

ACTIONNEURS ÉLECTRIQUES

EleCylinder EC avec électronique intégrée

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

Simple Operation

Various Model Types & Series

- Mini Rod type
- Mini Table type
- Radial Cylinder Type
- High Rigidity Type
- Waterproof Specification

Silver Type

Rod Type

13 rue Sigmund Freud
69120 Vaulx en Velin
Tél. : 04 72 04 68 61

infos@rosier.fr

Agence Paris

Tél. : 01 30 25 12 02

Agence Rennes - Grand Ouest

Tél. : 09 86 70 73 20

Simple

EC
ELECYLINDER

EleCylinder operation is
extremely simple.

Easily repairable in the event of a breakdown.

Simple model selection

■ Select the ideal model easily with model selection software.

➔ www.ele.robocylinder.de -> quick select

Simple programming-free operation

Operation is possible with data entry alone. No need to perform complicated programming.

Operation is possible with ON/OFF signals alone, just like solenoid valves.

Start and end points can be set to any position

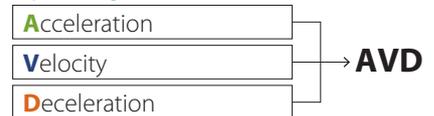
■ Enter stop position.

The diagram illustrates the process of setting stop positions. On the left, a keypad shows the 'ENT' key being pressed. On the right, a cylinder is shown with two stop positions: 'Backward end (home end)' at 0.00 mm and 'Forward end' at 100.00 mm. A blue box labeled 'Position setting' is positioned above the cylinder.

AVD values are easily set

■ Enter the operating conditions.

Operating conditions abbreviation: AVD



The diagram shows the 'Operating conditions' section with a keypad on the left where the 'ENT' key is pressed. The operating conditions are: A: Acceleration (%) = 70, V: Velocity (%) = 100, and D: Deceleration (%) = 50. To the right, a speed-time graph shows a cycle time of 1.27s. The graph has 'Speed' on the y-axis and 'Time' on the x-axis. It shows a green curve for acceleration (A), a blue horizontal line for velocity (V), and an orange curve for deceleration (D). A checkbox labeled 'Push' is in the top right corner.



Easily repairable in the event of a breakdown

Troubleshooting can be performed using the teaching pendant.

Device stoppage causes and countermeasures are displayed.

In nearly all cases, just replace the motor or controller circuit board yourself and the unit will recover.

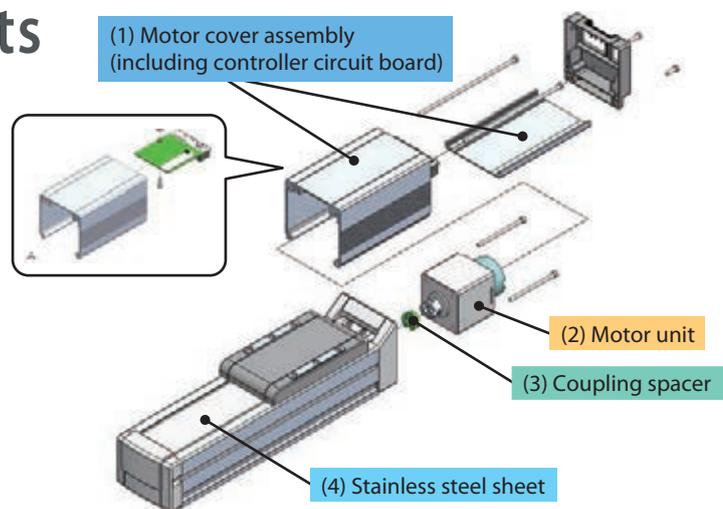
Point 1 The optimal countermeasure is displayed.

Point 2 Causes and countermeasures are displayed with illustrations.

Few maintenance parts

Since the ball screw and guide hardly ever break down, the only maintenance parts are

- (1) Motor cover assembly (including controller circuit board)
- (2) Motor unit

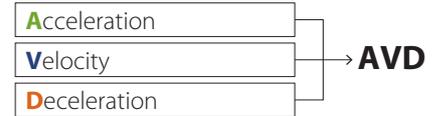


* Rear cover is not included in the motor cover assembly.
 * Bolts are not included in the motor cover assembly and motor unit.

High-level control of AVD

The **EleCylinder** allows fine adjustment of Acceleration, Velocity, and Deceleration, which can be adjusted individually in percentages. Air cylinders use flow valves to control movement and does not have the ability to finely-tune AVD individually.

