

ROBO Cylinder®

Power CON

RCP4 Series PCON-CA

**ROBO
CYLINDER**

High Speed
High power
RCP4



Power CON Realizing 1.5 Times the Speed and Double the Payload

The Power CON 150 series boosts the performance of ROBO Cylinder IAI is proud to introduce the **PCON-CA** model combining a **Power** developed high-output driver (patent pending).

- ▶ Improved dynamic performance (the speed is up to 1.5 times and payload is up to twice
*Specific values vary depending on the model.
- ▶ New functions designed to enhance maintainability enable preventative maintenance, so
- ▶ The takt time minimization function lets you set optimal operating conditions with greater



RCP4 Series Variations

Series	Shape	Type	External view	Actuator size (width)	Stroke
RCP4	Slider type	SA5		52mm	100 200 300
		SA6		58mm	
		SA7		73mm	
	Rod type	RA5		52mm	50mm~400mm
		RA6		61mm	50mm~500mm

Controller

Series	Type	Page
PCON	CA	p.21

150% the Output, Achievable with Standard Controllers

standard motorized cylinders to amazing new heights.

CON 150 controller with a **RCP4** actuator supporting the newly

IAI's conventional models*) significantly boosts the productivity of your system.

less time is needed for maintenance.
ease.



400	500	600	700	800	Ball screw lead (mm)	Maximum speed (mm/s)	Maximum payload (kg)		Maximum acceleration	Page
							Horizontal	Vertical		
50mm~800mm					20	1440	6.5	1	1G	p.9
					12	900	9	2.5		
					6	450	18	6		
50mm~800mm					3	225	20	12	1G	p.11
					20	1440	10	1		
					12	900	15	2.5		
50mm~800mm					6	450	25	6	1G	p.13
					3	225	25	12		
					24	1200	20	3		
					16	980	40	8	1G	p.15
					8	490	45	16		
					4	245	45	25		
					20	800	6	1.5	1G	p.17
					12	700	25	4		
					6	450	40	10		
					3	225	60	20	1G	p.17
					24	800	20	3		
					16	700	50	8		
					8	420	60	18	1G	p.17
					4	210	80	28		

Features

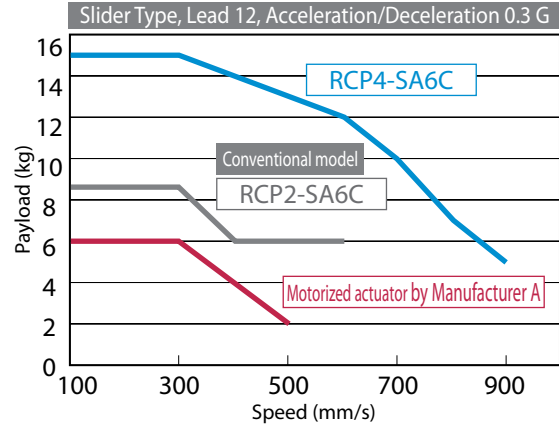
Shorter Takt Time Significantly Boosts New Functions of RCP4 Actuator

1 1.5 times higher maximum speed and double the payload when combined with a Power CON 150

When the new controller (Power CON 150) equipped with our newly developed high-output driver (patent pending) is used, the maximum speed increases significantly by up to 1.5 times the levels achievable with IAI's conventional models, while the payload is greater by up to twice (*). In addition to these amazing improvements in specifications, the maximum speed does not drop as much even when the payload increases due to increased torque with the high speed motor, meaning that dynamic performance equivalent to that of a higher-class model can be achieved at lower cost.

(*). The specific rates of improvement vary depending on the model.

