IAI
Quality and Innovation

Water-proof Radial Cylinder

ROBO CYLINDER® RCP4W-RA series

RCP4W-RA

www.intelligentactuator.com

ROBO CYLINDER

Introducing the IP67 Water-proof Radial Cylinder–

the Newest Addition to the Dust-proof/ Splash-proof ROBO Cylinder RCP4W Series

Features

1 Dust-proof/Splash-proof Performance of IP67

The RCP4W rod type adopts a splash-proof structure to shut out water even when the cylinder is submerged in water, for use in food preparation machines, washing machines and other systems exposed to water splashes and jets.

IP Marking

IP □ □

First digit
Protection against the human body and solid objects

Second digit
Protection against the intrusion of water

In-house Test Methods Conforming to JIS C0920

In-house Test Methods against Solid Objects
Operate the product for 12 hours in floating talc powder (grain size: 25 μm)
Results Powder did not enter the product.

In-house Test Method against Water
Submerge the product in water and kept it 1m below the water surface for 30 minutes.
Results Water did not enter the product.

NOTE: The splash-proof performance has been measured only with regard to water. Protection against coolant, cleaning solution, etc., is not guaranteed. If you wish to use your product in an environment where it may come in contact with coolant, consult IAI beforehand.

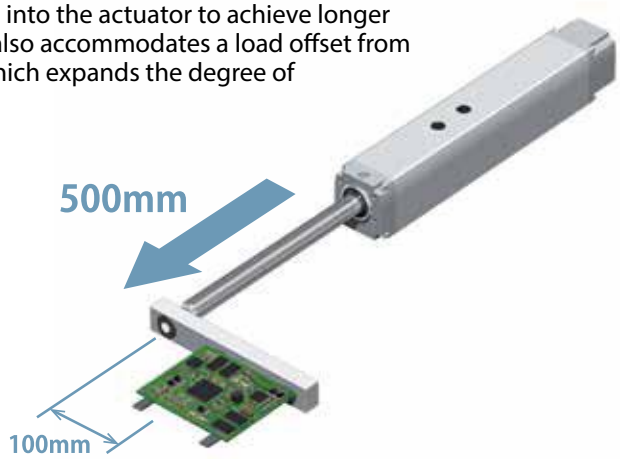
IP Classes

Environmental Resistance: High → Low

IP class		Description	Applicable IAI products
IP67	Solid objects	Fully protected against the entry of powder dust into the equipment.	 Rod type **RCP4W**  Slider type **RCP2W-SA16C**
	Water	Even when the equipment is submerged in water, water does not enter the equipment.	
IP65	Solid objects	Fully protected against the entry of powder dust into the equipment.	 Slider type **RCP4W**  Slider type **ISWA/ISPWA**
	Water	The equipment receives no harmful effect even when directly hit by water jets from any direction.	 Pulse motor rod type **RCP2W-RA4C/RA6C**  SCARA robot **IX-NNW**
IP54	Solid objects	Dust that would affect the operation of the equipment does not enter the equipment.	 High-thrust rod type **RCP2W-RA10C**  24-V servo motor rod type **RCAW-RA3/RA4** 200-V servo motor rod type **RCS2W-RA4**
	Water	The equipment receives no harmful effect even when contacted by water splashes from any direction.	
IP50	Solid objects	Dust that would affect the operation of the equipment does not enter the equipment.	 Small gripper (dust-proof type) **RCP2W-GR**
	Water	The equipment is not protected against water.	

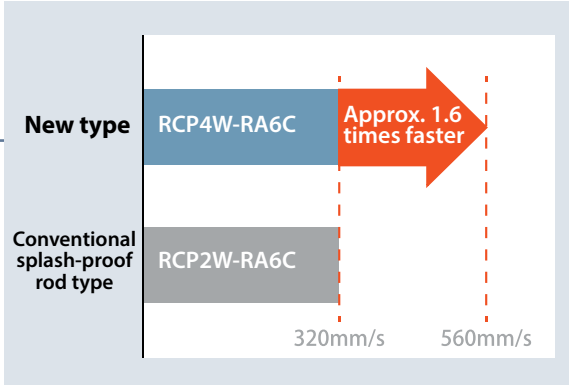
2 Built-in Guide to Achieve Longer Strokes While Accommodating a Radial Load on the Rod

A ball-circulating linear guide is built into the actuator to achieve longer strokes of up to 500 mm. The guide also accommodates a load offset from the rod center (by up to 100 mm), which expands the degree of freedom in transfer applications.



3 High Speed and High Acceleration/Deceleration

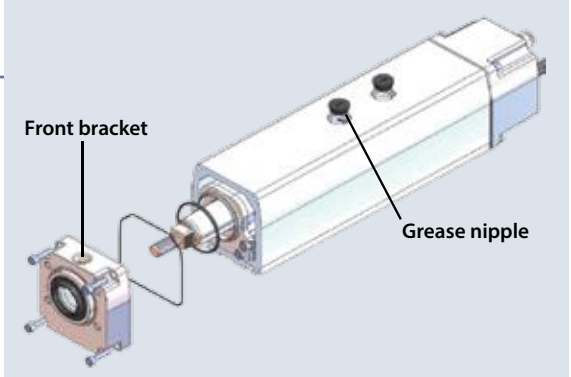
The RCP4W boasts the maximum acceleration/deceleration of 1 G and maximum speed of 560 mm/s, which are approx. 1.6 times the maximum acceleration/deceleration and maximum speed of any conventional splash-proof rod type, enabling a shorter cycle time for your system.



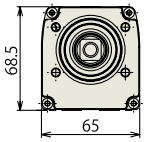
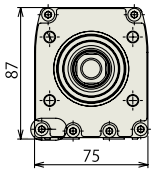
4 Improved Maintainability

The ball screw and guide can be lubricated at the same time by adding grease from the grease nipples provided on the top face of the nut holder. Another grease nipple is provided on the top face of the front bracket to grease the sliding part of the rod.

Replacing the seals at the sliding part of the rod is very easy, because all you need is to change the front bracket.



Specification Table

Type	External view	Actuator size (mm)	Stroke (mm)	Ball screw lead (mm)	Maximum speed (mm/s) (*1)	Payload (kg)		Maximum Push Force (N)	Reference page
						Horizontal	Vertical		
RA6C			50~400 (Every 50)	12	560 <500>	20	3	93	P5
				6	360	40	8	185	
				3	180	50	16	370	
					70	-	30	590	
RA7C			50~500 (Every 50)	16	560 <400>	40	7	219	P7
				8	340 <280>	50	15	437	
				4	170 <140>	70	25	875	
					80	-	45	1030	

(*1) The values in < > apply when the actuator is used vertically.

Model Number

Actuator

RCP4W – [Type code] – I – [Motor type] – [Ball screw lead] – [Stroke (mm)] – [Applicable controller] – [Cable length] – [Options]

Series | Type code | Encoder type | Motor type | Ball screw lead | Stroke (mm) | Applicable controller | Cable length | Options

Type code

RA6C	Actuator width 65mm
RA7C	Actuator width 75mm

Encoder type

I	Incremental

Motor type

42P	42□ motor
42SP	42□ high-thrust motor
56P	56□ motor
56SP	56□ high-thrust motor

Ball screw lead

3	Lead 3
4	Lead 4
6	Lead 6
8	Lead 8
12	Lead 12
16	Lead 16

Stroke (mm)

50	50mm
≀	≀
500	500mm

(Can be set in 50-mm increments.)

Applicable controller

P3	PCON-CA
P4	PCON-CFA

Cable length

N	No cable
P	1 m
S	3 m
M	5 m
X□□	Specified length
R□□	Robot cable

Options

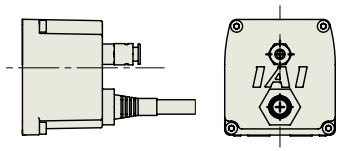
A1	Cable exit from the left
A3	Cable exit from the right
AT	Cable exit from the top
B	Brake
FL	With flange
FT	With foot bracket
NM	Non-motor side specification

NOTE: The settings for motor type, ball screw lead, stroke and options vary from one model to another. For details, check the specifications for each model.