Operating conditions abbreviation: AVD



Air cylinder operation

Flow valves
 Adjust velocity with air-flow throttle
 Air cylinder
 Pulling operation

Operating conditions (Push forward: Backward end → Forward end)

Speed
 Cycle time 1.27s
 V: Velocity
 A: Acceleration
 D: Deceleration
 Time

Push
 A: Acceleration (%) 70
 V: Velocity (%) 100
 D: Deceleration (%) 50

Cycle time can be reduced

Air cylinders cannot operate at high velocity due to the impact at stroke ends which occurs when excess velocity is applied. The **EleCylinder** can start and stop smoothly at high velocity, reducing cycle time.

Speed (mm/s)
 700
 300
 Time (s)
 0.4sec
 0.66sec

<EleCylinder>	Air cylinder
● Max. speed: 700 mm/s	● Average speed: 300 mm/s
● Acceleration: 1G	● Stroke: 200mm
● Stroke: 200mm	

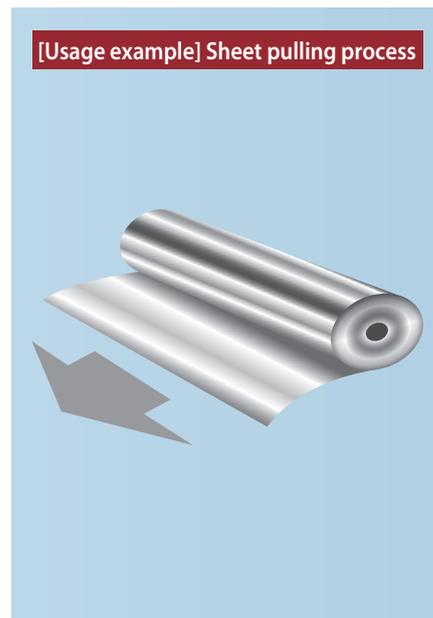
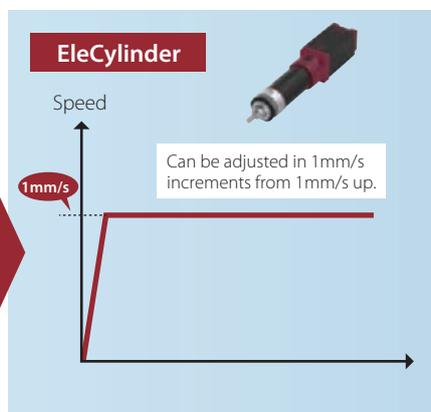
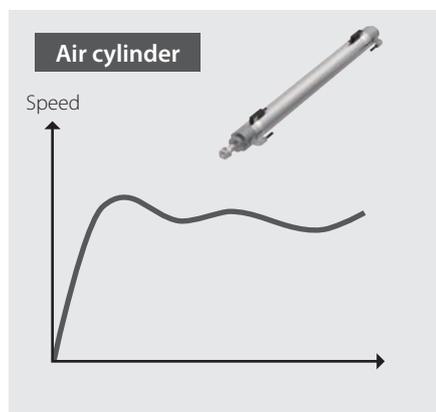
↓
↓
 Cycle time
0.4 seconds **0.66 seconds**



EC
ELECYLINDER

Stable velocity

Has excellent velocity stability even in the low velocity range.
Maintains consistent quality without film slack, even in low-velocity film or sheet pulling operations.



Fine tuning

To set **EleCylinder** start/end points, you may set the desired value by using the forward/backward step buttons set as low as 0.01mm increments on the Jog/Inching screen to visually confirm the workpiece position.

Air cylinders require position adjustment for mechanical end, auto switch, or shock absorber, as well as checking and tuning of each component's positioning.

Position setting

Easy To
Maintain

EC
ELECYLINDER

Battery-less Absolute Encoder and predictive maintenance function eliminate **time-consuming maintenance work.**

Overload warning and maintenance period notifications

The predictive maintenance function issues an overload warning when the applied load exceeds that of normal operation. It also issues maintenance period reminders.



Preventive maintenance	Predictive maintenance
Operation distance (km/m)	Overload warning
Movement count (times)	

If the criteria are set in advance, the LED built into the body will flash green/red to notify that the maintenance period is up

Battery-less Absolute Encoder can be selected

No battery means no maintenance required. Since home return operation is not required at startup or after emergency stop or malfunction, operation time and production costs can be reduced.



