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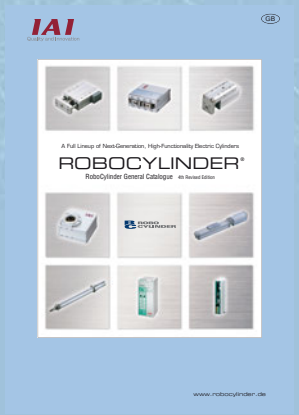
ROBO CYLINDER

Product Overview & Technical Reference

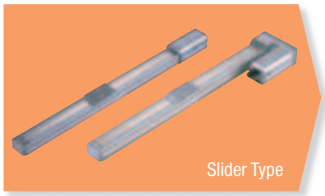
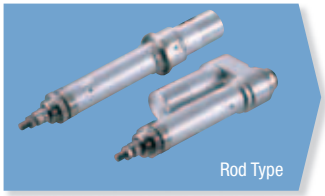
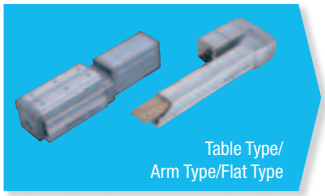
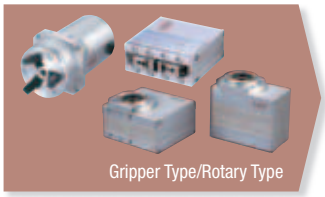
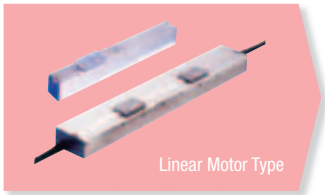
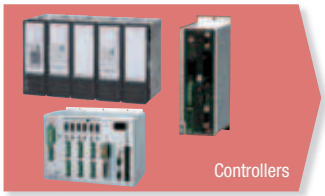
RCP2 & RCP3 / ERC2 / RCA & RCA2 / RCS2 / RCL

Catalogue Extract

4th revised Edition



RoboCylinder® Product Overview

Environment	Form	Specifications	Main Types	See Page
Standard Environment	 Slider Type	Stroke 25 - 1,200mm; Vertical Load 20 kg; Horizontal Load 60 kg	● Mini type ● Standard type ● Controller-Integrated type	P.1
	 Rod Type	Stroke 25 - 300mm; Vertical Load 300 kg; Horizontal Load 500 kg	● Mini type ● Standard type ● High-Thrust type ● Ultra-High-Thrust type ● Controller-Integrated type	P.129
	 Table Type/ Arm Type/Flat Type	Stroke 25 - 300mm; Vertical Load 18 kg; Horizontal Load 10 kg	● Mini type ● Standard type	P.267
	 Gripper Type/Rotary Type	Stroke (Gripper) 8 - 200mm; Stroke (Rotary) 360°	● Small type ● Medium type ● Large type	P.331
	 Linear Motor Type	Stroke 25 - 288mm; Horizontal Load 3.2 kg	● Slider type ● Rod type	P.371
Cleanroom	 Cleanroom Type	Stroke 50 - 1000mm; Vertical Load 20 kg; Horizontal Load 60 kg	● Slider type ● Gripper type	P.397
Dusty/Damp Environment	 Dustproof/Splash-Proof	Stroke 50 - 600mm; Vertical Load 150 kg; Horizontal Load 300 kg	● Slider type ● Rod type	P.441
Controllers	 Controllers		● Positioner type ● Program type ● Network type	P.461

Product Index

A comprehensive lineup and features that meet a wide variety of needs.

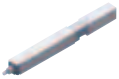
Developed by IAI, RoboCylinders offer high performance, outstanding usability, and economic efficiency, all in a versatile lineup to meet your needs.

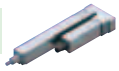
Product Overview

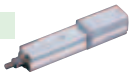
Addendum *1)
Medium thrust type — 85mm width RCP2-RA8C 146-1
Addendum *2)
Medium thrust side-mounted motor type — 85mm width RCP2-RA8R 150-1

Rod Type  ▶ P.129

■ Pulse Motor Type

Mini type 
- 22mm width RCP3-RA2AC ..... 131 Upgrade
- 28mm width RCP3-RA2BC ..... 133 Upgrade

Mini type w/ side-mounted motor 
- 22mm width RCP3-RA2AR ..... 135 Upgrade
- 28mm width RCP3-RA2BR ..... 137 Upgrade

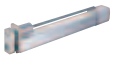
Coupled type 
- 25mm width RCP2-RA2C 139
- 35mm width RCP2-RA3C 141
- 45mm width RCP2-RA4C 143
- 64mm width RCP2-RA6C 145

← Addendum*1)

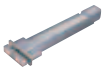
High-thrust type 
- 100mm width RCP2-RA10C 147

Short-length type 
- 45mm width RCP2-SRA4R 149

← Addendum*2)

Single guide type 
- 45mm width RCP2-RGS4C 151
- 64mm width RCP2-RGS6C 153

Short-length type w/ single guide
- 45mm width RCP2-SRGS4R 155

Double guide type 
- 35mm width RCP2-RGD3C 157
- 45mm width RCP2-RGD4C 159
- 64mm width RCP2-RGD6C 161

Short-length type w/ double guide
- 45mm width RCP2-SRGD4R 163

■ Controller-Integrated Type

Controller-integrated type 
- 58mm width ERC2-RA6C 165
- 68mm width ERC2-RA7C 167

Controller-integrated type w/ single guide 
- 58mm width ERC2-RGS6C 169
- 68mm width ERC2-RGS7C 171

Controller-integrated type w/ double guide 
- 58mm width ERC2-RGD6C 173
- 68mm width ERC2-RGD7C 175

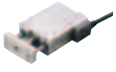
■ Servo Motor Type (24V)

← Addendum*3)

Mini type, nut mounting 
- 28mm width RCA2-RN3NA ..... 177 Upgrade
- 34mm width RCA2-RN4NA ..... 179 Upgrade

Mini type, tapped hole mounting 
- 28mm width RCA2-RP3NA ..... 181 Upgrade
- 34mm width RCA2-RP4NA ..... 183 Upgrade

Mini type, single guide 
- 28mm width RCA2-GS3NA ..... 185 Upgrade
- 34mm width RCA2-GS4NA ..... 187 Upgrade

Mini type, double guide 
- 28mm width RCA2-GD3NA ..... 189 Upgrade
- 34mm width RCA2-GD4NA ..... 191 Upgrade

Mini slide unit type 
- 60mm width RCA2-SD3NA ..... 193 Upgrade
- 72mm width RCA2-SD4NA ..... 195 Upgrade

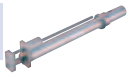
Addendum *3)
Mini type — 18mm width RCA2-RA2AC 176-1
Mini type w/ side-mounted motor — 18mm width RCA2-RA2AR 176-3

Coupled type 
- ø32mm RCA-RA3C 197
- ø37mm RCA-RA4C 199

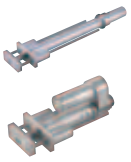
Built-in type 
- ø32mm RCA-RA3D 201
- ø37mm RCA-RA4D 203

Side-mounted motor type 
- ø32mm RCA-RA3R 205
- ø37mm RCA-RA4R 207

Short-length type 
- 45mm width RCA-SRA4R 209

Single guide type 
- ø32mm RCA-RGS3C 211
- ø37mm RCA-RGS4C 213
- ø32mm RCA-RGS3D 215
- ø37mm RCA-RGS4D 217

Short-length type w/ single guide
- 45mm width RCA-SRGS4R 219

Double guide type 
- ø32mm RCA-RGD3C 221
- ø37mm RCA-RGD4C 223
- ø32mm RCA-RGD3D 225
- ø37mm RCA-RGD4D 227
- ø32mm RCA-RGD3R 229
- ø37mm RCA-RGD4R 231

Short-length type w/ double guide
- 45mm width RCA-SRGD4R 233

■ Servo Motor Type (230V)

← Addendum*4)

Coupled type 
- ø37mm RCS2-RA4C 235
- 55mm width RCS2-RA5C 237

Built-in type 
- ø37mm RCS2-RA4D 239

Short-length type 
- 75mm width RCS2-SRA7BD 241

Side-mounted motor type 
- ø37mm RCS2-RA4R 243
- 55mm width RCS2-RA5R 245

Ultra-high thrust type 
- 130mm width RCS2-RA13R ..... 247 Upgrade

Single guide type 
- ø37mm RCS2-RGS4C 249
- 55mm width RCS2-RGS5C 251
- ø37mm RCS2-RGS4D 253

Short-length type w/ single guide
- 75mm width RCS2-SRGS7BD 255

Double guide type 
- ø37mm RCS2-RGD4C 257
- 55mm width RCS2-RGD5C 259
- ø37mm RCS2-RGD4D 261

Short-length type w/ double guide
- 75mm width RCS2-SRGD7BD 263

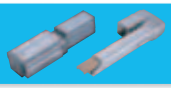
Side-mounted motor type w/ double guide
- ø37mm RCS2-RGD4R 265

Addendum *4)
Mini type, nut mounting — 46mm width RCS2-RN5N 234-1
Mini type, tapped hole mounting — 46mm width RCS2-RP5N 234-3
Mini type, single guide — 46mm width RCS2-GS5N 234-5
Mini type, double guide — 46mm width RCS2-GD5N 234-7
Mini slide unit type — 94mm width RCS2-SD5N 234-9

Product Index

Addendum *1)

Table Type/Arm Type/ Flat Type



▶ P.267

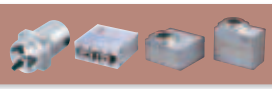
Pulse Motor Type

Servo Motor Type (24V)

Servo Motor Type (230V)

← Addendum*1)

Gripper Type/ Rotary Type



▶ P.331

Gripper Type (Pulse Motor)

← Addendum*2)

Addendum *2)

Addendum *3)

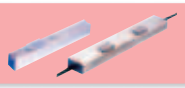
Gripper Type (Servo Motor)

Rotary Type (Pulse Motor)

Rotary Type (Servo Motor)

← Addendum*3)

Linear Motor Type



▶ P.371

Slider Type

Rod Type

Cleanroom Type

▶ P.397

Pulse Motor Type

Servo Motor Type (24V)

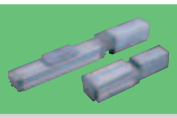
Technical References/Information

RoboCylinders® are available in seven series and can be categorized by three types of motors.

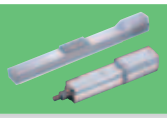
Pulse Motor

Affordably priced, excellent for push operation and complete stops.
Delivers high output at low speeds.

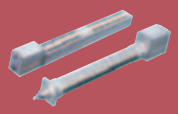
RCP3 Series
High maintainability, low price
Isolated motor for easy replacement



RCP2 Series
Standard models with pulse motor
High-speed/high-rigidity/high-thrust



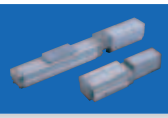
ERC2 Series
Controller-Integrated Type
Low price



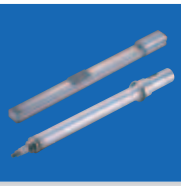
Servo Motor

Excellent for high-speed operations, with low noise.

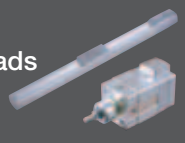
RCA2 Series
High maintainability, low price
Isolated motor for easy replacement



RCA Series
Installs the same way as an air cylinder
A wide variety of 24V models



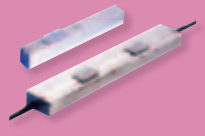
RCS2 Series
For high speeds and heavy loads
Operates at 115V/230V for high output



Linear Motor

High-speed operation with outstanding acceleration/deceleration.

RCL Series
For high speed, high acceleration/deceleration
Accelerates/decelerates at up to 2G



Controller Categories

Positioner Type

Operated by specifying the target position number from an external I/O interface.
No programming is necessary.

PMEC PSEP PCON ERC2
AMEC ASEP ACON SCON

Program Type

Operated by inputting programs.
Advanced controlling is possible, such as synchronous operation of two axes, and communication with external devices.

PSEL ASEL SSEL XSEL

Network Type

Supports operation on a field network or by serial communication. Operate a large system or multiple axes with less wiring.

RPCON RACON

Compatible Controllers

	PMEC	PSEP	PCON	RPCON	PSEL
	P477 	P487 	P525 	P503 	P557 
Power/Voltage	AC115/230V	DC24V	DC24V	DC24V	DC24V
Positioning Points	3 points	3 points	512 points	768 points	1500 points
Operating Method	Positioner	Positioner	Positioner	Network	Programs

	Built-in controller
	P515 
Power/Voltage	DC24V
Positioning Points	64 points
Operating Method	Positioner

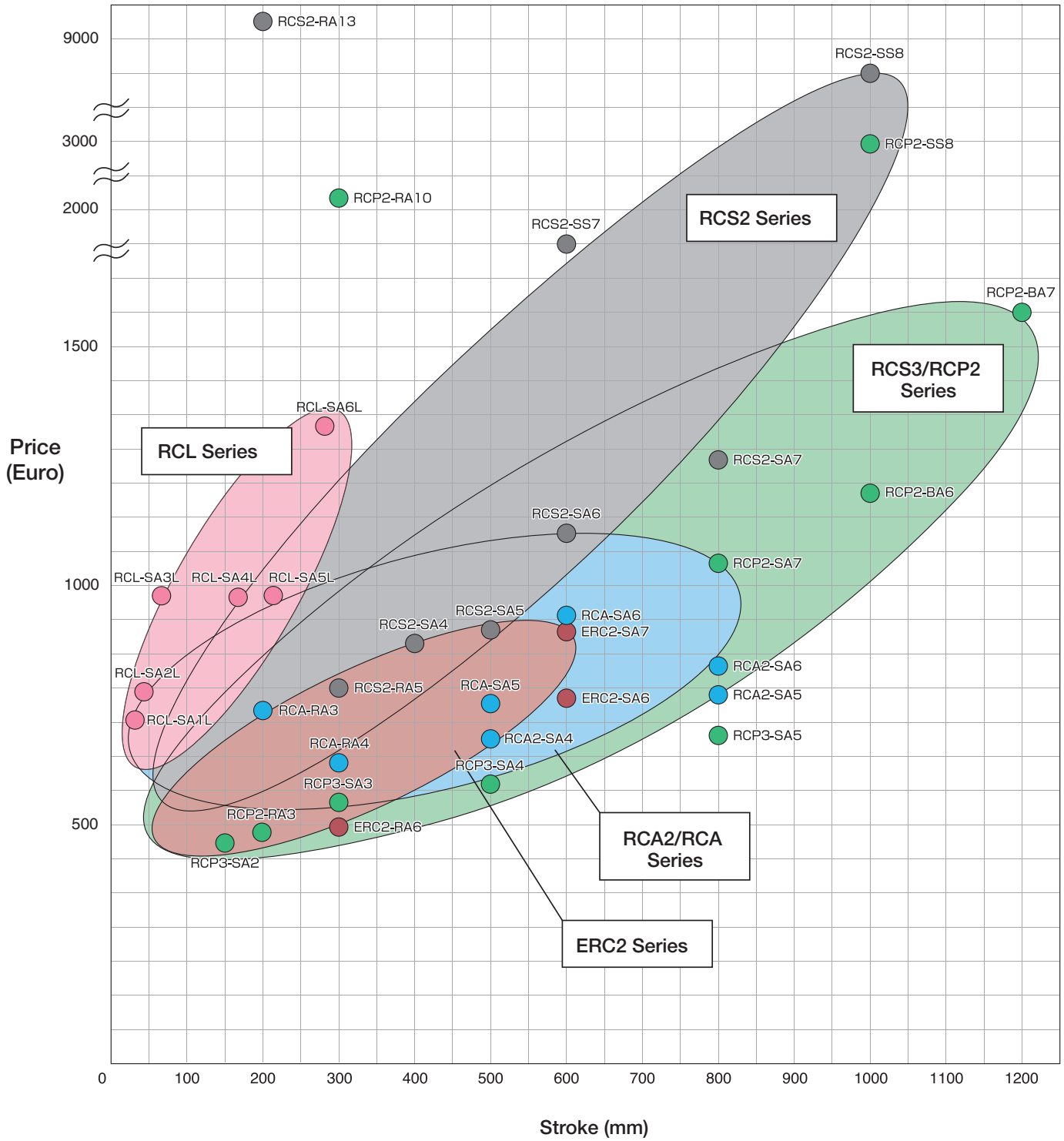
	AMEC	ASEP	ACON	RACON	ASEL
	P477 	P487 	P535 	P503 	P567 
Power/Voltage	AC115/230V	DC24V	DC24V	DC24V	DC24V
Positioning Points	3 points	3 points	512 points	768 points	1500 points
Operating Method	Positioner	Positioner	Positioner	Network	Programs

	SCON	SSEL	XSEL
	P547 	P577 	P587 
Power/Voltage	AC115/230V	AC115/230V	AC115/230V
Positioning Points	512 points	20000 points	20000 points
Operating Method	Positioner	Programs	Programs

	AMEC	ASEP	ACON	RACON	ASEL
	P477 	P487 	P535 	P503 	P567 
Power/Voltage	AC115/230V	DC24V	DC24V	DC24V	DC24V
Positioning Points	3 points	3 points	512 points	768 points	1500 points
Operating Method	Positioner	Positioner	Positioner	Network	Programs

Stroke vs. Pricing

The chart below shows the correlation between the stroke and pricing for each RoboCylinder series. Please use it as a reference to make a selection from the desired stroke.



Steps for Selecting the Right Model

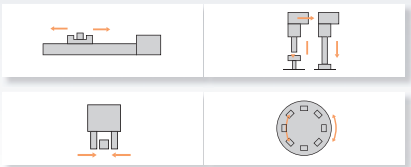
Select the right model of RoboCylinder using the steps below:

1 Check environment

Select the environment in which you will be using the RoboCylinder.

2 Check motion

Select the shape (model) from the desired motion.



3 Check performance (specs)

From the table of specifications, select a model that meets your requirements.

Stroke	Load Capacity
Speed	Push Force

4 Review details

Look up the selected model in the main section of this catalog to see if the size (dimensions), load capacity, stroke, and speed meet your requirements.

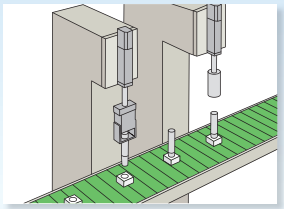
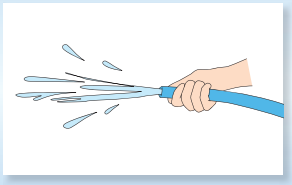
Reference

Recommended Models by Usage — See page Pre-13.

We have listed our typical models for each requirement.
Please use it as a reference for making a selection.

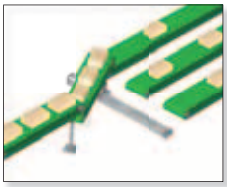
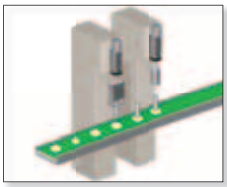
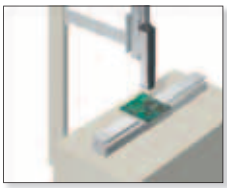
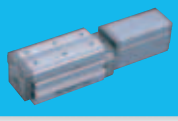
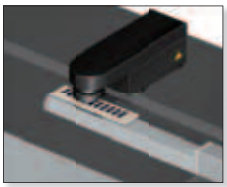
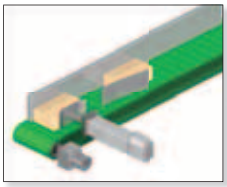
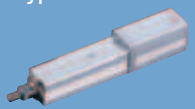
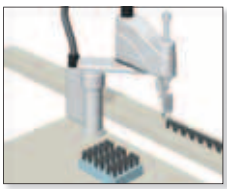
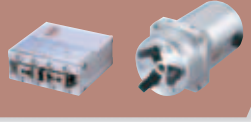
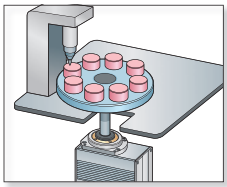
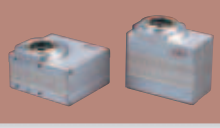
1 Check Environment

RoboCylinders can operate in any of the following three types of environments:
Select the RoboCylinder series based on your environment.

Environment	Model Group	Description	Series Name	
1 Normal Environment 	Standard	Used for general applications.	RCP2 RCP3 ERC2 RCA RCA2 RCS2 RCL	See page Pre-12
2 Cleanroom 	Cleanroom Type	Can be used in a cleanroom, e.g., in a production line for LCDs or semi-conductors.	RCP2CR RCACR RCS2CR	See page Pre-25
3 Poor Environment (Water, dust, etc.) 	Dustproof/ Splash-Proof	Can be used in areas prone to dust and water, such as automotive and food manufacturing machines.	RCP2W RCAW RCS2W	See page Pre-27

2 Check Motion

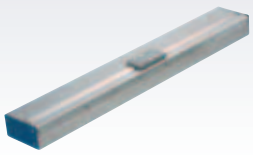
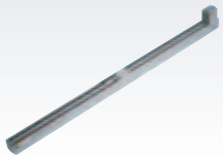
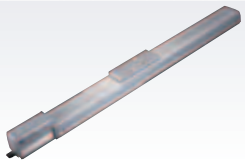
RoboCylinders are used for one of the following four motions:
Select the shape type for the desired motion.

Motion	Example Usage	Requirements	Shape Type	
1 Position		■ Move a workpiece horizontally ■ Move a long distance	Slider Type 	See page Pre-15
		■ Move a workpiece vertically ■ Transport a workpiece with a chuck	Rod Type 	See page Pre-17
		■ Move a workpiece vertically ■ Moment load is applied	Table Type 	See page Pre-20
		■ Transport light loads at a high speed	Linear Motor Type 	See page Pre-22
2 Push		■ Push and hold a workpiece ■ Press-fit a workpiece	Rod Type 	See page Pre-17
3 Grip		■ Grip and pick up a workpiece ■ Center a workpiece	Gripper Type 	See page Pre-23
4 Rotate		■ Reorient a workpiece ■ Set fine positions for indexing	Rotary Type 	See page Pre-24

Recommended Models by Usage

We have listed our typical models for each requirement.
Please use it as a reference for making a selection.

For fast operation

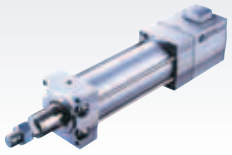
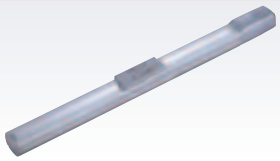
Model		RCL-SA6L	RCP2-BA7	RCP2-HS8C
Appearance				
Maximum Speed		1600mm/s	1500mm/s	1200mm/s
Maximum Acceleration/ Deceleration		2.0G	0.5G	0.5G (*4)
Stroke		48 - 288mm (48mm increments)	600 - 1200mm (50mm increments)	50 - 800mm (*3) (50mm increments)
Load Capacity	Horizontal	0.5kg (*1)	2kg (*2)	1kg
	Vertical	(N/A)	(N/A)	2kg (*4)
See Page		P387	P53	P37

(*1) Load capacity when operated at 2.0G.

(*2) Load capacity when operated at 1500mm/s.

(*3) Stroke range when operated at 1200mm/s.
(*4) Maximum acceleration for vertical motion is 0.2G.

For transporting heavy loads

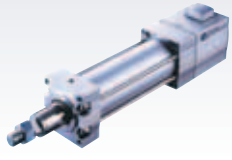
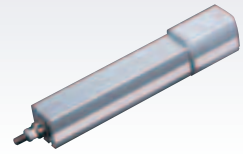
Model		RCS2-RA13R	RCP2-RA10C	RCS2-SS8C
Appearance				
Load Capacity	Horizontal	500kg (*4)	300kg (*4)	60kg
	Vertical	300kg	150kg	12kg
Maximum Speed		125mm/s	63mm/s	500mm/s(*5)
Maximum Acceleration/ Deceleration		0.02G	0.01G	0.3G
Stroke		50 - 200mm (50mm increments)	50 - 300mm (50mm increments)	50 - 1000mm (*5) (50mm increments)
See Page		P247	P147	P109

(*4) Load capacity when external guide is attached.

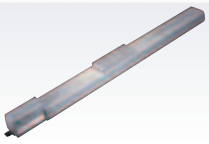
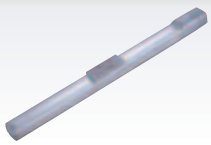
(*4) Load capacity when external guide is attached.

(*5) Maximum speed decreases with strokes over 650mm.

For press-fitting

Model	RCS2-RA13R	RCP2-RA10C	RCP2-RA6C
Appearance			
Maximum Push Force	19600N	6000N	800N
Stroke	50 - 200mm (50mm increments)	50 - 300mm (50mm increments)	50 - 300mm (50mm increments)
See Page	P247	P147	P145

For moving over a long distance

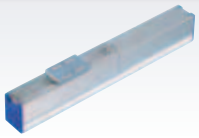
Model		RCP2-SS8C	RCP2-BA7	RCS2-SS8C
Appearance				
Stroke		50 - 1000mm (50mm increments)	600 - 1200mm (50mm increments)	50 - 1000mm (50mm increments)
Maximum Speed		515mm/s(*6)	1500mm/s	515mm/s(*8)
Maximum Acceleration/ Deceleration		0.3G	0.5G	0.3G
Load Capacity	Horizontal	10kg	2kg (*7)	20kg
	Vertical	0.5kg	(N/A)	4kg
See Page		P35	P53	P109

(*6) Maximum speed for 1000mm stroke.

(*7) Load capacity when operated at 1500mm/s.

(*8) Maximum speed for 1000mm stroke.

For small sizes

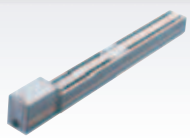
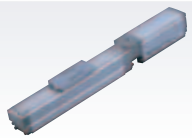
Model		RCP3-SA2AC	RCA2-RP3N	RCL-SA1L
Appearance				
Exterior Dimensions (W×H)		22mm×27mm	28mm×28mm	20mm×30mm
Stroke		25 - 100mm (25mm increments)	30mm	40mm
Maximum Speed		50mm/s	50mm/s	420mm/s
Maximum Acceleration/ Deceleration		0.2G	0.2G	2.0G
Load Capacity	Horizontal	1kg (*9)	1kg (*10)	0.15kg (*11)
	Vertical	(N/A)	0.5kg	(N/A)
See Page		P3	P181	P373

(*9) Load capacity when operated at 50mm/s.

(*10) Load capacity when external guide is attached.

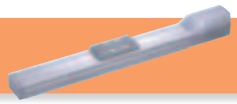
(*11) Load capacity when operated at 2.0G.

For best prices

Model		ERC2-SA6C	ERC2-RA6C	RCP3-SA3C
Appearance				
List Price		≥ 685 €	≥ 551 €	≥ 470 €
Stroke		50 - 600mm (50mm increments)	50 - 300mm (50mm increments)	50 - 300mm (50mm increments)
Maximum Speed		600mm/s	600mm/s	300mm/s
Maximum Acceleration/ Deceleration		0.3G	0.3G	0.3G
Load Capacity	Horizontal	6kg	25kg	1kg
	Vertical	1.5kg	4.5kg	0.5kg
See Page		P55	P165	P7

3 Check Specifications

Slider Type



The slider type is used for transporting and positioning workpieces. When selecting a slider-type model, note that the specifications are different when used horizontally versus vertically.

[Positioning]

For positioning motions, the criteria for selection are: (1) stroke; (2) load capacity; and (3) speed. From the table below, select a model that meets your requirements for the stroke, load capacity, and speed. For RCP3 and RCP2, which use a pulse motor, the load capacity changes with speed. See the "Speed vs. Load Capacity" chart on each respective page to check if your desired speed and load capacity are supported.

[How to Read the Table]

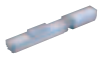
Slider Type

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke.	See Page
SA2		200	0.25	–	I	⊖24V	RCP3-SA2A□-I-20P-4S-***	P.3
		100	0.5	–			RCP3-SA2A□-I-20P-2S-***	
		50	1	–			RCP3-SA2A□-I-20P-1S-***	
		300	0.25	–			RCP3-SA2B□-I-20P-6S-***	P.5
		200	0.5	–			RCP3-SA2B□-I-20P-4S-***	
		100	1	–			RCP3-SA2B□-I-20P-2S-***	

Maximum Speed — Stroke Range — Horizontal Load Capacity — Vertical Load Capacity

Note: If the workpiece being transported is significantly overhanging from the actuator, the service life of the guide needs to be considered separately from the actuator's specifications. See "About Service Life and Moment" on page A-5 for details.

Slider Type

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke *Number inside bar = max. speed by stroke, < > denotes vertical use	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke.	See Page
SA2		200	0.25	–	I	⊖24V	RCP3-SA2A□-I-20P-4S-***	P.3
		100	0.5	–			RCP3-SA2A□-I-20P-2S-***	
		50	1	–			RCP3-SA2A□-I-20P-1S-***	
		300	0.25	–			RCP3-SA2B□-I-20P-6S-***	P.5
		200	0.5	–			RCP3-SA2B□-I-20P-4S-***	
		100	1	–			RCP3-SA2B□-I-20P-2S-***	
SA3		300	1	0.5	I	⊖24V	RCP3-SA3□-I-28P-6-***	P.7
		200	2	1			RCP3-SA3□-I-28P-4-***	
		100	3	1.5			RCP3-SA3□-I-28P-2-***	
		300	1	0.5			RCA2-SA3□-I-10-6-***	P.59
		200	2	1			RCA2-SA3□-I-10-4-***	
		100	3	1.5			RCA2-SA3□-I-10-2-***	
SA4		500	-7.5	-1.5	I	⊖24V	RCP3-SA4□-I-35P-10-***	P.9
		250	-9	-4			RCP3-SA4□-I-35P-5-***	
		125	-11	-8			RCP3-SA4□-I-35P-2.5-***	
		500	2	1			RCA2-SA4□-I-20-10-***	P.61
		250	4	1.5			RCA2-SA4□-I-20-5-***	
		125	6	3			RCA2-SA4□-I-20-2.5-***	
		665	4	1	I	⊖24V	RCA-SA4□-I-20-10-***	P.75
		330	6	2.5			RCA-SA4□-I-20-5-***	
		165	8	4.5			RCA-SA4□-I-20-2.5-***	
		665	4	1	A	⊖115V ⊖230V	RCS2-SA4□-I-20-10-***	P.99
		330	6	2.5			RCS2-SA4□-I-20-5-***	
		165	8	4.5			RCS2-SA4□-I-20-2.5-***	

Small Size ↕ Large Size

*Addendum 1) ←

*Addendum 1) (New RCA2 mini slider types) RCA2-SA2A□-I-5-4(2)(1)-*** (s. P. 58-1, 66-1): max. speed 200(100)(50) mm/s, load capacity 0.5/0.25(1/0.5)(2/1) kg (hor./vert.)

I = Incremental A = Absolute ⊖=DC ⊖=AC

***Model Upgrade 1)** (SA5 model with new 20mm lead)
RCP3-SA5□-I-42P-20-*** (s. P.11): max. speed 1000~610 mm/s, load capacity 4/0.5 kg (hor./vert.)
RCP2-SA5□-I-42P-20-*** (s. P.27): max. speed 1000~580 mm/s, load capacity 4/0.5 kg (hor./vert.)
RCA2-SA5□-I-20-20-*** (s. P.63): max. speed 1000~610 mm/s, load capacity 2/0.5 kg (hor./vert.)
RCA-SA5□-○-20-20-*** (s. P.77): max. speed 1300 mm/s, load capacity 2/0.5 kg (hor./vert.)
RCS2-SA5□-○-20-20-*** (s. P.101): max. speed 1300 mm/s, load capacity 2/0.5 kg (hor./vert.)

***Model Upgrade 2)** (SA6 model with new 20mm lead)
RCP3-SA6□-I-42P-20-*** (s. P.13): max. speed 1000~610 mm/s, load capacity 4/0.5 kg (hor./vert.)
RCP2-SA6□-I-42P-20-*** (s. P.29): max. speed 1000~580 mm/s, load capacity 6/0.5 kg (hor./vert.)
RCA2-SA6□-I-30-20-*** (s. P.65): max. speed 1000~610 mm/s, load capacity 3/0.5 kg (hor./vert.)
RCA-SA6□-○-30-20-*** (s. P.79): max. speed 1300~990 mm/s, load capacity 3/0.5 kg (hor./vert.)
RCS2-SA6□-○-30-20-*** (s. P.103): max. speed 1300~990 mm/s, load capacity 3/0.5 kg (hor./vert.)

Slider Type

Small Size ↓ Large Size

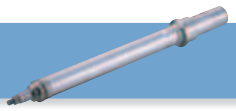
Type	Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use 25 mm / 50 / 100 / 150 / 200 / 250 / 300 / 350 / 400 / 450 / 500 / 550 / 600 / 700 / 800 / 900 / 1000 / 1100 / 1200	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke.	See Page
SA5 *Model Upgrade 1)	600 570 425 330	~6	~2			RCP3-SA5□-I-42P-12-***	P.11
	300 285 210 165	~10	~5			RCP3-SA5□-I-42P-6-***	
	150 140 105 80	19	~10			RCP3-SA5□-I-42P-3-***	
	600 540 400 300	~6	1			RCP2-SA5□-I-42P-12-***	P.27
	300 270 200 150	~13	~4	I		RCP2-SA5□-I-42P-6-***	
	150 135 100 75	16	~8			RCP2-SA5□-I-42P-3-***	
	600 570 425 330	3	1		⎓24V	RCA2-SA5□-I-20-12-***	P.63
	300 285 210 165	6	1.5			RCA2-SA5□-I-20-6-***	
	150 140 105 80	9	3			RCA2-SA5□-I-20-3-***	
	800 760	4	1			RCA-SA5□-○-20-12-***	P.77
	400 380	8	2			RCA-SA5□-○-20-6-***	
	200 190	12	4	I		RCA-SA5□-○-20-3-***	
	800 760	4	1	A		RCS2-SA5□-○-20-12-***	P.101
	400 380	8	2		⎓115V ∿230V	RCS2-SA5□-○-20-6-***	
	200 190	12	4			RCS2-SA5□-○-20-3-***	
SA6 *Model Upgrade 2)	600 570 425 330	~6	~2			RCP3-SA6□-I-42P-12-***	P.13
	300 285 210 165	~10	~5			RCP3-SA6□-I-42P-6-***	
	150 140 105 80	~19	~10			RCP3-SA6□-I-42P-3-***	
	600 540 400 300	~8.5	~1.5			RCP2-SA6□-I-42P-12-***	P.29
	300 270 200 150	~15	~4			RCP2-SA6□-I-42P-6-***	
	150 135 100 75	~19	~6	I		RCP2-SA6□-I-42P-3-***	
	600 515	~6	~1.5			ERC2-SA6C-I-PM-12-***	P.55
	300 255	12	~3		⎓24V	ERC2-SA6C-I-PM-6-***	
	150 125	12	~6			ERC2-SA6C-I-PM-3-***	
	600 570 425 330	4	1.5			RCA2-SA6□-I-30-12-***	P.65
	300 285 210 165	7	2			RCA2-SA6□-I-30-6-***	
	150 140 105 80	10	4			RCA2-SA6□-I-30-3-***	
	800 760 640 540	6	1.5			RCA-SA6□-○-30-12-***	P.79
	400 380 320 270	12	3			RCA-SA6□-○-30-6-***	
	200 190 160 135	18	6	I		RCA-SA6□-○-30-3-***	
	800 760 640 540	6	1.5	A		RCS2-SA6□-○-30-12-***	P.103
	400 380 320 270	12	3		⎓115V ∿230V	RCS2-SA6□-○-30-6-***	
	200 190 160 135	18	6			RCS2-SA6□-○-30-3-***	
SA7	533 480	~35	~5			RCP2-SA7□-I-56P-16-***	P.31
	266 240	~40	~10			RCP2-SA7□-I-56P-8-***	
	133 120	40	~15			RCP2-SA7□-I-56P-4-***	
	450<400>	~10	~2.5	I	⎓24V	ERC2-SA7C-I-PM-16-***	P.57
	250	~20	~5			ERC2-SA7C-I-PM-8-***	
	125	20	~10			ERC2-SA7C-I-PM-4-***	
	800 640 480	12	3			RCS2-SA7□-○-60-16-***	P.105
	400 320 240	25	6	I A	⎓115V ∿230V	RCS2-SA7□-○-60-8-***	
	200 160 120	40	12			RCS2-SA7□-○-60-4-***	
SS7	600 470	~30	~4			RCP2-SS7□-I-42P-12-***	P.33
	300 230	~30	~8	I	⎓24V	RCP2-SS7□-I-42P-6-***	
	150 115	~30	~12			RCP2-SS7□-I-42P-3-***	
	600 470	15	4	I	⎓115V ∿230V	RCS2-SS7□-○-60-12-***	P.107
	300 230	30	8	A		RCS2-SS7□-○-60-6-***	
SS8	1200<750> 1000<750> 800<750>	~20	~3			RCP2-HS8□-I-86P-30-***	P.37
	666<600> 625<600> 515	~40	~5			RCP2-SS8□-I-56P-20-***	P.35
	333<300> 310<300> 255	~50	~12	I	⎓24V	RCP2-SS8□-I-56P-10-***	
	165<150> 155<150> 125	~55	~20			RCP2-SS8□-I-56P-5-***	
	1000 960 765 625 515	20	4			RCS2-SS8□-○-100-20-***	P.109
	500 480 380 310 255	40	8	I	⎓115V ∿230V	RCS2-SS8□-○-100-10-***	
	1000 960 765 625 515	30	6	A		RCS2-SS8□-○-150-20-***	
	500 480 380 310 255	60	12			RCS2-SS8□-○-150-10-***	
BA6/ BA7	1000	~4	–	I	⎓24V	RCP2-BA6-I-42P-54-***	P.51
	1500	~8	–			RCP2-BA7-I-42P-54-***	P.53

* < > is for vertical use

I = Incremental A = Absolute ⎓=DC ∿=AC

3 Check Specifications

Rod Type



For the rod type, the criteria for selection are different, depending on whether it will be used for positioning or for pushing.

[Positioning]

For positioning motions, the criteria for selection are: (1) stroke; (2) load capacity; and (3) speed.
From the table below, select a model that meets your requirements for the stroke, load capacity, and speed.
For RCP3 and RCP2, which use a pulse motor, the load capacity changes with speed. See the "Speed vs. Load Capacity" chart on each respective page to check if your desired speed and load capacity are supported.

[Pushing]

For pushing motions, the criteria for selection are: (1) stroke and (2) maximum pushing force.
From the table below, select a model that meets your requirements for the stroke and pushing force.
We recommend our pulse motor models (RCP3 and RCP2) for push operation, because of the motor's characteristics. Moreover, the pushing force is adjustable between 20% to 70% (max. pushing force at 70%).

[How to Read the Table]

Rod Type

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Rated Thrust	Maximum Push Force	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke.	See Page
		25mm 30 50 75 100 150 200 250 300	(N)	(N)						
RA2		180 200	–	6.6~16.1	0.25	0.125			RCP3-RA2A□-I-20P-4S-***	
		100	–	13.2~28.3	0.5	0.25			RCP3-RA2A□-I-20P-2S-***	P.131
		50	–	26.4~39.5	1	0.5			RCP3-RA2A□-I-20P-1S-***	
		180 280 300	–	4.4~11.9	0.25	0.125	I	⊖24V	RCP3-RA2B□-I-20P-6S-***	
		180 200	–	6.6~16.1	0.5	0.25			RCP3-RA2B□-I-20P-4S-***	P.133
		100	–	13.2~28.3	1	0.5			RCP3-RA2B□-I-20P-2S-***	
		25	–	100	7	2.5			RCP2-RA2C-I-20P-1-***	P.139

Maximum Speed
Stroke Range
Maximum Push Force
Vertical Load Capacity
Horizontal Load Capacity

*Model Upgrade 1) (RA2 model new with ball screw, high-load motor und other performance parameters)

Rod Type

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Rated Thrust	Maximum Push Force	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
		25mm 30 50 75 100 150 200 250 300	(N)	(N)						
RA2 *Model Upgrade 1)		180 200	–	6.6~16.1	0.25	0.125			RCP3-RA2A□-I-20P-4S-***	
		100	–	13.2~28.3	0.5	0.25			RCP3-RA2A□-I-20P-2S-***	P.131
		50	–	26.4~39.5	1	0.5			RCP3-RA2A□-I-20P-1S-***	
		180 280 300	–	4.4~11.9	0.25	0.125	I	⊖24V	RCP3-RA2B□-I-20P-6S-***	
		180 200	–	6.6~16.1	0.5	0.25			RCP3-RA2B□-I-20P-4S-***	P.133
		100	–	13.2~28.3	1	0.5			RCP3-RA2B□-I-20P-2S-***	
		25	–	100	7	2.5			RCP2-RA2C-I-20P-1-***	P.139 *Addendum 1)

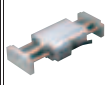
I = Incremental A = Absolute ⊖=DC ~=AC

*Addendum 1) (New RCA2 mini rod types)
RCA2-RA2A□-I-5-4(2)(1)-*** (s. P. 176-1, 176-3): max. speed 200(100)(50) mm/s, max. push force 21.4(42.3)(85.5) N

*Model Upgrade 1) 3) 5) 7) (RN3/RP3/GS3/GD3 models new with 50 mm stroke, ball screw und other performance parameters)
*Model Upgrade 2) 4) 6) 8) (RN4/RP4/GS4/GD4 models new with 50 mm stroke)
*Model Upgrade 9) (SD3 model new with ball screw und other performance parameters)

Rod Type

Small Size ↑ / ↓ Large Size

Type		Stroke(mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use									Rated Thrust	Maximum Push Force	Load Capacity (kg)		Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
		25mm	30	50	75	100	150	200	250	300	(N)	(N)	H	V				
RN3 *Model Upgrade 1)			200								25.1	–	0.25	0.125			RCA2-RN3NA-I-10-4S-30	P.177
			100								50.3	–	0.5	0.25			RCA2-RN3NA-I-10-2S-30	
			50								100.5	–	1	0.5			RCA2-RN3NA-I-10-1S-30	
RN4 *Model Upgrade 2)			<220> 270	300							33.8	–	2	0.5			RCA2-RN4NA-I-20-6-30	P.179
			200								50.7	–	3	0.75	I	⎓24V	RCA2-RN4NA-I-20-4-30	
			100								101.5	–	6	1.5			RCA2-RN4NA-I-20-2-30	
			220	300							19.9	–	0.25	0.125			RCA2-RN4NA-I-20-6S-30	
			200								29.8	–	0.5	0.25			RCA2-RN4NA-I-20-4S-30	
			100								59.7	–	1	0.5			RCA2-RN4NA-I-20-2S-30	
RP3 *Model Upgrade 3)			200								25.1	–	0.25	0.125			RCA2-RP3NA-I-10-4S-30	P.181
			100								50.3	–	0.5	0.25			RCA2-RP3NA-I-10-2S-30	
			50								100.5	–	1	0.5			RCA2-RP3NA-I-10-1S-30	
RP4 *Model Upgrade 4)			<220> 270	300							33.8	–	2	0.5			RCA2-RP4NA-I-20-6-30	P.183
			200								50.7	–	3	0.75	I	⎓24V	RCA2-RP4NA-I-20-4-30	
			100								101.5	–	6	1.5			RCA2-RP4NA-I-20-2-30	
			220	300							19.9	–	0.25	0.125			RCA2-RP4NA-I-20-6S-30	
			200								29.8	–	0.5	0.25			RCA2-RP4NA-I-20-4S-30	
			100								59.7	–	1	0.5			RCA2-RP4NA-I-20-2S-30	
GS3 *Model Upgrade 5)			200								25.1	–	0.25	0.125			RCA2-GS3NA-I-10-4S-30	P.185
			100								50.3	–	0.5	0.25			RCA2-GS3NA-I-10-2S-30	
			50								100.5	–	1	0.5			RCA2-GS3NA-I-10-1S-30	
GS4 *Model Upgrade 6)			<220> 270	300							33.8	–	2	0.5			RCA2-GS4NA-I-20-6-30	P.187
			200								50.7	–	3	0.75	I	⎓24V	RCA2-GS4NA-I-20-4-30	
			100								101.5	–	6	1.5			RCA2-GS4NA-I-20-2-30	
			220	300							19.9	–	0.25	0.125			RCA2-GS4NA-I-20-6S-30	
			200								29.8	–	0.5	0.25			RCA2-GS4NA-I-20-4S-30	
			100								59.7	–	1	0.5			RCA2-GS4NA-I-20-2S-30	
GD3 *Model Upgrade 7)			200								25.1	–	0.25	0.125			RCA2-GD3NA-I-10-4S-30	P.189
			100								50.3	–	0.5	0.25			RCA2-GD3NA-I-10-2S-30	
			50								100.5	–	1	0.5			RCA2-GD3NA-I-10-1S-30	
GD4 *Model Upgrade 8)			<220> 270	300							33.8	–	2	0.5			RCA2-GD4NA-I-20-6-30	P.191
			200								50.7	–	3	0.75	I	⎓24V	RCA2-GD4NA-I-20-4-30	
			100								101.5	–	6	1.5			RCA2-GD4NA-I-20-2-30	
			220	300							19.9	–	0.25	0.125			RCA2-GD4NA-I-20-6S-30	
			200								29.8	–	0.5	0.25			RCA2-GD4NA-I-20-4S-30	
			100								59.7	–	1	0.5			RCA2-GD4NA-I-20-2S-30	
SD3 *Model Upgrade 9)		200		200							25.1	–	0.25	0.125			RCA2-SD3NA-I-10-4S-***	P.193
		100		100							50.3	–	0.5	0.25			RCA2-SD3NA-I-10-2S-***	
		50		50							100.5	–	1	0.5			RCA2-SD3NA-I-10-1S-***	
SD4		240	<200>	300							33.8	–	2	0.5			RCA2-SD4NA-I-20-6-***	P.195
		200		200							50.7	–	3	0.75	I	⎓24V	RCA2-SD4NA-I-20-4-***	
		100		100							101.5	–	6	1.5			RCA2-SD4NA-I-20-2-***	
		200		300							19.9	–	0.25	0.125			RCA2-SD4NA-I-20-6S-***	
		200		200							29.8	–	0.5	0.25			RCA2-SD4NA-I-20-4S-***	
		100		100							59.7	–	1	0.5			RCA2-SD4NA-I-20-2S-***	

*Addendum 1)

* < > is for vertical use

I = Incremental A = Absolute ⎓=DC ~=AC

*Addendum 1) (New RCS2 mini rod types)
RCS2-RN5N-I-60-10(5)(2.5)-*** (s. P. 234-1): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N
RCS2-RP5N-I-60-10(5)(2.5)-*** (s. P. 234-3): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N
RCS2-GS5N-I-60-10(5)(2.5)-*** (s. P. 234-5): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N
RCS2-GD5N-I-60-10(5)(2.5)-*** (s. P. 234-7): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N
RCS2-SD5N-I-60-10(5)(2.5)-*** (s. P. 234-9): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N

Model Selection

***Model Upgrade 1)** (RA13 model new with load cell)

Rod Type

Small Size ↓ Large Size

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use									Rated Thrust	Maximum Push Force	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke.	See Page
		25mm	30	50	75	100	150	200	250	300	(N)	(N)						
RA3				187							–	73.5	-15	-6			RCP2-RA3C-I-28P-5-***	P.141
				114							–	156.8	-30	-10			RCP2-RA3C-I-28P-2.5-***	
				500							36.2	–	4	1.5	I	⊖24V	RCA-RA3C-I-20-10-***	P.197
				250							72.4	–	9	3			RCA-RA3C-I-20-5-***	
				125							144.8	–	18	6.5			RCA-RA3C-I-20-2.5-***	
RA4				458					458	350	–	150	-25	-4.5			RCP2-RA4C-I-42P-10-***	P.143
				250					237	175	–	284	-40	-12	I	⊖24V	RCP2-RA4C-I-42P-5-***	
				125<114>					118<114>	87	–	358	40	-19			RCP2-RA4C-I-42P-2.5-***	
				600							18.9	–	3	1			RCA-RA4C-○-20-12-***	P.199
				300							37.7	–	6	2			RCA-RA4C-○-20-6-***	
				150							75.4	–	12	4		⊖24V	RCA-RA4C-○-20-3-***	
				600							28.3	–	4	1.5			RCA-RA4C-○-30-12-***	
				300							56.6	–	9	3			RCA-RA4C-○-30-6-***	
				150							113.1	–	18	6.5	I		RCA-RA4C-○-30-3-***	
				600							18.9	–	3	1	A		RCS2-RA4C-○-20-12-***	P.235
				300							37.7	–	6	2			RCS2-RA4C-○-20-6-***	
				150							75.4	–	12	4		⊜115V	RCS2-RA4C-○-20-3-***	
				600							28.3	–	4	1.5		⊜230V	RCS2-RA4C-○-30-12-***	
				300							56.6	–	9	3			RCS2-RA4C-○-30-6-***	
				150							113.1	–	18	6.5			RCS2-RA4C-○-30-3-***	
SRA4				250							–	90	-25	-9	I	⊖24V	RCP2-SRA4R-I-35P-5-***	P.149
				125							–	170	-35	-15			RCP2-SRA4R-I-35P-2.5-***	
				250							41	–	9	3	I	⊖24V	RCA-SRA4R-I-20-5-***	P.209
				125							81	–	18	6.5			RCA-SRA4R-I-20-2.5-***	
RA5				800						755	63.8	–	12	2			RCS2-RA5C-○-60-16-***	P.237
				400						377	127.5	–	25	5			RCS2-RA5C-○-60-8-***	
				200						188	255.1	–	50	11.5	I	⊜115V	RCS2-RA5C-○-60-4-***	
				800						755	105.8	–	15	3.5	A	⊜230V	RCS2-RA5C-○-100-16-***	
				400						377	212.7	–	30	9			RCS2-RA5C-○-100-8-***	
				200						188	424.3	–	60	18			RCS2-RA5C-○-100-4-***	
RA6				450<400>							–	240	-40	-5			RCP2-RA6C-I-56P-16-***	P.145
				210							–	470	-50	-17.5			RCP2-RA6C-I-56P-8-***	
				130							–	800	-55	-26	I	⊖24V	RCP2-RA6C-I-56P-4-***	
				600						500	–	78	-25	-4.5			ERC2-RA6C-I-PM-12-***	P.165
				300						250	–	157	-40	-12			ERC2-RA6C-I-PM-6-***	
				150						125	–	304	40	-18			ERC2-RA6C-I-PM-3-***	
RA7				450<400>							–	220	-40	-5			ERC2-RA7C-I-PM-16-***	P.167
				250<200>							–	441	-50	-17.5	I	⊖24V	ERC2-RA7C-I-PM-8-***	
				125							–	873	-55	-25			ERC2-RA7C-I-PM-4-***	
SRA7				800							63	–	5	2			RCS2-SRA7BD-I-60-16-***	P.241
				400							127	–	10	5			RCS2-SRA7BD-I-60-8-***	
				200							254	–	20	10			RCS2-SRA7BD-I-60-4-***	
				800							103	–	10	3.5		⊜115V	RCS2-SRA7BD-I-100-16-***	
				400							207	–	22	9	I	⊜230V	RCS2-SRA7BD-I-100-8-***	
				200							414	–	40	19.5			RCS2-SRA7BD-I-100-4-***	
				800							157	–	15	6.5			RCS2-SRA7BD-I-150-16-***	
				400							314	–	35	14.5			RCS2-SRA7BD-I-150-8-***	
				200							628	–	55	22.5			RCS2-SRA7BD-I-150-4-***	*Addendum 1)
RA10				250<167>							–	1500	-80	-80			RCP2-RA10C-I-86P-10-***	P.147
				125							–	3000	150	-100	I	⊖24V	RCP2-RA10C-I-86P-5-***	
				63							–	6000	300	-150			RCP2-RA10C-I-86P-2.5-***	
RA13 *Model Upgrade 1)				85	120	125					5106	9800	400	200	I	⊜115V	RCS2-RA13R-○-750-2.5-***	P.247
				62							10211	19600	500	300	A	⊜230V	RCS2-RA13R-○-750-1.25-***	

* < > is for vertical use

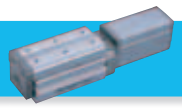
***Addendum 1)** (New RCP2 rod types)

RCP2-RA8□-I-60P-10(5)-*** (s. P. 146-1, 148-1): max. speed 300(150) mm/s, max. push force 857(1714) N

I = Incremental A = Absolute ⊖ =DC ⊜ =AC

3 Check Specifications

Table Type



Similar to the rod type, the table type can be used for positioning and pushing. The rod type is recommended for pushing motions, as it exerts stronger force and has more variety.

[Positioning]

For positioning motions, the criteria for selection are: (1) stroke; (2) load capacity; and (3) speed.
From the table below, select a model that meets your requirements for the stroke and pushing force.
For RCP3 and RCP2, which use a pulse motor, the load capacity changes with speed. See the "Speed vs. Load Capacity" chart on each respective page to check if your desired speed and load capacity are supported.

[How to Read the Table]

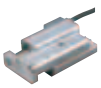
Table Type

Type		Stoke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use									Rated Thrust	Maximum Push Force	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
		25mm	30	50	75	100	150	200	250	300	(N)	(N)						
TCA3			200								25.1	–	0.25	0.125			RCA2-TCA3N-I-10-4S-30	P.289
			100								50.3	–	0.5	0.25			RCA2-TCA3N-I-10-2S-30	
			50								100.5	–	1	0.5			RCA2-TCA3N-I-10-1S-30	
TCA4			270	<220>							33.8	–	2	0.5			RCA2-TCA4N-I-20-6-30	
			200								50.7	–	3	0.75	I	⊖24V	RCA2-TCA4N-I-20-4-30	
			100								101.5	–	6	1.5			RCA2-TCA4N-I-20-2-30	

Maximum Speed — Stroke Range — Horizontal Load Capacity — Vertical Load Capacity

*Model Upgrade 1) 3) 5) (TCA3/TWA3/TFA3 models new with ball screw, 50 mm stroke and other performance parameters)
*Model Upgrade 2) 4) 6) (TCA4/TWA4/TFA4 models new with 50 mm stroke)

Table Type

	Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use									Rated Thrust	Maximum Push Force	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke.	See Page
			25mm	30	50	75	100	150	200	250	300	(N)	(N)						
Small Size	TCA3 *Model Upgrade 1)			200								25.1	–	0.25	0.125			RCA2-TCA3NA-I-10-4S-30	P.289
				100								50.3	–	0.5	0.25			RCA2-TCA3NA-I-10-2S-30	
				50								100.5	–	1	0.5			RCA2-TCA3NA-I-10-1S-30	
	TCA4 *Model Upgrade 2)		<220>	270	300							33.8	–	2	0.5			RCA2-TCA4NA-I-20-6-30	P.291
				200								50.7	–	3	0.75	I	⊖24V	RCA2-TCA4NA-I-20-4-30	
				100								101.5	–	6	1.5			RCA2-TCA4NA-I-20-2-30	
			220	300								19.9	–	0.25	0.125			RCA2-TCA4NA-I-20-6S-30	
				200								29.8	–	0.5	0.25			RCA2-TCA4NA-I-20-4S-30	
				100								59.7	–	1	0.5			RCA2-TCA4NA-I-20-2S-30	
	TWA3 *Model Upgrade 3)			200								25.1	–	0.25	0.125			RCA2-TWA3NA-I-10-4S-30	P.293
				100								50.3	–	0.5	0.25			RCA2-TWA3NA-I-10-2S-30	
				50								100.5	–	1	0.5			RCA2-TWA3NA-I-10-1S-30	
	TWA4 *Model Upgrade 4)		<220>	270	300							33.8	–	2	0.5			RCA2-TWA4NA-I-20-6-30	P.295
				200								50.7	–	3	0.75	I	⊖24V	RCA2-TWA4NA-I-20-4-30	
				100								101.5	–	6	1.5			RCA2-TWA4NA-I-20-2-30	
			220	300								19.9	–	0.25	0.125			RCA2-TWA4NA-I-20-6S-30	
				200								29.8	–	0.5	0.25			RCA2-TWA4NA-I-20-4S-30	
				100								59.7	–	1	0.5			RCA2-TWA4NA-I-20-2S-30	
Large Size	TFA3 *Model Upgrade 5)			200								25.1	–	0.25	0.125			RCA2-TFA3NA-I-10-4S-30	P.297
				100								50.3	–	0.5	0.25			RCA2-TFA3NA-I-10-2S-30	
				50								100.5	–	1	0.5			RCA2-TFA3NA-I-10-1S-30	
	TFA4 *Model Upgrade 6)		<220>	270	300							33.8	–	2	0.5			RCA2-TFA4NA-I-20-6-30	P.299
				200								50.7	–	3	0.75	I	⊖24V	RCA2-TFA4NA-I-20-4-30	
				100								101.5	–	6	1.5			RCA2-TFA4NA-I-20-2-30	
			220	300								19.9	–	0.25	0.125			RCA2-TFA4NA-I-20-6S-30	
				200								29.8	–	0.5	0.25			RCA2-TFA4NA-I-20-4S-30	
				100								59.7	–	1	0.5			RCA2-TFA4NA-I-20-2S-30	

*Addendum 1)

* < > is for vertical use

I = Incremental A = Absolute ⊖=DC ⊜=AC

*Addendum 1) (New RCS2 mini table types)
RCS2-TCA5N-I-60-10(5)(2.5)-*** (s. P. 322-1): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N
RCS2-TWA5N-I-60-10(5)(2.5)-*** (s. P. 322-3): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N
RCS2-TFA5N-I-60-10(5)(2.5)-*** (s. P. 322-5): max. speed 380(250)(125) mm/s, max. push force 89(178)(356) N

Model Selection

Table Type

Small Size ↕ Large Size

Type	Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Rated Thrust (N)	Maximum Push Force (N)	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
TA3	300<200>	–	9	~0.7	~0.3			RCP3-TA3□-I-20P-6-***	P.269
	200<133>	–	14	~1.4	~0.6			RCP3-TA3□-I-20P-4-***	
	100<67>	–	28	~2	~1			RCP3-TA3□-I-20P-2-***	
TA4	300	–	15	~1	~0.5			RCP3-TA4□-I-28P-6-***	P.271
	200	–	22	~2	~1	I	⊖24V	RCP3-TA4□-I-28P-4-***	
	100	–	44	~3	~1.5			RCP3-TA4□-I-28P-2-***	
	300	28	–	1	0.5			RCA2-TA4□-I-10-6-***	P.301
	200	43	–	2	1			RCA2-TA4□-I-10-4-***	
	100	85	–	3	1.5			RCA2-TA4□-I-10-2-***	
TA5	465<400>	–	34	~2	~1			RCP3-TA5□-I-35P-10-***	P.273
	250	–	68	~4	~1.5			RCP3-TA5□-I-35P-5-***	
	125	–	136	~6	~3			RCP3-TA5□-I-35P-2.5-***	
	465<400>	34	–	2	1	I	⊖24V	RCA2-TA5□-I-20-10-***	P.303
	250	68	–	3.5	2			RCA2-TA5□-I-20-5-***	
	125	137	–	5	3			RCA2-TA5□-I-20-2.5-***	
TA6	560<500>	–	47	~4	~1			RCP3-TA6□-I-42P-12-***	P.275
	300	–	95	~6	~2			RCP3-TA6□-I-42P-6-***	
	150	–	189	~8	~4			RCP3-TA6□-I-42P-3-***	
	560<500>	17	–	2	0.5	I	⊖24V	RCA2-TA6□-I-20-12-***	P.305
	300	34	–	4	1.5			RCA2-TA6□-I-20-6-***	
	150	68	–	6	3			RCA2-TA6□-I-20-3-***	
TA7	600<580>	–	47	~6	~1			RCP3-TA7□-I-42P-12-***	P.277
	300	–	95	~8	~2			RCP3-TA7□-I-42P-6-***	
	150	–	189	~10	~4			RCP3-TA7□-I-42P-3-***	
	600<580>	26	–	4	1	I	⊖24V	RCA2-TA7□-I-30-12-***	P.307
	300	53	–	6	2.5			RCA2-TA7□-I-30-6-***	
	150	105	–	8	4			RCA2-TA7□-I-30-3-***	

* < > is for vertical use

I = Incremental　A = Absolute　⊖=DC　≂=AC

Arm Type / Flat Type

Small Size ↕ Large Size

Type	Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Thrust (N)	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
A4R	330	39.2	–	2.5		⊖24V	RCA-A4R-○-20-10-***	P.317
	165	78.4	–	4.5	I		RCA-A4R-○-20-5-***	
	330	39.2	–	2.5	A	≂115V ≂230V	RCS2-A4R-○-20-10-***	P.323
	165	78.4	–	4.5			RCS2-A4R-○-20-5-***	
A5R	400	33.3	–	2		⊖24V	RCA-A5R-○-20-12-***	P.319
	200	65.7	–	4	I		RCA-A5R-○-20-6-***	
	400	33.3	–	2	A	≂115V ≂230V	RCS2-A5R-○-20-12-***	P.325
	200	65.7	–	4			RCS2-A5R-○-20-6-***	
A6R	400	48.4	–	3		⊖24V	RCA-A6R-○-30-12-***	P.321
	200	96.8	–	6	I		RCA-A6R-○-30-6-***	
	400	48.4	–	3	A	≂115V ≂230V	RCS2-A6R-○-30-12-***	P.327
	200	96.8	–	6			RCS2-A6R-○-30-6-***	
F5D	800	63.8	–	2			RCS2-F5D-○-60-16-***	P.329
	400	127.5	–	5			RCS2-F5D-○-60-8-***	
	200	255.1	–	11.5	I	≂115V ≂230V	RCS2-F5D-○-60-4-***	
	800	105.8	–	3.5	A		RCS2-F5D-○-100-16-***	
	400	212.7	–	9			RCS2-F5D-○-100-8-***	
	200	424.3	–	18			RCS2-F5D-○-100-4-***	

I = Incremental　A = Absolute　⊖=DC　≂=AC

3 Check Specifications

Linear Motor Type

The linear motor type is available as a slider type for positioning, or as a rod type for pushing. See below for the selection criteria.

[Positioning] (Slider Type)

For positioning motions, the criteria for selection are: (1) stroke; (2) load capacity; and (3) speed. From the table below, select a model that meets your requirements for the stroke, load capacity, and speed. For linear motor type, the maximum possible acceleration decreases as the load capacity increases. Check the specifications for the load capacity and acceleration on each page.

[Pushing] (Rod Type)

For pushing motions, the criteria for selection are: (1) stroke and (2) maximum pushing force. From the table below, select a model that meets your requirements for the stroke and pushing force. Moreover, the pushing force is adjustable between 30% to 80% (max. pushing force at 80%).

[How to Read the Table]

Linear Motor Type

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use								Rated Thrust	Maximum Push Force	Load Capacity (kg)		Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
		25mm	30	40	48	64	100	200	300	(N)	(N)	H	V				
SA1L				420						2	–	0.5	–			RCL-SA1L-I-2-N-40	P.373
SA2L					460					4	–	1	–			RCL-SA2L-I-5-N-48	P.375
SA3L						600				8	–	2	–			RCL-SA3L-I-10-N-64	P.377
SA4L					1200					2.5	–	0.8	–			RCL-SA4L-I-2-N-***	P.379
SA5L					1400					5	–	1.6	–			RCL-SA5L-I-5-N-***	P.383
SA6L						1600				10	–	3.2	–	I	⊖24V	RCL-SA6L-I-10-N-***	P.387

Maximum Speed

Stroke Range

Horizontal Load Capacity

Vertical Load Capacity

Linear Motor Type

	Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use								Rated Thrust	Maximum Push Force	Load Capacity (kg)		Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
			25mm	30	40	48	64	100	200	300	(N)	(N)	H	V				
Small Size	SA1L				420						2	–	0.5	–			RCL-SA1L-I-2-N-40	P.373
	SA2L					460					4	–	1	–			RCL-SA2L-I-5-N-48	P.375
	SA3L						600				8	–	2	–			RCL-SA3L-I-10-N-64	P.377
	SA4L					1200					2.5	–	0.8	–			RCL-SA4L-I-2-N-***	P.379
	SA5L					1400					5	–	1.6	–			RCL-SA5L-I-5-N-***	P.383
	SA6L						1600				10	–	3.2	–	I	⊖24V	RCL-SA6L-I-10-N-***	P.387
	SM4L					1200					2.5	–	0.8	–			RCL-SM4L-I-2-N-***	P.381
	SM5L					1400					5	–	1.6	–			RCL-SM5L-I-5-N-***	P.385
Large Size	SM6L						1600				10	–	3.2	–			RCL-SM6L-I-10-N-***	P.389
	RA1L		300								2.5	2	0.5	0.1			RCL-RA1L-I-2-N-25	P.391
	RA2L			340							5	4	1	0.2			RCL-RA2L-I-5-N-30	P.393
	RA3L				450						10	8	2	0.4			RCL-RA3L-I-10-N-40	P.395

I = Incremental A = Absolute ⊖ =DC ≈ =AC

3 Check Specifications

Gripper Type

The gripper type is used for gripping and centering workpieces. Gripping is done by a pushing motion, and centering is done by a positioning motion.

[Pushing]

For pushing motions, the criteria for selection are: (1) stroke and (2) maximum pushing force.
From the table below, select a model that meets your requirements for the stroke and gripping force.
Moreover, the gripping force can be adjusted between 20% to 70% (max. pushing force at 70%).

[Positioning]

For positioning motions, the criteria for selection are: (1) stroke and (2) speed.
Based on the stroke requirements, look for a balance between the load capacity and the speed, and select a model that meets your requirements.

[How to Read the Table]

Gripper Type

Type		Stroke (mm) and Maximum Speed (mm/sec)											Maximum Grip Force	Encoder Type	Controller Input Power	Model (* □ denotes motor shape ○ denotes encoder type *** denotes stroke)	See Page
		8mm	10mm	14mm	20mm	40mm	60mm	100mm	120mm	200mm	19°	180°	(N)				
GRSS		78											14			RCP2-GRSS-I-20P-30-8	P.333
GRLS												600	6.4			RCP2-GRLS-I-20P-30-180	P.335
GRS			33.3										21		⊖24V	RCP2-GRS-I-20P-1-10	P.337
GRM				36.7									80			RCP2-GRM-I-28P-1-14	P.339

Maximum Speed — Stroke Range — Maximum Gripping Force

Gripper Type

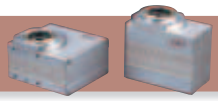
	Type		Stroke (mm) and Maximum Speed (mm/sec)											Maximum Grip Force	Encoder Type	Controller Input Power	Model (* □ denotes motor shape ○ denotes encoder type *** denotes stroke)	See Page	
			8mm	10mm	14mm	20mm	40mm	60mm	100mm	120mm	200mm	19deg.	180deg.	(N)					
Small Size	GRSS		78											14			RCP2-GRSS-I-20P-30-8	P.333	
	GRLS												600	6.4			RCP2-GRLS-I-20P-30-180	P.335	
	GRS			33.3										21		⊖24V	RCP2-GRS-I-20P-1-10	P.337	
	GRM				36.7									80			RCP2-GRM-I-28P-1-14	P.339	*Addendum 1)
	GRST						75							20			RCP2-GRST-I-20P-1-***	P.341	
							34							40			RCP2-GRST-I-20P-2-***		
	GR8					(60cpm)								45.1	I	⇄115V ⇄230V	RCS2-GR8-I-60-5-***	P.351	
Large Size	GR3LS											200		18			RCP2-GR3LS-I-28P-30-19	P.343	
	GR3LM											200		51		⊖24V	RCP2-GR3LM-I-42P-30-19	P.345	
	GR3SS			40										22			RCP2-GR3SS-I-28P-30-10	P.347	
	GR3SM				50									102			RCP2-GR3SM-I-42P-30-14	P.349	

I = Incremental　A = Absolute　⊖ = DC　⇄ = AC

***Addendum 1)** (New RCP2 gripper types)
RCP2-GRHM-I-35P-2-32 (s. P.340-1): stroke 32 mm, max. speed 100 mm/s, max. grip force 125 N
RCP2-GRHB-I-42P-2-40 (s. P.340-3): stroke 40 mm, max. speed 100 mm/s, max. grip force 200 N

3 Check Specifications

Rotary Type



For the rotary type, a model is selected for its positioning motion generated by the rotating part.

[Positioning]

For positioning motions, the criteria for selection are: (1) oscillating angle; (2) maximum torque; and (3) speed. Based on the oscillating angle requirements, look for a balance between the maximum torque and speed, and select a model that meets your requirements.

Check that the inertial moment, created when an object is mounted and moved on the rotating part, is within the allowable inertial moment for each model.