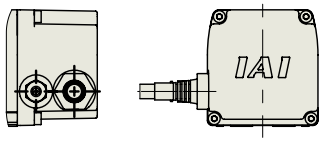
Options

■ Optional Cable Exit Direction Code: A1, A3, AT

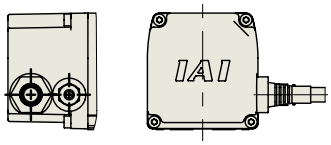
You can select one of the following three cable exit directions.
If no direction is specified, the cable exits from the rear.
*In the following figures, ( ) and < > refer to RA6 and RA7, respectively. Other than that, it refers to a common dimension.



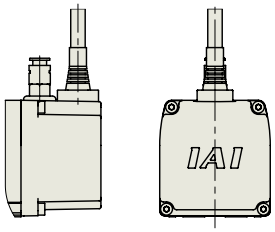
Exit from the rear (standard)
Option code: (Blank)



Exit from the left side face
Option code: A1



Exit from the right side face
Option code: A3



Exit from the top side face
Option code: AT

■ Brake Option code: B

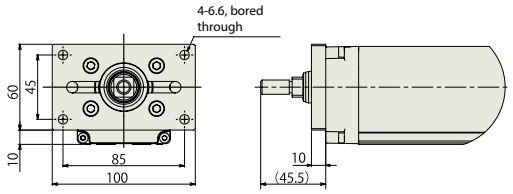
This option is provided to prevent the rod from dropping upon cutoff of power when the actuator is used vertically.

■ Non-motor side Specification Option code: NM

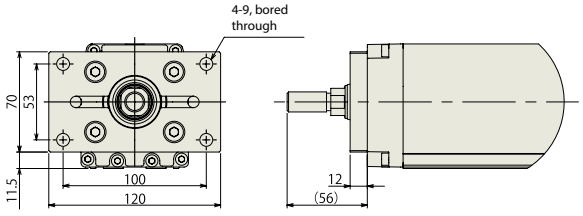
Normally the home position is where the rod is retracted. This option is provided to define the condition where the rod has extended as home.

■ With Flange Option code: FL

This flange is used to secure the actuator with bolts from the actuator side.



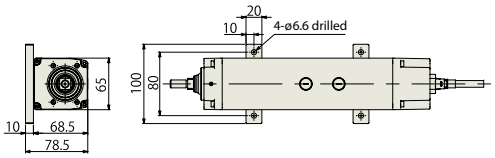
RCP4W-RA6 type | Model number of flange: RCP4W-FL-RA6



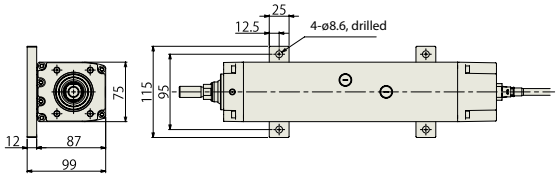
RCP4W-RA7 type | Model number of flange: RCP4W-FL-RA7

■ With Foot Bracket Option code: FT

This bracket is used to secure the actuator with bolts from above.



RCP4W-RA6 type | Model number of bracket: RCP4W-FT-RA6

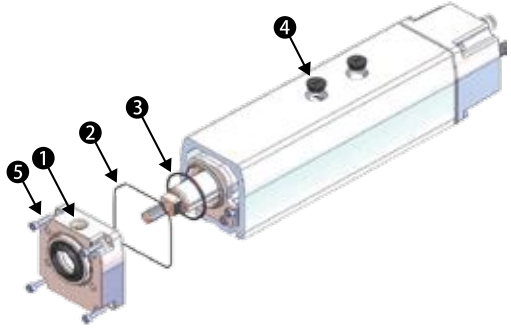


RCP4W-RA7 type | Model number of bracket: RCP4W-FT-RA7

Spare Parts

As a rough guide, replace the scraper (front bracket assembly) after every 1,000 km of traveling or 1 year of use.
When replacing the scraper, specify the applicable model number in your order as shown below.

No	Name	Model Number		Order unit
		RA6	RA7	
1	Front bracket assembly	RCP4W-FBA-RA6	RCP4W-FBA-RA7	1
2	O-ring	RCP4W-OR1-RA6	RCP4W-OR1-RA7	1
3	O-ring	RCP4W-OR2-RA6	RCP4W-OR2-RA7	1
4	Cap	RCP4W-CS-RA		1
5	Bolt	(Supplied with the front bracket assembly)		



RCP4W-RA6C

ROBO Cylinder Water-proof rod type Actuator width: 65 mm
24-V Pulse motor

Model Specification Items

RCP4W — **RA6C** — **I** — □ — □ — □ — □ — **P3** — □ — □

Series	Type	Encoder type	Motor type	Lead	Stroke	Applicable controller	Cable length	Options
		I: Incremental specification	42P: Pulse motor, size 42□ 42SP: High-thrust pulse motor, size 42□	12 :12mm 6 : 6mm 3 : 3mm	50 : 50mm 〜 400 : 400mm (every 50-mm)	P3: PCON-CA	N: None P: 1m S: 3m M: 5m X□□ : Specified length R□□ : Robot cable	Refer to the option list below. * If the high-thrust pulse motor is selected, the actuator comes standard with option B (Brake).

Built-in Guide Mechanism

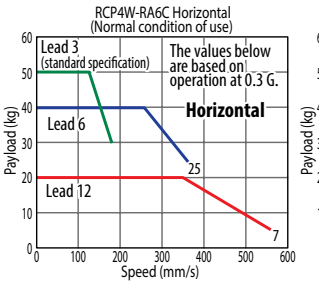
RoHS

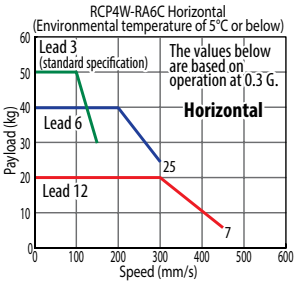
POINT Notes on selection

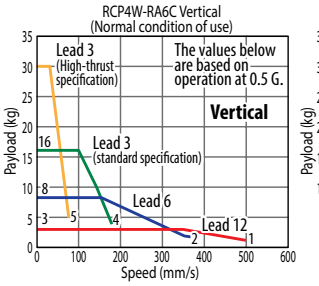
(1) The maximum payload is the value when operated horizontally and vertically at 0.3G and 0.5G, respectively. Note that raising the acceleration causes the payload to drop. (Refer to P. 10 for the maximum payload by acceleration.)
(2) The horizontal payload is calculated by assuming that an external guide is also used.
(3) The high-thrust specification is designed exclusively for vertical operation. It comes standard with a brake.

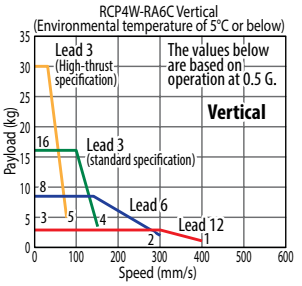
■ Correlation Diagrams of Speed and Payload

Due to its pulse motor characteristics, the RCP4 series provides lower payload at higher speed. Check the tables below to see if the desired speed and payload can be achieved.









Actuator Specifications

■ Leads and Payloads

Model number		Lead (mm)	Maximum payload (kg) Horizontal (kg)	Maximum payload (kg) Vertical (kg)	Maximum push force (N)	Positioning repeatability (mm)	Stroke (mm)
Standard specification	RCP4W-RA6C-I-42P-12-①-P3-②-③	12	20	3	93	±0.02	50 to 400 (in 50-mm increments)
	RCP4W-RA6C-I-42P-6-①-P3-②-③	6	40	8	185		
	RCP4W-RA6C-I-42P-3-①-P3-②-③	3	50	16	370		
High-thrust specification	RCP4W-RA6C-I-42SP-3-①-P3-②-③-B	3	–	30	590		

Legend ① Stroke ② Cable length ③ Options

■ Stroke and Maximum Speed (unit: mm/s)

Lead \ Stroke	50 (mm)	100 ~ 400 (in 50-mm increments)
12	500 [450 <400>]	560 <500> [450 <400>]
6	360 [300]	
3	180 [150]	
3	<70> [<70>]	

*The values in < > apply when the actuator is used vertically.
*The values in [ ] apply when the actuator is used at an environmental temperature of 5°C or below.