Battery-less Absolute Encoder

**No Battery,
No Maintenance, No Homing,
No Going Back to Incremental.**

Battery-less means maintenance-free

No battery purchase costs and reduced maintenance stock

No battery replacement operation

No battery installation space

No battery-caused mechanical failure

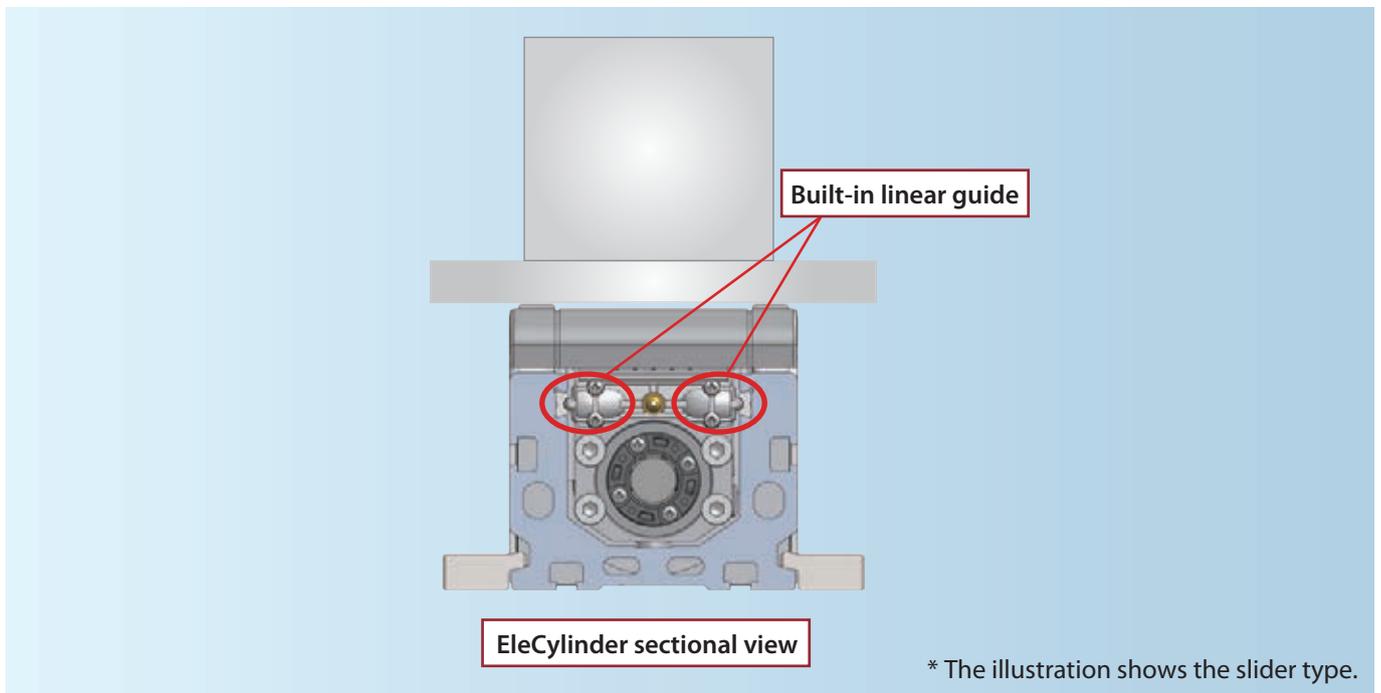


Built-in position memory system



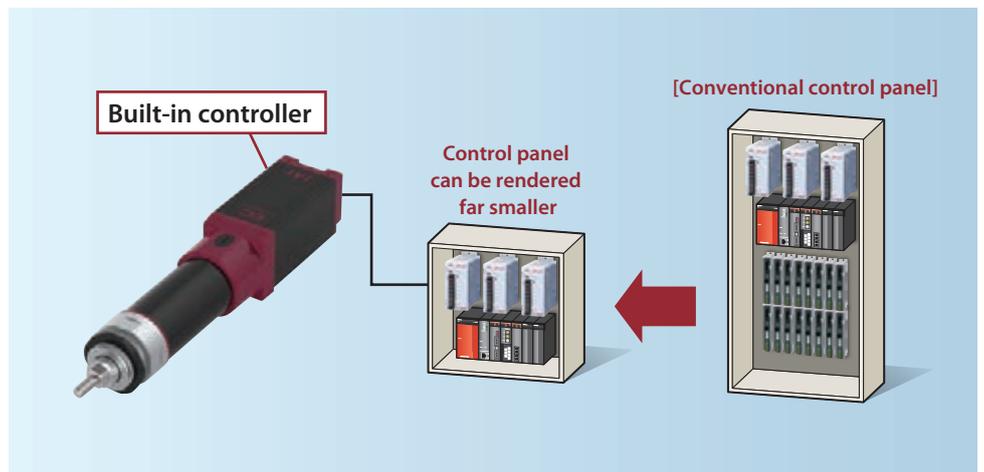
With built-in guide

The slider and radial cylinder types have built-in guides, so no external guide installation is needed. This keeps the equipment profile compact.



