IAI
Quality and Innovation

Introduction to New ROBO Cylinder Products

RC ROBO CYLINDER

Motor reversing specification

Clevis

With double guides

With single guide

Built-in specification

Coupling specification

Coupling specification

Trunnion

Knuckle joint

Foot bracket

Motor reversing specification

**ERC2** **RCP2** **RCA** **RCS2**

More Functional, More Affordable

The family of "ROBO Cylinder" next-generation cylinders offers easy operation, high functionality and energy-saving features at affordable cost.
IAI offers a wide variety of ROBO Cylinders, each providing convenient functions to meet your needs in system design.

Features of the ROBO Cylinder

1 Easy Assembly and Operation

- Compatible with various mounting mechanisms (foot, clevis, trunnion, etc.), just like air cylinders
- Easy operation without the need for programming (PCON, ACON, SCON)
- No "stick & slip" problem at low speed, as normally found with air cylinders
- Easy to change speed and acceleration
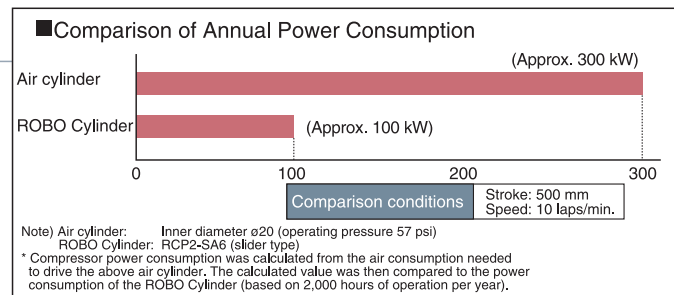- Easy to change line setup after operation
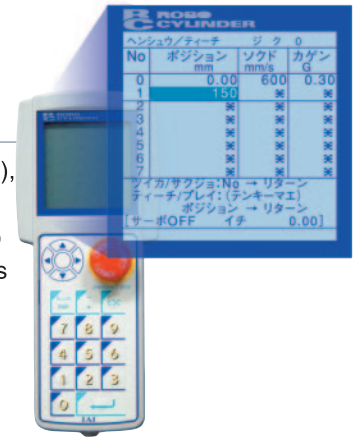
2 High Functionality

- Multi-point positioning to a maximum of 512 points
- Positioning repeatability of ±0.02 mm
- Connectable to field networks
- User-definable control using pulse trains
- Quick, easy programming using SEL language (PSEL, ASEL, SSEL)
- Push-motion operation, pitch feed, zone output, pause input, speed change during movement, and separate acceleration/deceleration settings
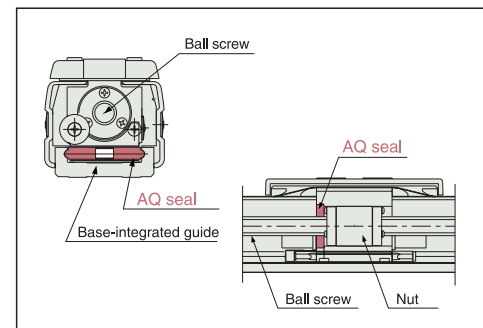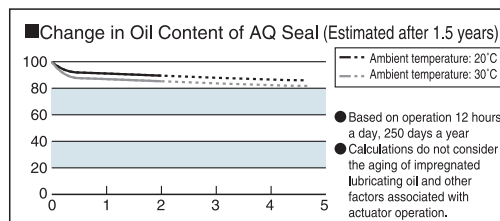
3 Energy Saving

- Running cost just one-third to one-tenth that of an air cylinder
- Environmentally friendly operation, free of oil mist

■Comparison of Annual Power Consumption

Air cylinder (Approx. 300 kW)

ROBO Cylinder (Approx. 100 kW)

0   100   200   300

Comparison conditions | Stroke: 500 mm Speed: 10 laps/min.