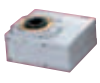
[How to Read the Table]

Rotary Type

Type		Oscillating Angle (deg) and Maximum Speed (deg/sec)			Maximum Torque	Allowable Inertial Moment	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
		300 degrees	330 degrees	360 degrees	(Nm)	kg•m²				
RTBS			400		0.24	0.0023			RCP2-RTBS-I-20P-30-330	P.353
			266		0.36	0.0035			RCP2-RTBS-I-20P-45-330	
RTBSL				400	0.24	0.0023			RCP2-RTBSL-I-20P-30-360	
				266	0.36	0.0035			RCP2-RTBSL-I-20P-45-360	

Maximum Speed — Oscillating Angle Range — Maximum Torque

Rotary Type

	Type		Oscillating Angle (deg) and Maximum Speed (deg/sec)			Maximum Torque	Allowable Inertial Moment	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
			300 degrees	330 degrees	360 degrees	(Nm)	kg•m²				
Small Size	RTBS			400		0.24	0.0023			RCP2-RTBS-I-20P-30-330	P.353
				266		0.36	0.0035			RCP2-RTBS-I-20P-45-330	
	RTBSL				400	0.24	0.0023			RCP2-RTBSL-I-20P-30-360	
					266	0.36	0.0035			RCP2-RTBSL-I-20P-45-360	
	RTCS			400		0.24	0.0023			RCP2-RTCS-I-20P-30-330	P.355
				266		0.36	0.0035			RCP2-RTCS-I-20P-45-330	
	RTCSL				400	0.24	0.0023			RCP2-RTCSL-I-20P-30-360	
					266	0.36	0.0035			RCP2-RTCSL-I-20P-45-360	
	RTB			600		1.1	0.01			RCP2-RTB-I-28P-20-330	P.357
				400		1.7	0.015			RCP2-RTB-I-28P-30-330	
	RTBL				600	1.1	0.01			RCP2-RTBL-I-28P-20-360	
					400	1.7	0.015		⊖24V	RCP2-RTBL-I-28P-30-360	
	RTC			600		1.1	0.01			RCP2-RTC-I-28P-20-330	P.359
				400		1.7	0.015	I		RCP2-RTC-I-28P-30-330	
	RTCL				600	1.1	0.01			RCP2-RTCL-I-28P-20-360	
					400	1.7	0.015			RCP2-RTCL-I-28P-30-360	
	RTBB			600		3	0.02			RCP2-RTBB-I-35P-20-330	P.361
				400		4.6	0.03			RCP2-RTBB-I-35P-30-330	
	RTBBL				600	3	0.02			RCP2-RTBBL-I-35P-20-360	
					400	4.6	0.03			RCP2-RTBBL-I-35P-30-360	
Large Size	RTCB			600		3	0.02			RCP2-RTCB-I-35P-20-330	P.363
				400		4.6	0.03			RCP2-RTCB-I-35P-30-330	
	RTCBL				600	3	0.02			RCP2-RTCBL-I-35P-20-360	
					400	4.6	0.03			RCP2-RTCBL-I-35P-30-360	
	RT6		500			2.4	0.025			RCS2-RT6-I-60-18-300	P.365
	RT6R		500			2.4	0.025		⇄115V ⇄230V	RCS2-RT6R-I-60-18-300	P.367
	RT7R		500			0.764	0.00125			RCS2-RT7R-I-60-4-300	P.369

*Addendum 1)

I = Incremental　A = Absolute　⊖=DC　⇄=AC

***Addendum 1)** (New RCS2 rotary types)

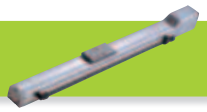
RCS2-RTC8(H)L-○-12(20)-24(15)-360 (s. P.370-1): oscill. angle 360 deg, max. speed 1200 deg/s, max. torque 0.85 Nm

RCS2-RTC10L-○-60-15(24)-360 (s. P.370-3): oscill. angle 360 deg, max. speed 1200 deg/s, max. torque 2.8 Nm

RCS2-RTC12L-○-150-18(30)-360 (s. P.370-5): oscill. angle 360 deg, max. speed 800 deg/s, max. torque 8.6 Nm

3 Check Specifications

Cleanroom Type



The cleanroom type is used for transporting and positioning workpieces. When selecting a cleanroom-type model, note that the specifications are different when used horizontally versus vertically.

[Positioning]

For positioning motions, the criteria for selection are: (1) stroke; (2) load capacity; and (3) speed.
From the table below, select a model that meets your requirements for the stroke, load capacity, and speed.
For RCP3CR and RCP2CR, which use a pulse motor, the load capacity changes with speed. See the "Speed vs. Load Capacity" chart on each respective page to check if your desired speed and load capacity are supported.

[How to Read the Table]

Cleanroom Type

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke *Number inside bar = max. speed by stroke, < > denotes vertical use	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
SA4		665	4	1	I A	⊖24V	RCACR-SA4C-○-20-10-***	P.415
		330	6	2.5			RCACR-SA4C-○-20-5-***	
		165	8	4.5			RCACR-SA4C-○-20-2.5-***	
		665	4	1	I A	≂115V ≂230V	RCS2CR-SA4C-○-20-10-***	P.425
		330	6	2.5			RCS2CR-SA4C-○-20-5-***	
		165	8	4.5			RCS2CR-SA4C-○-20-2.5-***	

Maximum Speed
Stroke Range
Horizontal Load Capacity
Vertical Load Capacity

Note: If the workpiece being transported is significantly overhanging the actuator, the service life of the guide needs to be considered separately from the actuator's specifications. See "About Service Life and Moment" on page A-5 for details.

***Model Upgrade 1)** (SA5 model with new 20mm lead)
RCP2CR-SA5□-I-42P-20-*** (s. P.399): max. speed 1000~580 mm/s, load capacity 4/0.5 kg (hor./vert.)
RCACR-SA5□-○-20-20-*** (s. P.417): max. speed 1300 mm/s, load capacity 2/0.5 kg (hor./vert.)
RCS2CR-SA5□-○-20-20-*** (s. P.427): max. speed 1300 mm/s, load capacity 2/0.5 kg (hor./vert.)

***Model Upgrade 2)** (SA6 model with new 20mm lead)
RCP2CR-SA6□-I-42P-20-*** (s. P.401): max. speed 1000~580 mm/s, load capacity 6/0.5 kg (hor./vert.)
RCACR-SA6□-○-30-20-*** (s. P.419): max. speed 1300~990 mm/s, load capacity 3/0.5 kg (hor./vert.)
RCS2CR-SA6□-○-30-20-*** (s. P.429): max. speed 1300~990 mm/s, load capacity 3/0.5 kg (hor./vert.)

Cleanroom Type

Small Size ↓ Large Size

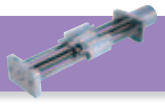
Type	Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
SA4	50mm 100 150 200 250 300 350 400 450 500 550 600 700 800 900 1000						
	665	4	1	I / A	⊖24V	RCACR-SA4C-○-20-10-***	P.415
	330	6	2.5	I / A	⊖24V	RCACR-SA4C-○-20-5-***	P.415
	165	8	4.5	I / A	⊖24V	RCACR-SA4C-○-20-2.5-***	P.415
	665	4	1	I / A	≂115V ≂230V	RCS2CR-SA4C-○-20-10-***	P.425
	330	6	2.5	I / A	≂115V ≂230V	RCS2CR-SA4C-○-20-5-***	P.425
	165	8	4.5	I / A	≂115V ≂230V	RCS2CR-SA4C-○-20-2.5-***	P.425
SA5 *Model Upgrade 1)	600 540 400 300	4	1	I	⊖24V	RCP2CR-SA5C-I-42P-12-***	P.399
	300 270 200 150	8	2.5	I	⊖24V	RCP2CR-SA5C-I-42P-6-***	P.399
	150 135 100 75	8	4.5	I	⊖24V	RCP2CR-SA5C-I-42P-3-***	P.399
	800 760	4	1	I	⊖24V	RCACR-SA5C-○-20-12-***	P.417
	400 380	8	2	I	⊖24V	RCACR-SA5C-○-20-6-***	P.417
	200 190	12	4	I	⊖24V	RCACR-SA5C-○-20-3-***	P.417
	800 760	4	1	A	≂115V ≂230V	RCS2CR-SA5C-○-20-12-***	P.427
	400 380	8	2	A	≂115V ≂230V	RCS2CR-SA5C-○-20-6-***	P.427
	200 190	12	4	A	≂115V ≂230V	RCS2CR-SA5C-○-20-3-***	P.427
SA6 *Model Upgrade 2)	600 540 400 300	6	~1.5	I	⊖24V	RCP2CR-SA6C-I-42P-12-***	P.401
	300 270 200 150	12	~3	I	⊖24V	RCP2CR-SA6C-I-42P-6-***	P.401
	150 135 100 75	12	~6	I	⊖24V	RCP2CR-SA6C-I-42P-3-***	P.401
	800 760 640 540	6	1.5	I	⊖24V	RCACR-SA6C-○-30-12-***	P.419
	400 380 320 270	12	3	I	⊖24V	RCACR-SA6C-○-30-6-***	P.419
	200 190 160 135	18	6	I	⊖24V	RCACR-SA6C-○-30-3-***	P.419
	800 760 640 540	6	1.5	A	≂115V ≂230V	RCS2CR-SA6C-○-30-12-***	P.429
	400 380 320 270	12	3	A	≂115V ≂230V	RCS2CR-SA6C-○-30-6-***	P.429
	200 190 160 135	18	6	A	≂115V ≂230V	RCS2CR-SA6C-○-30-3-***	P.429
SA7	533<400> 480 <400>	~25	~5	I	⊖24V	RCP2CR-SA7C-I-56P-16-***	P.403
	266 240	~30	~10	I	⊖24V	RCP2CR-SA7C-I-56P-8-***	P.403
	133 120	30	~15	I	⊖24V	RCP2CR-SA7C-I-56P-4-***	P.403
	800 640 480	12	3	I / A	≂115V ≂230V	RCS2CR-SA7C-○-60-16-***	P.431
	400 320 240	25	6	I / A	≂115V ≂230V	RCS2CR-SA7C-○-60-8-***	P.431
	200 160 120	40	12	I / A	≂115V ≂230V	RCS2CR-SA7C-○-60-4-***	P.431
SS7	600 470	~30	~4	I	⊖24V	RCP2CR-SS7C-I-42P-12-***	P.405
	300 230	~30	~8	I	⊖24V	RCP2CR-SS7C-I-42P-6-***	P.405
	150 115	~30	~12	I	⊖24V	RCP2CR-SS7C-I-42P-3-***	P.405
	600 470	15	4	I / A	≂115V ≂230V	RCS2CR-SS7C-○-60-12-***	P.433
	400 230	30	8	I / A	≂115V ≂230V	RCS2CR-SS7C-○-60-6-***	P.433
SS8	1200<750> 1000 <750> 800 <750>	~20	~3	I	⊖24V	RCP2CR-HS8C-I-86P-30-***	P.409
	666<500> 625 <500> 515 <500>	~40	~5	I	⊖24V	RCP2CR-SS8C-I-56P-20-***	P.407
	333<300> 310 <300> 255	~50	~12	I	⊖24V	RCP2CR-SS8C-I-56P-10-***	P.407
	165<150> 155 <150> 125	~55	~20	I	⊖24V	RCP2CR-SS8C-I-56P-5-***	P.407
	1000 960 765 625 515	20	4	I / A	≂115V ≂230V	RCS2CR-SS8C-○-100-20-***	P.435
	500 480 380 310 255	40	8	I / A	≂115V ≂230V	RCS2CR-SS8C-○-100-10-***	P.435
	1000 960 765 625 515	30	6	I / A	≂115V ≂230V	RCS2CR-SS8C-○-150-20-***	P.435
	500 480 380 310 255	60	12	I / A	≂115V ≂230V	RCS2CR-SS8C-○-150-10-***	P.435

* < > is for vertical use

I = Incremental A = Absolute ⊖ = DC ≂ = AC

3 Check Specifications

Dustproof/Splash-Proof Type



The criteria for selecing the dustproof/splash-proof type are different depending on whether it will be used for positioning or pushing.

[Positioning]

For positioning motions, the criteria for selection are: (1) stroke; (2) load capacity; and (3) speed.
From the table below, select a model that meets your requirements for the stroke, load capacity, and speed.
For RCP2W, which uses a pulse motor, the load capacity changes with speed. See the "Speed vs. Load Capacity" chart on each respective page to check if the desired speed and load capacity are supported.

[Pushing]

For pushing motions, the criteria for selection are: (1) stroke and (2) maximum pushing force.
From the table below, select a model that meets your requirements for the stroke and pushing force.
We recommend the pulse motor model (RCP2W) for the pushing motion, because of the motor's characteristics. Moreover, the pushing force is adjustable between 20% to 70% (max. pushing force at 70%).

[How to Read the Table]

Dustproof/Splash-Proof

Type		Stroke (mm) and Maximum Speed (mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Rated Thrust (N)	Max. Push Force (N)	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
		50mm 100 150 200 250 300 350 400 450 500 550 600 650 700								
SA16		180	–	N/A	~25	–	I	⊖24V	RCP2W-SA16C-I-86P-8-***	P.443
		133	–	N/A	~35	–			RCP2W-SA16C-I-86P-4-***	
RA4		450<250> 450 <250> 350 <250>	–	150	~25	~4.5		⊖24V	RCP2W-RA4C-I-42P-10-***	P.445
		190 190 175	–	284	~40	~12			RCP2W-RA4C-I-42P-5-***	
		125<115> 115 85	–	358	40	~19	I		RCP2W-RA4C-I-42P-2.5-***	

Maximum Speed
Stroke Range
Maximum Push Force
Vertical Load Capacity
Horizontal Load Capacity

Dustproof/Splash-Proof

Type		Stroke(mm) and Maximum Speed(mm/sec) * Length of bar = stroke * Number inside bar = max. speed by stroke, < > denotes vertical use	Rated Thrust (N)	Max. Push Force (N)	Load Capacity (kg) H	Load Capacity (kg) V	Encoder Type	Controller Input Power	Model * □ denotes motor shape ○ denotes encoder type *** denotes stroke	See Page
SA16		180	–	N/A	~25	–	I	⎓24V	RCP2W-SA16C-I-86P-8-***	P.443
		133	–	N/A	~35	–			RCP2W-SA16C-I-86P-4-***	
RA4		450<250> (450 <250> / 350 <250>)	–	150	~25	~4.5			RCP2W-RA4C-I-42P-10-***	P.445
		190 (190 / 175)	–	284	~40	~12		⎓24V	RCP2W-RA4C-I-42P-5-***	
		125<115> (115 / 85)	–	358	40	~19	I		RCP2W-RA4C-I-42P-2.5-***	
RA6		320<265>	–	240	~40	~5			RCP2W-RA6C-I-56P-16-***	P.447
		200	–	470	50	~17.5		⎓24V	RCP2W-RA6C-I-56P-8-***	
		100	–	800	55	~26			RCP2W-RA6C-I-56P-4-***	
RA10		250<167>	–	1500	~80	~80			RCP2W-RA10C-I-86P-10-***	P.449
		125	–	3000	150	~100	I	⎓24V	RCP2W-RA10C-I-86P-5-***	
		63	–	6000	300	~150			RCP2W-RA10C-I-86P-2.5-***	
RA3		500	36.2	–	4	1.5			RCAW-RA3□-I-20-10-***	P.455
		250	72.4	–	9	3	I	⎓24V	RCAW-RA3□-I-20-5-***	
		125	144.8	–	18	6.5			RCAW-RA3□-I-20-2.5-***	
RA4		600	18.9	–	3	1			RCAW-RA4□-○-20-12-***	P.457
		300	37.7	–	6	2			RCAW-RA4□-○-20-6-***	
		150	75.4	–	12	4		⎓24V	RCAW-RA4□-○-20-3-***	
		600	28.3	–	4	1.5			RCAW-RA4□-○-30-12-***	
		300	56.6	–	9	3			RCAW-RA4□-○-30-6-***	
		150	113.1	–	18	6.5	I		RCAW-RA4□-○-30-3-***	
		600	18.9	–	3	1	A		RCS2W-RA4□-○-20-12-***	P.459
		300	37.7	–	6	2			RCS2W-RA4□-○-20-6-***	
		150	75.4	–	12	4		⎓115V ⎓230V	RCS2W-RA4□-○-20-3-***	
		600	28.3	–	4	1.5			RCS2W-RA4□-○-30-12-***	
		300	56.6	–	9	3			RCS2W-RA4□-○-30-6-***	
		150	113.1	–	18	6.5			RCS2W-RA4□-○-30-3-***	

* < > is for vertical use

I = Incremental A = Absolute ⎓=DC ⎓=AC

Perform Various Functions Through Easy Operations

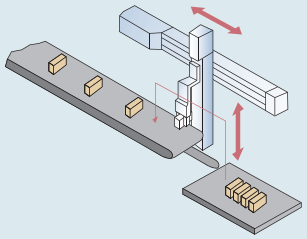
3 Types of Motion Patterns

Switch between three motion patterns depending on the equipment.

[Positioning Motion]

Objects attached to the axis slider and rod can be moved to be positioned with a positioning repeatability of ±0.02mm.

<Application> Transporting workpiece, positioning camera

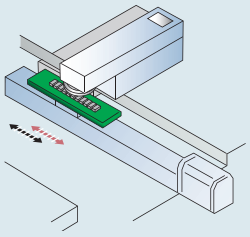


Used in a pick-and-place unit

[Pitch Feed Motion]

Instead of positioning by specifying coordinates from the home position, the object is moved over a specified distance from the current position.

<Application> Raising/lowering stacker, moving pallet

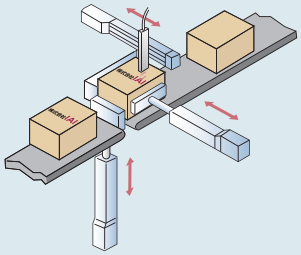


Used for sending workpieces in a marking process

[Pushing Motion]

Similar to an air cylinder, a rod can be used to push on a workpiece continuously.

<Application> Press-fitting workpiece, clamping



Used for pushing workpieces

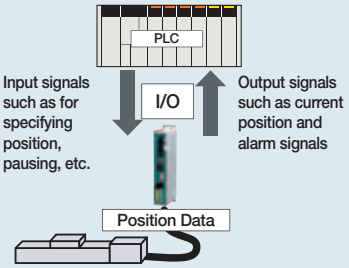
3 Methods of Positioning

Select from 3 types of I/O between the upper-level machine and the controller.

[Position Movement]

As with the solenoid valve, movement to preset positions is possible with just an ON/OFF signal.

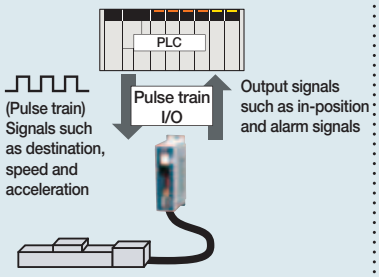
● Operated by I/O control with the PLC



[Pulse Train Input]

The destination, speed and acceleration can be freely controlled without inputting the destination beforehand.

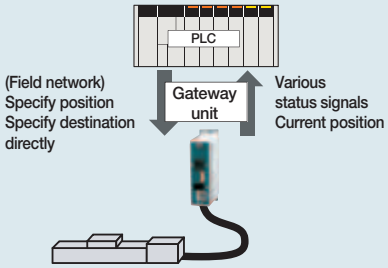
●Operated by pulse trains from the PLC and I/O control



[Field Network]

Movement can be instructed via a network, such as Profibus-DP and Ethernet. Workpieces can be moved by specifying the position, or by directly specifying the coordinates.

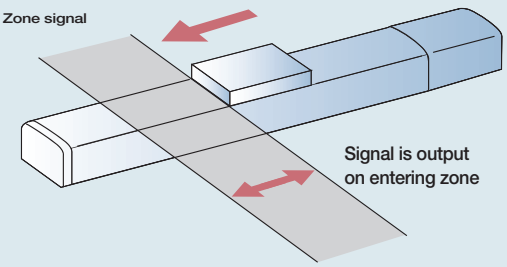
●Operated from the PLC via network



No Sensor Necessary with Zone Signal

You can set any zone within the stroke, and when the slider enters the zone, the signal is output. This is effective for outputting signals at a specific position, such as in painting, for example, (Up to 2 zones can be specified). In addition, as a new feature, P-Zone signals can be set per position. Although the output signal is the same, a zone range of up to 256 points can be set.

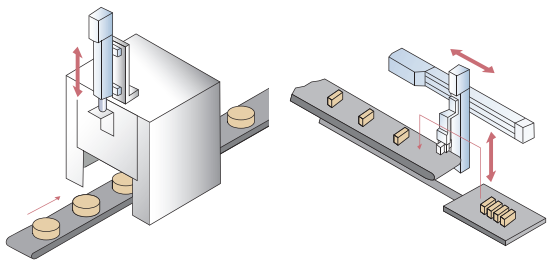
● Zone signal



Positioning Motion

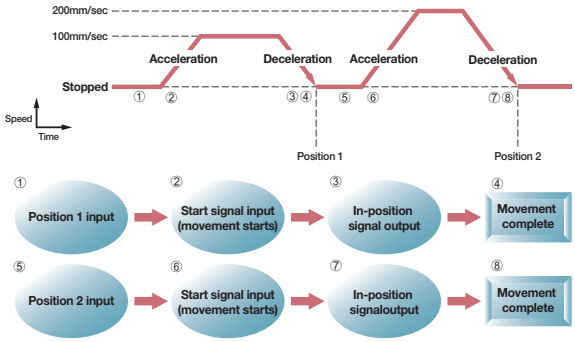
Objects attached to the axis slider and rod can be moved to be positioned with a positioning repeatability of ±0.02mm.

■ Used for opening/closing a door ■ Used in a pick-and-place unit



Application: Transporting/moving workpiece, etc.

Motion Example



[Features]

- Capable of positioning up to 512 points.
- Set speed and acceleration/deceleration per position.
- The in-position signal can be output at any position ahead of the specified position, depending on the positioning band setting.
- Acceleration and deceleration can be set separately.
- Speed can be changed in transit without stopping.

Position Data Table

(set by the teaching pendant or PC software)

No.	Position (mm)	Speed (mm/sec)	Acceleration (G)	Deceleration (G)	Push (%)	Positioning band (mm)
1	100	100	0.3	0.3	0	10
2	200	200	0.3	0.3	0	20

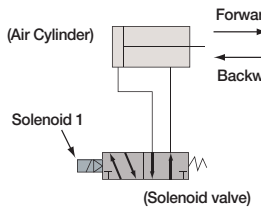
<PMEC, AMEC, PSEP, and ASEP can be operated with the same signals as the solenoid valve>

■Operating Method

PMEC, AMEC, PSEP, and ASEP can be operated with the same signals as the solenoid valve in air cylinders.
There are two types of solenoid valves, the single solenoid and the double solenoid; and both are supported.

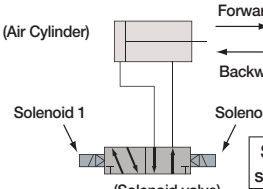
■For Air Cylinder Solenoid Valve

<Single Solenoid>



Signal to solenoid 1	Rod movement
ON	Forward end position
OFF	Backward end position

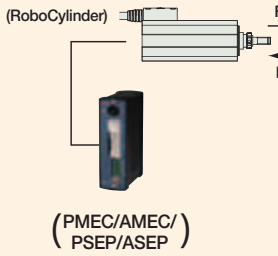
<Double Solenoid>



Signal to solenoid 1	Signal to solenoid 2	Rod movement
ON	OFF	Forward end position
OFF	ON	Backward end position

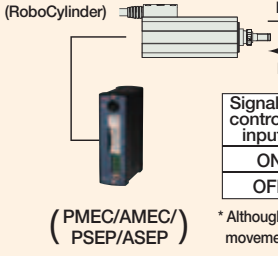
■For PMEC, AMEC, PSEP and ASEP

<Replacing Single Solenoid>



Signal to controller input 0	Rod movement
ON	Forward end position
OFF	Backward end position

<Replacing Double Solenoid>



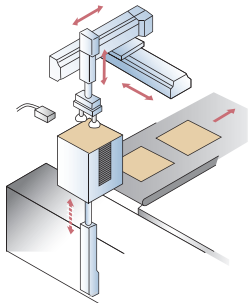
Signal to controller input 1	Signal to controller input 0	Rod movement
ON	OFF	Forward end position
OFF	ON	Backward end position

* Although it is set to 2-point movement by default, 3-point movement is also possible by switching the parameter.

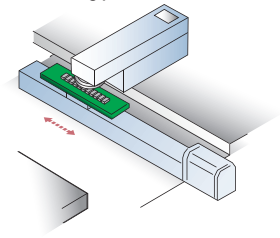
Pitch feed function (incremental function)

In addition to positioning by specifying coordinates from the home position, the workpiece can be moved over a specified distance from the current position.

■ Raising/lowering stacker

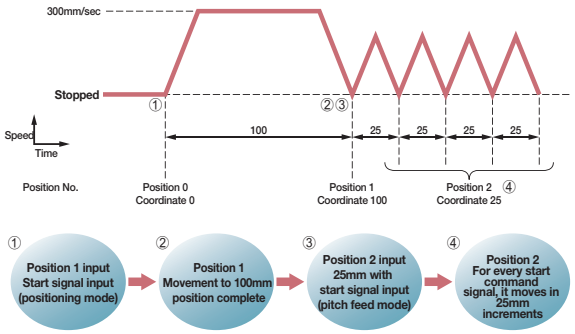


■ Used for sending workpieces in a marking process



Application: ● Raising/lowering stacker, moving pallet, etc.

Motion Example



[Features]

- Repeated movements with even spacing can be performed using one position data, instead of setting multiple positions.
- The pitch can be easily set in the position data table.

Position Data Table

(set by the teaching pendant or PC software)

No.	Position (mm)	Speed (mm/sec)	Acceleration (G)	Deceleration (G)	Push (%)	Positioning band (mm)
1	100	300	0.3	0.3	0	0.1
2	=	25	300	0.3	0.3	0	0.1

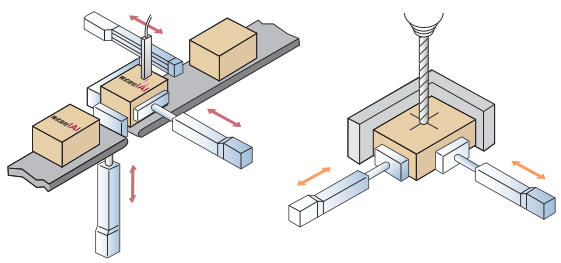
(Teaching Box)
"=" is displayed in pitch feed mode.

Pushing Motion

Similar to an air cylinder, a rod can be used to push on a workpiece continuously.

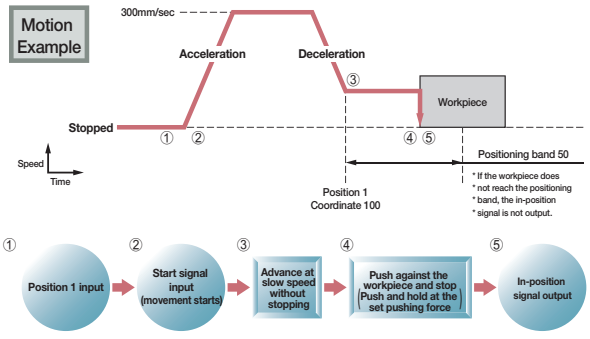
■ Pushing workpieces

■ Holding workpiece in place



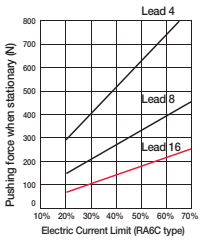
Application: ● Detecting workpiece, press-fitting, clamping, etc.

Motion Example



[Features]

- Since the in-position signal is output when the actuator pushes against the workpiece, you can use it with the zone signal to sort workpieces.
- The force against the workpiece (pushing force) can be adjusted by changing the setting in the position data table.



Position Data Table

(set by the teaching pendant or PC software)

No.	Position (mm)	Speed (mm/sec)	Acceleration (G)	Deceleration (G)	Push (%)	Positioning band (mm)
1	100	300	0.3	0.3	50	50

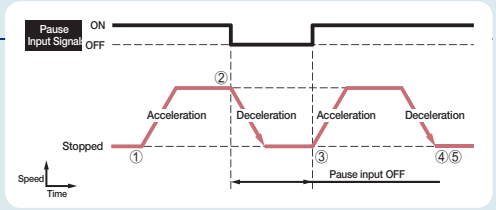
Note: The accuracy of the stationary pushing force is not guaranteed. Please use it only as a rough estimate. Please note that if the pushing force is too small, the pushing motion may not be completed properly due to sliding resistance.

Changing Speed During Movement

Since the speed can be changed from any position during the movement, the tact time can be effectively reduced through multi-tasking.

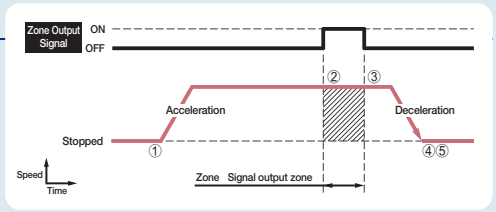
Pause Input

By setting an interlock (to prevent interference) with the peripherals, the slider slows down to a stop when the pause input is cut.
Once the pause input turns ON again, the remaining motion is resumed.



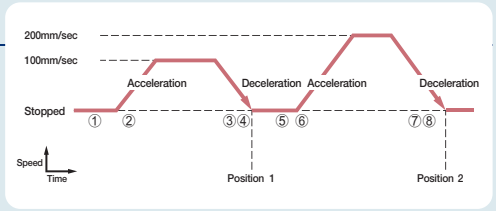
Zone Output

During movement, you can output a signal at an arbitrary position (whose range is set by a parameter).
This can be used to set a danger zone or to reduce tact time.



Capable of Controlling Speed and Acceleration/Deceleration

Speed and acceleration/deceleration can be set for each position.
By starting and stopping slowly and moving at a high-speed in between, the tact time can be effectively reduced.



Complete-Stop and Full-Servo Control Methods

In a pulse motor, you can use the complete-stop method to eliminate vibrations by increasing the current when stationary, or the full-servo method, in which the current is dropped to 1/2 to 1/4 of the complete-stop method to reduce power consumption.

Auto Servo OFF Method

After the positioning is complete, servo can be turned OFF automatically after a fixed time has passed.
Since no retention current is output, power consumption can be reduced.
When the move command is received from the PLC, the servo turns ON and the movement starts.

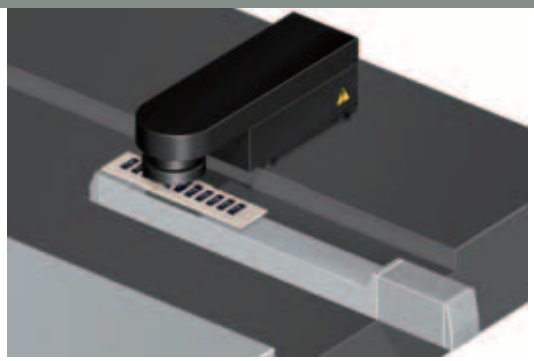
Simple Absolute Unit

A simple absolute unit retains the data from the encoder while the power is OFF.
When attaching to PCON, ACON, PSEL, and ROBONET, these modules (PCON-ABU, ACON-ABU, and SEP-ABU) can be used as simple absolute units to eliminate the need for homing.

Application Examples

Marking Machine

Pitch feed

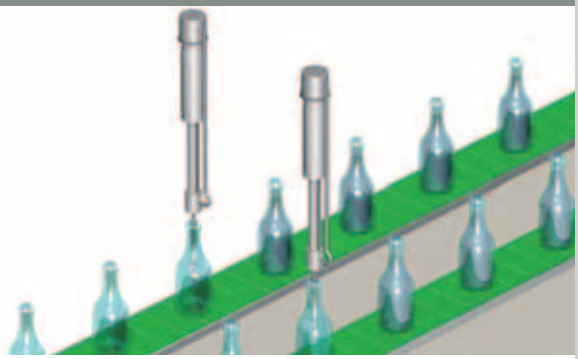


Use RoboCylinder in "pitch feed" mode to feed the workpieces in a laser marking process.

Actuator	ERC2-SA6 (P55)	Controller	Built-in (P515)

Liquid Injector

Positioning

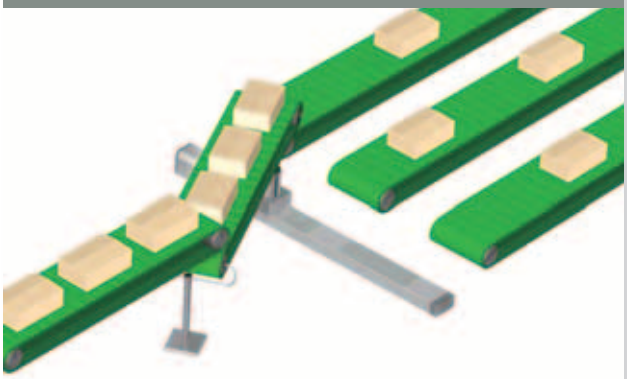


In this equipment, a nozzle is inserted into a shampoo container, and is raised as the shampoo is injected. Speed adjustments are controlled by pulse trains.

Actuator	RCA-RA3C (P197)	Controller	ACON-PL(P535)

Redirecting a Belt Conveyor

Positioning

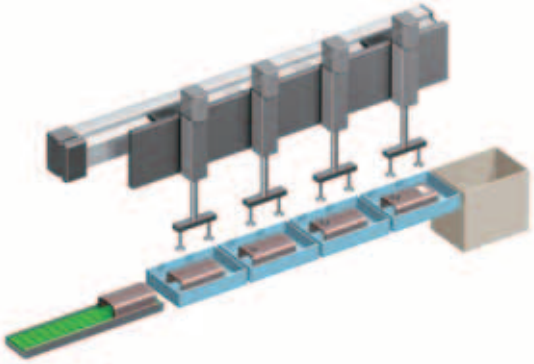


Workpieces can be sorted at high speeds.

Actuator	RCS2-SS8C (P109)	Controller	SCON-C (P547)

Parts Transfer Machine

Positioning

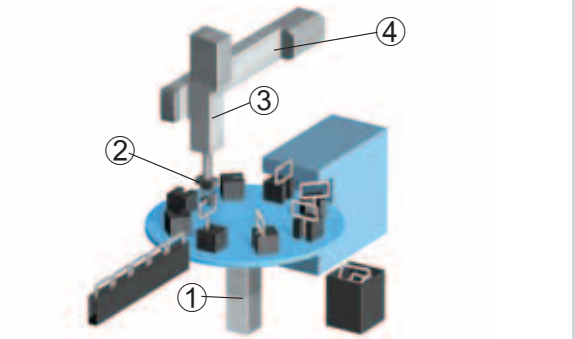


Use RoboCylinders for vertical positioning in transfer machines (for moving workpieces to a different process line) to make production lines more compact.

Actuator	RCA-RA4C (P199)	Controller	ACON-CY (P535)

Parts Inspection Machine

Pitch feed

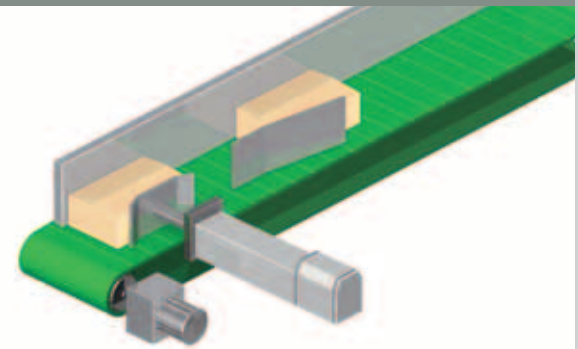


All horizontal/vertical movements, gripping, and rotating motions are driven by RoboCylinders. Moreover, controllers can be connected to a field network to reduce wiring.

Actuator	(1) RCS2-RT6 (P365) (2) RCP2-GRM (P339) (3) RCP2-RA6C (P145) (4) RCP2-SS8C (P35)	Controller	PCON-SE (P525) SCON-C (P547)

Aligning Workpieces

Pushing

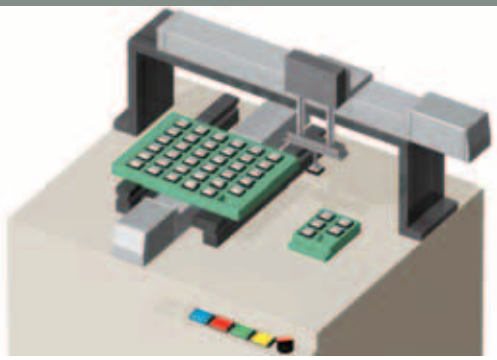


Workpieces are aligned by using the push motion to push them against the wall.

Actuator	RCP2-RA4C (P143)	Controller	PCON-CY (P525)

Pick-and-Place Machine

Pitch feed | Positioning

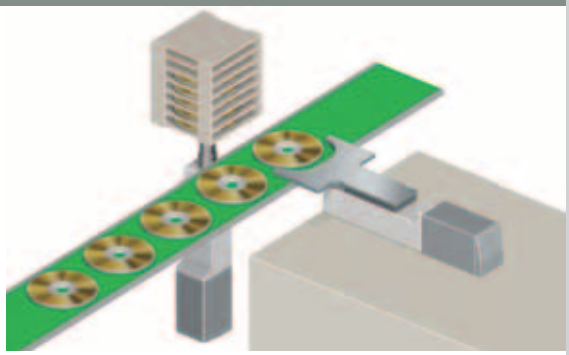


This low-cost pick-and-place machine uses RoboCylinders for the X and the Y axes.

Actuator	RCA-SA5C (P77) RCA2-GD4N (P191)	Controller	ACON-C (P535) ASEP-C (P487)

Disc Stacker

Pitch feed | Positioning

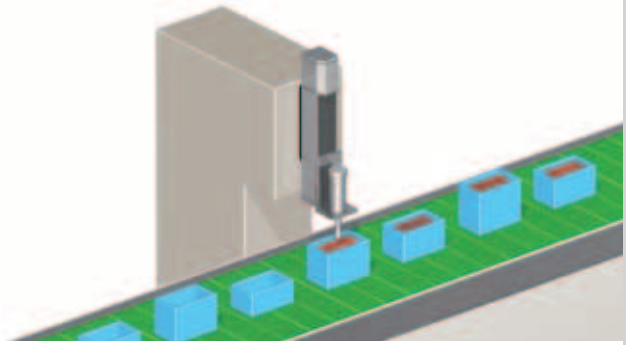


The raising and lowering of the stacker is done by RoboCylinder's "pitch feed" function, and the inserting of the discs into the stacker is done by the "acceleration/deceleration" function.

Actuator	RCP2-RA6C (P145) RCP2-SA6C (P29)	Controller	PCON-CY (P525)

Filling Machine

Positioning

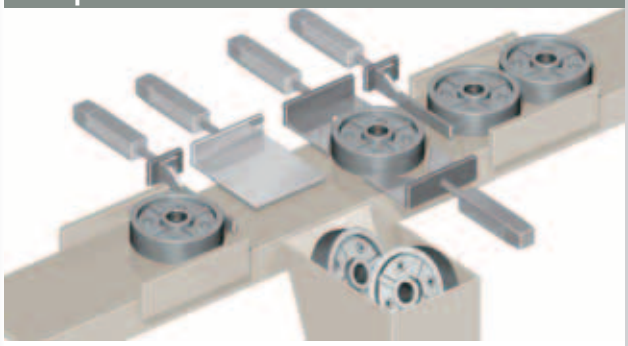


RoboCylinder is used to fill containers that are different in height.
With the ability to control multiple positions, multi-product production can be supported.

Actuator	RCP3-TA5C (P273)	Controller	PCON-C (P525)

Automotive Parts Inspection Machine

Positioning

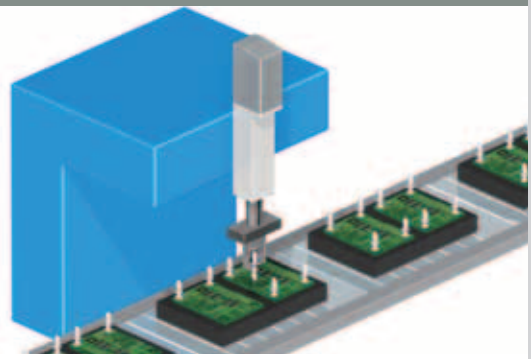


Use RoboCylinders in a part inspection line. Drive multiple axes to position and inspect the workpieces, and to sort out defects. All axes are controlled by a five-axis XSEL controller.

Actuator	RCS2-RA5C (P237)	Controller	XSEL-P (P587)

Spacer Insertion Machine

Pushing

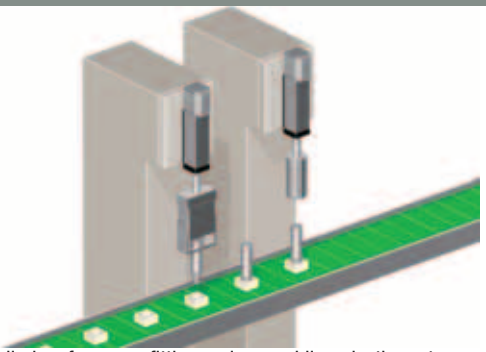


Use RoboCylinder's push motion to insert spacers for printed circuit boards.

Actuator	RCP2-RA6C (P145) RCP2-GRSS (P333)	Controller	PCON-C (P525) PSEP-C (P487)

Press-Fitting Machine

Positioning | Pushing



Use RoboCylinders for press-fitting and assembling plastic parts.
Assembling is done by the positioning moves of the RoboCylinders, while press-fitting is done by the pushing moves.

Actuator	RCP2-RA4C (P143) RCP2-RA10C (P147)	Controller	PCON-C (P525) PCON-CF (P525)

Description of Models

Each model of RoboCylinder is defined by the items (codes) below.
See descriptions below for the meaning of each item. The range of selectable values for each item (e.g. lead, stroke, etc.) is different for each product type. See each type for details.

Description of Items

Series	–	Type	–	Encoder	–	Motor	–	Lead	–	Stroke	–	Compatible Controllers	–	Cable Length	–	Option
①		②		③		④		⑤		⑥		⑦		⑧		⑨

① Series

Indicates the name of the series.

② Model

Indicates the product type (slider, rod, etc.), material (aluminum, steel, etc.), actuator size (52mm width, etc.), and motor connection method, using the convention below:

Type	Material / Form	Actuator width	Motor connection method
S (Slider) B (Belt) R (Rod) H (High-speed) T (Table) A (Arm) F (Flat)	A (Aluminum) S (Steel) GS (Single guide) GD (Double guide) SD (Slide unit) N (Nut mounting type) P (Tapped hole mounting type) C (Compact) W (Wide) F (Flat)	2 (22/25/28 width) 3 (30 width) 4 (40/42/45 width) 5 (52/54/55 width) 6 (58/64 width) 7 (60/68 width) 7A (width 75, rod 30) 7B (width 75, rod 35) 8 (80 width) 10 (100 width) 16 (158 width)	C (Coupled) D (Built-in) R (Side-mounted) U (Bottom-mounted) N (Hollow motor) L (Linear motor)

e.g. SA5C
Type: Slider
Material: Aluminum
Actuator width: 52mm
Motor: Coupled

* Gripper and rotary type RoboCylinders have their own naming convention.

③ Encoder

Indicates whether the actuator is equipped with an absolute or incremental encoder.

A : Absolute	Since the current slider position is retained even after the power is turned off, homing is not required.
I : Incremental	Since the position data for the slider becomes lost when the power is turned off, homing is required each time the power is turned on.

④ Motor

Indicates the power output (W) of the motor used in the actuator.
All ERC2 series products are labeled as "PM".
For the RCP3/RCP2 series, which use a pulse motor, this code indicates the motor size instead of the power output (e.g. "20P" = 20mm frame size motor).

⑤ Lead

Indicates the ball screw lead (the distance the slider travels as the ball screw completes one revolution).

⑥ Stroke

Indicates the stroke (range of motion) of the actuator (in mm or degrees).

⑦ Compatible controllers (I/O type)

Indicates the type of controllers that can be connected. For the ERC2 series, which has a built-in controller, this code indicates the type of I/O (input/output signals).

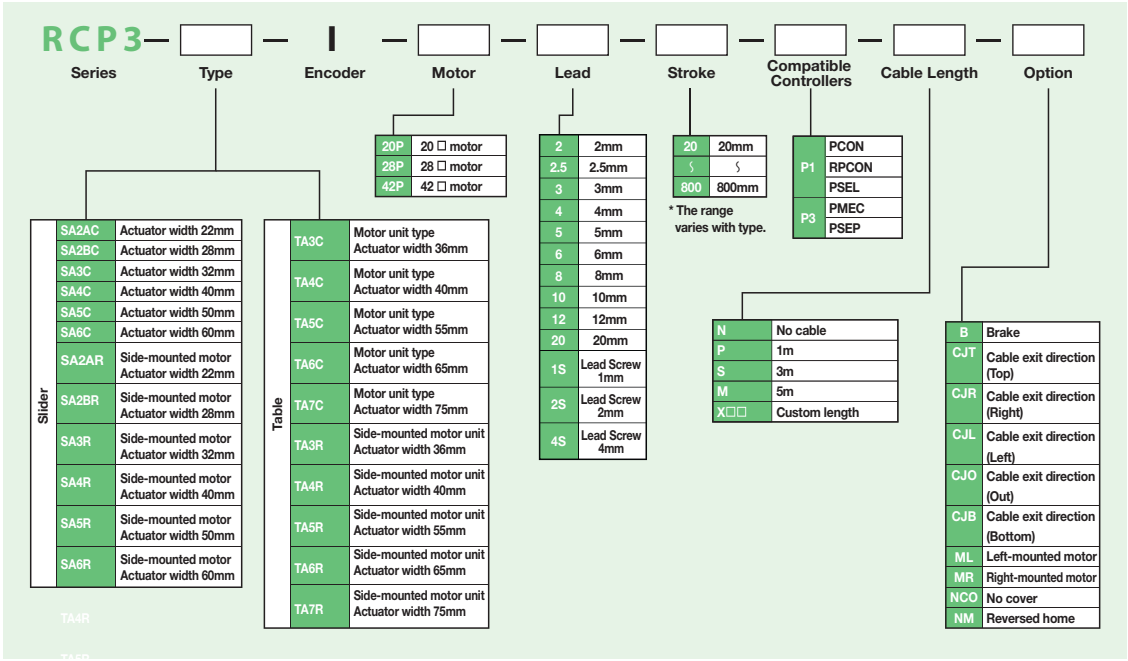
⑧ Cable length

Indicates the length of the motor-encoder cables, which connects the actuator and the controller.

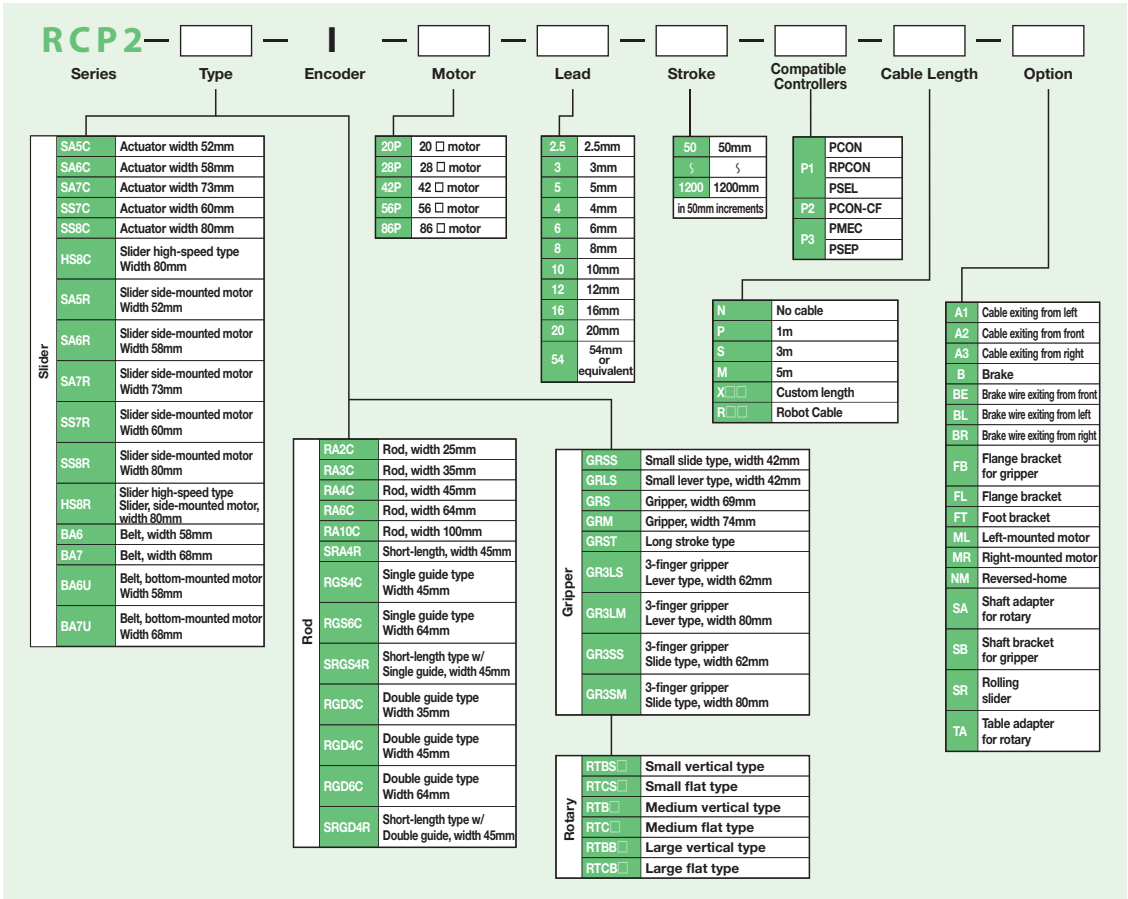
⑨ Options

Indicates the options added to the actuator. (See Technical Reference on page A-23 for details.)
* To select multiple options, specify them in alphabetical order (e.g. A3-B-FT)
* When specifying a side-mounted motor type, make sure to include the code (ML or MR) to indicate on which side the motor is to be mounted.

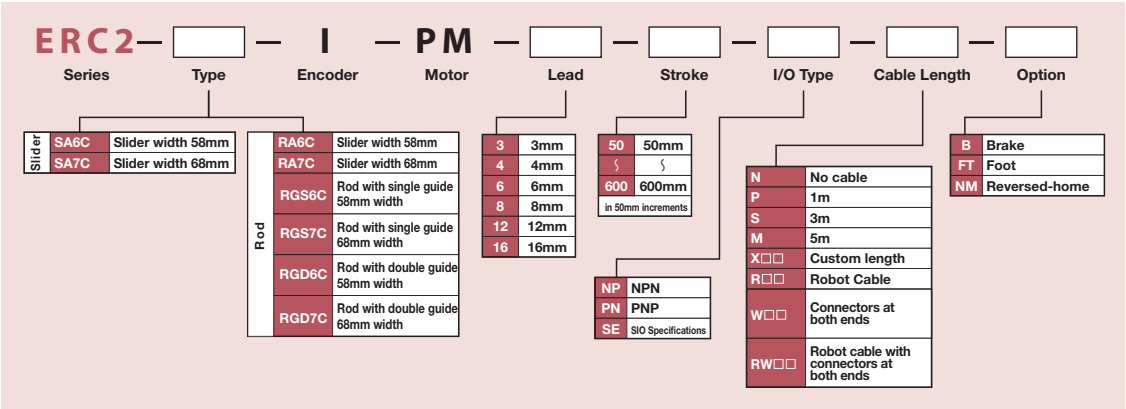
RCP3 series



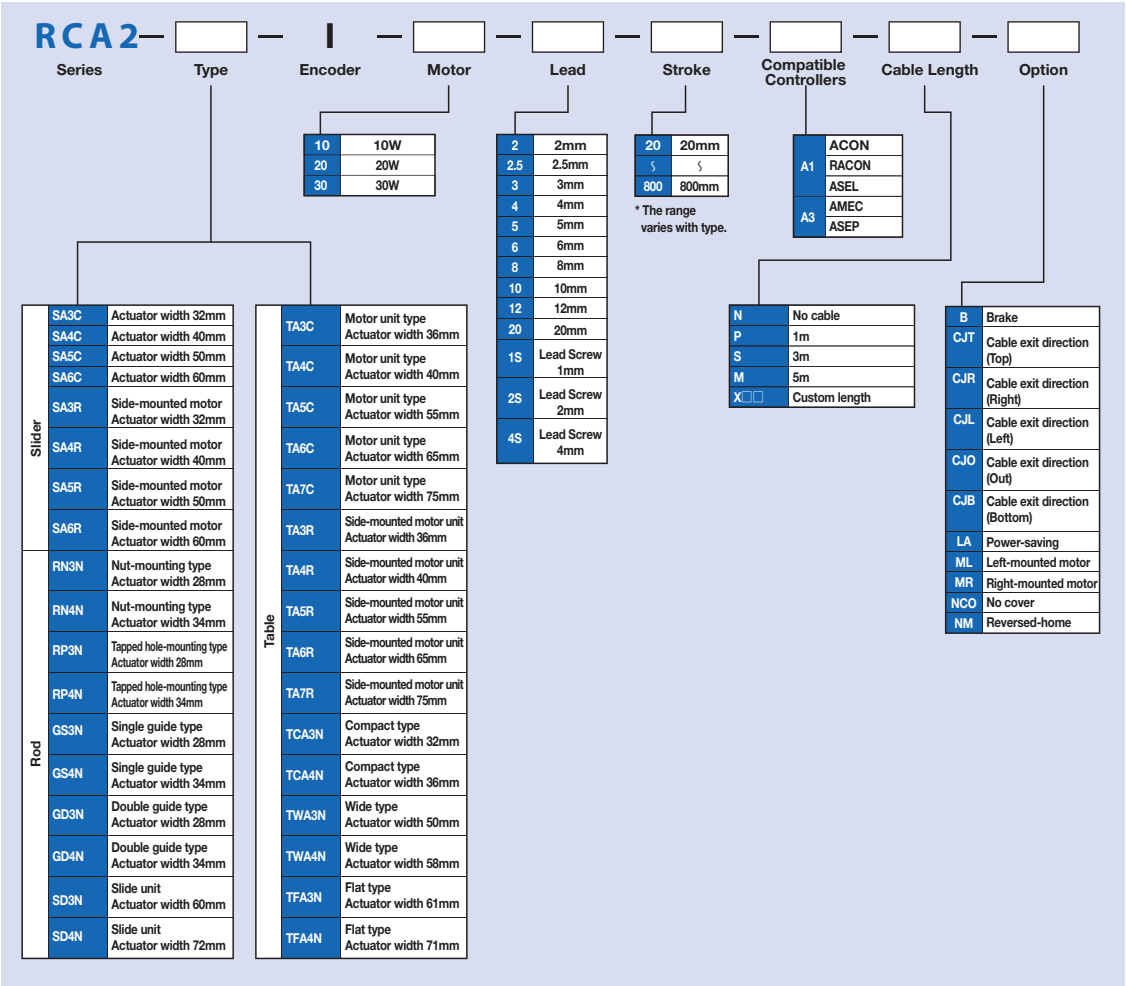
RCP2 series



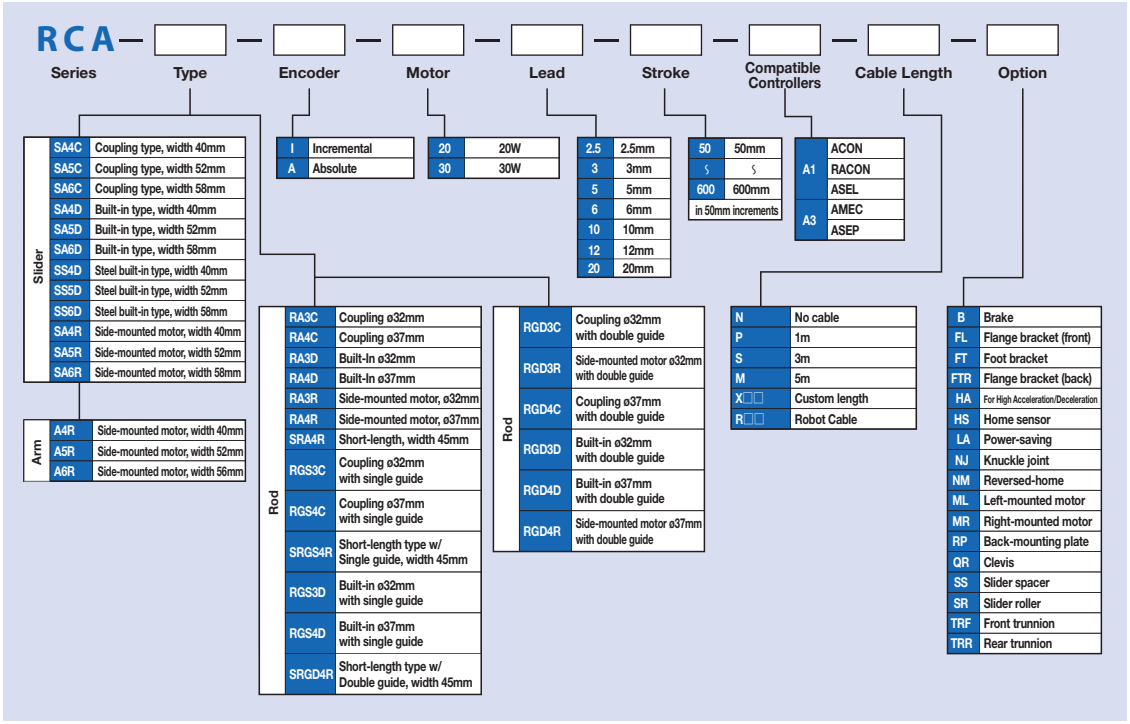
ERC2 series



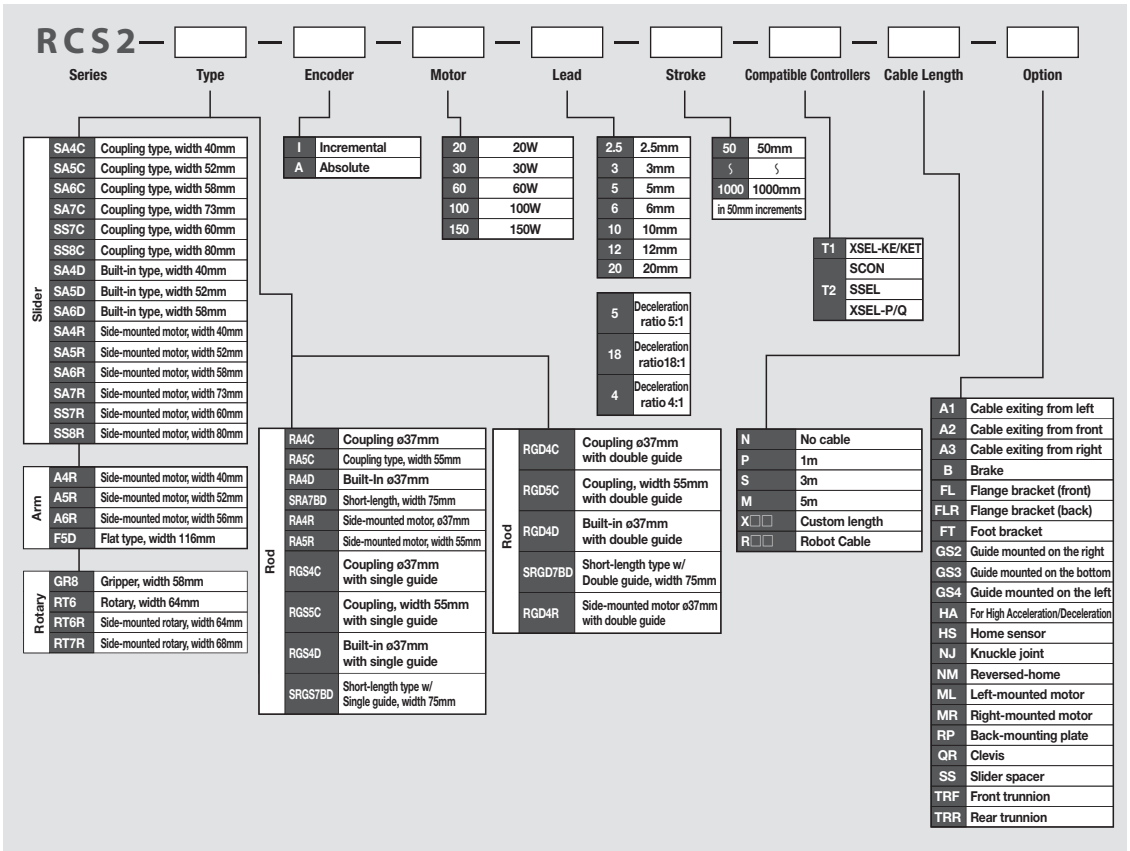
RCA2 series



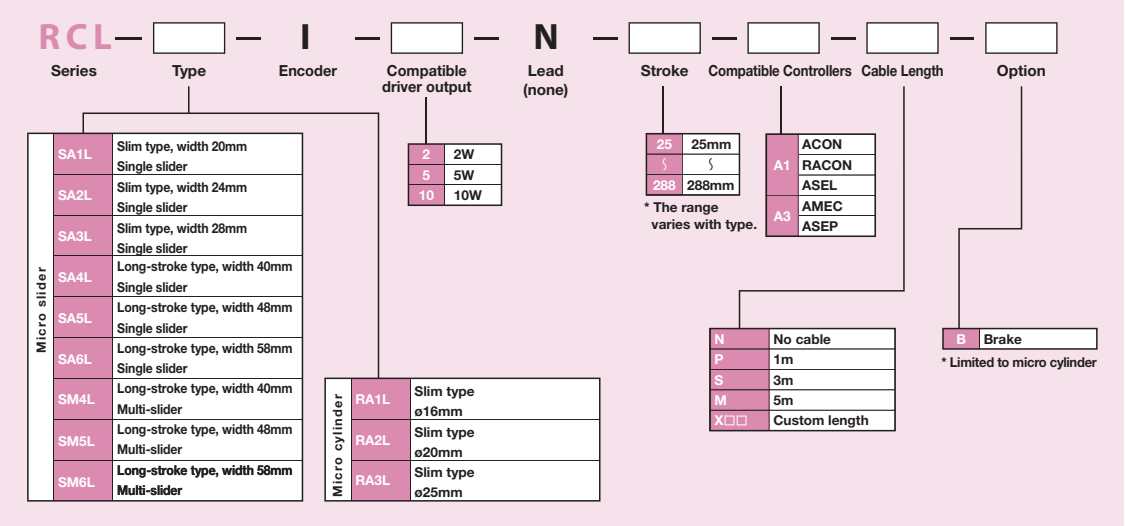
RCA *series*



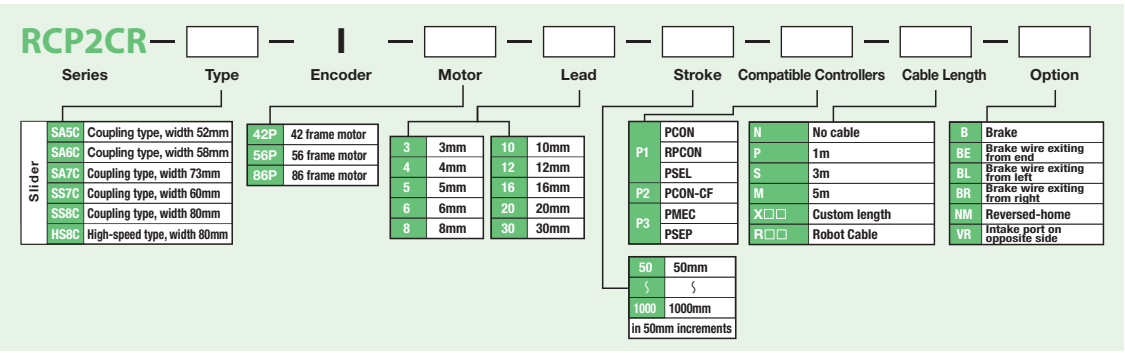
RCS2 *series*



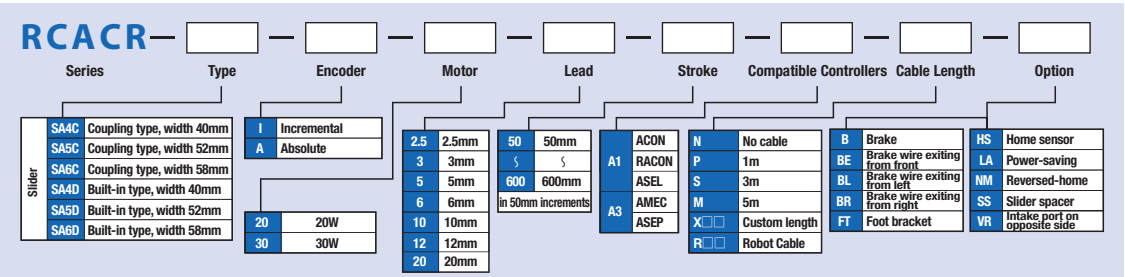
RCL series



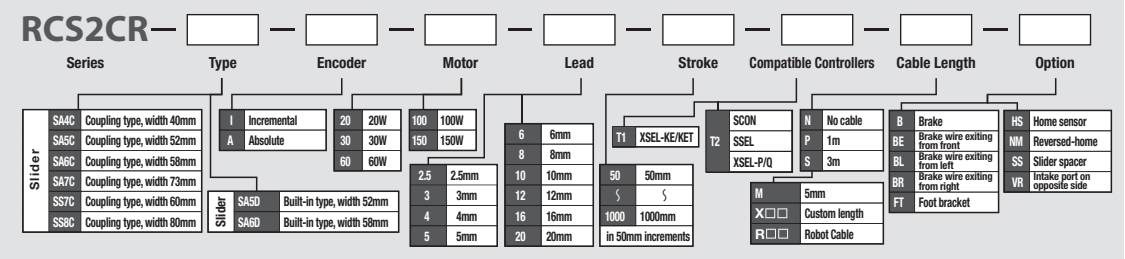
RCP2CR series



RCACR series

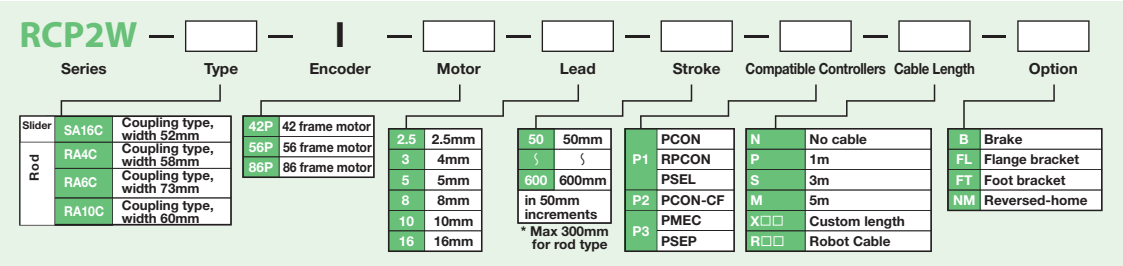


RCS2CR series

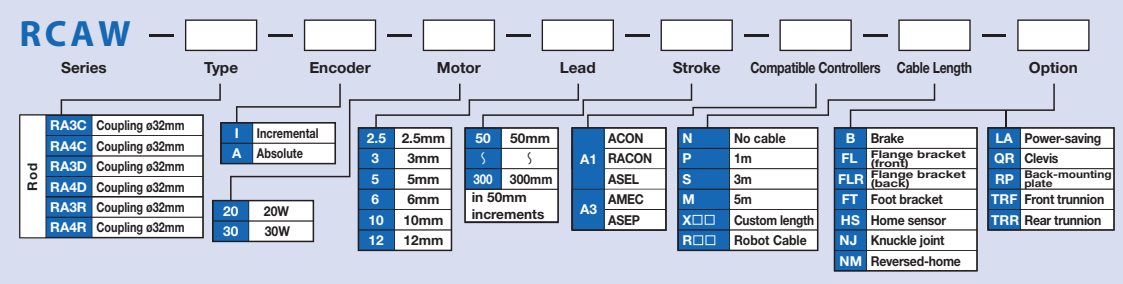


Dustproof/splash-proof series

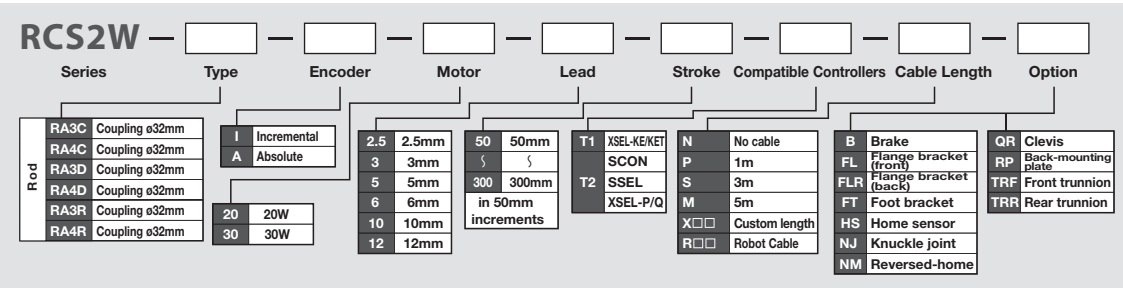
RCP2W *series*



RCAW *series*



RCS2W *series*



■ Notes on Specifications in this Catalog (All Models)

1. Speed

This refers to the set speed when moving the slider (or rod, arm, output axis) of the actuator.
The slider accelerates from rest to the specified speed, and continues to move at that speed until it decelerates to a stop at the specified target position.

<Note>

❶ For models equipped with a pulse motor (ERC2, RCP3, and RCP2), the maximum speed changes with the weight of the load being transported.
When selecting an actuator, refer to the "Speed vs. Load Capacity" (on each product page).

❷ If the axis has a short stroke, or if it has a long stroke but the travel distance is short, the specified speed may not be reached.

❸ As the stroke becomes longer, the maximum speed decreases, due to hazardous RPMs.
For details, see "■ Stroke vs. Maximum Speed" on each product page.

❹ For the RCP2 high-speed slider type (HS8C/HS8R) and belt type, vibration and/or resonance may occur when operated at low speeds. Therefore, use these models at 100mm/s or faster.

❺ For PMEC/AMEC controllers, a minimum speed is set for each actuator.
See the instructions manual for the PMEC/AMEC controllers.

❻ When calculating the time travelled, take into account the time taken to accelerate, decelerate, and converge, as opposed to only the time travelled at the specific speed.

2. Acceleration/Deceleration

Acceleration is the rate of change in speed from rest until a specified speed is reached.

Deceleration is the rate of change in speed from the specified speed to a state of rest.

Both are specified in "G" in programs (0.3G = 2940mm/sec^2).

* For rotary type, 0.3G = 2940 degrees/sec^2

<Note>

❶ Increasing the acceleration (deceleration) speeds up acceleration (deceleration), shortening the travel time.
However, caution should be exercised, as excessively high acceleration/deceleration may cause an error or a malfunction.

❷ The rated acceleration (deceleration) is 0.3G (2.0G, if the lead is 2.5, 3, or 4, or if used vertically)
With the exception of the high-acceleration/deceleration model, use the actuators at or below the rated acceleration.

❸ For models such as RCS2-SRA7 and RCS2-RA13R, use the actuator at or below the acceleration (deceleration) mentioned in "Notes on Selection" on the respective product page.

3. Duty

IAI's actuators should be used at a duty of 50% or below.

If used at over 50% duty, an excessive load error may occur depending on the load, speed, or acceleration.

4. Positioning Repeatability

A JIS B6192-compliant method for evaluating performance.

In this method, a positioning operation (stopping of the actuator at target point) is repeated seven times from the same direction, each time measuring the end position. Then the difference between the maximum and minimum values is calculated.

By using this measuring method for both end-points and the mid-point of the maximum stroke, the largest calculated value is multiplied by 1/2 and expressed with a ±.

5. Lead Screw

When using a lead screw type actuator, note the following:

<Note>

❶ This type is suited for applications with low frequency of use. (As a point of reference, one motion per 10 seconds, 24 hours per day, 240 days per year = approximately 5 years)

❷ This is suited for applications in which the load capacity and load requirements are low. (1kg or less)

❸ Use for applications that do not require a positioning repeatability smaller than ±0.05mm.

❹ Set up in a place that allows for easy maintenance.

6. Home Position

The home position is the reference point from which the actuator determines the target position.
Note that if the home position becomes misaligned, the target position also shifts by the same amount.