With built-in controller

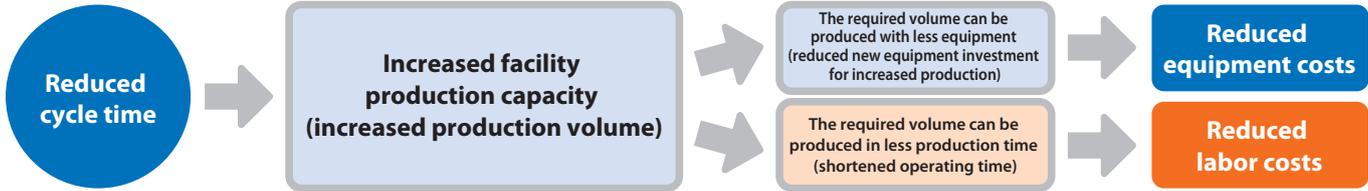
Built-in controller means no need to allocate controller space inside the control panel. This keeps the control panel size compact.



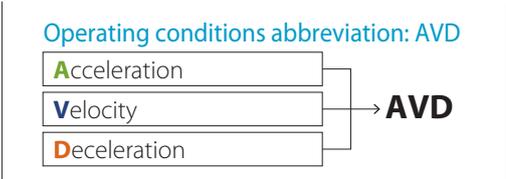
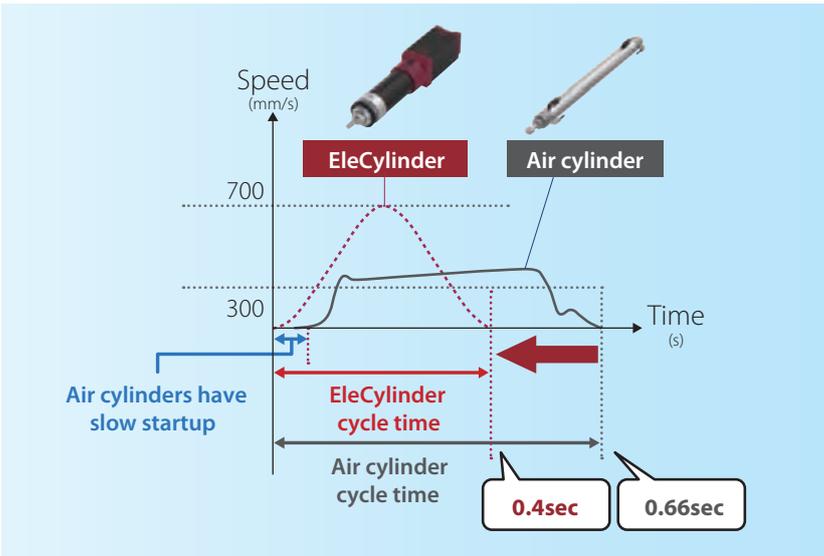


In fact, more **EleCylinder** operation means **more profit!**

Improves productivity and reduces labor costs

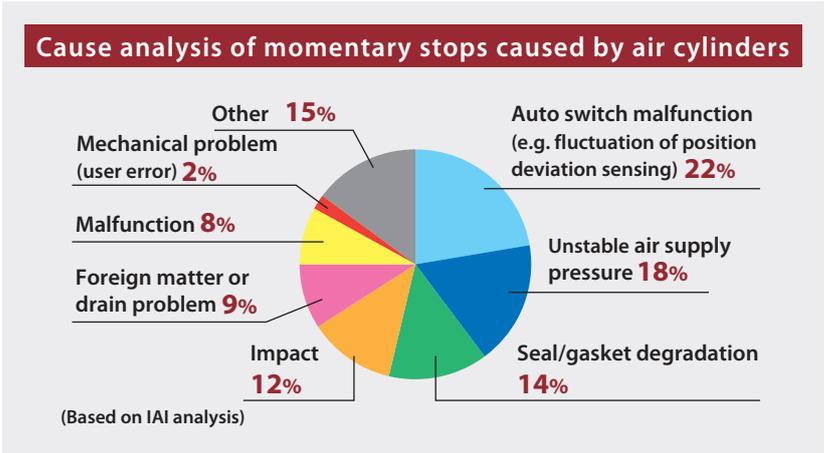


Air cylinders cannot operate at high velocity due to the impact at stroke ends which occurs when excess velocity is applied. The **EleCylinder** allows individual adjustment of AVD with percentage input for smooth starting/stopping at high velocity. This enables reduced cycle time.



Reduces momentary stops on the production line and improves equipment operating rates

Depending on the state of equipment, various air cylinder issues can trigger momentary stops on the production line. The **EleCylinder** can eliminate air cylinder-related momentary stops.





Long service life

Instead of an impact mechanism, the **EleCylinder** incorporates a ball screw and ball circulating type built-in linear guide to achieve a long service life. Based on calculation using the conditions below, the lifespan of the **EleCylinder** is five times longer than that of air cylinders.