Note) Air cylinder: Inner diameter ø20 (operating pressure 57 psi)
ROBO Cylinder: RCP2-SA6 (slider type)
* Compressor power consumption was calculated from the air consumption needed to drive the above air cylinder. The calculated value was then compared to the power consumption of the ROBO Cylinder (based on 2,000 hours of operation per year).

4 Maintenance Free

- Every model comes with the AQ seal, an innovative lubrication feature made of resin-solidified lubricating oil.
- The AQ seal minimizes the frequency of greasing.
  (If grease is applied in addition to the AQ seal, the ROBO Cylinder will operate maintenance free for 5,000 km of traveled distance, or approximately three years.)

■Change in Oil Content of AQ Seal (Estimated after 1.5 years)

100
80
60
40
20
0
0   1   2   3   4   5

- - - Ambient temperature: 20˚C
- - - Ambient temperature: 30˚C

● Based on operation 12 hours a day, 250 days a year
● Calculations do not consider the aging of impregnated lubricating oil and other factors associated with actuator operation.

Ball screw

AQ seal

AQ seal

Base-integrated guide

Ball screw   Nut

5 | **Wide Variety**

- Four actuator series to choose from: ERC2, RCP2, RCA and RCS2
- Each series includes models that employ a coupling connection. Built-in types and motor reversing types are also available, depending on the series.
- Position controllers (PCON, ACON, SCON) and program controllers (PSEL, ASEL, SSEL, XSEL) are available.
- Select from controllers employing various control methods (see the table on the right).

ROBO CYLINDER

■ Select a Controller to Meet Your Specific Control Needs

Type	Features
Positioner type	Standard control using parallel I/Os.
Solenoid valve type	Similar to the way the solenoid valve of an air cylinder works, there's no need for a start signal. Just enable three terminals, and the actuator will move to the three corresponding positions.
Serial communication type	Suitable for systems that move to positions set via serial communication using field networks, etc.
Pulse-train input type	No need to set positions from a controller. The ROBO Cylinder moves directly based on pulse trains input from a PLC, etc.

ROBO Cylinders come in the following four series, each offering different features. Select the type that meets your system requirement.

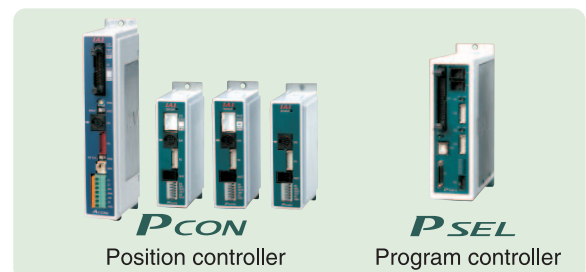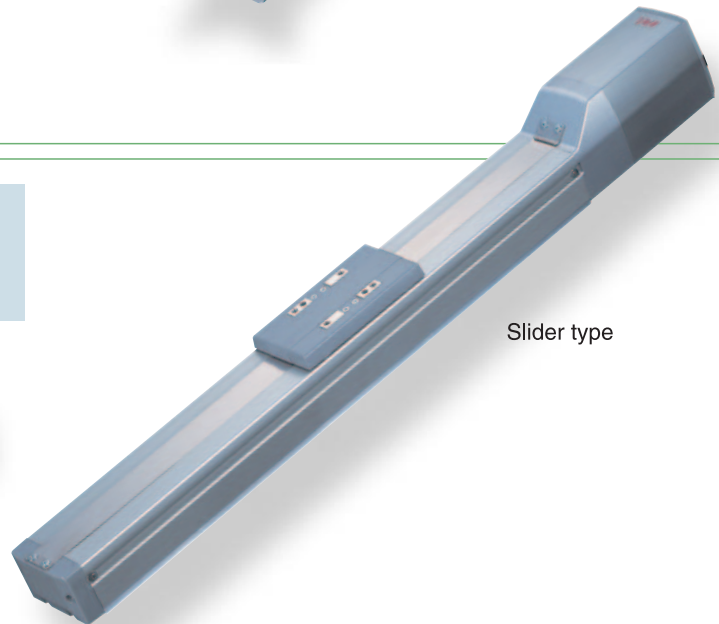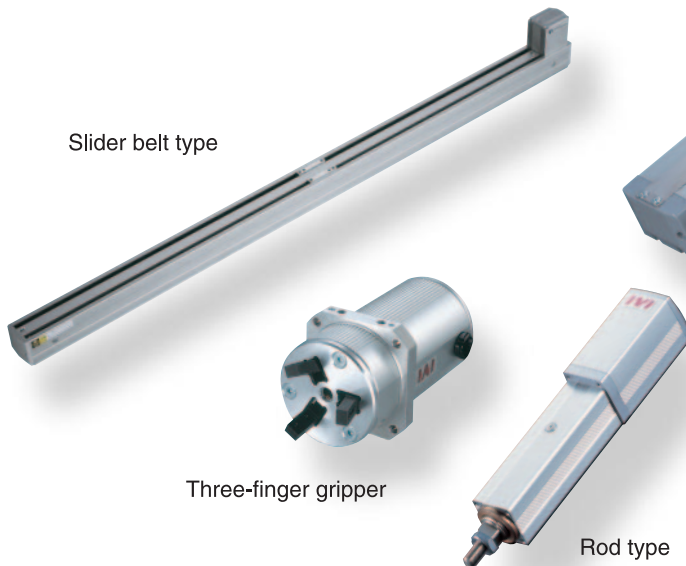Built-in Controller Type
ERC2 *series*