① Stroke

Stroke (mm)	Standard price Standard specification	Standard price High-thrust specification
50	–	–
100	–	
150	–	
200	–	
250	–	
300	–	
350	–	
400	–	

② Cable length

Type	Cable symbol	Standard price
Standard type	P (1m)	–
	S (3m)	–
	M (5m)	–
Special length	X06 (6m) ~ X10 (10m)	–
	X11 (11m) ~ X15 (15m)	–
	X16 (16m) ~ X20 (20m)	–
Robot cable	R01 (1m) ~ R03 (3m)	–
	R04 (4m) ~ R05 (5m)	–
	R06 (6m) ~ R10 (10m)	–
	R11 (11m) ~ R15 (15m)	–
	R16 (16m) ~ R20 (20m)	–

③ Options

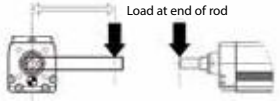
Name	Option code	See page	Standard price
Cable exit from the left side face	A1	P4	–
Cable exit from the right side face	A3		–
Cable exit from the top face	AT		–
Brake	B		–
With flange	FL		–
With foot bracket	FT		–
Non-motor side specification	NM		–

*The high-thrust specification comes standard with a brake.

Actuator Specifications

Item	Description
Drive system	Ball screw ø10mm, rolled C10
Positioning repeatability	±0.02mm
Lost motion	0.1mm or less
Rod	ø22 stainless steel pipe
Rod non-rotation accuracy	±0.1 deg
Allowable load/allowable torque at end of rod	Refer to the page on the right.
Lost offset distance at end of rod	100mm or less
Protective structure	IP67
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (Non-condensing)

Offset distance at end of rod (100mm or less)



Dimensional Drawings

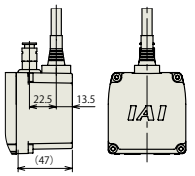
CAD drawings can be downloaded from the website. www.intelligentactuator.com

2D CAD

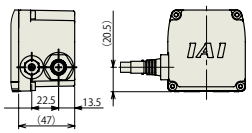
*1 Connect the motor and encoder cables.
*2 The rod moves to the ME during home return, so pay attention to possible contact with surrounding structures and objects.
*3 The orientation of the width across flats varies from one product to another.
*4 When installing the actuator using the front housing or flange, make sure the actuator does not receive any external force

<Cable Exit Direction Option>

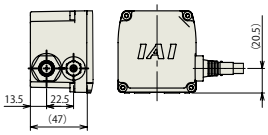
Exit from the top
Option code: AT



Exit from the left side face
Option code: A1



Exit from the right side face
Option code: A3

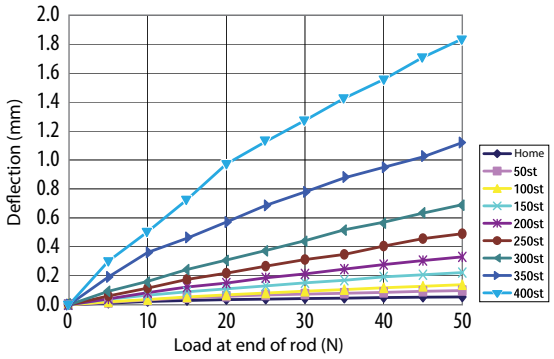


■ Materials of Key Components

①	Frame	Aluminum extrusion material (A6063SS-T5 or equivalent) with white alumite coating
②	Front bracket	Aluminum die-cast
③	Rear cover	Aluminum die-cast
④	Rod	Stainless steel pipe (SUS304 or equivalent), polished + hard chrome plated
⑤	Actuator cable	Polyvinyl chloride (PVC)
⑥	Intake/exhaust port	Polyphenylene sulfide (PPS)

■ Rod Deflection of RCP4W-RA6C (Reference Values)

(The graph below plots deflection as measured by installing the actuator vertically and applying a force to the rod from one side.)



■ Dimensions and Mass by Stroke

Stroke		50	100	150	200	250	300	350	400
L	Without brake	285	335	385	435	485	535	585	635
	With brake (*)	346	396	446	496	546	596	646	696
A	Without brake	40	40	40	40	40	40	40	40
	With brake (*)	101	101	101	101	101	101	101	101
B		1	1	2	2	3	3	4	4
C		35	85	35	85	35	85	35	85
D		6	6	8	8	10	10	12	12
M	Without brake	215	265	315	365	415	465	515	565
	With brake	276	326	376	426	476	526	576	626
Allowable static load at end of rod (N)		65.6	51.2	41.7	34.9	29.8	25.7	22.4	19.7
Allowable dynamic load at end of rod (N)	Load offset 0 mm	32.4	23.6	18.1	14.4	11.6	9.5	7.7	6.2
	Load offset 100 mm	25.6	19.7	15.7	12.7	10.4	8.6	7.1	5.7
Allowable static torque at end of rod (N•m)		6.6	5.2	4.3	3.7	3.2	2.8	2.6	2.3
Allowable dynamic torque at end of rod (N•m)		2.6	2.0	1.6	1.3	1.0	0.9	0.7	0.6
Mass (kg)	Without brake	3.1	3.5	3.8	4.2	4.6	5.0	5.4	5.8
	With brake	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4

(*) The dimensions of the high-thrust specification include the brake.

Applicable Controller

RCP4 series actuators can be operated with the controller indicated below. Select the type according to your intended application.

Name	External view	Model number	Features	Maximum number of positioning points	Input Power	Power supply capacity	Standard price	Reference page
Positioner type		PCON-CA-42PI-NP-□-0-□ PCON-CA-42PI-PN-□-0-□	Positioner type based on PIO control	512 points	DC24V	Refer to P. 13	–	Refer to P. 12
Pulse-train type		PCON-CA-42PI-PLN-□-0-□ PCON-CA-42PI-PLP-□-0-□	Pulse-train input type The actuator can be operated freely by pulse-train control.	–			–	
Field network type		PCON-CA-42PI-○-0-0-□	Supporting 7 major field networks	768 points			–	

*In the model numbers shown above, ○ indicates the field network specification (DV, CC, PR, CN, ML, EC or EP).

RCP4W-RA7C

ROBO Cylinder Water-proof rod type Actuator width: 75 mm
24-V Pulse motor

Model Specification Items: **RCP4W** — **RA7C** — **I** — □ — □ — □ — □ — □ — □ — □

Series	Type	Encoder type	Motor type	Lead	Stroke	Applicable controller	Cable length	Options
RCP4W	RA7C	I: Incremental specification	56P: Pulse motor, size 56□ 56SP: High-thrust pulse motor, size 56□	16 :16mm 8 : 8mm 4 : 4mm	50 : 50mm 〜 500 : 500mm (every 50-mm)	P3:PCON-CA P4:PCON-CFA *The PCON-CFA is designed exclusively for the high-thrust specification.	N: None P: 1 m S: 3 m M: 5 m X□□ : Specified length R□□ : Robot cable	Refer to the option list below. *If the high-thrust pulse motor is selected, the actuator comes standard with option B (Brake).

Built-in Guide Mechanism

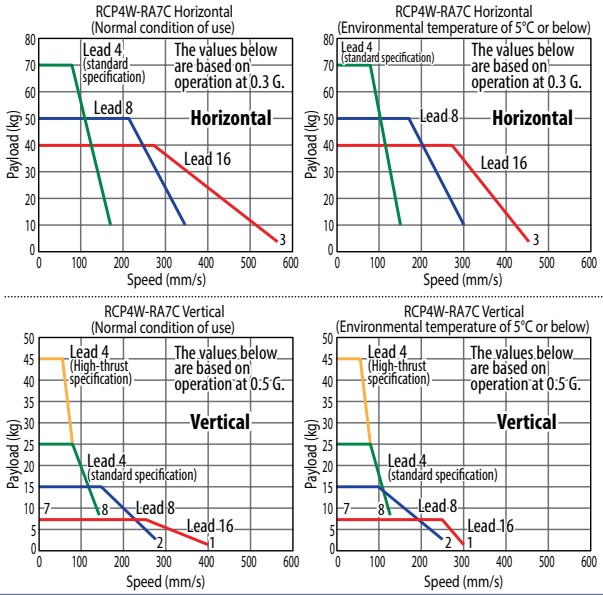
RoHS

POINT Notes on selection

(1) The maximum payload is the value when operated horizontally and vertically at 0.3G and 0.5G, respectively. Note that raising the acceleration causes the payload to drop. (Refer to P. 10 for the maximum payload by acceleration.)
(2) The horizontal payload is calculated by assuming that an external guide is also used.
(3) The high-thrust specification is designed exclusively for vertical operation. It comes standard with a brake.

