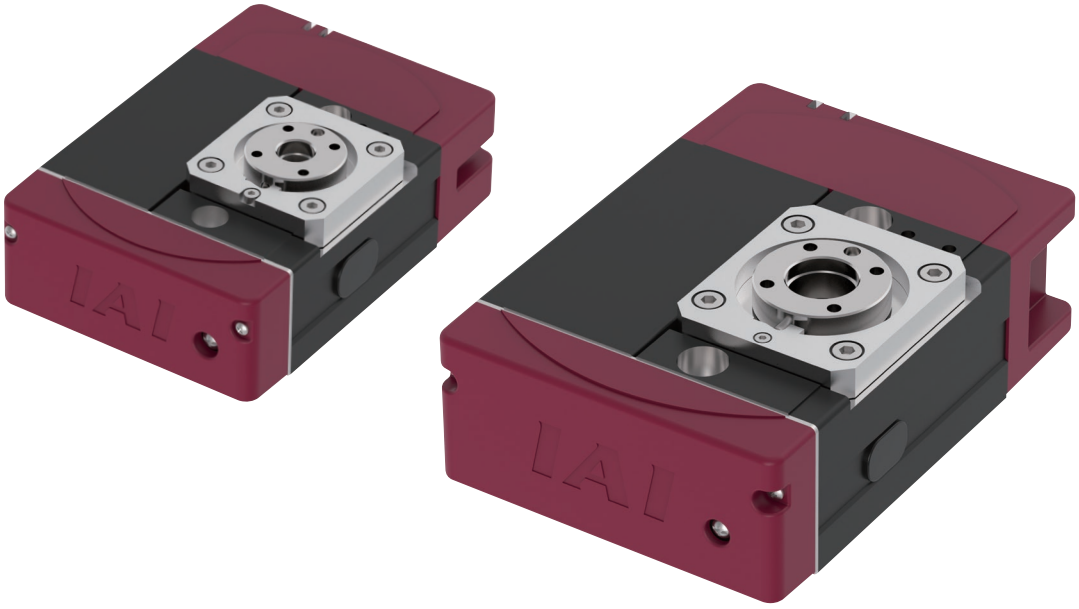
IAI
Quality and Innovation

EC-RTC9
EC-RTC12

ELECYLINDER® Rotary Type

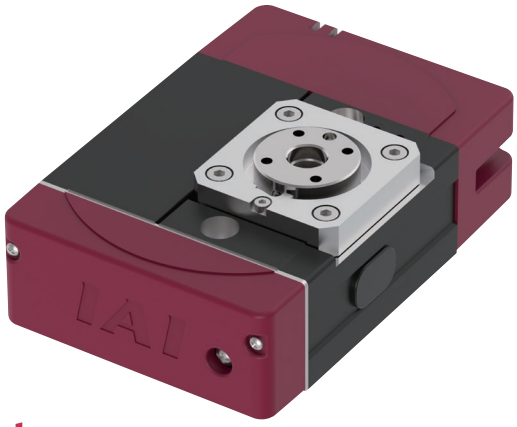


Simple & Wireless Operation
2 Position Actuator

www.intelligentactuator.com

2-point positioning | Built-in controller

ELECYLINDER®
EC-RTC9/RTC12
Rotary type

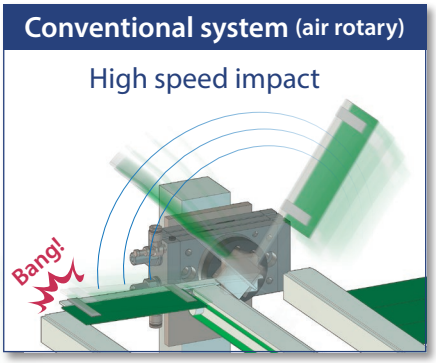


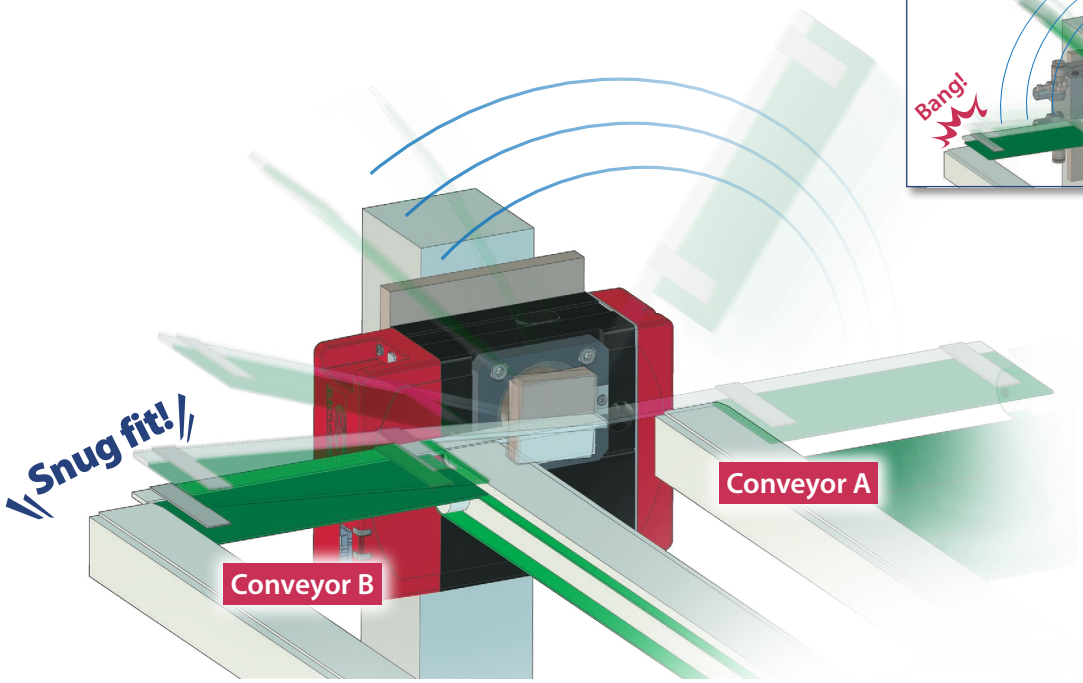
Smooth stopping without impact

ELECYLINDER allows the acceleration (A), velocity (V), and deceleration (D) to be set using numeric values. This allows the deceleration speed to be adjusted for smooth stopping without impact.

Circuit board turnover system

The **rotary cylinder** turns over circuit boards carried by conveyor A, and loads them on conveyor B

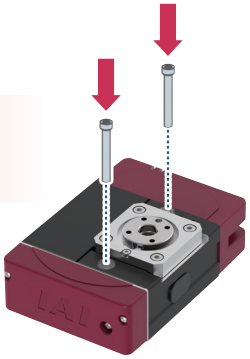




Can be bolted from the top

Installation bolt size	RTC9: M6 RTC12: M8

*Bolts should be prepared by the customer.



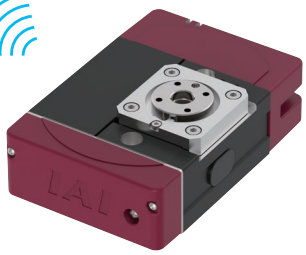
Wireless connection (option) eliminates annoying cable connections!

Touch Panel
Teaching Pendant
TB-03

Wireless
(Approx. 5m (guideline))

Cable not required

ELECYLINDER



Model Specification Items

ELECYLINDER®

EC - [ ] **M** - **330** - [ ] - ([ ])

Series | **Type** | **Deceleration ratio** | **Oscillation angle** | **Cable length** | **Options**

Type	
RTC9	Flat type S size 90mm wide
RTC12	Flat type L size 117mm wide

Deceleration ratio	
M	1/45

Oscillation angle	
330	330 degrees

Cable length	
0	0m
≀	≀
10	10m

Cable length
· 0: With power / I/O connector
· 1 ~ 10: Power I/O cable included

Options	
Left blank	Incremental encoder specification, NPN specification, no option
B	With brake
NM	Non-motor end specification
PN	PNP specification
SA	Shaft adapter
TA	Table adapter
TMD2	Twin power supply specification
WA	Battery-less Absolute Encoder specification
WL	Wireless communication specification
WL2	Wireless axis operation specification

Duty Ratio

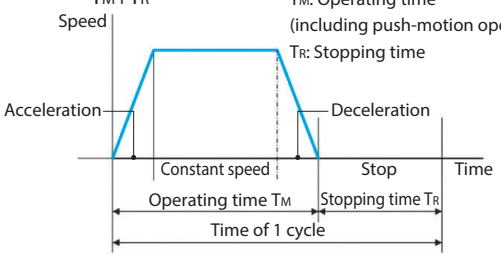
EC-RTC9/RTC12 can be operated at 100% of its duty cycle. (Ambient temperature 0~40°C.)