Operational conditions

Operating days per year	Operating hours	Movement stroke	Payload	Operation cycle
240 days	16 hours per day	300mm	Horizontal: 12kg	8 seconds per reciprocating motion

Lifespan

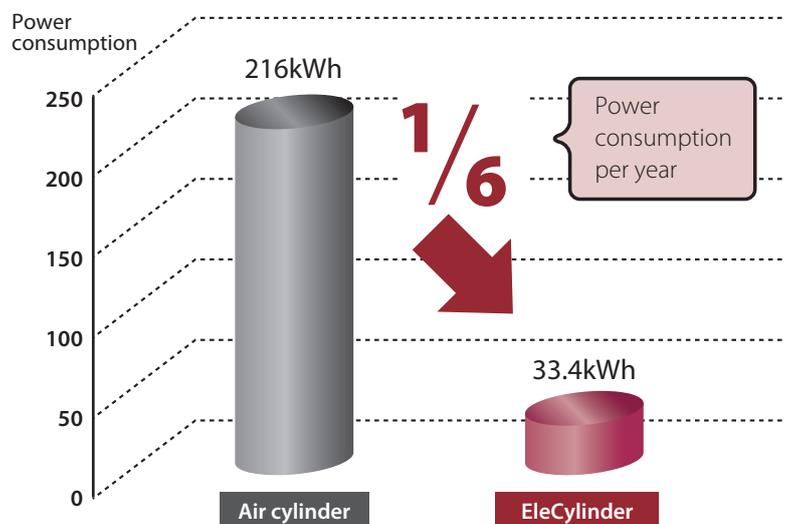
Product specifications	Life	Service life	Lifespan factors	Remarks
Air cylinder (rod type) ø32 	3 years	5 million times <small>* Lifespan estimated by cylinder manufacturer</small>	Gasket/ seal degradation	—
EleCylinder (rod type) EC-R7 	15 years	Approx. 16000km	End of bearing life	Max. speed: 155 mm/s Acceleration/deceleration: 0.5G

The EleCylinder lifespan is **5 times** longer than that of air cylinders

Reduces electricity bills

The difference in the rate of power consumption for the **EleCylinder** and air cylinders depends on the operational frequency. The higher the operational frequency, the more effective the energy-saving becomes.

Based on tests conducted by IAI, the **EleCylinder's** power consumption, under the following conditions is 1/6 that of air cylinders.



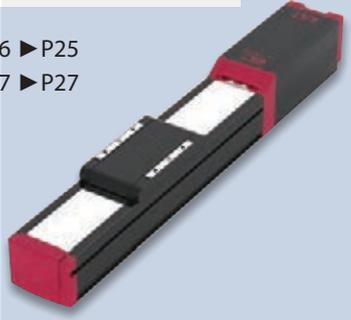
<Operational conditions>	
● EleCylinder: EC-R7	● Acceleration: 0.3G
● Air cylinder: ø32	● Load: 30kg
● Stroke: 300mm	● Installation orientation: Horizontal
● Speed: 280 mm/s	● Operational hours: 16 hours per day
● Operation cycle: 30 seconds per reciprocating motion	
● Operating days per year: 240 days	

EC Models & Features

Standard

Slider type

EC-S6 ▶ P25
EC-S7 ▶ P27



Rod type

EC-R6 ▶ P33
EC-R7 ▶ P35



<Features>

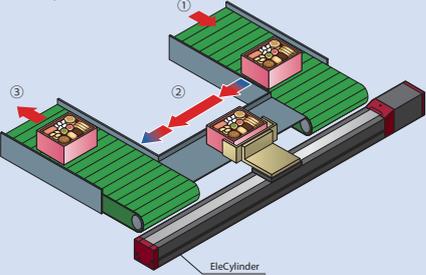
- For the slider type, the slider on the top of the body operates.
- For the rod type, the rod operates in the same way as a rod type air cylinder.

<Applications>

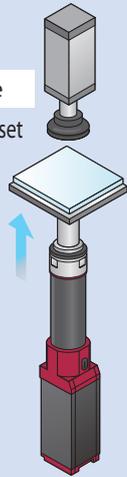
- Slider type: Suitable for transporting workpieces.
- Rod type: Suitable for pushing and lifting.

<Usage Examples>

Slider type
Transferring between conveyors



Rod type
Pushes up the set workpiece



Compact

Mini Table type

EC-TC4 ▶ P47
EC-TW4 ▶ P49



Attention! Check P.12!

Mini Guided rod type

EC-GS4 ▶ P43
EC-GD4 ▶ P45



Attention! Check P.12!

<Features>

- For the slider type, the table on the top of the body operates.
- For the mini guided rod type, the rod operates.
- The use of a nut rotation mechanism reduces the size.

<Applications>

Suitable for conveying and pushing workpieces in narrow spaces.

High Rigidity

Radial Cylinder High Rigidity Radial Cylinder

EC-RR6 ▶ P37
EC-RR7 ▶ P39



Attention! Check P.11!
Check P.13!

