** | ○ | ○ | **750** | ○ | ○ |
| **400** | ○ | ○ | **800** | ○ | ○ |

## Options

| Name | Option code | Reference page |
|---|---|---|
| RCON-EC connection specification (Note 1) | **ACR** | 23 |
| Brake | **B** | 23 |
| Air cylinder mounting plate | **CS** | 23 |
| Designated grease specification | **G5** | 25 |
| Motor side mounted to the left (Note2) | **ML** | 25 |
| Motor side mounted to the right (Note2) | **MR** | 25 |
| Non-motor end specification | **NM** | 25 |
| PNP specification | **PN** | 25 |
| Slider part roller specification | **SR** | 25 |
| Split motor and controller power supply specification | **TMD2** | 25 |
| Battery-less absolute encoder specification | **WA** | 25 |
| Wireless communication specification | **WL** | 25 |
| Wireless axis operation specification | **WL2** | 25 |

(Note 1) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected.
(Note 2) Make sure to specify either model in the option column of the model specification items.

**POINT Selection Notes**

(1) The maximum speed decreases as the stroke becomes longer due to the dangerous number of rotation of the ball screw. Confirm the maximum speed, referring to the "Stroke and Max. Speed" of the desired stroke.
(2) "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.
(3) If performing push-motion operations, refer to the "Correlation between Torque and Current Limit" diagram. The torques listed are only reference values. Refer to P. 26 for precautions.
(4) The duty ratio is to be limited depending on the ambient operating temperature. Refer to P. 26 for precautions.
(5) Pay close attention to the installation orientation. Please refer to P. 5 for details.
(6) The "H" and "S" leads cannot be vertically mounted.
(7) Push-motion operations are unavailable for the "S" lead.
(8) Reference value of the overhang load length is under 400mm in the Ma, Mb, and Mc directions. Refer to descriptions about the overhang length on P. 5.
(8) 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 abnormal vibration or noise is observed.

## Power · I/O cable length

### ■ Standard connector cable

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

(Note 3) Only terminal block connector is included. Please refer to P. 31 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) Robot cable is standard.

### ■ 4-way connector cable

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

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

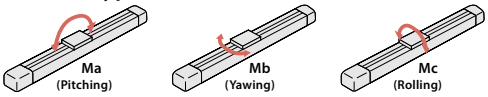
## Main Specifications

| 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) | - | - | 280 | 140 |
| | | 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) | - | 72 | 144 | 288 |
| | | 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, φ12mm, rolled C10 |
| Positioning repeatability | ±0.05mm |
| Lost motion | — (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 6) | 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/s² |
| Overseas standards | CE marking, RoHS directive |
| Motor type | Stepper motor(□42) |
| Encoder type | Incremental/battery-less absolute |
| Number of encoder pulses | 800 pulse/rev |

(Note 6) Assumes a standard rated life of 5,000km. The operational life will vary depending on operation and installation conditions.
Confirm the operational life on P. 1-244 of the General Catalog 2021.

### Slider type moment direction




## Table of Payload by Speed/Acceleration * The product is set to disabled for shipment. Refer to P. 4 for details.

### 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 | 3.5 |
| 360 | 10 | 8 | 6 | 3.5 |
| 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 | 4 | 3 |
| 280 | 30 | 16 | 3 | 2 |
| 320 | 22 | 12 | | |
| 360 | 15 | 9 | | |
| 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 | 11 |
| 140 | 50 | 5 |
| 160 | 42 | |
| 180 | 35 | |
| 210 | 20 | |

### 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 | |

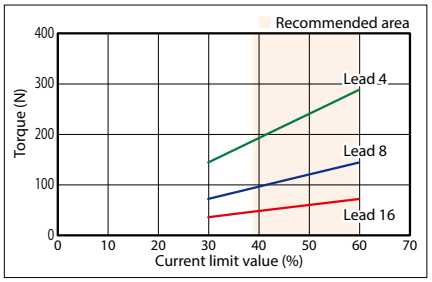
## Stroke and Max Speed

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

(Unit: mm/s)

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

## Correlation between torque and current limit



## Dimensions

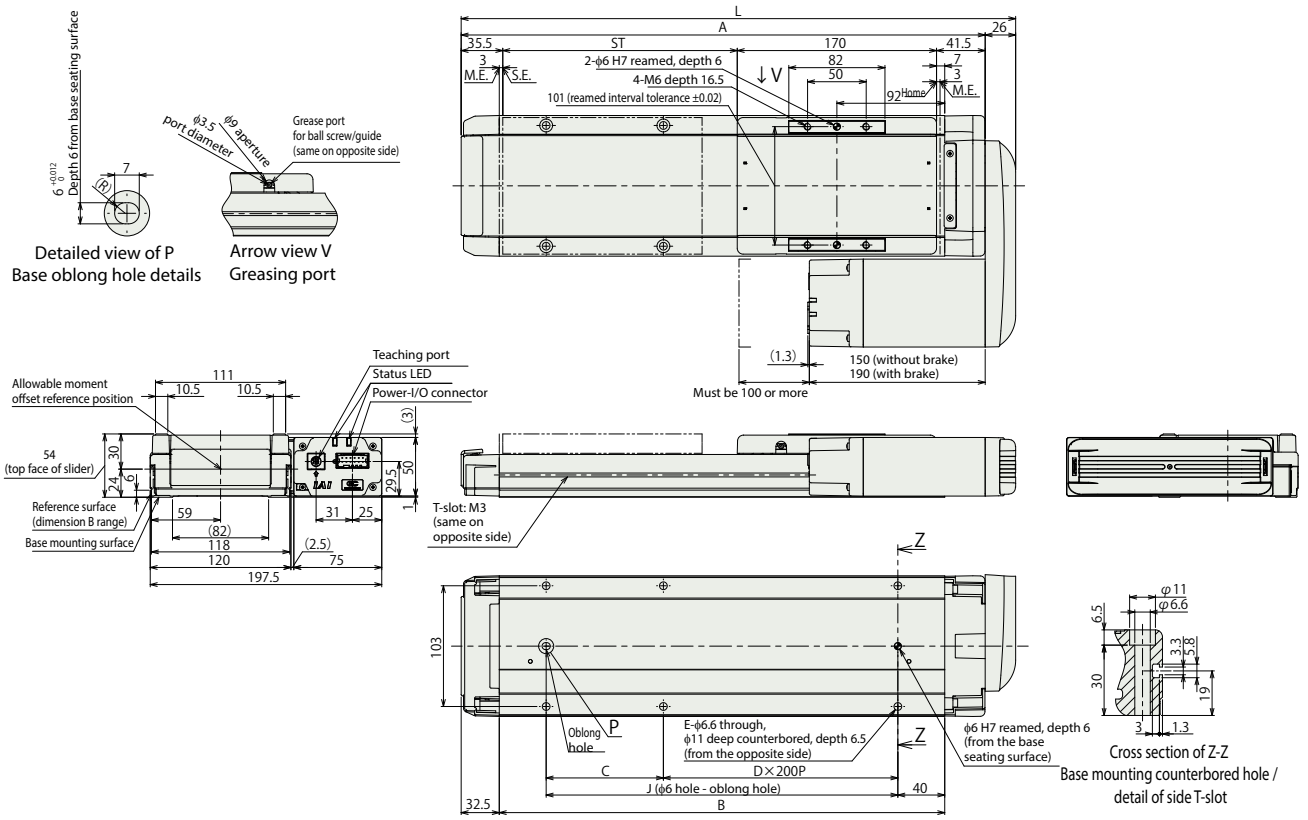
CAD drawings can be downloaded from our website.
www.intelligentactuator.com