■ Correlation Diagrams of Speed and Payload

Due to its pulse motor characteristics, the RCP4 series provides lower payload at higher speed. Check the tables below to see if the desired speed and payload can be achieved.



Actuator Specifications

■ Leads and Payloads

Model number		Lead (mm)	Maximum payload (kg) Horizontal (kg)	Maximum payload (kg) Vertical (kg)	Maximum push force (N)	Positioning repeatability (mm)	Stroke (mm)
Standard specification	RCP4W-RA7C-I-56P-16-①-P3-②-③	16	40	7	219	±0.02	50 to 500 (in 50-mm increments)
	RCP4W-RA7C-I-56P-8-①-P3-②-③	8	50	15	437		
	RCP4W-RA7C-I-56P-4-①-P3-②-③	4	70	25	875		
High-thrust specification	RCP4W-RA7C-I-56SP-4-①-P4-②-③-B	4	–	45	1030		

Legend ① Stroke ② Cable length ③ Options

■ Stroke and Maximum Speed (unit: mm/s)

Lead \ Stroke	50 (mm)	100 ~ 500 (in 50-mm increments)
16	500 [450 <300>]	560 <400> [450 <300>]
8	340 <280> [300 <250>	
4	170 <140> [150 <125>]	
4	<80> [<80>]	

*The values in < > apply when the actuator is used vertically.
*The values in [ ] apply when the actuator is used at an environmental temperature of 5°C or below.

①Stroke

Stroke (mm)	Standard price	
	Standard specification	High-thrust specification
50	–	–
100	–	
150	–	
200	–	
250	–	
300	–	
350	–	
400	–	
450	–	
500	–	

②Cable length

Type	Cable symbol	Standard price
Standard type	P (1m)	–
	S (3m)	–
	M (5m)	–
Special length	X06 (6m) ~ X10 (10m)	–
	X11 (11m) ~ X15 (15m)	–
	X16 (16m) ~ X20 (20m)	–
Robot cable	R01 (1m) ~ R03 (3m)	–
	R04 (4m) ~ R05 (5m)	–
	R06 (6m) ~ R10 (10m)	–
	R11 (11m) ~ R15 (15m)	–
	R16 (16m) ~ R20 (20m)	–

①Options

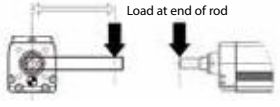
Name	Option code	See page	Standard price
Cable exit from the left side face	A1	P4	–
Cable exit from the right side face	A3		–
Cable exit from the top face	AT		–
Brake	B		–
With flange	FL		–
With foot bracket	FT		–
Non-motor side specification	NM		–

*The high-thrust specification comes standard with a brake.

Actuator Specifications

Item	Description
Drive system	Ball screw ø12mm, rolled C10
Positioning repeatability	±0.02mm
Lost motion	0.1mm or less
Rod	ø25 stainless steel pipe
Rod non-rotation accuracy	±0.1 deg
Allowable load/allowable torque at end of rod	Refer to the page on the right.
Lost offset distance at end of rod	100mm or less
Protective structure	IP67
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (Non-condensing)

Offset distance at end of rod (100mm or less)



Dimensional Drawings

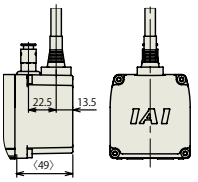
CAD drawings can be downloaded from the website. www.intelligentactuator.com

2D CAD

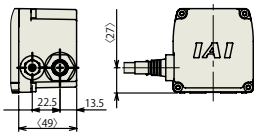
*1 Connect the motor and encoder cables.
*2 The rod moves to the ME during home return, so pay attention to possible contact with surrounding structures and objects.
*3 The orientation of the width across flats varies from one product to another.
*4 When installing the actuator using the front housing or flange, make sure the actuator does not receive any external force

<Cable Exit Direction Option>

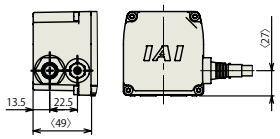
Exit from the top
Option code: AT



Exit from the left side face
Option code: A1

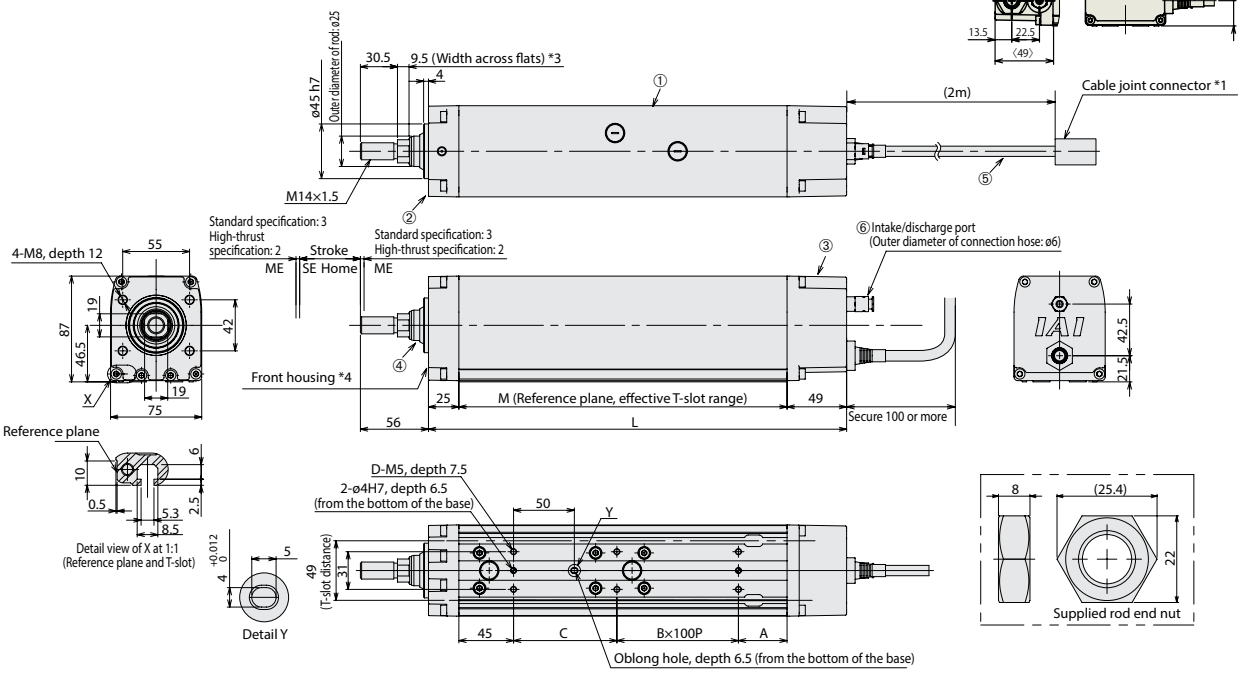


Exit from the right side face
Option code: A3



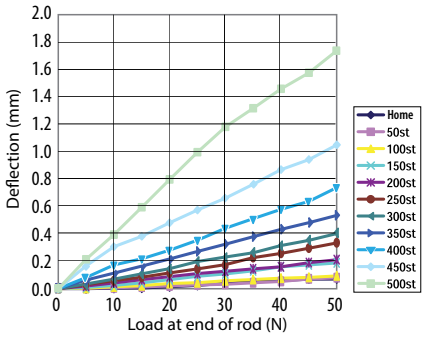
■ Materials of Key Components

①	Frame	Aluminum extrusion material (A6063SS-T5 or equivalent) with white alumite coating
②	Front bracket	Aluminum die-cast
③	Rear cover	Aluminum die-cast
④	Rod	Stainless steel pipe (SUS304 or equivalent), polished + hard chrome plated
⑤	Actuator cable	Polyvinyl chloride (PVC)
⑥	Intake/exhaust port	Polyphenylene sulfide (PPS)



■ Rod Deflection of RCP4W-RA7C (Reference Values)

(The graph below plots deflection as measured by installing the actuator vertically and applying a force to the rod from one side.)