[Duty Cycle]

Duty cycle is the percentage of the actuator's active operation time in each cycle.

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

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



Selection Method

The following conditions must be satisfied for use. Calculate and check the following values (procedures 1 and 2).

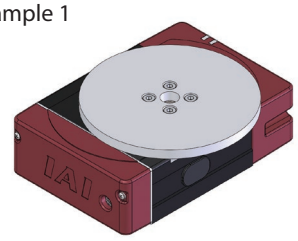
Procedure 1

Check the moment of inertia
(1) If there is no load torque
(2) If there is load torque
*The method for checking the moment of inertia differs depending on whether or not there is a load torque.

(1) If there is no load torque

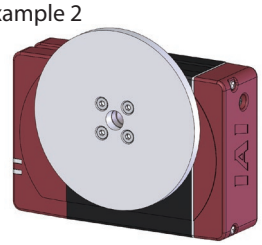
When used as shown in the figure below, there will be no load torque due to gravity. Therefore, calculate the moment of inertia of the load only, and then confirm that it does not exceed the allowable inertia moment. Use the calculation method for the applicable typical shape (P. 4) to calculate the moment of inertia for the tooling or workpiece that will be used.

Example 1



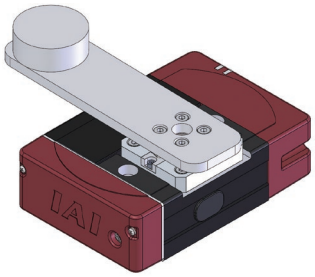
Center mass location of load: Output shaft center
Installation orientation: Horizontal on flat surface/suspended

Example 2



Center mass location of load: Output shaft center
Installation orientation: On side/vertical

Example 3

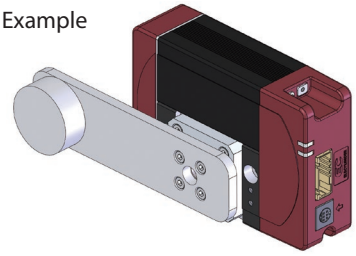


Center mass location of load: Offset from output shaft center
Installation orientation: Horizontal on flat surface/suspended

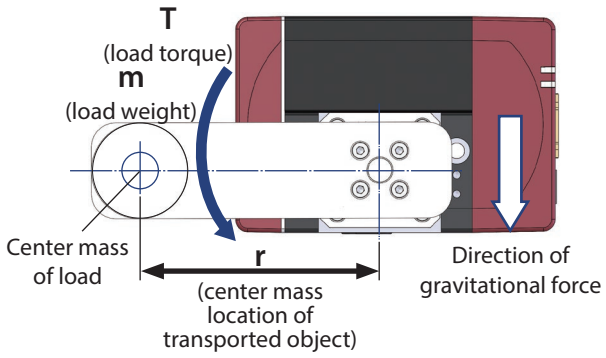
(2) If there is load torque

When used as shown in the figure below, there will be load torque due to gravity. This will cause the allowable moment of inertia to decrease by that amount. First, calculate the load torque and obtain the corrected allowable moment of inertia. Then, calculate the moment of inertia and confirm that it does not exceed the corrected allowable moment of inertia.

Example



Center mass location of load: Offset from output shaft center
Installation orientation: On side/vertical



Step 1 Calculate load torque T

$T = mgr \times 10^{-3}$ [N·m]

m : Weight of transported object [kg]

g : Gravitational acceleration [m/s²]

r : Center mass location of transported object [mm]

Step 2 Calculate allowable moment of inertia correction factor Cj

$$Cj = \frac{Tmax - T}{Tmax}$$

Tmax: Output torque [N·m]

*See the individual product pages for the value of output torque Tmax.

Step 3 Calculate corrected allowable moment of inertia Jtl

$Jtl = Jmax \times Cj\ [kg \cdot m^2]$

Jmax: Allowable inertia moment (kg·m²)

***See the individual product pages for the value of allowable moment of inertia Jmax .**

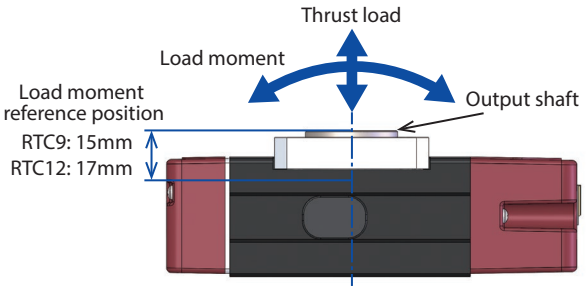
Step 4 Check moment of inertia of transported object

Use the "formulas for calculating moment of inertia of typical shapes" below to calculate the moment of inertia of the load, and confirm that it does not exceed the corrected moment of inertia calculated during Step 3.

Procedure 2

Check the moment load and thrust load

Confirm that the moment load and thrust load on the output shaft are within the allowable range. If used in excess of the allowable range, it could shorten product life or cause failure.
***See the individual product pages for the values of the allowable dynamic thrust load and allowable dynamic load moment.**



Formulas for calculating moment of inertia of typical shapes

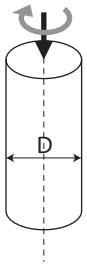
1. When the rotational axis passes through the center of the object

(1) Moment of inertia of cylinder 1

*The same formula can be applied irrespective of the height of the cylinder (also for circular plate)

<Formula> $J = M \times (D \times 10^{-3})^2 / 8$

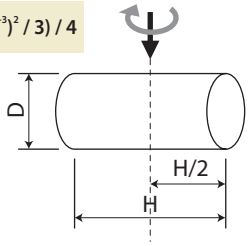
Moment of inertia of cylinder: J (kg·m²)
Cylinder weight: M (unit: kg)
Cylinder diameter: D (mm)



(2) Moment of inertia of cylinder 2

<Formula> $J = M \times ((D \times 10^{-3})^2 / 4 + (H \times 10^{-3})^2 / 3) / 4$

Moment of inertia of cylinder: J (kg·m²)
Cylinder weight: M (kg)
Cylinder diameter: D (m)
Cylinder length: H (mm)

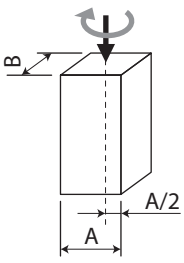


(3) Moment of inertia of prism 1

*The same formula can be applied irrespective of the height of the prism (also for rectangular plate)

<Formula> $J = M \times ((A \times 10^{-3})^2 + (B \times 10^{-3})^2) / 12$

Moment of inertia of prism: J (kg·m²)
One side of prism: A (mm)
One side of prism: B (mm)



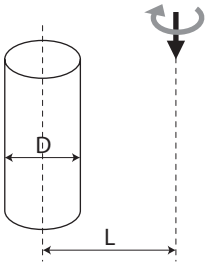
2. When the center of the object is offset from the rotational axis

(4) Moment of inertia of cylinder 3

*The same formula can be applied irrespective of the height of the cylinder (also for circular plate)

<Formula> $J = M \times (D \times 10^{-3})^2 / 8 + M \times (L \times 10^{-3})^2$

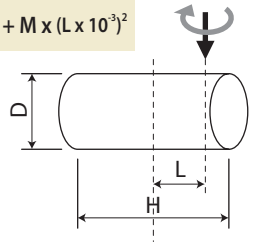
Moment of inertia of cylinder: J (kg·m²)
Cylinder weight: M (kg)
Cylinder diameter: D (m)
Distance from rotational axis to center: L (mm)



(5) Moment of inertia of cylinder 4

<Formula> $J = M \times ((D \times 10^{-3})^2 / 4 + (H \times 10^{-3})^2 / 3) / 4 + M \times (L \times 10^{-3})^2$

Moment of inertia of cylinder: J (kg·m²)
Cylinder weight: M (kg)
Cylinder diameter: D (m)
Cylinder length: H (mm)
Distance from rotational axis to center: L (mm)