2D CAD 3D CAD

### ■ EC-WS12□R

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The drawings below are for the motor side mounted to the left (ML).

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 | 323 | 373 | 423 | 473 | 523 | 573 | 623 | 673 | 723 | 773 | 823 | 873 | 923 | 973 | 1023 | 1073 |
| 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 |

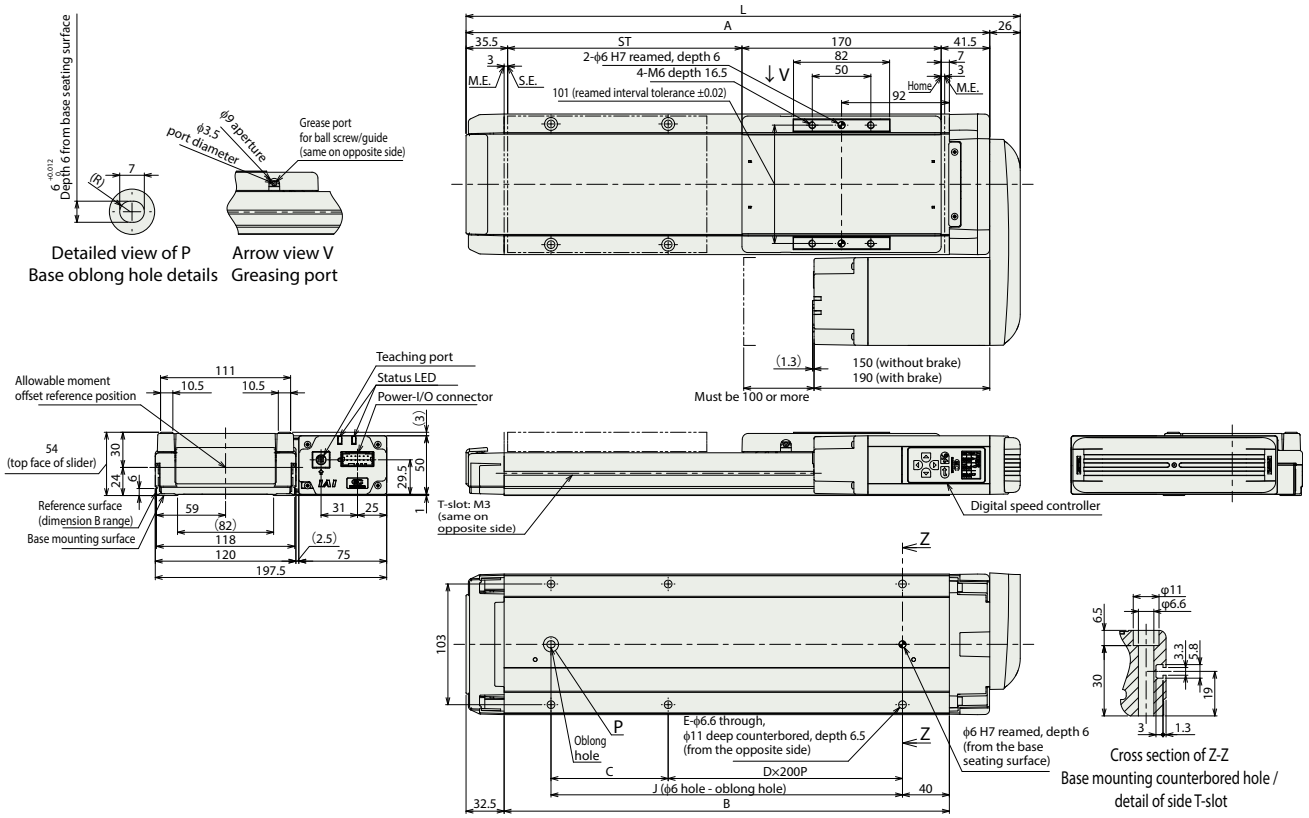
### ■ Mass by stroke

| Stroke | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mass (kg) | Without brake | 3.9 | 4.2 | 4.6 | 4.9 | 5.3 | 5.6 | 6.0 | 6.4 | 6.7 | 7.1 | 7.4 | 7.8 | 8.1 | 8.5 | 8.8 | 9.2 |
| | With brake | 4.2 | 4.5 | 4.9 | 5.2 | 5.6 | 5.9 | 6.3 | 6.7 | 7 | 7.4 | 7.7 | 8.1 | 8.4 | 8.8 | 9.1 | 9.5 |

## ■ EC-DWS12□R <with digital speed controller>

(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The drawings below are for the motor side mounted to the left (ML).

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 | 323 | 373 | 423 | 473 | 523 | 573 | 623 | 673 | 723 | 773 | 823 | 873 | 923 | 973 | 1023 | 1073 |
| 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 | 3.9 | 4.2 | 4.6 | 4.9 | 5.3 | 5.6 | 6.0 | 6.4 | 6.7 | 7.1 | 7.4 | 7.8 | 8.1 | 8.5 | 8.8 | 9.2 |
| | With brake | 4.2 | 4.5 | 4.9 | 5.2 | 5.6 | 5.9 | 6.3 | 6.7 | 7 | 7.4 | 7.7 | 8.1 | 8.4 | 8.8 | 9.1 | 9.5 |

## ■ Applicable controllers

(Note) EC Series products are equipped with a built-in controller. Please refer to P. 30 for details on built-in controllers.