■ Dimensions and Mass by Stroke

Stroke		50	100	150	200	250	300	350	400	450	500
L	Without brake	344	394	444	494	544	594	644	694	744	794
	With brake (*)	399	449	499	549	599	649	699	749	799	849
A	Without brake	40	40	40	40	40	40	40	40	40	40
	With brake (*)	95	95	95	95	95	95	95	95	95	95
B		1	1	2	2	3	3	4	4	5	5
C		85	135	85	135	85	135	85	135	85	135
D		6	6	8	8	10	10	12	12	14	14
M	Without brake	270	320	370	420	470	520	570	620	670	720
	With brake	325	375	425	475	525	575	625	675	725	775
Allowable static load at end of rod (N)		112.7	91.5	76.7	65.7	57.2	50.4	44.8	40.2	36.2	32.7
Allowable dynamic load at end of rod (N)	Load offset 0 mm	49.0	37.4	29.9	24.5	20.4	17.1	14.5	12.3	10.3	8.6
	Load offset 100 mm	38.7	31.0	25.5	21.4	18.1	15.4	13.2	11.2	9.5	8.0
Allowable static torque at end of rod (N•m)		11.4	9.3	7.9	6.8	6.0	5.4	4.9	4.5	4.1	3.8
Allowable dynamic torque at end of rod (N•m)		3.9	3.1	2.5	2.1	1.8	1.5	1.3	1.1	1.0	0.8
Mass (kg)	Without brake	5.6	6.1	6.6	7.2	7.7	8.2	8.7	9.2	9.7	10.2
	With brake	6.4	6.9	7.4	7.9	8.4	9.0	9.5	10.0	10.5	11.0

(*) The dimensions of the high-thrust specification include the brake.

Applicable Controller

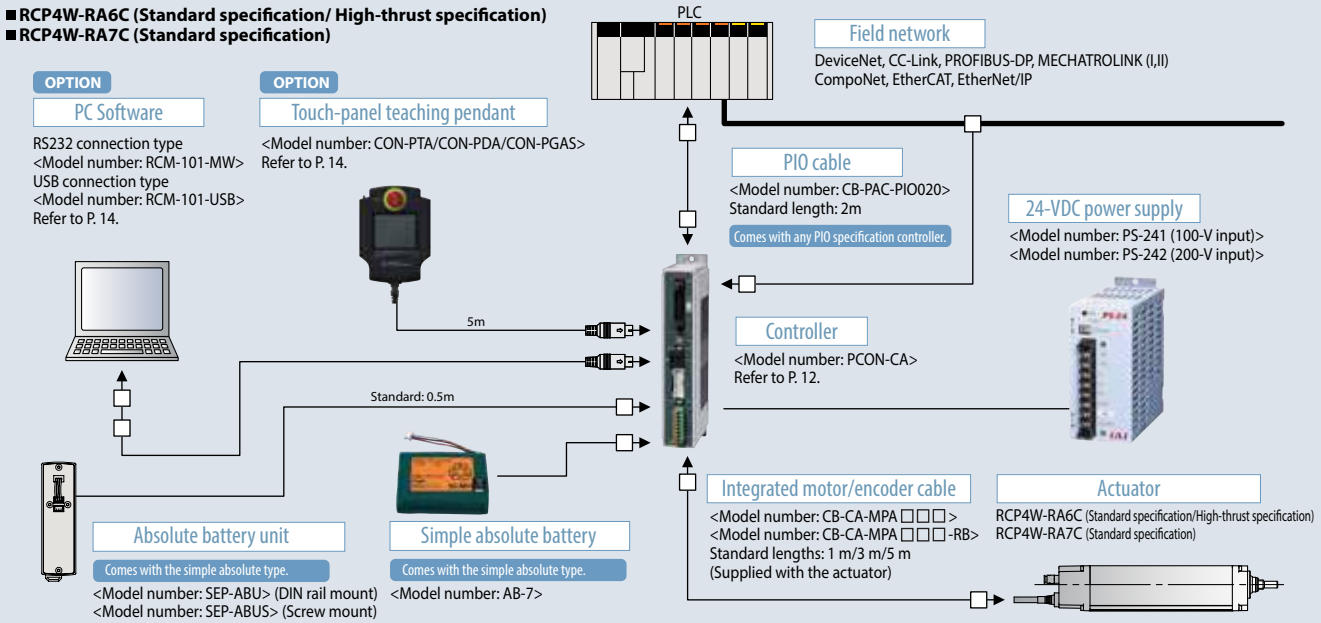
RCP4 series actuators can be operated with the controller indicated below. Select the type according to your intended application.

Name	External view	Model number	Features	Maximum number of positioning points	Input Power	Power supply capacity	Standard price	Reference page
Positioner type		PCON-CA-56PI-NP-□-0-□ PCON-CA-56PI-PN-□-0-□	Positioner type based on PIO control	512 points	DC24V	Refer to P. 13	–	Refer to P. 12
Pulse-train type		PCON-CA-56PI-PLN-□-0-□ PCON-CA-56PI-PLP-□-0-□	Pulse-train input type The actuator can be operated freely by pulse-train control.	–			–	
Field network type		PCON-CA-56PI-○-0-0-□	Supporting 7 major field networks	768 points			–	
Positioner type		PCON-CFA-56SPI-NP-□-0-□ PCON-CFA-56SPI-PN-□-0-□	High-thrust specification Positioner type based on PIO control	512 points	DC24V	Refer to P. 13	–	Refer to P. 12
Pulse-train type		PCON-CFA-56SPI-PLN-□-0-□ PCON-CFA-56SPI-PLP-□-0-□	High-thrust specification Pulse-train input type	–			–	
Field network type		PCON-CFA-56SPI-○-0-0-□	High-thrust specification Supporting 7 major field networks	768 points			–	

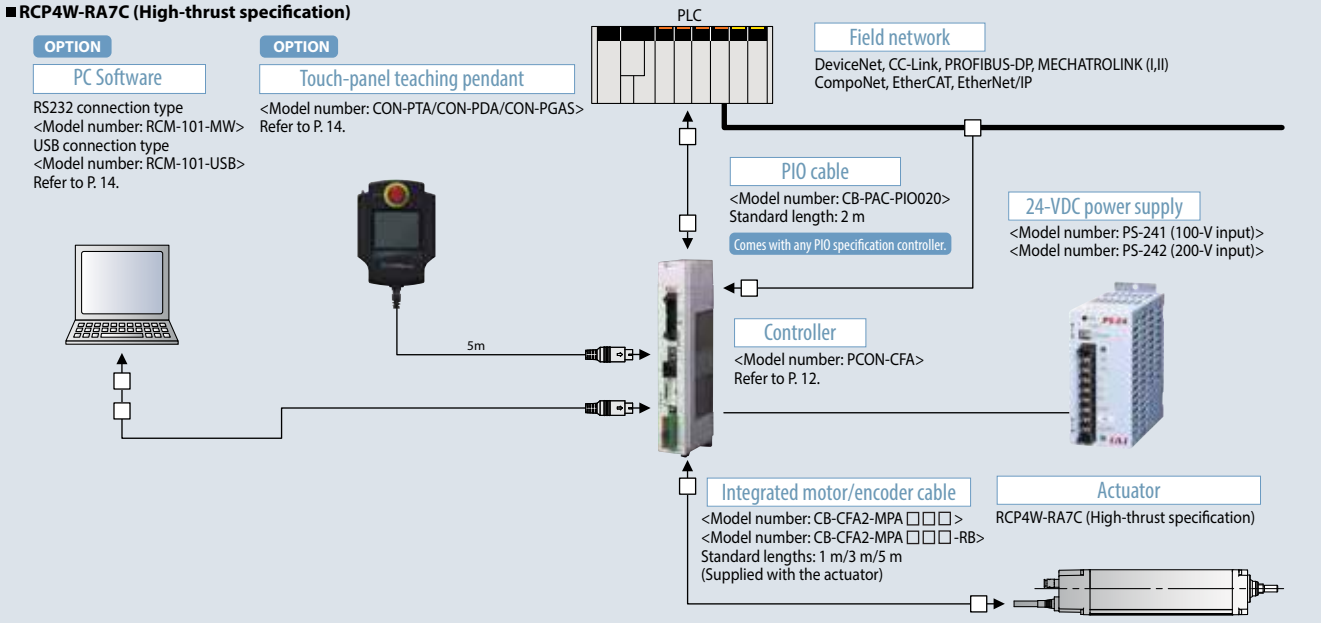
*In the model numbers shown above, ○ indicates the field network specification (DV, CC, PR, CN, ML, EC or EP).