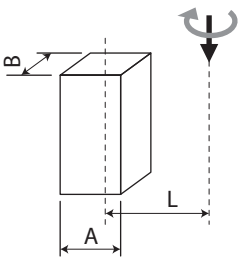


(6) Moment of inertia of prism 2

*The same formula can be applied irrespective of the height of the prism (also for rectangular plate)

<Formula> $J = M \times ((A \times 10^{-3})^2 + (B \times 10^{-3})^2) / 12 + M \times (L \times 10^{-3})^2$

Moment of inertia of prism: J (kg·m²)
Prism weight: M (kg)
One side of prism: A (mm)
One side of prism: B (mm)
Distance from rotational axis to center: L (mm)

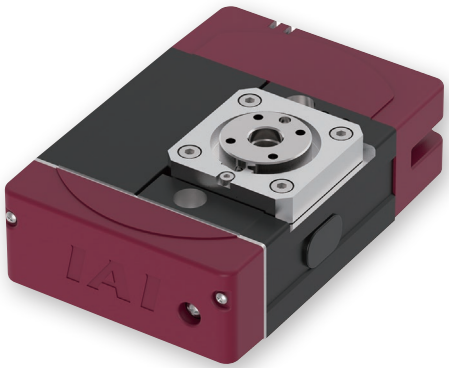


EC-RTC9

Body Width 90 mm | 24V Stepper motor

Model Specification Items

EC	-	RTC9	M	-	330	-		-	
Series		Type	Deceleration ratio		Oscillation angle		Cable length		Options
			M: Deceleration ratio 1/45		330: 330-degree rotation		0: Terminal block type With connector 1: 1m ⁞ 10: 10m		Refer to Options table below.



CE RoHS

Horizontal | Vertical | Side | Ceiling

Products

Oscillation angle (°)	EC-RTC9
330	○

Options

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

Name	Option code	Reference page
Brake	**B**	13
Non-motor end specification	**NM**	13
PNP specification	**PN**	13
Shaft adapter	**SA**	13
Table adapter	**TA**	13
Twin power supply specification	**TMD2**	13
Battery-less absolute encoder specification	**WA**	13
Wireless communication specification	**WL**	13
Wireless axis operation specification	**WL2**	13

Cable length

Cable code	Cable length
0	No cable (with connector)
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m

(Note) Robot cable.

POINT Selection Notes

(1) Output torque decreases as rotation speed increases. Refer to the "correlation diagram between rotation speed and output torque" for details.

(2) The allowable moment of inertia of a workpiece being rotated will vary depending on the rotation speed. Refer to the "correlation diagram between rotation speed and allowable moment of inertia" for details.

(3) The brake is used for retention purposes only, Do not use it for braking or emergency stopping.

(4) When selecting, calculate values as described in "Selection Method (from P. 3)" and check the usage conditions.

(5) If performing push-motion operations, refer to the "correlation diagrams between push force and current limit". The push forces listed are for reference only.

(6) The maximum acceleration/deceleration is 0.5G when horizontal/suspended, or 0.3G when on side/vertical.

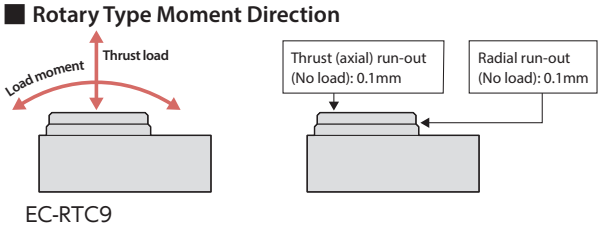
Main Specifications

Item		Description
Deceleration ratio		1/45
Max. torque (N·m)		1.5
Speed / acceleration/ deceleration (Note 1)	Max. speed (degrees/s)	600
	Min. speed (degrees/s)	20
	Rated acceleration/deceleration (G)	0.3
	Max. acceleration/deceleration (G) (Note 2)	0.5
Brake	Braking specification	Non-excitation actuating solenoid brake
	Brake retaining torque (N·m) (Note 3)	0.9
Operation range (degrees)		330

(Note 1) 1G≈9807°/s²
(Note 2) Horizontal only. The maximum acceleration/deceleration will be 0.3G when on side/vertical.
(Note 3) Both the allowable moment of inertia and brake retaining torque will not necessarily be established. Confirm that the load torque does not exceed the retaining torque.

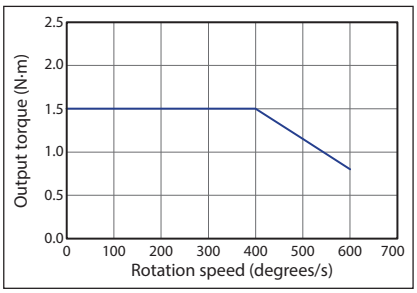
Item	Description
Drive system	Hypoid gear + timing belt
Positioning repeatability	±0.05 degrees
Homing method	Mechanical stopper method
Homing precision	±0.05 degrees
Backlash	0.2° or less
Allowable thrust load	50N
Allowable load moment	5N·m
Allowable moment of inertia	0.02kg·m²
Radial run-out	0.1mm or less
Thrust run-out	0.1mm or less
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
Encoder Type	Incremental
Number of encoder pulses	800 pulse/rev
Delivery time	Listed on website [Check lead times]

Rotary Type Moment Direction

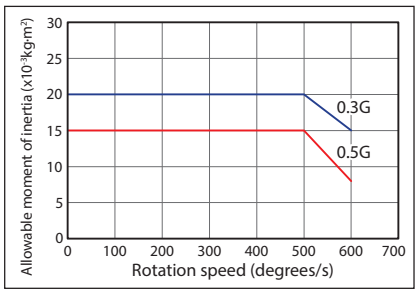


Correlation diagram between speed and output torque, allowable moment of inertia

Correlation diagram between rotation speed and output torque



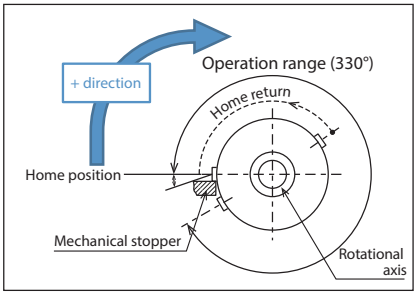
Correlation diagram between rotation speed and allowable moment of inertia



(Note) 0.5G can be used only when horizontal/suspended.

Homing method and positive rotation direction

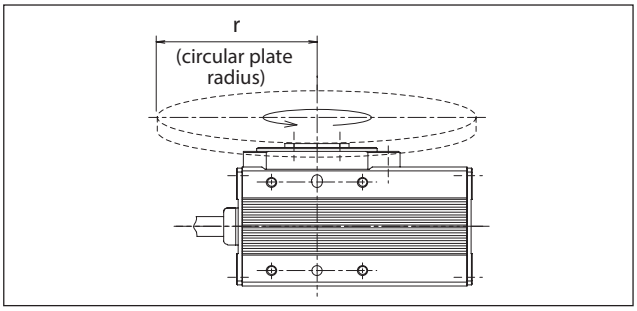
330-degree rotation specification



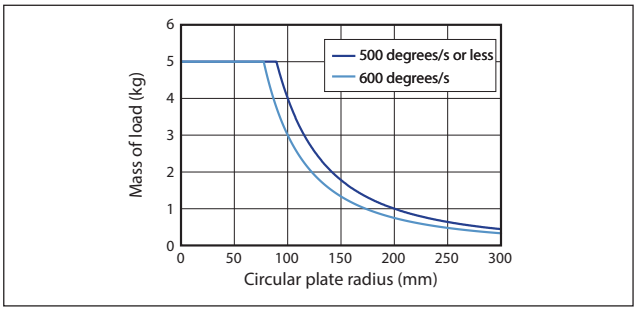
The positive rotation direction will be clockwise when viewing the rotating part from above.
During home return motion, it rotates counterclockwise.
It detects the mechanical stopper position, moves in reverse, and then stops.
It cannot rotate to the home return motion in the clockwise direction.
(Note) For the non-motor end specification, all movement directions are in reverse.