Pulse-motor cylinders integrated with a controller. Easy to use, and ideal for applications where space is limited.

Slider type

Rod type

Rod guide type
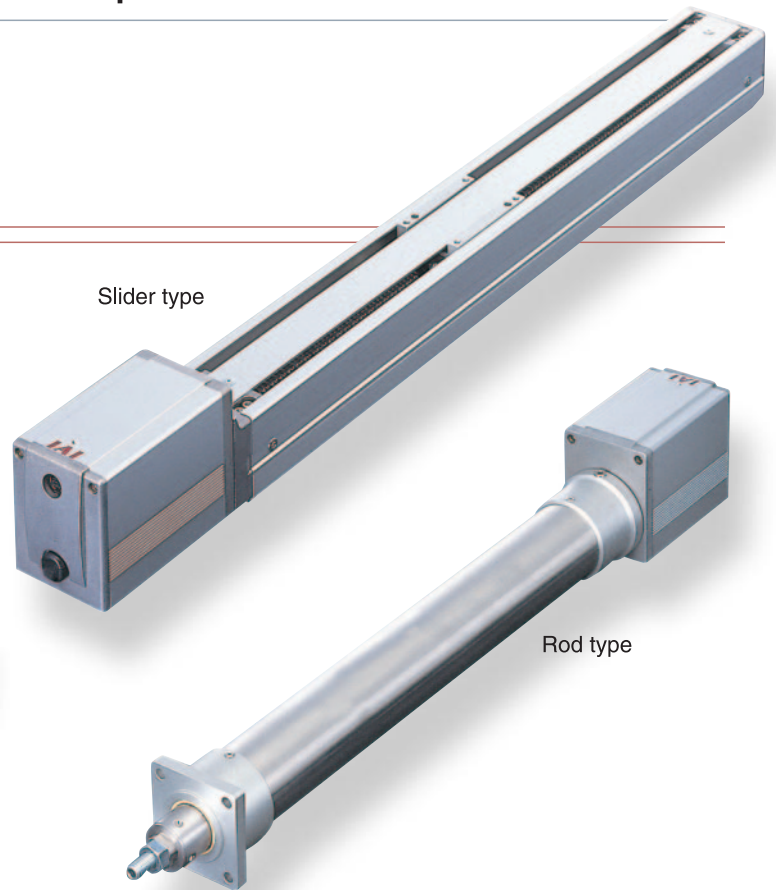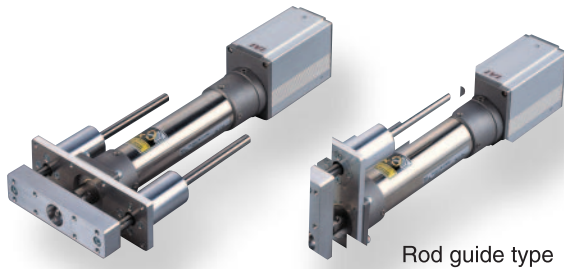
Pulse Motor Type
RCP2 *series*