# 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.
* When this option is selected, the power source becomes twin power and input/output specifications are fixed to NPN. Therefore, TMD2 and PN options cannot be selected at the same time.

## Brake

Model **B** Applicable models **All models**

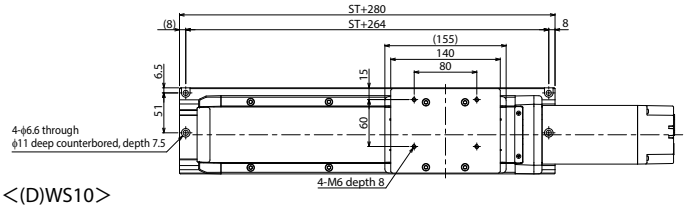
Description
This mechanism stops the slider from moving when the power or servo is turned off. This option is necessary when the actuator is used vertically.

## Air cylinder mounting plates

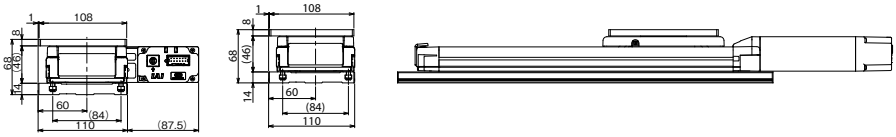
Model **CS** Applicable models **All models**

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




<(D)WS10□R> <(D)WS10>



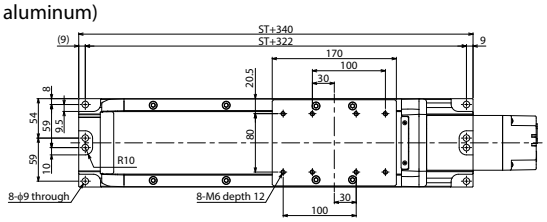

◆ Additional accessories
- Hex socket bolts (for mounting to the slider carriage): M5×10 (4 bolts)
- Parallel pin: φ5×8 type B h7 (2 pins)
- Hex socket bolts (for mounting to the actuator base): M5×35 (no. of bolts shown in following table)
- Square nuts: □8×4 M5 (no. of nuts shown in following table)

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

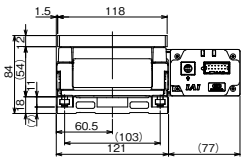
◆ Mass by stroke (plate addition)

| 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 |

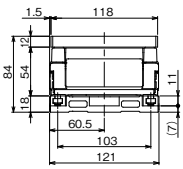
EC-(D)WS12 / (D)WS12□R
Individual model number Base bracket: EC-CSB-WS12-(stroke) (material: aluminum)
Slider bracket: EC-CSS-WS12 (material: aluminum)

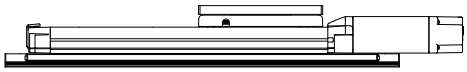



<(D)WS12□R>




<(D)WS12>



◆ Additional accessories
- Hex socket bolts (for slider mounting): M6×15 (4 bolts)
- Parallel pin: φ6×10 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 |

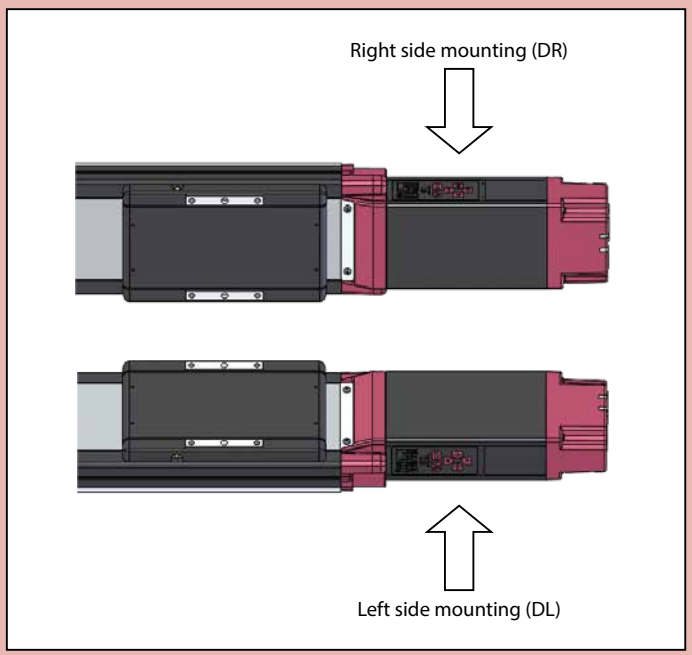
◆ Mass by stroke (plate addition)

| 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 |

## Digital speed controller installation direction

**Model** **DL/DR** **Applicable models** **EC-DWS10 / DWS12 (motor straight type)**

**Description** This code specifies the installation orientation of the digital speed controller for types with digital speed controllers.
The left side and right side are indicated with DL and DR, respectively, when looking from the motor side. Be sure to enter a code in the model number.



## Designated grease specification

Model **G1/G5** Applicable models **G1: EC-(D)WS10 / (D)WS12 (motor straight type)**
**G5: All models**

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

## Side mounted motor

Model **ML/MR** Applicable models **EC-(D)WS10□R / (D)WS12□R (motor straight type)**

Description This option is to specify the orientation of the side mounted motor. Motor side mounted to the left is ML, and to the right is MR.

## Non-motor end specification

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

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.

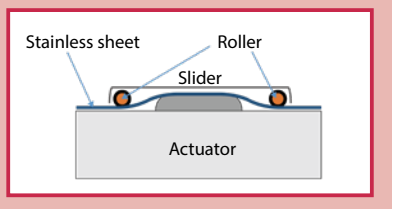
Model **PN** Applicable models **All models**

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

## Slider part roller specification

Model **SR** Applicable models **All models**

Description The slider construction of the standard slider type will be changed to the roller construction same as that of the cleanroom specification.




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

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

Description This option provides separate power for the motor and controller.
Select this option to allow shutting down the actuator drive power only.
Please refer to P. 31 for more information on wiring.