Guideline for load shape and mass

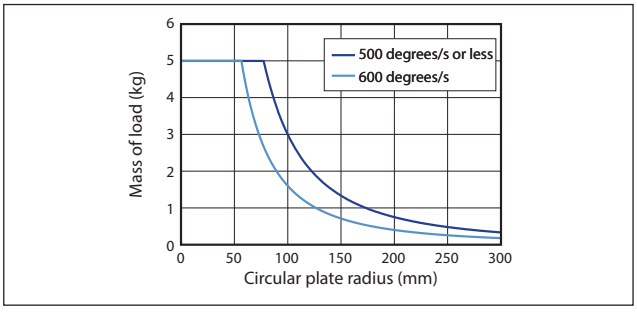
When the center of gravity of a circular plate load is the same as the rotational center of the output shaft



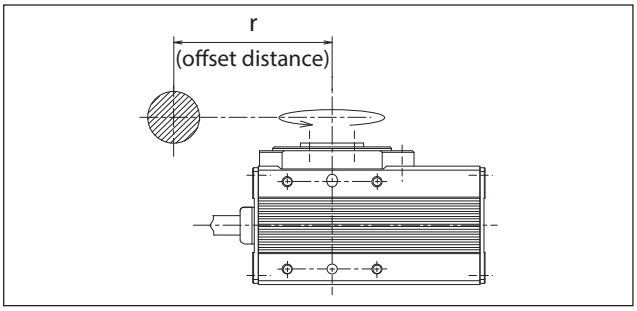
Acceleration 0.3G



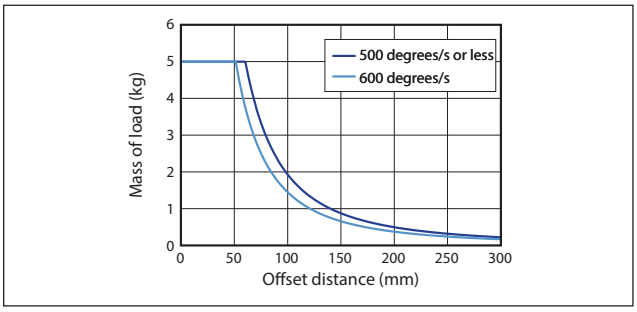
Acceleration 0.5G



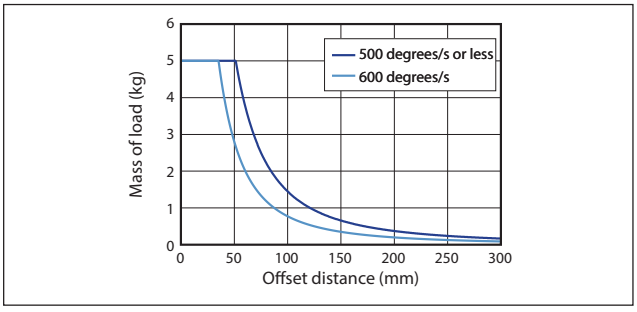
When the center of gravity of the load is offset from the rotational center of the output shaft



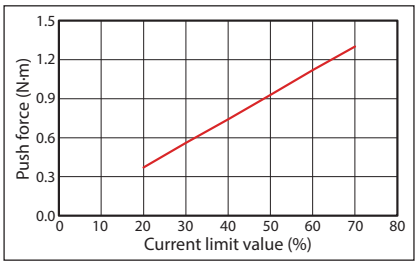
Acceleration 0.3G



Acceleration 0.5G



Correlation of push force and current limit value

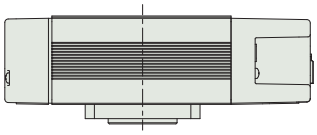


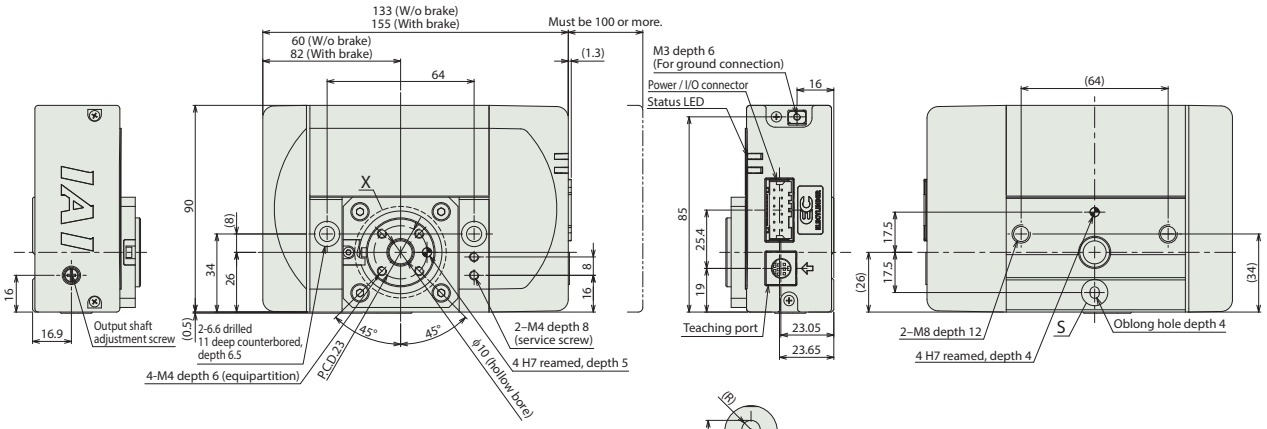
Dimensions

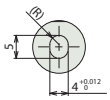
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

(Note) Rotating parts are shown shaded in the plane figures below.

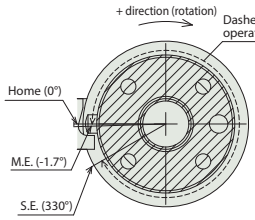
M.E: Mechanical end
S.E: Stroke end



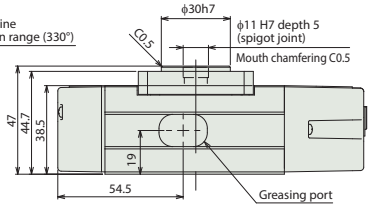


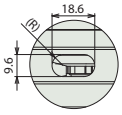


Detailed view of S
Details of base oblong hole

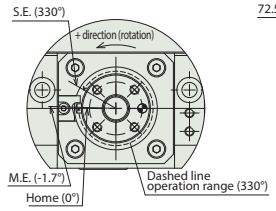


Detailed view of X

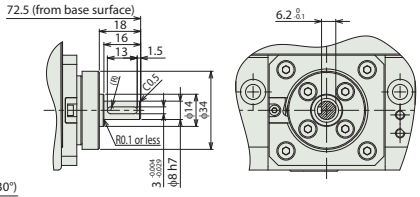




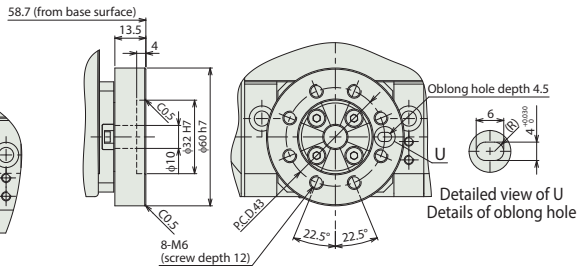
Grease lubrication port
detailed view



Non-motor end specification



Shaft adapter specification



Detailed view of U
Details of oblong hole

Table adapter specification

Mass

Item		Description
Mass	Without brake	0.88kg
	With brake	0.98kg

Applicable controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P.14 for more information on built-in controllers.

EC-RTC9

EC-RTC12

Body Width 120 mm | 24V Stepper motor

Model Specification Items

EC	-	RTC12	M	-	330	-		-	
Series		Type	Deceleration ratio		Oscillation angle		Cable length		Options

Deceleration ratio	
M	Deceleration ratio 1/45

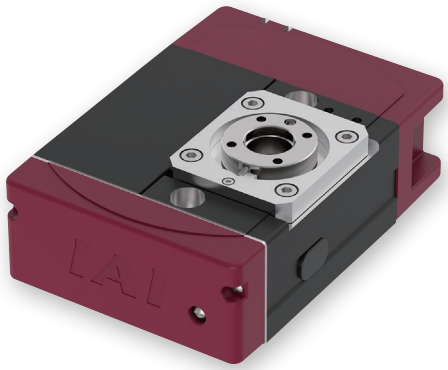
Oscillation angle	
330	330-degree rotation

Cable length	
0	Terminal block type With connector
1	1m
⁞	⁞
10	10m

Options: Refer to Options table below.