Pulse-motor cylinders suitable for push-motion operation, taking advantage of a pulse motor that demonstrates high thrust at low speed.
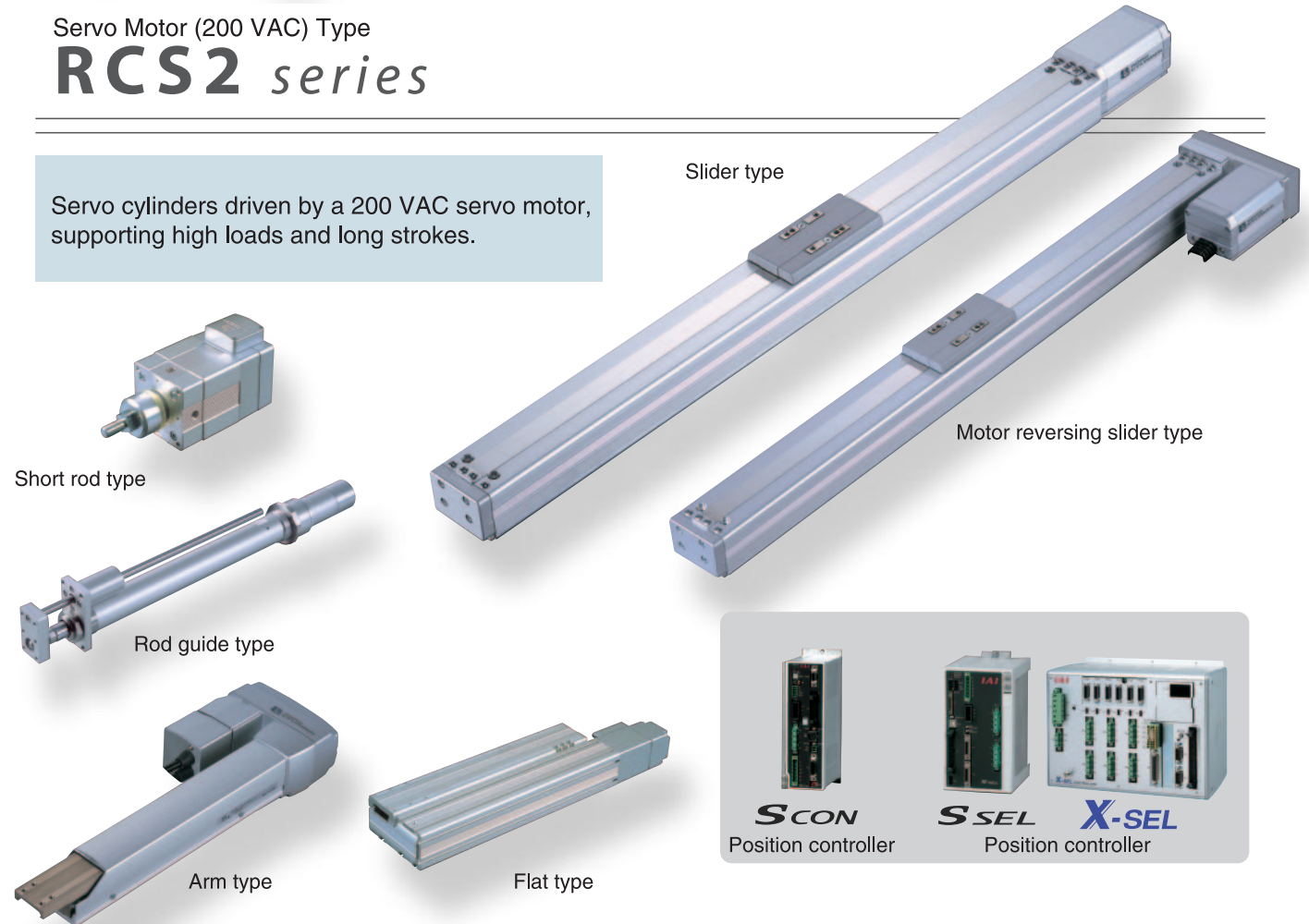
Slider type