EC-RR6□H ▶ P40-1
EC-RR7□H ▶ P40-3



High Rigidity slider type

EC-S6□H ▶ P29
EC-S7□H ▶ P31



Attention! Check P.13!

<Features>

- A ball circulating type linear guide is built in.
- The high rigidity specification type has a built-in 4-row linear guide. The highly rigid structure supports loads distributed over 4 rows of steel balls.

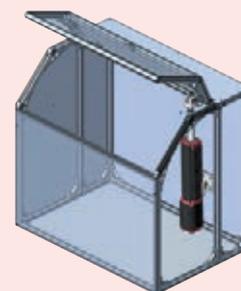
<Applications>

Radial Cylinder Suitable for oscillating motion such as opening and closing clamps and doors.

High Rigidity Spec. Type Suitable for applications where a large reaction force is applied, such as tightening screws and drilling holes.

<Usage Examples>

Radial Cylinder
Door open/close



Environmental Resistance

Waterproof rod type

EC-R6□W ▶ P51
EC-R7□W ▶ P53



Attention! Check P.13!

<Features>

- The rod operates in the same way as a rod type air cylinder.
- Waterproof specification type with ingress protection rating of IP67.

<Applications>

- Suitable for use in environments with flying dust or exposure to water.
- Usable in places where food-related equipment is washed.

▶ Non-standard Types

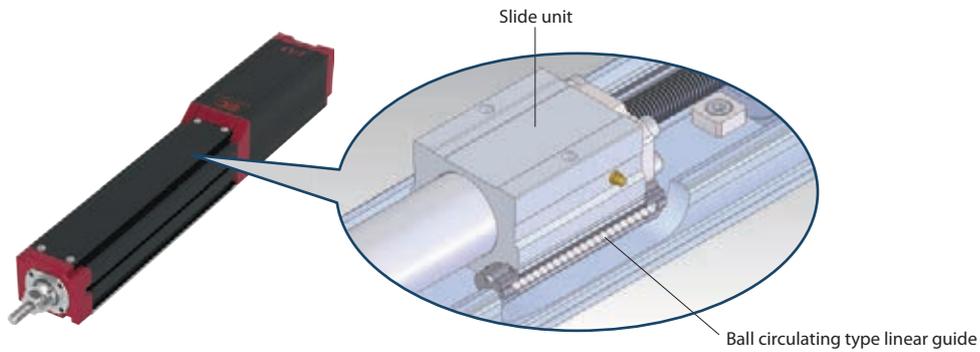
Radial load can be applied without an external guide!

Radial Cylinder



1. Includes a built-in guide.

The radial cylinder is equipped with a built-in ball circulating type linear guide in the rod body. No external guide is required, as both radial loads and eccentric loads can be applied.



(1) There is no tip runout.

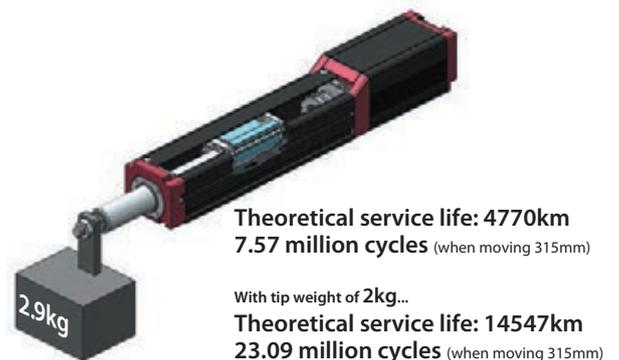
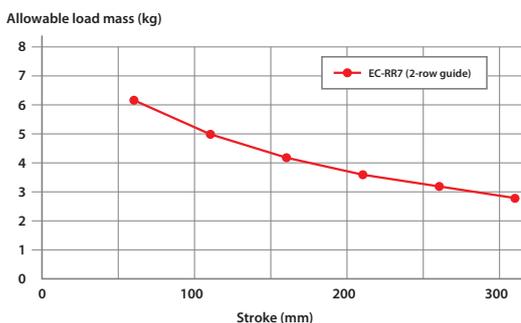
Since it has a built-in linear guide and the rod is supported by the guide, there is no runout to the tip.



(2) It can be used in narrow spaces.

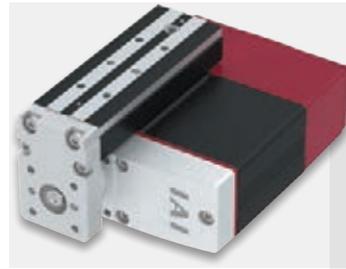
Since there is no need for an external guide, it can be used even in narrow spaces to save overall space.

The theoretical service life of the 315 mm stroke radial cylinder, with a load of 2.9kg applied to the rod tip, is 4770km. When the load on rod tip is halved, the theoretical service life increases 8-fold.