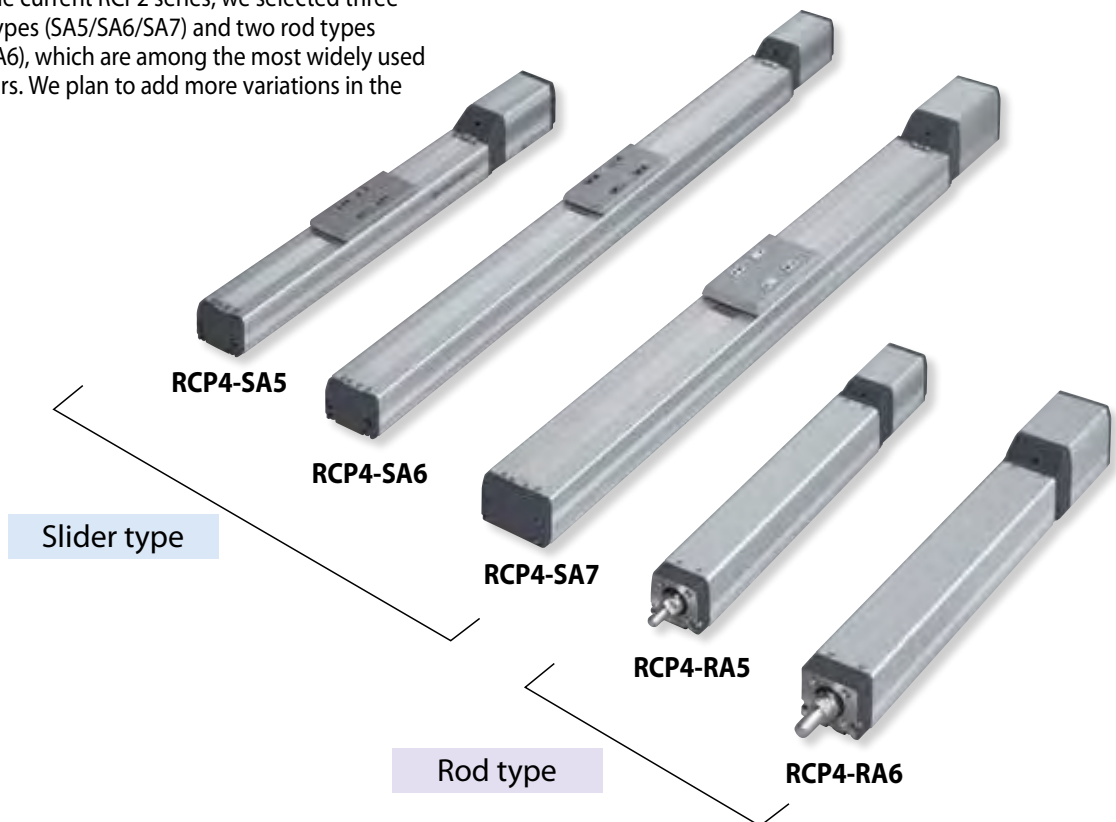
Power CON 150 PCON-CA



Correlation Diagram of Speed and Payload

2 Many variations to choose from, including three slider types and two rod types

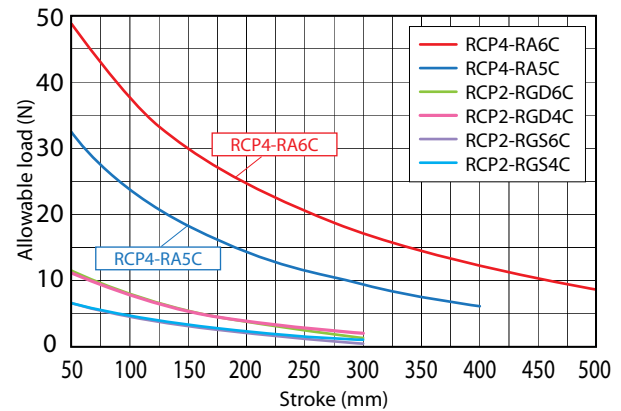
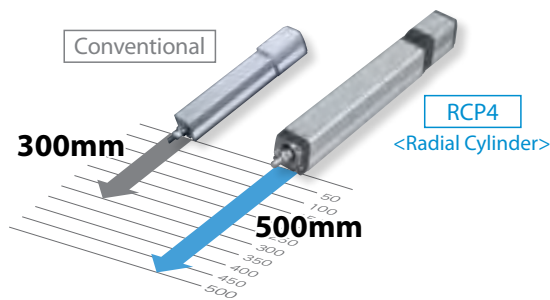
From the current RCP2 series, we selected three slider types (SA5/SA6/SA7) and two rod types (RA5/RA6), which are among the most widely used actuators. We plan to add more variations in the future.