<Note>

❶ Actuators with an incremental encoder must be homed upon power-on.

❷ During homing operation, the slider (rod, table) moves to actuator's mechanical end, and then reverses. Therefore, watch for any interference with its surroundings.

❸ By default, the home position is on the motor-side (i.e. the open side on the gripper type, or the left side on the rotary type (looking down at the output shaft.)) Optionally, the home position can be moved to the opposite side (i.e. away from the motor). To change the home position after the actuator has been delivered, it must be sent back to IAI for adjustment.

❹ Models without the option code "NM" do not support reversed home position.

7. Encoder Type (Incremental/Absolute/Simple Absolute)

There are two types of encoders that can be used in an actuator, "incremental" and "absolute" encoders.

Incremental encoder .....When an incremental encoder is powered off, its coordinate data is erased. Therefore, homing is necessary each time it is powered back on.

Absolute encoder .....When an absolute encoder is powered off, it uses a battery to store its coordinate data. Therefore, homing is not necessary when it is powered back on. However, note that it cannot be operated once the battery for storing data runs out.

<Note>

In addition to the above two types of encoders, there is the "simple absolute" type, which is an incremental encoder with a dedicated simple absolute unit connected to the actuator's controller, for storing its coordinate data. This eliminates the need for homing upon power-on. Note that the simple absolute actuators (encoders) fall under the incremental type and not the absolute type.

8. Encoder Pulse Number

The pulse number of the encoder varies depending on the actuator. See the table below for the pulse number of each actuator.

Series	Type	Encoder Pulse Number
RCP3	All models	800
RCP2	All models	800
RCA2	RN□N/RP□N/GS□N/ GD□N/SD□N/TCA□N/ TWA□N/TFA□N	1048
	All other models	800

Series	Type	Encoder Pulse Number
RCA	All models	800
RCL	SA1L/RA1L	715
	SA2L/RA2L	855
	SA3L/RA3L	1145
RCS2	SRA7BD	3072
	All other models	16384

9. Motor

Different motors are used depending on the series.

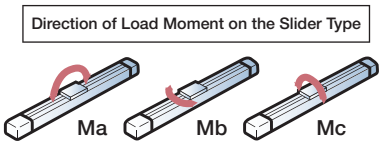
- ERC2/RCP2 (CR)/RCP3: Pulse motor
- RCA (CR)/RCA2: Servo motor (24V)
- RCS2 (CR): Servo motor (230V)

Pulse motors and 24V servo motors may exhibit slight vibration when the motor is excited while the servo is on.

■ Notes on Specifications in this Catalog (All Models)

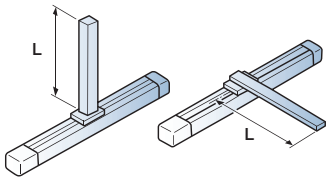
10. Allowable Load Moment (Ma, Mb, Mc)

Models with a built-in linear guide have static and dynamic allowable moments. Please note that using the guide with a load moment that exceeds specification will result in shorter service life of the guide.
(See page A-5 for details on load moment and its calculation method)



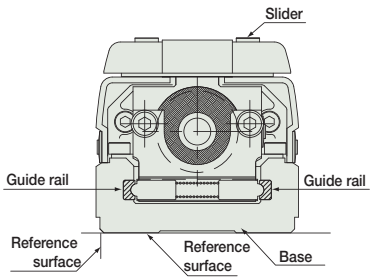
11. Overhang Load Length (L)

When mounting a workpiece or a bracket at an offset distance from the center of actuator/slider, the overhang load length indicates the maximum offset at which the actuator can operate smoothly.
Please make sure to keep the overhang load length within the allowable value, as exceeding the allowable value for for each model may cause vibration or shorten the service life .



12. Actuator Body Precision

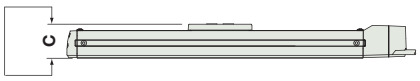
Below are the measures of precision for the body of the slider-type RoboCylinder. Moreover, the side and bottom surfaces of the actuator's base provide references for the run of the slider, and hence can be used as a guide to ensure parallel mounting of the actuator.



* Parallelism does not apply to RCP2W-SA16C, due to its sliding guide.

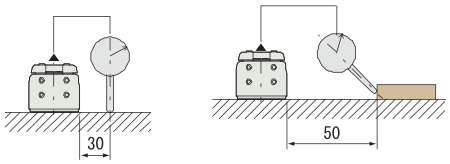
Parallelism: Base Underside & Load Surface (Top Side)

ERC2: ≤ ±0.1mm/m
RCP2/RCA/RCS2: ≤ ±0.05mm/m



Parallelism When Mounted onto a Frame (Fixed onto a Smooth Surface*1)

ERC2: ≤ ±0.1mm/m
RCP2/RCA/RCS2: ≤ ±0.05mm/m



Condition: The above values were measured at 20°C. *1: 0.05mm or less deviation from flatness.

13. Rod Type (Rod End vibration)

The standard rod-type actuators do not take into account any vibration or load resistance (The non-rotational accuracy values documented in the actuator specifications are initial values, and the backlash will increase with operation). If the rod vibrates or if the non-rotational accuracy fluctuates, or if a there is a force being applied from any direction other than the actuator's linear movement, use the guide-equipped actuator type, or use an external guide.

14. Vertical Setup and Use

When using the actuator in a vertical setup, add the optional brake to prevent the slider (or rod) from falling and breaking the machine when the power is turned off or an emergency stop is activated.
However, when mounting a brake-equipped RoboCylinder, be aware that the slider (or rod) will not move unless it is connected to the controller and the brake is released.

15. Moving the Slider Manually

For ball screws with a low (1, 2.5, 3, 4) lead, the actuator's slider cannot be moved by hand, even if the power and/or servo is off, due to high sliding resistance.
To move the slider on a low-lead actuator, use the teaching box or the JOG function of the computer software.

16. Actuator Cable

The actuator cable is the cable that extends from the rear of the actuator's motor.
Secure the actuator cable in place so that it does not move, as any force exerted on the actuator cable may cause a malfunction. If the cable must support bending motion, use a motor-encoder cable, designed for robots.

17. Motor-Encoder Cable

The motor-encoder cable is the cable that connects the actuator and the controller.
Depending on the actuator type, some models use a motor-encoder cable that is split into a separate motor cable and an encoder cable, and other models use an integrated motor-encoder cable.
Moreover, there are two different specifications of this cable: The standard cable specification and the robot cable specification, which has an outstanding flex resistance.
To use in a cable track, be sure to use the robot cable, using caution not to bend beyond the minimum bend radius R for the cable. (The minimum bend radius R is specified for each cable on the respective pages.)
To check the cable type for each model, see "Table of Actuator-Controller Connection Cable Types" on page A-39.

18. About the Splash-Proof Actuator Cable

Although the scope of protective construction of the splash-proof type includes the cable, the connector at the end of the actuator cable is not splash proof. Therefore, secure the end of the actuator cable in a place that is not prone to water spills. (For this reason, the actuator cable for a splash-proof model is 2m long)

19. Service Life

The service life of the actuator is directly related to the service life of the components that make up the actuator (guide, ball screw, motor, etc.).
Moreover, the service life for these components changes significantly depending on the usage requirements. For example, each guide has an allowable load moment (see page A-5). If the guide is hypothetically used at half the moment of the allowable moment, its service life is eight times more than the specified service life.
If used conservatively, it can be used for 10 years or more.
Therefore, when selecting a model, it is recommended that you select a model with more head room.

20. Warranty

The warranty period expires upon elapse of one of the following periods, whichever occurs first.

- 18 months after shipment from IAI factory in Japan
- 12 months after delivery to the location specified
- 2500 hours after start of operation

IAI will repair free of charge any actuator defects due to craftsmanship or material that may occur during the above warranty period despite use under appropriate conditions. Note, however, that defects resulting from handling or use in any condition or environment not specified in the catalog, operation manual are excluded from the scope of warranty. The warranty covers only the actuator delivered by IAI or by IAI authorized distributors, and any secondary losses arising from a failure of the delivered product is excluded from the scope of warranty.
The defective actuator must be sent in for repair.

Controller Overview

The RoboCylinder model can be selected from an ultra-simple type, which is operable with the same controls as a solenoid valve, to a high functionality type compatible with networks; A variety of models are available according to the customer's usage.
Controller types can be categorized according to the 3 groups below based on their operations.

RoboCylinder Controllers

Positioner Type

- Operable only with an ON/OFF signal; easy-to-operate type.
- Operable with the same signal as a solenoid valve.
- Pulse train input type is available as well which is operable freely based on the customer's control.

Program Type

- Standalone operation available without master devices such as a PLC.
- Interpolated motion for 2-6 axes is possible; available for application and transferring movements.

Network Type

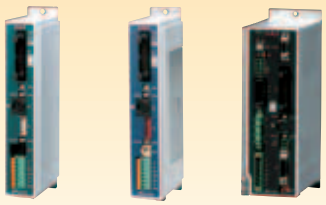
- Connection to a main field network such as ProfiBus or DeviceNet is available; applicable for large scale equipment.
- Position can be specified directly using a numeric value; there will be no limit of positioning points.
- Only one dedicated cable is needed; The number of operational steps will be significantly reduced.

3-Position Controller
AC115V/AC230V Type

PMEC/AMEC

3-Position Controller
DC24V Type

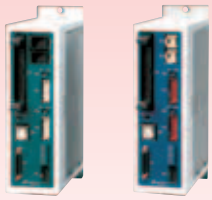
PSEP/ASEP



Position Controller
DC24V/AC115V/AC230V Type

PCON/ACON/SCON

See page 465.



Program Controller
DC24V Type

PSEL/ASEL

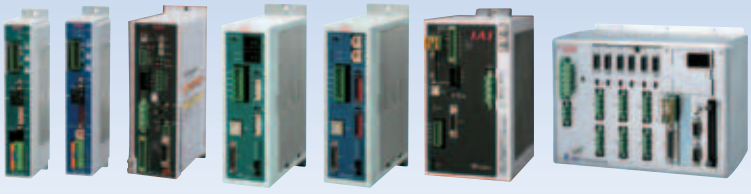
Program Controller
AC115V/AC230V Type

SSEL/XSEL

See page 467.

Network Dedicated Controller
DC24V Type

RPCON/RACON



Network Compatible Controller
DC24V/AC115V/AC230V Type

PCON/ACON/SCON/PSEL/ASEL/SSEL/XSEL

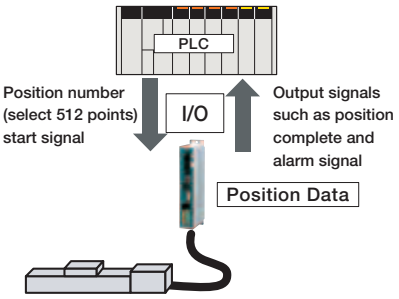
See page 469.

Positioner Type

The positioner type controller stores positions to which the actuator is moved by specifying a target position number.
In particular, PMEC/AMEC, PSEP/ASEP controllers specify 2 or 3 positions and can be operated with the same signals used for an air cylinder.

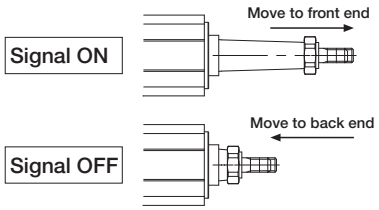
1 No programming needed

The positioner type controller operates by selecting the target position number externally using I/O after teaching the position data.
Therefore, no operation programming is needed, allowing for immediate operation directly after mounting to the equipment.



2 Operation using the same signal as solenoid valve possible (PMEC/AMEC, PSEP/ASEP controllers)

Same as single solenoid-type valve, traveling between front/back ends is possible only by the single ON/OFF.
Furthermore, if the double solenoid-type valve signal (two signals) are used, positioning at 3 points including an intermediate position is possible.



3 Reasonable price

A reasonable price range is offered for the pulse motor type controllers which maintain the effective functionality of a servo motor.
The PMEC controller, including the power supply, PC software and communication cable, is sold as a set at a reasonable price.

4 No homing needed for absolute type and simple absolute type

A direct operation without homing upon power-on is possible if an absolute-type actuator and controller are used with the SCON Controller.
Other controllers(*) are also operable without homing just like the absolute-type actuator by installing the simple absolute unit between the actuator and the controller.
(*) Except PMEC/AMEC

PMEC/AMEC Controller

■Every element needed for operation such as the controller, power supply, PC software and communication cable, etc. are supplied in the set so that direct operation right after the purchase is possible.

■Intuitive operation is possible without the need for instruction. Acceleration/deceleration and speed can be programmed from the front panel of the controller.

■Operable with the same signals as a solenoid valve.

■Power supply of the controller is single-phase AC115V/AC230V (Actually only AC115V for AMEC)

See page 477.

PSEP/ASEP Controller

■Operable with the same signals as a solenoid valve.

■Splash-proof type having good resistance to water splashes.

■Simple absolute unit SEP-ABU eliminates the need for homing upon power-on.

■Controller power supply: DC24V

See page 487.

PCON/ACON/SCON Controller

■Positioning is possible for up to 512 points.

■Compatible for pulse train input control.

■Incremental type and absolute type are available for the SCON. Same as the absolute type; no homing is needed for the PCON/ACON with an incremental type actuator using the simple absolute unit PCON/ACON-ABU.

■Controller power supply is DC24V for PCON/ACON and single-phase AC115V/230V for SCON.

See page 525.

See page 535.

See page 547.

Program Type

The program type controller executes programs that are input to it.
Programs input to the controller are used to perform various tasks such as operating the actuator and communicating with external equipment. Ideal for small systems where a PLC is not required which leads to cost savings.

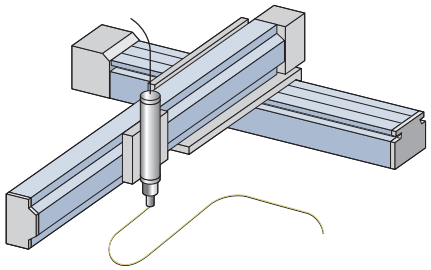
1 High-level control available using simple language.

A program is generated for the program type controller using the simple and easy Super SEL Language to execute operation of the actuator and communication between peripheral equipment.
Expert knowledge is not needed to use the Super SEL Language, so it's easy to create programs even for beginners.

No.	B	E	N	Cnd	Cmnd	Operand 1	Operand 2
1					HOME	100	
2					HOME	11	
3					VEL	200	
4					WTON	1	
5					MOVL	1	
6					BTON	301	
7					WTON	2	
8					BTOF	301	
9					MOVL	2	
10					BTON	302	

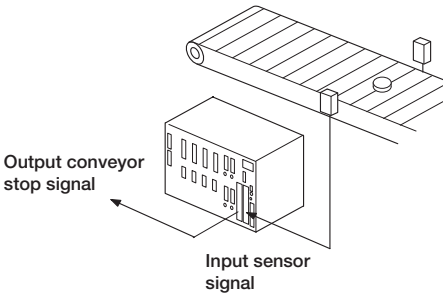
2 Interpolation possible up to 2/6 axes

Simultaneous movement of the actuators are possible up to 2 axes for PSEL/ASEL/SSEL controllers and 6 axes for the XSEL controller.
Depending on the program, interpolation is available to easily perform arc or path movements needed for dispensing jobs.



3 Controlling external equipment is possible

Multi-purpose I/O signals are available for the controller which makes communication with peripheral equipment possible.
Therefore, receiving signals from sensors and such through the controller or outputting signals from the controller to lamps or moving equipment, etc. to operate them is possible.



4 No homing needed for absolute type controller

A direct operation without homing is possible upon power-on if an absolute-type actuator is applied for ASEL/SSEL/XSEL controllers with internal absolut module.
The PSEL controller is also operable without homing just like an absolute-type actuator by installing the simple absolute unit PCON-ABU between the actuator and the controller.

PSEL/ASEL/SSEL Controller

- Program controller with reasonable price and compact body.
- Interpolation of up to 2 axes is possible which is applicable for dispensing jobs.
- By selecting the positioner mode, can be used in the same manner as the position controller.
- Communication via PC USB port and direct USB cable is possible with integrated USB port.
- Can store up to 1500 points for PSEL/ASEL and 20000 points for SSEL.
- Absolute type available for ASEL/SSEL controllers. PSEL controller is available for the same operation if a simple absolute unit is connected.
- Controller power supply is DC24V for PSEL/ASEL and single-phase AC115V/230V for SSEL.

PSEL

See page 557.

ASEL

See page 567.

SSEL

See page 577.

XSEL Controller

- High-function controller with up to 6 axes that can be simultaneously controlled.
- Precise dispensing jobs are possible through high velocity uniformity and tracking accuracy.
- Absolute type available for selection.
- 20000 points can be stored for positioning.
- Expansion I/O is available up to a maximum of 384 points.
- P/Q type controls PCON/ACON/SCON/ROBONET via serial communication for up to 16 axes. (→ Refer to Gateway function p469)
- Controller power supply is single-phase AC115V/230V for XSEL-KE/KET type and single/three-phase AC230V for XSEL-P/Q type.

XSEL

See page 587.

Network Type

The network type controller is available for field networks or serial communication.
Compatible with the majority of main field networks widely used over the world.
There is a large variety available for use with various kinds of factory automation equipment such as a PLC or touch panel, etc.

1 Compatible with main field networks

Direct connection is possible with main field networks such as ProfiBus, DeviceNet or EtherCAT, etc.
A position controller is available for an operation defined by movement specified with position number and direct coordinate value using the network. When defining coordinate values directly, there is no restriction for the number of positioning points.

■Compatible Network and Function

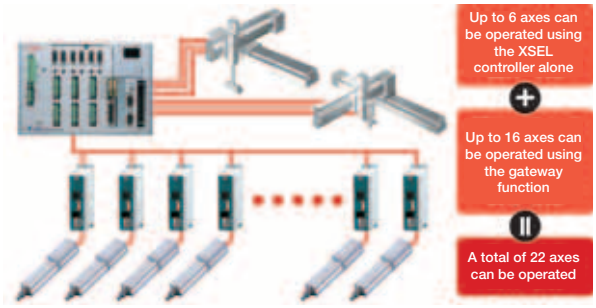
Controller series		ROBONET	PCON	ACON	SCON	PSEL	ASEL	SSEL	XSEL
Network Type	DeviceNet / CompoNet	○ / –	○ / ○	○ / ○	○ / ○	○ / –	○ / –	○ / –	○ / –
	EtherCAT	–	○	○	○	–	–	–	–
	CC-Link / MechatroLink	○ / –	○ / ○	○ / ○	○ / ○	○ / –	○ / –	○ / –	○ / –
	Sercos III (**)	–	○	○	○	–	–	–	–
	ProfiBus / ProfiNet	○ / –	○ / ○	○ / ○	○ / ○	○ / –	○ / –	○ / –	○ / –
	Ethernet / Ethernet-IP	– / –	– / ○	– / ○	– / ○	– / –	– / –	– / –	○ / –
Applicable RoboCylinder		RCP2/RCP3 RCA/RCA2/RCL	RCP2/RCP3	RCA/RCA2/RCL	RCS2	RCP2/RCP3	RCA/RCA2/RCL	RCS2	RCS2
Number of positioning points		768 points (*)	768 points (*)	768 points (*)	512 points	1500 points	1500 points	20000 points	20000 points
Operating Method	Movement by specifying positions	○	○	○	○	○	○	○	○
	Movement by specifying direct values	○	○	○	–	–	–	–	–

(*) When it is operated by movement by specifying direct values, the number of positioning points is unlimited. (**) In planning stage.

2 RC Gateway function for XSEL controller

The RoboCylinder gateway function controls the RoboCylinder via serial communication from the XSEL controller.
Wiring work is significantly reduced, comparing with PIO control. The RoboCylinder can be operated using the XSEL controller via the SEL Language.

■RoboCylinder gateway function is available in the controller firmware (main CPU application) V0.68 or higher (for P/Q type), or V0.34 or higher (for PX/QX type).
■The version of the PC software (IA-101-X-MW) that is compatible with the RoboCylinder gateway function is V7.2.0.0 or later.
■The teaching pendants compatible with the RoboCylinder gateway function are IA-T-X (XD) V1.4.6 or later, or SEL-T (TD) V1.0.1 or later.



■Type

Item	Description
Number of maximum connected axes for RoboCylinder	16 axes
Number of maximum operation axes for XSEL Controller	6 axes
Available ROBO Cylinder series	ERC2/RCP2/RCP3/RCA/RCA2/RCS2
Connectible controller	ERC2/PCON/ACON/SCON/ROBONET
Communication system	Modbus

(Comparison of PIO Control and Gateway function)

	PIO control	Gateway function
Wiring process	Many wires	Only two wires
Control method	Only ON/OFF of I/O	Program available
Movement position	Requires input into controller ahead of time	Can send command from XSEL controller
Current actuator position	Verify with end position No.	Can numerically check current position

■Connectible Units

The following units are required to use the RoboCylinder Gateway function. Please contact us for further details for wiring.

Name	Model	Notes
RS232 conversion unit	RCB-CV-GW	1 unit needed for each XSEL controller.
Communication cable	CB-RCB-SIO050	1 cable needed for each XSEL controller.
Controller link cable	CB-RCB-CTL002	1 cable needed for each RoboCylinder controller to be connected.

3 Connection with various types of factory automation equipment

Available for direct connection with a touch panel, PLC (serial communication unit) or vision system of various manufacturers.

■Main Connecting Equipment * Please contact us for further details for connectable equipment, etc.

Name of product	Manufacturer
Touch Panel	Digital, Omron, Hakko Electronics, Keyence, Mitsubishi Electric, Beijer, Proface, Red Lion
PLC (Serial communication)	Omron, Mitsubishi Electric, Keyence
Vision System	Omron, Cognex, Keyence

ROBONET Controller

■ROBONET is a controller dedicated for field networks.
Wiring was reduced significantly as it can be connected with up to a maximum of 16 control units for a single gateway unit which is compatible with various networks.

■Operation is available with target position, speed or acceleration, etc. sent through a network by means of a value; this is effective when target position changes based on conditions.

■Simple absolute unit can be installed to make homing unnecessary.

■Controller power supply; DC24V

See page 503.

Controller compatible with field network * Network type set for each controller

See page 525.

See page 535.

See page 547.

See page 557.

See page 567.

See page 577.

■Can be connected to the main network directly.

■The position controller is able to be operated with the value of the target position, speed or acceleration etc. directly sent via the network.

See page 587.

RCM-PM-01

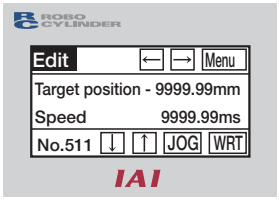
■ Model RCM-PM-01

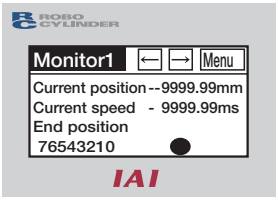
Position controller
Touch panel

Characteristics

1 Controller data is easy to enter, amend or monitor.

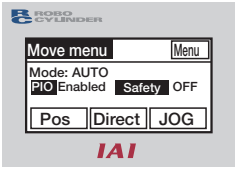
Entering, changing and monitoring (of actual position, speed or input/output condition, etc.)
controller position data is possible without connecting teaching box or computer software if touch panel display is installed on the device. (*1)
Easy-to-use even for beginners as the display is interactive.
(* 1) Teaching box or software for PC is needed to reset error or change parameter.



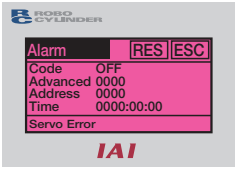


2 Able to check the current condition at a glance with 3 back lights of good visibility.

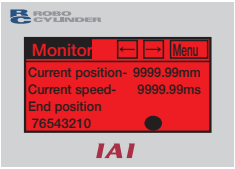
Improved operativity with easy-to-see display with back-light.
Color of back light changes depending on three step conditions of normal, alarmed and emergency stop generation which is white, pink and red respectively; this makes very easy to identify current situation.



Normal (white)



Alarm activated (pink)



Emergency stop (red)

3 Able to display current position, speed, electric current value and alarm up to 4 axes simultaneously when connected with ROBONET.

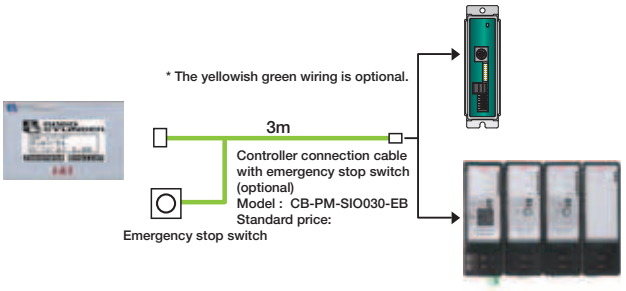
Displays controller condition of ROBONET simultaneously up to 4 axes when connected with ROBONET Gateway unit.
(Able to display up to 16 axes by switching the panel.)
The details of the display show the actual position of the operating actuator, speed, electric current value, alarm code, etc.

Model/Price

Model	RCM-PM-01

Connecting methods

[When Connecting to the Controller's Power Source]



RCM-PM-01

Pin No.	Signal Name
1	DC24V
2	GND
3	FG
4	RS422 SD+
5	RS422 SD-
6	RS422 RD+
7	RS422 RD-
8	RS422 E

120Ω1/4W

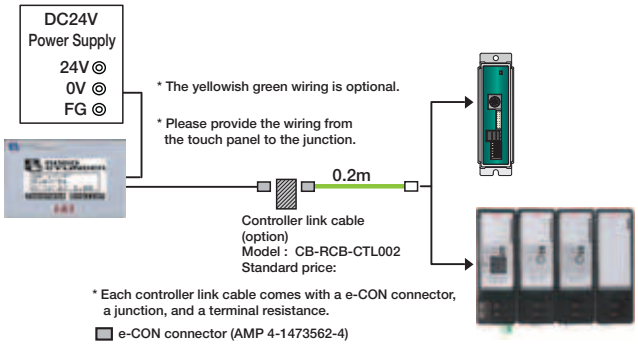
Emergency stop switch

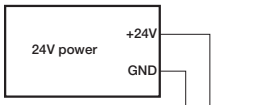
Controller SIO port

Pin No.	Signal Name
1	SGA
2	SGB
3	5V
4	ENB
5	EMGA
6	24V
7	GND
8	EMGB

[MiniDIN]

[When Connecting to a Separate Power Source]





RCM-PM-01

Pin No.	Signal Name
1	DC24V
2	GND
3	FG
4	RS422 SD+
5	RS422 SD-
6	RS422 RD+
7	RS422 RD-
8	RS422 E

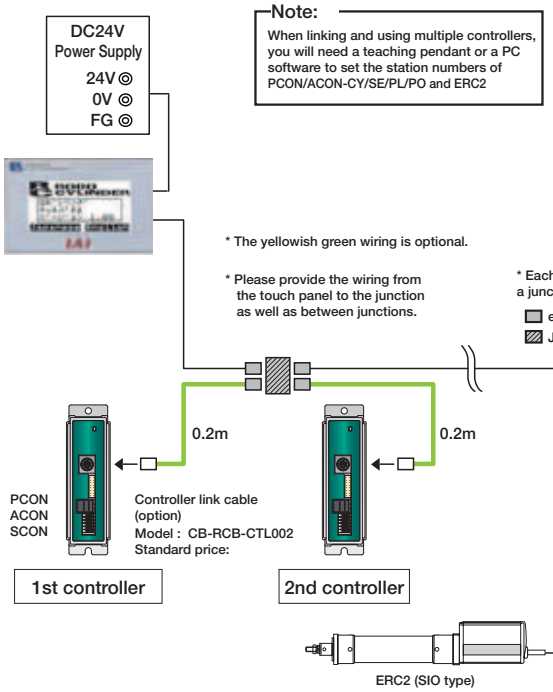
Controller SIO port

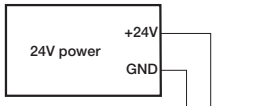
Pin No.	Signal Name
1	SGA
2	SGB
3	5V
4	ENB
5	EMGA
6	24V
7	GND
8	EMGB

[MiniDIN]

* The above connection diagram only shows the serial line. Please see the instructions manual for the controllerfor connecting the power and emergency stop lines.

[When Connecting to Multiple Controllers]





RCM-PM-01

Pin No.	Signal Name
1	DC24V
2	GND
3	FG
4	RS422 SD+
5	RS422 SD-
6	RS422 RD+
7	RS422 RD-
8	RS422 E

1st controller SIO port

Pin No.	Signal Name
1	SGA
2	SGB
3	5V
4	ENB
5	EMGA
6	24V
7	GND
8	EMGB

[MiniDIN]

2nd controller SIO port

Pin No.	Signal Name
1	SGA
2	SGB
3	5V
4	ENB
5	EMGA
6	24V
7	GND
8	EMGB

[MiniDIN]

nth controller SIO port

Pin No.	Signal Name
1	SGA
2	SGB
3	5V
4	ENB
5	EMGA
6	24V
7	GND
8	EMGB

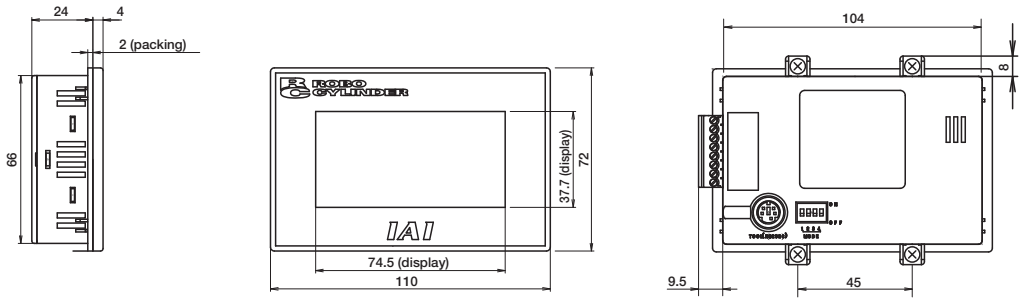
[MiniDIN]

* The above connection diagram only shows the serial line. Please see the instructions manual for the controller for connecting the power and emergency stop lines.

Model/Specification

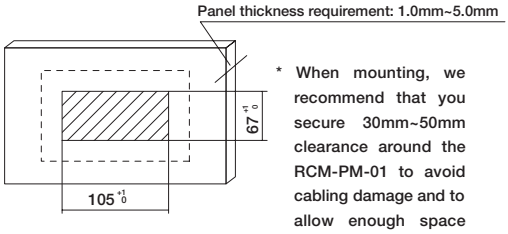
Model		RCM-PM-01
Basic Specifications	Rated Voltage	DC24V
	Operational Voltage Range	DC21.6∽26.4V
	Power Consumption	2W or less (80mA or less)
	Operating Ambient Temp./Humidity	0∽50°C 20∽85% RH (non-condensing)
	Environment resistance	IP65 (initial state) dust- and splash-proof, only from front side of the panel
	Mass	Approx. 160g
Communications Specifications	Communications Standard	RS485 Compliant
	Communication Conditions	Transfer speed: 115.200bps, Data bit: 8-bit, Non-parity, Stop bit; 1-bit
	Protocol	Modbus/RTU
	Connectible Controllers	PCON/ACON/SCON/ERC2/ROBONET *Connectible up to 16 controllers max.
function	Monitor	Current position, current speed, alarm code, alarm message PIO status bit, speed wave form, current wave form, current, rated current ratio
	Alarm list	History: 16 entries (code, detailed code, address occurred, message)
	Position table edit	Target position, position, acceleration, positioning width, pushing, separate zone±, incremental setting, threshold, accel/decel. mode Stop mode, importing current position via JOG/inching/direct teaching, warning function for abnormal input value
	Move function	Position movement, direct movement, JOG movement, jump-to-screen function when alarm is triggered
	Edit parameters	Zone signal, software limit, select PIO pattern, JOG speed, inching distance, pushing force, safety speed
	Backlight	White (normal), Pink (alarm triggered), red (emergency stop)
	Display adjustments	Adjustable contrast and brightness for the backlight
	Gateway Monitor Functions	Current position (4 axes), current speed (4 axes), current (4 axes) current for all axes, alarm monitor for all axes, Gateway system status

Dimensions



Example of body installation

■Dimensions for Cutting and Drilling Holes



* When mounting, we recommend that you secure 30mm~50mm clearance around the RCM-PM-01 to avoid cabling damage and to allow enough space for mounting.

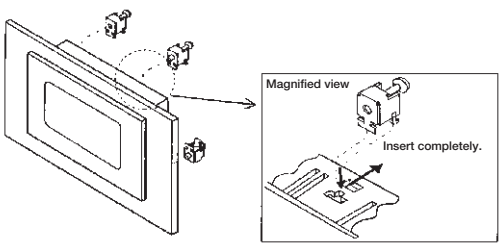
Caution Never block the slits on the actuator.

■Mounting Method (Using Supplied 4 Mounting Brackets)

① Insert the RCM-PM-01 to the mounting plate.
② Attach the mounting brackets to the slots on RCM-PM-01, and secur e the RCM-PM-01 onto the mounting place by tightening the screw.

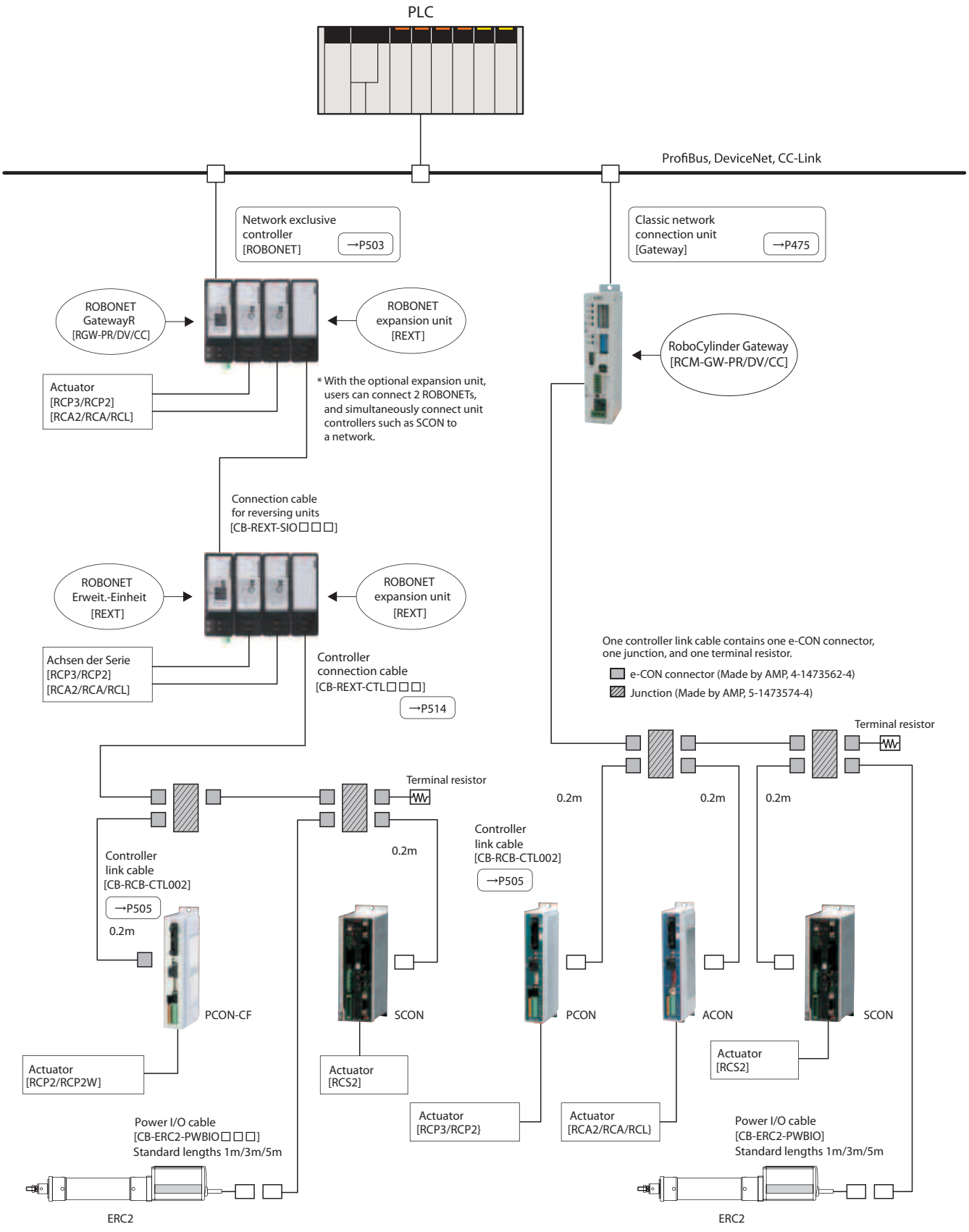
Note 1) Screw tightening torque 0.1 N·m~0.25N·m

Note 2) Excessive tightening of the scr ews may warp the front panel, causing the touch switches to malfunction. Please mount using appropriate torque.



Fieldbus Network System

When operating RoboCylinders over a fieldbus network, a network-dedicated controller ROBONET can be used or a stand-alone controller (PCON/ACON/SCON) can be used connected to a gateway unit or directly via optional fieldbus interface.

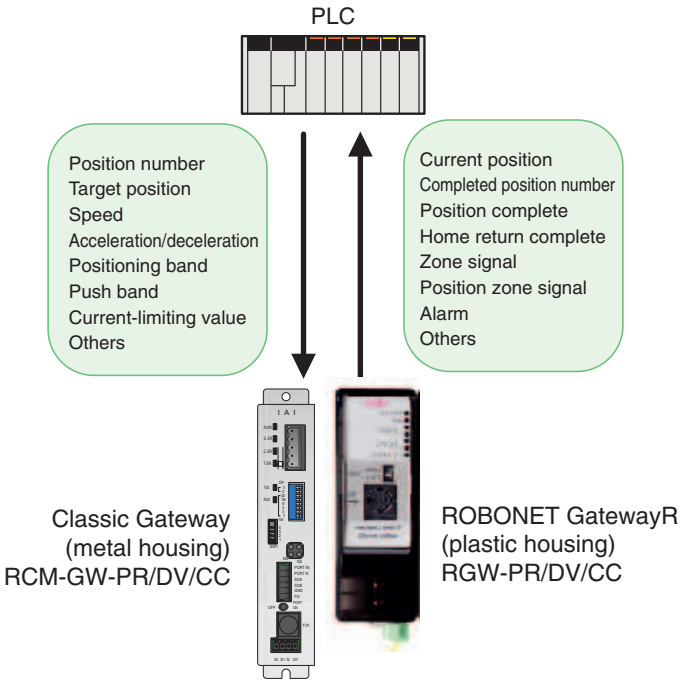


Gateway Unit

The gateway unit is a conversion unit for connecting a RoboCylinder controller to a fieldbus network such as Profibus or DeviceNet. Connect a gateway unit to your field network, and link the gateway unit and each controller via serial communication (RS485). Numerical data such as coordinates, speeds, accelerations and current values can be sent and received between the network master (PLC) and controller by means of I/O-level communication.

Features

1. Move the actuator by specifying positions from a PLC via fieldbus network.
2. Perform push-motion operation via fieldbus network.
3. Operate the actuator by directly sending the target position, speed, acceleration/deceleration and positioning band as numerical values from a PLC.
4. Read the current actuator position and various signals using a PLC.
5. Connectable to a maximum of 16 axes.



Functions

One of the following three operation modes can be selected.

(1) Position-number specification mode

Input target positions, speeds, accelerations/decelerations, positioning bands and other settings to the controller in advance as position data, and specify a desired position number via network, just like you do with PIO signals, to move the actuator. A maximum of 64 positioning points (ROBONET GatewayR: 768) can be set. Various status signals can be read using a PLC.

(2) Positioning-data specification mode

Specify a desired target position, speed, acceleration/deceleration, positioning band, push band, current-limiting value, etc., directly as numerical values to move the actuator or cause it to perform push-motion operation. Various status signals can be input/output and current position data read using a PLC.

(3) Simple direct/position-number specification mode

Call desired position data except for a target position (by specifying an applicable position number), and specify only a target position as a numerical value, to move the actuator. A maximum of 512 positioning points (ROBONET GatewayR: 768) can be set.

Serial Communication System

Please use the options below to connect controller by link through serial communication.

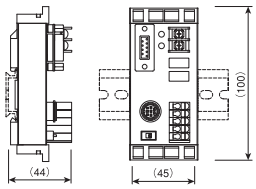
SIO Converter

RS232 communication available transformer with serial communication cable of power supply and I/O cable(SGA, SGB) connected and pin-cross cable D-Sub9 for connecting PC used.

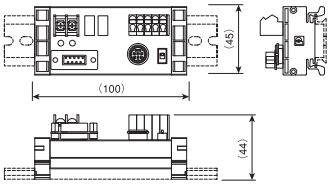
Characteristics Able to separate the connecting point for teaching box or PC connection cable from the body and install them anyway.

Able to operate through PC serial communication by connecting multiple axes.

■Vertical type Model: RCB-TU-SIO-A



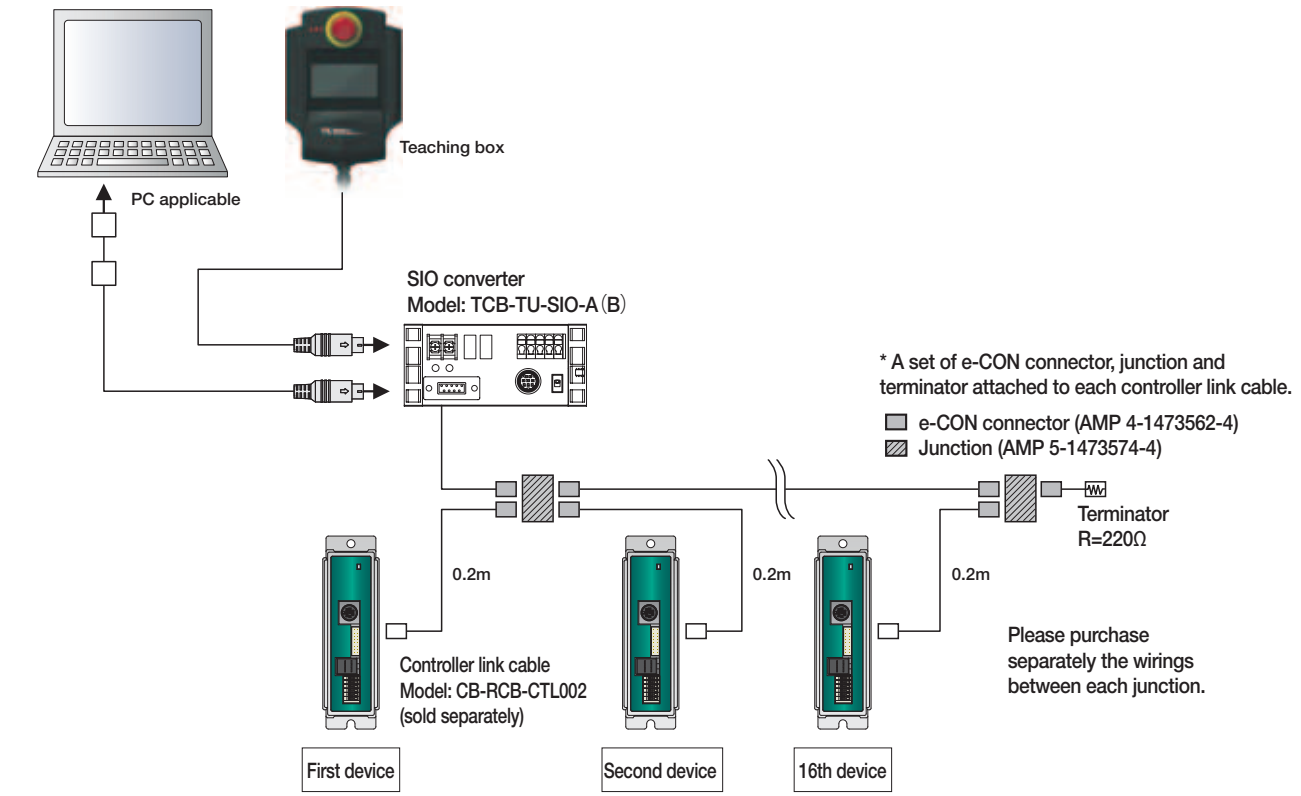
■Horizontal type Model: RCB-TU-SIO-A



type

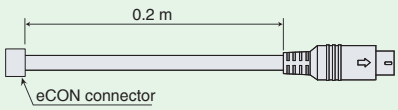
Item	type
Power supply voltage	DC24V±10%
Ambient Operating Temp./Humidity	0 ~ 50°C, 85% RH or less (Non-condensing)
Terminator	120Ω (Integrated)

Wiring diagram



■ Controller link cable

(e-CONconnector, junction and terminator attached)
Model CB-RCB-CTL002



Color	Signal	No.
Yellow	SGA	1
Orange	SGB	2
Blue	GND	3
		4

No.	Signal	Color
1	SGA	Yellow
2	SGB	Orange
3	+5V	
4	ENBL	
5	EMGA	
6	+24V	
7	GND	Blue
8	EMGB	

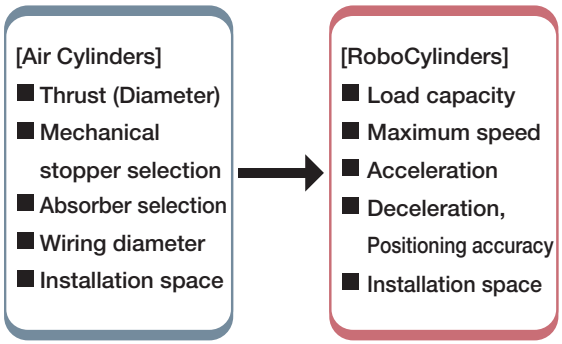
Considerations when Switching from Air Cylinders

Air Cylinder and RoboCylinder

Air cylinders are devices used to push and grasp objects by means of supplying and releasing compressed air. Air cylinders are used widely in all industries, mainly for transfer equipment, assembly systems, various automation systems, etc.
Air cylinders generally have diameters of between 4mm and 320mm, and their lengths (strokes) can also be set in fine steps. There are several tens to hundreds of thousands of different air cylinder products, which makes it easy to select optimal models for a variety of applications. However, since product lines are overly complex, many with identical specs, it can be difficult to select the best model for your specifications.
For this reason, there are many cases where air cylinders are selected largely out of past experience and familiarity. RoboCylinders are easy-to-use electric cylinders offering a variety of functions not achievable with air cylinders. The RoboCylinder product family makes it easy for you to select the model that best suits the needs of your application. However, the controls and configuration possibilities of RoboCylinders are completely different from air cylinders.
This section explains some of the key points to consider when switching from air cylinders to RoboCylinders.

Overview of Switching

The following explains the differences in the basic items to be checked when selecting RoboCylinders and air cylinders.
Since both are linear motion actuators, there are some common matters that must be taken into consideration. However, the different configurations and controls described above result in different designations for adjustments and check items between the two. A comparison of these various items is shown at right.



The above diagram shows that the two have different mechanical viewpoints to consider.

Installation Space

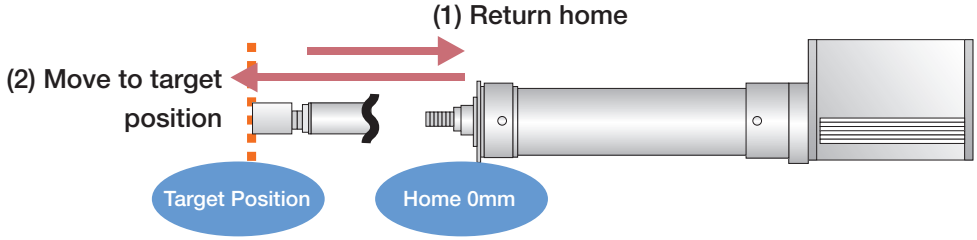
RoboCylinders are driven by a motor. Compared with air cylinders, simply from a size perspective, the RoboCylinder requires more attention paid to space requirements for installation.

Home Return

Unlike air cylinders, RoboCylinder operation is based on a “coordinates” concept. A home return operation is necessary at the beginning of operation because operations are controlled in movement quantities that are always referenced against a home point (0 point).

Specifically, in the case of incremental specifications, bear in mind that a pushing operation to the actuator stroke end will be performed as the initial operation when the power is turned ON.

- Incremental Specification: Return home operation after power is turned ON
- Absolute Specification : Absolute reset operation during initialization



Critical Rotating Speed

The ball screw inevitably deflects due to bending and its own deadweight. The RoboCylinder operates at high speeds causing the ball screw to rotate faster, and as the rotations increase the screw deflection also increases until the rotating axis is ultimately damaged. Hazardous rotational speeds that may damage the rotary axis are referred to as “critical speeds”, “whirling speeds” or “whipping speeds”.
Ball screw type RoboCylinders operate linearly as the ball screw is rotated with the end of the ball screw supported by a bearing. Although the maximum speed is specified for each RoboCylinder in accordance with the actuator type, some models with certain strokes have their maximum speed set in consideration of the aforementioned critical rotating speeds.

General Purpose (Types, Modes, Parameters)

RoboCylinders offer the “air-cylinder specification (or air cylinder mode)” that allows the RoboCylinder to be used just like an air cylinder. When using these, it is possible to operate the actuator by simple ON/OFF control by an external signal in exactly the same way as an air cylinder. This type or mode may be sufficient in the case of a simple swap-out, but a variety of types and parameters have been introduced for customers who desire higher value-added uses.
Feel free to contact IAI to discuss features to match your use conditions and needs when the equipment is actually installed.

Maintenance

The key maintenance points of air cylinders and RoboCylinders are compared.
Air cylinders require periodic maintenance performed according to the frequency and conditions of use. Although air cylinders offer a certain level of flexibility in that minor damage or malfunction can be ignored by means of increasing the source air pressure and moving the cylinder with a greater force, ignoring maintenance will inevitably shorten the service life of the air cylinder.
On the other hand, RoboCylinders have a more complex structure and use a greater number of parts and are therefore seen as requiring cumbersome maintenance work. This is wrong. RoboCylinders are clearly easier to use and offer longer life than air cylinders. Of course, RoboCylinders also require lubrication of sliding parts just as air cylinders do. However, RoboCylinders are equipped with a lubrication unit (AQ Seal) for ball screw and the sliding parts of the guides. This ensures a long maintenance-free period (5000 km of traveled distance, or three years). After 5000 km or travel or 3 years, greasing every 6 months to 1 year as instructed in the Operating Manual will vastly prolong the service life of the product.
In addition, absolute type controllers are currently equipped with a position retention battery. Since this is a consumable part, it must be periodically replaced (for periods that vary with the product).

[Primary Maintenance Tasks]

[Air Cylinders]
- Lubricating sliding parts
- Replacing gasket
- Draining
- Replacing absorber

[RoboCylinders]
- Lubricating ball screw and guide (after AQ seals have worn out)
- Replacing battery (absolute encoder types only)

Operation

Air cylinders are generally operated with the use of a direction control valve to determine the direction of reciprocating motion, as well as a flow control valve (speed controller) to determine the speed. Immediately after their system is started up, many users operate the air cylinder at low speed by restricting the flow control valve.

The same procedure is also recommended for RoboCylinders after the system is started up.
With RoboCylinders, “speed setting” replaces the flow control valve. Operate your RoboCylinder at speeds where safety is ensured, and then change to the desired speed after safety is confirmed.

Service Life and Moment

One of the main factors related to an actuator's service life is the "load rating".
There are two types of load rating: A static load is the weight of a load that leaves a small amount of indentation when the load is applied. A dynamic load is the weight of a load that maintains a constant survival probably of the guide when the load is applied while moving a constant distant.
Guide manufacturers rate dynamic load values to maintain a 90% survival rate at a travel distance of 50km. However, when taking account the speed of movement and work rate, the actual travel distance needs to be 5000 to 10000km. While the life of a guide is sufficiently long for radial loads, it is actually the moment load that is offset from the guide center that is most problematic to its service life.
The service life for IAI actuators as documented in this catalog shows the allowable dynamic moment based on a 5000 or 10000km service life.

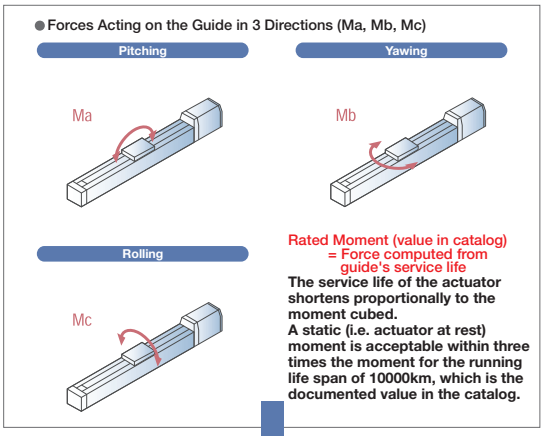
IAI uses the following equation calculate the service life: (for 10000km service life)

$$L_{10}=\left(\frac{C_{IA}}{P}\right)^{3}\cdot 10000\text{km}$$

L_{10} : Service life (90% Survival Probability)
C_{IA} : Allowable Dynamic Moment in IAI Catalog
P : Moment used

Allowable Dynamic Moment

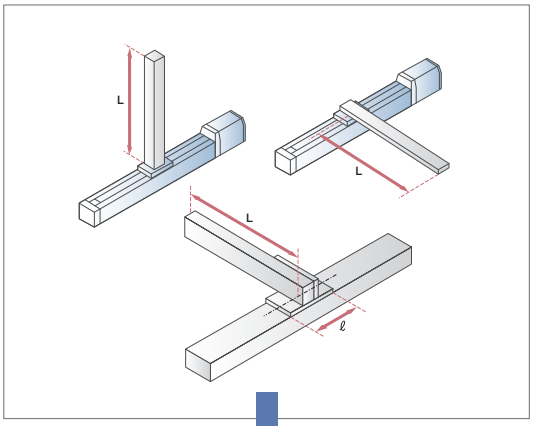
The allowable dynamic moment is the maximum offset load exerted on the slider, calculated from the guide service life. The direction in which force is exerted on the guide is categorized into 3 directions - Ma (pitch), Mb (yaw), Mc (roll) - the tolerance for each of which are set for each actuator. Applying a moment exceeding the allowable value will reduce the service life of the actuator. Use an auxiliary guide when working within or in excess of these tolerances.



The allowable dynamic moment is calculated from the service life of the guide.

Overhang load length

An overhang load length is specified for a slider-type actuator to indicate the length of overhang (offset) from the actuator.
When the length of an object mounted to the slider actuator exceeds this length, it will generate vibration and increase the settling time. So, pay attention to the allowable overhang length as well as the allowable dynamic moment.



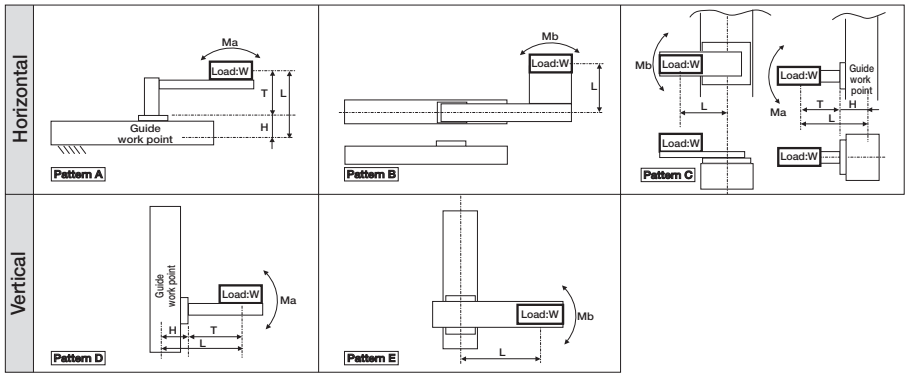
The allowable overhang load length is determined by the slider length.

An overhang that exceeds the allowable overhang length will generate vibration and increase settling time.

L/ℓ = 5 or less
* Between 3 to 4 for a camera-equipped measuring machine.
● For example:
L/ℓ=1.2 Mechanical machine
L/ℓ= 3 Measuring machine
L/ℓ= 5 Robot

How to calculate allowable dynamic moment

M2 (N•m) = W (kg) × L (mm) × a (G) × 9.8/1000



W : Load
L : Distance from work point to the center of gravity of payload (L=T+H)
T : Distance from top surface of slider to the center of gravity of payload
H : Distance from guide work point to the top surface of slider
a : Specified acceleration

Allowable Dynamic Moment and Allowable Static Moment

There are two types of moment that can be applied to the the guide: the allowable dynamic moment and the allowable static moment.
The allowable dynamic moment is calculated from the travel life (when flaking occurs) when moved with the moment load applied.
In contrast, the static moment is calculated from the load that causes permanent deformation to the steel ball or its rolling surface (i.e. rated static moment), taking into account the rigidity and deformity of the base.

[Allowable Dynamic Moment]

IAI's catalog contains the allowable dynamic moments based on a load coefficient of 1.2 and 10000km or 5000km.
This value is different from the so-called basic rated dynamic moment, which is based on a 50km travel life.
To calculate the basic rated dynamic moment for a 50km travel life, use the following equation.

$$M_{50}=f_w \times M_S \div \left(\frac{50}{S}\right)^{\frac{1}{3}} \quad \cdots\cdot \text{Equation 1}$$

M_S : Allowable dynamic moment at an assumed travel distance (catalog value)
S : IAI catalog assumed travel life (5000km or 10000km)
f_w : Load coefficient (=1.2)
M_{50} : Basic rated dynamic moment (50km travel life)

The allowable dynamic moments mentioned in the catalog (10000km or 5000km life) are based on a load coefficient fw=1.2. To calculate the service life of a guide with a different load coefficient, use Table 1 below to determine the load coefficient that matches your requirements.

Table 1: Load Coefficients

Operation and Load Requirements	Load Coefficient fw
Slow operation with light vibration/shock (1500mm/s or less, 0.3G or less)	1.0～1.5
Moderate vibration/shock, abrupt braking and accelerating (2500mm/s or less, 1.0G or less)	1.5～2.0
Operation with abrupt acceleration/deceleration with heavy vibration/shock (2500mm/s or faster, 1.0G or faster)	2.0～3.5

$$L_{10}=\left(\frac{C_{IA}}{P} \cdot \frac{1.2}{f_w}\right)^3 \times S \quad \cdots\cdot \text{Equation (2)}$$

L_{10} : Service life (90% Survival Probability)
C_{IA} : Allowable dynamic moment in IAI Catalog (5000km or 10000km)
P : Moment used ($\leq$ CIA)
S : IAI catalog assumed travel life (5000km or 10000km)
f_w : Load coefficient (from Table 1)

[Allowable Static Moment]

The maximum moment that can be applied to a slider at rest.
These values are calculated by taking the basic rated static moment of the slider and multiplying with the safety rate that takes into consideration any effects from the rigidity and deformity of the base.
Therefore, if a moment load is applied to the slider at rest, keep the moment within this allowable static moment. However, use caution to avoid adding any unexpected shock load from any inertia that reacts on the load.

[Basic Rated Static Moment]

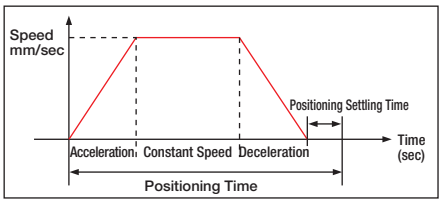
The basic rated static moment is the moment value at which the sum of the permanent deformation at the center of contact between the rolling body (steel ball) and the rolling surface (rail) is 0.0001 times the diameter of the rolling body.
These values are simply calculated strictly from the permanent deformation done to the steel ball and its rolling surface. However, the actual moment value is restricted by the rigidity and deformation of the base. Hence, the allowable static moment the actual moment that can be applied statically, taking into account those factors.

Technical Information

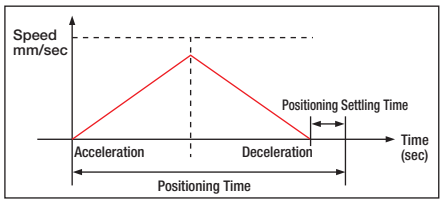
How to calculate positioning time

The actuator positioning time can be found from an equation.
Depending on the distance to be moved and the amount of acceleration/deceleration to be applied, the positioning operation can follow one of two patterns, shown below:

A Trapezoidal Pattern



B Triangular Pattern



First confirm the movement pattern as trapezoidal or triangular, then calculate the positioning time using the respective equation.

Confirming the Movement Pattern

Whether a movement pattern is trapezoidal or triangular can be determined by whether the peak speed reached after accelerating over a distance at a specified rate is greater than or less than the specified speed.

$$\text{Peak speed (Vmax)} = \sqrt{\text{Distance travelled S(mm)} \times \text{Specified acceleration}}$$

$$= \sqrt{\text{Smm} \times 9800\text{mm/sec}^2 \times \text{Acceleration setting (G)}}$$

If Vmax > V: Trapezoidal pattern

If Vmax < V: Triangular pattern, where Vmax is the peak speed reached and V is the speed that was specified.

Method of Calculating the Positioning Time

A Trapezoidal Pattern

$$\text{Positioning Time (T)} = \frac{\text{Distance (mm)}}{\text{Speed (mm/sec)}} + \frac{\text{Speed (mm/sec)}}{\text{Accel. (mm/sec}^2\text{)}} + \text{Positioning Settling Time}$$

B Triangular Pattern

$$\text{Positioning Time} = 2\sqrt{\frac{\text{Distance (mm)}}{\text{Accel. (mm/sec}^2\text{)}}} + \text{Positioning Settling Time}$$

$$\text{Accel. Time} = \frac{\text{Speed* (mm/sec)}}{\text{Accel. (mm/sec}^2\text{)}}$$

$$\text{Distance Accelerated} = \frac{\text{Accel. (mm/sec}^2\text{)} \times (\text{Accel. Time (sec)})^2}{2}$$

* Here, "Speed" refers to the specified speed in the trapezoid pattern, and the peak speed in the triangle pattern.

Note

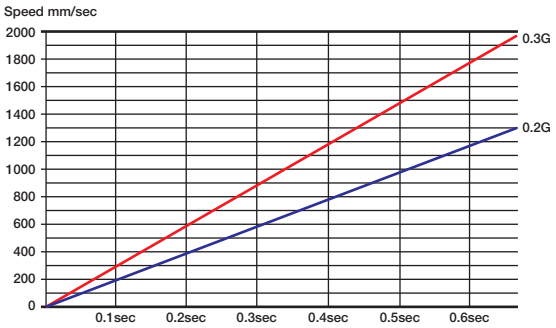
- The acceleration is calculated by the following: Acceleration setting in the controller (G)×9800mm/sec². If the acceleration setting in the controller is 0.3G, then 0.3×9800mm/sec² = 2940mm/sec².
- The positioning settling time is the time required to determine the completion of movement to the target position, typically around 0.15sec for ball screw types and 0.2sec for belt types.

Positioning time (sec)

Accel. Setting	Specified Speed (mm/sec)	Distance Moved (mm) 10	20	30	40	50	100	150	200	250	300	350	400	450	500	600	1000	1100	1300	1400
0.3G	100	0.13	0.23	0.33	0.43	0.53	1.03	1.53	2.03	2.53	3.03	3.53	4.03	4.53	5.03	6.03	10.03	11.03	13.03	14.03
	200	0.12	0.17	0.22	0.27	0.32	0.57	0.82	1.07	1.32	1.57	1.82	2.07	2.32	2.57	3.07	5.07	5.57	6.57	7.07
	300	0.12	0.16	0.2	0.24	0.27	0.44	0.6	0.77	0.94	1.1	1.27	1.44	1.6	1.77	2.1	3.44	3.77	4.44	4.77
	400	0.12	0.16	0.2	0.23	0.26	0.39	0.51	0.64	0.76	0.89	1.01	1.14	1.26	1.39	1.64	2.64	2.89	3.39	3.64
	500	0.12	0.16	0.2	0.23	0.26	0.37	0.47	0.57	0.67	0.77	0.87	0.97	1.07	1.17	1.37	2.17	2.37	2.77	2.97
	600	0.12	0.16	0.2	0.23	0.26	0.37	0.45	0.54	0.62	0.7	0.79	0.87	0.95	1.04	1.2	1.87	2.04	2.37	2.54
	700	0.12	0.16	0.2	0.23	0.26	0.37	0.45	0.52	0.6	0.67	0.74	0.81	0.88	0.95	1.1	1.67	1.81	2.1	2.24
	800	0.12	0.16	0.2	0.23	0.26	0.37	0.45	0.52	0.58	0.65	0.71	0.77	0.83	0.9	1.02	1.52	1.65	1.9	2.02
	900	0.12	0.16	0.2	0.23	0.26	0.37	0.45	0.52	0.58	0.64	0.7	0.75	0.81	0.86	0.97	1.42	1.53	1.75	1.86
	1000	0.12	0.16	0.2	0.23	0.26	0.37	0.45	0.52	0.58	0.64	0.69	0.74	0.79	0.84	0.94	1.34	1.44	1.64	1.74
	1750	0.12	0.16	0.2	0.23	0.26	0.37	0.45	0.52	0.58	0.64	0.69	0.74	0.78	0.82	0.9	1.17	1.37	1.56	1.65
	2000	0.12	0.16	0.2	0.23	0.26	0.37	0.45	0.52	0.58	0.64	0.69	0.74	0.78	0.82	0.9	1.17	1.22	1.33	1.48

Note: Does not include the positioning settling time (0.15sec for ball screw, and 0.2sec for belt). Triangular Pattern

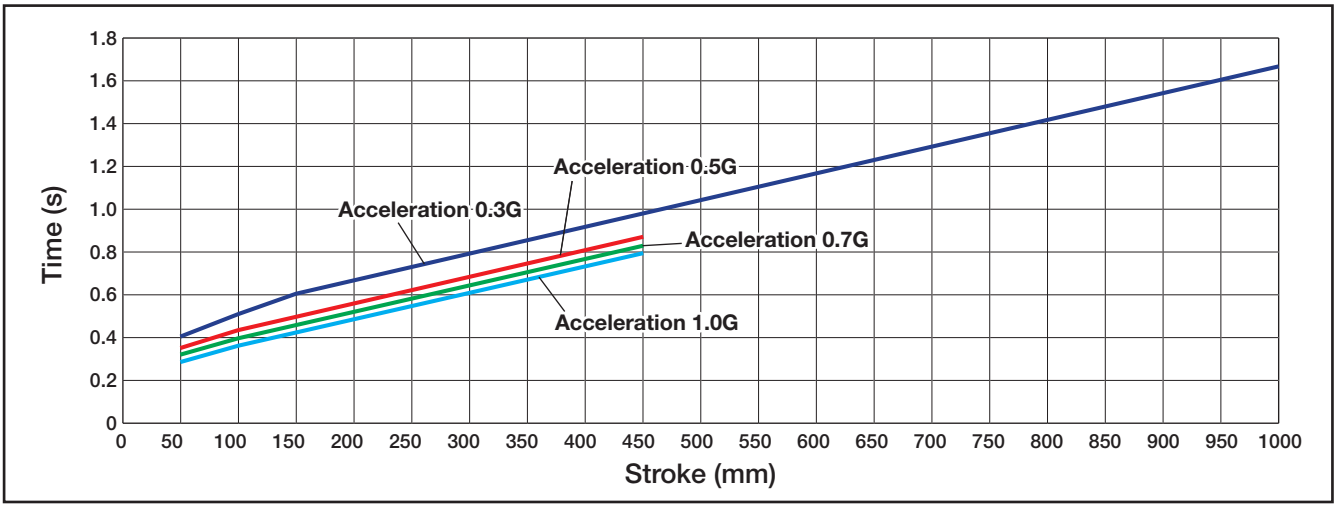
Acceleration time



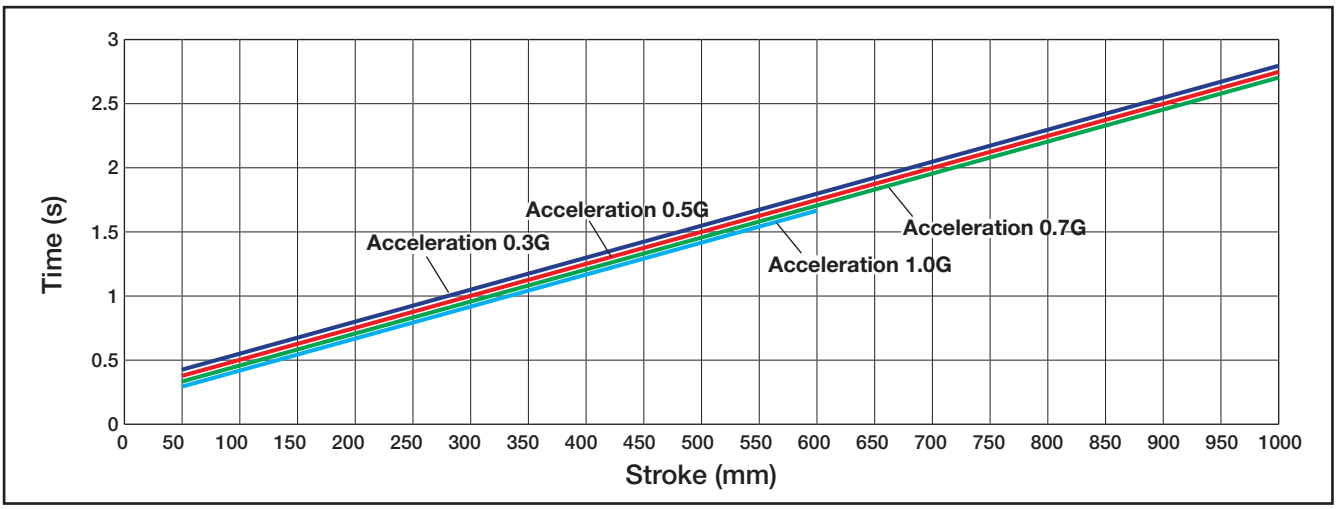
Reference Chart of Movement Time per Speed/Acceleration

The charts below show the estimated time required for the movement per speed/acceleration. Please use it as a reference for cycle time.
(Note) Stroke indicates the one-sided and unidirectional movement distance. For RCP2, RCP3 and ERC2, please note that the maximum speed varies depending on load capacity.