System Configulation

■ **RCP4W-RA6C (Standard specification/ High-thrust specification)**
■ **RCP4W-RA7C (Standard specification)**



■ **RCP4W-RA7C (High-thrust specification)**



Notes

1. **This actuator conforms to the IP67 standard, but it is not IP67-protected when operated in water. IP67 defines a degree of protection against water, so if the actuator is to be used in an environment where it may come in contact with coolant, etc., contact IAI beforehand.**
2. **The air joint attached to the motor cover of the actuator is connected to the pipe for bleeding air from the actuator. Connect an air hose of ø6 in outer diameter and extend the opposite end of the hose to a location free from liquids and powder dust.**
3. **If the actuator is installed with its rod facing up, be careful not to let any liquid collect in the scraper part of the front bracket.**
4. **If the environmental temperature is 5°C or below, the speed drops compared to when the actuator is used in normal conditions. For details, refer to the correlation diagram of speed and payload on the page featuring the specifications of each model.**

Payload by Acceleration

(Unit of payload: kg)

	TYPE	Installation direction	Lead	Acceleration (G)			
				0.3	0.5	0.7	1
Payload	RA6C Standard specification	Horizontal	12	20	15	12	10
			6	40	35	25	20
			3	50	45	40	35
		Vertical	12	3	3	–	–
			6	8	8	–	–
			3	16	16	–	–
	RA6C High-thrust specification		3	30	30	–	–
	RA7C Standard specification	Horizontal	16	40	35	30	25
			8	50	45	40	35
			4	70	60	50	45
		Vertical	16	7	7	–	–
			8	15	15	–	–
			4	25	25	–	–
	RA7C High-thrust specification		4	45	45	–	–

Correlation Diagrams of Push Force and Current-limiting Value

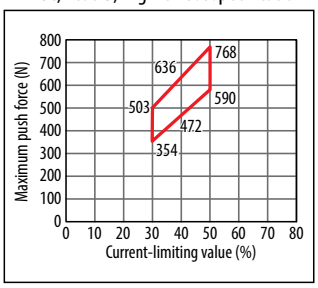
The push force can be adjusted by changing the current-limiting value of the controller.
Refer to the graphs below to select a model capable of generating the required push force.

Note

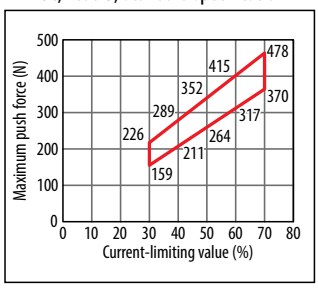
- **The push force varies depending on the slide resistance and also due to aging. Accordingly, the push forces shown in the graphs are a little conservative relative to the current-limiting values. Select a model whose graph shows the desired push force inside the red lines.**
- **All push forces have been measured at a speed of 20 mm/s. Note that the push force changes when the speed is changed.**

■RCP4W-RA6C type

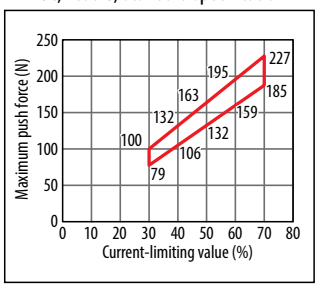
<RA6C, Lead 3, High-thrust specification>



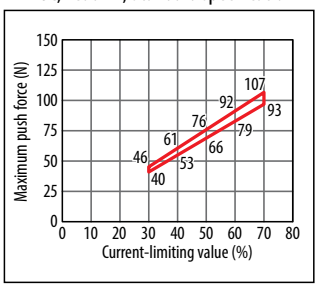
<RA6C, Lead 3, Standard specification>



<RA6C, Lead 6, Standard specification>

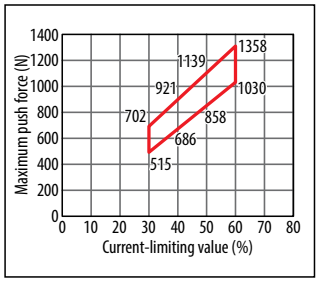


<RA6C, Lead 12, Standard specification>

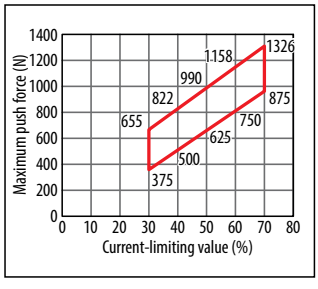


■RCP4W-RA7C type

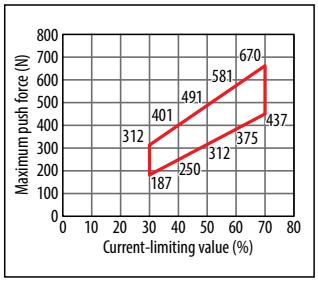
<RA7C, Lead 4, High-thrust specification>



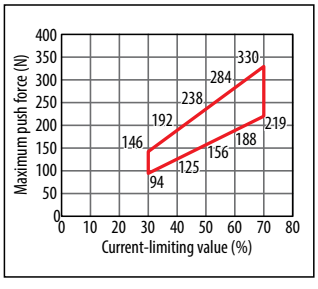
<RA7C, Lead 4, Standard specification>



<RA7C, Lead 8, Standard specification>



<RA7C, Lead 16, Standard specification>

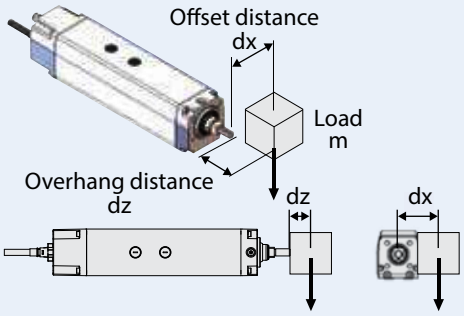


Selection References (Guide for Selecting Allowable Load for Radial Cylinder)

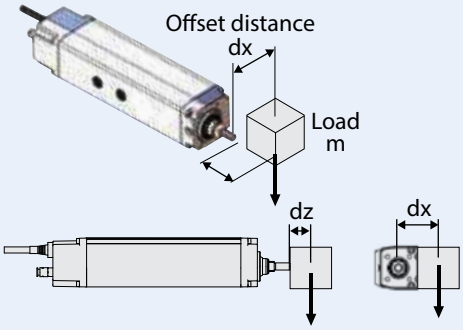
The RCP4W rod type cylinder has a built-in guide, so loads up to a certain level can be applied to the rod without using an external guide. Refer to the graphs below for the allowable load mass. If the allowable load will be exceeded under the required operating conditions, add an external guide.

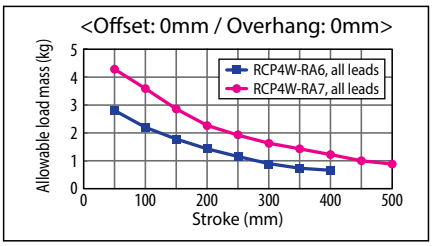
■Allowable load mass for RCP4W-RA6C/7C horizontally mounted

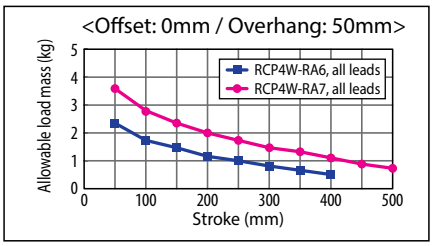
[Horizontally mounted, laid flat]

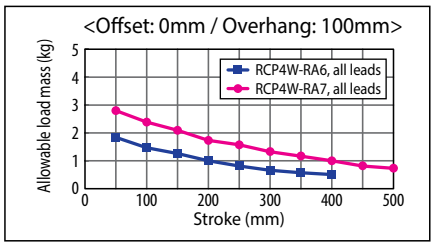


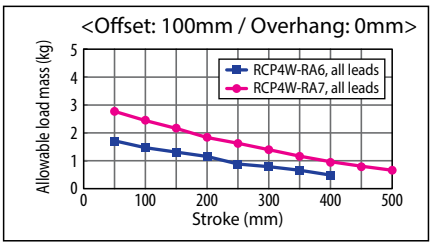
[Horizontally mounted, laid on its side]