the Productivity of Your System

3 The rod type <Radial Cylinder> with a built-in guide mechanism can carry radial loads over a long stroke (500mm).

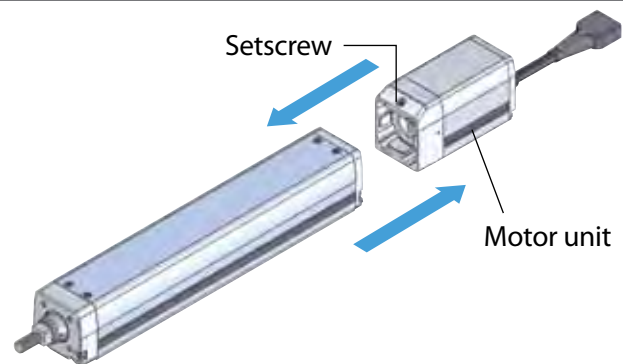
The rod type <Radial Cylinder> has a built-in guide mechanism in the actuator to carry radial loads on the rod over a long stroke of up to 500 mm. The guide mechanism also reduces vibration and deflection of the rod significantly.



Comparison of Allowable Load at End of Rod
(Assuming 5,000 km of Traveling Life)

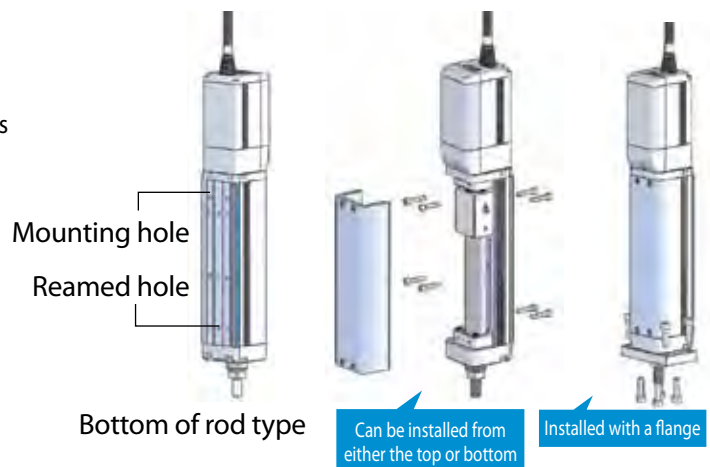
4 Easy replacement of the motor with removal of only one setscrew

The motor has been unitized for easy replacement. The actuator and motor unit can be separated and replaced by removing only one setscrew, so the time required for maintenance becomes significantly shorter.



5 Slider types have mounting holes compatible with the RCP2

Slider types have mounting holes that are compatible with RCP2 actuators, meaning that you can replace your current RCP2 actuator with a RCP4 with ease. Also, the mounting holes provided on rod types are the same as those provided on slider types, instead of T-slots found on the RCP2, and reamed holes are also provided to significantly improve installation repeatability.



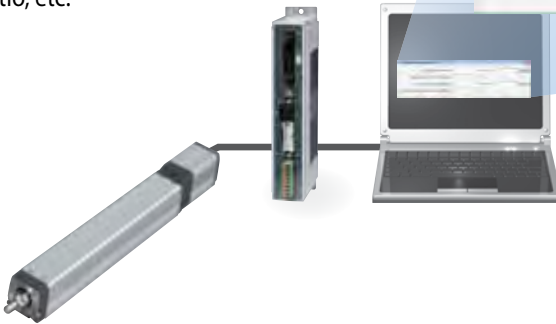
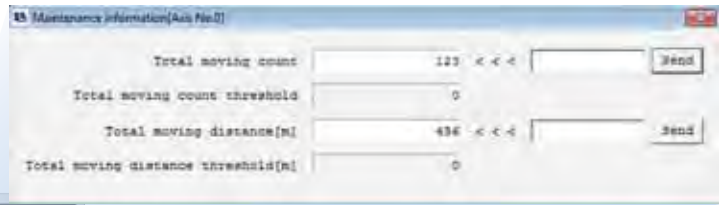
Features

New Functions to Enhance Maintainability

New Functions of Power CON 150 PCON-CA

6 Keep track of the production volume and utilization ratio with the total movement counter function

The total number of times the actuator has moved is counted and recorded in the controller, and a signal is output to an external device once the pre-defined count is exceeded. This function can be used to keep track of the production volume, utilization ratio, etc.