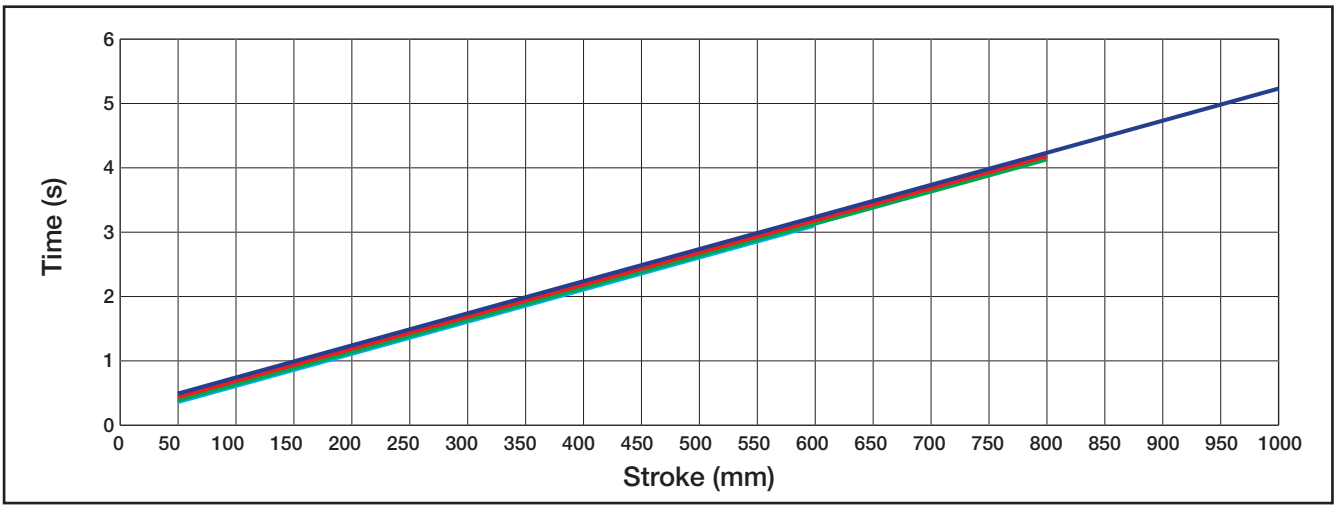
Speed 800mm/s



Speed 400mm/s



Speed 200mm/s



Information on special orders

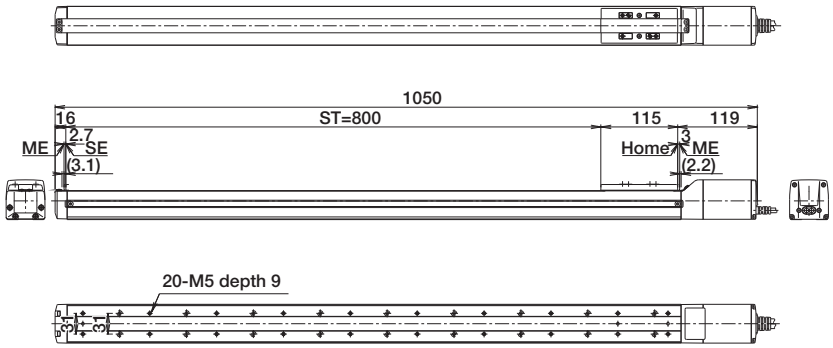
If you don't find your desired product in this catalog,
feel free to contact us, as we are able to fill special orders.
Some typical special orders are shown below for your reference.

Caution:

Special order is not always available for all the models. Please feel free to contact us for details.

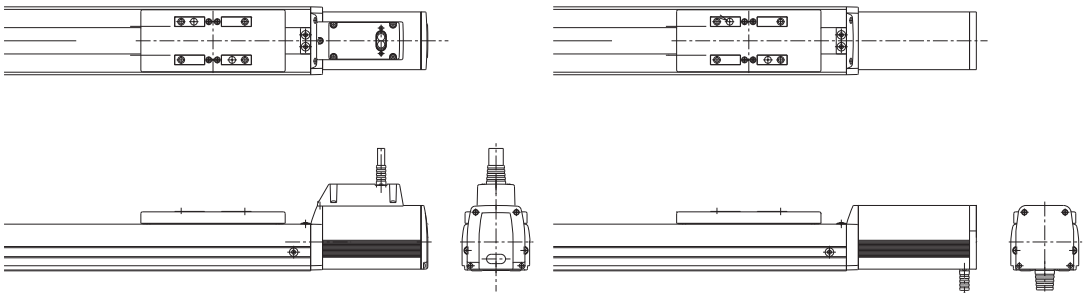
Special Stroke

Ex.) RCP2-SA6 800 Stroke (Non-standard stroke)



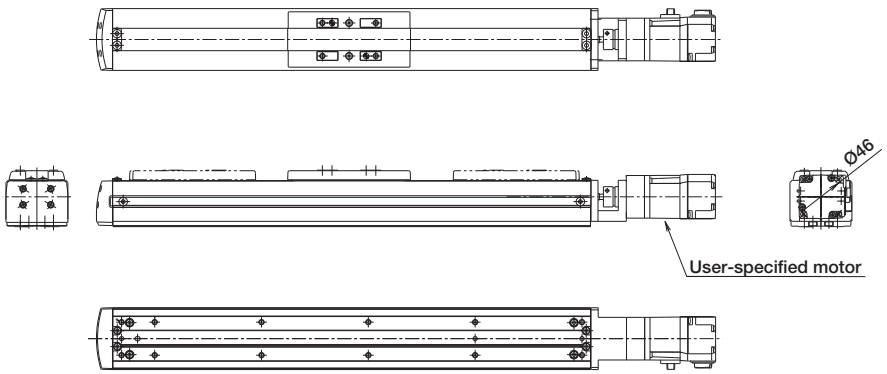
Cable Outlet Directional Changes

Ex.) Actuator cable outlet top/bottom



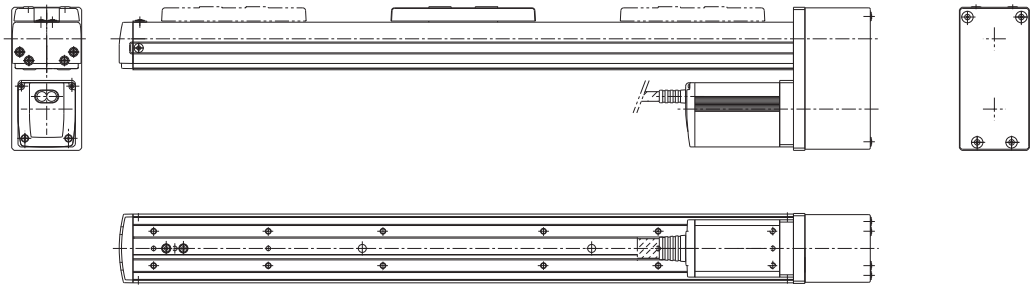
Special Motor

Ex.) Mount Customer-Specified Motor Specification



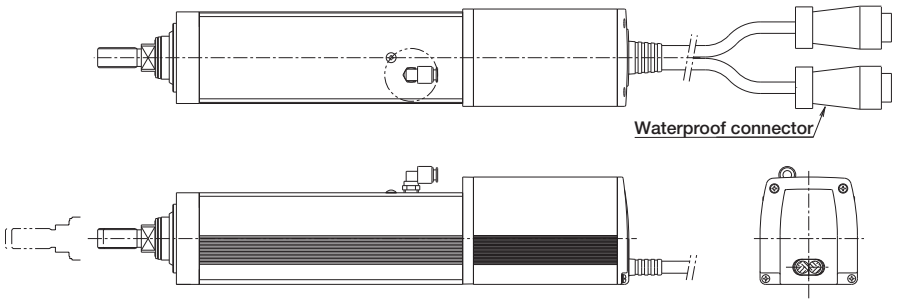
Side-Mount Motor Orientation

Ex.) Side-Mount Motor to the Bottom



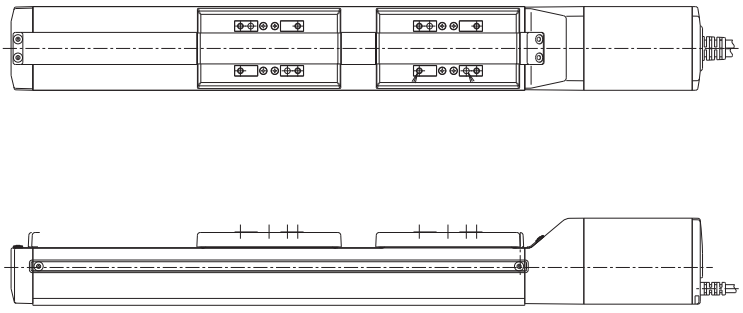
Special Connector

Ex.) Change motor-encoder connector to waterproof connector



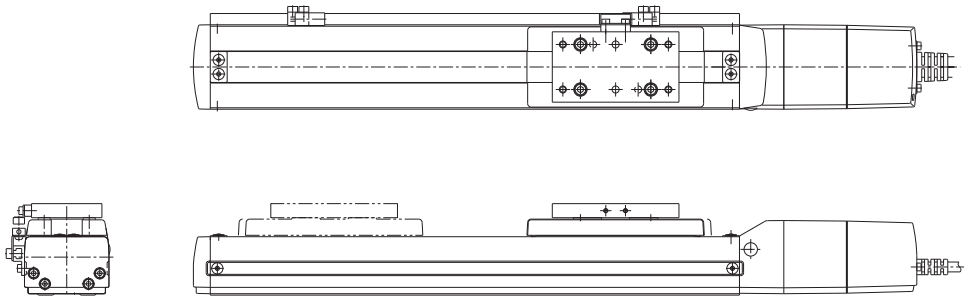
Special Slider

Double Slider Specification (Add non-driven slider)



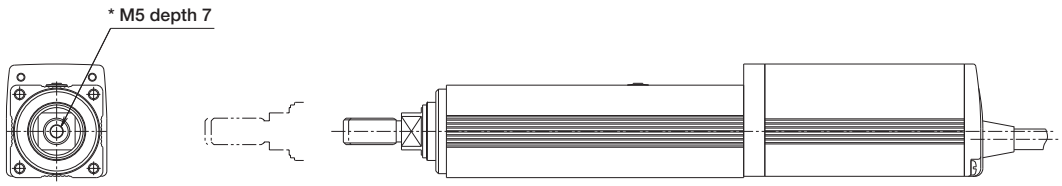
Sensor Specifications

Ex.) Sensor Mounting Specifications



Lead-End Tapped Hole Processing

Ex.) Add a tapped hole to the lead-end of the rod in a rod type



Other

- Special Ball Screw Lead
- Raydent Treated Ball Screw
- ESD (Electrostatic Discharge) Specification
- Assembly Unit

Correlation Table by RoHS Order/CE Mark/UL Listed Models

◎ : Standard / ○ : Planned
△ : Special order / × : Not available

Product Family	Series Name	Type, Model		RoHS Compliance	CE Mark Compliance	UL Compliance
ROBO Cylinder Actuators	ERC2	Slider	SA6/SA7	◎	◎	
		Rod	RA6/RA7	◎	◎	
	RCP3	Slider & Rod	SA2AC/SA2BC/SA3C/SA4C/SA5C/SA6C/RA2AC/RA2BC	◎	◎	
		Table	TA3C/TA4C/TA5C/TA6C/TA7C	◎	◎	
	RCL	Slider & Rod	SA1L/SA2L/SA3L/SA(M)4L/SA(M)5L/SA(M)6L/RA1L/RA2L/RA3L	◎	○	
	RCP2	Slider (Coupled)	SA5C/SA6C/SA7C/SS7C/SS8C	◎	◎	
		Slider (Side-Mounted Motor)	SA5R/SA6R/SA7R/SS7R/SS8R			
		Rod	RA3C/RA4C/RA6C	◎	◎	
		Belt	BA6/BA7/BA6U/BA7U	◎	◎	
		Ultra-Mini	RA2C	◎	◎	
		Gripper	GRLS/GRSS/GRS/GRM/GRST/GRHM/GRHB	◎	◎	
			GR3L/GR3S			
		Rotary	RTBS/RTB/RTBB/RTBSL/RTBBL	◎	◎	
			RTCS/RTC/RTCB/RTCSL/RTCBL			
		High-Thrust	RA8C/RA10C	◎	◎	
		High-Speed Ball Screw	HS8C/HS8R	◎	◎	
		Cleanroom (RCP2CR)	SA5C/SA6C/SA7C/SS7C/SS8C	◎	◎	
		Dustproof/Splash-Proof (RCP2W Rod)	RA4C/RA6C	◎	◎	
		Waterproof (RCP2W Slider)	SA16C	◎	◎	
		Absolute	–	◎	◎	
	RCA2	Slider & Rod	SA2AC/SA3C/SA4C/SA5C/SA6C/RA2AC/RN3N/RN4N/RP3N/RP4N	◎	◎	
		Table	TC(W)(F)A3N/TC(W)(F)A4N/TA4C/TA5C/TA6C/TA7C	◎	◎	
	RCA	Slider (Coupled)	SA4C/SA5C/SA6C	◎	◎	
		Slider (Direct-Coupled Motor)	SA4D/SA5D/SA6D/SS4D/SS5D/SS6D			
		Slider (Side-Mounted Motor)	SA4R/SA5R/SA6R			
		Rod	RA3C/RA3D/RA3R	◎	◎	
			RA4C/RA4D/RA4R			
		Arm	A4R/A5R/A6R	◎	◎	
		Cleanroom (RCACR)	SA4C/SA5C/SA6C	◎	◎	
		Cleanroom (RCACR)	SA5D/SA6D			
		Dustproof/Splash-proof (Rod)	RCAW-RA3C/RA3D/RA3R	◎	◎	
			RCAW-RA4C/RA4D/RA4R			
		Absolute	All Models	◎		
	RCS2	Slider (Coupled)	SA4C/SA5C/SA6C/SA7C/SS7C/SS8C	◎	◎	
		Slider (Direct-Coupled Motor)	SA4D/SA5D/SA6D			
		Slider (Side-Mounted Motor)	SA4R/SA5R/SA6R/SA7R/SS7R/SS8R			
		Rod	RA4C/RA5C	◎	◎	
			RA4D/RA7AD/RA7BD			
			RA4R/RA5R			
		Flat	F5	◎	◎	
		Gripper	GR8	◎	◎	
		Rotary	RT6/RT6R/RT7R/RTC8L/RTC10L/RTC12L	◎	◎	
		Arm	A4R/A5R/A6R	◎	◎	
		Cleanroom (RCS2CR)	SA4C/SA5C/SA6C/SA7C/SS7C/SS8C	◎	◎	
			SA5D/SA6D			
		Ultra-High Thrust	RA13R	◎	◎	
		Absolute	All Models	◎	◎	
	ERC	Slider	SA6/SA7	◎		
		Rod	RA54/RA64	◎		
	RCP	Slider (Side-Mounted Motor)	SA5/SA6/SS/SM	×		
			SSR/SMR			
		Rod	RS/RM	×		
	RCS	Slider (Side-Mounted Motor)	SA4/SA5/SA6/SS/SM	×		
			SSR/SMR			
		Rod	RA/RB	×		
		Flat	F	×		
		Gripper	G	×		
		Rotary	R10/R20/R30	×		
		Absolute	–	×		

Correlation Table by RoHS Order/CE Mark/UL Listed Models

◎ : Standard / ○ : Planned
△ : Special order / × : Not available

Product Family	Series Name	Type, Model		RoHS Compliance	CE Mark Compliance	UL Compliance
Single-Axis	IS(P)	Standard	S/M/L/T/W	×		
	IS(P)A	Standard	S/M/L/W	◎	◎	
	IS(P)WA	Dustproof/Splash-proof	S/M/L	×	◎	
	IS(P)WB	Dustproof/Splash-proof	S/M/L/MX/LX	◎	◎	
	IS(P)D	Simple Dustproof	S/M/L/W	×		
	IS(P)DA	Simple Dustproof	S/M/L	◎	◎	
	SSPA	Standard	S/M/L	◎	◎	
	IS(P)B	Standard	SX/MX/LX	◎	◎	
	IS(P)DB	Simple Dustproof	S/M/L/MX/LX	◎	◎	
	IS(P)DACR	Cleanroom	S/M/L/W	◎	◎	
	IS(P)DBCR	Cleanroom	S/M/L/MX/LX	◎	◎	
	SSPDACR	Cleanroom	S/ML	◎	◎	
	NS	Standard	S/M/L	◎	◎	
	IF	Standard	SA/MA	◎	○	
	FS	Standard	N/W/L/H	◎	○	
	DS	Slider	SA4/SA5/SA6	×		
		Arm	A4/A5/A6	×		
		Cleanroom	–	×		
		Absolute	–	×		
	SS	Standard	S/M	×		
	SSCR	Cleanroom	–	×		
	RS, ZR	Rotary	30/60/Z/M	◎	○	
Cartesian Systems	ICS(P)A	–	–	◎	○	
	IK			◎	○	
SCARA	IH	–	–	×		
	IX	Standard, Cleanroom	120/150/180	◎	△	
		Standard	250/350	◎	◎	
			500/600	◎	◎	
			700/800	◎	◎	
		Cleanroom	250/350/500/600/700/800	◎	◎	
		Dustproof/Splash-proof	250/350/500/600/700/800	◎	◎	
		Suspended, High-Thrust, Wall-Mounted	300/350/500/600/700/800	◎	◎	
Linear	LS	Small/Large	S/L	×		
	LSA(S)	Small	H	◎	○	
		Medium	N	◎	○	
		Large	W	◎	○	
		Shaft	S	◎	○	
		Flat	L	◎	○	
Table-top	TT	Old	TT-300	×		
		New	TT-A2/A3/C2/C3	◎	◎	
Other	TX	–	–	◎		
	Motor	ISAC	200W/400W	◎		
	Motor	ISAC High-Rigidity (T1)	60W(RS)/100W/150W	◎		
ROBO Cylinder Controllers	PCON	Standard, High-Thrust, Compact	C/CG/CF/CY/SE/PL/PO	◎	◎	◎
	PMEC	Standard	C	◎	◎	◎
	PSEP	Standard, Dustproof	C/CW	◎	◎	◎
	ACON	Standard, Compact	C/CG/CY/SE/PL/PO	◎	◎	◎
	ASEP	Standard, Dustproof	C/CW	◎	◎	◎
	SCON	–	–	◎	◎	
	PSEL	–	–	◎	◎	
	ASEL	–	–	◎	◎	
	SSEL	–	–	△	◎	
	ROBONET	GatewayR Unit	RGW-DV/RGW-CC	◎	◎	◎
			RGW-PR/RGW-SIO			
		Controller Unit	RACON/RPCON-	◎	◎	◎
		Simple Absolute R Unit	RABU	◎	◎	◎
		Extension Unit	REXT	◎	◎	◎
	RCP2	Standard	C/CG	◎	◎	◎
		High-Thrust	CF	◎	◎	◎
		Absolute	–	◎	◎	◎
	RCS	100V/200V	C	×		
		24V (General)		×		
		24V (Economy)	E	×		
		EU	–	×		
		CC-Link (256-point)	–	×		
		DeviceNet	–	×		
		ProfiBus	–	×		

◎ : Standard / ○ : Planned
△ : Special order / × : Not available

Product Family	Series Name	Type, Model		RoHS Compliance	CE Mark Compliance	UL Compliance
Controllers for Single-Axis/ Cartesian/ SCARA	E-Con	Standard	–	×		
		EU	–	×		
		CC-Link (256-point)	–	×		
		DeviceNet	–	×		
		ProfiBus	–	×		
		Absolute	–	×		
	P-Driver	–	–	×		
	TX	TX-C1	–	◎		
	XSEL-KE/KET	–	–			
		–	–			
		Global	KET	△	◎	
		Standard	KE	△	◎	
		SCARA	KETX	△	◎	
		General Extension SIO	IA-105-X-MW-A/B/C	◎		
	XSEL-P/Q	Standard	P	△	◎	
		Global	Q	△	◎	
		SCARA	PX/QX	△	◎	
	XSEL Option	CC-Link (256-point)	IA-NT-3206/4-CC256	◎		
		CC-Link (16-point)	IA-NT-3204-CC16	◎		
		DeviceNet	IA-NT-3206/4-DV	◎		
		ProfiBus	IA-NT-3206/4-PR	◎		
		EtherNet	IA-NT-3206/4-ET	◎		
		Extension PIO	IA-103-X-32/16	◎		
		Multi-Point I/O	IA-IO-3204/5-NP/PN	◎		
	DS-S-C1	Standard	–	×		
		EU	–	×		
	SEL-E/G	Standard	–	×		
		EU	–	×		
	SEL-F	–	–	×		
	IH	–	–	×		
Table-top	TT (Controller Section)	Old	–	×		
		New	–	◎	◎	
Teaching Pendant	PCON, ACON, SCON, ERC2	Standard	CON-T	◎	◎	
		Safety Category Compliant	CON-TG	◎	◎	◎
	RCP2	Standard (with Deadman Switch)	RCA-T/TD	×		
	ERC		RCM-T/TD			
	RCS	Simple	RCA-E	△		
	E-Con		RCM-E			
	RC	Data Setting Unit	RCA-P	△		
			RCM-P			
	RCP2	JOG Switch	RCB-J	△		
	ERC					
	PSEL, ASEL, SSEL, XSEL	Standard	SEL-T	◎	◎	
		Safety Category Compliant	SEL-TD/TG	◎	◎	◎
	XSEL	Standard (with Deadman Switch)	IA-T-X (IA-T-XD)	×		
	DS	DS-S-T1	–	×		
	E/G, F	NE-T-SS	–	×		
	IH	IA-T-IH	–	×		
	TX	TX-JB	–	◎		
Touch Panel	–	RCM-PM-01	–	◎		
Simple Absolute Unit	PCON, ACON	PCON-ABU	–	◎	◎	◎
		ACON-ABU				
Gateway Unit	RCM-GW	ProfiBus/DeviceNet/CC-Link	RCM-GW-PR/DV/CC	◎	◎	
		–	–			
Regenerative Resistance Unit	E-Con	REU-1	–	◎		
	PDR					
	XSEL					
	SCON	REU-2	–	◎		
	SSEL					
	XSEL-P/Q					
Absolute Battery	PCON/ACON-ABU	AB-7	–	(*)		
	RCP	AB-2	–			
	RCP2	AB-4	–			
	RCS	AB-1	–			
	XSEL-P/Q	AB-5	–			
	XSEL-KE/KET	IA-XAB	–	◎		

(*) Correspondence to EU battery directive (2006/66/EC)

Correlation Table by RoHS Order/CE Mark/UL Listed Models

◎ : Standard / ○ : Planned
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Product Family	Series Name	Type, Model		RoHS Compliance	CE Mark Compliance	UL Compliance
Brake Box	E/G	1-Axis AC	H-109-□A	×		
		1-Axis DC	H-109-□D	×		
		2-Axis AC	H-110-□A	×		
		2-Axis DC	H-110-□DH-500	×		
		Coil	H-500	×		
	GDS	1-Axis	H-401	×		
		2-Axis	H-402	×		
	XSEL-KE/KET	IA-110-X-0	–	◎		
PIO Terminal Block	–	–	RCB-TU-PIO-A/B	◎		
SIO Converter	–	–	RCB-TU-SIO-A/B	◎		
RS232 Converter	RCS	New	RCB-CV-MW	◎		
Unit	ERC	Old	RCA-ADP-MW	×		
Multi-Point I/O Board Terminal Block	XSEL-KE/KET	TU-MA96(-P)	–	◎		
Filter Box	E-Con	PFB-1	–	×		
Pulse Converter	PDR	AK-04	–	◎		
I/O Extension Box	E/G	H-107-4	–	×		
M/PG Cable	RCP3	Motor-Encoder Integrated Cable	CB-PCS-MPA	◎		
	RCP/RCP2	Motor Cable	CB-RCP2-MA	◎		
		Encoder cable	CB-RCP2-PB	◎		
			CB-RFA-PA			
			CB-RCP2-PB-* *-RB	◎		
			CB-RFA-PA-* *-RB			
	RCA2	Motor-Encoder Integrated Cable	CB-ACS-MPA	◎		
	RCA	Motor Cable	CB-ACS-MA	◎		
		Encoder cable	CB-ACS-PA	◎		
			CB-ACS-PA-* *-RB	◎		
	RCS2	Motor Cable	CB-RCC-MA	◎		
			CB-RCC-MA-* *-RB	◎		
		Encoder cable	CB-RCS2-PA	◎		
			CB-RCBC-PA	◎		
			CB-RCBC-PA-* *-RB	◎		
	XSEL	Motor Cable	CB-XEU-MA	◎		
		Encoder cable	CB-XEU-PA	◎		
			CB-XEU1-PA/PLA	◎		
			CB-XEU2-PA/PLA	◎		
			CB-XEU1-PA-* *-WC	◎		
		Limit Switch Cable	CB-XEU-LC	◎		
	TX	Motor Cable	CB-TX-ML050-RB	◎		
Other	RC	PC software	RCM-101-MW-EU	◎		
			RCM-101-USB-EU	◎		
		External Communication Cable	CB-RCA-SIO020	◎		
		RS232C Converter Cable	RCB-CV-MW	◎		
		USB Cable	CB-SEL-USB010	◎		
		USB Conversion Adapter	CB-CV-USB	◎		
		Link Cable	CB-RCB-CTL002	◎		
	SCON	Pulse Train Control Cable	CB-SC-PIOS	◎		
	XSEL	PC software (Cable + EMG BOX)	IA-101-X-MW	◎		
			IA-101-XA-MW	◎		
			IA-101-X-USB	◎		
			IA-101-X-USBMW	◎		
			EMG SW BOX	◎		
		Insulating Cable (Standalone)	CB-ST-E1MW050	◎		
			CB-ST-A1MW050	◎		
			CB-SEL-USB010	◎		
		USB Conversion Adapter	IA-CV-USB	◎		
		I/O Flat Cable	CB-X-PIO	◎		
	TX	Connection Cable	CB-TX-P1MW020	◎		

SuperSEL Language

Our PSEL/ASEL/SSEL/XSEL controllers control actuator operation and communications, etc. using programs that have been prepared using the SuperSEL language.

The SuperSEL language is the simplest of the numerous robotic languages.
SuperSEL adeptly solves the difficult question of “realizing a high level of control with a simple language.”

SuperSEL has a step-wise structure in which commands are entered in operation sequence, which are then executed in sequence from step 1, making it extremely easy to understand, even for a novice.

The SuperSEL language has two types of data: “program data,” which runs commands to move the various axes and commands to performed external communications, and “position data,” which records the positions to which the various axes are moved.

Program data can be entered as up to 9999 command steps, which can be divided into 128 programs.
Position data can be registered for up to 20000 positions, with 3 axes worth of position data for each position.
(These maximum values are different depending on each controller, for details please refer to the catalog page for each controller.)

When each of the axes is moved, the motion command in the program data designates the number of position data, and it is moved to the position registered in the position data.

● Program Data

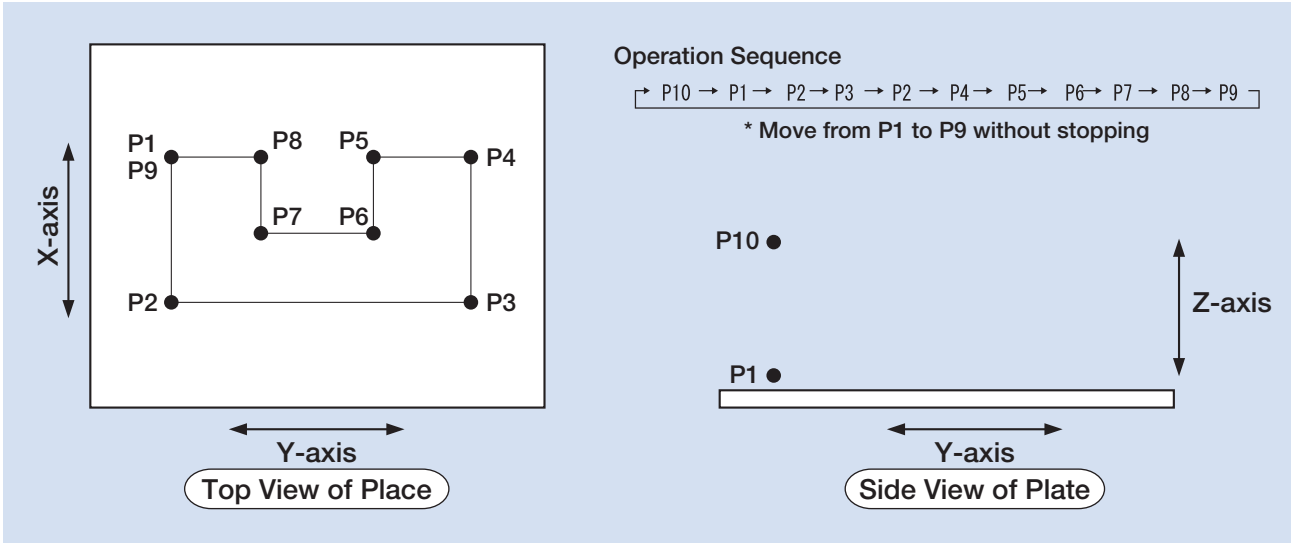
No.	B	E	N	Cnd	Cmnd	Operand 1	Operand 2
1					HOME	100	
2					HOME	11	
3					VEL	200	
4					WTON	1	
5					MOVL	1	
6					BTON	301	
7					WTON	2	
8					BTOF	301	
9					MOVL	2	
10					BTON	302	

● Position Data

No.	Axis1	Axis2	Axis3	V
1	10.000	150.000	50.000	
2	20.000	140.000	50.000	
3	30.000	150.000	50.000	
4	40.000	140.000	50.000	
5	40.000	110.000	50.000	
6	30.000	100.000	50.000	

Operation Summary

Apply sealant to a plate along the path shown in the figure below.
Continuous movement is performed along a path from position 1 to position 9, without stopping.



Position Data

	X-axis	Y-axis	Z-axis
P1	10	150	50
P2	40	150	50
P3	40	70	50
P4	10	70	50
P5	10	90	50
P6	20	90	50
P7	20	130	50
P8	10	130	50
P9	10	150	50
P10	10	150	0

Program

Step	Extension Condition	Input Condition	Command	Operation 1	Operation 2	Output Condition	Comment
1			HOME	100			Homing on Z-axis only
2			HOME	11			Homing on XY axes
3			VEL	100			Set speed to 100mm/sec
4			ACC	0.3			Set acceleration to 0.3G
5			TAG	1			Destination of GOTO1 in step 11
6			WTON	16			Stop until input 16 from the start button
7			MOVP	10			Move to space above Position 1 (i.e. Position 10)
8			MOVP	1			Move down to Position 1
9			PATH	2	9		With position 1 as base point, move continuously to position 9
10			MOVP	10			Move to space above Position 1 (i.e. Position 10)
11			GOTO	1			Jump to TAG1

Explanation of Terms

(This terminology is related to IAI products, and so the definitions are more limited than usual.)

10,000km service life

Around 10000 hours are guaranteed for actual use in the field. When considering the speed, work ratio, etc, this translates to a distance of 5000 to 10000km. While the life of a guide is sufficiently long for radial loads, it is the uneven loads due to moment loads that are problematic to its service life.

For this reason, the 10000km service life is established by specifying the rated dynamic load moment that can guarantee 10000km of travel distance.

50km service life

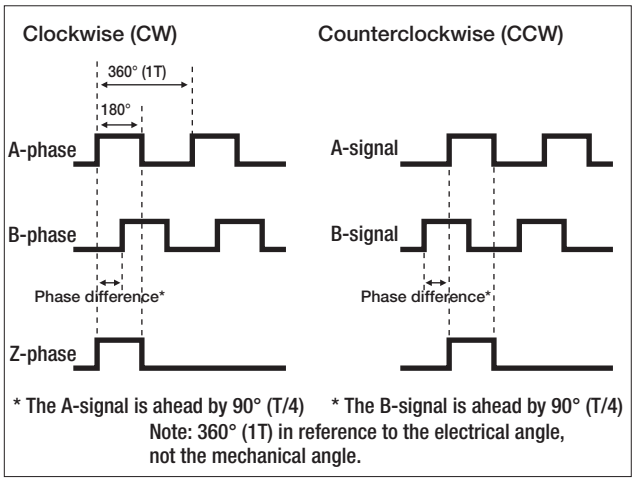
A way of expressing the allowable load capacity, submitted by the guide manufacturer. This is the value at which the probability of the guide not breaking (i.e. survival probability) when used with this allowable radial load (basic dynamic rated load) is 90%.

Calculating the actual distance of travel, considering the motion velocity and work rate, etc, an actual industrial equipment, it is necessary to ensure 5000km to 10000km of travel. From that viewpoint, this data is difficult to understand and difficult to utilize.

A-phase (signal) output / B-phase (signal) output

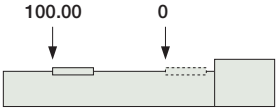
The direction of rotation (CW or CCW) of the axis is determined from the phase difference between the A-phase and the B-phase of the incremental encoder output, as shown in the diagram below. In a clockwise rotation, the A-phase is ahead of the B-phase.

■ Diagram of Output Modes

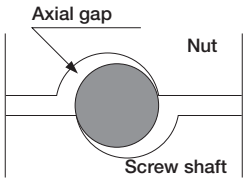


Absolute positioning accuracy

When positioning is performed to an arbitrary target point specified in coordinate values, the difference between the coordinate values and the actual measured values.



Backlash



As shown in the figure on the right, there is a gap between the nut and the ball (steel ball) and the screw shaft. Even if the screw shaft moves, the nut will not move the extent of the gap. The mechanical play in the direction of this slider movement is called the backlash. The measurement method used is to feed the slider, then use the reading for the slight amount of movement time shown on a test indicator as a standard. Also, in that condition, without using the feed device, move the slider in the same direction with a fixed load, then without the load. Then find the difference between the standard value and the time when the load was removed. This measurement is conducted at the midpoint of the distance of movement and at points nearly at the two ends. The maximum value obtained among the values is used as the measurement value.

Bellows

A cover to prevent the infiltration of dust or debris from outside.

Brake

Primarily used for the vertical axis to prevent the slider from dropping when the servo is turned off. The brake activates when the power is turned off.

C10

One of the grades of a ball screw. The lower the number, the higher the precision.

Grade C10 has a typical movement error of ±0.21mm for a 300mm stroke.

CCW (Counterclockwise rotation)

Abbreviation for counterclockwise rotation.

It describes a rotation to the left, as viewed from above, i.e. opposite of the rotation of a clock's hands.

Explanation of Terms

Cleanliness

Grade of cleanliness for cleanrooms according to ISO standard. ISO class 4 (equivalent to US FED STD class 10) indicates an environment in which there are fewer than 10 pieces of debris 0.5µm or smaller per cubic foot.

Coupling

A component used as a joint to join a shaft to another shaft.
e.g. The joint between the ball screw and the motor.

Creep sensor

An optional sensor to allow high-speed homing operation.

Critical speed

Ball screw resonation with slider speed (No. of ball screw rotations). The maximum physical speed limit that can be utilized.

CW (Clockwise rotation)

Abbreviation for clockwise rotation.
It describes a rotation to the right, as viewed from above, i.e. same as the rotation of a clock's hands.

Cycle time

The time taken by one process.

Dispenser

A device that controls the flow rate of a liquid. This is integrated into devices for applying adhesives, sealants, etc.

Duty

Indicates the work ratio in the equipment industry. (e.g. The time that the actuator operates in one cycle.)

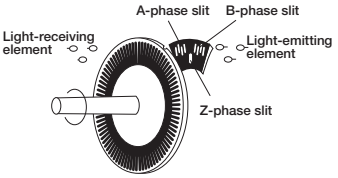
Dynamic brake

A brake that uses the motor's regenerative energy.

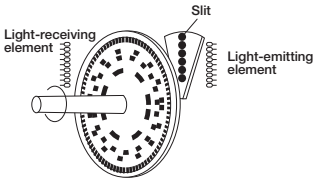
Encoder

A device for recognizing the RPM and the direction of a rotation by shining a light onto a disc with slits, and using a sensor to detect whether the light is ON or OFF as the disc is rotated. (i.e. a device that converts rotation into pulses.) The controller uses this signal from the encoder to determine the position and speed of the slider.

■ Incremental



■ Absolute



An incremental encoder
detects the rotational angle and the RPM of the axis from the number of output pulses. To detect the rotational angle and the RPM, a counter is needed to cumulatively add the number of output pulses. An incremental encoder allows you to electrically increase the resolution by using the rise and fall points on the pulse waveform to double or quadruple the pulse generation frequency.

An absolute encoder
detects the rotation angle of the axis from the state of the rotation slit, enabling you to know the absolute position at all times, even when the rotating slit is at rest. Consequently, the rotational position of the axis can always be checked even without a counter.
In addition, since the home position of the input rotation axis is determined at the time it is assembled into the machine, the number of rotations from home can always be accurately expressed, even when turning the power ON during startup or after a power outage or an emergency stop.

Excess voltage

Voltage applied to motor that exceeds regulation value when commanded speed is too fast.

External operation mode

This is the operation mode started by a start signal from an external device (PLC, etc.). This is also called automatic operation.

Flexible hose

Tube for SCARA Robot MPG cable that the user passes wiring through.

Gain

The numeric value of an adjustment of the controller's reaction (response) when controlling the servo motor. Generally, the higher the gain the faster the response, and the lower it is the slower the response.

Gantry

A type of two-axis (X and Y) assembly in which a support guide is mounted to support the Y-axis, so that heavier objects can be carried on the Y-axis.

Grease

High-viscosity oil applied to contact surfaces to make the guide and the ball screw move smoothly.

Greasing

Injection or application of grease to sliding parts.

Guide

A mechanism for guiding (supporting) the slider of the actuator. A bearing mechanism that supports linear motions.

Guide module

An axis in a two-shaft assembly that is used in parallel with the X-shaft to support the end of the Y-shaft when the Y-shaft overhang is long. Typical models include the FS-12WO and FS-12NO.

Home

Reference point for actuator operation. The pulse counts are determined and recorded for all positions the actuator moves to / from home.

Home accuracy

The amount of variation among the positions when home return is performed (if home varies, all positions vary).

Key slotted

A rotary shaft or mounting component is machined with a slot for key mounting.
(Key: One means of preventing positional slip in the rotation direction of the rotary axis and the mounting component)

Lead

The lead of the feed screw is the distance moved after the motor (hence the feed screw) has rotated one turn.

Understanding lead value

The lead value changes the actuator speed and thrust.

- Speed: With an AC230V servo motor, the rated rpm is 3000rpm. In other words, this is 50 revolutions per second. In this case, with a 20mm screw lead,
  the speed is 50 revolutions/s×20mm/revolution = 1000mm/s.
- Thrust: If the lead is large, then the thrust is small; and vice-versa.

Load capacity (Payload)

The weight of objects that can be moved by the actuator's slider or rod.

Lost Motion [mm]

First, for one position, run with positioning straight in front and then measure that position. Next, make a movement in the same direction by issuing a command. Then, issue the same command for movement in a negative direction from the position. Conduct positioning in the negative direction and measure that position. Again, issue a command for a movement in the negative direction, and issue the same command for a positioning movement straight ahead from that position. Then measure that position.
Using this method, repeat measurement in positive and negative directions, seven times each. Conduct positioning for each and obtain the deviation from the average value for each stop position. Determine the position for the center of the movements in these measurements and positions nearly at both ends. The measurement value will be the maximum value among those obtained. (Complies with JIS B6201)

Mechanical end

Position where actuator slider comes to mechanical stop. Mechanical stopper. (Example: Urethane rubber)

Offline

A state in which the PC software is started without the RS232 cable connected to the controller.

Explanation of Terms

Offset

To shift from a position.

Online mode

The state in which the PC software is started with the RS232 cable connected to the controller.

Open collector output

A system with no overload resistance in the voltage output circuit, that outputs signals by sinking the load current. Since this circuit can turn the load current ON/OFF regardless of voltage potential to which the current is connected, it is useful for switching an external load and is widely used as a relay or ramp circuit or the like for switching external loads, etc.

Open loop system

A type of control system. This system only outputs commands and does not take feedback.

A typical example of this is the stepping motor. Since it does not compare each actual value against the commanded value, even if a loss of synchronization (i.e signal error) occurs, the controller would not be able to correct it.

Operation

Operation.

Overhang

The state in which the object that is mounted onto the actuator extends out to the front/rear, left/right, or above/below the axis of movement.

Overload check

A check for overload. (One of the protection functions)

Override

A setting for the percentage with respect to the running speed. (e.g. If VEL is set to 100mm/sec, an override setting of 30 will yield 30mm/sec)

Pitch error [pitch deviation or lead deviation]

Due to problems in the manufacturing, such as the heat treatment process used, the deviations of the ball screws, which are a key mechanical element of the actuator, are not always small when inspected closely. A JIS rating is used to indicate the qualitative accuracy of these items.

These items made for the market must meet tolerance values set as Class C10.

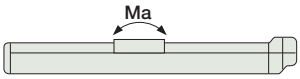
The accuracy required to meet the C10 standard is to be within a margin of error of ±0.21mm for every 300mm of length. Generally the screw pitch error deviation accumulates in a plus or minus direction. One method of improving these items is to grind them in a finishing process.

[e.g.] When positioning 300mm from home:

The machine accepts a set position of 300 ±0.21. Supposing that the actual stop position is 300.21, if this position is repeatable and maintained at 300.21 ± 0.02 using a JIS6201-compliant method, then the repeatability standard for accuracy is met.

Pitching

Forward-backward motion along the axis of the slider's movement. (Direction of Ma)



PLC

Abbreviation for Programmable Logic Controller.

(Also referred to as sequencers or programmable controllers).

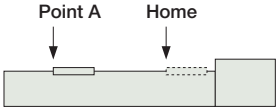
These are controllers that can be programmed to control production facilities and equipment.

Positioning band

The span within which a positioning operation is deemed as complete with respect to the target point. This is specified by a parameter. (PEND BAND)

Positioning repeatability

The variation in stop position accuracy for repeated positioning toward the same point.



Positioning settling time

The gap between the actual movement time and the ideal calculated value for movement. (Positioning operation time; processing time for internal controller operations.) The broader meaning includes the time for convergence of the mechanical swing.

Radial load

Load up to down in a direction 90° to horizontal slider.

Regenerative energy

Energy, generated by the motor's rotation. When the motor decelerates, this energy returns to the motor's driver (controller). This energy is called regenerative energy.

Regenerative resistance

The resistance that discharges the regenerative current.
The regenerative resistance required for IAI's controllers is noted in the respective page of each controller.

Rolling

An angular movement around the axis of the slider's movement. (Mc direction)

SCARA

SCARA is an acronym for Selective Compliance Assembly Robot Arm, and refers to a robot that maintains compliance (tracking) in a specific direction (horizontal) only, and is highly rigid in the vertical direction.

Screw type

The types of screws for converting rotary motion of a motor to linear motion are summarized on the right.
IAI's single-axis robots and electric cylinders use rolled ball screws as a standard feature.

		Characteristics
Ball screw	Polished	Screws are polished for good precision, but expensive
	Rolled	Since the screws are rolled, they can be mass produced
Lead screw		Cheap, but poor precision and short life. Also not suitable for high-speed operation.

SEL language

The name of IAI's proprietary programming language, derived from an acronym for SHIMIZUKIDEN ECOLOGY LANGUAGE.

Semi-closed loop system

A system for controlling the position information or velocity information sent from the encoder with constant feedback to the controller.

Servo-free (servo OFF)

The state in which the motor power is OFF. The slider can be moved freely.

Servo-lock (servo ON)

The state in which, opposite to the above, the motor power is turned ON. The slider is continually held at a determined position.

Slider mounting weight [kg]

The maximum mounting weight of the slider when operating normally, without major distortion in the velocity waveform or current waveform, when operated at the specified acceleration/deceleration factor (factory settings).

Software limit

A limit in the software beyond which a given set stroke will not advance.

Stainless sheet

A dust-proof sheet used in slider types.

Stepper motor (Pulse motor)

A motor that performs angular positioning in proportion to an input pulse signal by means of open loop control.

Thrust load

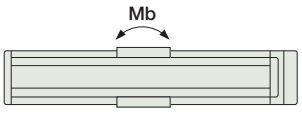
The load exerted in the axial direction.

Work rate

The ratio between the time during which the actuator is operating and the time during which it is stopped. This is also called duty.

Yawing

Motion at an angle in a left-right direction along slider movement axis. (Mb direction)



Along with pitching, laser angle measurement system is used for measurement, and the reading is the indication of maximum difference.

Z-phase

The phase (signal) that detects the incremental encoder reference point, used to detect the home position during homing operation.
Searching for the Z-phase signal for the reference during homing is called the "Z-phase search".

Options Available per Model

			Option Symbol																
			Cable Exit Direction									Brake				No Brake Box*	With Cover	Flange Bracket	Front Flange
			A1	A2	A3	CJT	CJR	CJL	CJB	CJO	K2	B	BE	BL	BR	BN	CO	FB	FL
Slider Type	RCP3	SA2□C																	
		SA3/4/5/6C				●	●	●	●			●							
		SA2□R																	
		SA3/4/5/6R				●			●	●		●							
	RCP2	SA5/6/7C											●	●	●				
		SS7/SS8/HS8C										●							
		SA5/6/7R										●							
		SS7/SS8/HS8R										●							
		BA6/7																	
	RCA2	SA3/4/5/6C				●	●	●	●			●							
		SA3/4/5/6R				●			●	●		●							
	RCA	SA4C										●							
		SA5/6C										●							
		SA4D											●	●	●				
		SA5/6D											●	●	●				
		SA4R										●							
		SA5/6R										●							
	RCS2	SA4C										●							
		SA5/6C										●							
		SA7C											●	●	●				
		SS7/8C										●							
		SA4D											●	●	●				
		SA5/6D											●	●	●				
		SA4R										●							
		SA5/6R										●							
		SA7R										●							
		SS7/8R										●							
Rod Type	RCP3	RA2□C										●							
		RA2□R										●							
	RCP2	RA2C																	●
		RA3C																	●
		RA4/6C										●							●
		RA10C	●	●	●							●							●
		SRA4R										●							●
	RCA2	RN/RP/GS/GD□N									●								
		SD□N																	
	RCA	RA3/4C										●							●
		RA3/4D																	●
		RA3/4R										●							●
		SRA4R										●							●
	RCS2	RA4C										●							●
		RA5C		●								●							●
		RA4D																	●
		SRA7BD	●	●	●							●							●
		RA4R										●							●
		RA5R		●								●							●
		RA13R										●				●			●
Table/ Arm/Flat Type	RCP3	TA3C										●							
		TA4/5/6/7C				●	●	●	●			●							
		TA3R										●							
		TA4/5/6/7R				●			●	●		●							
	RCA2	TCA/TWA/TFA□N									●								
		TA4/5/6/7C				●	●	●	●			●							
		TA4/5/6/7R				●			●	●		●							
	RCA	A4/5/6R										●							
	RCS2	A4/5/6R										●							
		F5D										●							
Gripper Type	RCP2	GR□□/GR3□□																●	
Rotary Type	RCP2	RT□□																	
		RT□□L																	
	RCS2	RT6/RT6R/RT7R																	
Linear Motor Type	RCL	SA4/5/6L																	
		RA1/2/3L										●				●			
Cleanroom Type	RCP2CR	SA4/5/6C											●	●	●				
		SS7/SS8/HS8C										●							
	RCACR	SA4C										●							
		SA5/6C										●							
		SA5/6D											●	●	●				
	RCS2CR	SA4C										●							
		SA5/6C										●							
		SA7C											●	●	●				
		SS7/8C										●							
		SA5/6D											●	●	●				
Splash-Proof	RCP2W	SA16C															●		
		RA4/6C										●							●
		RA10C	●	●	●							●							●
	RCAW	RA3/4C										●							●
		RA3/4D																	●
		RA3/4R										●							●
	RCS2W	RA4C										●							●
		RA4D																	●
		RA4R										●							●

* Spare part order only

Option Symbol																										
	Rear Flange	Foot	Foot (Right, Left)	High Acceleration/ Deceleration	Home Sensor	Limit Switch	Power Saving	No Cover	Reversed-home	Knuckle Joint	Clevis	Side-Mounted Motor Orientation				Rod Extension	Rear Mounting Plate	Shaft Adapter	Shaft Bracket	Slider Roller	Slider Spacer	Table Adapter	Front Trunnion	Rear Trunnion	Vacuum Joint On Opposite Side
	FLR	FT	FT□	HA	HS	L	LA	NCO	NM	NJ	QR	MB	ML	MR	MT	RE	RP	SA	SB	SR	SS	TA	TRF	TRR	VR
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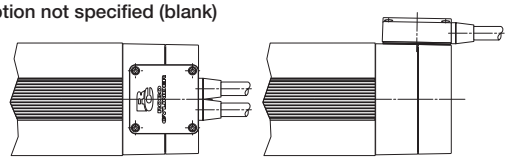
Cable exit direction

■ Models A1, A2, and A3

Applicable models	RCP2 / RCP2W-RA10C RCS2-RA5C / RA5R / SRA7BD
Description	Specify this option when you wish to change the direction from which the actuator cable is taken out.

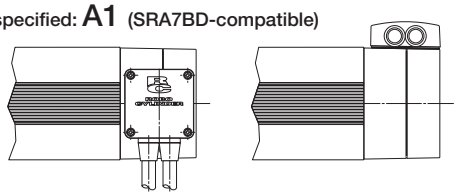
Actuator cable taken out from motor side (standard)

■ Option not specified (blank)



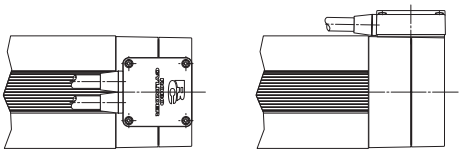
Actuator cable taken out from left

■ Option specified: **A1** (SRA7BD-compatible)



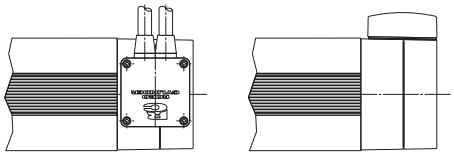
Actuator cable taken out from rod side

■ Option specified: **A2** (RA5C/RA5R/SRA7BD-compatible)



Actuator cable taken out from right

■ Option specified: **A3** (SRA7BD-compatible)



Brake

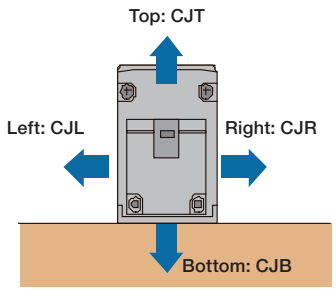
■ Models B, BE, BL and BR

Applicable models	All slider-type models (excluding RCP3-SA2A□ / SA2B□ and RCP2-BA6 / BA7) All rod-type models (excluding RCP2-RA2C / RA3C, RCA2-RN□N, RP□N, GS□N, GD□N, SD□N and RCA / RCS2 built-in types) All table-type models (excluding TCA□N, TWA□N and TFA□N) All arm-type and flat-type models (the arm type is a standard feature) Linear Motor Rod type All cleanroom type models Dust-proof / Splash-proof type (excluding RCP2W-SA16C, RCAW-RA3 / 4D and RCS2W-RA4D)
Description	A retention mechanism used on an actuator positioned vertically to prevent the slider from dropping and damaging the part, etc., when the power or servo is turned off.

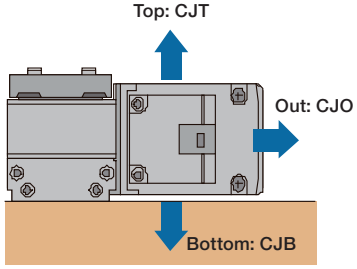
Cable exit direction

■ Models CJT, CJR, CJL, CJB and CJO

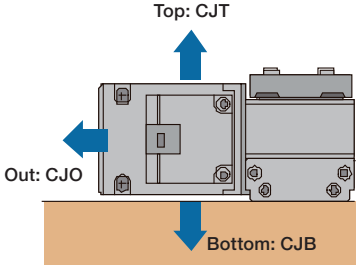
Applicable models	RCP3 (RCA2)-SA3C / SA4C / SA5C / SA6C / SA3R / SA4R / SA5R / SA6R RCP3 (RCA2)-TA4C / TA5C / TA6C / TA7C / TA4R / TA5R / TA6R / TA7R
Description	The direction of the motor-encoder cable mounted on the actuator can be changed vertically or horizontally.



Straight Type



Side-Mounted Motor Type
Mounted on left side (ML)



Side-Mounted Motor Type
Mounted on right side (MR)

Actuator cover

■ Models CO

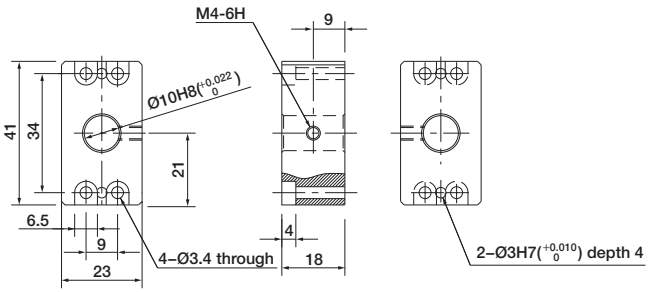
Applicable models	RCP2W-SA16
Description	This cover protects the guide area and slider area on the waterproof slider type.

Flange bracket

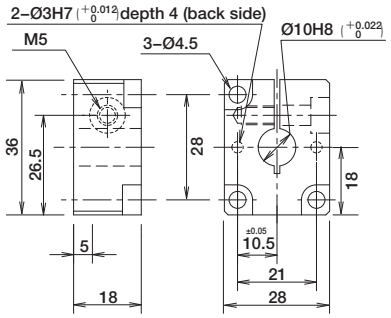
■ Models FB

Applicable models	RCP2-GRSS / GRLS / GRS / GRM / GR3LS / GR3LM / GR3SS / GR3SM
Description	A bracket for affixing the gripper body.

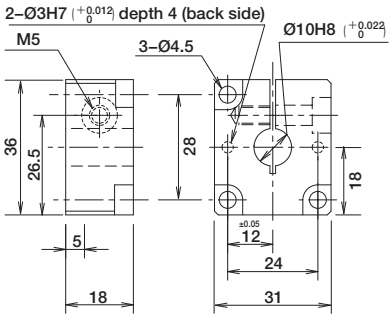
GRSS/GRLS type
Unit model RCP2-FB-GRSS



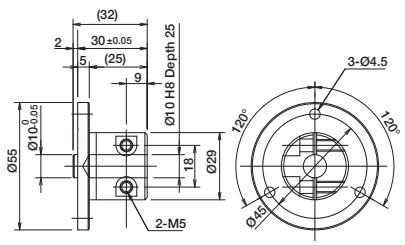
GRS type
Unit model RCP2-FB-GRS



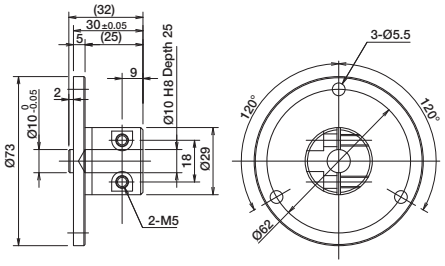
GRM type
Unit model RCP2-FB-GRM



GR3LS/GR3SS type
Unit model RCP2-FB-GR3S



GR3LM/GR3SM type
Unit model RCP2-FB-GR3M

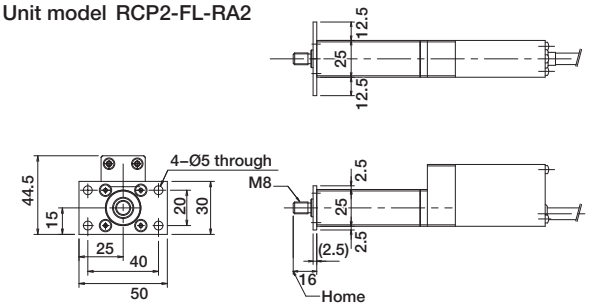


Front flange

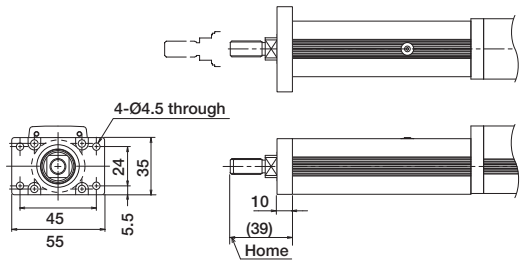
■ Models FL

Applicable models	All rod type models (excluding RCP3 and RCA2)
Description	A bracket for affixing the actuator using bolts from the actuator side.

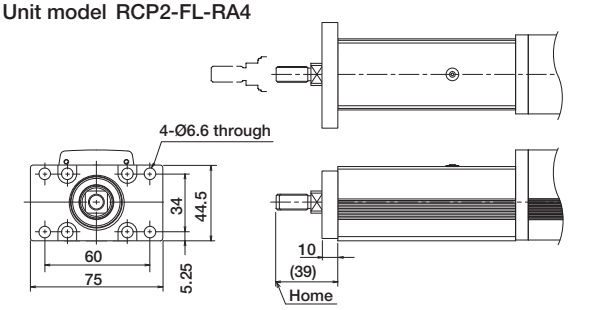
RCP2-RA2C
Unit model RCP2-FL-RA2



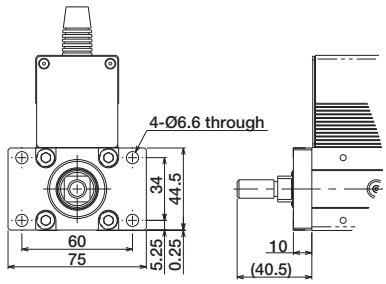
RCP2-RA3C
Unit model RCP2-FL-RA3



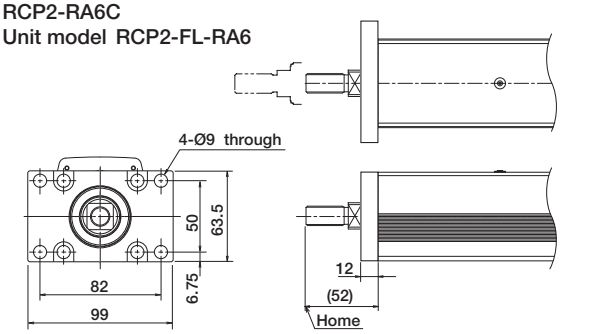
RCP2-RA4C
Unit model RCP2-FL-RA4



RCP2/RCA-SRA4R
Unit model RCP2-FL-SRA4

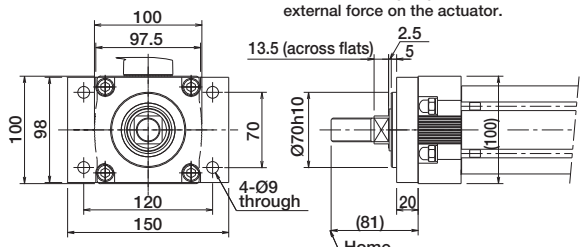


RCP2-RA6C
Unit model RCP2-FL-RA6



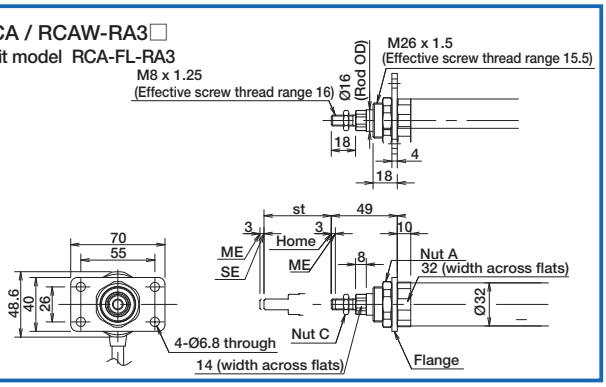
RCP2 / RCP2W-RA10C
Unit model RCP2-FL-RA10

* When using in horizontal setting, be careful not apply any excessive external force on the actuator.

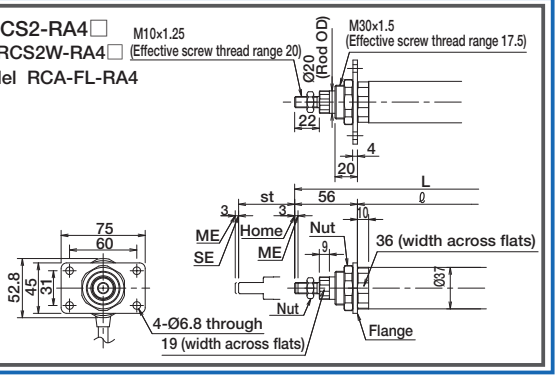


Mounting flange weight: Approx. 2kg

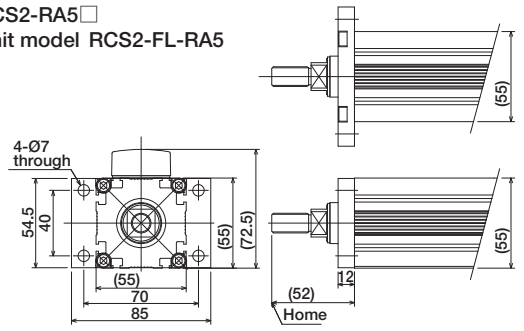
RCA / RCAW-RA3□
Unit model RCA-FL-RA3



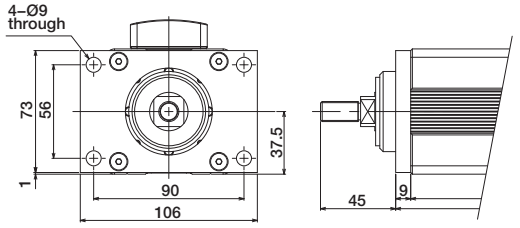
RCA / RCS2-RA4□
RCAW / RCS2W-RA4□
Unit model RCA-FL-RA4



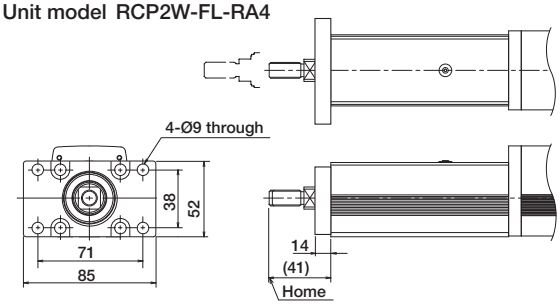
RCS2-RA5□
Unit model RCS2-FL-RA5



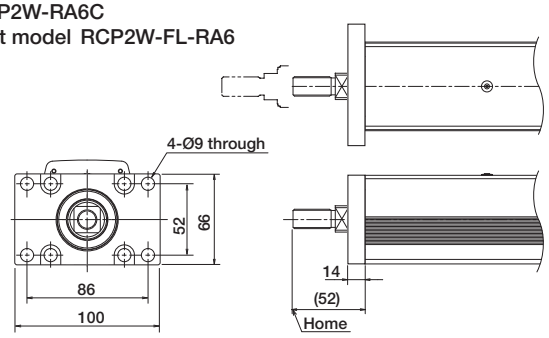
RCS2-SRA7BD
Unit model RCS2-FL-SRA7



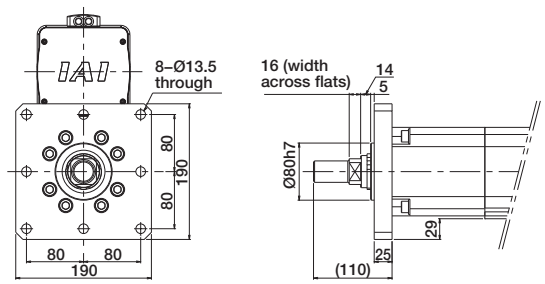
RCP2W-RA4C
Unit model RCP2W-FL-RA4



RCP2W-RA6C
Unit model RCP2W-FL-RA6



RCS2-RA13R
Unit model RCS2-FL-RA13

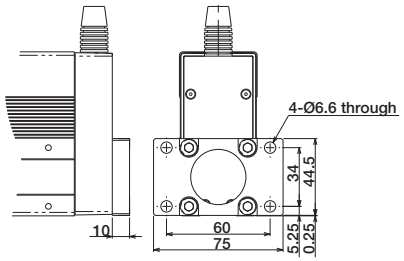


Rear flange

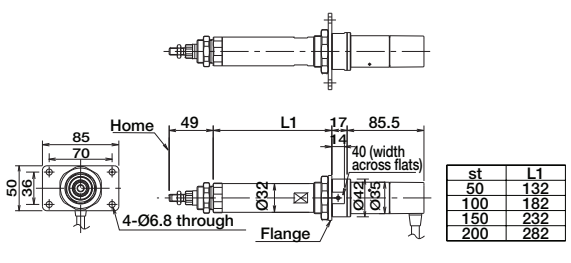
■ Models FLR

Applicable models	RCP2-SRA4R RCA (RCAW)-RA3C / RA3D / RA3R / RA4C / RA4D / RA4R / SRA4R RCS2 (RCS2W)-RA4C / RA4D / RA4R
Description	A bracket to fix a rod-type actuator on the rear (motor side).

RCP2/RCA-SRA4R
Unit model RCP2-FL-SRA4

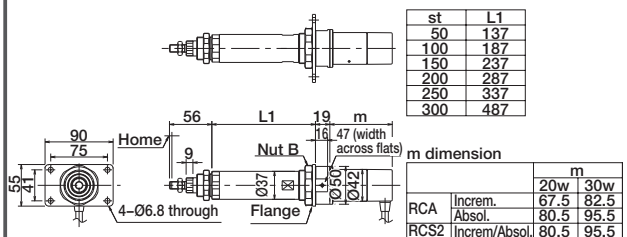


RCA / RCAW-RA3C and RA3D
Unit model RCA-FLR-RA3



st	L1
50	132
100	182
150	232
200	282

RCA / RCAW-RA4C and RA4D
RCS2 / RCS2W-RA4C / RA4D
Unit model RCA-FLR-RA4



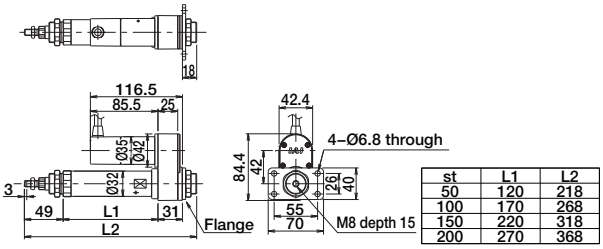
st	L1
50	137
100	187
150	237
200	287
250	337
300	487

m dimension

		m	
		20w	30w
RCA	Increm.	67.5	82.5
	Absol.	80.5	95.5
RCS2	Increm/Absol.	80.5	95.5

RCA / RCAW-RA3R
Unit model RCA-FL-RA3

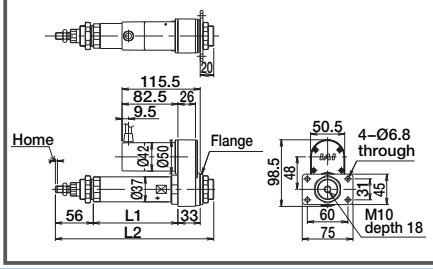
* On the side-mounted motor type, the same flanges can be used on the front and rear.



st	L1	L2
50	120	218
100	170	268
150	220	318
200	270	368

RCA / RCAW-RA4R
RCS2 / RCS2W-RA4R
Unit model RCA-FL-RA4

* On the side-mounted motor type, the same flanges can be used on the front and rear.



st	L1	L2
50	125	234
100	175	284
150	225	334
200	275	384
250	325	434
300	375	484

Foot

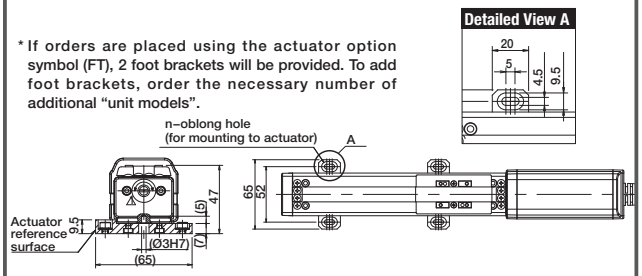
■ Models FT

*** See the mounting pitch dimensions on the actuator drawing for mounting pitch dimensions between foot brackets.**

Applicable models	Slider Type RCA (RCACR)-SA4C / SA5C / SA6C / SA4D / SA5D / SA6D RCS2 (RCS2CR)-SA4C / SA5C / SA6C All rod-type models (excluding RCA2-RN□N / RP□N / GS□N / GD□N / SD□N)
Description	A bracket for affixing the actuator using bolts from the top side. With a slider type subject to large moment load, install foot brackets at all mounting holes in the actuator. If the number of foot brackets is not sufficient, the actuator may deflect, resulting in a shorter service life.

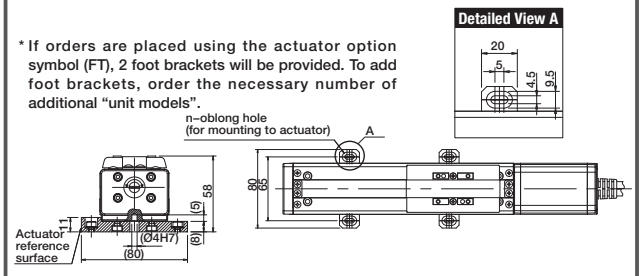
RCA / RCACR-SA4C RCS2 / RCS2CR-SA4C
Unit model RCA-FT-SA4

* If orders are placed using the actuator option symbol (FT), 2 foot brackets will be provided. To add foot brackets, order the necessary number of additional "unit models".



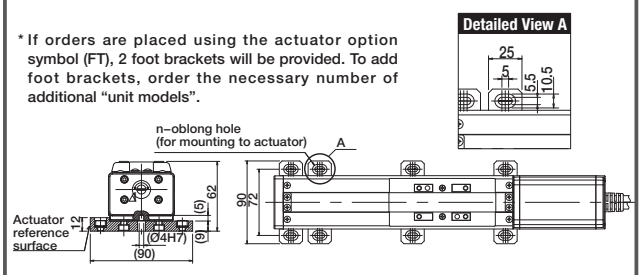
RCA / RCACR-SA5C RCS2 / RCS2CR-SA5C
Unit model RCA-FT-SA5

* If orders are placed using the actuator option symbol (FT), 2 foot brackets will be provided. To add foot brackets, order the necessary number of additional "unit models".

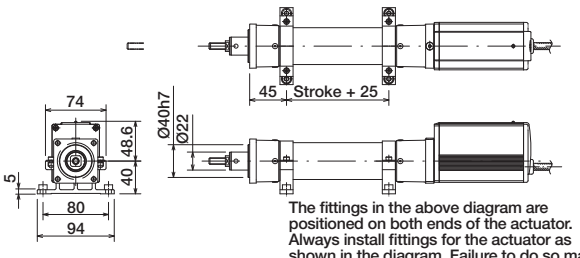


RCA / RCACR-SA6C RCS2 / RCS2CR-SA6C
Unit model RCA-FT-SA6

* If orders are placed using the actuator option symbol (FT), 2 foot brackets will be provided. To add foot brackets, order the necessary number of additional "unit models".