## Battery-less absolute encoder specification

Model **WA** Applicable models **All models**

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** Applicable models **All models**

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** Applicable models **All models**

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. 326 of the ELECYLINDER® General Catalog 2020 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.

## Duty ratio

The duty ratio is the operation rate in % of the actuator operating time in one cycle.

For ELECYLINDER types, the duty ratio is limited as shown below.

The duty ratio for operations at the maximum speed and acceleration/deceleration is as follows.

[Duty ratio]

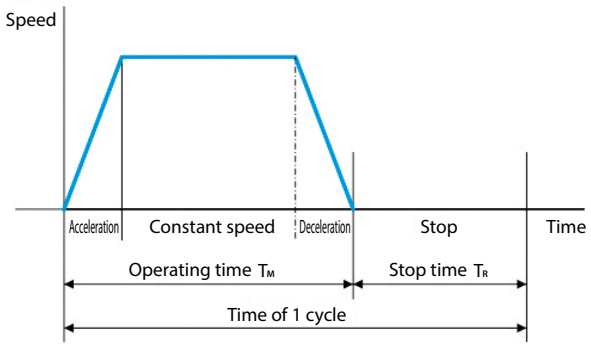
The duty ratio is the operation rate in % of the actuator operating time in one cycle.

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

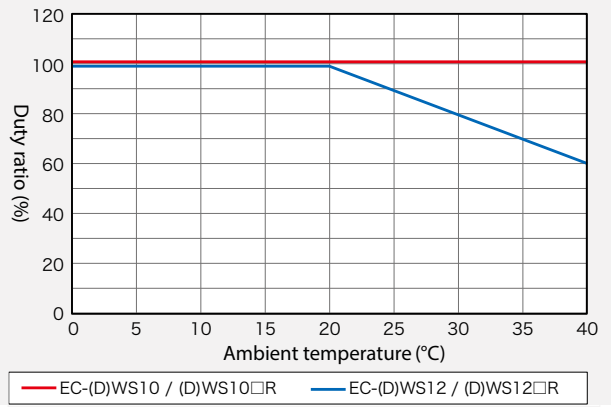
D : duty ratio

$T_M$: Motion time (including push motion)

$T_R$ : Stop time




■ **Ambient temperature and duty ratio**




## Push motion

A push motion is a function that pushes the slider against workpiece, etc. and holds it like an air cylinder..

Make sure to confirm the method of use and precautions stated below before using it..

### [Adjustment of the push force]

- The force of the push motion (push force) can be adjusted by changing the "Push Force (%)" of the ELECYLINDER.
- To select the most suitable model, confirm the push force at the "Correlation between Torque and Current Limit" of each product page.

### [Method of lead selection]

Select a lead whose desired push force is within the recommended area of the current limit value (colored area in the graph).

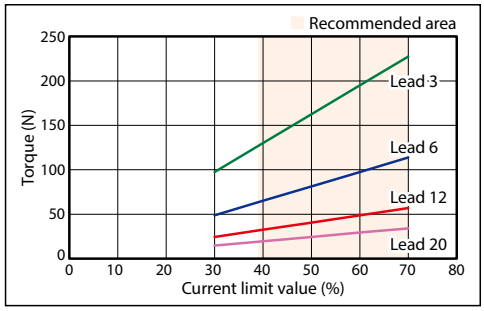
Taking the EC-(D)WS10 type in the right graph as an example, when the desired push force is 100N, Lead 6 is appropriate. If Lead 3 is selected, the adjustment area is limited.

### [Precautions]

When a push motion is performed using a slider type, it is necessary to consider the dynamic allowable moment of the guide. Limit the push current so that the reaction moment generated by the push force does not exceed the dynamic allowable moment (Ma and Mb) specified in the catalog.

**(Example)**

**EC-(D)WS10**




<Correlation between Torque and Current Limit>

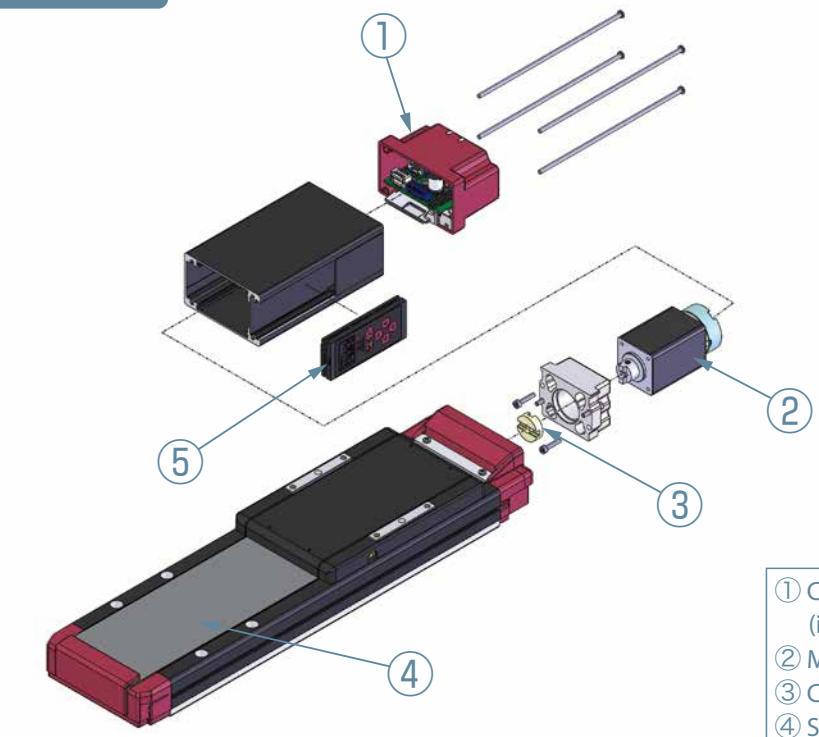
**Notes**

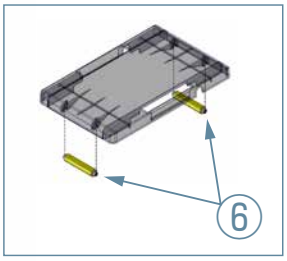
- **The "Correlation between Push Force and Current Limit" shows lower guidelines for push force for each current limit value.**
- **Individual differences in the motor and variations in machine operation may cause the push force lower limit to be exceeded by around 40%, even if the current limit value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