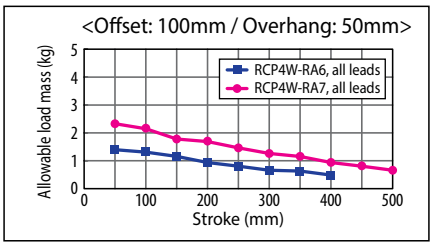


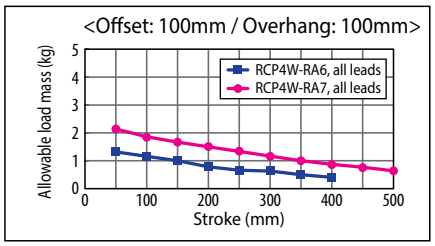








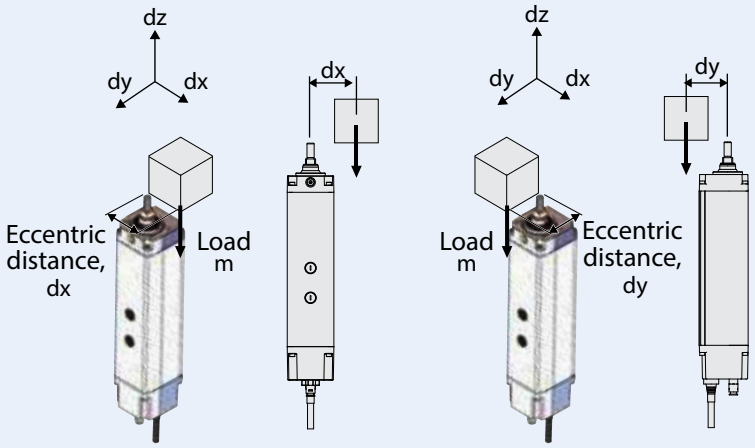


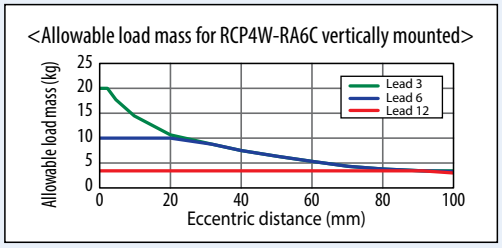


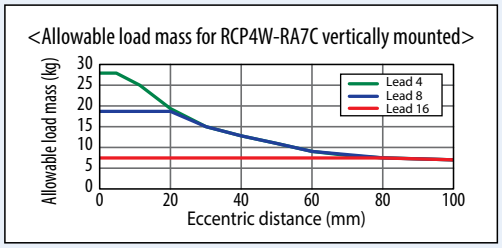
Allowable load calculation conditions: Load mass corresponding to a guide traveling life of 5,000 km, considering moments generated by acceleration/deceleration.
(Acceleration: 1 G / Speed: 500 mm/s)

■Allowable load mass for RCP4W-RA6C/7C vertically mounted

[Vertical mounted]







Allowable load calculation conditions:
Load mass corresponding to a guide traveling life of 5,000 km, considering moments generated by acceleration/deceleration. (Acceleration: 0.5 G / Speed: 500mm/s)

PCON-CA/CFA

Positioner / Pulse-train Type
RCP4W Controller

Refer to the catalog of the RCP4 series for the details of each controller.

List of Models

ROBO Cylinder Position Controller <PCON-CA/CFA>

					Positioner type	Pulse-train type	Field network type						
External view													
I/O type							DeviceNet	CC-Link	PROFIBUS	CompoNet	MECHATROLINK	EtherCAT	EtherNet/IP
							DeviceNet connection specification	CC-Link connection specification	PROFIBUS-DP connection specification	CompoNet connection specification	MECHATROLINK connection specification	EtherCAT connection specification	EtherNet/IP connection specification
I/O type model code					NP/PN	PLN/PLP	DV	CC	PR	CN	ML	EC	EP
Standard price	PCON -CA	Incremental specification			—	—	—	—	—	—	—	—	—
		Simple absolute specification	With absolute battery		—	—	—	—	—	—	—	—	—
			With absolute battery unit		—	—	—	—	—	—	—	—	—
			No absolute battery		—	—	—	—	—	—	—	—	—
	PCON -CFA	Incremental specification			—	—	—	—	—	—	—	—	—

Model Number

PCON — [Type] — [Motor type] — I — [Encoder type] — [I/O type] — [I/O cable length] — 0 — [Power supply voltage] — [Simple absolute specification] — [Actuator mounting specification]

Series

Type

CA	Standard type
CFA	for RCP4W-RA7C High-thrust specification

Motor type

20P	20 frame pulse motor
20SP	20 frame pulse motor (RCP3-RA2 high-thrust type dedicated)
28P	28 frame pulse motor
28SP	28 frame pulse motor (RCP2-RA3C dedicated)
35P	35 frame pulse motor
42P	42 frame pulse motor
42SP	for RCP4W-RA6 High-thrust specification
56P	56 frame pulse motor
56SP	for RCP4W-RA7 High-thrust specification

Encoder type

I	Incremental

I/O type

NP	PIO (NPN) specification
PLN	Pulse-train (NPN) specification
PN	PIO (PNP) specification
PLP	Pulse-train (PNP) specification
DV	DeviceNet connection specification
CC	CC-Link connection specification
PR	PROFIBUS-DP connection specification
CN	CompoNet connection specification
ML	MECHATROLINK connection specification
EC	EtherCAT connection specification
EP	EtherNet/IP connection specification

I/O cable length

0	No cable
2	2m
3	3m
5	5m

* If a network connection specification (I/O type = DV, CC, PR, CN, ML, EC or EP) is selected, the I/O cable length becomes "0" (no cable).

Power supply voltage

0	DC24V

Simple absolute specification

(Blank)	Incremental specification
AB	Simple absolute specification (With absolute battery)
ABU	Simple absolute specification (With absolute battery unit)
ABUN	Simple absolute specification (No absolute battery)

*PCON-CFA does not support the simple absolute specification.

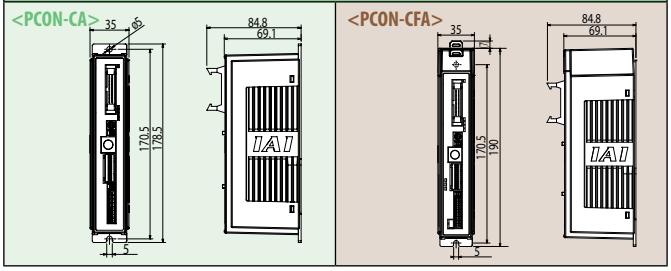
Actuator mounting specification

(Blank)	Screw fastening specification
DN	DIN rail mounting specification

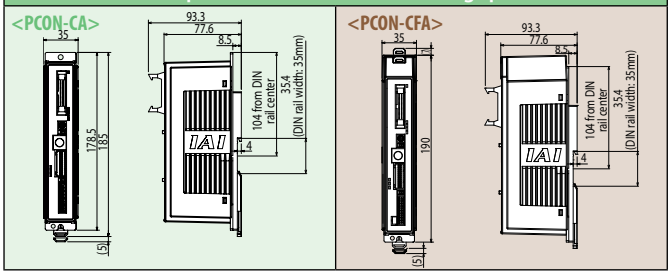
* The mounting specification for the absolute battery unit (screws mounting or DIN rail mounting) conforms to the mounting specification for the controller.

External Dimensions

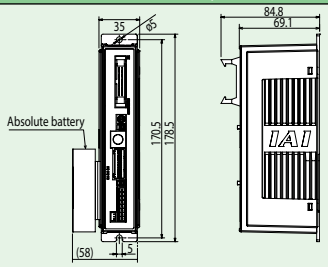
Incremental specification <Screw fastening specification>



Incremental specification <DIN rail mounting specification>

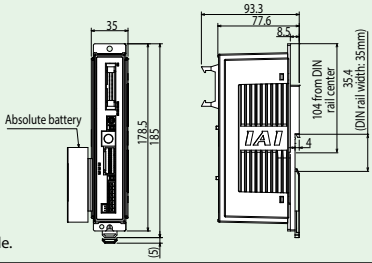


Simple absolute specification with absolute battery <Screw fastening specification>



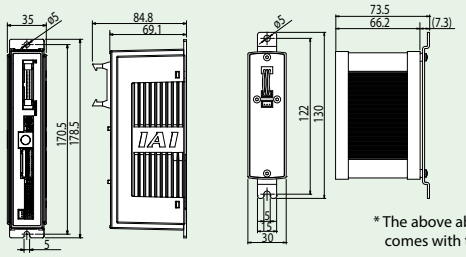
* The absolute battery is installed on the left side when the controller is viewed from the front side.