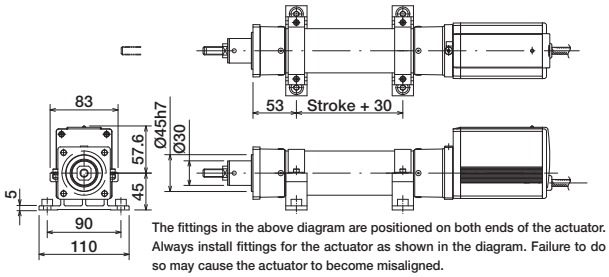
ERC2-RA6C / RGS6C / RGD6C
Unit model ERC2-FT-RA6



The fittings in the above diagram are positioned on both ends of the actuator. Always install fittings for the actuator as shown in the diagram. Failure to do so may cause the actuator to become misaligned.

* Mounting bolt (M6) is not provided.

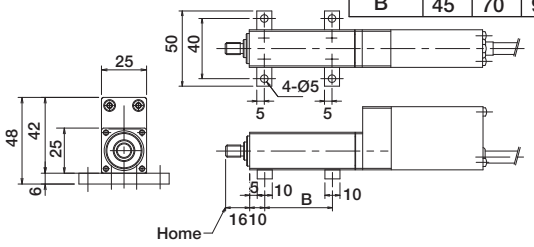
ERC2-RA7C / RGS7C / RGD7C
Unit model ERC2-FT-RA7



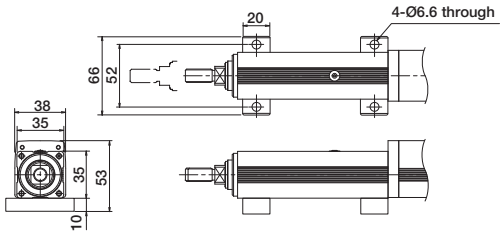
The fittings in the above diagram are positioned on both ends of the actuator. Always install fittings for the actuator as shown in the diagram. Failure to do so may cause the actuator to become misaligned.

RCP2-RA2C
Unit model RCP2-FT-RA2

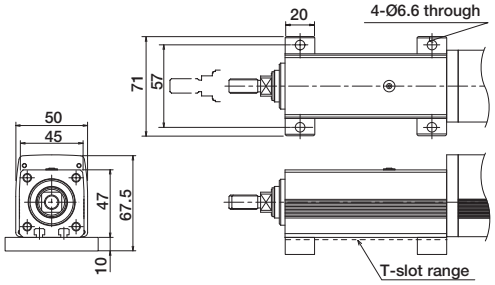
Length \ Stroke	25	50	75	100
B	45	70	95	120



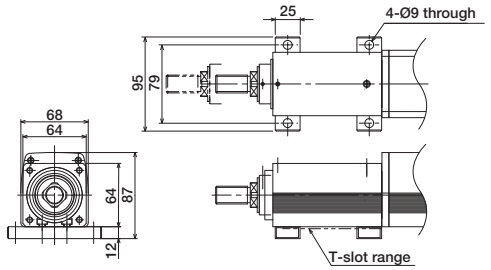
RCP2-RA3C / RGD3C
Unit model RCP2-FT-RA3



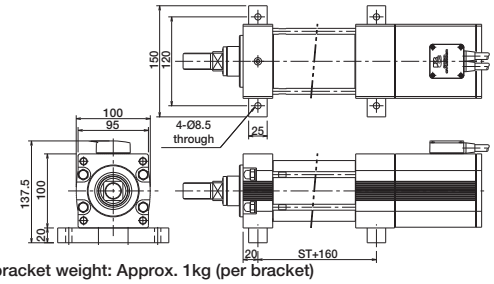
RCP2-RA4C / RGS4C / RGD4C / RCP2W-RA4C
Unit model RCP2-FT-RA4



RCP2-RA6C / RGS6C / RGD6C / RCP2W-RA6C
Unit model RCP2-FT-RA6

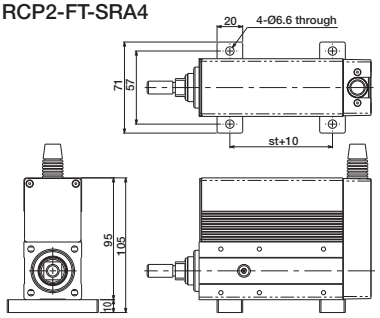


RCP2-RA10C / RCP2W-RA10C
Unit model RCP2-FT-RA10

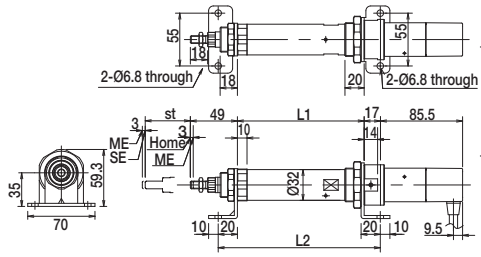


Foot bracket weight: Approx. 1kg (per bracket)

RCP2 / RCA-SRA4R
Unit model RCP2-FT-SRA4



RCA-RA3C / RGS3C / RGD3C
Unit model RCA-FT-RA3



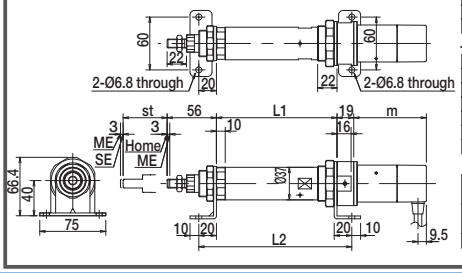
<RA3C>

st	L1	L2
50	132	168.8
100	182	218.8
150	232	268.8
200	282	318.8

<RGS3C/RGD3C>

st	L1	L2
50	140	176.8
100	190	226.8
150	240	276.8
200	290	326.8

RCA (RCS2)-RA4C / RGS4C / RGD4C
Unit model RCA-FT-RA4



<RA4C>

st	L1	L2
50	137	173.8
100	187	223.8
150	237	273.8
200	287	323.8
250	337	373.8
300	487	423.8

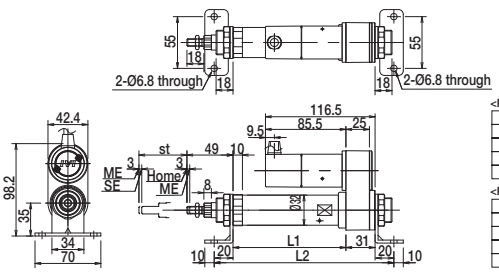
<RGS4C/RGD4C>

st	L1	L2
50	145	181.8
100	195	231.8
150	245	281.8
200	295	331.8
250	345	381.8
300	495	431.8

m dimension

		m	
		20w	30w
RCA	Incremental	67.5	82.5
	Absolute	80.5	95.5
RCS2	Incrt/Abst	80.5	95.5

RCA / RA3R / RGS3R / RGD3R
Unit model RCA-FT-RA3R



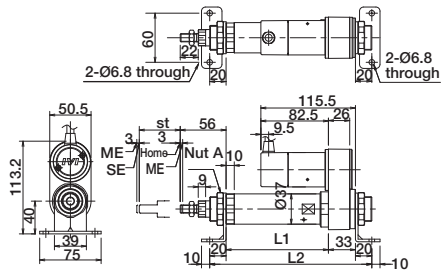
<RA3R>

st	L1	L2
50	120	191
100	170	241
150	220	291
200	270	341

<RGS3R/RGD3R>

st	L1	L2
50	128	199
100	178	249
150	228	299
200	278	349

RCA (RCS2)-RA4R / RGS4R / RGD4R
Unit model RCA-FT-RA4R



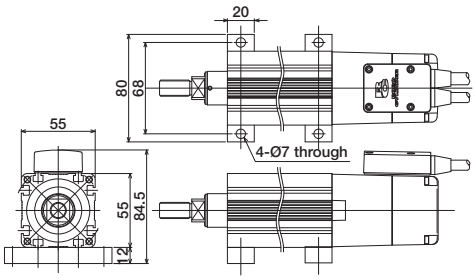
<RA4R>

st	L1	L2
50	125	198
100	175	248
150	225	298
200	275	348
250	325	398
300	375	448

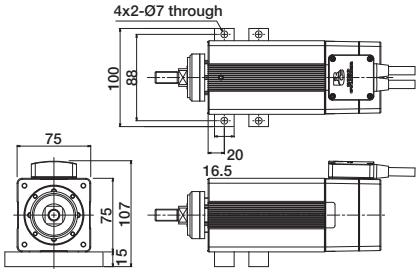
<RGS4R/RGD4R>

st	L1	L2
50	133	206
100	183	256
150	233	306
200	283	356
250	333	406
300	383	456

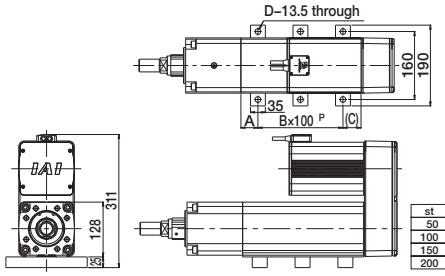
RCS2-RA5C / RA5R / RGS5C / RGD5C
Unit model RCS2-FT-RA5



RCS2-SRA7BD
Unit model RCS2-FT-SRA7



RCS2-RA13R
Unit model RCS2-FT-RA13



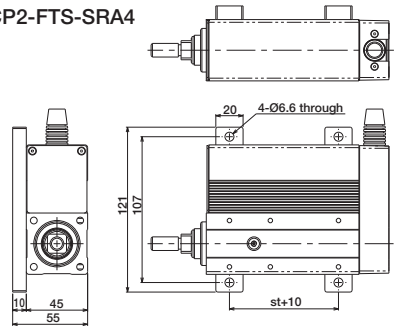
st	A	B	C	D
50	40	2	42.5	6
100	65	2	67.5	6
150	40	3	42.5	8
200	65	3	67.5	8

Foot (Mounted on right side face/left side face)

■Models FT2(Mounted on right side face)
FT4(Mounted on right side face)

Applicable models	RCP2 (RCA)-SRA4R
Description	A bracket for affixing the actuator using bolts from the top side. RCP2(RCA)-SRA4R can be mounted on the side face also.

RCP2 / RCA-SRA4R
Unit model RCP2-FTS-SRA4



Guide mounting direction (for single-guide type only)

■ Models GS2, GS3 and GS4

Applicable models	RCP2 (RCA)-SRGS4R RCS2-RGS5C / SRA7BD
Description	For the single-guide model, the mounting position of the rod can be selected from the right (GS2), bottom (GS3), or left side (GS4).

High acceleration/deceleration

■ Models HA

Applicable models	RCA-SA4C / SA5C / SA6C / RA3C / RA4C RCS2-SA4C / SA5C / SA6C / SA7C / RA4C / RA5C
Description	Option to increase to 1G the standard acceleration rate of 0.3G. An actuator with 1G of acceleration can be operated with the same load capacity as the 0.3G unit. The controller settings are different from the standard specification, so when operating with high acceleration, the controller also needs to be set to the high acceleration specification.

Home check sensor

■ Models HS

Applicable models	Slider Type	RCA (RCACR)-SA4C / SA5C / SA6C, RCS2 (RCS2CR)-SA4C / SA5C / SA6C RCA-SA4R / SA5R / SA6R and RCS2-SA4R / SA5R / SA6R
	Rod Type	RCA-RA3C / RA3D / RA3R / RA4C / RA4D / RA4R and RCS2-RA4C / RA4D / RA4R
Description	When an actuator is instructed to return home, this sensor checks to make sure that the slider moves to the home position. * This cannot be used with the reversed-home specification for rod types.	

Connector cable exit direction

■ Models K1, K2 and K3

Applicable models	RCA2-RN□NA / RP□NA / GS□NA / GD□NA / TCA□NA / TWA□NA / TFA□NA RCS2-RN5N / RP5N / GS5N / GD5N / SD5N /TCA5N / TWA5N / TFA5N
Description	Connector cable outlet direction can be changed to left (K1), from the front to the rear(K2) and to right (K3).

Limit switch

■ Models L

Applicable models	Rotary Type	RCS2-RT6 / RT6R / RT7R
Description	When home return is performed, the home will be determined after the actuator reverses following contact with the mechanical end. This optional sensor is used to detect this reversing.(However, with the rotary type, all models will have the standard settings.)	

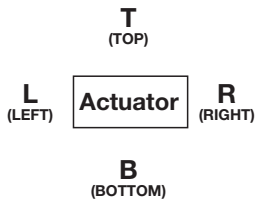
Low power compatible

■ Models LA

Applicable models	RCA / RCA2 / RCACR / RCA Series, all models
Description	This option decreases the power capacity of the controller. With the standard specification and high-speed acceleration specification, the maximum is 5.1A, but if the low-power specification is selected, the maximum decreases to 3.4A. (The maximum values differ for some models, so see the power capacities of the ACON/ASEL controllers for details.)

Side-Mounted Motor Orientation

■ Models MB, ML, MR and MT



Applicable models	All side-mounted motor type models
Description	These abbreviations specify the motor reversing direction of the motor reversing type. Viewed from the motor side, downward reversing is MB (arm type only), leftward reversing is ML (all models), rightward reversing is MR (all models), and upward reversing is MT (limited to RCS2-RA13R). The arm type is MB, but for other models, ML is standard. (MT has different criteria for RCS2-RA13R.)

No cover

■ Models NCO

Applicable models	RCP3 (RCA2)-SA3C / SA4C / SA5C / SA6C / SA3R / SA4R / SA5R / SA6R
Description	By removing the cover from the actuator, the cost reduction can be achieved and the maintainability can be enhanced.

Reversed-home specification

■ Models NM

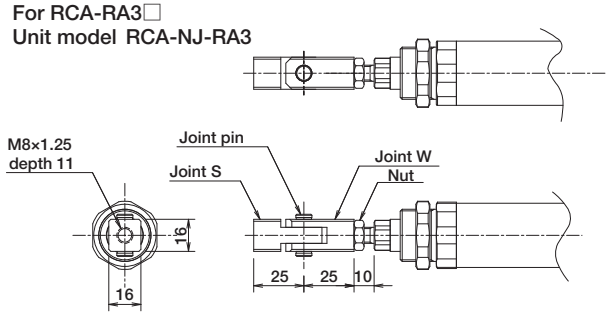
Applicable models	All slider-type models All rod-type, table-type, arm-type, and flat-type models (* excluding RCP2-RA2C / SRA4R / RA10C, RCA2-RN / RP / GS / GD / SD / TCA / TWA / TFA □N, RCA-SRA4R and RCS2-RA5C / RA5R / SRA7BD / RA13R)
Description	The normal home position is set by the slider and rod on the motor side, but there is the option for the home position to be on the other side to accomodate variations in device layout, etc. (Note: Home position settings are factory settings. Changes to these settings after the product is delivered will require shipping the product back to IAI for re-setting.)

Knuckle joint

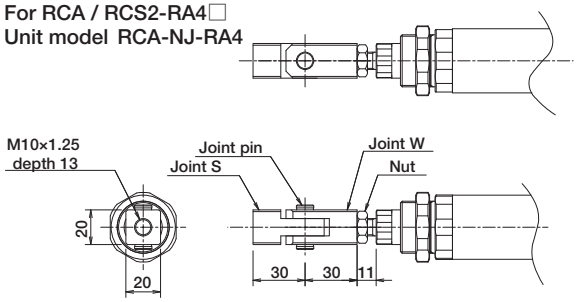
■ Models NJ

Applicable models	Rod Type	RCA-RA3C / RA3D / RA3R / RA4C / RA4D / RA4R RCS2-RA4C / RA4D / RA4R
Description	Clevis or trunnion fittings give rotational freedom of movement for the ends of the actuator rods.	

For RCA-RA3□
Unit model RCA-NJ-RA3



For RCA / RCS2-RA4□
Unit model RCA-NJ-RA4



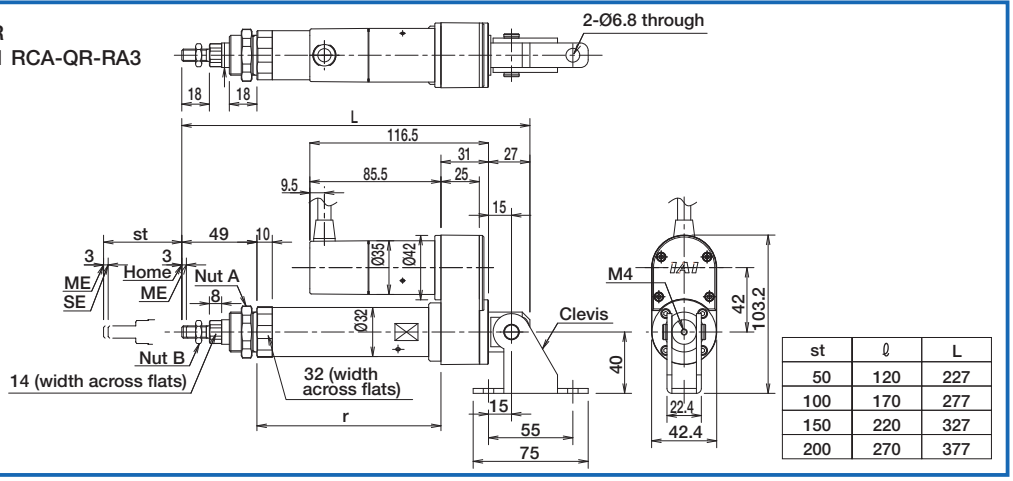
Clevis

■ Models QR

Applicable models	Rod Type	RCA-RA3R / RA4R RCS2-RA4R
Description	A bracket for aligning the cylinder movement when the load installed at the tip of the rod moves in a direction different from the rod.	

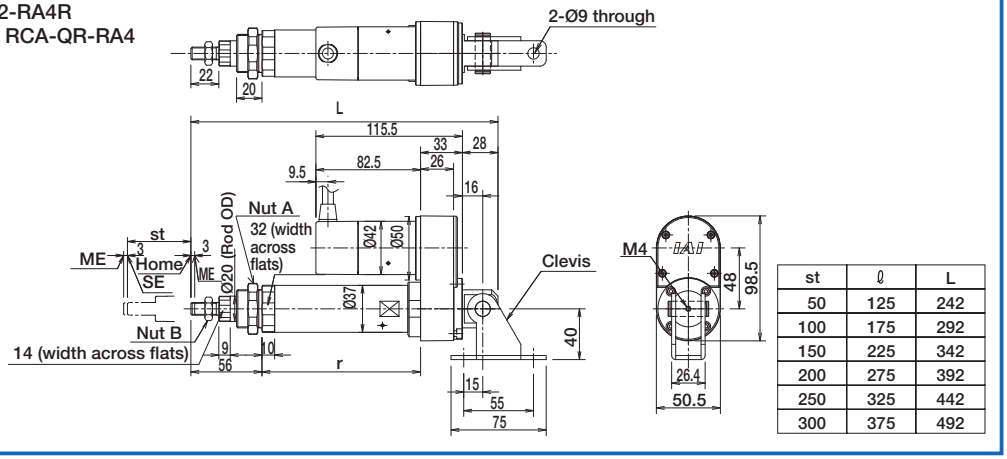
Caution If the rod is to be moved with a clevis bracket attached to it, use a guide type or install an external guide to prevent the rod from receiving any load other than from its moving direction.

RCA-RA3R
Unit model RCA-QR-RA3



st	ℓ	L
50	120	227
100	170	277
150	220	327
200	270	377

RCA / RCS2-RA4R
Unit model RCA-QR-RA4



st	ℓ	L
50	125	242
100	175	292
150	225	342
200	275	392
250	325	442
300	375	492

Rod end extension specification

■ Models RE

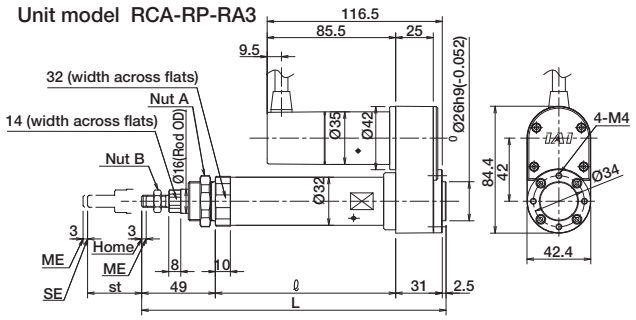
Applicable models	RCS2-SRA7BD
Description	An adapter for extending the rod end so that the distance between the mounting hole and the rod end can be the same as that of RCS2-RA7BD.

Rear mounting plate

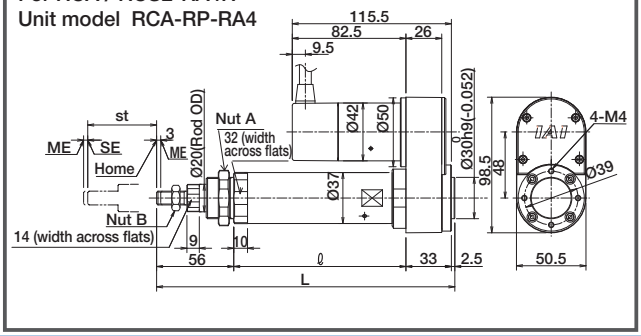
■ Models RP

Applicable models	Motor reversing rod types RCA-RA3R / RA4R and RCS2-RA4R
Description	A bracket (plate) for affixing the back of a motor-reversing rod type (RA3R/RA4R) to the system.

For RCA-RA3R
Unit model RCA-RP-RA3



For RCA / RCS2-RA4R
Unit model RCA-RP-RA4

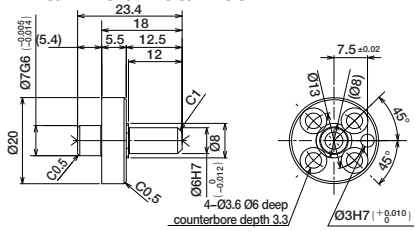


Shaft adapter

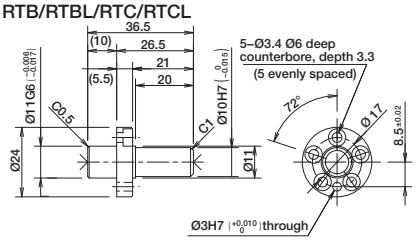
■ Models SA

Applicable models	All RCP2 rotary type models
Description	An adapter for installing a jig, etc., onto the rotating part of a rotary type.

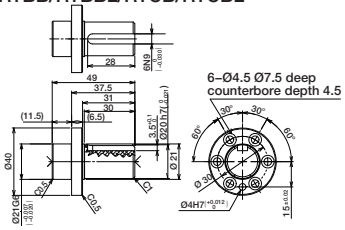
RTBS/RTBSL/RTCS/RTCSL



RTB/RTBL/RTC/RTCL

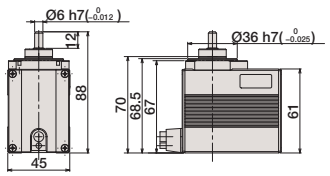


RTBB/RTBBL/RTCB/RTCBL



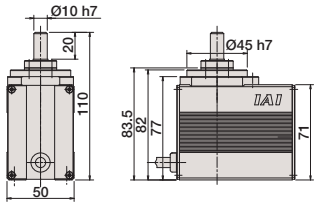
Combined w/ RCP2-RTBS/RTBSL

Configuration: RCP2-SA-RTS
(Weight: 0.02kg)



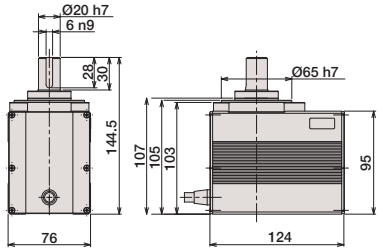
Combined w/ RCP2-RTB/RTBL

Configuration: RCP2-SA-RT
(Weight: 0.04kg)



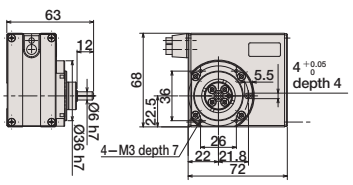
Combined w/ RCP2-RTBB/RTBBL

Configuration: RCP2-SA-RTB (Weight: 0.2kg)



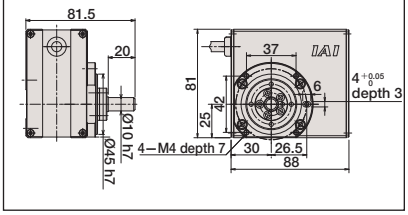
Combined w/ RCP2-RTCS/RTCSL

Configuration: RCP2-SA-RTS
(Weight: 0.02kg)



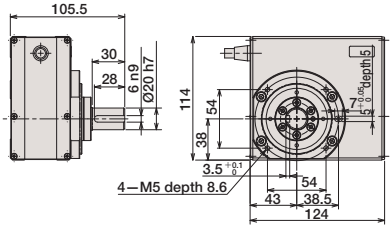
Combined w/ RCP2-RTC/RTCL

Configuration: RCP2-SA-RT
(Weight: 0.04kg)



Combined w/ RCP2-RTCB/RTCBL

Configuration: RCP2-SA-RTB
(Weight: 0.2kg)

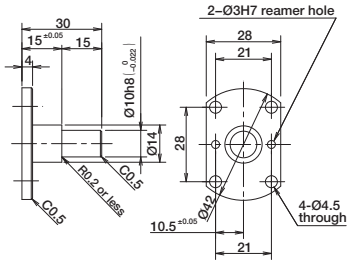


Shaft bracket

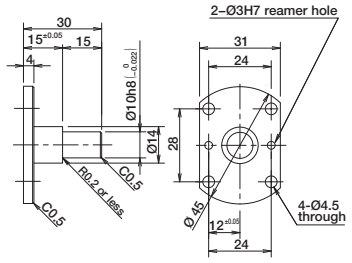
■ Models SB

Applicable models	Gripper Type	RCP2-GRS / GRM / GR3LS GR3LM / GR3SS / GR3SM
Description	This bracket is for mounting the gripper unit.	

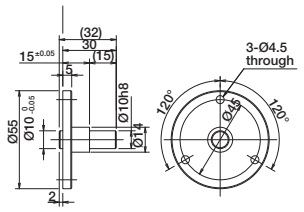
Unit model for RCP2-GRS: RCP2-SB-GRS



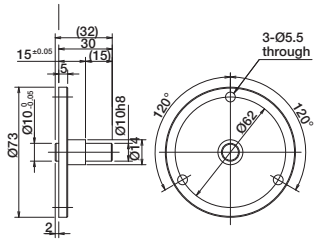
Unit model for RCP2-GRM: RCP2-SB-GRM



Unit model for RCP2-GR3LS/GR3SS: RCP2-SB-GR3S



Unit model for RCP2-GR3LM/GR3SM: RCP2-SB-GR3M



Slider roller specification

■ Models SR

Applicable models	Slider type	RCA-SA4□/SA5□/SA6□ RCS2-SA4□/SA5□/SA6□/SA7□/SS7□/SS8□
Description	This changes the structure of the standard slider type that is similar to those found in cleanroom types.	

Slider spacer

■ Models SS

Applicable models	Slider Type	RCA-SA4C / SA4R RCS2-SA4C / SA4R
Description	A spacer for raising the top face of the slider on the SA4 type to above the motor. This spacer is not required for non-SA4 types because the top face of the slider is above the motor on these actuators.	

For RCA / RCS2-SA4□
Unit model RCA-SS-SA4

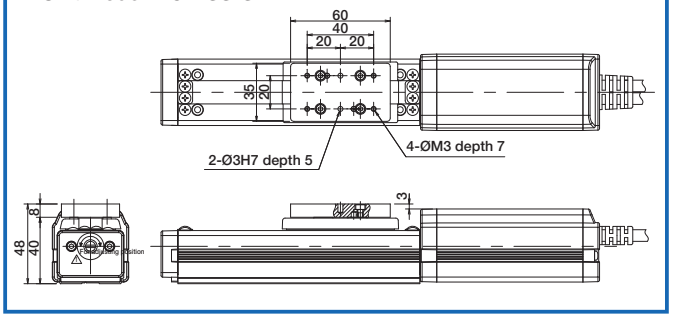
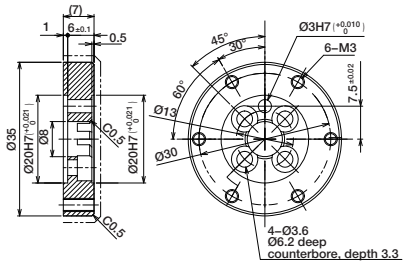


Table adapter

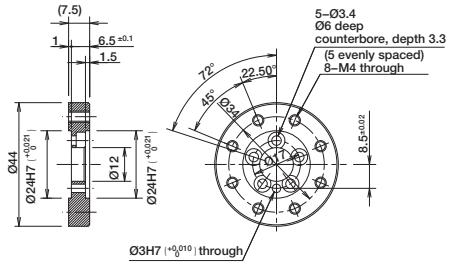
■ Models TA

Applicable models	All RCP2 rotary type models
Description	An adapter for installing a jig, etc., onto the rotating part of a rotary type.

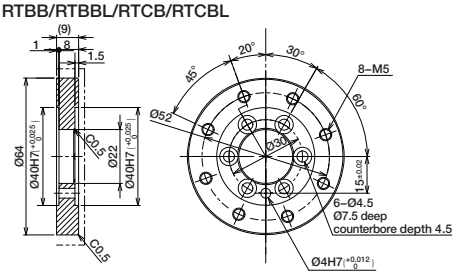
RTBS/RTBSL/RTCS/RTCSL



RTB/RTBL/RTC/RTCL

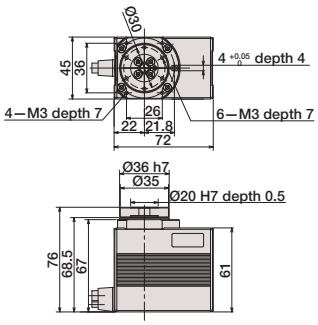


RTBB/RTBBL/RTCB/RTCBL



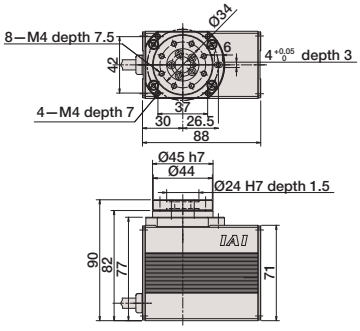
Combined w/ RCP2-RTBS/RTBSL

Configuration: RCP2-TA-RTS
(Weight: 0.02kg)



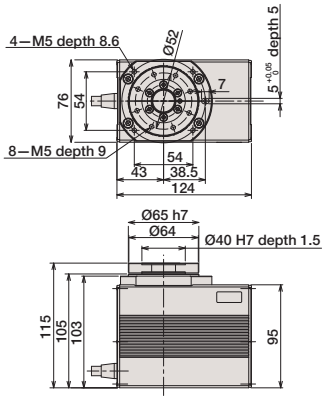
Combined w/ RCP2-RTB/RTBL

Configuration: RCP2-TA-RT
(Weight: 0.03kg)



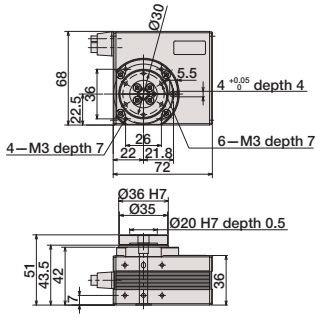
Combined w/ RCP2-RTBB/RTBBL

Configuration: RCP2-TA-RTB
(Weight: 0.06kg)



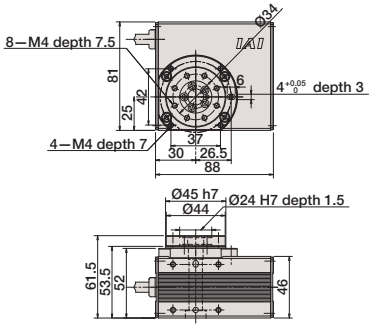
Combined w/ RCP2-RTCS/RTCSL

Configuration: RCP2-TA-RTS
(Weight: 0.02kg)



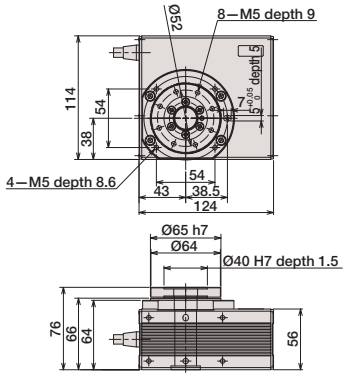
Combined w/ RCP2-RTC/RTCL

Configuration: RCP2-TA-RT
(Weight: 0.03kg)



Combined w/ RCP2-RTCB/RTCBL

Configuration: RCP2-TA-RTB
(Weight: 0.06kg)



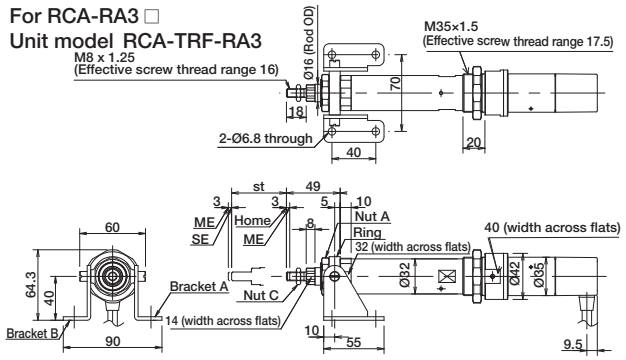
Front trunnion

■ Models TRF

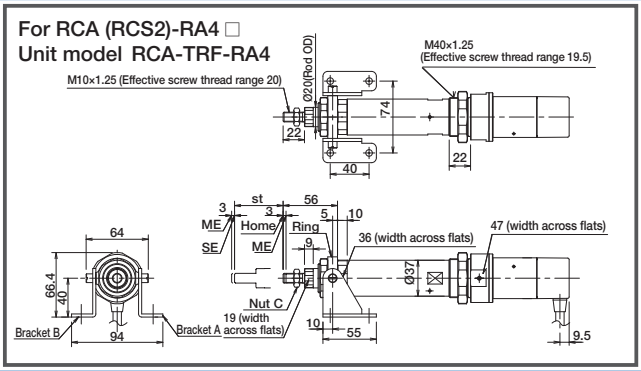
Applicable models	Rod Type	RCA-RA3C / RA3D / RA3R / RA4C / RA4D / RA4R RCS2-RA4C / RA4D / RA4R
Description	A bracket for aligning the cylinder movement when the load installed at the tip of the rod moves in a direction different from the rod.	

Caution If a rod is moved with a trunnion bracket mounted to it, use a guide type or install an external guide so no load is applied to the rod in a direction other than the proper direction the rod travels.

For RCA-RA3 □
Unit model RCA-TRF-RA3



For RCA (RCS2)-RA4 □
Unit model RCA-TRF-RA4



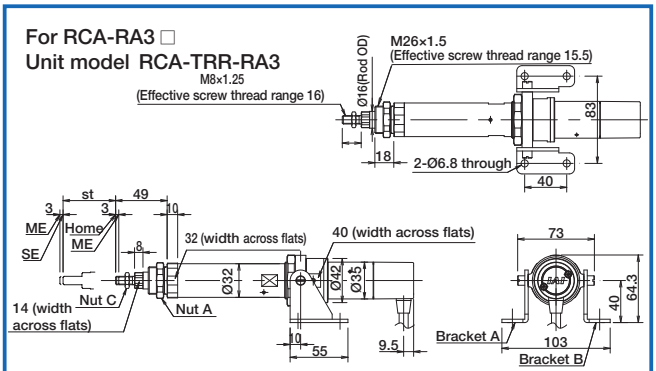
Rear trunnion

■ Models TRR

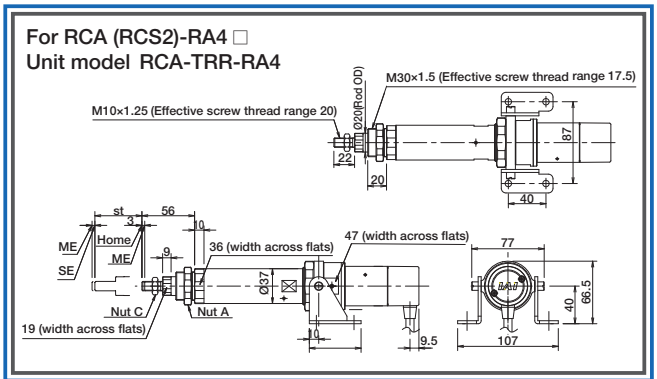
Applicable models	Rod Type	RCA-RA3C / RA3D / RA4C / RA4D RCS2-RA4C / RA4D
Description	A bracket for aligning the cylinder movement when the load installed at the tip of the rod moves in a direction different from the rod.	

Caution If a rod is moved with a trunnion bracket mounted to it, use a guide type or install an external guide so no load is applied to the rod in a direction other than the proper direction the rod travels.

For RCA-RA3 □
Unit model RCA-TRR-RA3



For RCA (RCS2)-RA4 □
Unit model RCA-TRR-RA4



Vacuum joint mounted on opposite side

■ Models VR

Applicable models	All cleanroom type models
Description	Looking from the motor side, the standard position for the vacuum joint is on the left side of the actuator, but this option allows users to change the position to the opposite side (right side).

Table of Actuator-Controller Connection Cable Models

This table shows the models of cables connecting the actuator of the vertical axis and the controller of the horizontal axis.
For the details of cabling, cable size, etc., see the applicable page shown beneath the model number.

Connection Actuator		Cable Type	Connection Controller			
			PMEC PSEP	**AMEC ASEP**	**PCON PSEL**	
RCP3 (All Models) **RCP2-GRSS/GRLS/GRST/GRHM/GRHB** **RCP2-SRA4R/SRGS4R/SRGD4R**		Motor-Encoder Integrated Cable	Model CB-APSEP-MPA□□□ See page 485 for details.	Unavailable	Model CB-PCS-MPA□□□ See page 534 for details.	
RCP2 RCP2CR RCP2W	Any model other than those below	Motor Cable	Motor-Encoder Integrated Cable (The standard robot cable) Model CB-APSEP-MPA□□□ See page 485 for details.	Unavailable	Model CB-RCP2-MA□□□ See page 533 for details.	
		Encoder Cable		Unavailable	Model CB-RCP2-PB□□□ See page 533 for details.	
		Encoder Robot Cable		Unavailable	Model CB-RCP2-PB□□□-RB See page 533 for details.	
	RTBS RTBSL RTCS RTCSL	Motor Cable	Motor-Encoder Integrated Cable (The standard robot cable) Model CB-RPSEP-MPA□□□ See page 486 for details.	Unavailable	Motor-Encoder Integrated Cable (The standard robot cable) Model CB-PCS-MPA□□□ See page 534 for details.	
		Encoder Cable		Unavailable		
		Encoder Robot Cable		Unavailable		
	HS8C HS8R SA16C RA10C	Motor Cable	Unavailable	Unavailable	Unavailable	
		Encoder Cable	Unavailable	Unavailable	Unavailable	
		Encoder Robot Cable	Unavailable	Unavailable	Unavailable	
RCA2(All Models) **RCA-SRA4R/SRGS4R/SRGD4R**		Motor-Encoder Integrated Cable	Unavailable	Model CB-APSEP-MPA□□□ See page 485 for details.	Unavailable	
RCA RCACR RCAW		Motor Cable	Unavailable	Motor-Encoder Integrated Cable (The standard robot cable) Model CB-ASEP-MPA□□□ See page 485 for details.	Unavailable	
		Encoder Cable	Unavailable		Unavailable	
		Encoder Robot Cable	Unavailable		Unavailable	
RCS2 RCS2CR RCS2W (Note) **RCS2-RT□/RA13R** is a dedicated cable. See page 556 for details.		Motor Cable	Unavailable	Unavailable	Unavailable	
		Encoder Cable	Unavailable	Unavailable	Unavailable	
		Motor Robot Cable	Unavailable	Unavailable	Unavailable	
		Encoder Robot Cable	Unavailable	Unavailable	Unavailable	
RCL		Motor-Encoder Integrated Cable	Unavailable	Model CB-APSEP-MPA□□□ See page 485 for details.	Unavailable	

Connection Controller					
	PCON-CF	**ACON ASEL**	**SCON SSEL**	**XSEL KE/KET**	**XSEL P/Q**
	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	Model CB-RCP2-MA□□□ See page 533 for details.	Unavailable	Unavailable	Unavailable	Unavailable
	Model CB-RFA-PA□□□ See page 534 for details.	Unavailable	Unavailable	Unavailable	Unavailable
	Model CB-RFA-PA□□□-RB See page 534 for details.	Unavailable	Unavailable	Unavailable	Unavailable
	Unavailable	Model CB-ACS-MPA□□□ See page 544 for details.	Unavailable	Unavailable	Unavailable
	Unavailable	Model CB-ACS-MA□□□ See page 543 for details.	Unavailable	Unavailable	Unavailable
	Unavailable	Model CB-ACS-PA□□□ See page 544 for details.	Unavailable	Unavailable	Unavailable
	Unavailable	Model CB-ACS-PA□□□-RB See page 544 for details.	Unavailable	Unavailable	Unavailable
	Unavailable	Unavailable	Model CB-RCC-MA□□□ See page 556 for details.	Model CB-RCC-MA□□□ See page 599 for details.	Model CB-RCC-MA□□□ See page 599 for details.
	Unavailable	Unavailable	Model CB-RCS2-PA□□□ See page 556 for details.	Model CB-RCBC-PA□□□ See page 599 for details.	Model CB-RCS2-PA□□□ See page 599 for details.
	Unavailable	Unavailable	Model CB-XEU-MA□□□ See page 556 for details.	Model CB-XEU-MA□□□ See page 599 for details.	Model CB-XEU-MA□□□ See page 599 for details.
	Unavailable	Unavailable	Model CB-XEU3-PA□□□ See page 556 for details.	Model CB-XEU-PA□□□ See page 599 for details.	Model CB-XEU3-PA□□□ See page 599 for details.
	Unavailable	Model CB-ACS-MPA□□□ See page 544 for details.	Unavailable	Unavailable	Unavailable

Table of Replacement Stainless Sheet Models

Series	Type			Stainless Sheet Model
RCP3 RCA2	SA3C	SA3R		ST-3A3-(Stroke)
	SA4C	SA4R		ST-3A4-(Stroke)
	SA5C	SA5R		ST-3A5-(Stroke)
	SA6C	SA6R		ST-3A6-(Stroke)
RCP2	SA5C	SA5R		ST-2A5-(Stroke)
	SA6C	SA6R		ST-2A6-(Stroke)
	SA7C	SA7R		ST-2A7-(Stroke)
	SS7C	SS7R		ST-SS1-(Stroke)
	SS8C	SS8R		ST-SM1-(Stroke)
	HS8C	HS8R		ST-SM1-(Stroke)
RCA	SA4C	SA4D	SA4R	ST-SA4-(Stroke)
	SA5C	SA5D	SA5R	ST-SA5-(Stroke)
	SA6C	SA6D	SA6R	ST-SA6-(Stroke)
	SS4D			ST-SS4-(Stroke)
	SS5D			ST-SS5-(Stroke)
	SS6D			ST-SS6-(Stroke)
RCS2	SA4C	SA4D	SA4R	ST-SA4-(Stroke)
	SA5C	SA5D	SA5R	ST-SA5-(Stroke)
	SA6C	SA6D	SA6R	ST-SA6-(Stroke)
	SA7C		SA7R	ST-SA7-(Stroke)
	SS7C		SS7R	ST-SS1-(Stroke)
	SS8C		SS8R	ST-SM1-(Stroke)
RCP2CR	SA5C			ST-2A5-(Stroke)
	SA6C			ST-2A6-(Stroke)
	SA7C			ST-2A7-(Stroke)
	SS7C			ST-SS2-(Stroke)
	SS8C			ST-SM2-(Stroke)
	HS8C			ST-SM2-(Stroke)
RCACR	SA4C			ST-SA4-(Stroke)
	SA5C	SA5D		ST-SA5-(Stroke)
	SA6C	SA6D		ST-SA6-(Stroke)
RCS2CR	SA4C			ST-SA4-(Stroke)
	SA5C	SA5D		ST-SA5-(Stroke)
	SA6C	SA6D		ST-SA6-(Stroke)
	SA7C			ST-SA7-(Stroke)
	SS7C			ST-SS2-(Stroke)
	SS8C			ST-SM2-(Stroke)

Table of RCP3/RCA2 Replacement Motor Unit Models

Series	Type	Cable Outlet Direction Change Option	Motor Unit Model	
			No Brake	Brake-Equipped
RCP3	SA2AC	None	RCP3-MU00A	–
	SA2BC	None	RCP3-MU00A	–
	SA3C	None	RCP3-MU1A	RCP3-MU1A-B
		Upward	RCP3-MU1A-CJT	RCP3-MU1A-B-CJT
		Rightward	RCP3-MU1A-CJR	RCP3-MU1A-B-CJR
		Leftward	RCP3-MU1A-CJL	RCP3-MU1A-B-CJL
		Downward	RCP3-MU1A-CJB	RCP3-MU1A-B-CJB
	SA4C	None	RCP3-MU2A	RCP3-MU2A-B
		Upward	RCP3-MU2A-CJT	RCP3-MU2A-B-CJT
		Rightward	RCP3-MU2A-CJR	RCP3-MU2A-B-CJR
		Leftward	RCP3-MU2A-CJL	RCP3-MU2A-B-CJL
		Downward	RCP3-MU2A-CJB	RCP3-MU2A-B-CJB
	SA5C	None	RCP3-MU3A	RCP3-MU3A-B
		Upward	RCP3-MU3A-CJT	RCP3-MU3A-B-CJT
		Rightward	RCP3-MU3A-CJR	RCP3-MU3A-B-CJR
		Leftward	RCP3-MU3A-CJL	RCP3-MU3A-B-CJL
		Downward	RCP3-MU3A-CJB	RCP3-MU3A-B-CJB
	SA6C	None	RCP3-MU3A	RCP3-MU3A-B
		Upward	RCP3-MU3A-CJT	RCP3-MU3A-B-CJT
		Rightward	RCP3-MU3A-CJR	RCP3-MU3A-B-CJR
		Leftward	RCP3-MU3A-CJL	RCP3-MU3A-B-CJL
		Downward	RCP3-MU3A-CJB	RCP3-MU3A-B-CJB
	SA2AR	None	RCP3-MU00B	–
	SA2BR	None	RCP3-MU00B	–
	SA3R	None	RCP3-MU1B	RCP3-MU1B-B
		Upward	RCP3-MU1B-CJT	RCP3-MU1B-B-CJT
		Outward	RCP3-MU1B-CJO	RCP3-MU1B-B-CJO
		Downward	RCP3-MU1B-CJB	RCP3-MU1B-B-CJB
	SA4R	None	RCP3-MU2B	RCP3-MU2B-B
		Upward	RCP3-MU2B-CJT	RCP3-MU2B-B-CJT
		Outward	RCP3-MU2B-CJO	RCP3-MU2B-B-CJO
		Downward	RCP3-MU2B-CJB	RCP3-MU2B-B-CJB
	SA5R	None	RCP3-MU3B	RCP3-MU3B-B
		Upward	RCP3-MU3B-CJT	RCP3-MU3B-B-CJT
		Outward	RCP3-MU3B-CJO	RCP3-MU3B-B-CJO
		Downward	RCP3-MU3B-CJB	RCP3-MU3B-B-CJB
	SA6R	None	RCP3-MU3B	RCP3-MU3B-B
		Upward	RCP3-MU3B-CJT	RCP3-MU3B-B-CJT
		Outward	RCP3-MU3B-CJO	RCP3-MU3B-B-CJO
		Downward	RCP3-MU3B-CJB	RCP3-MU3B-B-CJB
	RA2AC	None	RCP3-MU00A	RCP3-MU00A-B
	RA2BC	None	RCP3-MU00A	RCP3-MU00A-B
	RA2AR	None	RCP3-MU00B	RCP3-MU00B-B
	RA2BR	None	RCP3-MU00B	RCP3-MU00B-B
	TA3C	None	RCP3-MU0A	RCP3-MU0A-B
	TA4C	None	RCP3-MU1A	RCP3-MU1A-B
		Upward	RCP3-MU1A-CJT	RCP3-MU1A-B-CJT
		Rightward	RCP3-MU1A-CJR	RCP3-MU1A-B-CJR
		Leftward	RCP3-MU1A-CJL	RCP3-MU1A-B-CJL
		Downward	RCP3-MU1A-CJB	RCP3-MU1A-B-CJB

Table of RCP3/RCA2 Replacement Motor Unit Models

Series	Type	Cable Outlet Direction Change Option	Motor Unit Model	
			No Brake	Brake-Equipped
RCP3	TA5C	None	RCP3-MU2A	RCP3-MU2A-B
		Upward	RCP3-MU2A-CJT	RCP3-MU2A-B-CJT
		Rightward	RCP3-MU2A-CJR	RCP3-MU2A-B-CJR
		Leftward	RCP3-MU2A-CJL	RCP3-MU2A-B-CJL
		Downward	RCP3-MU2A-CJB	RCP3-MU2A-B-CJB
	TA6C	None	RCP3-MU3A	RCP3-MU3A-B
		Upward	RCP3-MU3A-CJT	RCP3-MU3A-B-CJT
		Rightward	RCP3-MU3A-CJR	RCP3-MU3A-B-CJR
		Leftward	RCP3-MU3A-CJL	RCP3-MU3A-B-CJL
		Downward	RCP3-MU3A-CJB	RCP3-MU3A-B-CJB
	TA7C	None	RCP3-MU3A	RCP3-MU3A-B
		Upward	RCP3-MU3A-CJT	RCP3-MU3A-B-CJT
		Rightward	RCP3-MU3A-CJR	RCP3-MU3A-B-CJR
		Leftward	RCP3-MU3A-CJL	RCP3-MU3A-B-CJL
		Downward	RCP3-MU3A-CJB	RCP3-MU3A-B-CJB
	TA3R	None	RCP3-MU0B	RCP3-MU0B-B
	TA4R	None	RCP3-MU1B	RCP3-MU1B-B
		Upward	RCP3-MU1B-CJT	RCP3-MU1B-B-CJT
		Outward	RCP3-MU1B-CJO	RCP3-MU1B-B-CJO
		Downward	RCP3-MU1B-CJB	RCP3-MU1B-B-CJB
	TA5R	None	RCP3-MU2B	RCP3-MU2B-B
		Upward	RCP3-MU2B-CJT	RCP3-MU2B-B-CJT
		Outward	RCP3-MU2B-CJO	RCP3-MU2B-B-CJO
		Downward	RCP3-MU2B-CJB	RCP3-MU2B-B-CJB
	TA6R	None	RCP3-MU3B	RCP3-MU3B-B
		Upward	RCP3-MU3B-CJT	RCP3-MU3B-B-CJT
		Outward	RCP3-MU3B-CJO	RCP3-MU3B-B-CJO
		Downward	RCP3-MU3B-CJB	RCP3-MU3B-B-CJB
	TA7R	None	RCP3-MU3B	RCP3-MU3B-B
		Upward	RCP3-MU3B-CJT	RCP3-MU3B-B-CJT
		Outward	RCP3-MU3B-CJO	RCP3-MU3B-B-CJO
		Downward	RCP3-MU3B-CJB	RCP3-MU3B-B-CJB
RCA2	SA3C	None	RCA2-MU1A	RCA2-MU1A-B
		Upward	RCA2-MU1A-CJT	RCA2-MU1A-B-CJT
		Rightward	RCA2-MU1A-CJR	RCA2-MU1A-B-CJR
		Leftward	RCA2-MU1A-CJL	RCA2-MU1A-B-CJL
		Downward	RCA2-MU1A-CJB	RCA2-MU1A-B-CJB
	SA4C	None	RCA2-MU2A	RCA2-MU2A-B
		Upward	RCA2-MU2A-CJT	RCA2-MU2A-B-CJT
		Rightward	RCA2-MU2A-CJR	RCA2-MU2A-B-CJR
		Leftward	RCA2-MU2A-CJL	RCA2-MU2A-B-CJL
		Downward	RCA2-MU2A-CJB	RCA2-MU2A-B-CJB
	SA5C	None	RCA2-MU3A	RCA2-MU3A-B
		Upward	RCA2-MU3A-CJT	RCA2-MU3A-B-CJT
		Rightward	RCA2-MU3A-CJR	RCA2-MU3A-B-CJR
		Leftward	RCA2-MU3A-CJL	RCA2-MU3A-B-CJL
		Downward	RCA2-MU3A-CJB	RCA2-MU3A-B-CJB
	SA6C	None	RCA2-MU3A	RCA2-MU3A-B
		Upward	RCA2-MU3A-CJT	RCA2-MU3A-B-CJT
		Rightward	RCA2-MU3A-CJR	RCA2-MU3A-B-CJR
		Leftward	RCA2-MU3A-CJL	RCA2-MU3A-B-CJL
		Downward	RCA2-MU3A-CJB	RCA2-MU3A-B-CJB

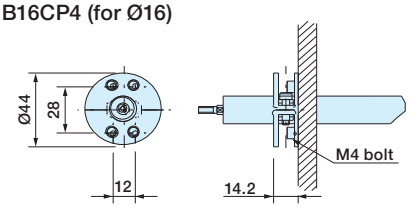
Series	Type	Cable Outlet Direction Change Option	Motor Unit Model	
			No Brake	Brake-Equipped
RCA2	SA3R	None	RCA2-MU1B	RCA2-MU1B-B
		Upward	RCA2-MU1B-CJT	RCA2-MU1B-B-CJT
		Outward	RCA2-MU1B-CJO	RCA2-MU1B-B-CJO
		Downward	RCA2-MU1B-CJB	RCA2-MU1B-B-CJB
	SA4R	None	RCA2-MU2B	RCA2-MU2B-B
		Upward	RCA2-MU2B-CJT	RCA2-MU2B-B-CJT
		Outward	RCA2-MU2B-CJO	RCA2-MU2B-B-CJO
		Downward	RCA2-MU2B-CJB	RCA2-MU2B-B-CJB
	SA5R	None	RCA2-MU3B	RCA2-MU3B-B
		Upward	RCA2-MU3B-CJT	RCA2-MU3B-B-CJT
		Outward	RCA2-MU3B-CJO	RCA2-MU3B-B-CJO
		Downward	RCA2-MU3B-CJB	RCA2-MU3B-B-CJB
	SA6R	None	RCA2-MU3B	RCA2-MU3B-B
		Upward	RCA2-MU3B-CJT	RCA2-MU3B-B-CJT
		Outward	RCA2-MU3B-CJO	RCA2-MU3B-B-CJO
		Downward	RCA2-MU3B-CJB	RCA2-MU3B-B-CJB
	TA3C	None	RCA2-MU0A	RCA2-MU0A-B
	TA4C	None	RCA2-MU1A	RCA2-MU1A-B
		Upward	RCA2-MU1A-CJT	RCA2-MU1A-B-CJT
		Rightward	RCA2-MU1A-CJR	RCA2-MU1A-B-CJR
		Leftward	RCA2-MU1A-CJL	RCA2-MU1A-B-CJL
		Downward	RCA2-MU1A-CJB	RCA2-MU1A-B-CJB
	TA5C	None	RCA2-MU2A	RCA2-MU2A-B
		Upward	RCA2-MU2A-CJT	RCA2-MU2A-B-CJT
		Rightward	RCA2-MU2A-CJR	RCA2-MU2A-B-CJR
		Leftward	RCA2-MU2A-CJL	RCA2-MU2A-B-CJL
		Downward	RCA2-MU2A-CJB	RCA2-MU2A-B-CJB
	TA6C	None	RCA2-MU3A	RCA2-MU3A-B
		Upward	RCA2-MU3A-CJT	RCA2-MU3A-B-CJT
		Rightward	RCA2-MU3A-CJR	RCA2-MU3A-B-CJR
		Leftward	RCA2-MU3A-CJL	RCA2-MU3A-B-CJL
		Downward	RCA2-MU3A-CJB	RCA2-MU3A-B-CJB
	TA7C	None	RCA2-MU3A	RCA2-MU3A-B
		Upward	RCA2-MU3A-CJT	RCA2-MU3A-B-CJT
		Rightward	RCA2-MU3A-CJR	RCA2-MU3A-B-CJR
		Leftward	RCA2-MU3A-CJL	RCA2-MU3A-B-CJL
		Downward	RCA2-MU3A-CJB	RCA2-MU3A-B-CJB
	TA3R	None	RCA2-MU0B	RCA2-MU0B-B
	TA4R	None	RCA2-MU1B	RCA2-MU1B-B
		Upward	RCA2-MU1B-CJT	RCA2-MU1B-B-CJT
		Outward	RCA2-MU1B-CJO	RCA2-MU1B-B-CJO
		Downward	RCA2-MU1B-CJB	RCA2-MU1B-B-CJB
	TA5R	None	RCA2-MU2B	RCA2-MU2B-B
		Upward	RCA2-MU2B-CJT	RCA2-MU2B-B-CJT
		Outward	RCA2-MU2B-CJO	RCA2-MU2B-B-CJO
		Downward	RCA2-MU2B-CJB	RCA2-MU2B-B-CJB
	TA6R	None	RCA2-MU3B	RCA2-MU3B-B
		Upward	RCA2-MU3B-CJT	RCA2-MU3B-B-CJT
		Outward	RCA2-MU3B-CJO	RCA2-MU3B-B-CJO
		Downward	RCA2-MU3B-CJB	RCA2-MU3B-B-CJB
	TA7R	None	RCA2-MU3B	RCA2-MU3B-B
		Upward	RCA2-MU3B-CJT	RCA2-MU3B-B-CJT
		Outward	RCA2-MU3B-CJO	RCA2-MU3B-B-CJO
		Downward	RCA2-MU3B-CJB	RCA2-MU3B-B-CJB

How To Mount an RCL Mini Rod Slim Type To The Actuator

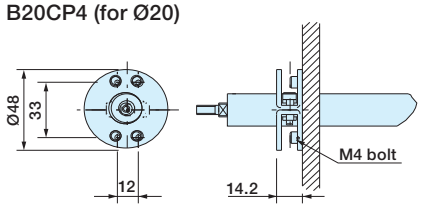
Mount the RCL mini rod slim type using a commercial bracket as shown below.
For details concerning the bracket, please refer to the manufacturer.

● Shaft Bracket (Iwata Mfg. Co., Ltd.)

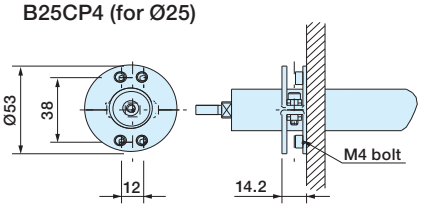
B16CP4 (for Ø16)



B20CP4 (for Ø20)

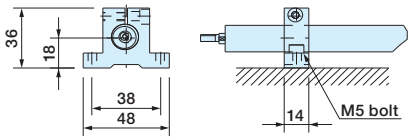


B25CP4 (for Ø25)

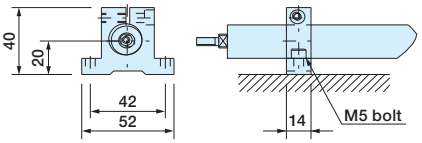


● Maru-Pijon (Miyoshi Pijon Co., Ltd).

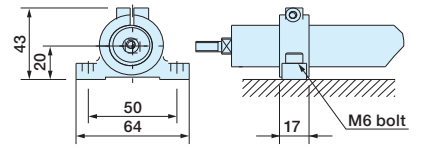
PN600 (for Ø16)



PQ600 (for Ø20)



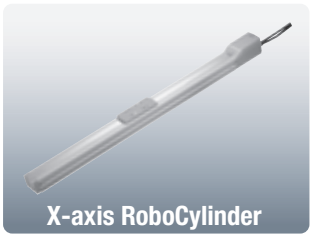
PH600 (for Ø25)

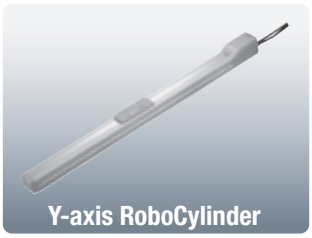


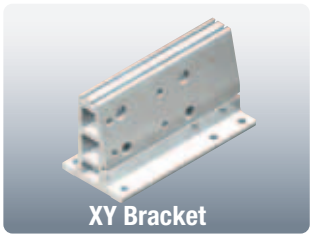
Note: When clamping the main pipe, do not exceed the tightening torque documented in the instructions manual. If the tightening torque for securing the main pipe is too strong, the pipe may become deformed or defective, and may cause a malfunction.

Combination of RCP2 and RCS2 Slider Types to 2- or 3-Axis System

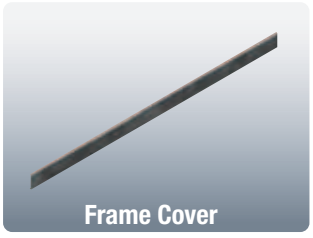
The IK Series (see IK cataloque) is a set that includes RCP2 or RCS2 slider axes and the following components needed to assemble a cartesian cylinder.

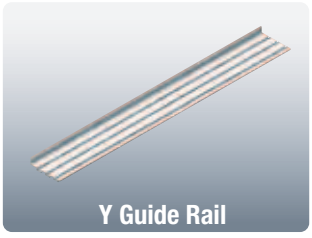

X-axis RoboCylinder

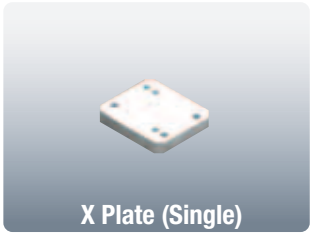

Y-axis RoboCylinder

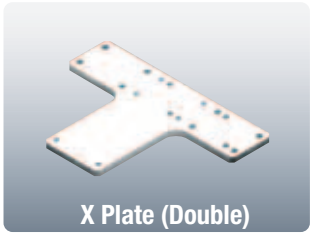

XY Bracket

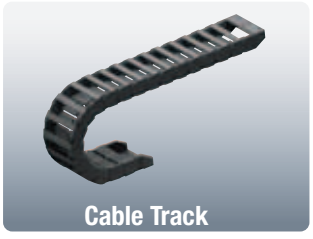

X Guide Rail

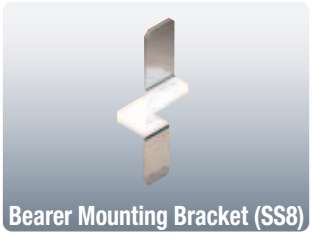

Frame Cover

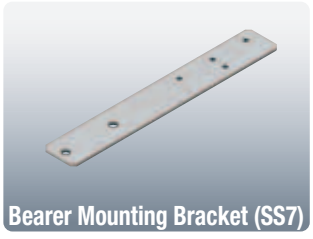

Y Guide Rail

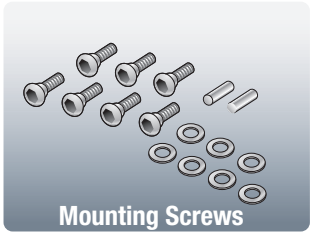

X Plate (Single)


X Plate (Double)

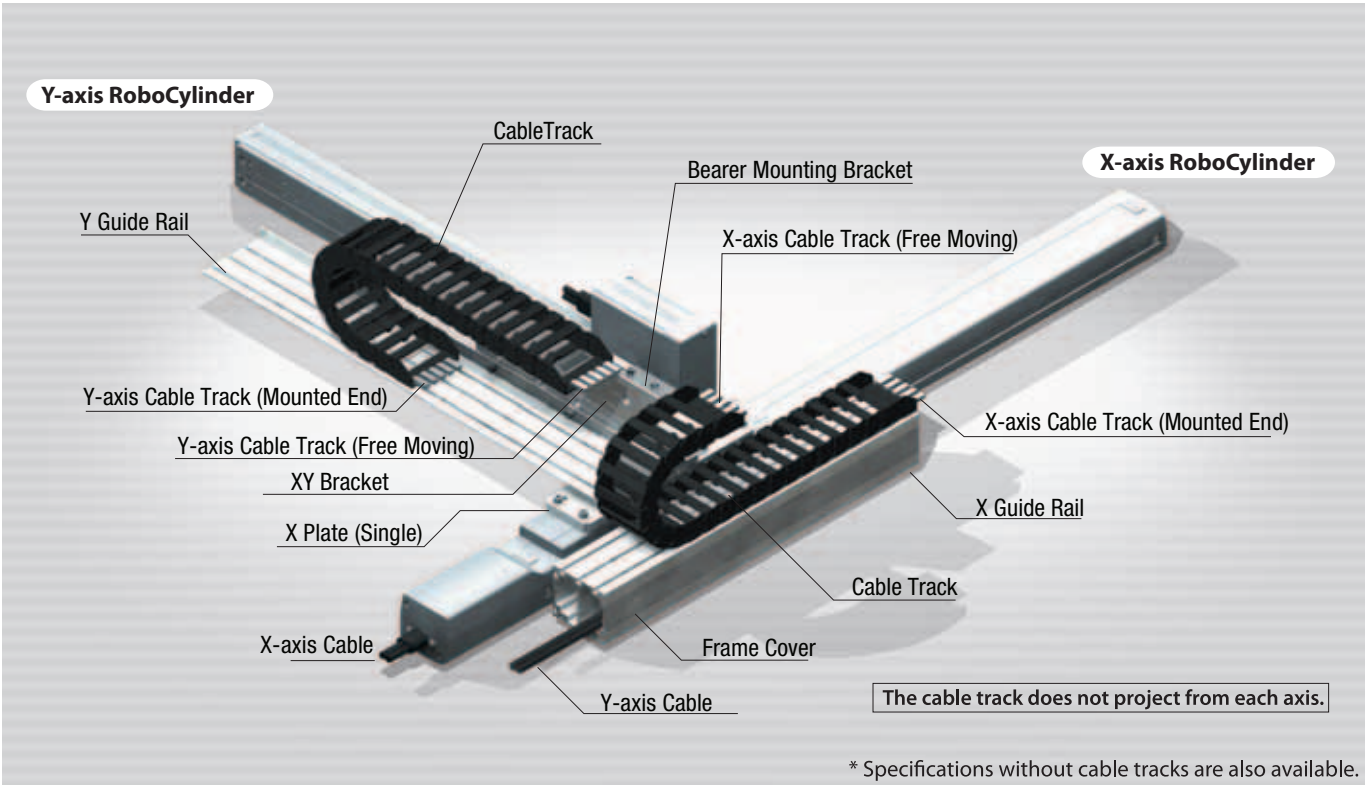

Cable Track


Bearer Mounting Bracket (SS8)


Bearer Mounting Bracket (SS7)


Mounting Screws

Note: The above images are provided for reference purpose only.
The actual components may vary depending on the combination type, direction, etc.



* Specifications without cable tracks are also available.

Selection Standard (Speed vs. Load Capacity Graph)

ERC2 Series Slider Type

Select horizontal or vertical use

From the device cycle time, select speed type

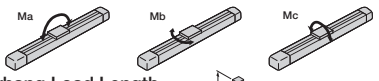
Use the graphs below to select a model for your purpose

Cautionary Notes

- When using a slider type, if the overhang from the center of the object mounted on the slider is large, please consider the moment load and the overhang load length.

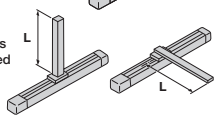
Moment Load

Please ensure the moment loads are within the specified range for Ma, Mb, and Mc.



Overhang Load Length

The value when the mounted object's center of gravity is L/2. If the mounted object overhangs in the direction of Ma, Mb, or Mc, make sure that the length is within range.

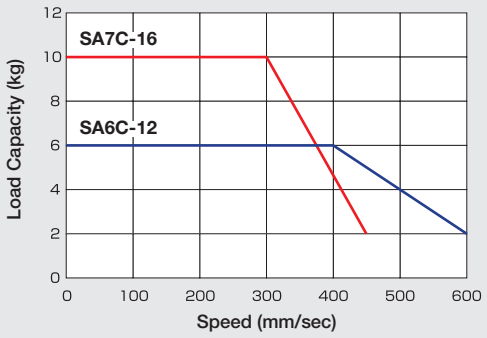
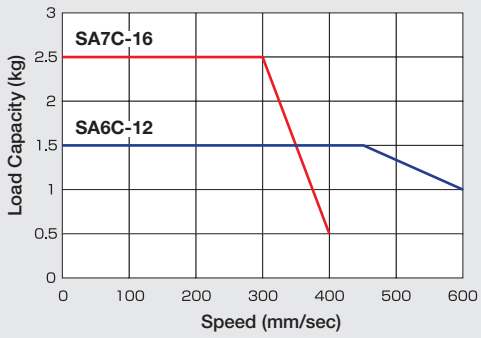
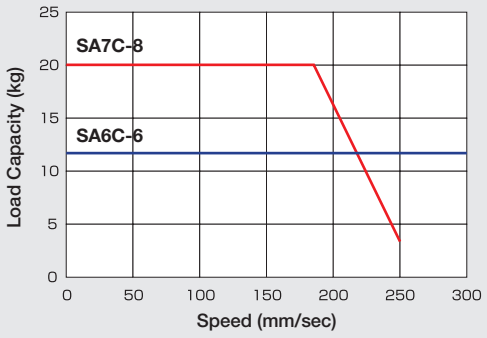
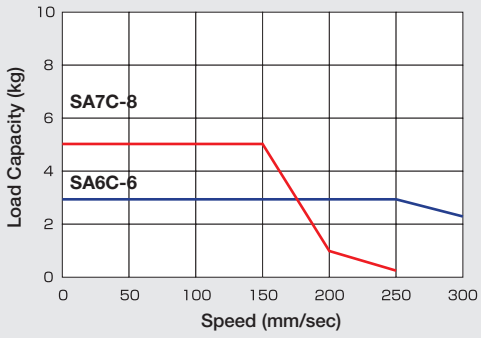
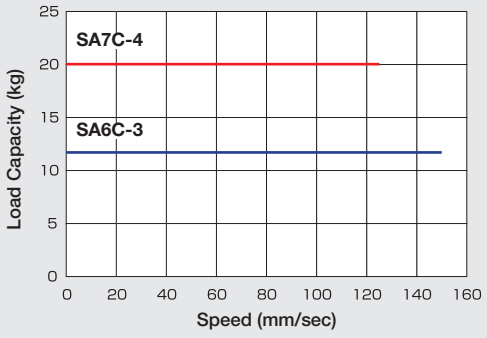
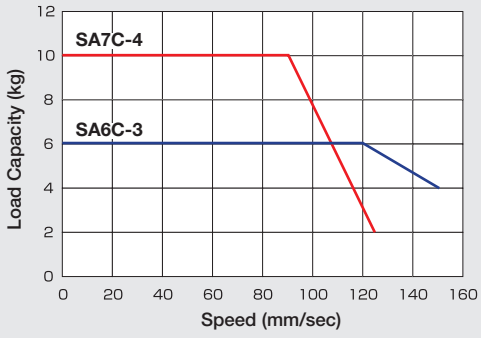


- The maximum speed for the SA6 type's 600 strokes is limited by the relation to the critical number of rotations.
  600 stroke (Lead 12:515mm/sec, Lead 6:255mm/sec, Lead 3:125mm/sec)

Maximum Speed 600 mm/sec

300 mm/sec

150 mm/sec

	Horizontal Setting	Vertical Setting
High-Speed Type		
Medium-Speed Type		
Low-Speed Type		

Note: In the graph above, the number after the type is the lead number.