7 Know when to perform maintenance with the total travel counter function

The total distance travelled by the actuator is counted and recorded in the controller, and a signal is output to an external device once the pre-defined count is exceeded. By using this function, you know when to add grease or perform periodic maintenance.

8 Retain alarm generation times with the calendar function

The calendar function (clock function) lets you add timestamps to the history of alarms, etc. This information is useful in troubleshooting, etc.

Data type	Date	Alarm Details
Warning last	0FF PowerON No Error	00000000 21/11/14 11:07:00
History 1	0CE Control power voltage abnormal	00000000 21/11/14 10:04:00
History 2	0FF PowerON No Error	00000000 21/11/14 10:40:00
History 3	0CE Control power voltage abnormal	00000000 21/11/14 10:41:00
History 4	0FF PowerON No Error	00000000 21/11/14 10:50:00
History 5	0CE Control power voltage abnormal	00000000 21/11/14 10:51:00
History 6	0CE Control power voltage abnormal	00000000 21/11/14 10:50:00
History 7	0FF PowerON No Error	00000000 21/11/14 10:50:00
History 8		
History 9		
History 10		
History 11		
History 12		
History 13		
History 14		
History 15		

Optimal Operating Conditions Are Set Automatically

Takt time minimization function

9 Setting optimal operating conditions has become easier with the takt time minimization function

The takt time minimization function is a new feature added to the ROBO Cylinder PC software (Ver. 8.03.00.00 or later) and touch-panel teaching (model number CON-PTA). All you need is to connect the actuator to a controller supporting this function and enter the actuator model, load, etc., and optimal acceleration/deceleration and speed according to the load will be set automatically.

The first step to using the takt time minimization function is to set the model number of the actuator used and the load (mass) to be transported.

No	Position [mm]	Speed [mm/s]	ACC [G]	DCL [G]	Push [%]	LoTh [%]	Pos.band [mm]	Zone + [mm]	Zone - [mm]	ACC/DCL/ABS mode	Carr. INC	Stop Load Mode	VibSup No.	Comment
0														
1	0.00	420.00	0.30	0.30	0	0	0.10	0.00	0.00	0	0	0	0	
2	250.00	420.00	0.30	0.30	0	0	0.10	0.00	0.00	0	0	0	0	
3	175.00	420.00	0.30	0.30	0	0	0.10	0.00	0.00	0	0	0	0	

1. Setting the acceleration/deceleration from the speed

Enter a desired speed in the position data table, and the maximum settable acceleration/deceleration will be set automatically according to the pre-defined load-speed combinations.

2. Setting the acceleration/deceleration and speed from the travel

Specify the position data number associated with desired start/end positions of movement and set a desired travel distance, and the combination of acceleration/deceleration and speed that gives the shortest travel time will be set automatically.