## Maintenance parts (Actuator)

* The following is a schematic drawing of an actuator with a digital speed controller.
In case of models without a digital speed controller, the external appearance of the motor cover is different.
(There is no machining for the digital speed controller)

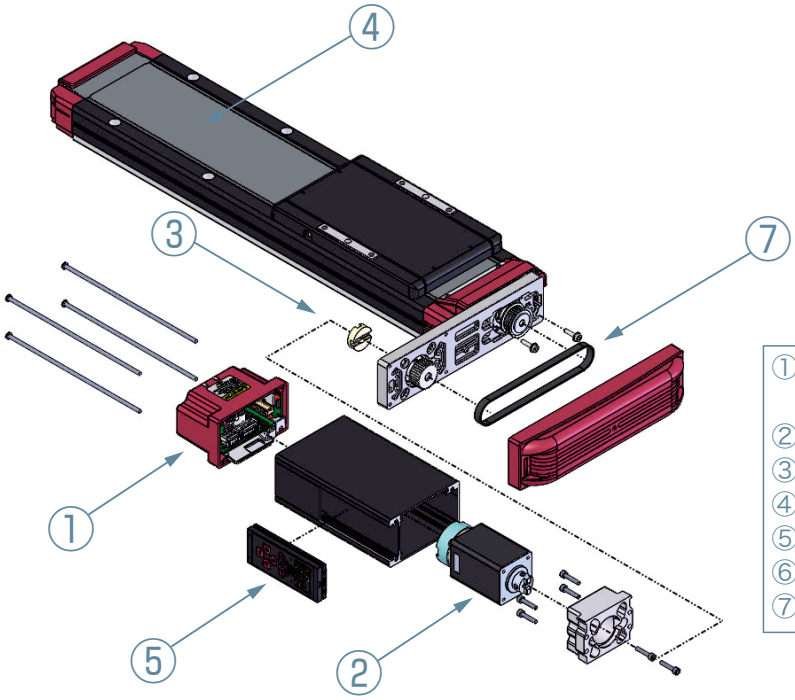
### EC-(D)WS10 (D)WS12

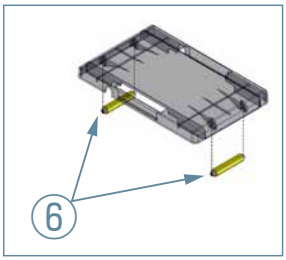



① Controller cover Assy
(including controller substrate)
② Motor unit
③ Coupling spacer
④ Stainless sheet
⑤ Digital speed controller
⑥ Slider roller Assy

### EC-(D)WS10□R (D)WS12□R




① Controller cover Assy
(including controller substrate)
② Motor unit
③ Coupling spacer
④ Stainless sheet
⑤ Digital speed controller
⑥ Slider roller Assy
⑦ Timing belt

The numbers in the table correspond to those in the schematic drawing.
(Note) Maintenance parts do not come with fixing screws. For a modification purpose, contact IAI.

### ①-1 Controller cover Assy

| Type | I/O | Wireless | Model |
|---|---|---|---|
| (D)WS10(□R) | NPN | No | CCA-EC-WS10 |
| | | WL | CCA-EC-WS10-WL |
| | | WL2 | CCA-EC-WS10-WL2 |
| | PNP | No | CCA-EC-WS10-P |
| | | WL | CCA-EC-WS10-P-WL |
| | | WL2 | CCA-EC-WS10-P-WL2 |
| (D)WS12(□R) | NPN | No | CCA-EC-WS12 |
| | | WL | CCA-EC-WS12-WL |
| | | WL2 | CCA-EC-WS12-WL2 |
| | PNP | No | CCA-EC-WS12-P |
| | | WL | CCA-EC-WS12-P-WL |
| | | WL2 | CCA-EC-WS12-P-WL2 |

### ①-2 Controller cover Assy for twin power supply

| Type | I/O | Wireless | Model |
|---|---|---|---|
| (D)WS10(□R) | NPN | No | CCA-EC-WS10-TMD2 |
| | | WL | CCA-EC-WS10-TMD2-WL |
| | | WL2 | CCA-EC-WS10-TMD2-WL2 |
| | PNP | No | CCA-EC-WS10-P-TMD2 |
| | | WL | CCA-EC-WS10-P-TMD2-WL |
| | | WL2 | CCA-EC-WS10-P-TMD2-WL2 |
| (D)WS12(□R) | NPN | No | CCA-EC-WS12-TMD2 |
| | | WL | CCA-EC-WS12-TMD2-WL |
| | | WL2 | CCA-EC-WS12-TMD2-WL2 |
| | PNP | No | CCA-EC-WS12-P-TMD2 |
| | | WL | CCA-EC-WS12-P-TMD2-WL |
| | | WL2 | CCA-EC-WS12-P-TMD2-WL2 |

### ①-3 Controller cover Assy for twin power supply RCON-EC connection specification

| Type | I/O | Wireless | Model |
|---|---|---|---|
| (D)WS10(□R) | NPN-REC | No | CCA-EC-WS10-ACR |
| | | WL | CCA-EC-WS10-ACR-WL |
| | | WL2 | CCA-EC-WS10-ACR-WL2 |
| (D)WS12(□R) | NPN-REC | No | CCA-EC-WS12-ACR |
| | | WL | CCA-EC-WS12-ACR-WL |
| | | WL2 | CCA-EC-WS12-ACR-WL2 |

### ② Motor unit

| Type | Encoder | Brake | Model |
|---|---|---|---|
| (D)WS10(□R) | Incremental | No | EC-MUSRR4 |
| | | Yes | EC-MUSRR4-B |
| | Battery-less absolute | No | EC-MUSRR4-WA |
| | | Yes | EC-MUSRR4-WA-B |
| (D)WS12(□R) | Incremental | No | EC-MUSR6 |
| | | Yes | EC-MUSR6-B |
| | Battery-less absolute | No | EC-MUSR6-WA |
| | | Yes | EC-MUSR6-WA-B |

### ③ Coupling spacer

| Type | Model |
|---|---|
| (D)WS10(□R)<br>(D)WS12(□R) | CPG-EC-SR6 |

### ④ Stainless sheet

| Type | Model |
|---|---|
| (D)WS10(□R) | ST-6WA10-(Stroke) |
| (D)WS12(□R) | ST-EC-WS12-(Stroke) |