ERC2 Series Rod Type (Straight Type)

Select horizontal or vertical use

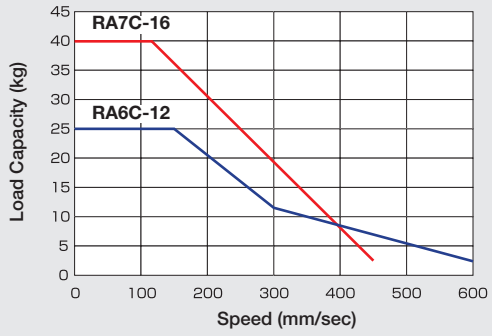
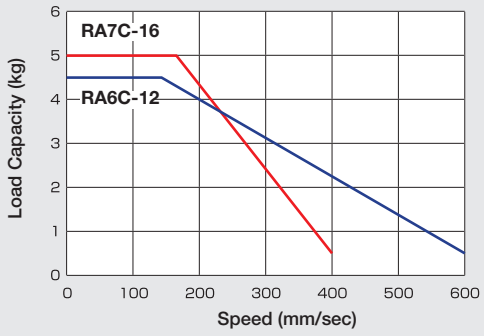
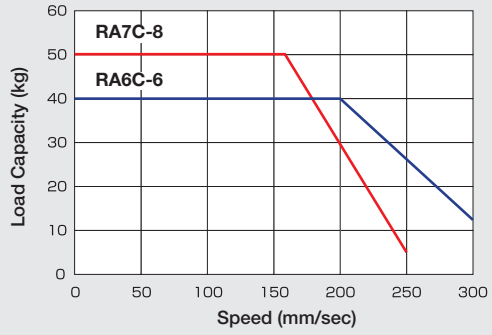
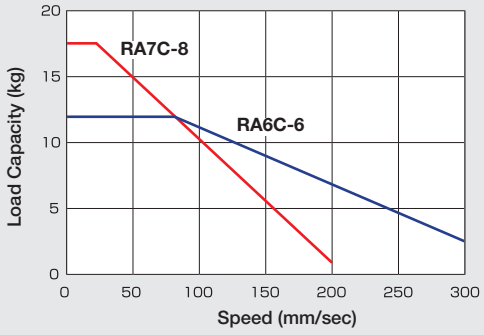
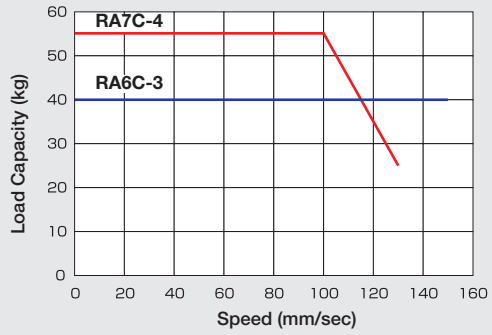
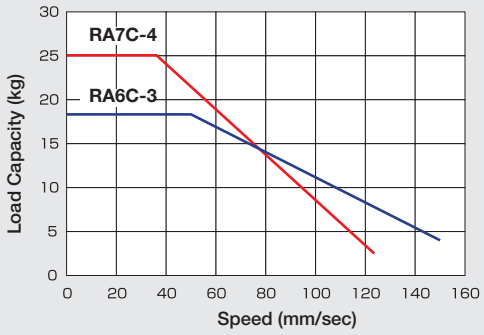
From the device cycle time, select speed type

Use the graphs below to select a model for your purpose

Cautionary Notes

- Absolutely no external force is considered for the rod type, other than that coming from the direction of the rod's advance. Please use a high-rigidity model or add a guide if an external force is applied at a right angle to the rod and in the direction of the rotation.
- The graphs below for the horizontal setting show the values when an external guide is used.
- The maximum speed for the SA6 type's 300 strokes is limited by the relation to the critical number of rotations. 300 stroke (Lead 12:500mm/sec, Lead 6:250mm/sec, Lead 3:125mm/sec)

Maximum Speed
600 mm/sec
300 mm/sec
150 mm/sec

	Horizontal Setting	Vertical Setting
High-Speed Type		
Medium-Speed Type		
Low-Speed Type		

Note: In the graph above, the number after the type is the lead number.

Selection Standard (Speed vs. Load Capacity Graph)

RCP3 Series Slider Type

Select horizontal or vertical use

From the device cycle time, select speed type

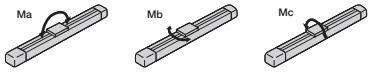
Use the graphs below to select a model for your purpose

Cautionary Notes

When using a slider type, if the overhang from the center of the object mounted on the slider is large, please consider the moment load and the overhang load length.

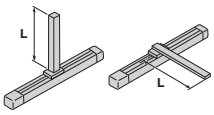
Moment load

Please ensure the moment loads are within the specified range for Ma, Mb, and Mc.

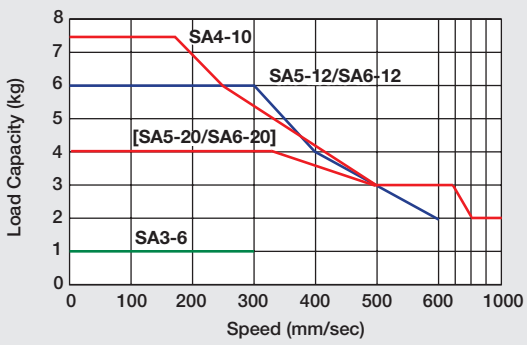
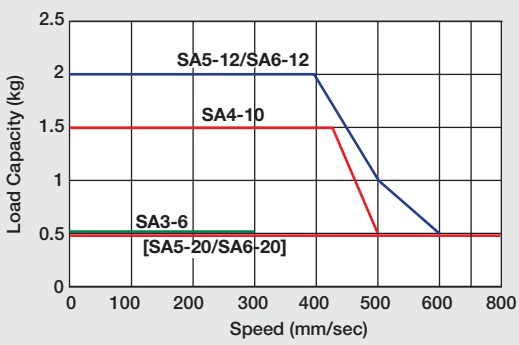
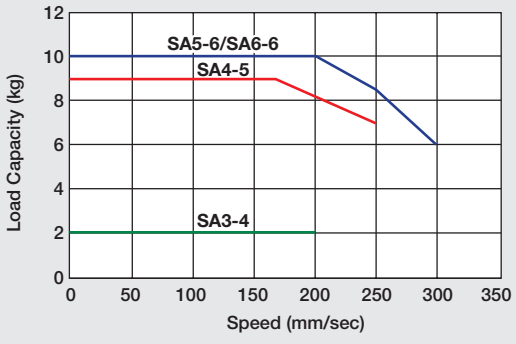
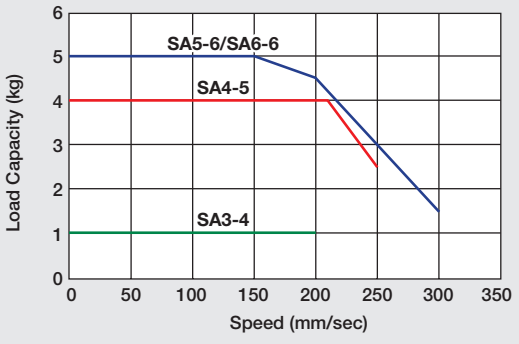
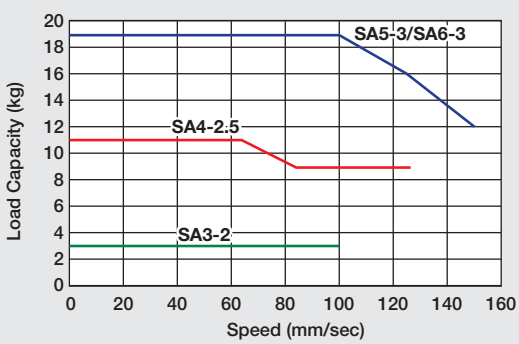
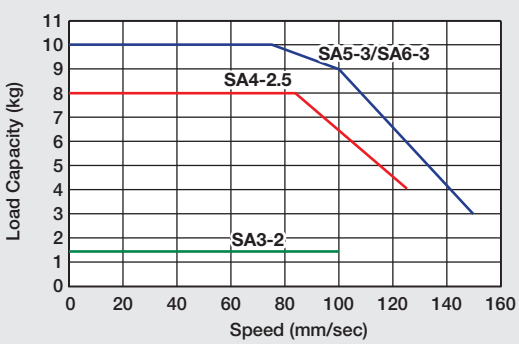


Overhang Load Length

The value when the mounted object's center of gravity is L/2. If the mounted object overhangs in the direction of Ma, Mb, or Mc, make sure that the length is within range.



Maximum Speed
600 [1000] mm/sec
300 mm/sec
150 mm/sec

	Horizontal Setting	Vertical Setting
High[Top]-Speed Type		
Medium-Speed Type		
Low-Speed Type		

Note: In the graph above, the number after the type is the lead number.

Table of Load Capacity per Speed/Acceleration

For RCP3-SA4C/SA5C/SA6C, the acceleration can be increased up to 0.7G.
However, please note that load capacity decreases as the speed and acceleration increase, as shown below.

[RCP3-SA4C]

	Speed (mm/s)	Horizontal Operation				Vertical Operation		
		Acceleration				Acceleration		
		0.2G	0.3G	0.5G	0.7G	0.1G	0.2G	0.3G
High-Speed Type (Lead 10)	0	9	7.5	6.5	5.5	1.5	1.5	1.5
	83							
	167							
	250	7	6	5	4			
	333	6	5	4	3			
	417	5	4	3	2			
	500	4	3	2	1	1	0.5	0.5
Medium-Speed Type (Lead 5)	0	10	9	8	7	4	4	4
	42							
	83							
	125							
	167							
	208	9	8	7	6			
	250	8	7	6	5	3	2.5	2
Low-Speed Type (Lead 2.5)	0	11	10	9	8	8	8	8
	21							
	42							
	63							
	83	9	8	7	6			
	104						6	6
	125					5	4	4

[RCP3-SA5C/SA6C]

	Speed (mm/s)	Horizontal Operation				Vertical Operation		
		Acceleration				Acceleration		
		0.2G	0.3G	0.5G	0.7G	0.1G	0.2G	0.3G
High-Speed Type (Lead 12) [Top-Speed Type (Lead 20)]	0	8 [4]	6 [4]	4 [2]	3 [2]	2 [0.5]	2 [0.5]	2 [0.5]
	100							
	200							
	300	6 [4]						
	400	5 [3.5]	4 [3.5]	3 [1.8]	2.5 [1.8]			
	500	4 [3]	3 [3]	2 [1.5]	1.5 [1.5]	1 [0.5]	1 [0.5]	1 [0.5]
	600	3 [3]	2 [3]	1 [1.5]	0.5 [1.5]	0.5 [0.5]	0.5 [0.5]	0.5 [0.5]
Medium-Speed Type (Lead 6)	0	12	10	8	6	5	5	5
	50							
	100							
	150							
	200						4.5	3.5
	250	10	8.5	6	4.5	3.5	3	2
	300	7	6	3	1	2	1.5	0.5
Low-Speed Type (Lead 3)	0	19	14	9	7	10	10	10
	25							
	50							
	75							
	100						9	8
	125	16	11	7	5	7	6	5
	150	12	8	5	3	4	3	2

Selection Standard (Speed vs. Load Capacity Graph)

RCP3 Series Table Type

Select horizontal or vertical use

From the device cycle time, select speed type

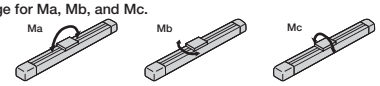
Use the graphs below to select a model for your purpose

Cautionary Notes

When using a table type, if the overhang from the center of the object mounted on the slider is large, please consider the moment load and the overhang load length.

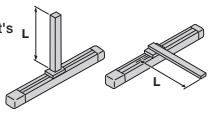
Moment load

Please ensure the moment loads are within the specified range for Ma, Mb, and Mc.



Overhang Load Length

The value when the mounted object's center of gravity is L/2. If the mounted object overhangs in the direction of Ma, Mb, or Mc, make sure that the length is within range.



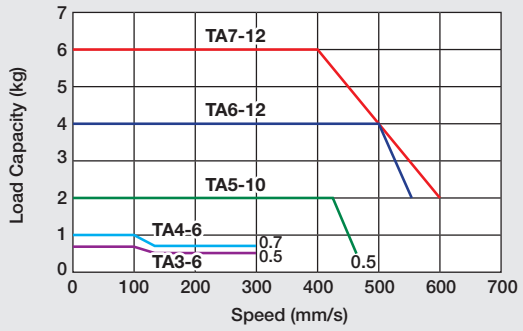
Maximum Speed 600 mm/sec

300 mm/sec

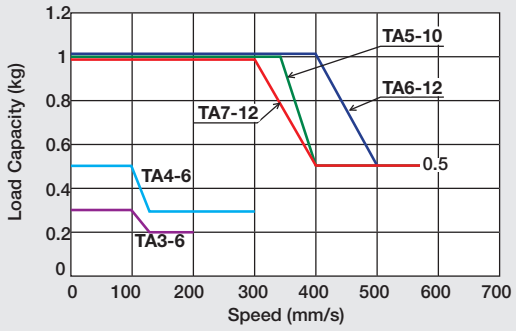
150 mm/sec

High-Speed Type

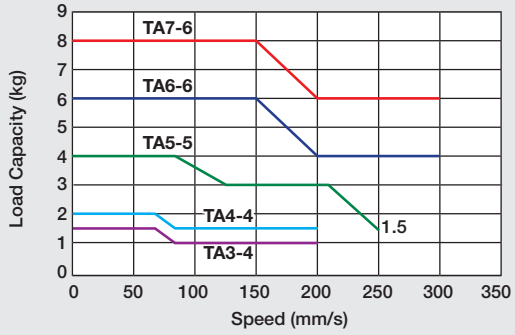
Horizontal Setting

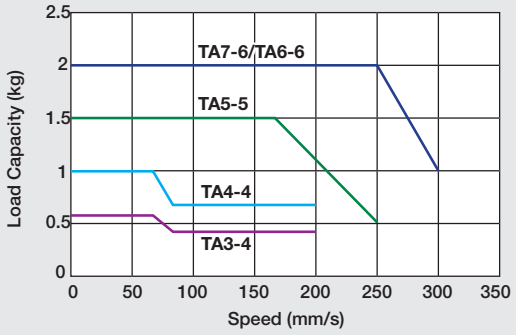


Vertical Setting

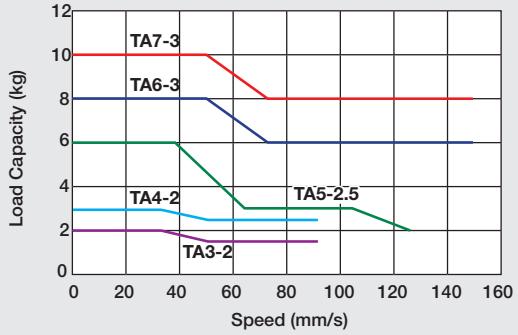


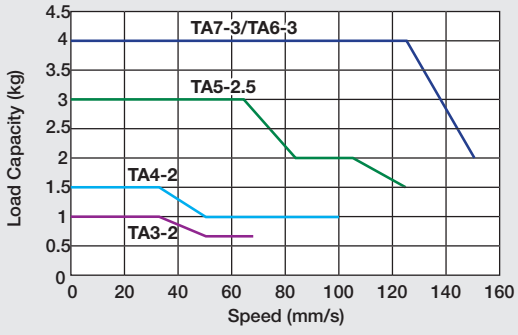
Medium-Speed Type





Low-Speed Type





Note: In the graph above, the number after the type is the lead number.

RCP2 Series Slider Type (Straight Type)

Select horizontal or vertical use

From the device cycle time, select speed type

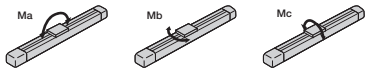
Use the graphs below to select a model for your purpose

Cautionary Notes

When using a slider type, if the overhang from the center of the object mounted on the slider is large, please consider the moment load and the overhang load length.

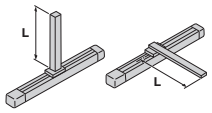
Moment load

Please ensure the moment loads are within the specified range for Ma, Mb, and Mc.



Overhang Load Length

The value when the mounted object's center of gravity is L/2. If the mounted object overhangs in the direction of Ma, Mb, or Mc, make sure that the length is within range.



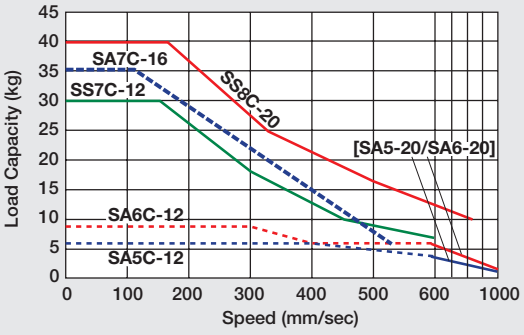
Maximum Speed **600 [1000]** mm/sec

300 mm/sec

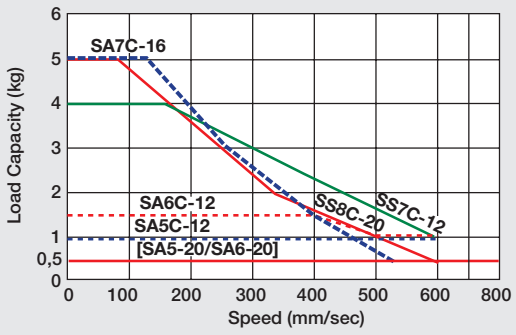
150 mm/sec

High[Top]-Speed Type

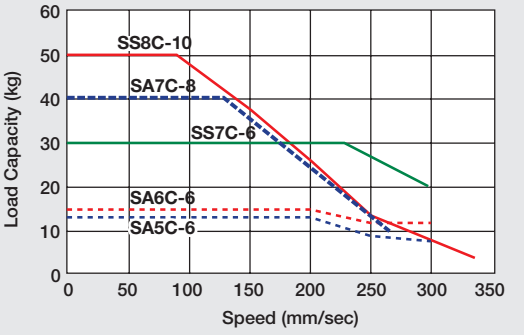
Horizontal Setting

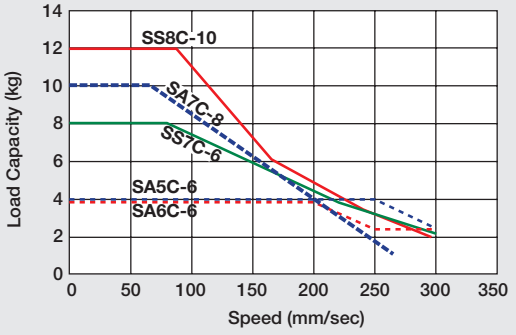


Vertical Setting

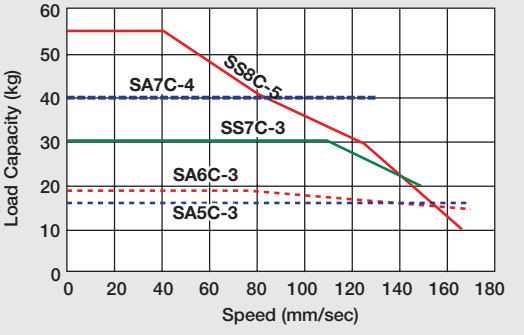


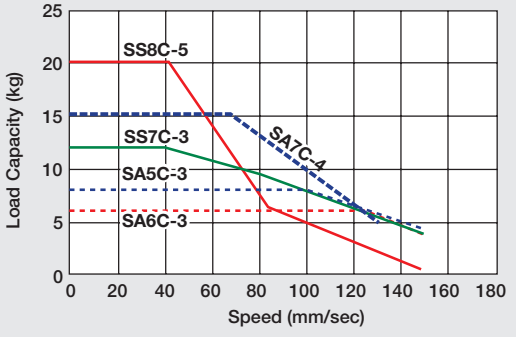
Medium-Speed Type





Low-Speed Type





Note: In the graph above, the number after the type is the lead number.

Table of Load Capacity per Speed/Acceleration

For RCP2-SA5C/SA6C, the acceleration can be increased up to 0.7G.
However, please note that load capacity decreases as the speed and acceleration increase, as shown below.

[RCP2-SA5C]

	Speed (mm/s)	Horizontal Operation				Vertical Operation		
		Acceleration				Acceleration		
		0.2G	0.3G	0.5G	0.7G	0.1G	0.2G	0.3G
High-Speed Type (Lead 12) [Top-Speed Type (Lead 20)]	0	8 [5]	6 [4]	5.5 [3]	5 [3]	1	1	1
	100							
	200							
	300							
	400			4 [3]	3.5 [3]			
	500	7 [4.5]	5 [3.5]	2 [3]	1.5 [3]			
	600	4 [4]	4 [3]	2 [2.5]	1.5 [2.5]			0.5
Medium-Speed Type (Lead 6)	0	13	13	13	12	4	4	4
	50							
	100							
	150							
	200							
	250		9	8	7			3
	300		8	5	4	2.5	2.5	1.5
Low-Speed Type (Lead 3)	0	16	16	16	16	8	8	8
	25							
	50							
	75				14			
	100			14	12			
	125		13	11	10	6	5.5	5
	150		10	9	8	5	4.5	1.5

[RCP2-SA6C]

	Speed (mm/s)	Horizontal Operation				Vertical Operation		
		Acceleration				Acceleration		
		0.2G	0.3G	0.5G	0.7G	0.1G	0.2G	0.3G
High-Speed Type (Lead 12) [Top-Speed Type (Lead 20)]	0	8.5 [6]	8.5 [6]	7 [4]	6 [4]	1.5	1.5	1.5
	100							
	200							
	300							
	400	6 [5.5]	6 [5.5]	4 [3.7]	3 [3.7]			0.5
	500	6 [5]	6 [5]	3 [3]	2 [3]		1	
	600	6 [4.5]	6 [4.5]	2 [2.4]	1 [2.4]	1		
Medium-Speed Type (Lead 6)	0	16	15	12	10	4	4	4
	50							
	100							
	150							
	200					3	3	3
	250	15	12	8	6	2.5	2.5	2
	300	13		4	3			1
Low-Speed Type (Lead 3)	0	19	19	19	19	6	6	6
	25							
	50							
	75							
	100	17	15	12	11			
	125	16	14	11	10			
	150	15	13	10	9	4	4	2

RCP2 Series Slider Type (Side-mounted Motor Type)

Select horizontal or vertical use

From the device cycle time, select speed type

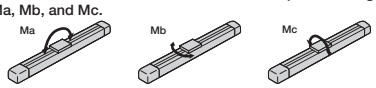
Use the graphs below to select a model for your purpose

Cautionary Notes

When using a slider type, if the overhang from the center of the object mounted on the slider is large, please consider the moment load and the overhang load length.

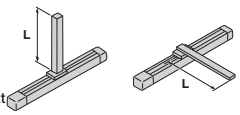
Moment load

Please ensure the moment loads are within the specified range for Ma, Mb, and Mc.



Overhang Load Length

The value when the mounted object's center of gravity is L/2. If the mounted object overhangs in the direction of Ma, Mb, or Mc, make sure that the length is within range.

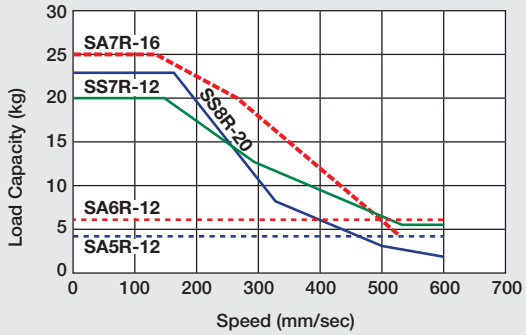


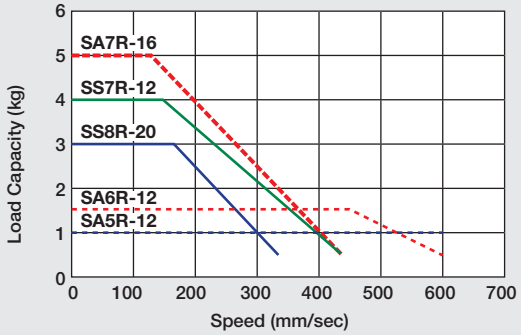
Maximum Speed 600 mm/sec

300 mm/sec

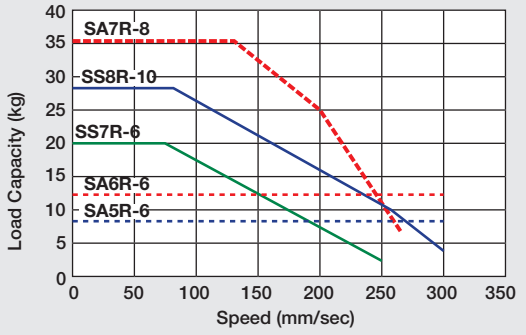
150 mm/sec

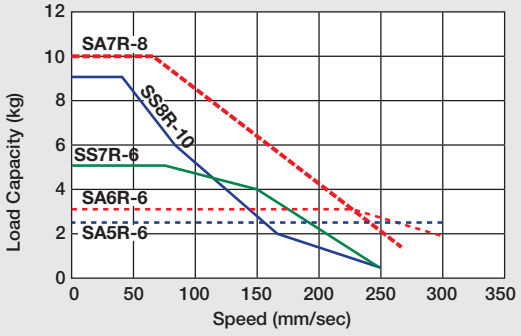
High-Speed Type



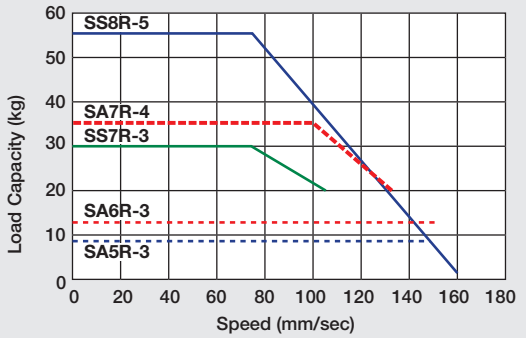


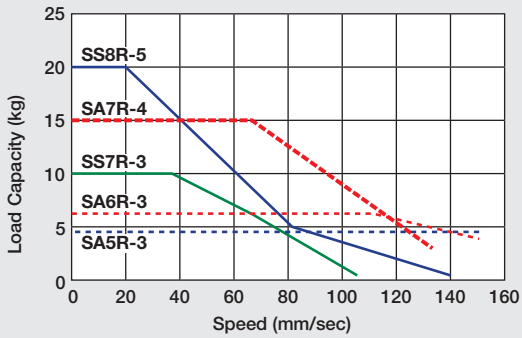
Medium-Speed Type





Low-Speed Type





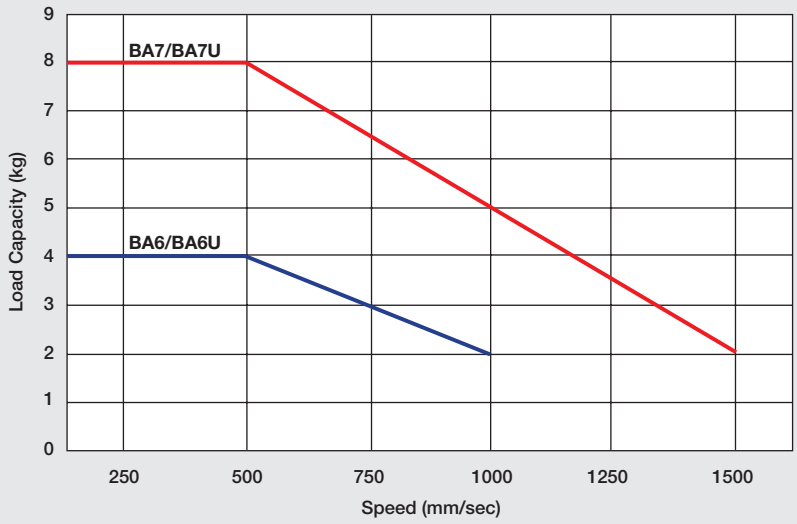
Note: In the graph above, the number after the type is the lead number.

Selection Standard (Speed vs. Load Capacity Graph)

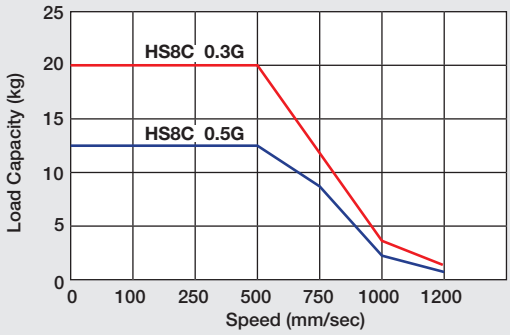
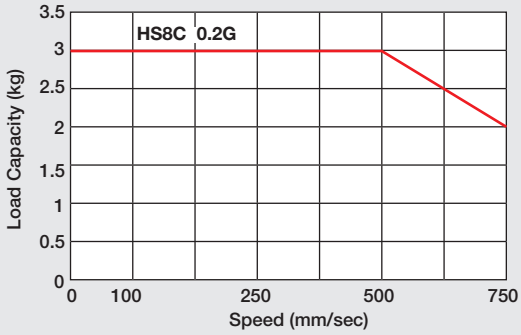
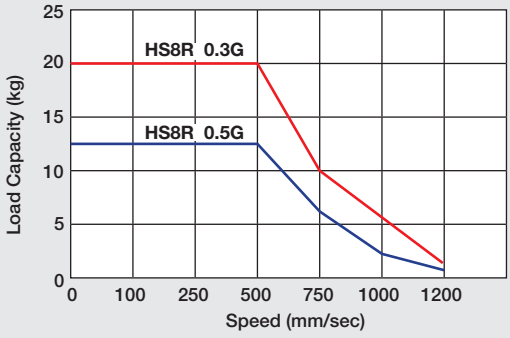
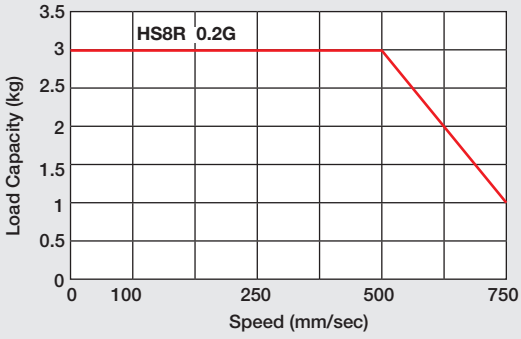
RCP2 Series Slider Belt Type

Use the graphs below to select the model for your purpose.

Horizontal Setting



RCP2 Series Slider High-speed Ball-screw Type

	Horizontal Setting	Vertical Setting
RCP2-HS8C		
RCP2-HS8R		

RCP2 Series Rod Type (Straight Type)

Select horizontal or vertical use

From the device cycle time, select speed type

Use the graphs below to select a model for your purpose

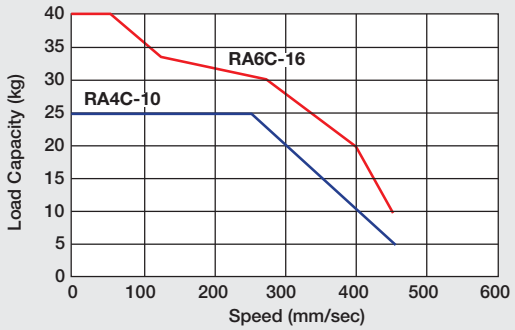
Cautionary Notes

- Absolutely no external force is considered for the rod type, other than that coming from the direction of the rod's advance.
  Please use a high-rigidity model or add a guide if an external force is applied at a right angle to the rod and in the direction of the rotation.

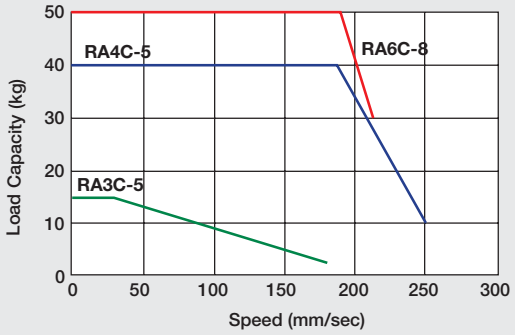
Maximum Speed
500 mm/sec
250 mm/sec
125 mm/sec

Horizontal Setting (Note 1)

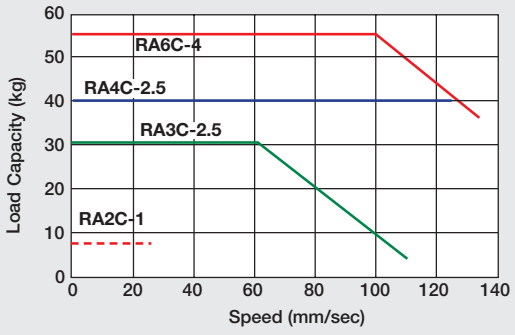
High-Speed Type



Medium-Speed Type

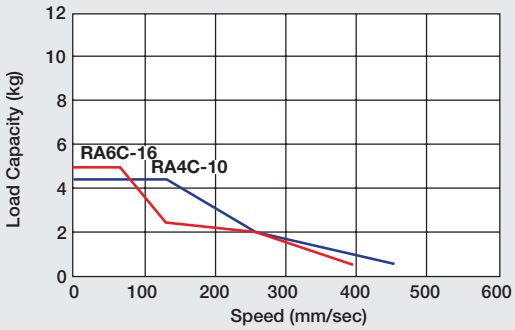


Low-Speed Type

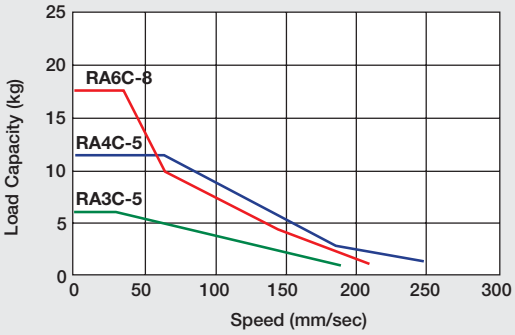


Vertical Setting

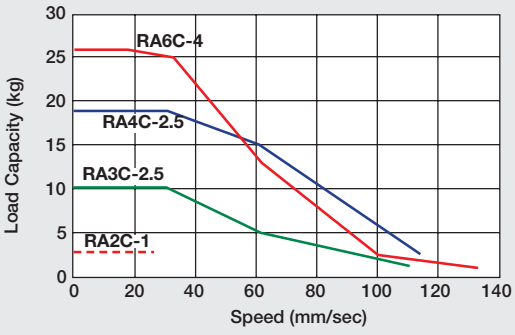
High-Speed Type



Medium-Speed Type



Low-Speed Type



Note: In the graph above, the number after the type is the lead number.
Note 1: This is the number in the case of horizontal specification, when an external guide is attached.

Selection Standard (Speed vs. Load Capacity Graph)

RCP2 Series Single Guide Type

Select horizontal or vertical use

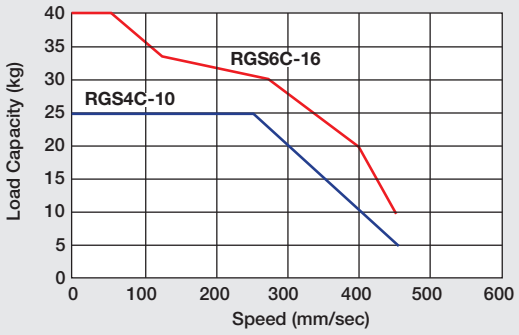
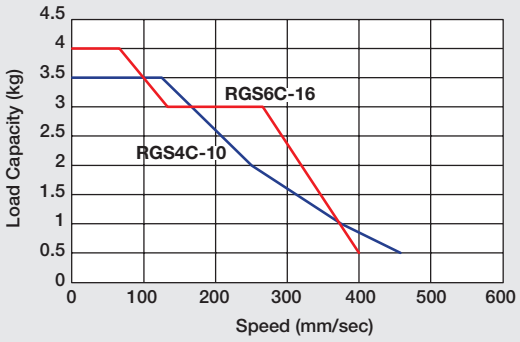
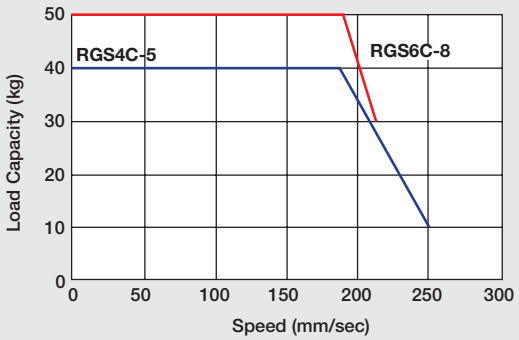
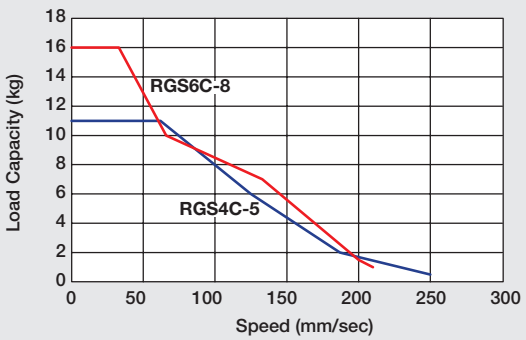
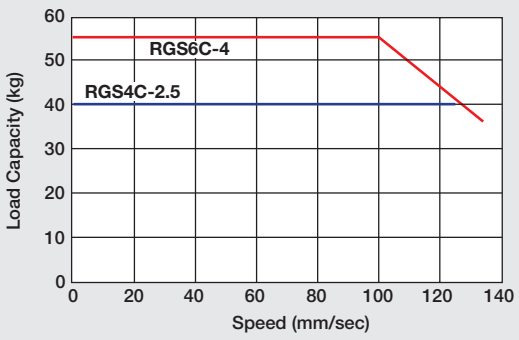
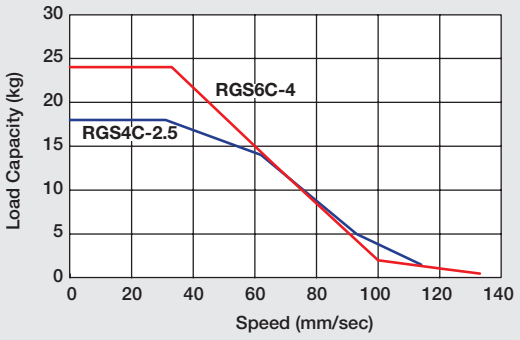
From the device time cycle, select speed type

Use the graphs below to select the model for your purpose.

Cautionary Notes

- The graphs below for the horizontal setting show the values when an external guide is used.

Maximum Speed
500 mm/sec
250 mm/sec
125 mm/sec

	Horizontal Setting (Note 1)	Vertical Setting
High-Speed Type		
Medium-Speed Type		
Low-Speed Type		

Note: In the graph above, the number after the type is the lead number.
Note 1: This is the number in the case of horizontal specification, when an external guide is attached.

RCP2 Series Double Guide Type

Select horizontal or vertical use

From the device time cycle, select speed type

Use the graphs below to select the model for your purpose.

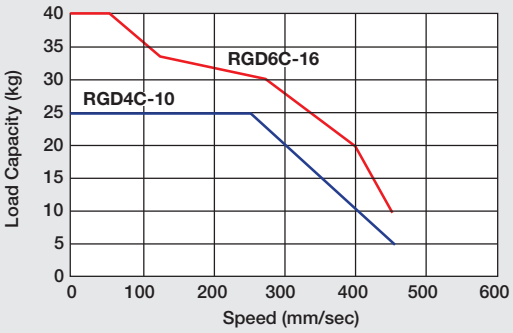
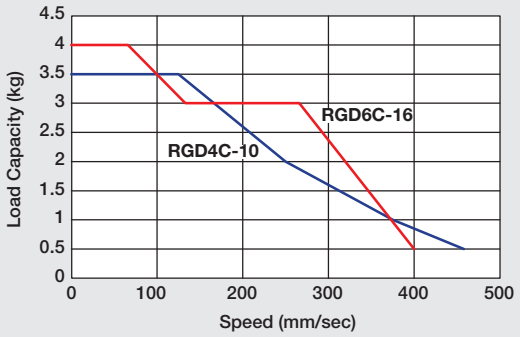
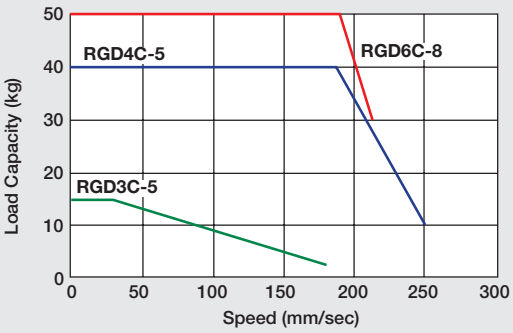
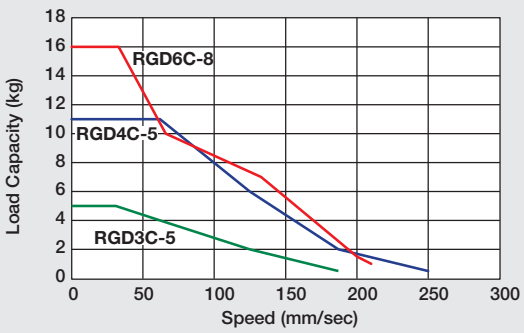
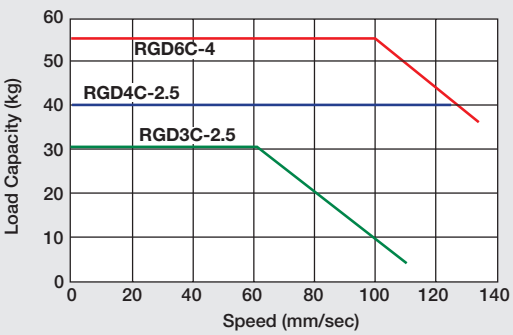
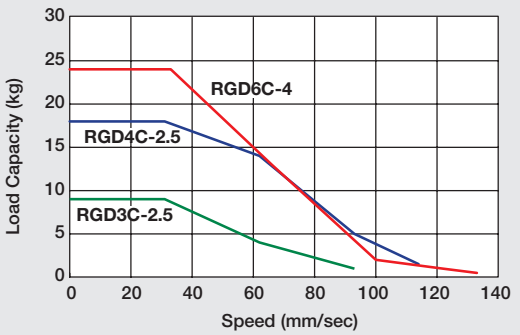
Cautionary Notes

- The graphs below for the horizontal setting show the values when an external guide is used.

Maximum Speed 500 mm/sec

250 mm/sec

125 mm/sec

	Horizontal Setting (Note 1)	Vertical Setting
High-Speed Type		
Medium-Speed Type		
Low-Speed Type		

Note: In the graph above, the number after the type is the lead number.
Note 1: This is the number in the case of horizontal specification, when an external guide is attached.

Selection Standard (Speed vs. Load Capacity Graph)

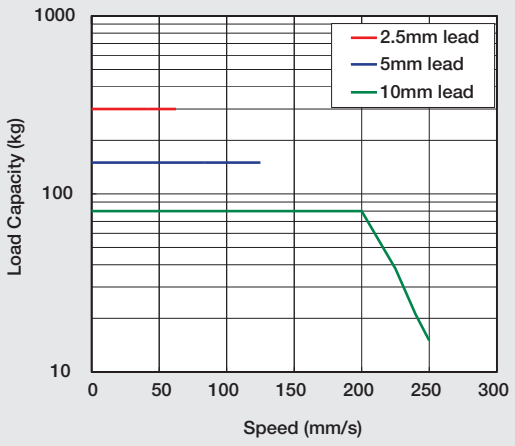
RCP2 Series High-thrust Type

Cautionary Notes

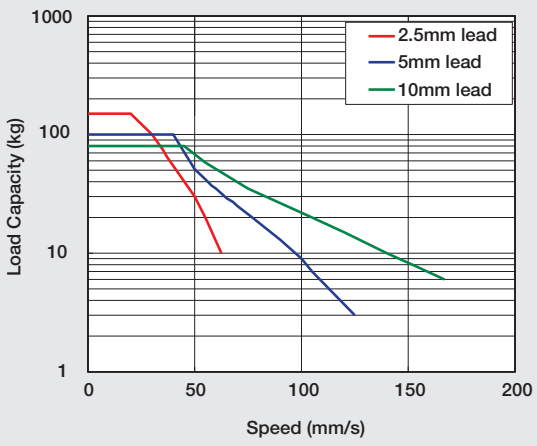
- Absolutely no external force is considered for the rod type, other than that coming from the direction of the rod's advance.
  Please add a guide if an external force is applied at a right angle to the rod and in the direction of the rotation.
- The graphs below for the horizontal setting shows the values when an external guide.

Use the graphs below to select the model for your purpose.

Horizontal Setting



Vertical Setting



Note: In the graph above, the number after the type is the lead number.

RCP2CR Series Cleanroom Slider Type

Select horizontal or vertical use

From the device cycle time, select speed type

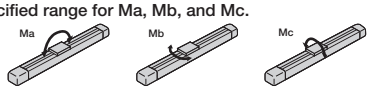
Use the graphs below to select a model for your purpose

Cautionary Notes

When using a slider type, if the overhang from the center of the object mounted on the slider is large, please consider the moment load and the overhang load length.

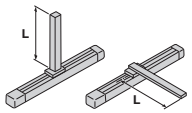
Moment load

Please ensure the moment loads are within the specified range for Ma, Mb, and Mc.



Overhang Load Length

The value when the mounted object's center of gravity is L/2. If the mounted object overhangs in the direction of Ma, Mb, or Mc, make sure that the length is within range.



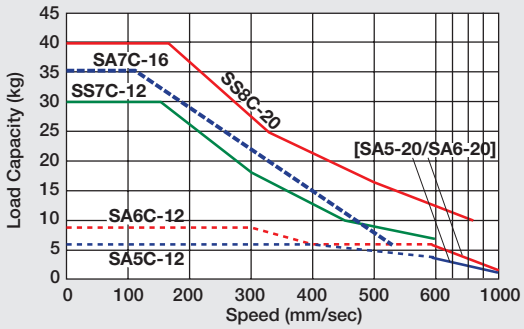
Maximum Speed **600 [1000]** mm/sec

300 mm/sec

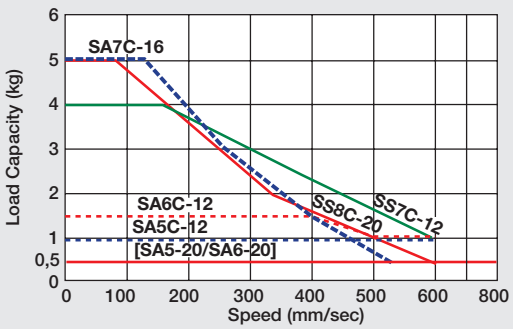
150 mm/sec

High[Top]-Speed Type

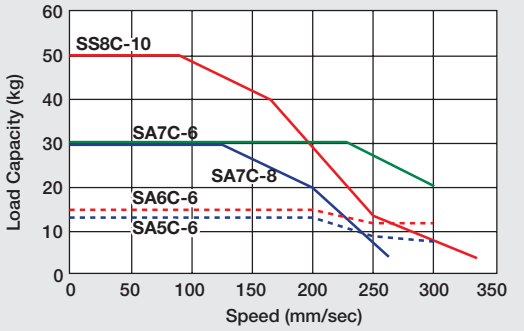
Horizontal Setting

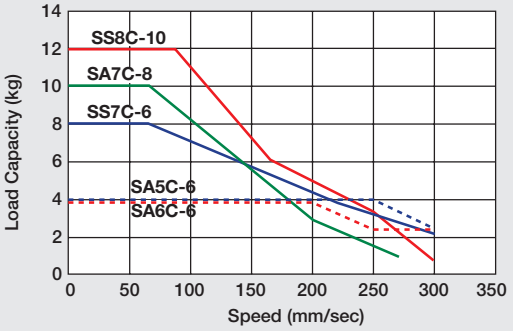


Vertical Setting

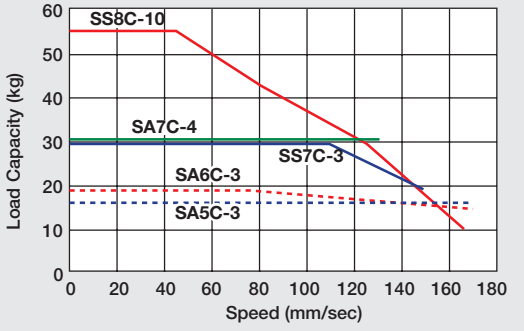


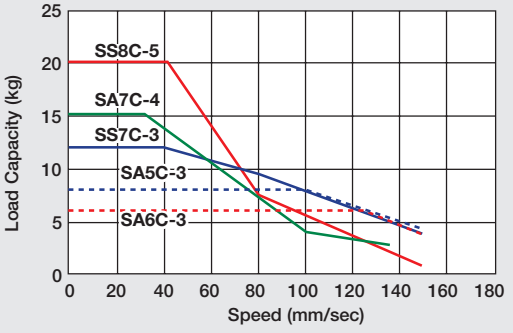
Medium-Speed Type





Low-Speed Type





Note: In the graph above, the number after the type is the lead number.

Selection Standard (Speed vs. Load Capacity Graph)

RCP2W Series Splashproof Rod Type

Select horizontal or vertical use

From the device cycle time, select speed type

Use the graphs below to select a model for your purpose

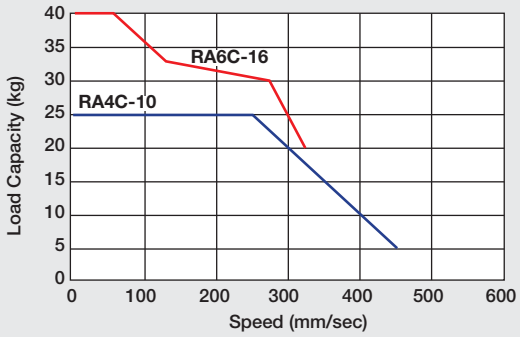
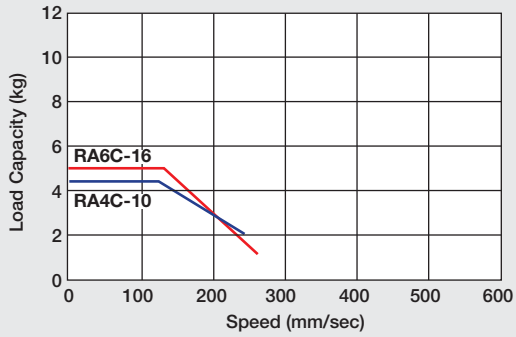
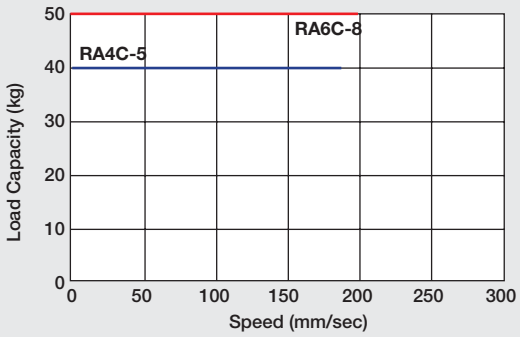
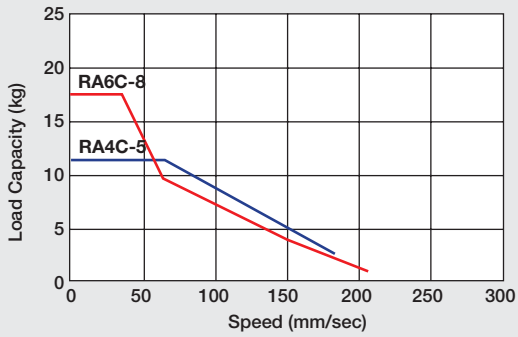
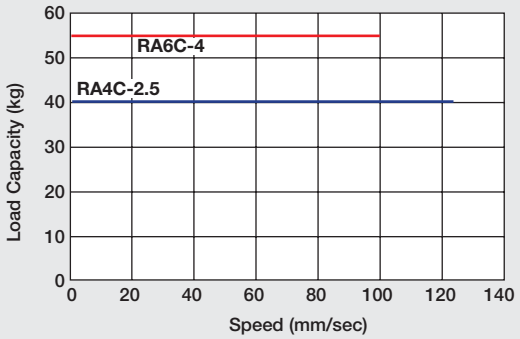
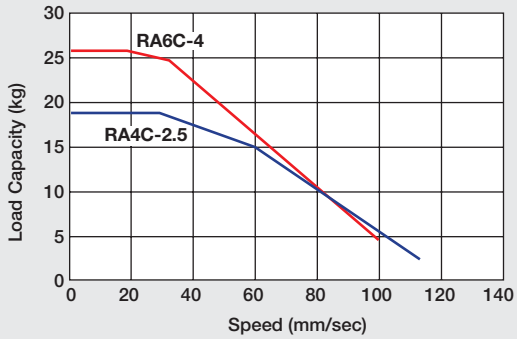
Cautionary Notes

- Absolutely no external force is considered for the rod type, other than that coming from the direction of the rod's advance. Please use a high-rigidity model or add a guide if an external force is applied at a right angle to the rod and in the direction of the rotation.

Maximum Speed 500 mm/sec

250 mm/sec

125 mm/sec

	Horizontal Setting	Vertical Setting
High-Speed Type		
Medium-Speed Type		
Low-Speed Type		

RCP2W Series Waterproof Slider Type

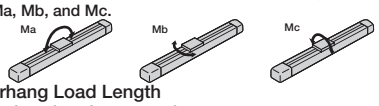
Use the graphs below to select a model for your purpose

Cautionary Notes

When using a slider type, if the overhang from the center of the object mounted on the slider is large, please consider the moment load and the overhang load length.

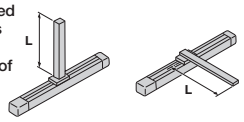
Moment load

Please ensure the moment loads are within the specified range for Ma, Mb, and Mc.

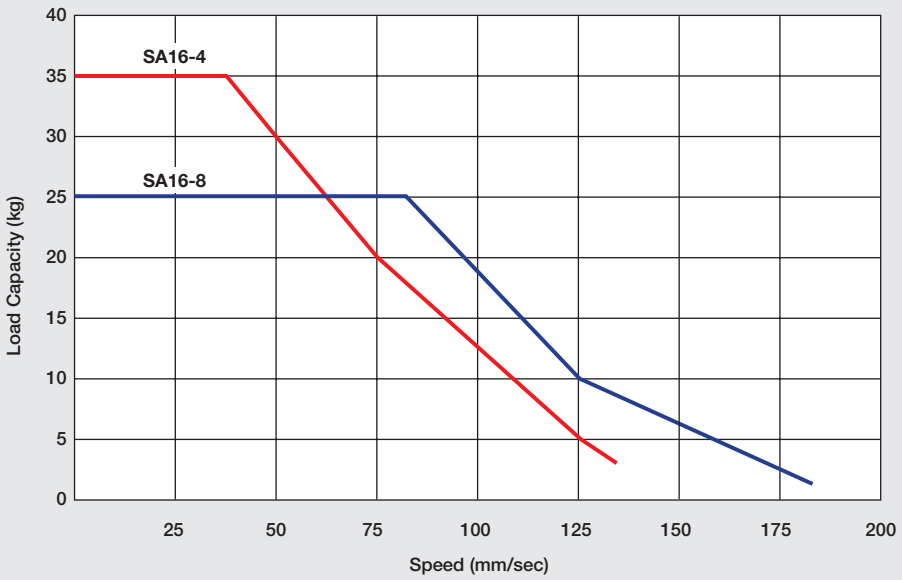


Overhang Load Length

The value when the mounted object's center of gravity is L/2. If the mounted object overhangs in the direction of Ma, Mb, or Mc, make sure that the length is within range.



Horizontal Setting

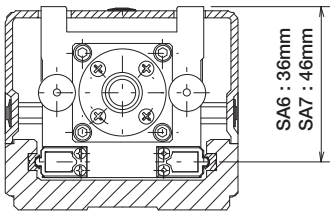


Note: RCP2W-SA16 has no brake setting, which means vertical use cannot be handled.
Note: In the graph above, the number after the type is the lead number.

Selection Guide (Push Force and Electric Current Limitation Correlation Graph)

ERC2 Series Slider Type

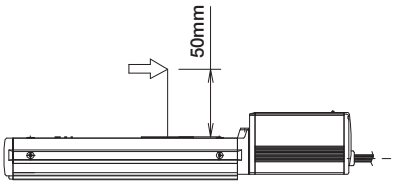
When using slider type for pressing operation, limit pressing current to prevent anti-moment generated by push force from exceeding 80% of the catalog spec rating for moment (Ma, Mb).
To calculate moment, use the guide moment action position shown in the figure below, and consider the amount of offset at the push force action position.
Be aware that, if excess force above the rated moment is applied, the guide can be damaged and its use life can be shortened. Therefore, carefully set the current with safety in mind.



Moment operation position

Caution:
Note: The movement speed during pressing is fixed at 20mm/s.

Example of calculation:
With this type, at the position shown in the figure at the right, when there is 100N of pressing
the moment received by the guide is Ma = (46 + 50) x 100
= 9600 (N•m)
= 9.6 (N•m).

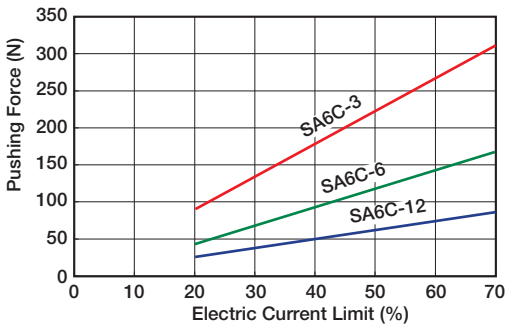


The SA7 rated moment is Ma = 13.8 (N•m)
and 13.8 x 0.8 = 11.04 > 9.6, which means it is OK.
Also, when pressing generates moment Mb, use the overhang calculation to similarly confirm that the moment is within 80% of the rated moment.

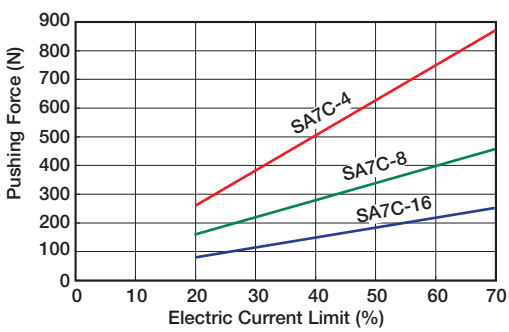
Push force and current limit correlation graph

* In the table below, standard figures are shown. Actual figures will differ slightly.

SA6C Type



SA7C Type

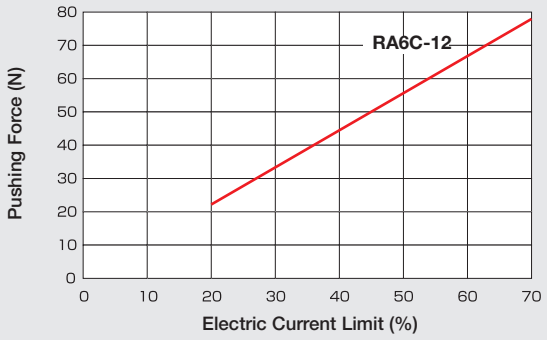
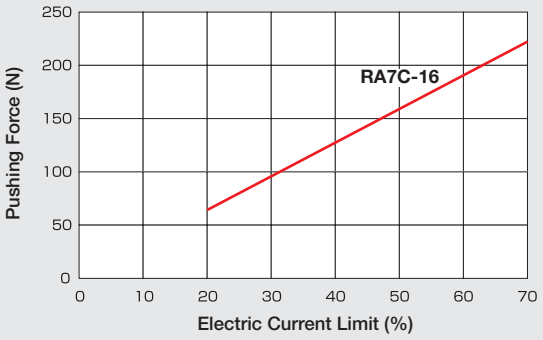
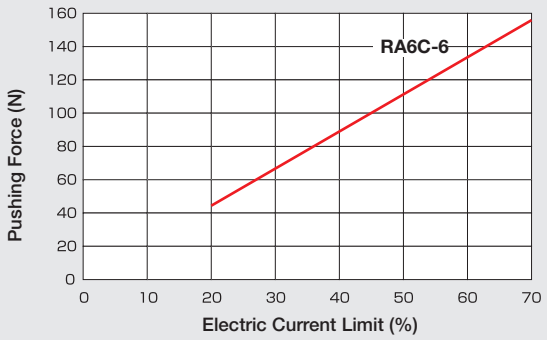
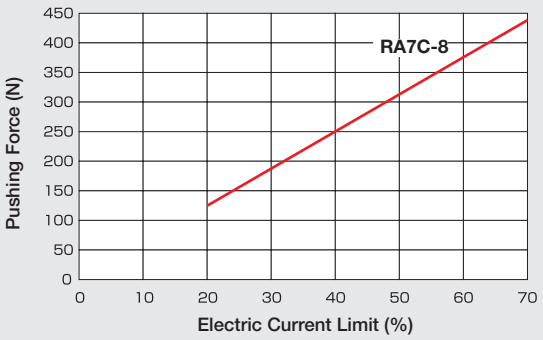
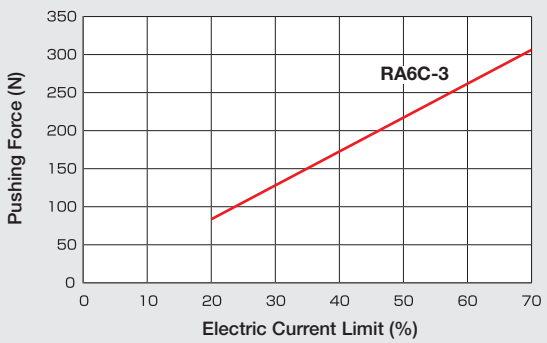
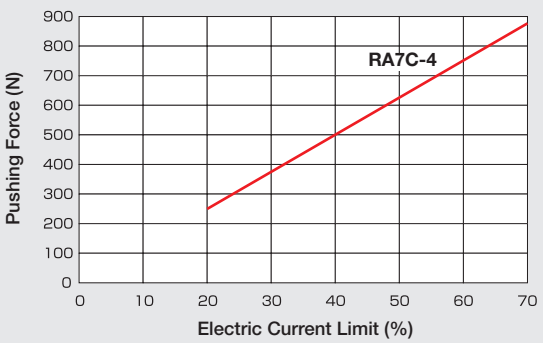


ERC2 Series Rod Type (Straight Type)

The push force during pressing operation can be freely changed by changing the controller current limit value.
The maximum push force changes according to the type of device, so please select the push force you need from the table below.

Caution for Use

- The push force and current limit correlation figures are given as standard. Actual figures will slightly differ.
- When the current limit is less than 20%, the push force may vary. Therefore use a current limitation that is 20% or higher.
- Movement speed during pressing operation is fixed at 20mm/s.

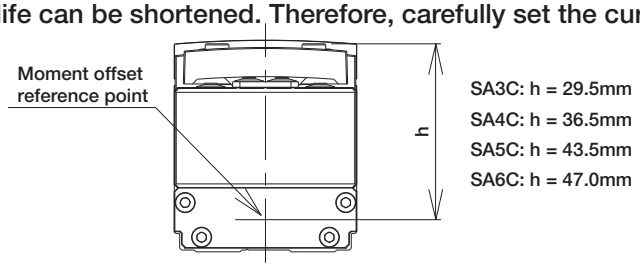
	RA6C Type	RA7C Type
High-Speed Type		
Medium-Speed Type		
Low-Speed Type		

Note: In the graph above, the number after the type is the lead number.

Selection Guide (Push Force and Electric Current Limitation Correlation Graph)

RCP3 Series Slider Type

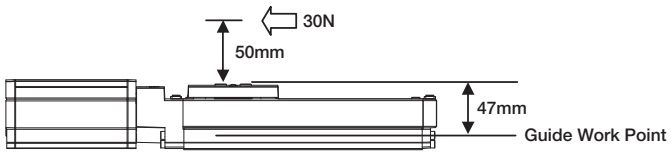
When using the slider type for the pressing operation, limit the pressing current to prevent anti-moment generated by push force from exceeding 80% of catalog spec rating for moment (Ma, Mb).
To calculate moment, use the guide moment action position shown in the figure below, and consider the amount of offset at the push force action position.
Be aware that, if excess force above the rated moment is applied, the guide can be damaged and its use life can be shortened. Therefore, carefully set the current with safety in mind.



When using slider type for the pressing operation, use setting to ensure that anti-moment generated by push force does not exceed **80% of catalog spec moment tolerance**.

Example of calculations:
When executing 30N pressing with RCP-3SA6C (Lead 12) type, and performing pressing at 30N,
the moment received by the guide is Ma = (47 + 50) x 30
= 2910 (N•mm)
= 2.91 (N•m).

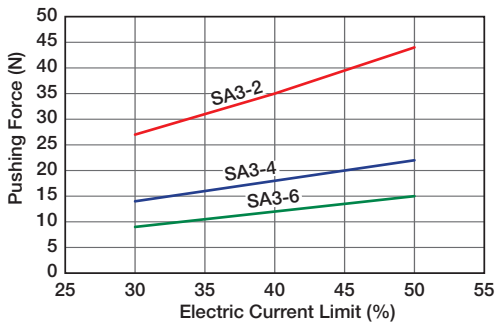
The SA6C allowable load moment (Ma) is 4.31(N•m), 80% of which is 3.448, which is greater than the actual moment load received by
the guide (2.91). Therefore, it can be decided that this moment load can be used.



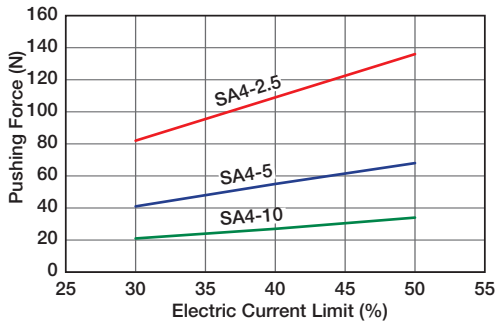
Push force and current limit correlation graph

* In the table below, standard figures are shown. Actual figures will differ slightly.

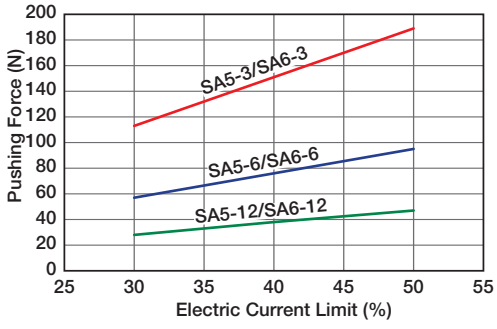
SA3C Type



SA4C Type

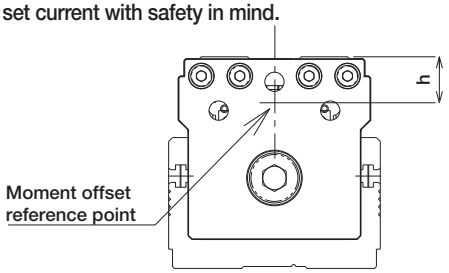


SA5C/SA6C Type



RCP3 Series Table Type

When using a table type for the pressing operation, limit the pressing current to prevent anti-moment generated by the push force from exceeding 80% of the catalog spec rating for moment (Ma, Mb).
To calculate moment, use the guide moment action position shown in the figure below, and consider the amount of offset at the push force action position.
Be aware that, if excess force above the rated moment is applied, the guide can be damaged and its use life can be shortened. Therefore, carefully set current with safety in mind.

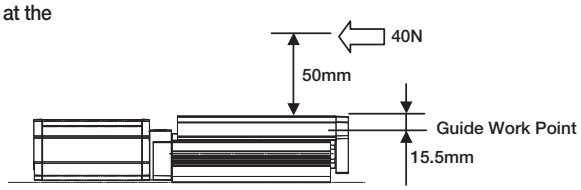


TA3□ : h = 10.5mm
TA4□ : h = 11.5mm
TA5□ : h = 13.5mm
TA6□ : h = 15.5mm
TA7□ : h = 17.5mm

When using a table type for the pressing operation, use setting to ensure that anti-moment generated by the push force does not exceed **80% of catalog spec moment tolerance**.

Example of calculations:
With the RCP3-TA6C (Lead 12) type, using the position shown in the figure at the right, and pressing at 40N,

the moment received by the guide is Ma = (15.5 + 50) x 40
= 2620 (N•mm)
= 2.62 (N•m).

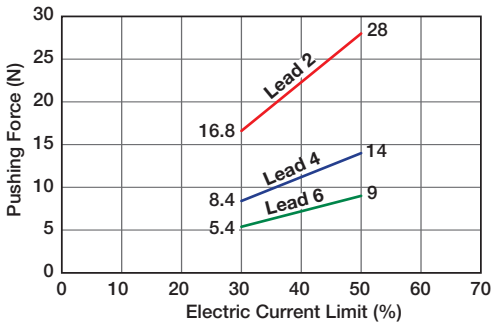


The TA6C allowable load moment (Ma) is 7.26(N•m),
80% of which is 5.968, which is greater than the actual moment load received by the guide (2.62). Therefore, it can be decided that this moment load can be used.

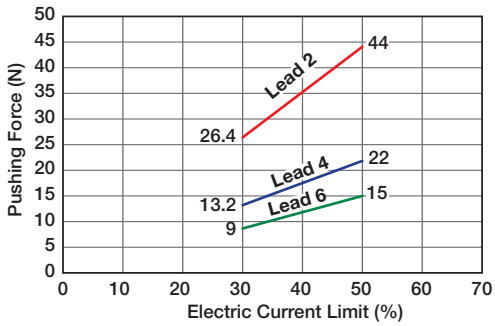
Push force and current limit correlation graph

* In the table below, standard figures are shown. Actual figures will differ slightly.