CE RoHS

Horizontal | Vertical | Side | Ceiling



Products

Oscillation angle (°)	EC-RTC12
330	○

Options

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

Name	Option code	Reference page
Brake	**B**	13
Non-motor end specification	**NM**	13
PNP specification	**PN**	13
Shaft adapter	**SA**	13
Table adapter	**TA**	13
Twin power supply specification	**TMD2**	13
Battery-less absolute encoder specification	**WA**	13
Wireless communication specification	**WL**	13
Wireless axis operation specification	**WL2**	13

Cable length

Cable code	Cable length
0	No cable (with connector)
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m

(Note) Robot cable.

POINT 選定上の注意

(1) Output torque decreases as rotation speed increases. Refer to the "correlation diagram between rotation speed and output torque" for details.

(2) The allowable moment of inertia of a workpiece being rotated will vary depending on the rotation speed. Refer to the "correlation diagram between rotation speed and allowable moment of inertia" for details.

(3) The brake is used for retention purposes only, Do not use it for braking or emergency stopping.

(4) When selecting, calculate values as described in "Selection Method (from P. 3)" and check the usage conditions.

(5) If performing push-motion operations, refer to the "correlation diagrams between push force and current limit". The push forces listed are for reference only.

(6) The maximum acceleration/deceleration is 0.7G when horizontal/suspended or 0.5G when on side/vertical with the energy-saving setting disabled, or 0.5G when horizontal/suspended or 0.3G on side/vertical with the energy-saving setting enabled.

Main Specifications

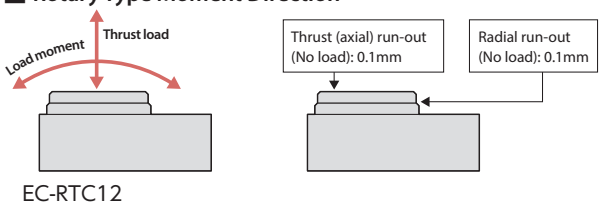
Item		Description
Deceleration ratio		1/45
Max. torque (N·m)		8.0
Speed / acceleration/ deceleration (Note 1)	Max. speed (degrees/s)	600
	Min. speed (degrees/s)	20
	Rated acceleration/deceleration (G)	0.3
	Max. acceleration/deceleration (G) (Note 2)	0.7
Brake	Braking specification	Non-excitation actuating solenoid brake
	Brake retaining torque (N·m) (Note 3)	5.3
Operation range (degrees)		330

(Note 1) 1G≈9807°/s²
(Note 2) Horizontal only. The maximum acceleration/deceleration will be 0.5G when on side/vertical.
(Note 3) Both the allowable moment of inertia and brake retaining torque will not necessarily be established. Confirm that the load torque does not exceed the retaining torque.

Item	Description
Drive system	Hypoid gear + timing belt
Positioning repeatability	±0.01 degrees
Homing method	Mechanical stopper method
Homing precision	±0.01 degrees
Backlash	0.2° or less
Allowable thrust load	400N
Allowable load moment (Note 4)	18N·m
Allowable moment of inertia	0.13kg·m²
Radial run-out	0.1mm or less
Thrust run-out	0.1mm or less
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
Encoder Type	Incremental
Number of encoder pulses	800 pulse/rev
Delivery time	Listed on website [Check lead times]

(Note 4) 12N·m when on side/vertical.

Rotary Type Moment Direction

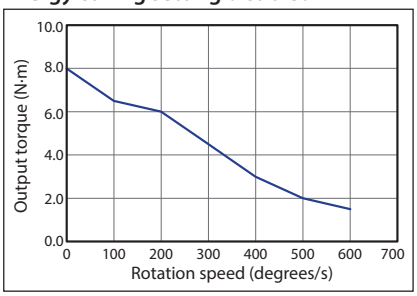


EC-RTC12

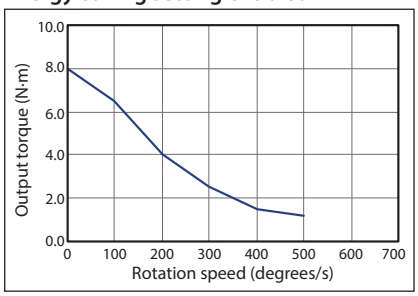
Correlation diagram between speed and output torque, allowable moment of inertia

Correlation diagram between rotation speed and output torque

Energy-saving setting disabled

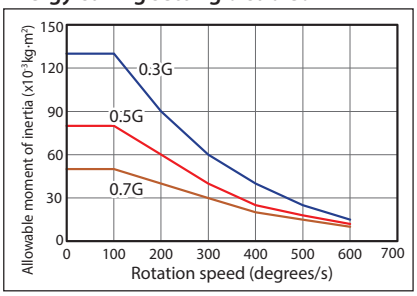


Energy-saving setting enabled



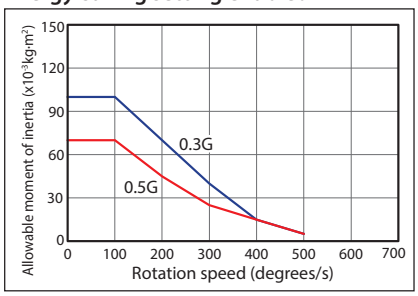
Correlation diagram between rotation speed and allowable moment of inertia

Energy-saving setting disabled



(Note) 0.7G can be used only when horizontal/suspended.

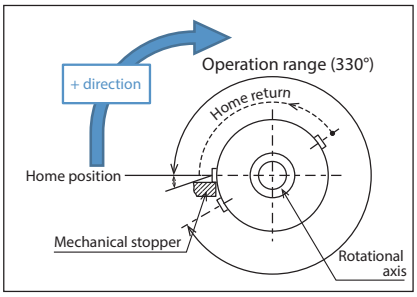
Energy-saving setting enabled



(Note) 0.5G can be used only when horizontal/suspended.

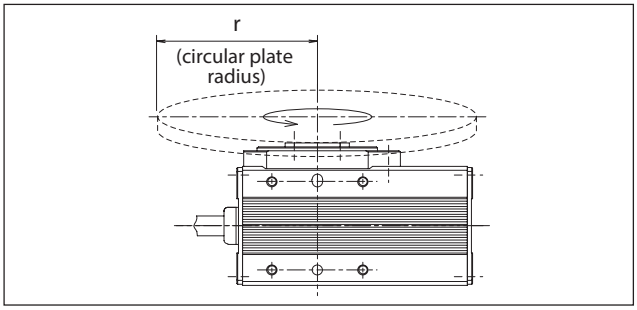
Homing method and positive rotation direction

330-degree rotation specification

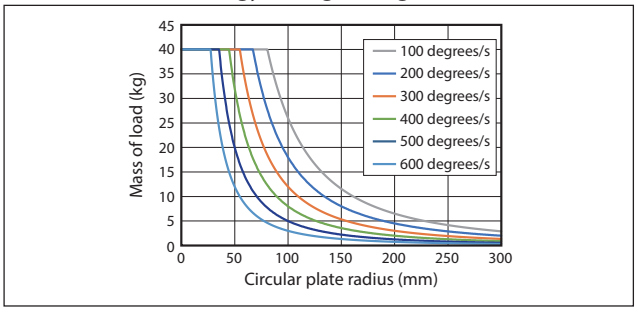


The positive rotation direction will be clockwise when viewing the rotating part from above.
During home return motion, it rotates counterclockwise.
It detects the mechanical stopper position, moves in reverse, and then stops.
It cannot rotate to the home return motion in the clockwise direction.
(Note) For the non-motor end specification, all movement directions are in reverse.