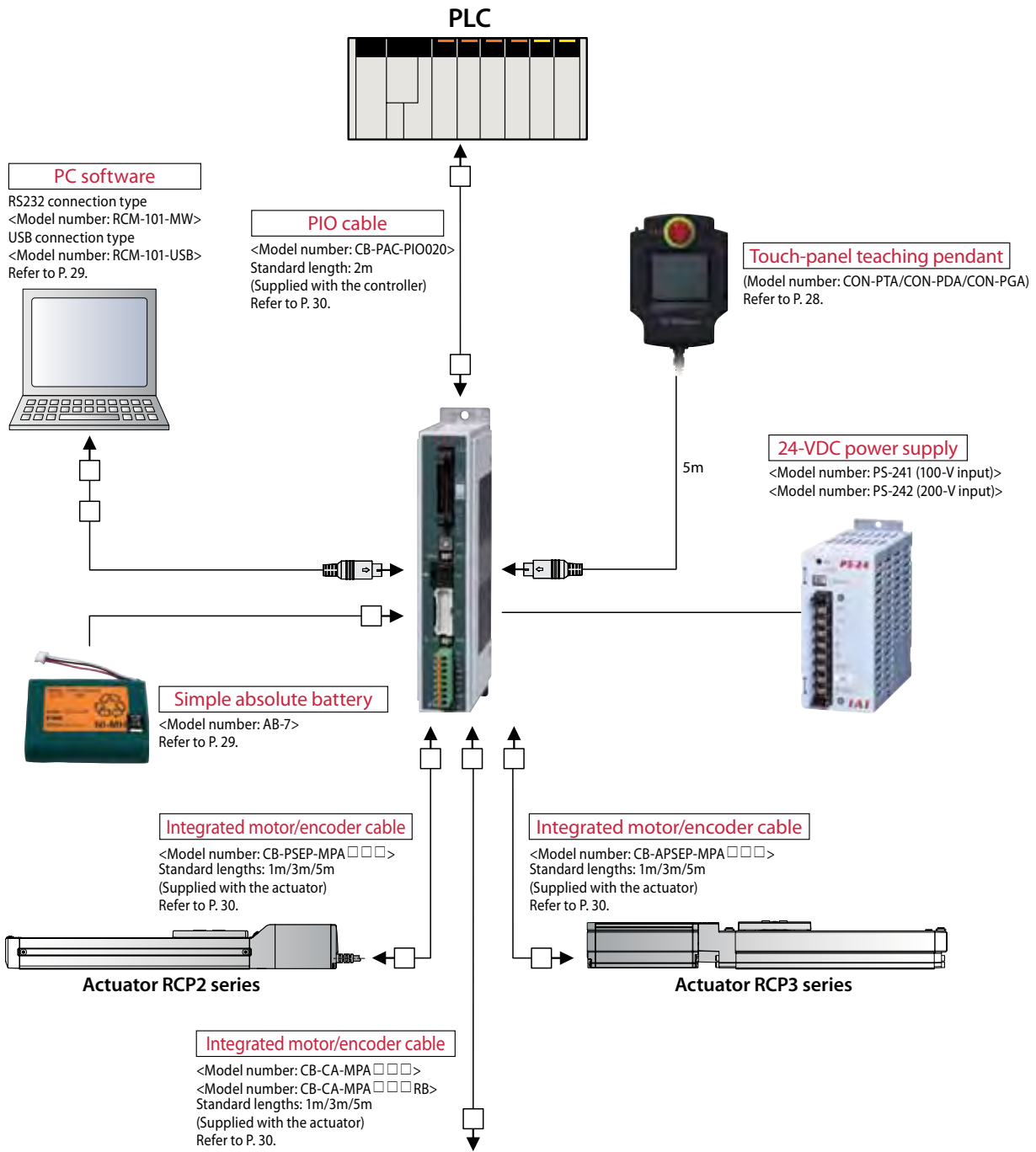
10 PIO control mode and pulse-train control mode to choose from

You can select a controller of one of two types: the positioner type where position numbers are specified by I/Os (input/output signals) from a PLC, etc., and the pulse-train type where the actuator is directly operated by sending pulses from a positioning unit. (Pulse-train controllers also support positioner operation using I/Os.)