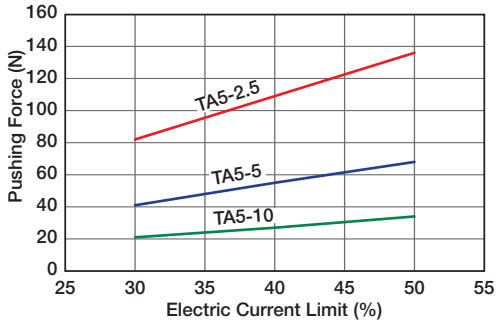
TA3C Type



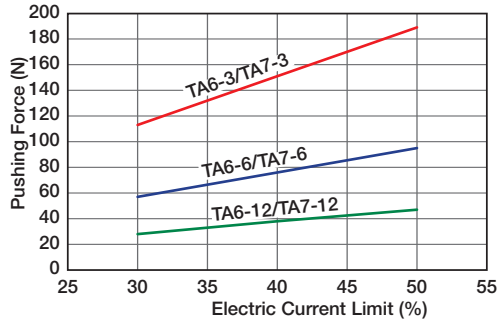
TA4C Type



TA5C Type



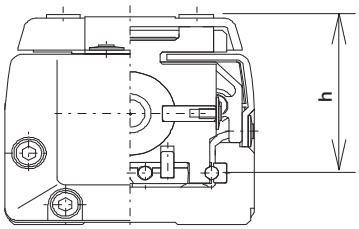
TA6C/TA7C Type



Selection Guide (Push Force and Electric Current Limitation Correlation Graph)

RCP2 Series Slider Type

When using the slider type for the pressing operation, limit the pressing current to prevent anti-moment generated by the push force from exceeding 80% of the catalog spec rating for moment (Ma, Mb).
To calculate moment, use the guide moment action position shown in the figure below, and consider the amount of offset at the push force action position.
Be aware that, if excess force above the rated moment is applied, the guide can be damaged and its use life can be shortened. Therefore, carefully set the current with safety in mind.

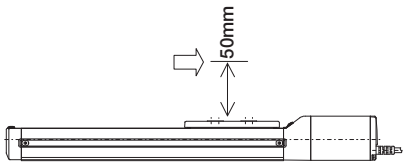


SA5C: h = 39mm
SA6C: h = 40mm
SA7C: h = 43mm
SS7C: h = 36mm
SS8C: h = 48mm

Caution:
- Pressing operations cannot be perfomed for Belt type (BA6/BA7).
- Note: The movement speed during pressing is fixed at 20mm/s.

Example of calculations:
With the RCP2-SS7C type, and using the position in the figure at right for 100N pressing,

the moment received by the guide is Ma = (36 + 50) x 100
= 8600 (N•mm)
= 8.6 (N•m).

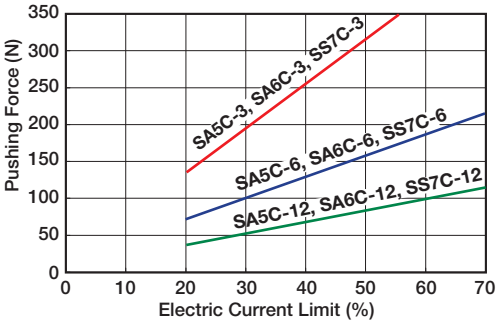


The SS rated moment is Ma = 14.7 (N•m)
and 14.7 x 0.8 = 11.76 > 8.6, which means it is OK.
Also, when pressing generates moment Mb, use the overhang calculation to similarly confirm that the moment is within 80% of the rated moment.

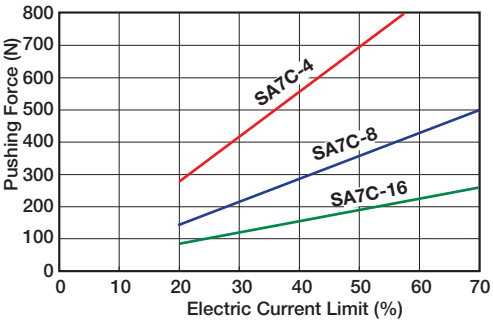
Push force and current limit correlation graph

* In the table below, standard figures are shown. Actual figures will differ slightly.

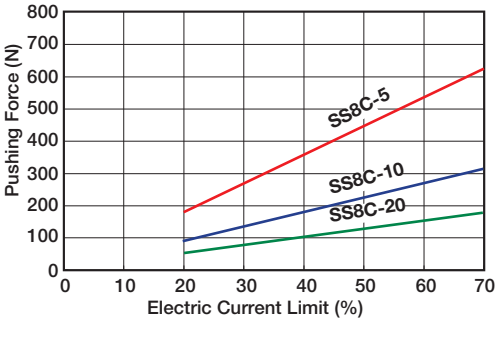
SA5C/SA6C/SS7C Type



SA7C Type



SS8C Type



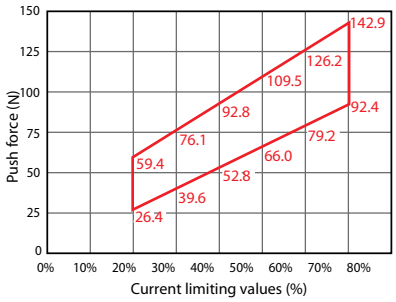
RCP3 Series Mini Rod Type

*The specification value is shown within an area indicated by a red line.

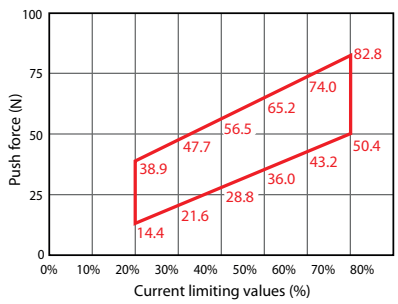
When performing a pressing operation, select a model which has desired push force within an area indicated by the red line in the graph below.
(The graph makes allowance for efficiency reduction due to change due to wear.)

Caution:
Movement speed during pressing operation is fixed at 5mm/s.

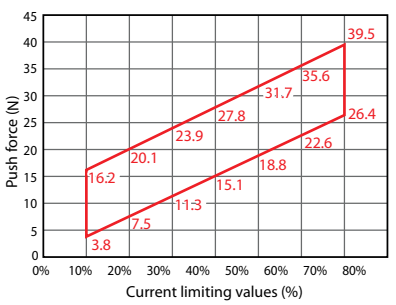
Ball screw type, high thrust <Lead 1>



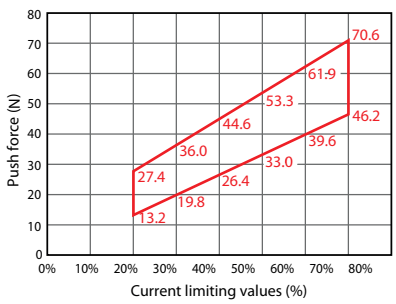
Ball screw type, standard <Lead 1>



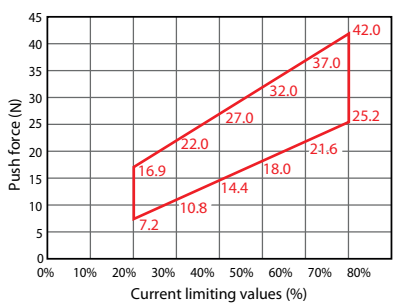
Lead screw type <Lead 1>



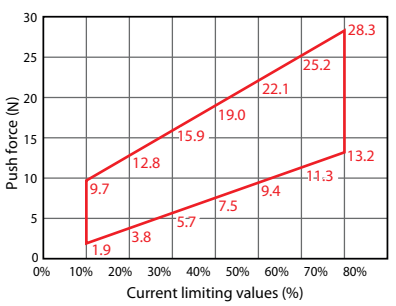
Ball screw type, high thrust <Lead 2>



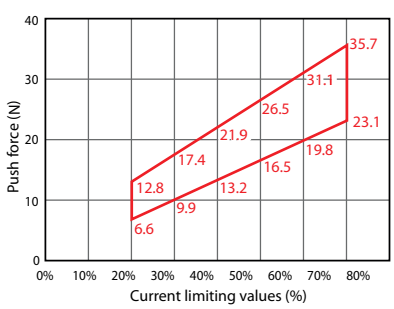
Ball screw type, standard <Lead 2>



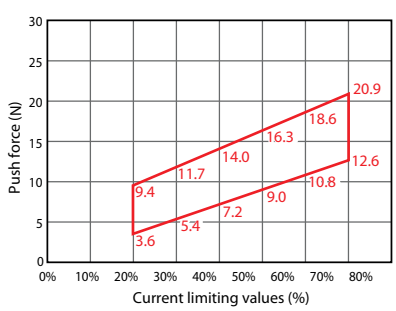
Lead screw type <Lead 2>



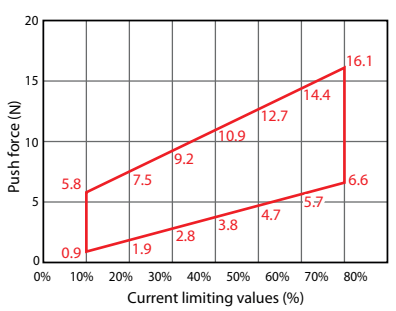
Ball screw type, high thrust <Lead 4>



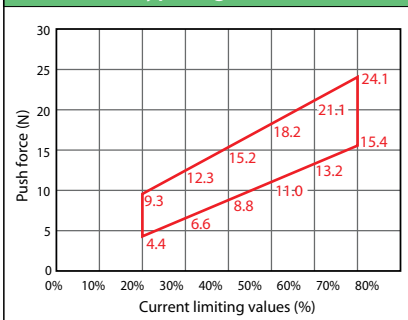
Ball screw type, standard <Lead 4>



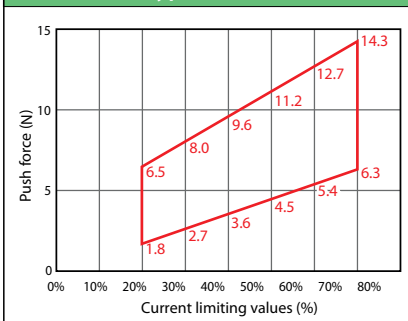
Lead screw type <Lead 4>



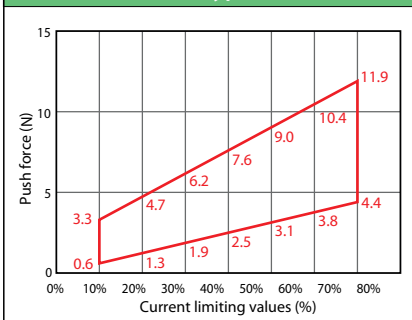
Ball screw type, high thrust <Lead 6>



Ball screw type, standard <Lead 6>



Lead screw type <Lead 6>



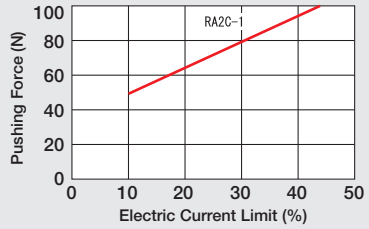
Lead 6 is for RA2BC/RA2BR only

Selection Guide (Push Force and Electric Current Limitation Correlation Graph)

RCP2 Series Rod Type

The push force during the pressing operation can be freely changed by changing the controller current limit value.
The maximum push force changes according to the type of device, so please select the push force you need from the table below.

RA2C Type

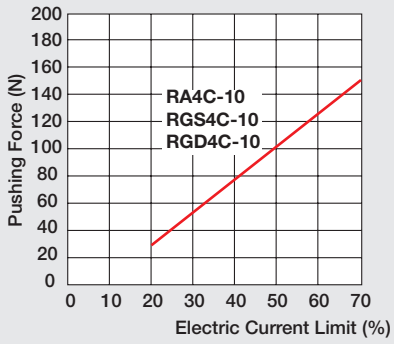
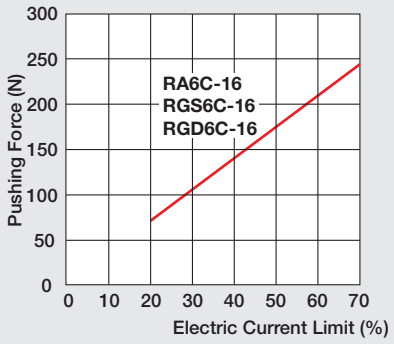
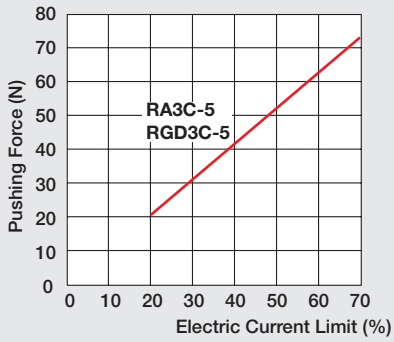
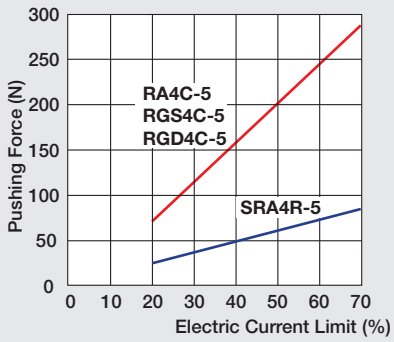
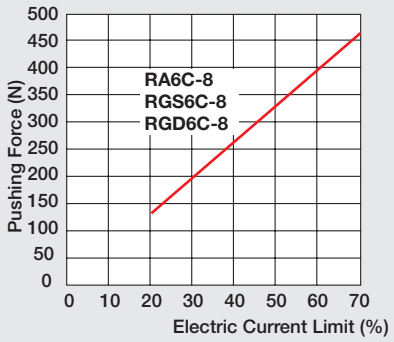
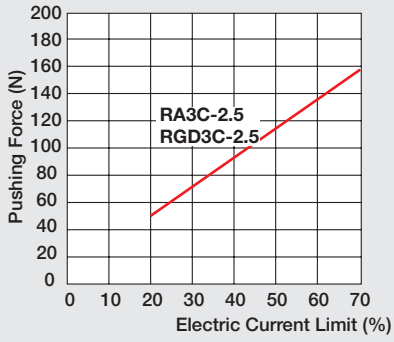
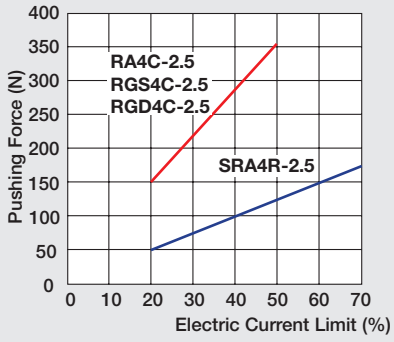
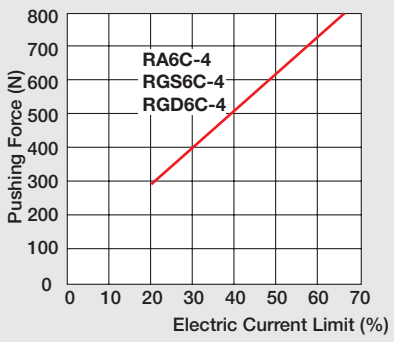


*With the RA2C type, the maximum push force limit is set according to the stroke.

25•50 stroke : 100N
75 stroke : 70N
100 stroke : 55N

Caution for Use

- The push force and current limit correlation figures are given as standard. Actual figures will slightly differ.
- When the current limit is less than 20%, the push force may vary. Therefore use a current limitation that is 20% or higher.
- Movement speed during the pressing operation is fixed at 20mm/s. (3mm/s for RA2C only)

	RA3C/RGD3C Type	RA4C/RGS4C/RGD4C/SRA4R Type	RA6C/RGS6C/RGD6C Type
High-Speed Type			
Medium-Speed Type			
Low-Speed Type			

Note: In the graph above, the number after the type is the lead number.

Selection Guide (Push Force and Electric Current Limitation Correlation Graph)

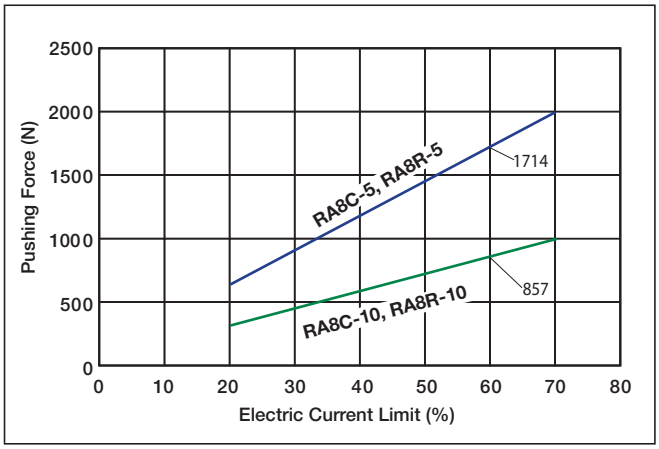
RCP2 Series High-thrust Rod Type

The push force during the pressing operation can be freely changed by changing the controller current limit value.
The maximum push force changes according to the type of device, so please select the push force you need from the table below.

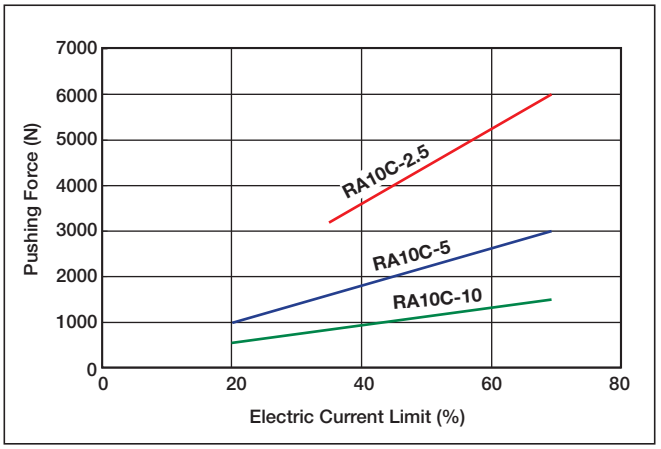
Caution for Use

- The push force and current limit correlation figures are given as standard. Actual figures will slightly differ.
- If the current limit is low, the push force may vary. Therefore, for Lead 10 and Lead 5, make the force 20% or more higher; 35% or higher for Lead 2.5.
  Also note that, while the RA8C/RA8R can perform push-motion operation at current limiting values of up to 70%, certain conditions must be met if the current limiting value exceeds 60%. For details, refer to the operation manual of your actuator.
- The movement speed in a pressing operation is fixed at 10mm/s. Note that in the graph below, 10mm/s was the speed in the pressing operation. So, if the speed changes, the push force will drop.
  (Consult with us if you need to change the pressing speed.)
- When the pressing speed has been performed with the moving speed 10mm/s or less before pressing is started, the pressing speed is the same as the moving speed.

RA8C/RA8R Type



RA10C Type



Note:
Use the standards in the table below for the maximum number of pressing operations for each type of lead, for maximum push force, and (each) 1-mm pressing movement.

Lead (Type)	2.5	5	10
Number of Pushes	1.4 million	25 million	157.6 million

* The maximum number of pushes will vary according to shock, vibration and other operating conditions.
The figures shown at left are for conditions with no shock or vibration.

Selection Guide (Push Force and Electric Current Limitation Correlation Graph)

RCL Series Mini-Slim Rod Type

Use the following models for push-motion operation.
The push force applied in push-motion operation can be freely set by changing the current-limiting value in the controller.
The push force setting ranges differ according to type. Use the following chart to verify.

● Setting the current limiting value in push-motion operation

For push-motion operation, set the current limiting values that determine push force. *The push force is an approximate standard, so it will vary somewhat. *The push time is not limited. Continuous pushing is possible.

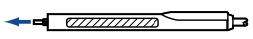
Standard for push force [N]

Current limiting value	30%	40%	50%	60%	70%	80%
RA1L	0.75	1	1.25	1.5	1.75	2
RA2L	1.5	2	2.5	3	3.5	4
RA3L	3	4	5	6	7	8

Caution
- Depending on teaching pendant version or PC software, the current limiting value can be set within 71% to 80%. Be sure to read the "Caution" section shown at the beginning of the manual.
- Movement speed during push operation is fixed at 20mm/s.

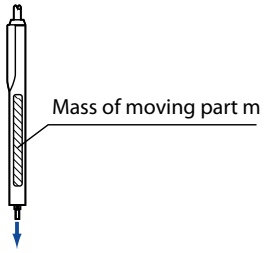
Effect by push direction

Horizontal



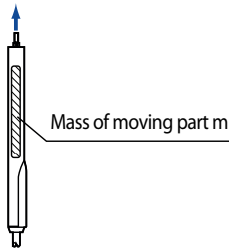
Push force = Thrust
F=f

Vertical (downward push)



Push force = Thrust + Mass of moving part
F=f+M

Vertical (upward push)



Push force = Thrust - Mass of moving part
F=f−M

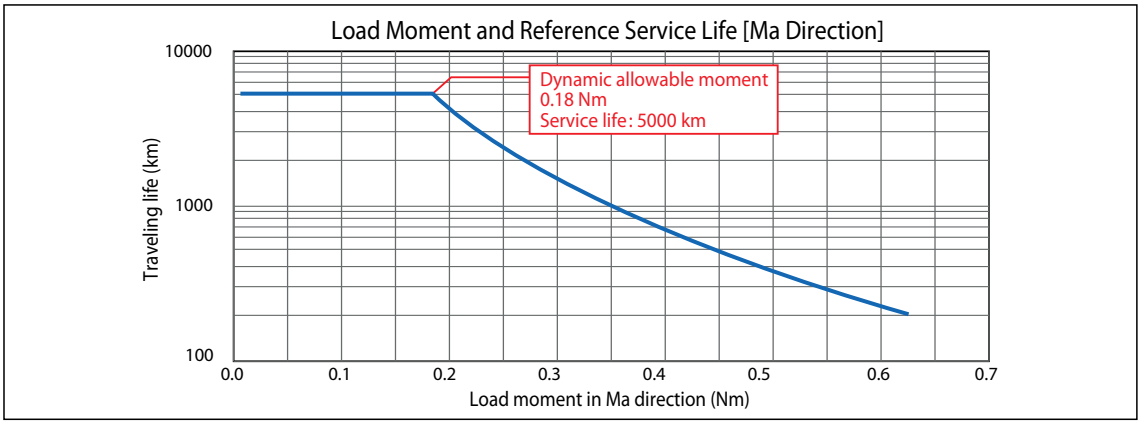
Mass of moving part

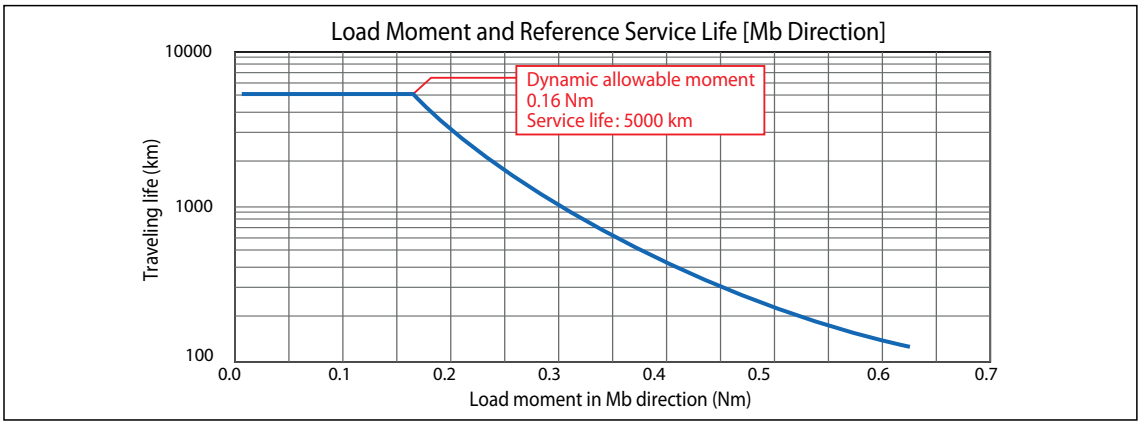
Model	Mass of moving part [N]
RA1L	0.5
RA2L	1
RA3L	1.8

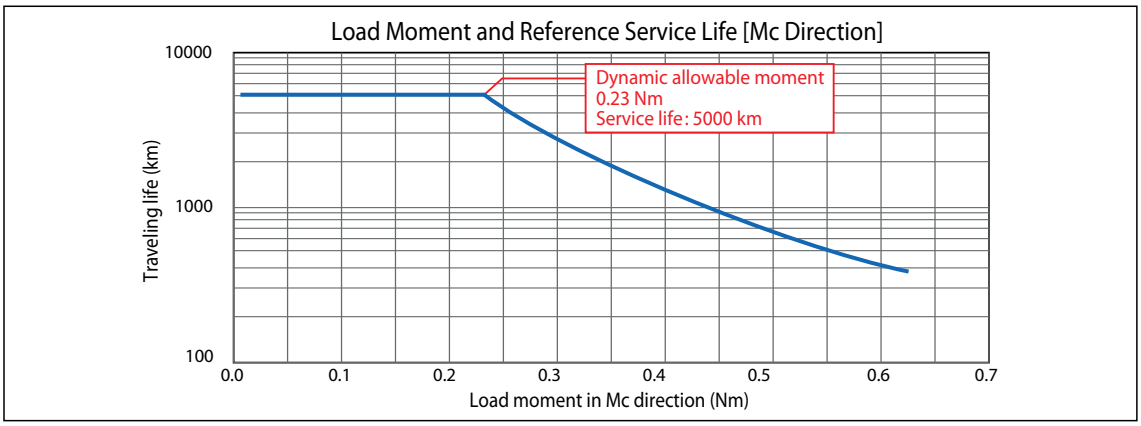
Selection Guide (Load Moment/Reference Service Life)

RCA2 Series Mini-Slim Slider Type

Actuators of mini slider type (RCA2-SA2AC/SA2AR) have a built-in guide, so they can receive a load overhanging from the slider.
Note, however, that the service life of the actuator will decrease if the specified dynamic allowable moment is exceeded.
(See the graphs below.)
When calculating this moment, use a point 25 mm below the top surface of the slider as the reference point.
Even when the allowable moment is not breached, keep the overhang length from the actuator (overhang length) within 40 mm.







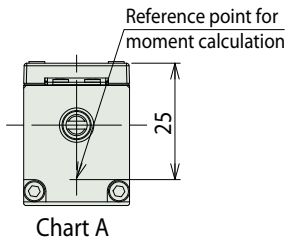
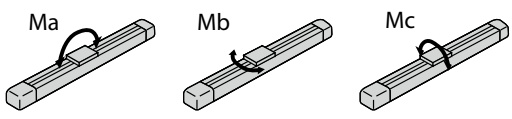
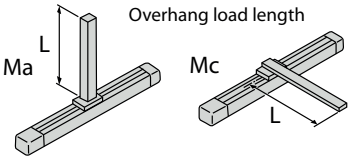


Chart A

Directions of allowable load moments



Overhang load length



Selection Guide (Push Force / Continuous Operation Thrust)

RCS2 Series Ultra-high-thrust Rod Type

The following three conditions must be met when using this device.
Condition 1: The pushing time must be less than the time determined.
Condition 2: One cycle of continuous thrust must be less than the rated thrust for an ultra-high-thrust actuator.
Condition 3: There must be one pushing operation in one cycle.

Selection Method

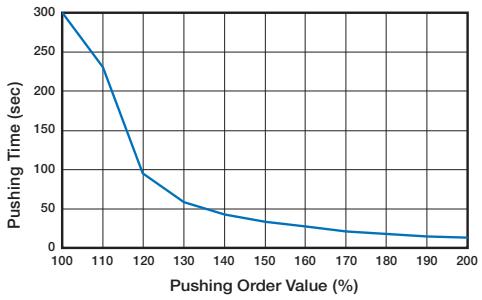
Condition 1. Pushing Time

The maximum pressing time for each pressing order must be determined as shown in the table below. The pressing time used must be less than the time indicated in the table below.
Actuator malfunction could result if the process is used without adhering to the table below.

Table 1

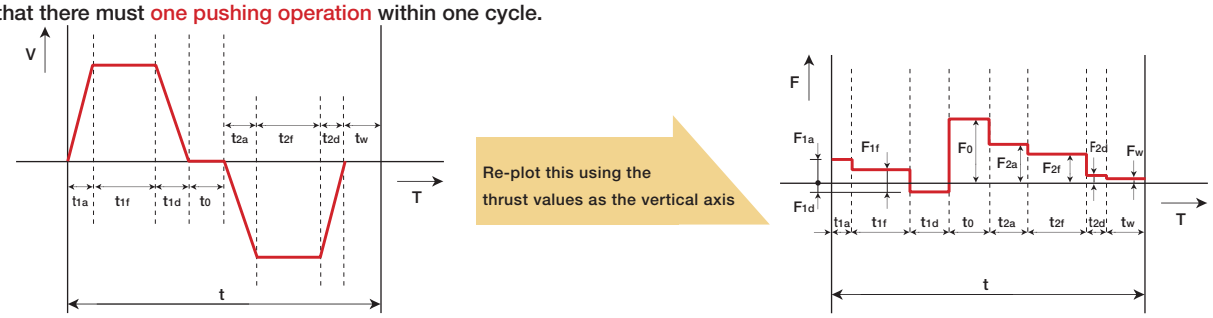
Pushing Order Value (%)	Maximum Pushing Time (sec)
70 or less	(Continuous pushing possible)
80~100	300
110	230
120	95
130	58
140	43
150	33
160	27
170	21
180	18
190	15
200	13

[Pushing Time]



Condition 2. Continuous Operation Thrust

Confirm that 1 cycle of continuous operation thrust Ft, based on a consideration of load and duty, is less than that of the rated thrust for a ultra-high-thrust actuator.
Note that there must one pushing operation within one cycle.



t : Operation duration per cycle (s)	t_{2a} : Acceleration duration2
t_{1a} : Acceleration duration1	t_{2f} : Constant speed duration2
t_{1f} : Constant speed duration1	t_{2d} : Deceleration duration2
t_{1d} : Deceleration duration1	t_w : Waiting duration
t_0 : Pushing duration	

F_{1a} : Thrust1 needed for acceleration	F_{2a} : Thrust2 needed for acceleration
F_{1f} : Thrust1 needed for motion at constant speed	F_{2f} : Thrust2 needed for motion at constant speed
F_{1d} : Thrust1 needed for deceleration	F_{2d} : Thrust2 needed for deceleration
F_0 : Thrust needed for pushing	F_w : Thrust needed for waiting

Use the equation below to calculate the continuous operation thrust Ft for one cycle.

$$Ft = \sqrt{\frac{F_{1a}^2 \times t_{1a} + F_{1f}^2 \times t_{1f} + F_{1d}^2 \times t_{1d} + F_0^2 \times t_0 + F_{2a}^2 \times t_{2a} + F_{2f}^2 \times t_{2f} + F_{2d}^2 \times t_{2d} + F_w^2 \times t_w}{t}}$$

* For horizontal use, it is not necessary to calculate the thrust needed for constant speed motion and for waiting.

- Since $F_{1a}/F_{2a}/F_{1d}/F_{2d}$ will change with the direction of motion, use the equations below.

Horizontal use (for both accel./decel.)	$F_{1a} = F_{1d} = F_{2a} = F_{2d} = (M+m) \times d$
Vertical use, downward acceleration	$F_{1a} = (M+m) \times 9.8 - (M+m) \times d$
Vertical use, constant downward speed	$F_{1f} = (M+m) \times 9.8 + \alpha$(*1)
Vertical use, downward deceleration	$F_{1d} = (M+m) \times 9.8 + (M+m) \times d$
Vertical use, upward acceleration	$F_{2a} = (M+m) \times 9.8 + (M+m) \times d$
Vertical use, constant upward motion	$F_{2f} = (M+m) \times 9.8 + \alpha$(*1)
Vertical use, upward deceleration	$F_{2d} = (M+m) \times 9.8 - (M+m) \cdot d$
Vertical use, waiting	$F_W = (M+m) \times 9.8$

M : Moveable weight (kg)
m : Loaded weight (kg)
d : Accel./decel. (m/s^2)
α : Thrust (taking into account the travel resistance by the external guide.)

*1 If an external guide is attached, it is necessary to consider travel resistance.

Moveable weight for ultra-high-thrust actuator: 9kg

● The method of calculating t□a, which is the acceleration duration, will vary for ① trapezoidal pattern vs. ② triangular patter movements.
Whether a movement pattern is trapezoidal or triangular can be determined by whether the peak speed reached after accelerating over a distance at a specified rate is greater than or less than the specified speed.

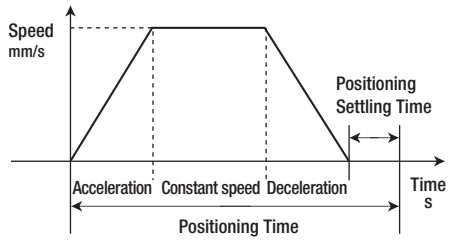
Peak Speed (Vmax)= $\sqrt{\text{Distance Moved (m)} \times \text{Set Acceleration (m/s}^2\text{)}}$

Set Speed < Peak Speed → ① Trapezoidal Pattern
Set Speed > Peak Speed → ② Triangular Pattern

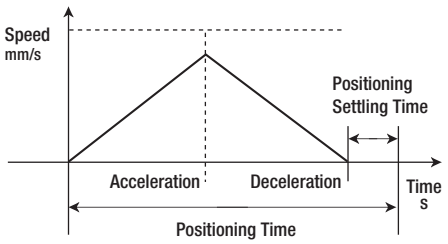
① For trapezoidal pattern,
t□a=Vs/a Vs : Set speed (m/s) a : Ordered acceleration (m/s²)

② For triangular pattern
t□a=Vt/a Vt : Peak speed (m/s) a : Ordered acceleration (m/s²)

① Trapezoidal Pattern



② Triangular Pattern



● t□f is the time taken to move at constant speed. You can calculate this time by computing the distance moved at constant speed.
t□f= Lc/V Lc : Distance moved at constant speed (m) V : Commanded acceleration (m/s)

* Distance moved at constant speed = total distance – accelerated distance – decelerated distance Accel./decel. distance = V²/2a

● t□d is the deceleration time. This is the same as the acceleration time, if the magnitude of acceleration and deceleration are the same.
t□d=V/a V : Set speed (trapezoidal pattern) or Peak speed (triangular pattern)(m/s) a : Commanded deceleration (m/s²)

If the continuous operation thrust Ft by this method is less than the rated thrust, then operation is possible.

Rated thrust for ultra-high-thrust actuator with 2.5 lead: 5100N	Rated thrust for ultra-high-thrust actuator with 1.25 lead: 10200N

Operation is possible if both of the above operating conditions 1 and 2 are met.
If either condition cannot be met, make adjustments such as shortening the pushing operation time or decreasing the duty.

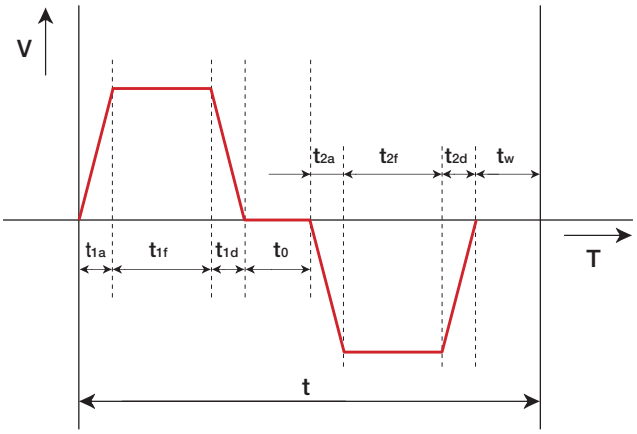
Sample Problem

■ Select an operation pattern by using the selection method described above.

Operating Conditions
- Model used : Ultra-high-thrust actuator with 1.25 lead
- Mounting orientation : Vertical
- Speed : 62mm/s
- Acceleration : 0.098m/s² (0.01G, same value for deceleration.)
- Distance moved : 50mm
- Payload : 100kg
- Push order value : 200% (2000kgf)
- Pushing Time : 3 seconds
- Wait time : 2 seconds
- Push down 50mm, then raise 50mm, and finally wait 2 seconds.
  The conditions for downward and upward motions are identical.

Plotting the above operation yields the graph on the right.

1G = 9.8m/s²



Selection Guide (Push Force / Continuous Operation Thrust)

Using the selection method:

Condition 1. Confirm push operation time

By comparing our push time of 3 seconds with the maximum push time for a push order value of 200%, which is 13 seconds (see Table 1 on page A-71), it is clear that the pressing time is acceptable.

Condition 2. Calculate the continuous operation thrust

Substitute the above operational pattern to the previously mentioned equation for continuous operation thrust.

$$F_t = \sqrt{\frac{F_{1a}^2 \times t_{1a} + F_{1f}^2 \times t_{1f} + F_{1d}^2 \times t_{1d} + F_0^2 \times t_0 + F_{2a}^2 \times t_{2a} + F_{2f}^2 \times t_{2f} + F_{2d}^2 \times t_{2d} + F_w^2 \times t_w}{t}}$$

At this point, by looking at the motion pattern for t1a/t1d/t2a/t2d, the peak speed (Vmax) $=\sqrt{0.05 \times 0.098} \rightarrow 0.07$m/s, which is greater that the set speed, 62mm/s (0.06m/s). Hence this is a trapezoidal pattern.

Hence, $t_{1a}/t_{1d}/t_{2a}/t_{2d} = 0.062 \div 0.098 \rightarrow 0.63$s

Next, calculate t_{1f}/t_{2f}:
Distance moved at constant speed $= 0.05-\{(0.062 \times 0.062) \div (2 \times 0.098)\} \times 2 \rightarrow 0.011$m, so $t_{1f}/t_{2f} = 0.011 \div 0.062 \rightarrow 0.17$s.

Also, calculating the F1a/F1f/F1d/F2a/F2f/F2d from the equations yields the following:
$F_{1a} = F_{2d} = (9+100) \times 9.8-(9+100) \times 0.098 \rightarrow 1058$N
$F_{1d} = F_{2a} = (9+100) \times 9.8+(9+100) \times 0.098 \rightarrow 1079$N
$F_{1f} = F_{2f} = f_w = (9+100) \times 9.8 \rightarrow 1068$N

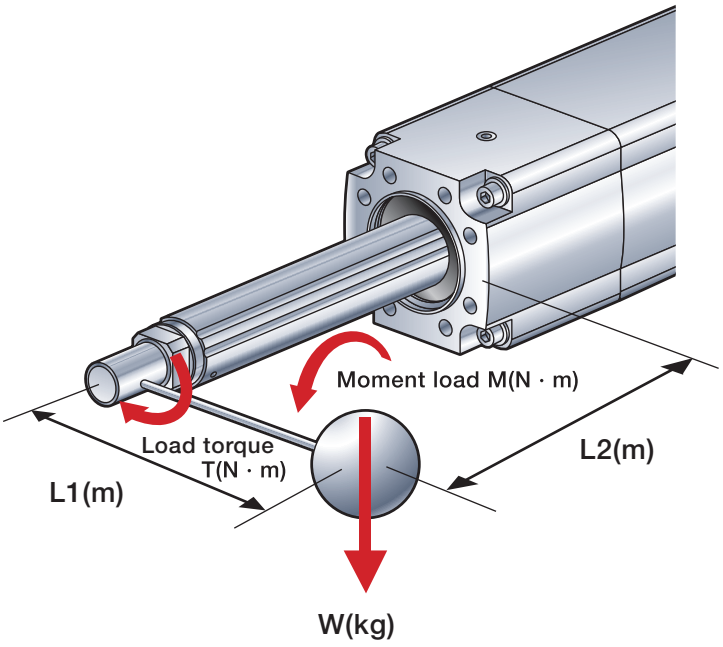
By substituting these values to the continuous operation thrust equation,

$$F_t = \sqrt{\{(1058 \times 1058) \times 0.63+(1068 \times 1068) \times 0.17+(1079 \times 1079) \times 0.63+(19600 \times 19600) \times 3+(1079 \times 1079) \times 0.63 +(1068 \times 1068) \times 0.17+(1058 \times 1058) \times 0.63+(1068 \times 1068) \times 2\} \div (0.63+0.17+0.63+3+0.63+0.17+0.63+2)} \rightarrow 12113\text{N}$$

Since this exceeds the rated thrust for the 2-ton ultra-high-thrust actuator, which is 10200N, operation with this pattern is not possible.

In response, let us increase the wait time. (i.e. decrease the duty)
Recalculating with tw=6.12s(t=12s) will change the thrust to F_t=9814N, making it operable.

Information on Moment Selection



The ultra-high-thrust actuator can apply a load on the rod within the range of conditions calculated below.

$M+T \leqq 120$ (N · m)
Moment Load $M = Wg \times L_2$
Load Torque $T = Wg \times L_1$

* g = Gravitational acceleration 9.8
* L1 = Distance from the center of rod to the center of gravity of the work piece
* L2 = Distance from the actuator mounting surface to the center of gravity of the work piece + 0.07

If the above condition is not met, consider installing an external guide, or the like, so that the load is not exerted on the rod.

Selection Guide (Gripping Force)

RCP2 Series Gripper Slider Type

Step 1 Check necessary gripping force and transportable work part weight

Step 2 Check distance to gripping point

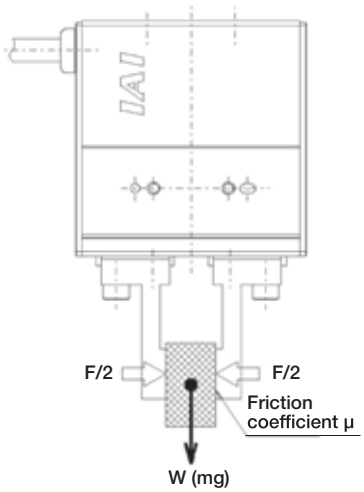
Step 3 Check external force applied to the finger attachment (claw)

Step 1 Check necessary gripping force and transportable work part weight

When gripping with frictional force, calculate the necessary gripping force as shown below.

(1) Normal transportation

F : Gripping force [N] …… Sum of push forces
μ : Coefficient of static friction between the finger attachment and the work part
m : Work part weight [Kg]
g : Gravitational acceleration [= 9.8m/s^2]



A condition in which a work part does not drop when the work part is gripped statistically:

$$F\mu > W$$

$$F > \frac{mg}{\mu}$$

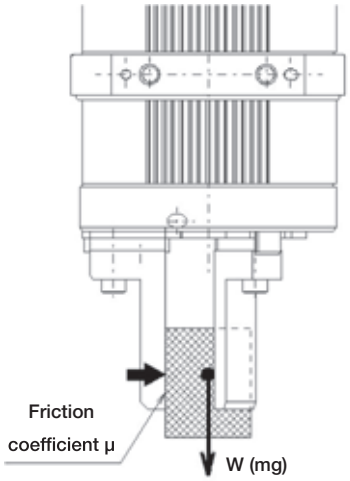
Necessary gripping force as the recommended safety factor of 2 in normal transportation:

$$F > \frac{mg}{\mu} \times 2 \text{ (safety factor)}$$

When the friction coefficient μ is between 0.1 and 0.2:

$$F > \frac{mg}{0.1 \sim 0.2} \times 2 = (10 \sim 20) \times mg$$

* As the Coefficient of static friction increases, the work part weight also increases. Select a model which can achieve the gripping force of 10 to 20 times or more.

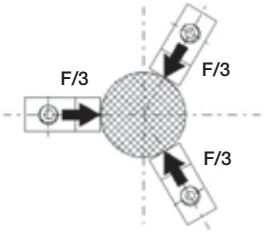


Normal work part transportation

Necessary gripping force	→	10 to 20 times the work part weight or more
Transportable work part weight	→	One-tenth to one-twentieth or less of gripping force

(2) When remarkable acceleration, deceleration and/or impact occur at work part transportation

Stronger inertial force is applied to a work part by gravity. In this case, consider the sufficient safety rate when selecting a model.



When remarkable acceleration, deceleration and/or impact occur

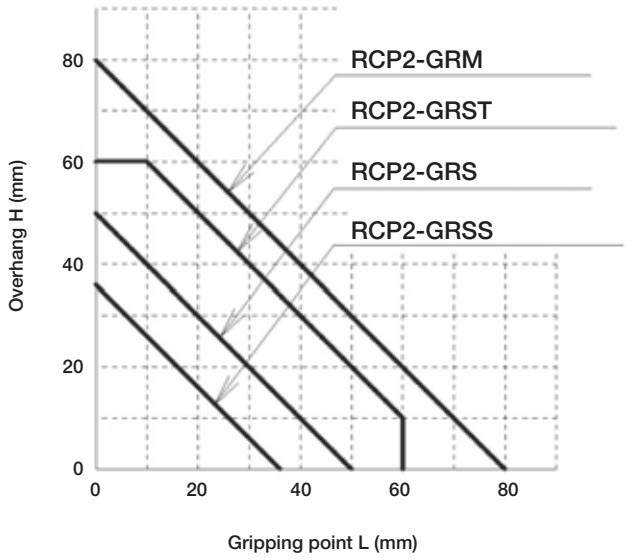
Necessary gripping force	→	30 to 50 times the work part weight or more
Transportable work part weight	→	One-thirtieth to one-fiftieth or less of gripping force

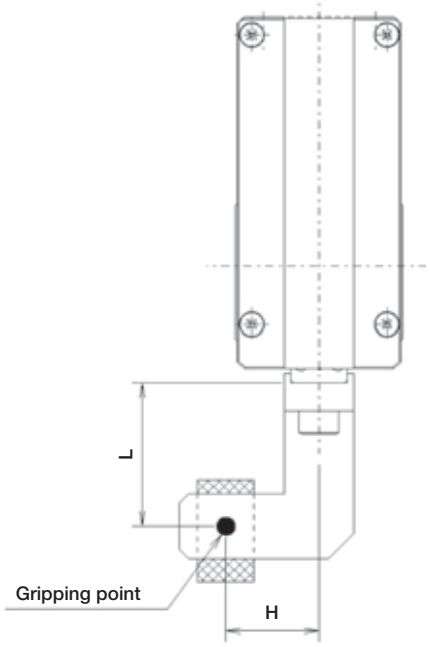
Selection Guide (Gripping Force)

Step 2 Distance between finger attachment (claw) to gripping point

Keep the distance (L, H) from the finger (claw) mounting surface to the gripping point within the following range. If such distance does not fall within such range, excessive moment applies to the finger sliding parts and internal mechanism and the service life may be affected.

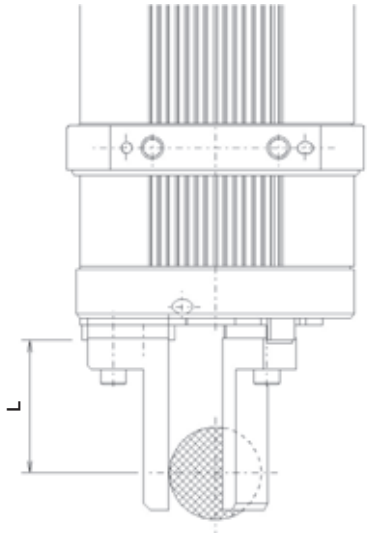
▪ **2-Finger gripper**





▪ **3-Finger gripper**

RCP2-GR3SS	→ L: 50mm or less
RCP2-GR3SM	→ L: 80mm or less



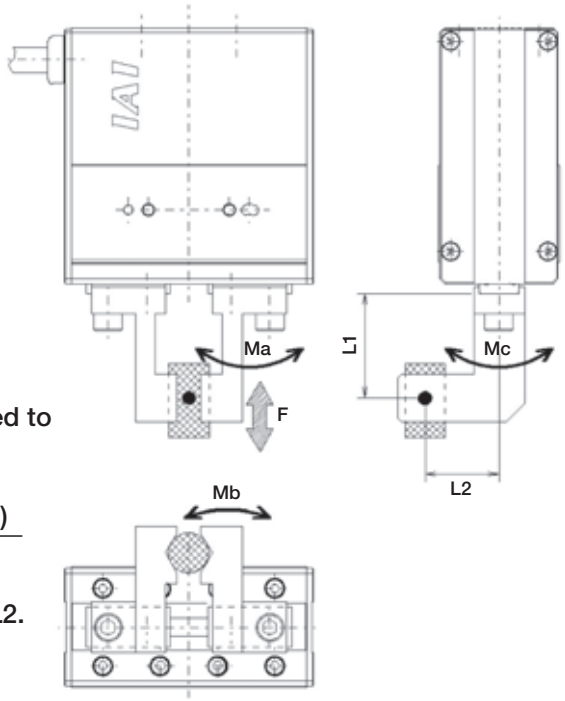
Keep the fingers mounted to the actuator as small and light as possible, even if the distance to the gripping point falls within a restricted range.

There are cases in which performance will be decreased or the guides will be adversely affected by inertial forces or bending moment if the finger is too long or too heavy.

Step 3 Checking external force applied to finger

(1) Allowable vertical load

Confirm that the vertical load applied to each finger is the allowable load or less.



(2) Allowable load moment

Calculate Ma and Mc using L1 and Mb using L2.
Confirm that the moment applied to each finger is the maximum allowable load moment or less.

Allowable external force when the moment load is applied to each claw:

$$\text{Allowable load F (N)} > \frac{\text{M (Maximum allowable moment (N•m)}}{\text{L (mm) x } 10^{-3}}$$

Calculate the allowable load F (N) using both of L1 and L2.

Confirm that the external force applied to finger is the calculated allowable load F (N) (L1 or L2, whichever is smaller) or less.

Model	Allowable vertical load F (N)	Maximum allowable load moment (N•m)		
		Ma	Mb	Mc
RCP2-GRSS	60	0.5	0.5	1.5
RCP2-GRS	253	6.3	6.3	7.0
RCP2-GRM	253	6.3	6.3	8.3
RCP2-GRST	275	2.93	2.93	5.0
RCP2-GR3SS	169	3.8	3.8	3.0
RCP2-GR3SM	253	6.3	6.3	5.7

1. The allowable value ky above shows a static value.
2. The allowable value per finger is shown.

* Finger weight and work part weight are also a part of the external force. Centrifugal force when the gripper rotated gripping a work part and inertial force due to acceleration or deceleration when moving are also the external force applied to the finger.

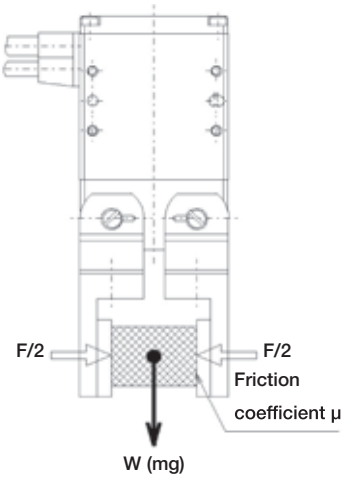
Selection Guide (Gripping Force)

RCP2 Series Gripper Lever Type

Step 1 Check necessary gripping force and transportable work part weight

Step 2 Check moment of inertia of the finger attachment (claw)

Step 3 Check external force applied to the finger



Step 1 Check the necessary gripping force and transportable work part weight

Like Step 1 of Slide type, calculate the necessary gripping force and confirm that the gripping force meets conditions. Calculate it referring to "Paragraph 5.3 Adjustment of Gripping Force", effective gripping force by gripping point.

Normal work transportation

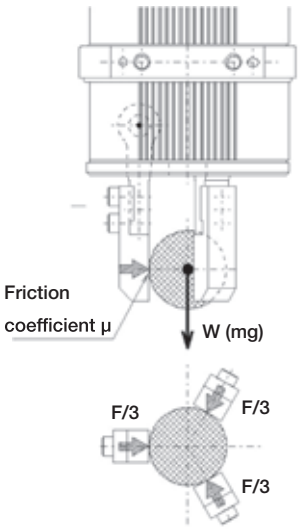
Necessary gripping force → 10 to 20 times the work part weight or more

Transportable work part weight → One-tenth to one-twentieth or less of gripping force

When remarkable acceleration, deceleration and/or impact occur

Necessary gripping force → 30 to 50 times the work part weight or more

Transportable work part weight → One-thirtieth to one-fiftieth or less of gripping force



Step 2 Checking moment of inertia of the finger attachment (claw)

Confirm that all moments of inertia around the Z axis (fulcrum) of the finger attachment (claw) fall within an allowable area. Depending on the configuration and/or shape of the finger, divide it into several elements when calculating. For your reference, an example of calculation by dividing into two elements is shown below.

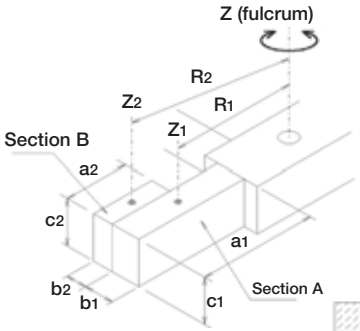
(1) Moment of inertia around Z_1 axis (the center of gravity of A) (section A)

m_1 : Weight of A [Kg]

a, b, c : Dimension of Section A [mm]

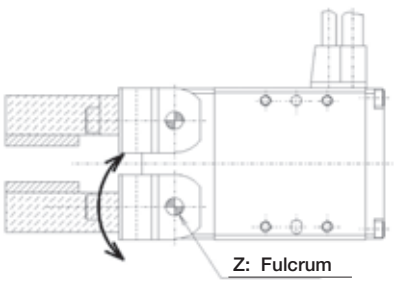
m_1 [Kg] = $a_1 \times b_1 \times c_1 \times$ specific gravity $\times 10^{-6}$

$$Iz_1\ [kg.m^2] = \frac{m_1 (a_1^2 + b_1^2)}{12} \times 10^{-6}$$



(2) Moment of inertia around the Z_2 axis (the center of gravity of B) (section B)

$$Iz_2\ [kg.m^2] = \frac{m_2 (a_1^2 + b_1^2)}{12} \times 10^{-6}$$

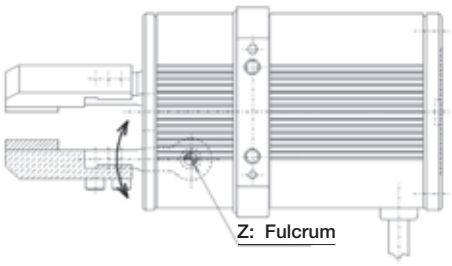


(3) All moments of inertia around the Z axis (fulcrum)

R_1 : Distance from the center of gravity of A to the finger opening/closing fulcrum [mm]

R_2 : Distance from the center of gravity of B to the finger opening/closing fulcrum [mm]

$I\ [kg \cdot m^2] = (Iz_1 + m_1 R_1^2) + (Iz_2 + m_2 R_2^2)$



Model	Allowable moment of inertia [kg•m^2]	Weight (Reference) [kg]
RCP2-GRLS	1.5×10^{-4}	0.07
RCP2-GR3LS	3.0×10^{-4}	0.15
RCP2-GR3LM	9.0×10^{-4}	0.5

Step 3 Checking external force applied to the finger

(1) Allowable load torque

Confirm that the load torque applied to the finger is the maximum allowable load torque or less.

The load torque is calculated by finger and work part weight as stated below.

m_1 : Work part weight

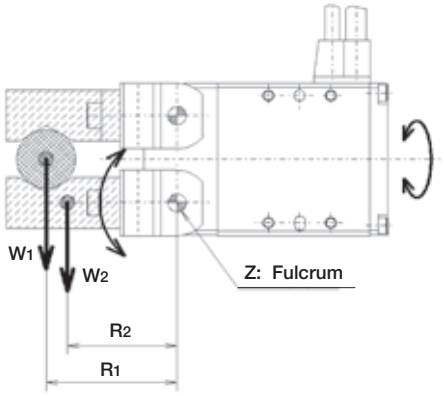
R_1 : Distance from the center of gravity of work part to the finger opening/closing fulcrum

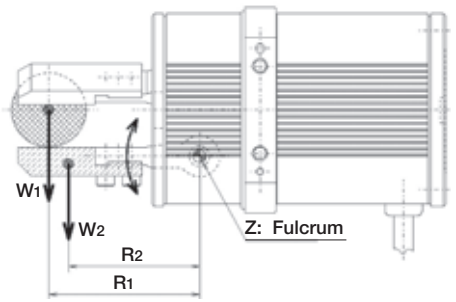
m_2 : Claw weight

R_2 : Distance from the center of gravity of the claw to the finger opening/closing fulcrum

$T = (W_1 \times R_1) + (W_2 \times R_2) + (\text{other load torque})$

$= (m_1 g \times R_1) + (m_2 g \times R_2) + (\text{other load torque})$





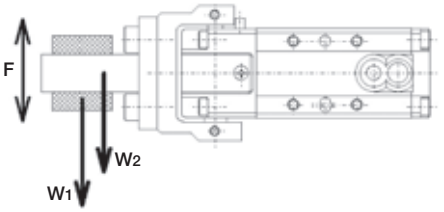
* Centrifugal force when the gripper rotated gripping a work part and inertial force due to acceleration or deceleration when moving horizontally are also the load torque applied to the finger. If applicable, confirm that the total torque including the torque above is the maximum allowable load torque or less.

(2) Allowable thrust load

Confirm that the thrust load of finger opening/closing the axis is the allowable load or less.

$F = W_1 + W_2 + (\text{other thrust load})$

$= m_1 g + m_2 g + (\text{other thrust load})$



Model	Maximum allowable load torque T [N•m]	Allowable thrust load F [N]
RCP2-GRLS	0.05	15
RCP2-GR3LS	0.15	–
RCP2-GR3LM	0.4	–

Rotary Type Technical Materials

Selection Guide

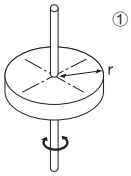
Check the following two points to confirm whether the RoboCylinder rotary type is compatible with your desired service conditions.

1 Inertial Moment

Inertial moment expresses the amount of inertia in a rotational motion, and corresponds to weight for linear motion.
The greater the inertial moment, the more difficult it is for that object to move and stop.
In other words, when choosing a rotary-type unit, a factor in that selection is whether or not it is possible to control the inertial moment of the object being rotated.
Inertial moment differs with the weight and shape of the object, but refer to the calculation formula in the typical example illustrated on the right.
The allowable inertial moment value for a RC rotary type is expressed as **load inertia.**
A RC rotary type can be used if the calculated inertial moment is less than its load inertia.

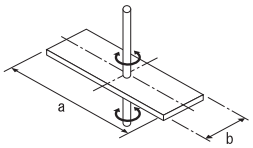
●Calculating the Moment of Inertia for Typical Shapes

J: Moment of inertia (kg•m^2) / M: Mass (kg) / r: Radius (m) / a, b: Length of sides (m



① **Cylinder (incl. thin discs)**
Axis of rotation: Central axis

$$J = M \cdot \frac{r^2}{2}$$



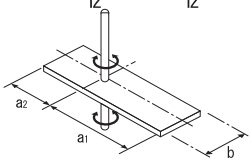
② **Thin rectangular plate (Solid)**
Axis of rotation: Perpendicular and through the center of gravity of the plate. (Same for a thicker plate)

$$J = M \cdot \frac{a^2+b^2}{12}$$

③ **Thin rectangular plate (Solid)**
Axis of rotation: Perpendicular through one end of the plate.

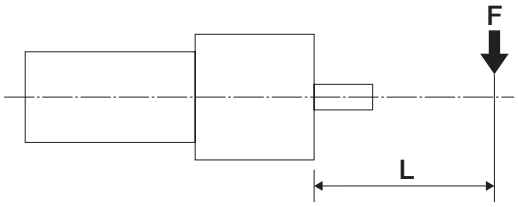
M_1 : Mass of section a1 (kg)
M_2 : Mass of section a2 (kg)

$$J = M_1 \cdot \frac{4a_1^2+b^2}{12} + M_2 \cdot \frac{4a_2^2+b^2}{12}$$



2 Load Moment

If the inertial moment is a controllable (electrical) guide, the load moment is a guide for the limit to forced (mechanical) use.
Using the actuator body end of the output shaft mounting base as the reference position for moment, check whether the load moment exerted on the output axis is within the load moment tolerances in the catalog.
Use in excess of the allowable load moment may cause damage and shortened service life.



Load Moment (N · m) = F (N) × L (m)

Precautions regarding range of motion and home-return

Please note that, when a RCS2 rotary type performs home-return, there are cases in which the direction or rotation in the return-home operation will differ depending on the stopping position of the axis.
In the RCS2 rotary type home-return operation, the axis turns and the home-return sensor detects, and the home-return is completed at the position where the Z-phase is detected as inverted. At this time, the axis **rotates in the counter-clockwise direction** ①, seen from the direction of the axis, and rotation stops when the sensor detection is inverted ② and the Z-phase is detected ③. (See Figure 1)
However, **if the axis is detected by the sensor** when home-return begins, **it rotates in the clockwise direction from that position** ④ and stops when the Z-phase is detected ⑤.
(Figure 2)
The range of operation of the RCS2-RT6/RT6R/RT7R is 300 degress, but since there is no stopper, there are cases in which the range of operation is exceeded when the axis is manually turned with the servo OFF, etc.
Please note that there are cases where the sensor will be detected when the range of operation has been exceeded.

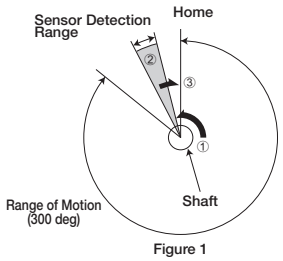


Figure 1

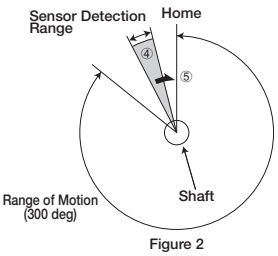


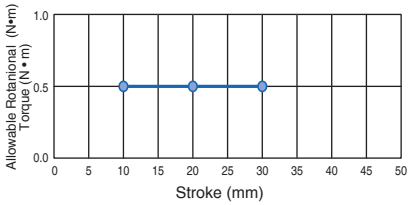
Figure 2

Guide-Equipped Type RCA2/ERC2/RCP2/RCA/RCS2

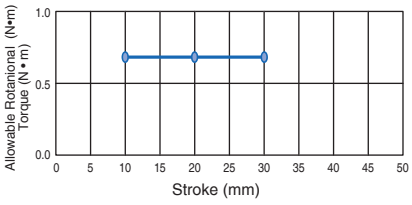
Allowable Rotating Torque

The allowable torque for each model is as shown below.
When rotational torque is exerted, use within the range of the values below. Further, single-guide types cannot be subjected to rotational torque.

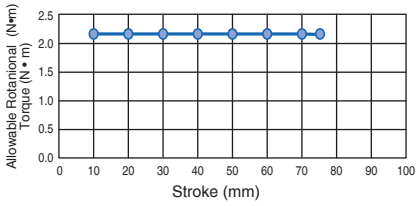
RCA2-GD3NA Type



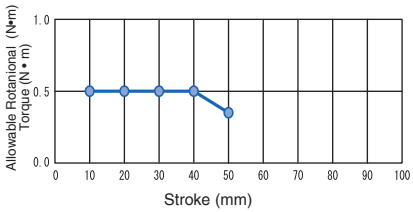
RCA2-GD4NA Type



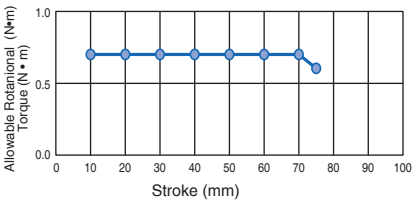
RCS2-GD5N Type



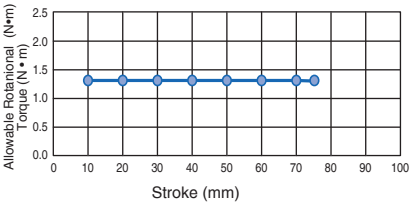
RCA2-SD3NA Type



RCA2-SD4NA Type

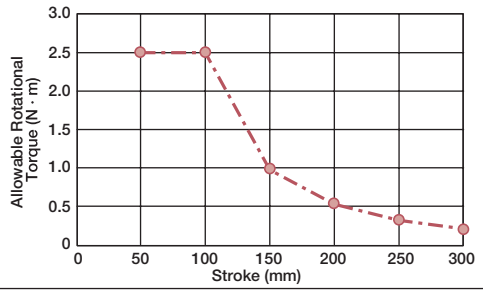


RCS2-SD5N Type



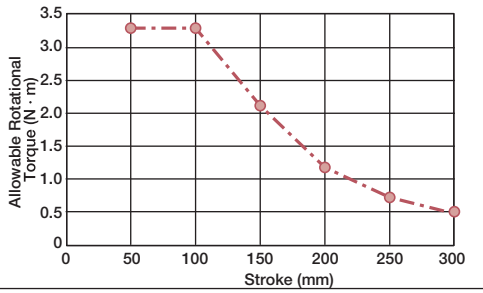
ERC2-RGD6C Type

■ Double-guide



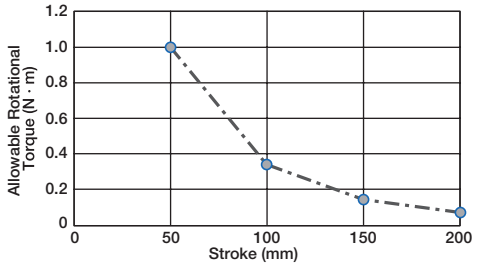
ERC2-RGD7C Type

■ Double-guide



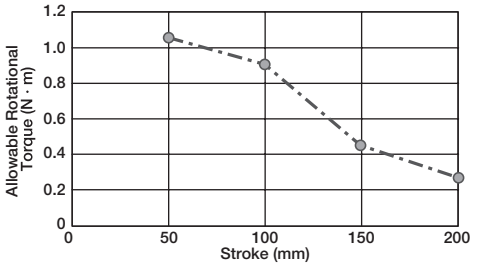
RCA / RCS2-RGD3□ Type

■ Double-guide



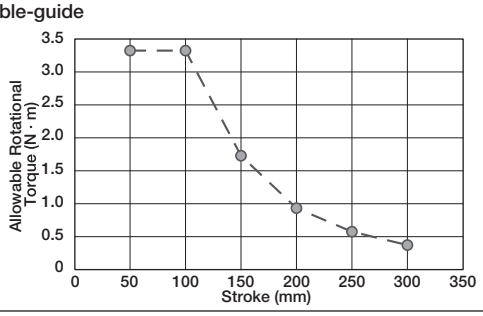
RCS2-RGD4□ Type

■ Double-guide



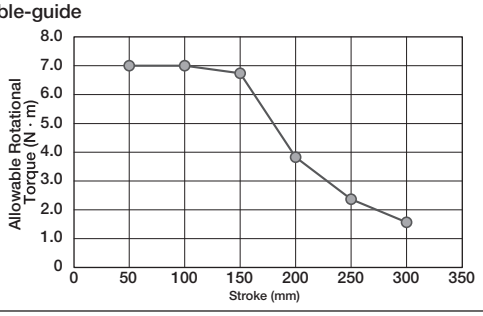
RCS2-RGD5C Type

■ Double-guide



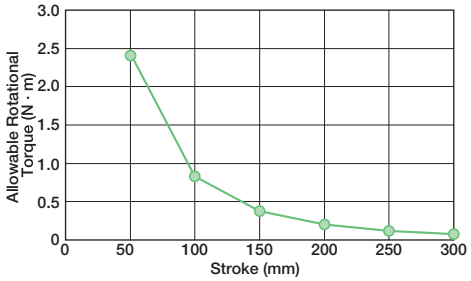
RCS2-SRGD7BD Type

■ Double-guide

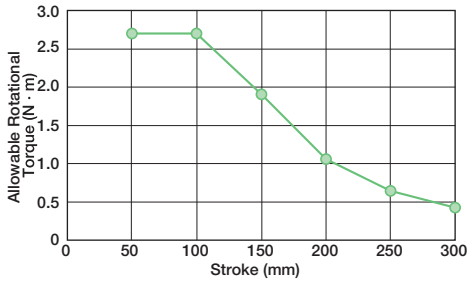


RCP2-RGD3C Type

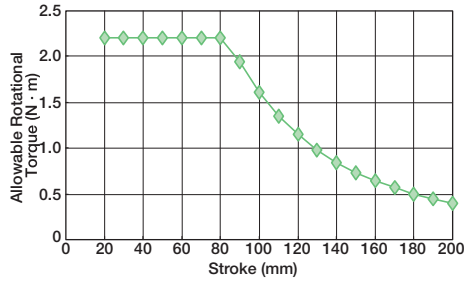
RCP2-RGD4C Type



RCP2-RGD6C Type



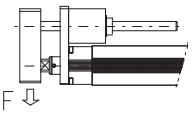
RCP2-SRGD4R Type



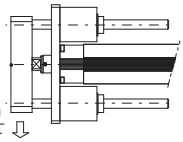
Relationship Between Allowable Load at Tip & Running Service Life

The greater the load at the guide tip, the shorter the running service life. Select the appropriate model, considering balance between load and service life.

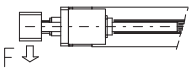
■ Single-guide type



■ Double-guide type
<Vertical>



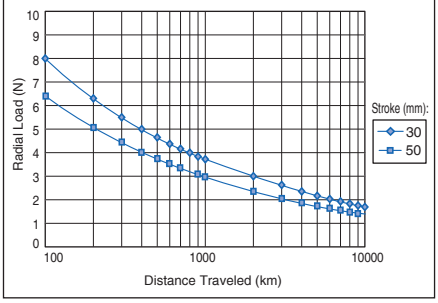
<Horizontal>



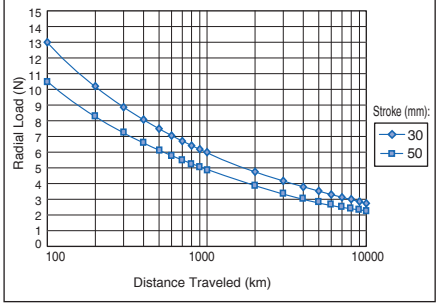
* The single-guide specification can only be used with vertical loads.