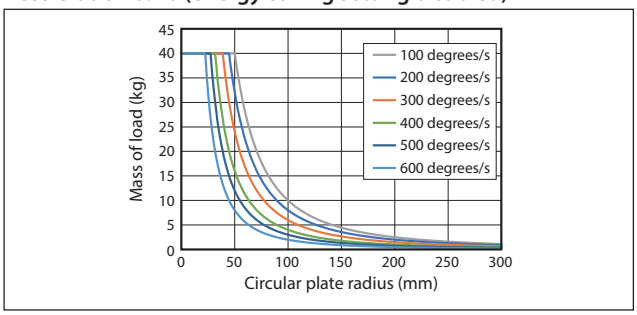
When the center of gravity of a circular plate load is the same as the rotational center of the output shaft



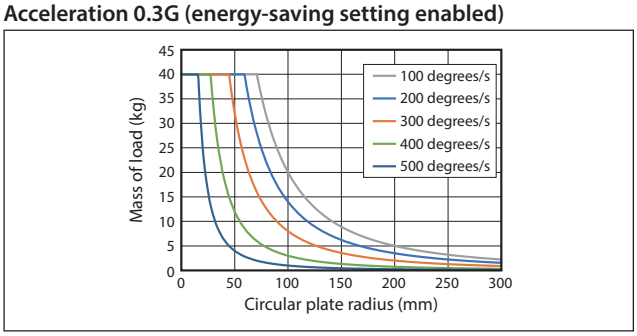
Acceleration 0.3G (energy-saving setting disabled)



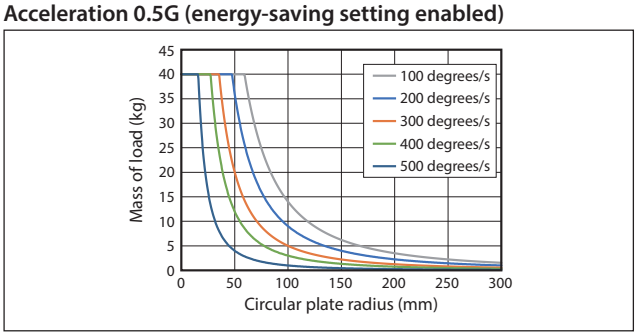
Acceleration 0.7G (energy-saving setting disabled)



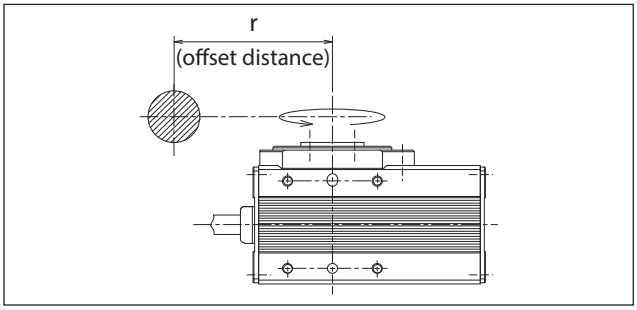
Acceleration 0.3G (energy-saving setting enabled)



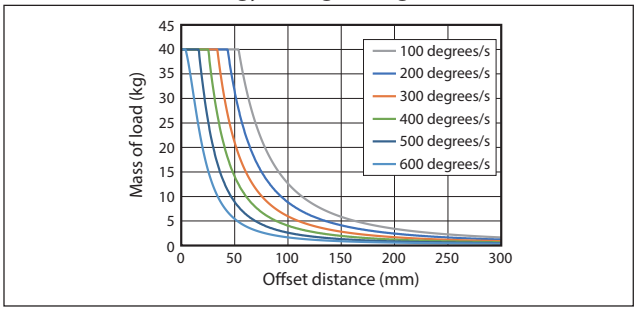
Acceleration 0.5G (energy-saving setting enabled)



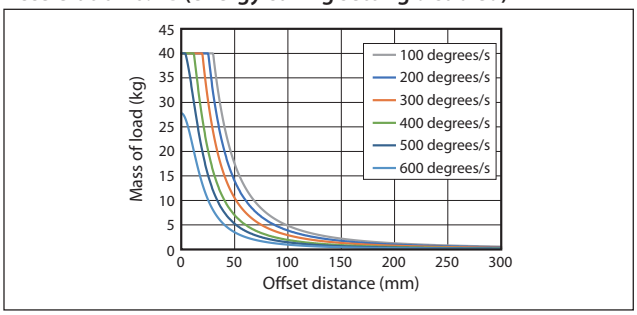
When the center of gravity of the load is offset from the rotational center of the output shaft



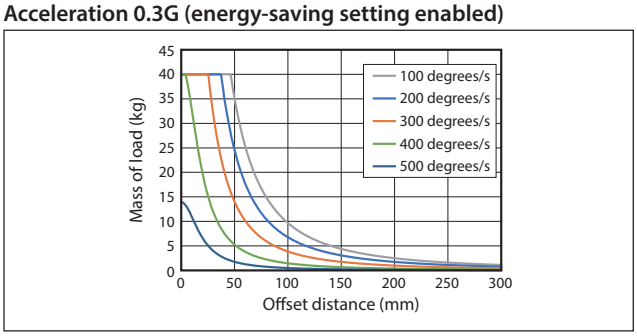
Acceleration 0.3G (energy-saving setting disabled)



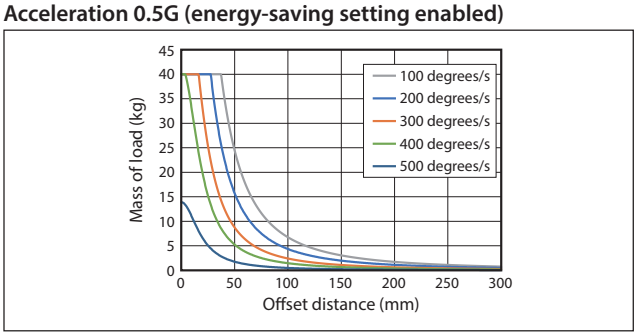
Acceleration 0.7G (energy-saving setting disabled)



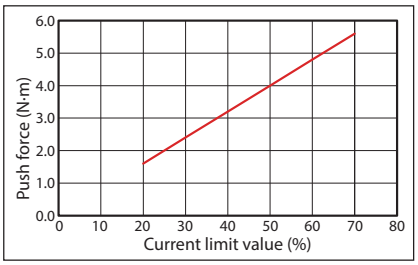
Acceleration 0.3G (energy-saving setting enabled)



Acceleration 0.5G (energy-saving setting enabled)



Correlation of push force and current limit value

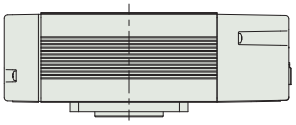


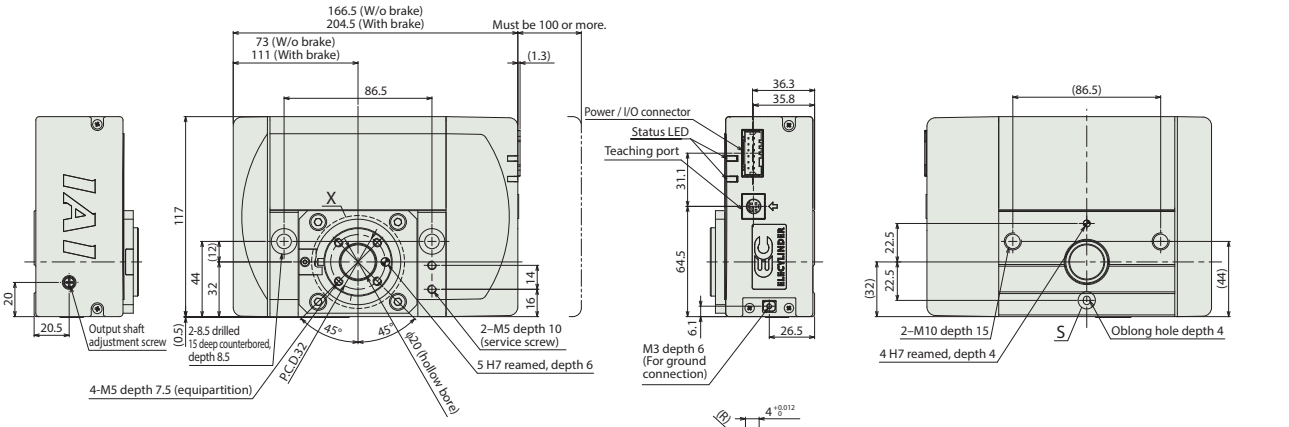
Dimensions

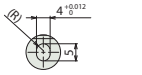
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

(Note) Rotating parts are shown shaded in the plane figures below.