Simple absolute specification with absolute battery <DIN rail mounting specification>



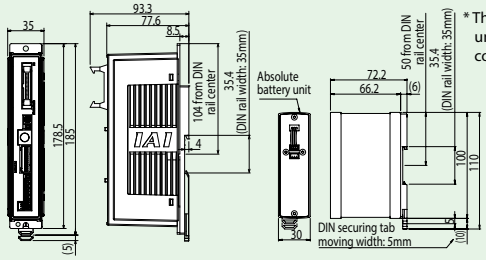
* The absolute battery is installed on the left side when the controller is viewed from the front side.

Simple absolute specification with absolute battery unit <Screw fastening specification>



* The above absolute battery unit comes with the controller.

Simple absolute specification with absolute battery unit <DIN rail mounting specification>



* The absolute battery unit comes with the controller.

Specification Table

Item				Description	
				PCON-CA	PCON-CFA
Number of controlled axes				1 axis	
Power supply voltage				24 VDC ± 10%	
Load capacity (Current consumption of controlled axes included) (Note 1)	RCP4W	Motor type	42P, 42SP, 56P	2.2A max.	
			56SP		6A max.
Power supply for electromagnetic brake (for actuators with brake)				24 VDC ± 10%, 0.15 A (max.)	24 VDC ± 10%, 0.5 A (max.)
Rush current (Note 2)				8.3 A	10 A
Momentary power failure resistance				500 µs max.	
Applicable encoder				Incremental encoder of 800 pulses/rev in resolution	
Actuator cable length				20m max.	
External interface		PIO specification		Dedicated 24-VDC signal input/output (NPN or PNP selected) --- Up to 16 input points, up to 16 output points / Cable length: 10m max.	
		Field network specification		DeviceNet, CC-Link, PROFIBUS, CompoNet, MECHATROLINK, EtherCAT, EtherNet/IP	
Data setting/input method				PC software, touch-panel teaching pendant	
Data retention memory				Position data and parameters are saved in the non-volatile memory (The memory can be written an unlimited number of times.)	
Operation modes				Positioner mode / Pulse-train control mode (Selectable by parameter setting)	
Number of positions in positioner mode				Up to 512 points for the positioner type, up to 768 points for the network type (Note) The number of positioning points varies depending on the PIO pattern selected.	
Pulse-train interface		Input pulse		Differential method (line driver method): 200 kpps max. / Cable length: 10 m max.	
				Open collector method: Not supported * If the host uses open-collector output, convert the open-collector pulses to differential pulses using the AK-04 (available as an option).	
		Command pulse magnification (electronic gear ratio: A/B)		1/50 < A/B < 50/1 Setting range of A and B (set by parameters): 1 to 4096	
		Feedback pulse output		None	
Isolation resistance				500-VDC 10 MΩ or more	
Electric shock protection mechanism				Class I basic isolation	
Mass (Note 3)		Incremental specification		Screw fastening type: 250 g or less DIN rail securing type: 285 g or less	Screw fastening type: 270 g or less DIN rail securing type: 305 g or less
		Simple absolute specification (190 g of battery weight included)		Screw fastening type: 450 g or less DIN rail securing type: 485 g or less	
Cooling method				Natural air cooling	Forced air cooling
Environment		Ambient operating temperature		0 to 40°C	
		Ambient operating humidity		85%RH or less (non-condensing)	
		Operating ambience		Not exposed to corrosive gases	
		Protection degree		IP20	

Note 1) The value increases by 0.3 A for the field network specification.
Note 2) After the power is turned on, rush current will flow for approx. 5 msec (at 40°C). Take note that the rush current varies depending on the impedance of the power-supply line.
Note 3) The value increases by 30 g for the field network specification.

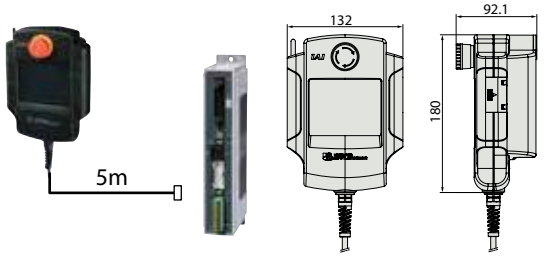
Option

Teaching pendant

Summary Teaching device for positioning input, test operation, and monitoring.

Model **CON-PTA-C** (Touch panel teaching pendant)

Setting



Specification

Item	Touch panel teaching		
Model number	CON-PTA-C	CON-PDA-C	CON-PGAS-C-S
Type	Standard type	Enable switch type	Safety-category compliant type
Display	65536 colors (16-bit colors), white LED backlight		
Operating ambient temperature/humidity	Temperature 0 to 40°C, humidity 85%RH or less (non-condensing)		
Protection degree	IP40		
Mass	Approx. 570g	Approx. 600g	
Cable length	5m		
Accessories	Stylus	Stylus	Stylus, TP adapter (Model number: RCB-LB-TGS) Dummy plug (Model number: DP-4S) Controller cable (Model number: CB-CON-LB005)

PC software (Windows only)

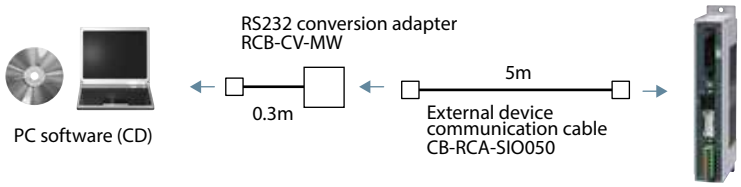
* For the MSEP field network specification, the PC software is required.

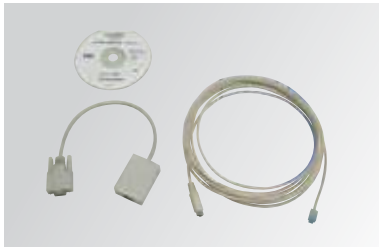
Summary A startup support software for inputting positions, performing test runs, and monitoring. With enhancements for adjustment functions, the startup time is shortened.

Model **RCM-101-MW** (External device communication cable + RS232 conversion unit)

Setting

MSEP is supported by Ver.9.01.00.00 or later

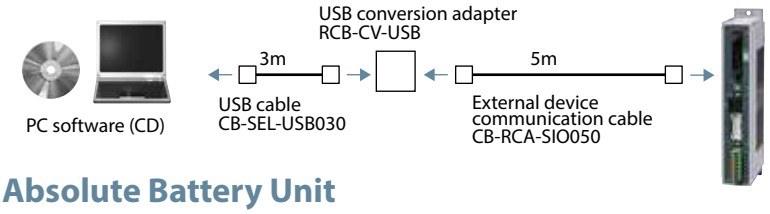




Model **RCM-101-USB** (External device communication cable + USB converter adapter + USB cable)

Setting

MSEP is supported by Ver.9.01.00.00 or later



Absolute Battery Unit

Summary Battery unit that comes with a simple absolute controller, used to back up the current controller position.

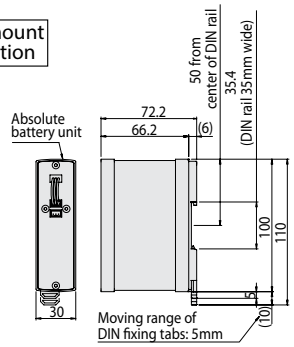
Model **SEP-ABU** (DIN rail mount specification)

SEP-ABUS (screw fixing specification)

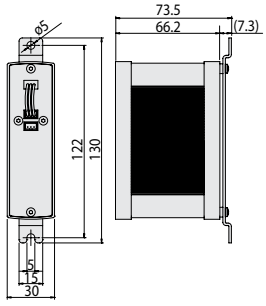
Specifications

Item	Specification
Ambient operating temperature, humidity	0 to 40°C (desirably around 20°C), 95% RH or below (non-condensing)
Operating ambience	Free from corrosive gases
Absolute battery	Model number: AB-7 (Ni-MH battery / Life: Approx. 3 years)
Controller/absolute battery unit link cable	Model number: CB-APSEP-AB005 (Length: 0.5m)
Mass	Standard type: Approx. 230g / Dust-proof type: Approx. 260g

DIN rail mount specification



Screw fixing specification



Replacement battery

Summary The replacement battery for the absolute data backup battery box.

Model **AB-7**

CJ0205-1A-UST-1-0214

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