Palm size

Mini EleCylinder



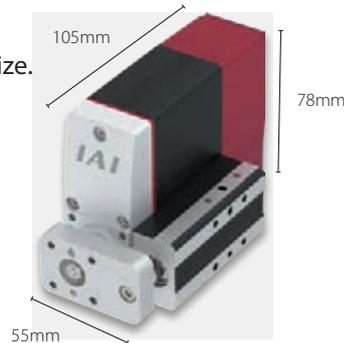
Mini Table type



Mini Guided rod type

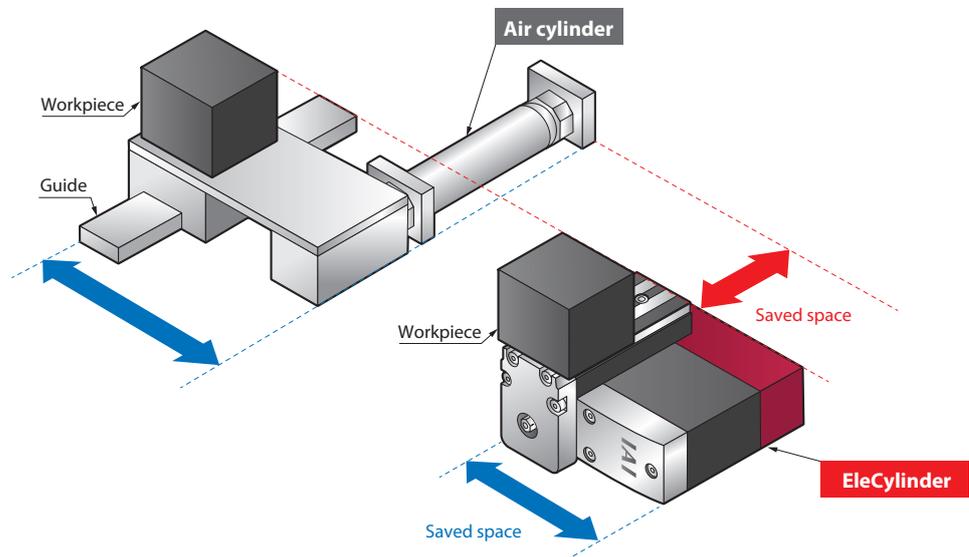
1. It can be used in narrow spaces.

- (1) The use of a nut rotation mechanism reduces the size.
- (2) Even with a built-in controller, the size is a compact 55mm × 105mm × 78mm.



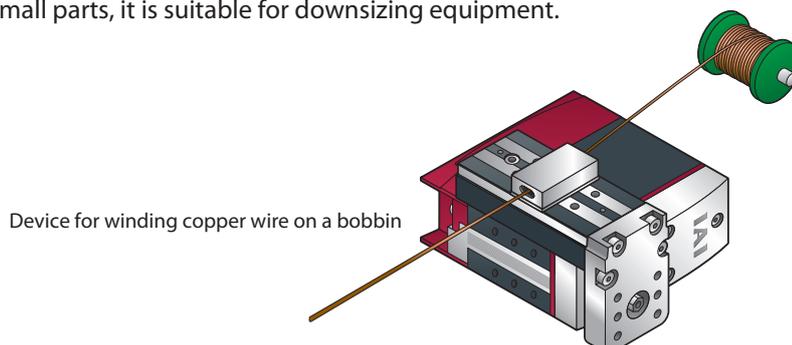
2. As it has a guide, no external guide is required.

- (1) The guide design process can be eliminated.
- (2) It helps save space.



<Applications>

As it handles small parts, it is suitable for downsizing equipment.



▶ Non-standard Types

Immersed in water? No problem!

Water-proof/ Dust-proof Specification



1. The ingress protection rating is IP67.

- (1) This rating represents protection from dust and is able to withstand water immersion between 15 cm and 1 meter for 30 minutes.
- (2) The waterproof structure prevents the ingress of water even when immersed, making it suitable for equipment such as food-related machines and washing machines which are exposed to violent splashes of water. It can also be used in environments where oil mist is present around processing machines.



<Usage Example>
Processing machine door open/close

Increases the allowable dynamic moment through a 4-row guide

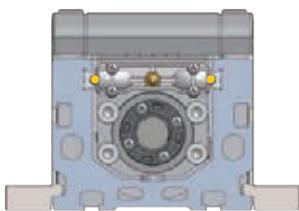
High Rigidity slider type / Radial Cylinder

1. The allowable dynamic moment is at least 3.5 times that of the conventional product.

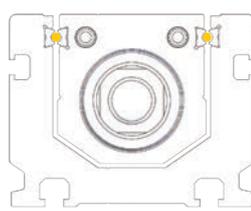
The structure supports loads distributed over 4 rows of steel balls, providing an allowable dynamic moment of at least 3.5 times (slider type) or up to 2.5 times (radial cylinder) that of the conventional product. Moreover, the overhang load length, a guideline for the overhang amount, of high rigidity slider type is 1.3 times longer than that of the conventional slider type. The overhang distance of high rigidity radial cylinder EC-RR7□H at the rod end is 1.5 times longer than of the conventional radial cylinder EC-RR7.