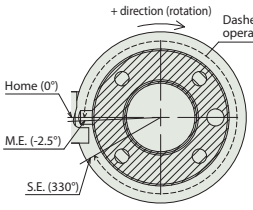
M.E: Mechanical end
S.E: Stroke end



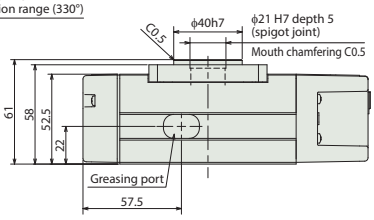


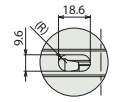


Detailed view of S
Details of base oblong hole

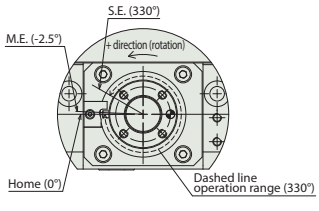


Detailed view of X

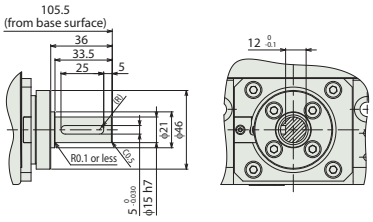




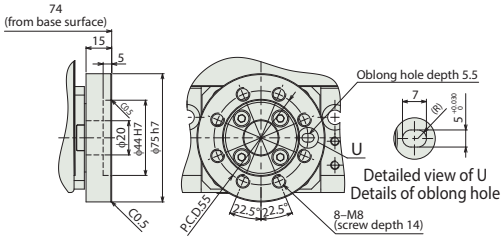
Grease lubrication port detailed view



Non-motor end specification



Shaft adapter specification



Detailed view of U
Details of oblong hole

Table adapter specification

Mass

Item		Description
Mass	Without brake	1.74kg
	With brake	1.90kg

Applicable controllers

(Note) The EC series is equipped with a built-in controller. Please refer to P.14 for more information on built-in controllers.

ELECYLINDER Series Options

Brake

Model **B**

Description When using the rotary on its side or vertically, this holding mechanism prevents the output shaft from accidentally rotating due to the weight of the attached object, and damaging the attached object when the power or servo is turned off.

Non-motor end specification

Model **NM**

Description The positive rotation direction will normally be clockwise when viewing the rotating part from above.
Counterclockwise can optionally be set as the positive rotation direction.
Contact IAI if you would like to change the rotation direction after shipment.

PNP specification

Model **PN**

Description The EC series offers NPN specification input/output for connecting external devices as standard.
Specifying this option changes input/output to PNP specification.

Shaft adapter

Model **SA**

Description This adapter is used to mount jigs, etc., to rotating parts.
Refer to the dimensions on the individual product page for detailed dimensions.

Table adapter

Model **TA**

Description This adapter is used to mount jigs, etc., to rotating parts.
Refer to the dimensions on the individual product page for detailed dimensions.

Twin power supply specification

Model **TMD2**

Description This option provides a separate motor power supply and control power supply.
Please refer to P.16 for more information on wiring.

Battery-less Absolute Encoder specification

Model **WA**

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

Wireless communication specification

Model **WL**

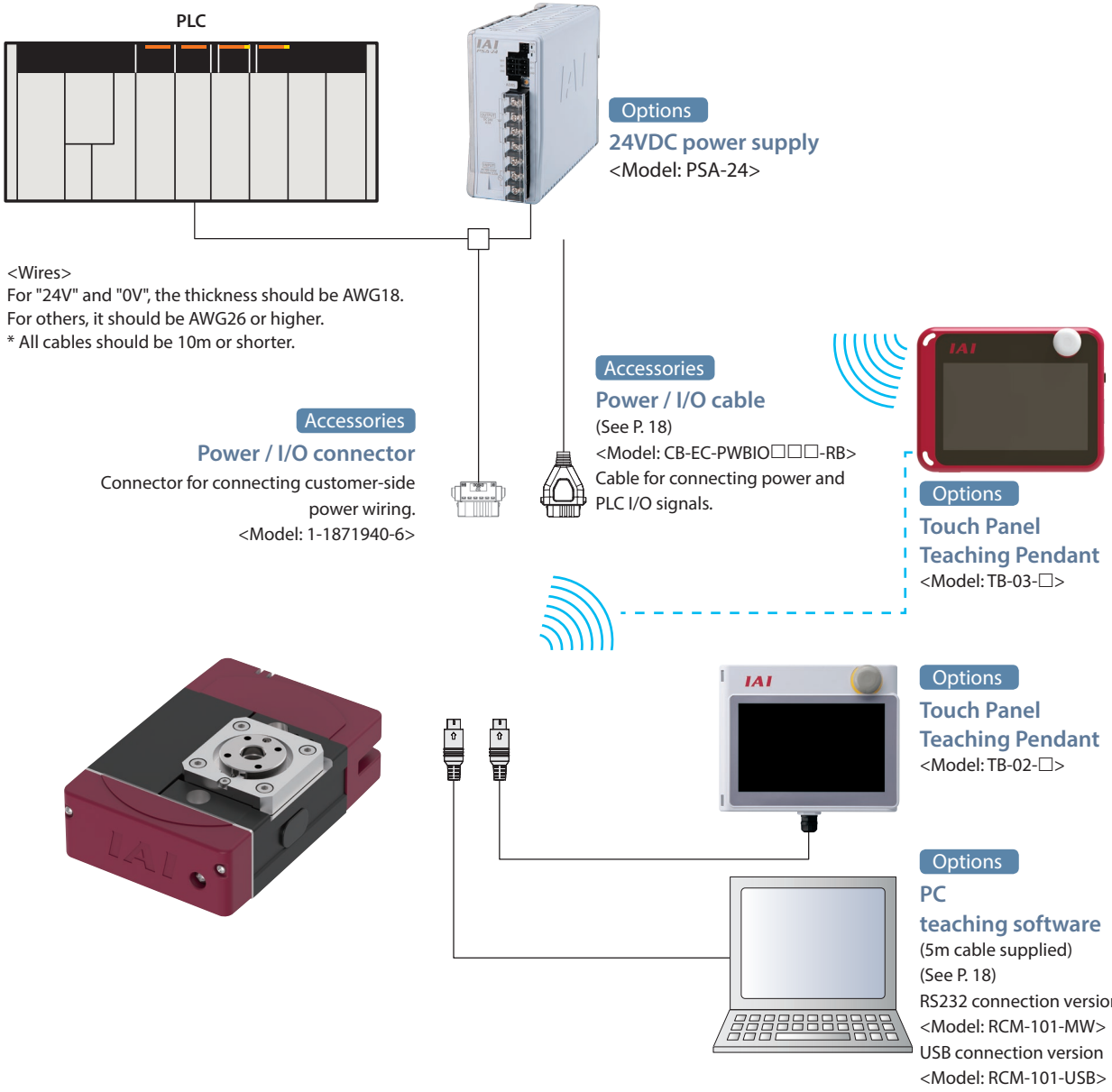
Description This option supports wireless communication. Specifying this option enables wireless connection with the TB-03 teaching pendant.
The start point, end point, and AVD can be adjusted by wireless communication.

Wireless axis operation specification

Model **WL2**

Description Specifying WL2 allows for the product to operate wirelessly as with WL (start point, end point, and AVD adjustment), and to also perform axis travel operation tests (forward end/backward end movement, jog, and inching). However, this function is not meant to perform automatic operation. Refer to P. 7-310 of the General Catalog 2019 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.