Slider belt type

Three-finger gripper

Rod type

PCON
Position controller

PSEL
Program controller

Servo Motor (24 VDC) Type
RCA *series*

Compact 24 VDC servo cylinders in a shape close to a rod-type air cylinder.

Coupling type

Built-in motor type

Rod guide type

Motor reversing type

Slider type

Motor reversing type

A *CON*
Position controller

A *SEL*
Program controller

Servo Motor (200 VAC) Type
RCS2 *series*

Servo cylinders driven by a 200 VAC servo motor, supporting high loads and long strokes.

Slider type

Short rod type

Motor reversing slider type

Rod guide type

Arm type

Flat type

S *CON*
Position controller

S *SEL*
X-*SEL*
Position controller

4

These actuators are available with optional mounting brackets similar to those normally used with air cylinders, such as the foot, trunnion and clevis.The rod tip accepts a knuckle joint, floating joint or other mounting brackets, so you can quickly and economically convert your existing air cylinder to a ROBO Cylinder.

[Knuckle joint]

[Front trunnion]

[Flange]

[Foot]

[Rear trunnion]

[Clevis]
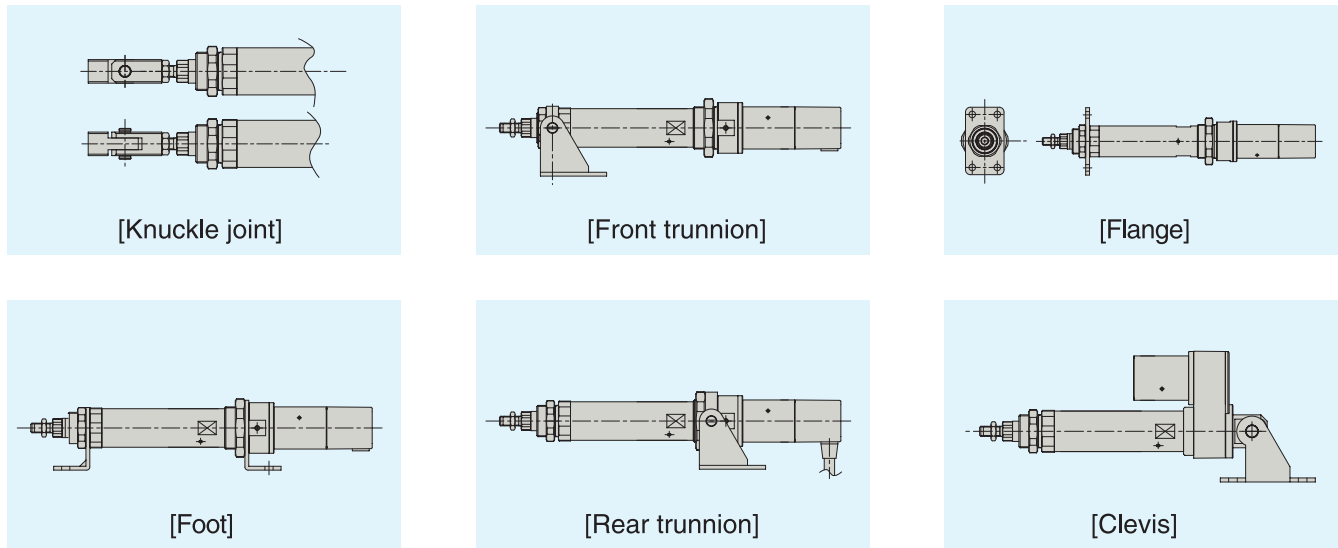
■Application Examples

Want to replace an existing air cylinder without hassle

Solenoid valve type

The PCON-CY and ACON-CY are recommended.
(You can also use the SCON-C in the PIO mode.)
Your ROBO Cylinder can be controlled just like an air cylinder.