* ○○○ is the stroke

### ⑤ Digital speed controller

| Type | Model |
|---|---|
| DWS10(□R)<br>DWS12(□R) | DSC-01 |

### ⑥ Slider roller

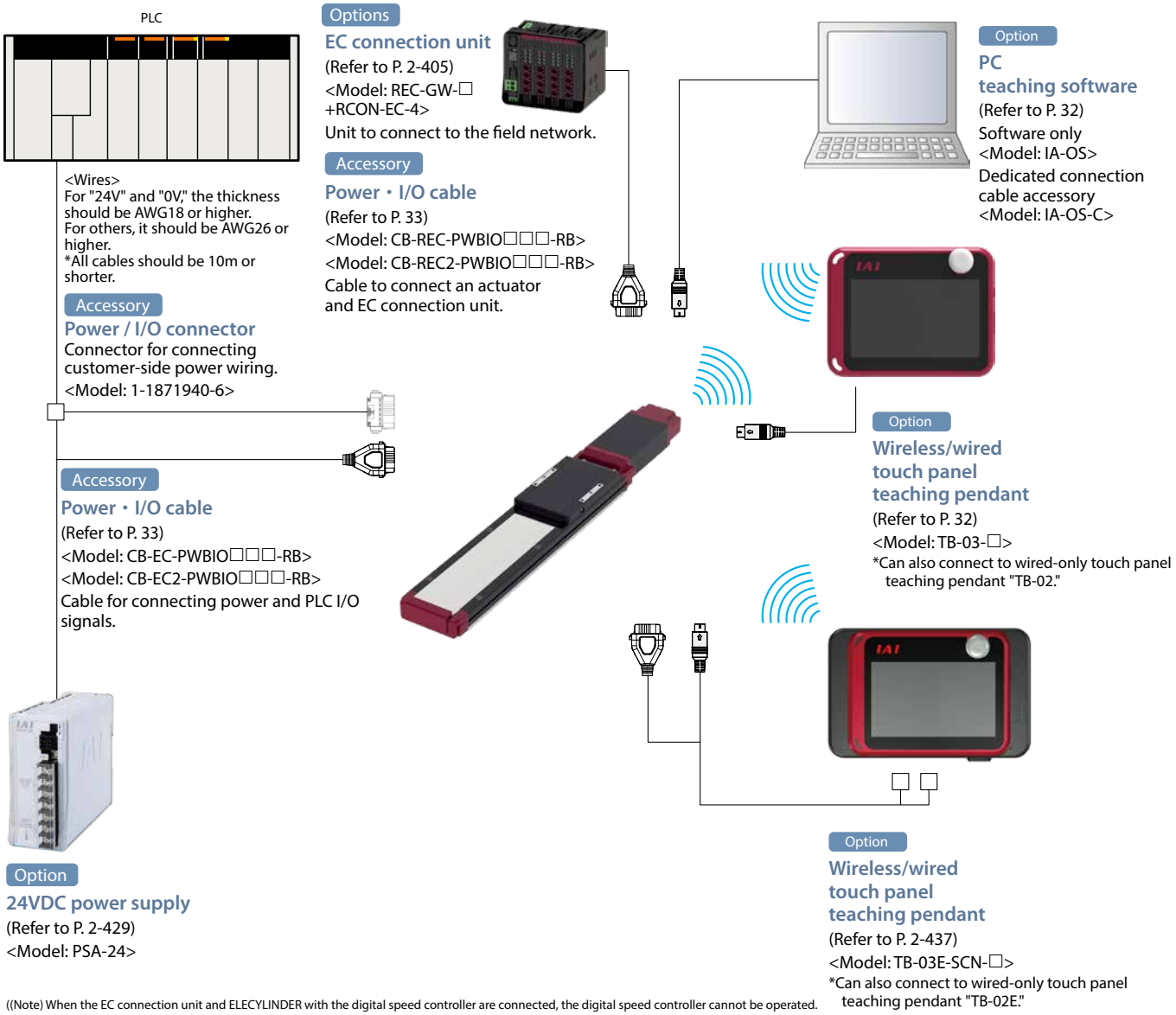
| Type | Model |
|---|---|
| (D)WS10(□R)<br>(D)WS12(□R) | EC-SR-WS1012 |

*The above model is for one piece.
Order two pieces for one axis.

### ⑦ Timing belt

| Type | Model |
|---|---|
| (D)WS10□R<br>(D)WS12□R | TB-EC-WS10R12R |

## System Configuration




((Note) When the EC connection unit and ELECYLINDER with the digital speed controller are connected, the digital speed controller cannot be operated.

## 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・/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

| Specification item | | | Specification content |
|---|---|---|---|
| Number of controlled axes | | | 1 axis |
| Power supply voltage | | | 24VDC ±10% |
| Power capacity( including 0.3A control power) (Note 1) | | | With energy-saving setting disabled: Rated 3.5A, max. 4.2A<br>With energy-saving setting enabled: Max. 2.2A |
| Brake release power supply | | | 24VDC ±10%, 200mA (only for external brake release) |
| Generated heat (at 100% duty) | | | 8W |
| Inrush current (Note 2) | | | 8.3A (with inrush current limit circuit) |
| Momentary power failure resistance | | | Max 500μs |
| Motor size | | | □35, □42 |
| Motor rated current | | | 1.2A |
| Motor control system | | | Weak field-magnet vector control |
| Supported encoders | | | Incremental (800 pulse/rev), battery-less absolute encoder (800 pulse/rev) |
| SIO | | | RS485 1ch (Modbus protocol compliant) |
| PIO | Input specification | No. of inputs | 3 points (forward, backward, alarm clear) |
| | | Input voltage | 24VDC ±10% |
| | | Input current | 5mA per circuit |
| | | Leakage current | Max. 1mA per point |
| | | Isolation method | Non-isolated |
| | Output specification | No. of outputs | 3 points (forward complete, backward complete, alarm) |
| | | Output voltage | 24VDC ±10% |
| | | Output current | 50mA per point |
| | | Residual voltage | 2V or less |
| | | Isolation method | Non-isolated |
| Data setting, input method | | | PC teaching software, touch panel teaching pendant, digital speed controller |
| Data retention memory | | | Position and parameters are saved in non-volatile memory (no limit to number of rewrites) |
| LED display | Controller status display | | Servo ON (green light ON) / Alarm (red light ON) / Initializing when power comes ON (orange light ON) / Minor failure alarm (green/red alternately blinking) / Operation from teaching: Stop from teaching (red light ON) / Servo OFF (light OFF) |
| | Wireless status display | | Initializing wireless hardware, without wireless connection, or connecting from 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 and when the LED (right side) blinks alternately green and red at overload warning<br>*Only when configured in advance |
| Ambient operating temperature | | | 0 ~ 40°C |
| Ambient operating humidity | | | 5%RH - 85% RH or less (Non-condensing or freezing) |
| Operating environment | | | No corrosive gas and excessive dust |
| Insulation resistance | | | 500 VDC 10MΩ |
| Electric shock protection mechanism | | | Class 1 basic insulation |
| Cooling method | | | Natural air cooling |