Single-guide

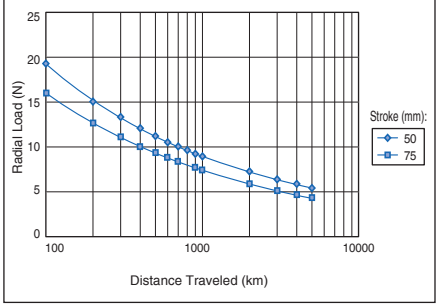
RCA2-GS3NA Type



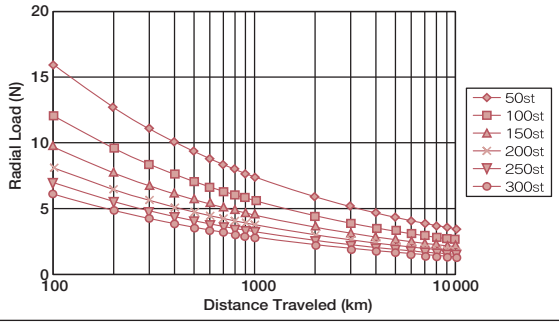
RCA2-GS4NA Type



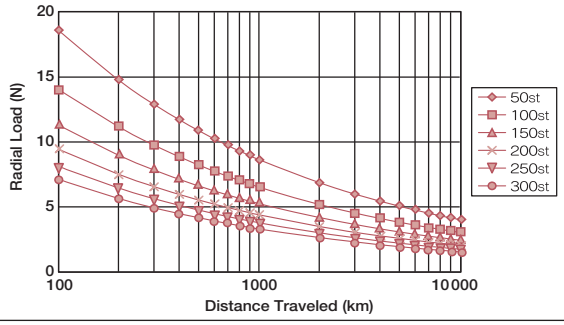
RCS2-GS5N Type



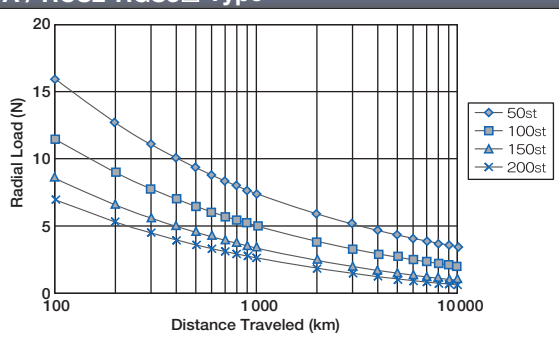
ERC2-RGS6C Type



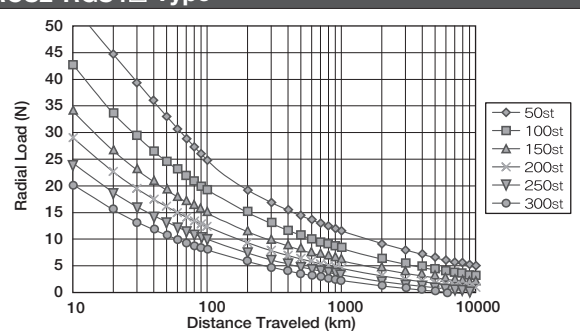
ERC2-RGS7C Type



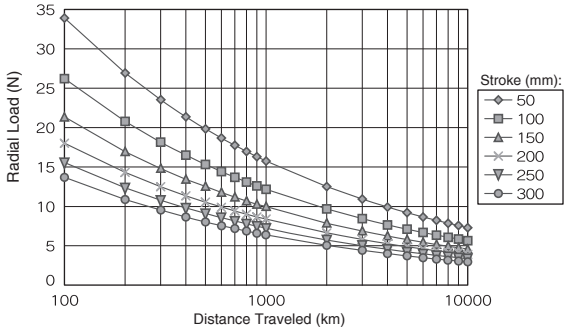
RCA / RCS2-RGS3□ Type



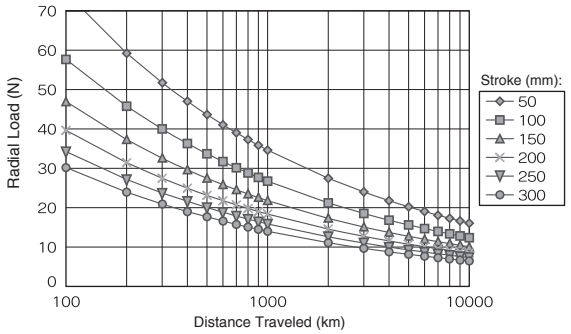
RCS2-RGS4□ Type



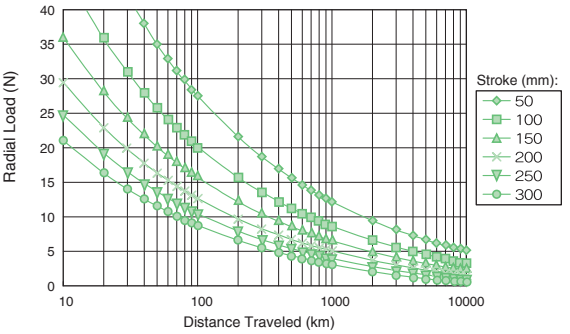
RCS2-RGS5C Type



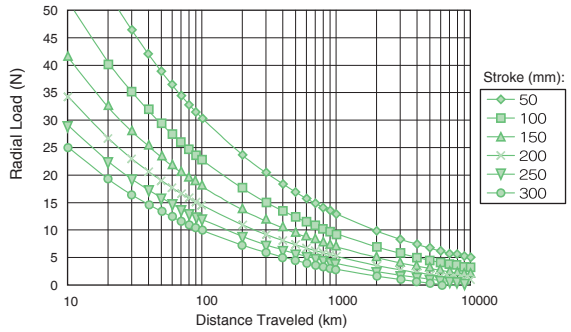
RCS2-SRGS7BD Type



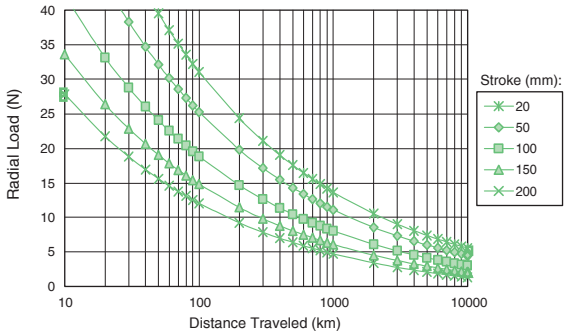
RCP2-RGS4C Type



RCP2-RGS6C Type

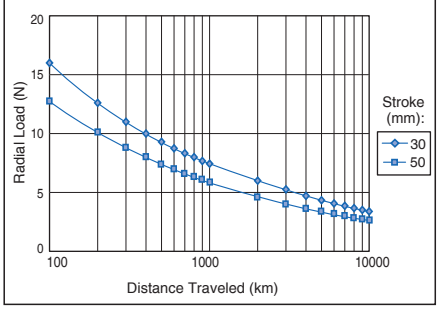


RCP2-SRGS4R Type

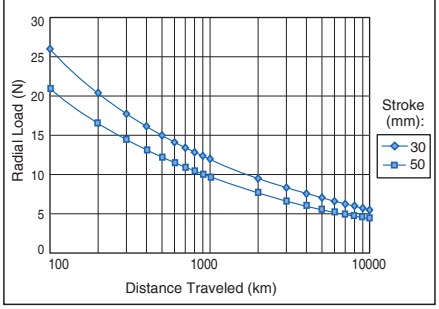


Double-Guide

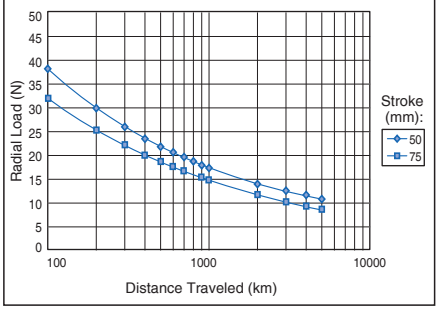
RCA2-GD3NA Type



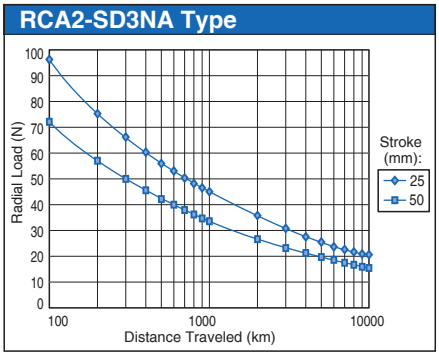
RCA2-GD4NA Type



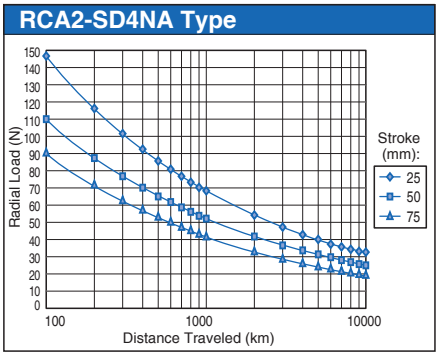
RCS2-GD5N Type



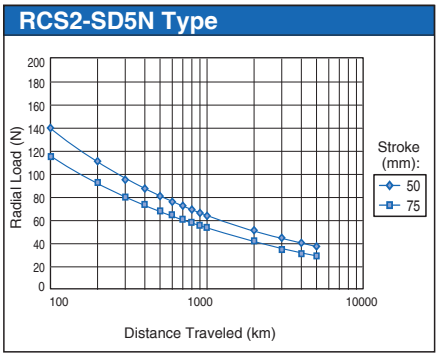
RCA2-SD3NA Type



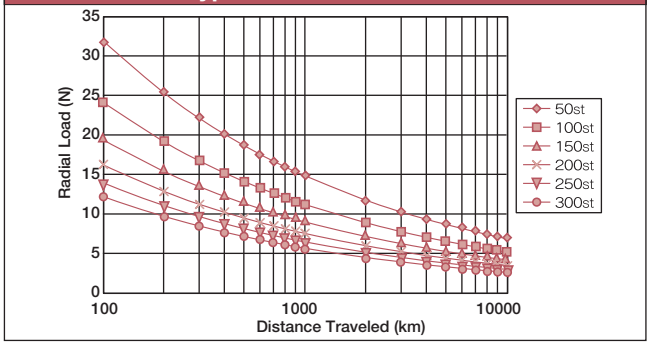
RCA2-SD4NA Type



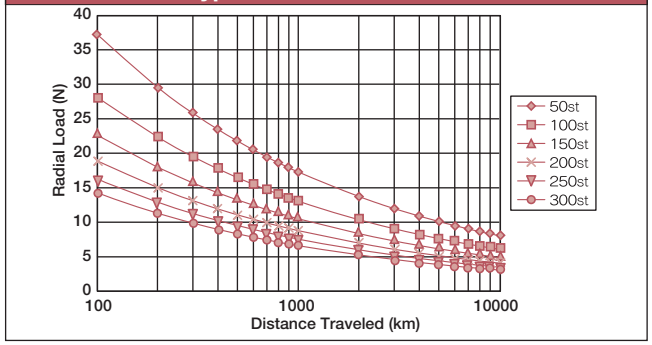
RCS2-SD5N Type



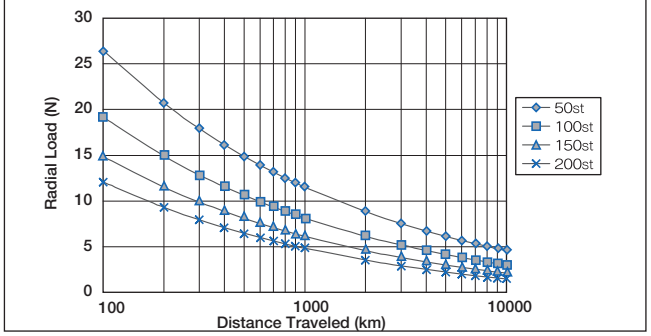
ERC2-RGD6C Type



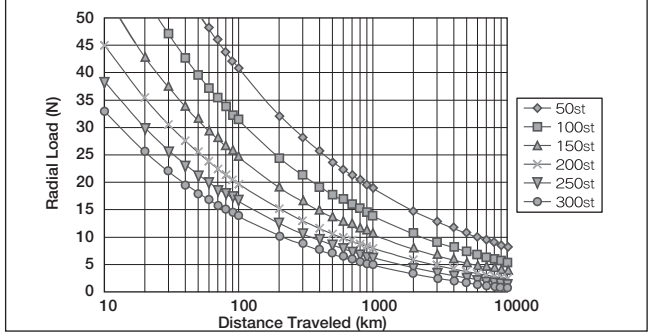
ERC2-RGD7C Type



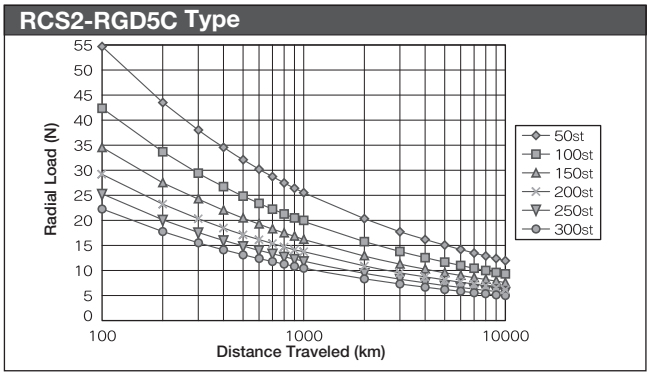
RCA / RCS2-RGD3□ Type



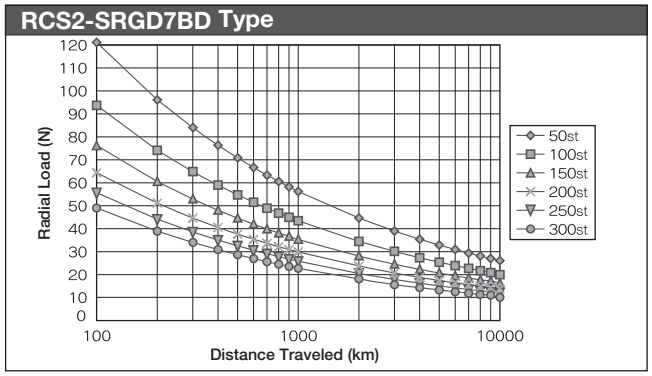
RCS2-RGD4□ Type



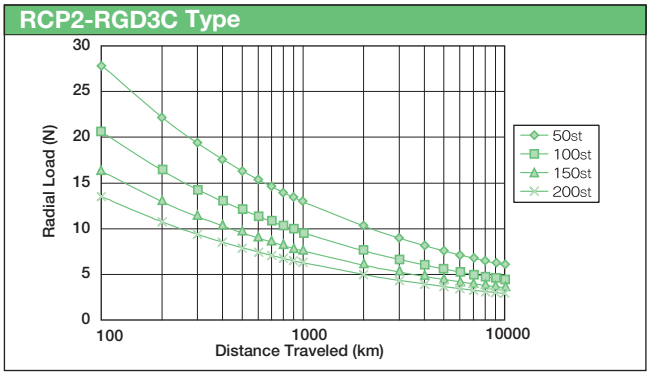
RCS2-RGD5C Type



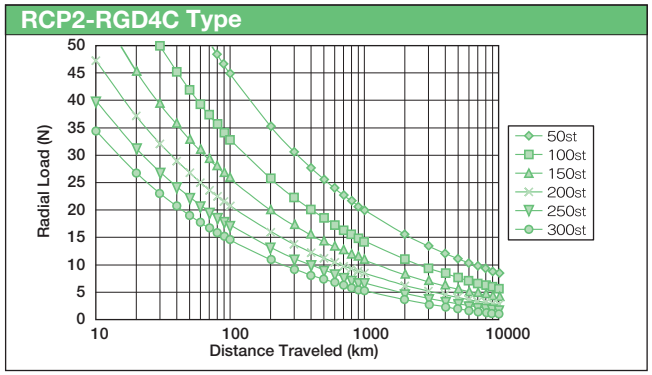
RCS2-SRGD7BD Type



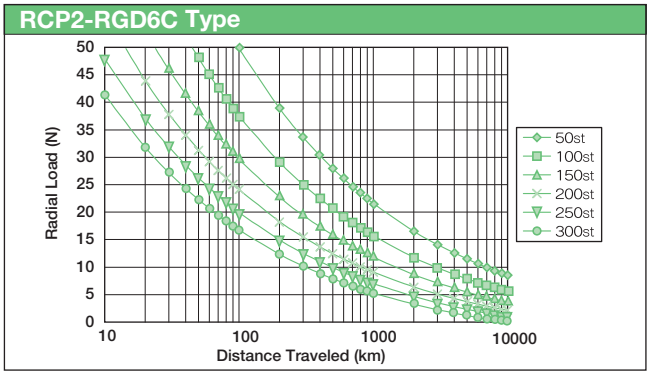
RCP2-RGD3C Type



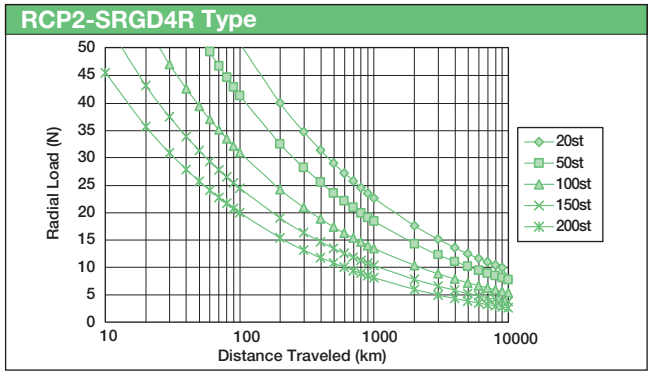
RCP2-RGD4C Type



RCP2-RGD6C Type



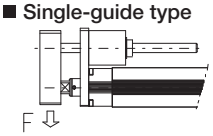
RCP2-SRGD4R Type



Radial Load & Tip Deflection

The graph below shows the correlation between the load exerted at the guide tip and the amount of deflection generated.

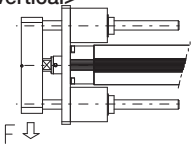
■ Single-guide type



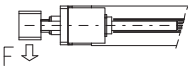
* The single-guide specification can only be used with vertical loads.

■ Double-guide type

<Vertical>

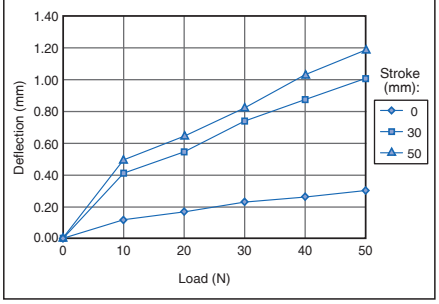


<Horizontal>

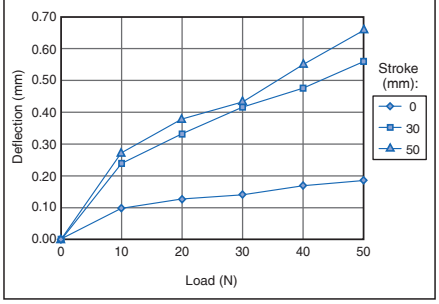


Single-guide

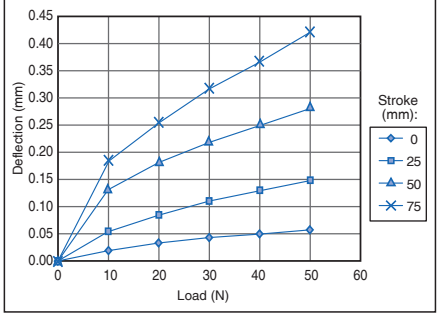
RCA2-GS3NA Type



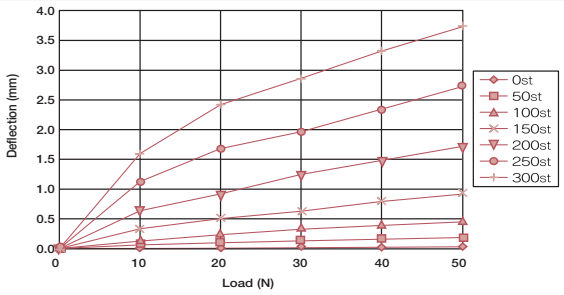
RCA2-GS4NA Type



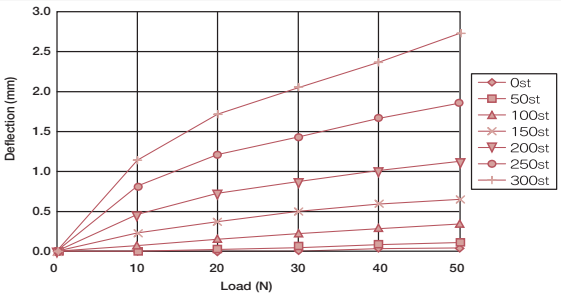
RCS2-GS5N Type



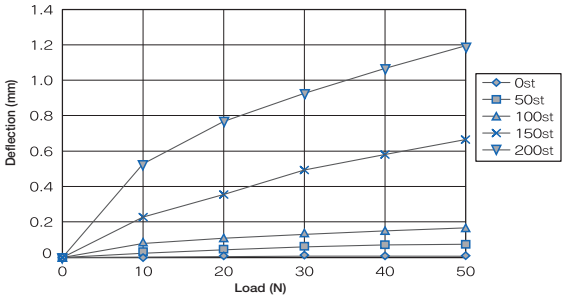
ERC2-RGS6C Type



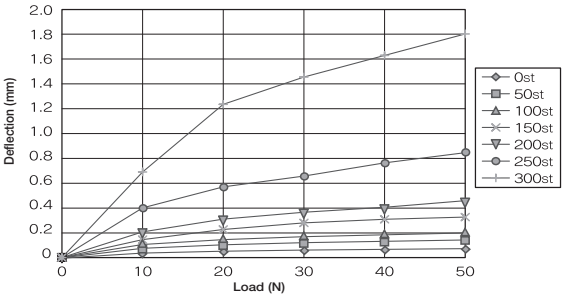
ERC2-RGS7C Type



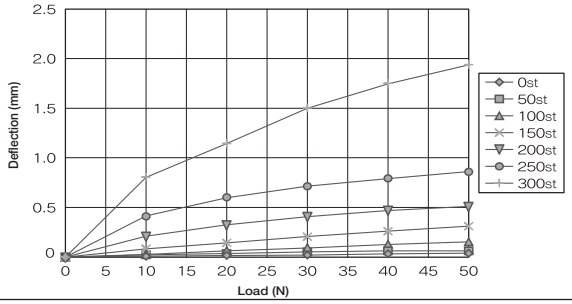
RCA / RCS2-RGS3□ Type



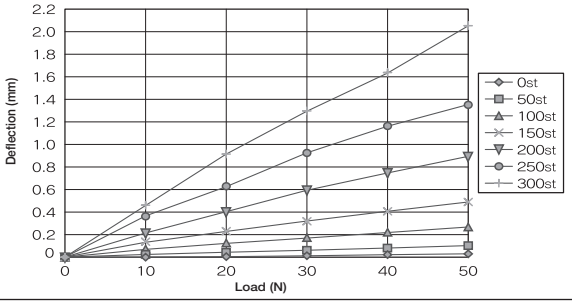
RCS2-RGS4□ Type



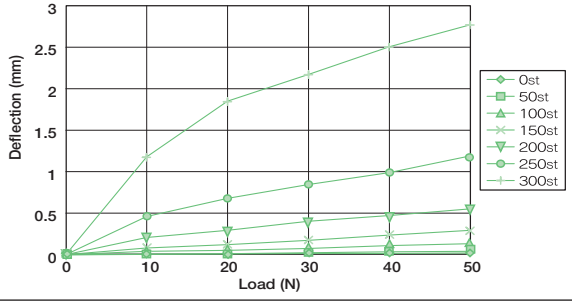
RCS2-RGS5C Type



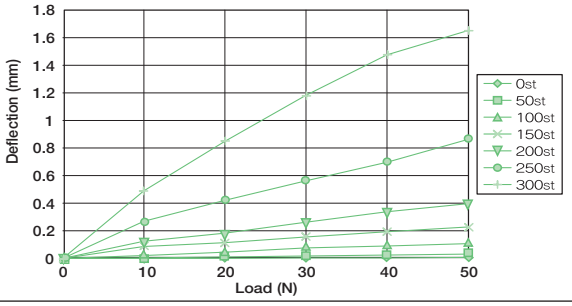
RCS2-SRGS7BD Type



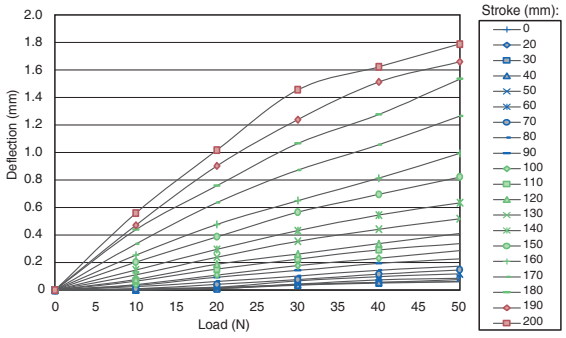
RCP2-RGS4C Type



RCP2-RGS6C Type



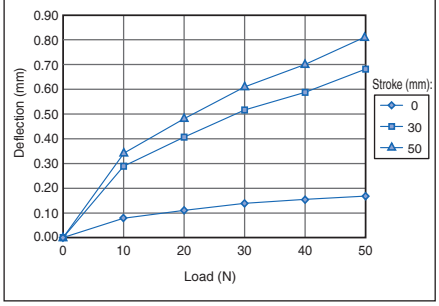
RCP2-SRGS4R Type



Double-Guide

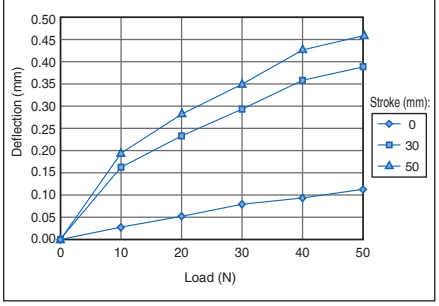
RCA2-GD3NA Type

■ Double-Guide <Vertical> Specification



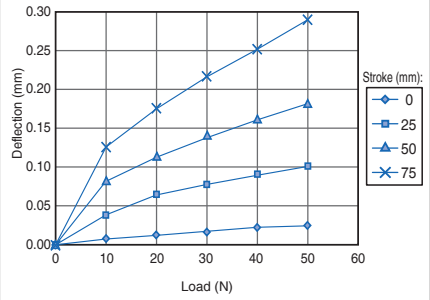
RCA2-GD4NA Type

■ Double-Guide <Vertical> Specification



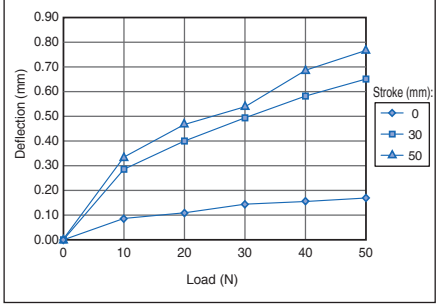
RCS2-GD5N Type

■ Double-Guide <Vertical> Specification



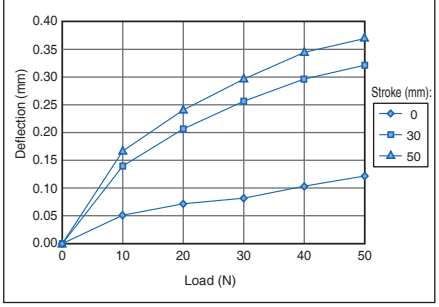
RCA2-GD3NA Type

■ Double-Guide <Horizontal> Specification



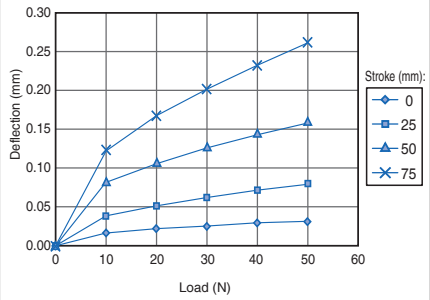
RCA2-GD4NA Type

■ Double-Guide <Horizontal> Specification



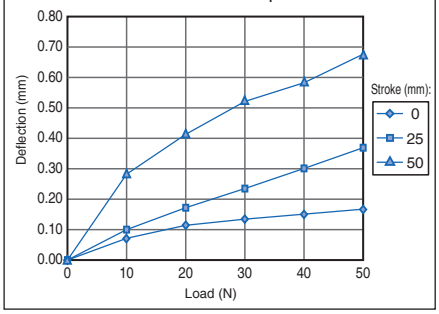
RCS2-GD5N Type

■ Double-Guide <Horizontal> Specification



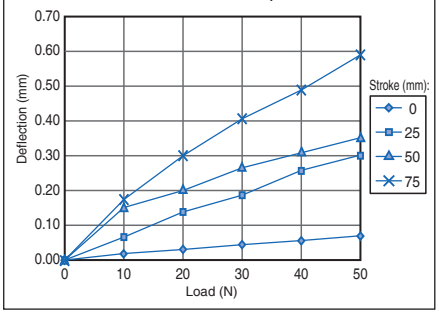
RCA2-SD3NA Type

■ Double-Guide <Vertical> Specification



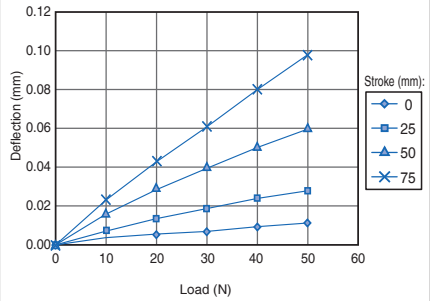
RCA2-SD4NA Type

■ Double-Guide <Vertical> Specification



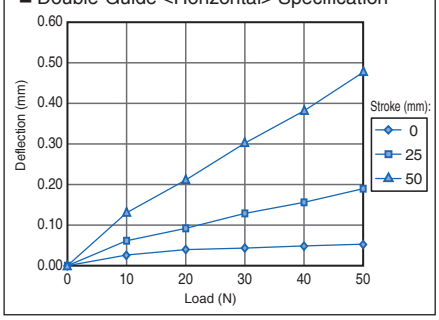
RCS2-SD5N Type

■ Double-Guide <Vertical> Specification



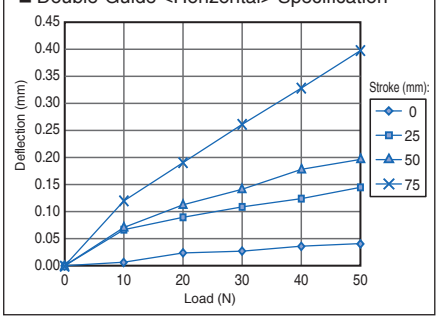
RCA2-SD3NA Type

■ Double-Guide <Horizontal> Specification



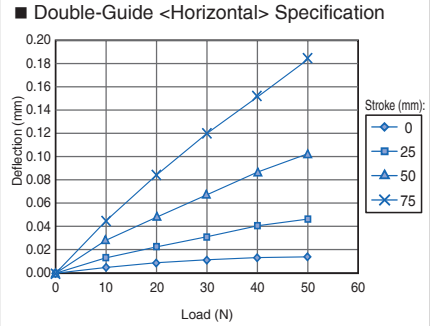
RCA2-SD4NA Type

■ Double-Guide <Horizontal> Specification



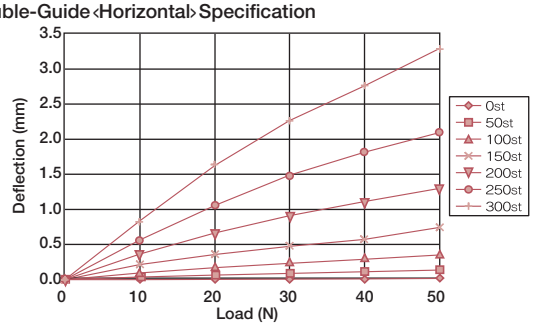
RCS2-SD5N Type

■ Double-Guide <Horizontal> Specification



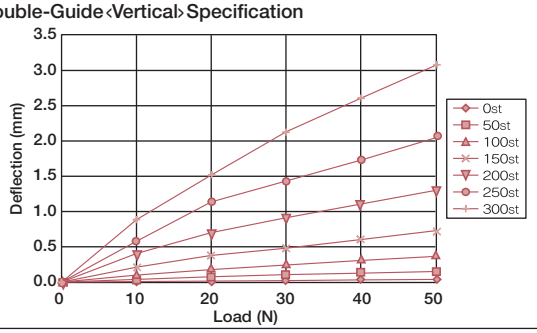
ERC2-RGD6C Type

■Double-Guide〈Horizontal〉Specification



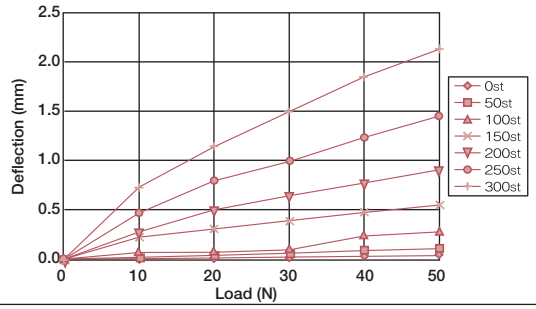
ERC2-RGD6C Type

■Double-Guide〈Vertical〉Specification



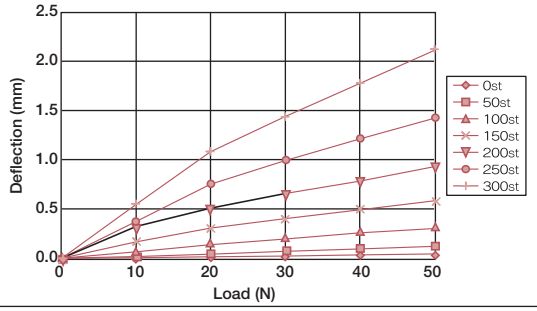
ERC2-RGD7C Type

■Double-Guide〈Horizontal〉Specification



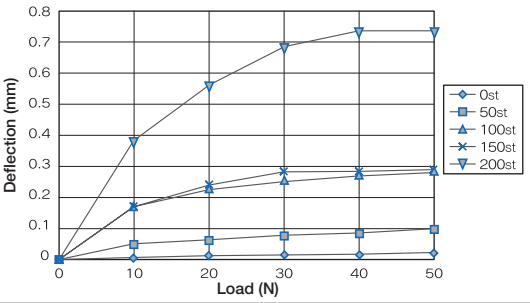
ERC2-RGD7C Type

■Double-Guide〈Vertical〉Specification



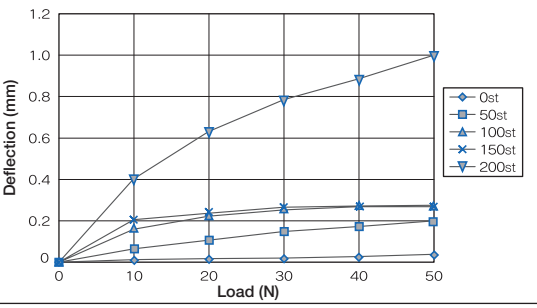
RCA / RCS-RGD3□ Type

■Double-Guide〈Horizontal〉Specification



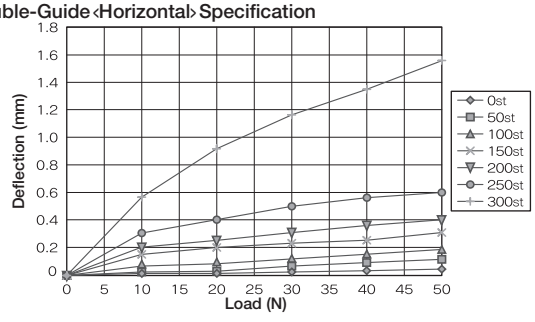
RCA / RCS-RGD3□ Type

■Double-Guide〈Vertical〉Specification



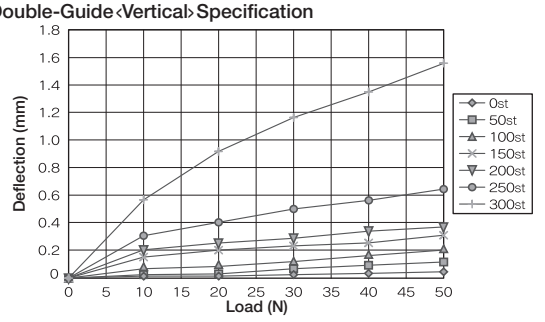
RCS2-RGD4□ Type

■Double-Guide〈Horizontal〉Specification



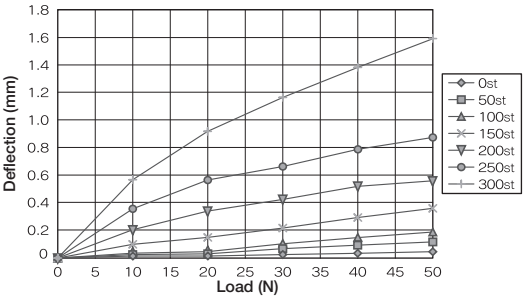
RCS2-RGD4□ Type

■Double-Guide〈Vertical〉Specification



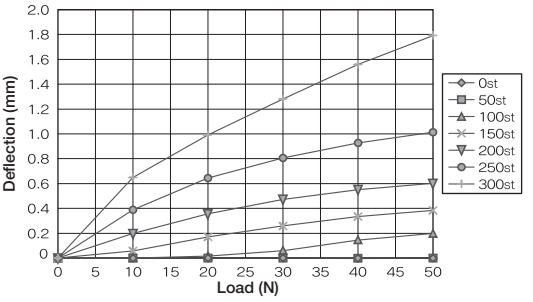
RCS2-RGD5C Type

■Double-Guide〈Horizontal〉Specification



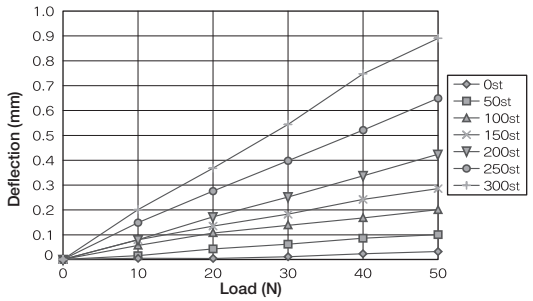
RCS2-RGD5C Type

■Double-Guide〈Vertical〉Specification



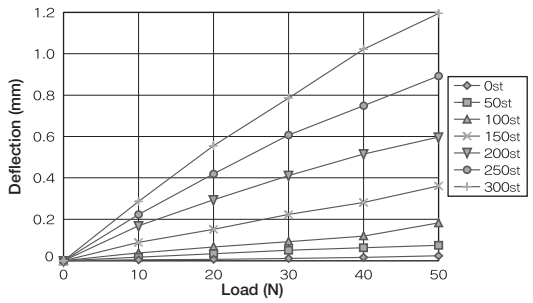
RCS2-SRGD7BD Type

■Double-Guide〈Horizontal〉Specification



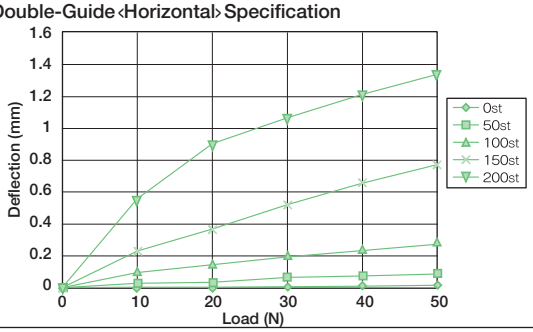
RCS2-SRGD7BD Type

■Double-Guide〈Vertical〉Specification



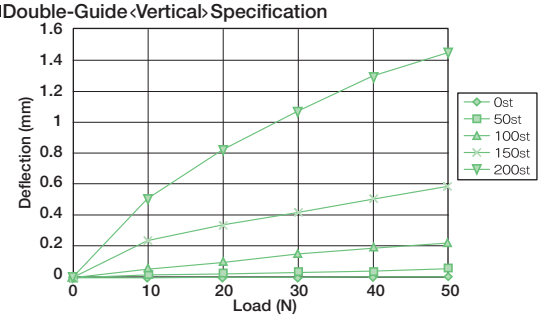
RCP2-RGD3C Type

■Double-Guide〈Horizontal〉Specification



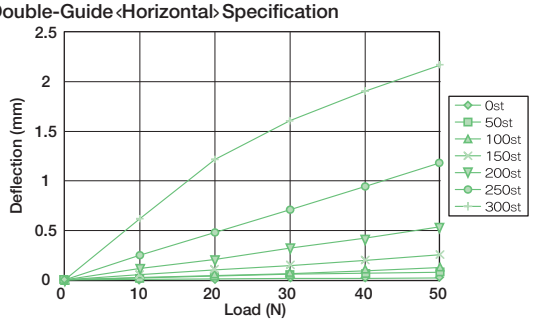
RCP2-RGD3C Type

■Double-Guide〈Vertical〉Specification



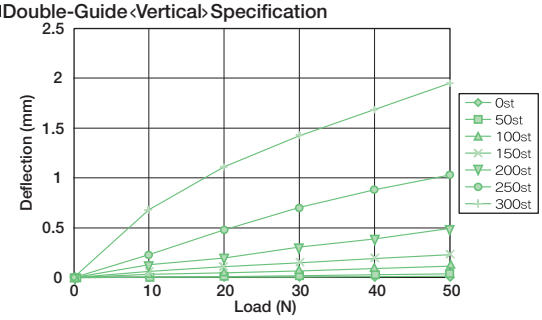
RCP2-RGD4C Type

■Double-Guide〈Horizontal〉Specification



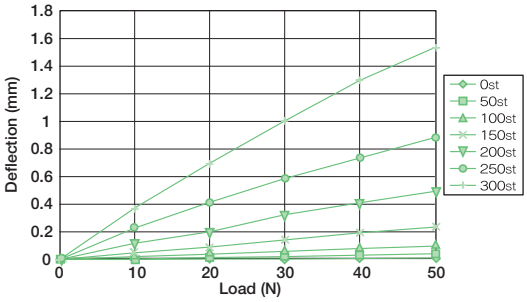
RCP2-RGD4C Type

■Double-Guide〈Vertical〉Specification



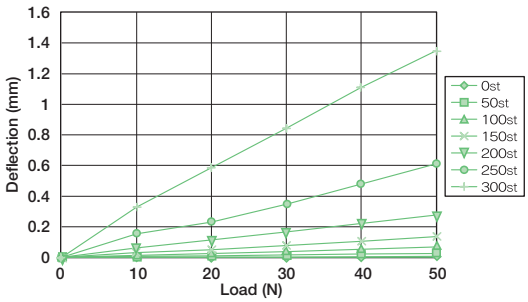
RCP2-RGD6C Type

■Double-Guide〈Horizontal〉Specification



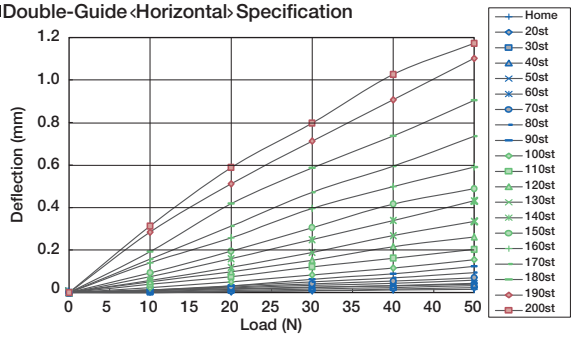
RCP2-RGD6C Type

■Double-Guide〈Vertical〉Specification



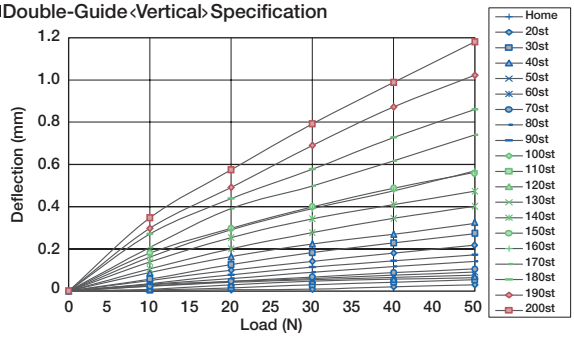
RCP2-SRGD4R Type

■Double-Guide〈Horizontal〉Specification



RCP2-SRGD4R Type

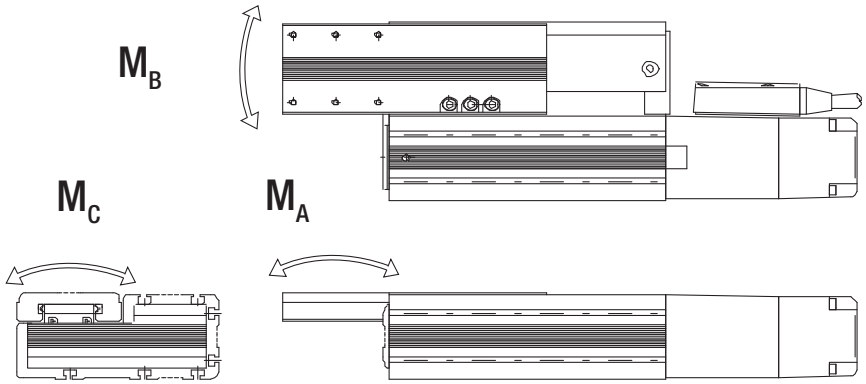
■Double-Guide〈Vertical〉Specification



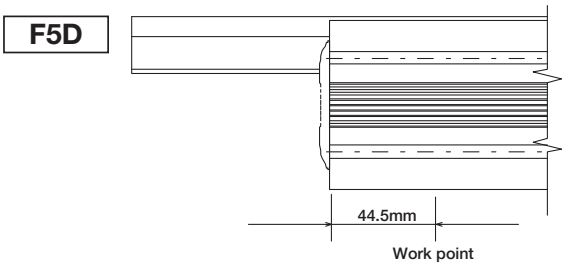
Flat Type F5D Technical Materials

Flat Type (F5D) Moment, load capacity

The direction of the moment in the flat type is as shown in the figure below.



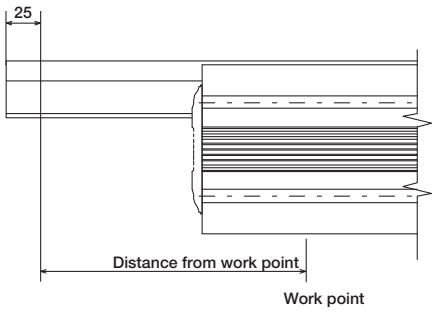
The points of moment application in the Ma and Mb directions are as shown below.



Be careful that the load exerted on the plate tip does not exceed the Ma moment when using a flat type horizontally.

Refer to the table below for the allowable tip loads calculated from the Ma moment for each stroke.

Stroke		50	100	150	200	250	300
F5D Type	Distance from point of action (m)	0.07	0.12	0.17	0.22	0.27	0.32
	Allowable tip load (N)	64.3	37.5	26.5	20.5	16.7	14.1
	Allowable weigth-force (kgf)	6.56	3.83	2.70	2.09	1.70	1.43



Previous Model Conversion Table [ERC, RCP2, RCP2CR, RCP2W]

Previous Product Model				New Product Model	Note
Series	Model	Model		Model	
ERC	RA54	ERC-RA54-I-PM-③-④-⑤	→	ERC2-RA6C-I-PM-③-④-NP-⑤	
	RA54GD	ERC-RA54GD-I-PM-③-④-⑤	→	ERC2-RGD6C-I-PM-③-④-NP-⑤	
	RA54GS	ERC-RA54GS-I-PM-③-④-⑤	→	ERC2-RGS6C-I-PM-③-④-NP-⑤	
	RA64	ERC-RA64-I-PM-③-④-⑤	→	ERC2-RA7C-I-PM-③-④-NP-⑤	
	RA64GD	ERC-RA64GD-I-PM-③-④-⑤	→	ERC2-RGD7C-I-PM-③-④-NP-⑤	
	RA64GS	ERC-RA64GS-I-PM-③-④-⑤	→	ERC2-RGS7C-I-PM-③-④-NP-⑤	
	SA6	ERC-SA6-I-PM-③-④-⑤	→	ERC2-SA6C-I-PM-③-④-NP-⑤	
	SA7	ERC-SA7-I-PM-③-④-⑤	→	ERC2-SA7C-I-PM-③-④-NP-⑤	
RCP2	BA6	RCP2-BA6-I-PM-54-④-P1-⑤	→	RCP2-BA6-I-42P-54-④-P1-⑤	
		RCP2-BA6-A-PM-54-④-P1-⑤	→	RCP2-BA6-I-42P-54-④-P1-⑤	For use with Simple Absolute unit
	BA6U	RCP2-BA6U-I-PM-54-④-P1-⑤	→	RCP2-BA6U-I-42P-54-④-P1-⑤	
		RCP2-BA6U-A-PM-54-④-P1-⑤	→	RCP2-BA6U-I-42P-54-④-P1-⑤	For use with Simple Absolute unit
	BA7	RCP2-BA7-I-PM-54-④-P1-⑤	→	RCP2-BA7-I-42P-54-④-P1-⑤	
		RCP2-BA7-A-PM-54-④-P1-⑤	→	RCP2-BA7-I-42P-54-④-P1-⑤	For use with Simple Absolute unit
	BA7U	RCP2-BA7U-I-PM-54-④-P1-⑤	→	RCP2-BA7U-I-42P-54-④-P1-⑤	
		RCP2-BA7U-A-PM-54-④-P1-⑤	→	RCP2-BA7U-I-42P-54-④-P1-⑤	For use with Simple Absolute unit
	GRS	RCP2-GRS-I-PM-1-10-P1-⑤	→	RCP2-GRS-I-20P-1-10-P1-⑤	
	GRM	RCP2-GRM-I-PM-1-14-P1-⑤	→	RCP2-GRM-I-28P-1-14-P1-⑤	
	GR3LS	RCP2-GR3LS-I-PM-30-1X-P1-⑤	→	RCP2-GR3LS-I-28P-30-19-P1-⑤	
	GR3LM	RCP2-GR3LM-I-PM-30-1X-P1-⑤	→	RCP2-GR3LM-I-42P-30-19-P1-⑤	
	GR3SS	RCP2-GR3SS-I-PM-30-10-P1-⑤	→	RCP2-GR3SS-I-28P-30-10-P1-⑤	
	GR3SM	RCP2-GR3SM-I-PM-30-14-P1-⑤	→	RCP2-GR3SM-I-42P-30-14-P1-⑤	
	HSM	RCP2-HSM-I-PM-30-④-P1-⑤	→	RCP2-HS8C-I-86P-③-④-P2-⑤	
	HSMR	RCP2-HSMR-I-PM-30-④-P1-⑤	→	RCP2-HS8R-I-86P-③-④-P2-⑤	
	RFA	RCP2-RFA-I-PM-③-④-P1-⑤	→	RCP2-RA10C-I-86P-③-④-P2-⑤	
	RFW	RCP2-RFW-I-PM-③-④-P1-⑤	→	RCP2W-RA10C-I-86P-③-④-P2-⑤	
	RMA	RCP2-RMA-I-PM-③-④-P1-⑤	→	RCP2-RA6C-I-56P-③-④-P1-⑤	
		RCP2-RMA-A-PM-③-④-P1-⑤	→	RCP2-RA6C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	RMGD	RCP2-RMGD-I-PM-③-④-P1-⑤	→	RCP2-RGD6C-I-56P-③-④-P1-⑤	
		RCP2-RMGD-A-PM-③-④-P1-⑤	→	RCP2-RGD6C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	RMGS	RCP2-RMGS-I-PM-③-④-P1-⑤	→	RCP2-RGS6C-I-56P-③-④-P1-⑤	
		RCP2-RMGS-A-PM-③-④-P1-⑤	→	RCP2-RGS6C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	RMW	RCP2-RMW-I-PM-③-④-P1-⑤	→	RCP2W-RA6C-I-56P-③-④-P1-⑤	
		RCP2-RMW-A-PM-③-④-P1-⑤	→	RCP2W-RA6C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	RPA	RCP2-RPA-I-PM-1-④-P1-⑤	→	RCP2-RA2C-I-20P-1-④-P1-⑤	
	RSA	RCP2-RSA-I-PM-③-④-P1-⑤	→	RCP2-RA4C-I-42P-③-④-P1-⑤	
		RCP2-RSA-A-PM-③-④-P1-⑤	→	RCP2-RA4C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	RSGD	RCP2-RSGD-I-PM-③-④-P1-⑤	→	RCP2-RGD4C-I-42P-③-④-P1-⑤	
		RCP2-RSGD-A-PM-③-④-P1-⑤	→	RCP2-RGD4C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	RSGS	RCP2-RSGS-I-PM-③-④-P1-⑤	→	RCP2-RGS4C-I-42P-③-④-P1-⑤	
		RCP2-RSGS-A-PM-③-④-P1-⑤	→	RCP2-RGS4C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit

* ③ is the lead, ④ is the stroke, and ⑤ is the cable length.

Previous Product Model				New Product Model	Note
Series	Model	Model		Model	
RCP2	RSW	RCP2-RSW-I-PM-③-④-P1-⑤	→	RCP2W-RA4C-I-42P-③-④-P1-⑤	
		RCP2-RSW-A-PM-③-④-P1-⑤	→	RCP2W-RA4C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	RTB	RCP2-RTB-I-PM-③-330-P1-⑤	→	RCP2-RTB-I-28P-③-330-P1-⑤	
	RTC	RCP2-RTC-I-PM-③-330-P1-⑤	→	RCP2-RTC-I-28P-③-330-P1-⑤	
	RXA	RCP2-RXA-I-PM-③-④-P1-⑤	→	RCP2-RA3C-I-28P-③-④-P1-⑤	
		RCP2-RXA-A-PM-③-④-P1-⑤	→	RCP2-RA3C-I-28P-③-④-P1-⑤	For use with Simple Absolute unit
	RXGD	RCP2-RXGD-I-PM-③-④-P1-⑤	→	RCP2-RGD3C-I-28P-③-④-P1-⑤	
		RCP2-RXGD-A-PM-③-④-P1-⑤	→	RCP2-RGD3C-I-28P-③-④-P1-⑤	For use with Simple Absolute unit
	SA5	RCP2-SA5-I-PM-③-④-P1-⑤	→	RCP2-SA5C-I-42P-③-④-P1-⑤	
		RCP2-SA5-A-PM-③-④-P1-⑤	→	RCP2-SA5C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SA5R	RCP2-SA5R-I-PM-③-④-P1-⑤	→	RCP2-SA5R-I-42P-③-④-P1-⑤	
		RCP2-SA5R-A-PM-③-④-P1-⑤	→	RCP2-SA5R-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SA6	RCP2-SA6-I-PM-③-④-P1-⑤	→	RCP2-SA6C-I-42P-③-④-P1-⑤	
		RCP2-SA6-A-PM-③-④-P1-⑤	→	RCP2-SA6C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SA6R	RCP2-SA6R-I-PM-③-④-P1-⑤	→	RCP2-SA6R-I-42P-③-④-P1-⑤	
		RCP2-SA6R-A-PM-③-④-P1-⑤	→	RCP2-SA6R-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SA7	RCP2-SA7-I-PM-③-④-P1-⑤	→	RCP2-SA7C-I-56P-③-④-P1-⑤	
		RCP2-SA7-A-PM-③-④-P1-⑤	→	RCP2-SA7C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	SA7R	RCP2-SA7R-I-PM-③-④-P1-⑤	→	RCP2-SA7R-I-56P-③-④-P1-⑤	
		RCP2-SA7R-A-PM-③-④-P1-⑤	→	RCP2-SA7R-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	SS	RCP2-SS-I-PM-③-④-P1-⑤	→	RCP2-SS7C-I-42P-③-④-P1-⑤	
		RCP2-SS-A-PM-③-④-P1-⑤	→	RCP2-SS7C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SSR	RCP2-SSR-I-PM-③-④-P1-⑤	→	RCP2-SS7R-I-42P-③-④-P1-⑤	
		RCP2-SSR-A-PM-③-④-P1-⑤	→	RCP2-SS7R-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SM	RCP2-SM-I-PM-③-④-P1-⑤	→	RCP2-SS8C-I-56P-③-④-P1-⑤	
		RCP2-SM-A-PM-③-④-P1-⑤	→	RCP2-SS8C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	SMR	RCP2-SMR-I-PM-③-④-P1-⑤	→	RCP2-SS8R-I-56P-③-④-P1-⑤	
		RCP2-SMR-A-PM-③-④-P1-⑤	→	RCP2-SS8R-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
RCP2 CR	HSM	RCP2CR-HSM-I-PM-30-④-P1-⑤	→	RCP2CR-HS8C-I-86P-30-④-P2-⑤	
	SA5	RCP2CR-SA5-I-PM-③-④-P1-⑤	→	RCP2CR-SA5C-I-42P-③-④-P1-⑤	
		RCP2CR-SA5-A-PM-③-④-P1-⑤	→	RCP2CR-SA5C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SA6	RCP2CR-SA6-I-PM-③-④-P1-⑤	→	RCP2CR-SA6C-I-42P-③-④-P1-⑤	
		RCP2CR-SA6-A-PM-③-④-P1-⑤	→	RCP2CR-SA6C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SA7	RCP2CR-SA7-I-PM-③-④-P1-⑤	→	RCP2CR-SA7C-I-56P-③-④-P1-⑤	
		RCP2CR-SA7-A-PM-③-④-P1-⑤	→	RCP2CR-SA7C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
	SS	RCP2CR-SS-I-PM-③-④-P1-⑤	→	RCP2CR-SS7C-I-42P-③-④-P1-⑤	
		RCP2CR-SS-A-PM-③-④-P1-⑤	→	RCP2CR-SS7C-I-42P-③-④-P1-⑤	For use with Simple Absolute unit
	SM	RCP2CR-SM-I-PM-③-④-P1-⑤	→	RCP2CR-SS8C-I-56P-③-④-P1-⑤	
		RCP2CR-SM-A-PM-③-④-P1-⑤	→	RCP2CR-SS8C-I-56P-③-④-P1-⑤	For use with Simple Absolute unit
RCP2W	SA16	RCP2W-SA16-I-PM-③-④-P1-⑤	→	RCP2W-SA16C-I-86P-③-④-P1-⑤	

* ③ is the lead, ④ is the stroke, and ⑤ is the cable length.

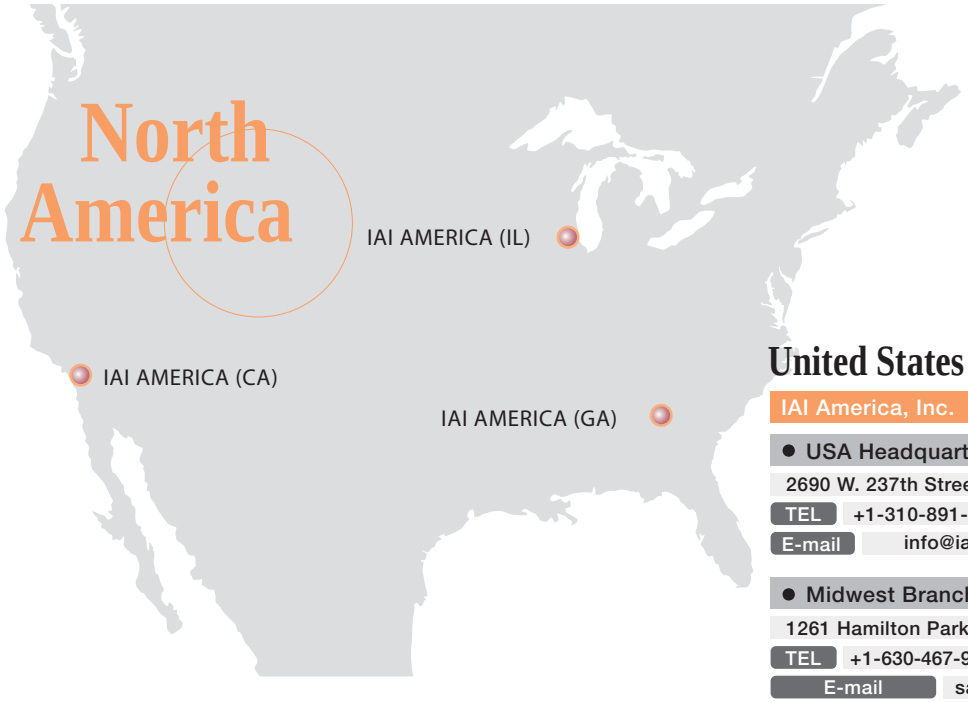
Previous Model Conversion Table [RCS]

Previous Product Model				New Product Model	Note
Series	Model	Model		Model	
RCS	F45	RCS-F45-①-30-H-④-⑤	→	N/A	
		RCS-F45-①-30-M-④-⑤	→	N/A	
		RCS-F45-①-30-L-④-⑤	→	N/A	
	F55	RCS-F55-①-②-H-④-⑤	→	RCS2-F5D-①-②-16-④-T2 (T1)-⑤	
		RCS-F55-①-②-M-④-⑤	→	RCS2-F5D-①-②-8-④-T2 (T1)-⑤	
		RCS-F55-①-②-L-④-⑤	→	RCS2-F5D-①-②-4-④-T2 (T1)-⑤	
	G20	RCS-G20-I-60-5-④-⑤	→	RCS2-GR8-I-60-5-④-T2 (T1)-⑤	
	RA35	RCS-RA35-I-20-GN-H-④-⑤	→	(RCA-RA3C-I-20-10-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GN-M-④-⑤	→	(RCA-RA3C-I-20-5-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GN-L-④-⑤	→	(RCA-RA3C-I-20-2.5-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GS-H-④-⑤	→	(RCA-RGS3C-I-20-10-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GS-M-④-⑤	→	(RCA-RGS3C-I-20-5-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GS-L-④-⑤	→	(RCA-RGS3C-I-20-2.5-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GD-H-④-⑤	→	(RCA-RGD3C-I-20-10-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GD-M-④-⑤	→	(RCA-RGD3C-I-20-5-④-A1-⑤)	Not compatible
		RCS-RA35-I-20-GD-L-④-⑤	→	(RCA-RGD3C-I-20-2.5-④-A1-⑤)	Not compatible
	RA35R	RCS-RA35R-I-20-GN-H-④-⑤	→	(RCA-RA3R-I-20-10-④-A1-⑤)	Not compatible
		RCS-RA35R-I-20-GN-M-④-⑤	→	(RCA-RA3R-I-20-5-④-A1-⑤)	Not compatible
		RCS-RA35R-I-20-GN-L-④-⑤	→	(RCA-RA3R-I-20-2.5-④-A1-⑤)	Not compatible
	RA45	RCS-RA45-①-30-GN-H-④-⑤	→	(RCA-RA4C-①-30-12-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GN-M-④-⑤	→	(RCA-RA4C-①-30-6-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GN-L-④-⑤	→	(RCA-RA4C-①-30-3-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GS-H-④-⑤	→	(RCA-RGS3C-①-30-12-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GS-M-④-⑤	→	(RCA-RGS3C-①-30-6-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GS-L-④-⑤	→	(RCA-RGS3C-①-30-3-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GD-H-④-⑤	→	(RCA-RGD4C-①-30-12-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GD-M-④-⑤	→	(RCA-RGD4C-①-30-6-④-A1-⑤)	Not compatible
		RCS-RA45-①-30-GD-L-④-⑤	→	(RCA-RGD4C-①-30-3-④-A1-⑤)	Not compatible
	RA45R	RCS-RA45R-①-30-GN-H-④-⑤	→	(RCA-RA4R-①-30-12-④-A1-⑤)	Not compatible
		RCS-RA45R-①-30-GN-M-④-⑤	→	(RCA-RA4R-①-30-6-④-A1-⑤)	Not compatible
		RCS-RA45R-①-30-GN-L-④-⑤	→	(RCA-RA4R-①-30-3-④-A1-⑤)	Not compatible
	RA55	RCS-RA55-①-②-GN-H-④-⑤	→	(RCS2-RA5C-①-②-16-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GN-M-④-⑤	→	(RCS2-RA5C-①-②-8-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GN-L-④-⑤	→	(RCS2-RA5C-①-②-4-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GS-H-④-⑤	→	(RCS2-RGS5C-①-②-16-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GS-M-④-⑤	→	(RCS2-RGS5C-①-②-8-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GS-L-④-⑤	→	(RCS2-RGS5C-①-②-4-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GD-H-④-⑤	→	(RCS2-RGD5C-①-②-16-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GD-M-④-⑤	→	(RCS2-RGD5C-①-②-8-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55-①-②-GD-L-④-⑤	→	(RCS2-RGD5C-①-②-4-④-T2 (T1)-⑤)	Not compatible
	RA55R	RCS-RA55R-①-60-GN-H-④-⑤	→	(RCS2-RA5R-①-60-16-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55R-①-60-GN-M-④-⑤	→	(RCS2-RA5R-①-60-8-④-T2 (T1)-⑤)	Not compatible
		RCS-RA55R-①-60-GN-L-④-⑤	→	(RCS2-RA5R-①-60-4-④-T2 (T1)-⑤)	Not compatible

* ① is the encoder type, ② is the motor type, ④ is the motor type, and ⑤ is the cable length.

Previous Product Model				New Product Model	Note
Series	Model	Model		Model	
RCS	RB7525	RCS-RB7525-I-60-□-H-④-⑤	→	N/A	
		RCS-RB7525-I-60-□-M-④-⑤	→	N/A	
	RB7530	RCS-RB7530-I-②-GN-H-④-⑤	→	RCS2-SRA7BD-I-②-12-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GN-M-④-⑤	→	RCS2-SRA7BD-I-②-6-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GN-L-④-⑤	→	RCS2-SRA7BD-I-②-3-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GS-H-④-⑤	→	RCS2-SRGS7BD-I-②-12-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GS-M-④-⑤	→	RCS2-SRGS7BD-I-②-6-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GS-L-④-⑤	→	RCS2-SRGS7BD-I-②-3-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GD-H-④-⑤	→	RCS2-SRGD7BD-I-②-12-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GD-M-④-⑤	→	RCS2-SRGD7BD-I-②-6-④-T2 (T1)-⑤	
		RCS-RB7530-I-②-GD-L-④-⑤	→	RCS2-SRGD7BD-I-②-3-④-T2 (T1)-⑤	
	RB7535	RCS-RB7535-I-②-GN-H-④-⑤	→	RCS2-SRA7BD-I-②-16-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GN-M-④-⑤	→	RCS2-SRA7BD-I-②-8-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GN-L-④-⑤	→	RCS2-SRA7BD-I-②-4-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GS-H-④-⑤	→	RCS2-SRGS7BD-I-②-16-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GS-M-④-⑤	→	RCS2-SRGS7BD-I-②-8-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GS-L-④-⑤	→	RCS2-SRGS7BD-I-②-4-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GD-H-④-⑤	→	RCS2-SRGD7BD-I-②-16-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GD-M-④-⑤	→	RCS2-SRGD7BD-I-②-8-④-T2 (T1)-⑤	
		RCS-RB7535-I-②-GD-L-④-⑤	→	RCS2-SRGD7BD-I-②-4-④-T2 (T1)-⑤	
	R10	RCS-R10-I-60-18-300-⑤	→	RCS2-RT6-I-60-18-300-T2 (T1)-⑤-L	
	R20	RCS-R20-I-60-18-300-⑤	→	RCS2-RT6R-I-60-18-300-T2 (T1)-⑤-L	
	R30	RCS-R30-I-60-4-300-⑤	→	RCS2-RT7R-I-60-4-300-T2 (T1)-⑤-L	
	SA4	RCS-SA4-①-20-H-④-⑤	→	RCA-SA4D-①-20-10-④-A1-⑤	
		RCS-SA4-①-20-M-④-⑤	→	RCA-SA4D-①-20-5-④-A1-⑤	
		RCS-SA4-①-20-L-④-⑤	→	RCA-SA4D-①-20-2.5-④-A1-⑤	
	SA5	RCS-SA5-①-20-H-④-⑤	→	RCA-SA5D-①-20-12-④-A1-⑤	
		RCS-SA5-①-20-M-④-⑤	→	RCA-SA5D-①-20-6-④-A1-⑤	
		RCS-SA5-①-20-L-④-⑤	→	RCA-SA5D-①-20-3-④-A1-⑤	
	SA6	RCS-SA6-①-20-H-④-⑤	→	RCA-SA6D-①-20-12-④-A1-⑤	
		RCS-SA6-①-20-M-④-⑤	→	RCA-SA6D-①-20-6-④-A1-⑤	
		RCS-SA6-①-20-L-④-⑤	→	RCA-SA6D-①-20-3-④-A1-⑤	
	SS	RCS-SS-①-60-H-④-⑤	→	RCS2-SS7C-①-60-12-④-T2 (T1)-⑤	
		RCS-SS-①-60-M-④-⑤	→	RCS2-SS7C-①-60-6-④-T2 (T1)-⑤	
	SSR	RCS-SSR-①-60-H-④-⑤	→	RCS2-SS7R-①-60-12-④-T2 (T1)-⑤	
		RCS-SSR-①-60-M-④-⑤	→	RCS2-SS7R-①-60-6-④-T2 (T1)-⑤	
	SM	RCS-SM-①-②-H-④-⑤	→	RCS2-SS8C-①-②-20-④-T2 (T1)-⑤	
		RCS-SM-①-②-M-④-⑤	→	RCS2-SS8C-①-②-10-④-T2 (T1)-⑤	
	SMR	RCS-SMR-①-②-H-④-⑤	→	RCS2-SS8R-①-②-20-④-T2 (T1)-⑤	
		RCS-SMR-①-②-M-④-⑤	→	RCS2-SS8R-①-②-10-④-T2 (T1)-⑤	

* ① is the encoder type, ② is the motor type, ④ is the motor type, and ⑤ is the cable length.



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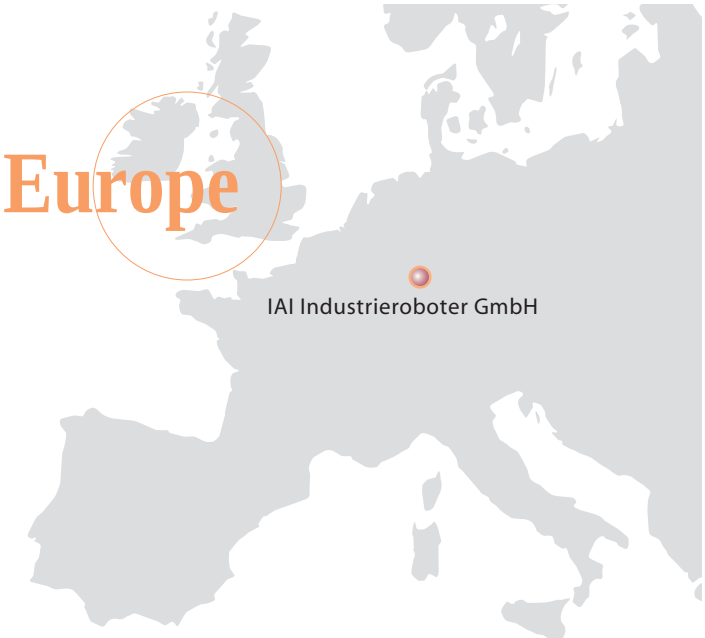

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