System Configuration



List of accessories

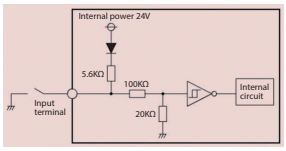
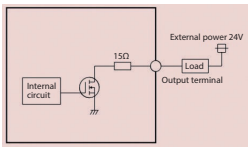
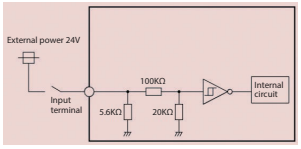
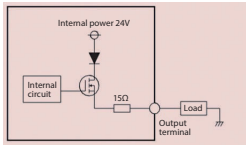
Product category	Accessories
Without EC power / I/O cable (when "0" is selected for the cable length for an actuator model)	Power / I/O connector (1-1871940-6)
With EC power / I/O cable (when "1" to "10" is selected for the cable length for an actuator model)	Power / I/O cable (CB-EC-PWBIO□□□-RB)

Basic Controller Specifications

Specification item			Specification content
Number of controlled axes			1 axis
Power supply voltage			24VDC ±10%
Power capacity		RTC9	Max. 2A (with energy-saving setting enabled only)
		RTC12	With energy-saving setting disabled: Rated 3.5A, max. 4.2A With energy-saving setting enabled: Max. 2.2A
Brake release power supply			24VDC ±10%, 200mA (only for external brake release)
Generated heat			8W (at 100% duty)
Inrush current (Note 1)		RTC9	2A
		RTC12	8.3A (with inrush current limit circuit)
Momentary power failure resistance			Max 500μs
Motor size			□28, □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	Number of input	3 points (forward, backward, alarm clear)
		Input voltage	24VDC ±10%
		Input current	5mA per circuit
		Leakage current	Max 1mA/1 point
		Isolation method	Non-isolated
	Output specification	No. of output	3 points (forward complete, backward complete, alarm)
		Output voltage	24VDC ±10%
		Output current	50mA/1 point
		Residual voltage	2V or less
		Isolation method	Non-isolated
Data setting and input methods			Teaching software for PC, touch panel teaching pendant
Data retention memory			Position and parameters are saved in non-volatile memory. (No limit to rewrite)
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 * Only when configured in advance
Ambient operating temperature			0 ~ 40°C
Ambient operating humidity			85% RH or less (no condensation or freezing)
Operating ambience			Avoid corrosive gas and excessive dust
Insulation resistance			500VDC 10MΩ
Electric shock protection mechanism			Class 1 basic insulation
Cooling method			Natural air cooling

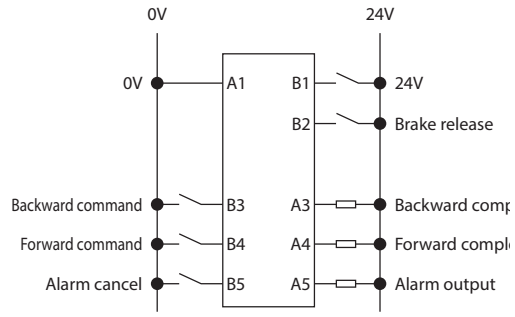
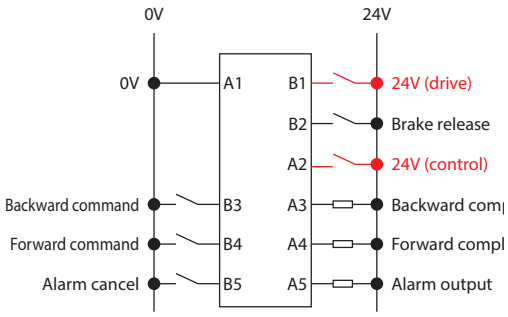
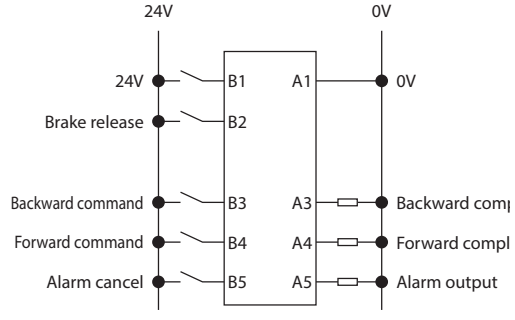
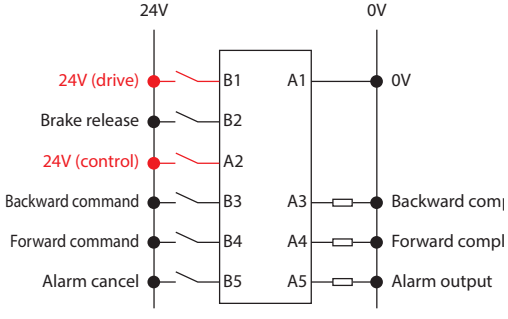
(Note 1) Inrush current flows for approximately 5ms after the power is input. (At 40°C.) Inrush current value differs depending on the impedance on the power supply line.

I/O (Input/Output) Specifications

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

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

I/O Signal Wiring Diagram

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

I/O Signal Table

Power / I/O connector pin assignment			
Pin No.	Connector nameplate name	Signal abbreviation	Function overview
B3	Backward	ST0	Backward command
B4	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)	24V	24V	24V input
A1	0V	0V	0V input
A2 (Note)	(24V)	(24V)	24V input

(Note) For the twin power supply specification (TMD2), B1 is 24V (drive) and A2 is 24V (control).

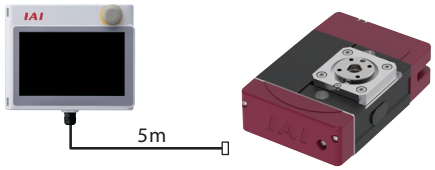
Options

Touch Panel Teaching Pendant

■ **Features** A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

■ **Model** **TB-02-□** Please contact IAI for the current supported versions.

■ **Conÿguration** Wireless connection



■ **Speciÿcations**

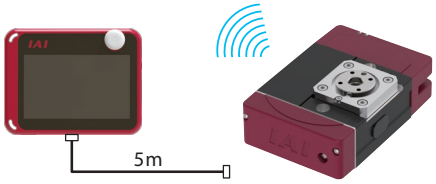
Rated voltage	DC24V
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

Touch Panel Teaching Pendant

■ **Features** A teaching device that supports wireless connection. Start point/end point/AVD input and axis operation can be performed with wireless connection.

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

■ **Conÿguration** Wireless or wired connection



■ **Speciÿcations**

Rated voltage	DC24V
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Environmental resistance	IPX0
Mass	Approx. 485g (body) + approx. 175g (battery)
Charging method	Wired connection with dedicated adapter/controller
Wireless connection	Bluetooth 4.2 class2

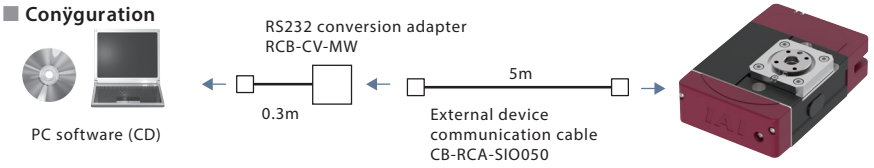
Teaching software for PC (Windows only)

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

Supported Windows versions: 7/8/10

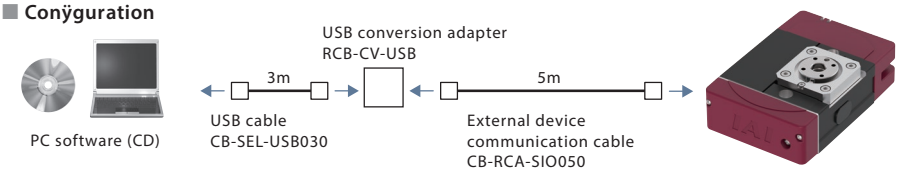
■ **Model** **RCM-101-MW** (with an external device communication cable + RS232 conversion unit) Please contact IAI for the current supported versions.

■ **Conꢀguration**



■ **Model** **RCM-101-USB** (with an external device communication cable + USB conversion adapter + USB cable) Please contact IAI for the current supported versions.

■ **Conꢀguration**



Maintenance Parts

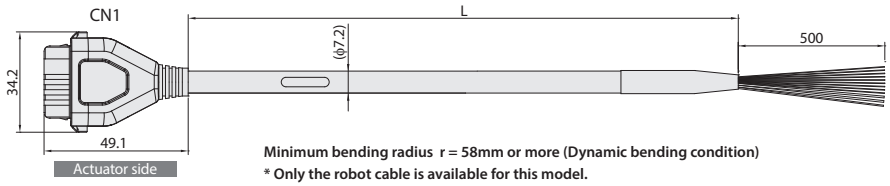
When placing an order for a replacement cable, please use the model name shown below.

■ **Table of compatible cables**

Model name	Power / I/O cable
EC	CB-EC-PWBIO□□□-RB

Model CB-EC-PWBIO□□□-RB

*Please indicate the cable length (L) in □□□, e.g.) 030 = 3m



Minimum bending radius 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)	(reserve)	B6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
White (AWG26)	(reserve)	A6
Brown (AWG26)	BKRLS	B2

(Note 1) 24V (control) when twin power supply specification (TMD2) selected.

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