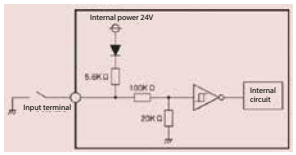
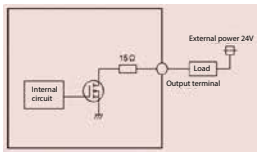
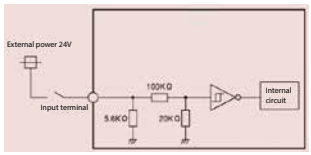
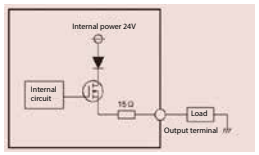
(Note 1) In case of the RCON-EC, subtract 0.3A of control power from the control power.
(Note 2) Inrush current flows approx. 5ms after the power is turned on. (at 40°C) Inrush current value varies depending on the impedance of the power source line.

## 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.

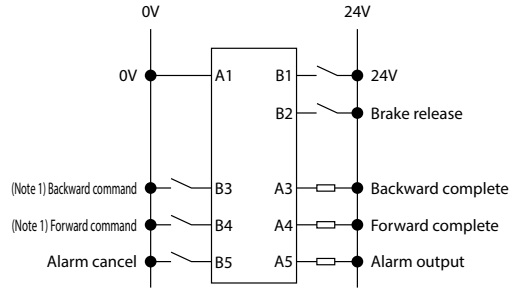
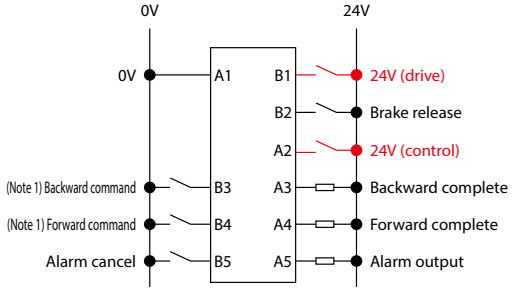
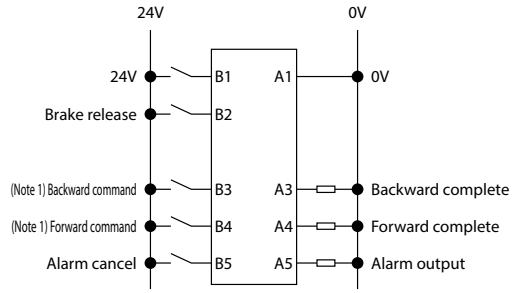
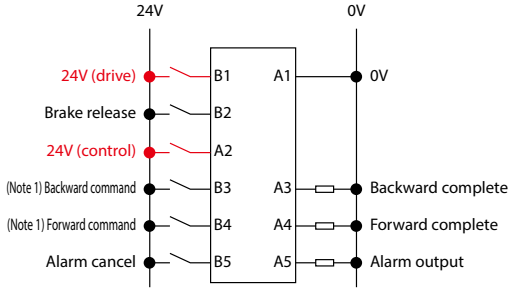
<Caution>
Operation cannot be performed using the single solenoid method when operating connected to RCON-EC.

## 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<br>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<br>(Reserved) A2<br>(Note 1) Backward complete A3<br>(Note 1) Forward complete A4<br>Alarm output A5<br>(Reserved) A6<br>  <br>B1 24V<br>B2 Brake release<br>B3 Backward command<br>B4 Forward command<br>B5 Alarm cancel<br>B6 (reserved) | The TMD2 specification is equipped with the driving power and control power separated.<br>0V A1<br>24V (control) A2<br>(Note 1) Backward complete A3<br>(Note 1) Forward complete A4<br>Alarm output A5<br>(Reserved) A6<br>  <br>B1 24V (drive)<br>B2 Brake release<br>B3 Backward command<br>B4 Forward command<br>B5 Alarm cancel<br>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).

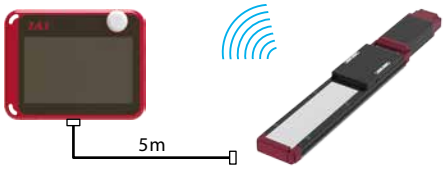
## Option

### 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 | 5 ~ 85%RH (no condensing) |
| Environmental resistance | IP20 |
| 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** **IA-OS** (Software only, for customers who already own a dedicated connection cable)

**Supported Windows versions: 7/10**

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


■ **Configuration**


PC software
(Download Only)

(Your dedicated connection cable) (Please contact IAI for the current supported versions.)

■ **Model** **IA-OS-C** (Software with an external device communication cable + USB cable)

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


■ **Configuration**


PC software
(Download Only)

(Please contact IAI for the current supported versions.)
USB conversion adapter
RCB-CV-USB
3m
USB cable
CB-SEL-USB030
5m
External device communication cable
CB-RCA-SI0050

## Maintenance Parts (Cable)

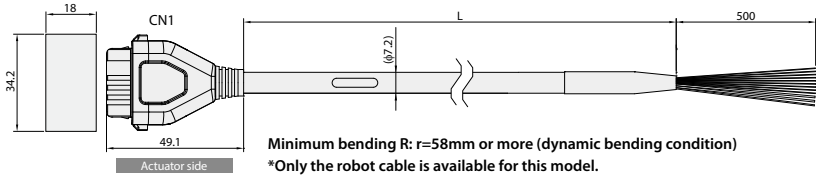
**When placing an order for a replacement cable, please use the model name shown below.**