PLC

Solenoid valve

Air cylinder

PLC

Hassle-free replacement

ROBO Cylinder
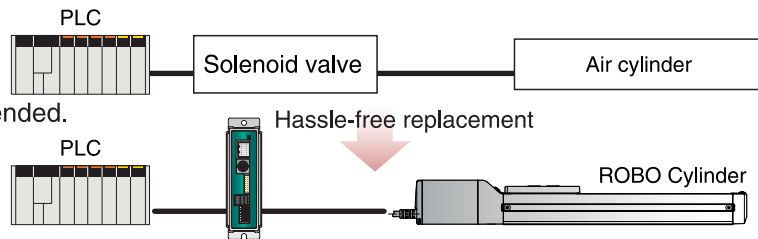
Want to connect to CC-Link and DeviceNet

Serial communication type

You can connect the PCON-SE or ACON-SE to a gateway unit.
The SCON connects directly to field networks.

Field network

GateWay

Serial communication type

Number of connectable units: DeviceNet – 16 units, CC-Link – 14 units
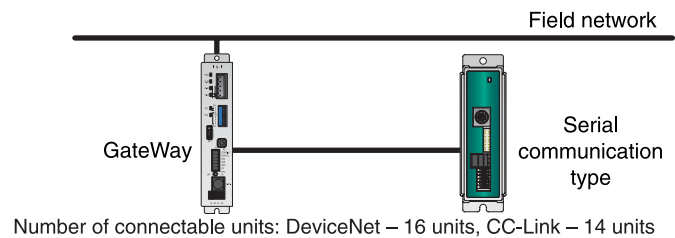
Want to operate it using a PLC based on pulse trains

Pulse-train input type
You can use the PCON-PL/PO, ACON-PL/PO or SCON-C.

Want to operate two axes

The PSEL, ASEL and SSEL have two-axis types.
They can perform synchronized operation and interpolation operation.

Want to install it based on clevis/trunnion mount

Select either the rod-type RA3 or RA4 in the RCA/RCS2 series.

5

We offer 15 types of controllers supporting different actuator types and control methods.

Supported actuators

	RCP2 *series*	RCA *series*	RCS2 *series*
	24 VDC pulse motor type	24 VDC servo motor type	200 VAC servo motor type

Position controllers

| | **P**CON | **A**CON | **S**CON |

Positioner type

These controllers support a maximum of 512 positioning points. You can also use it as a solenoid valve controller or serial communication controller, simply by changing the mode setting.

PCON-C/CG — ACON-C/CG

Solenoid valve type

Super-easy control, with effortless three-point positioning. You can use the same solenoid-valve control operations you are already familiar with on your air cylinders.

PCON-CY — ACON-CY

Pulse-train input type

These controllers eliminate the need to input positions in advance. They are ideal in applications requiring many or complex operation patterns, or where flexibility is required in changing speed and other settings.

PCON-PL/PO — ACON-PL/PO

SCON-C
All functions are combined into one unit.

Serial communication type

These controllers are used to connect to DeviceNet and CC-Link via a gateway unit. Their compact, low-cost construction is perfect for multi-axis operations.

PCON-SE — ACON-SE

Program controller

| | **P**SEL | **A**SEL | **S**SEL |

Program type

Program controllers can operate two axes at once. Since interpolation operation is possible, they are ideal for coating and palletizing operations requiring synchronized movements of two axes.

| 1-axis type 2-axis type | 1-axis type 2-axis type | 1-axis type 2-axis type |
| PSEL-C | ASEL-C | SSEL-C |

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