Conventional 2-row linear guide

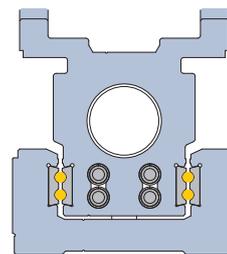
NEW 4-row linear guide



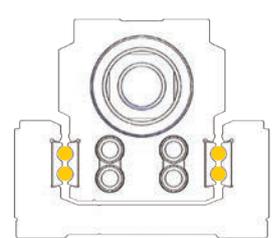
Slider type



Radial Cylinder



High Rigidity slider type



High Rigidity Radial Cylinder

Model Specification Items

EleCylinder

EC

Series

Type

Ball screw lead

Specifications

Stroke

Power / I/O cable length

Options

S6	Slider 63mm width
S7	Slider 73mm width (75mm for high rigidity type)
R6	Rod 63mm width
R7	Rod 73mm width
RR6	Radial cylinder 63 mm width
RR7	Radial cylinder 73 mm width
RP4	Rod type side-mounted motor specification 34 mm width
GS4	Rod type side-mounted motor specification 55 mm width (with single guide)
GD4	Rod type side-mounted motor specification 76 mm width (with double guide)
TC4	Mini table type (table part) 31 mm width
TW4	Mini table type (table part) 73 mm width

<S6/R6/RR6>

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

<S7/R7/RR7>

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

<RP4/GS4/GD4/TC4/TW4>

L	Lead 2mm
M	Lead 4mm
H	Lead 6mm

0	0m
?	?
10	10m

Cable length
 · 0: With power / I/O connector
 · 1 to 10: With relay cable with cover

<S6/S7>

50~400mm (S6)
50~500mm (S7)

(Every 50mm)

<R6/R7>

50~300mm

(Every 50mm)

<RR6/RR6□H/RR7/RR7□H>

65~315mm (RR6, RR7)
50~300mm (RR6□H/RR7□H)

(Every 50mm)

<RP4/RP4/GS4/GD4/TC4/TW4>

30 mm, 50 mm

(Blank)	Slider type, rod type, radial cylinder, mini table type
H	High rigidity slider type, high rigidity radial cylinder
W	Waterproof specification

(Blank)	Incremental encoder specification, NPN specification, no option
AC5	Actuator cable length: 5 m
B	Brake
FFA	Tip adapter (flange)
FL	Flange (front)
FT	Foot bracket (bolting from top)
GT2	GS4 guide right mount / TC4 table right mount
GT3	GS4 guide bottom mount / TC4 table bottom mount
GT4	GS4 guide left mount / TC4 table left mount
NFA	Tip adapter (internal thread)
NJ	Knuckle joint
NJPB	Knuckle joint + oscillation receiving bracket
NM	Non-motor end specification
PN	PNP specification
QR	Clevis bracket
QRPB	Clevis bracket + oscillation receiving bracket
WA	Battery-less Absolute Encoder specification
WL	Wireless communication specification

* The range of selectable options varies according to the actuator type. Please refer to the pages of each type for details.

**EC EleCylinder Series
Catalogue No. 0218-E**



The information contained in this catalog is subject to change without notice for the purpose of product improvement



IAI Industrieroboter GmbH

Ober der Röth 4

D-65824 Schwalbach / Frankfurt

Germany

Phone: +49-6196-8895-0

Fax: +49-6196-8895-24

E-Mail: info@IAI-GmbH.de

Internet: <http://www.eu.IAI-GmbH.de>

IAI America, Inc.

2690 W. 237th Street, Torrance, CA 90505, U.S.A

Phone: +1-310-891-6015, Fax: +1-310-891-0815

IAI (Shanghai) Co., Ltd

Shanghai Jiahua Business Center A8-303, 808,

Hongqiao Rd., Shanghai 200030, China

Phone: +86-21-6448-4753, Fax: +86-21-6448-3992

IAI CORPORATION

577-1 Obane, Shimizu-Ku, Shizuoka, 424-0103 Japan

Phone: +81-543-64-5105, Fax: +81-543-64-5192

IAI Robot (Thailand) Co., Ltd

825 PhairojKijja Tower 12th Floor, Bangna-Trad RD.,

Bangna, Bangna, Bangkok 10260, Thailand

Phone: +66-2-361-4457, Fax: +66-2-361-4456