**■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 □□□, Max. 10m, (Ex. 030=3m)



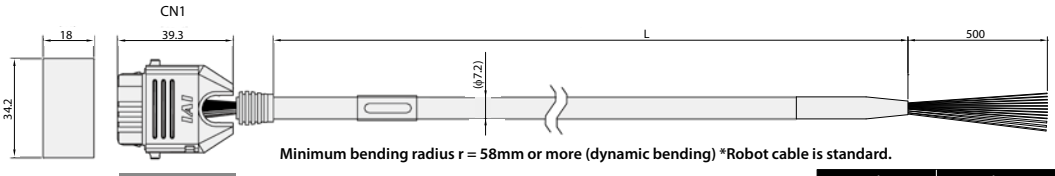

**Minimum bending R: r=58mm or more (dynamic bending condition)**
***Only the robot cable is available for this model.**

| 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 |

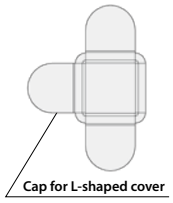
(Note 1) 24V (control) when split motor and controller power supply specification (TMD2) selected.

### Model CB-EC2-PWBIO□□□-RB

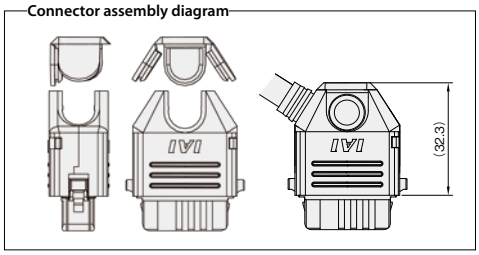
*Please indicate the cable length (L) in □□□, Max. 10m, (Ex. 030=3m)




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




**Connector assembly diagram**

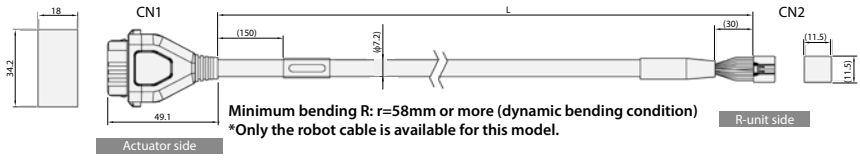



| Color | Signal name | Pin No. |
|---|---|---|
| Black (AWG18) | 0V | A1 |
| Red (AWG18) | 24V | B1 |
| Light blue (AWG22) | (Reserved) (Note 1) | A2 |
| Orange (AWG26) | IN0 | B3 |
| Yellow (AWG26) | IN1 | B4 |
| Green (AWG26) | IN2 | B5 |
| Pink (AWG26) | (Reserved) | B6 |
| Blue (AWG26) | OUT0 | 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.

*Please indicate the cable length (L) in □□□, Max. 10m, (Ex. 030=3m)

### Model CB-REC-PWBIO□□□-RB



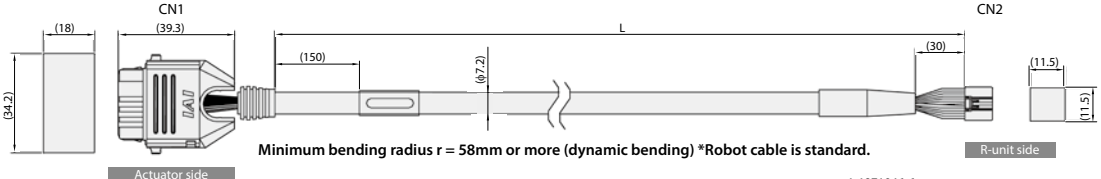

**Minimum bending R: r=58mm or more (dynamic bending condition)**
***Only the robot cable is available for this model.**

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

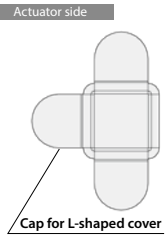
| Pin No. | Signal name | Color |
|---|---|---|
| | | |
| 1 | 24V(MP) | Red (AWG18) |
| 12 | 24V(CP) | Light blue |
| 7 | OUT0 | Orange (AWG26) |
| 8 | OUT1 | Yellow (AWG26) |
| 9 | OUT2 | Green (AWG26) |
| 6 | SD+ | Pink (AWG26) |
| 10 | SD- | White (AWG26) |
| 3 | INO | Blue (AWG26) |
| 4 | IN1 | Purple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

*Please indicate the cable length (L) in □□□, Max. 10m, (Ex. 030=3m)

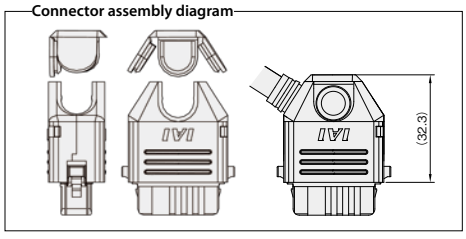
### Model CB-REC2-PWBIO□□□-RB




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




**Connector assembly diagram**




1-1871946-6

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

DF62C-13S-2C(18)

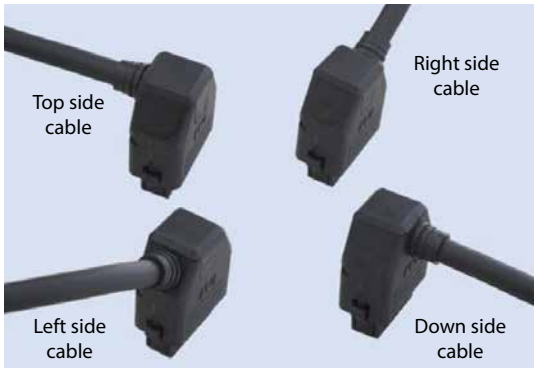
| Pin No. | Signal name | Color |
|---|---|---|
| 2 | 0V | Black (AWG22) |
| 1 | 24V(MP) | Red (AWG22) |
| 12 | 24V(CP) | Light blue |
| 7 | OUT0 | Orange |
| 8 | OUT1 | Yellow |
| 9 | OUT2 | Green |
| 6 | SD+ | Yellow |
| 10 | SD- | Light gray |
| 3 | INO | Blue (AWG26) |
| 4 | IN1 | Purple |
| 5 |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

## Maintenance Parts (Cable)

### ■ 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 (user wiring specification)
CB-REC2-PWBIO□□□-RB (RCON-EC connection specification)




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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