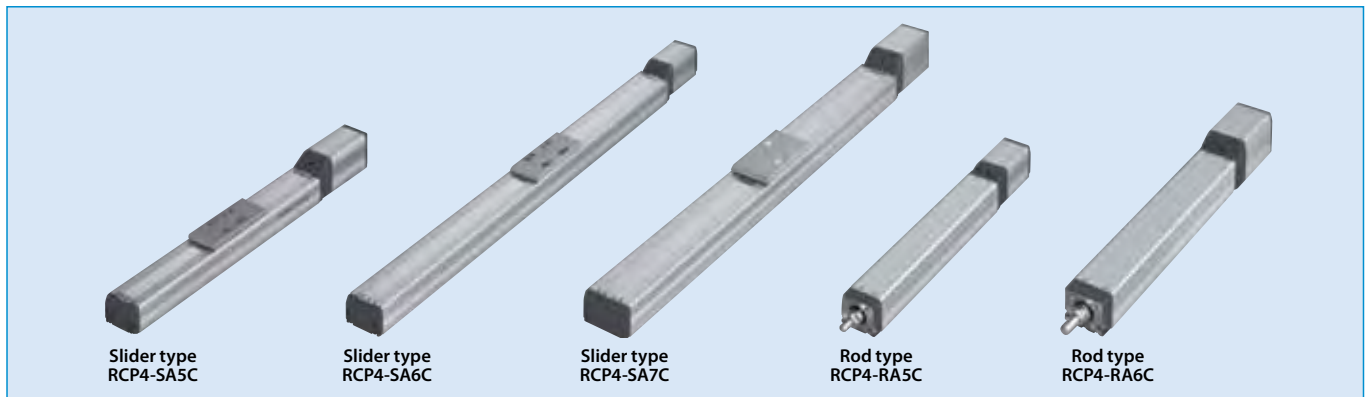
11 Motor silencer function

Typical operating noises of pulse motors are reduced at low speed.

System Configuration

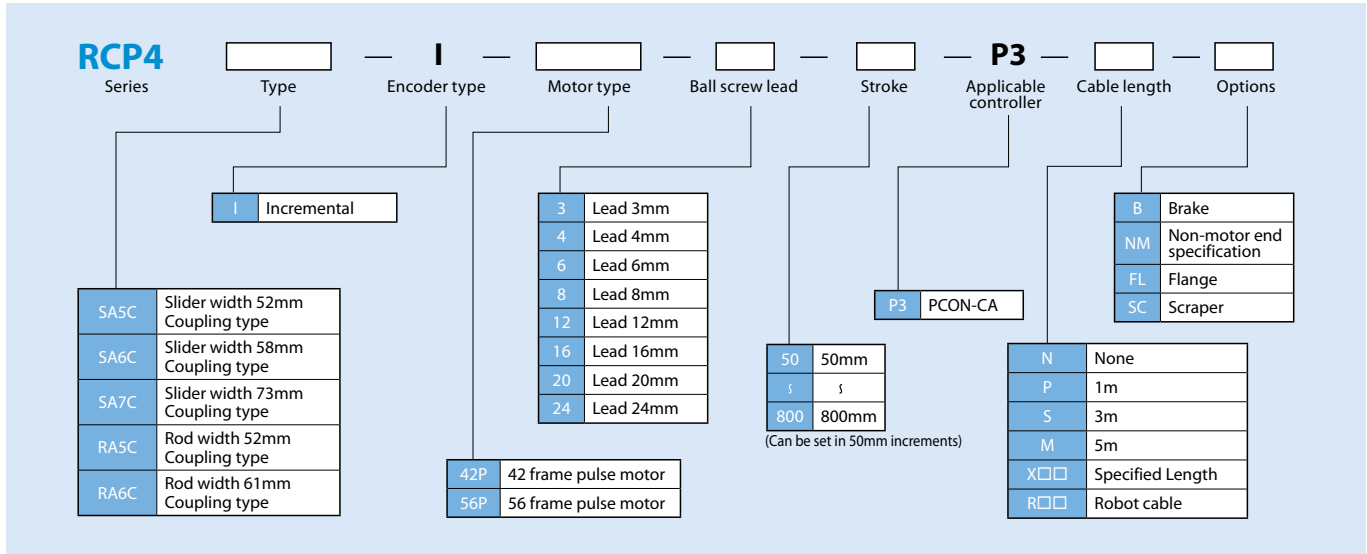


<RCP4 series>



Model Specification Items

Actuator



Actuator Options

Brake Option code: B

Applicable models

RCP4-SA5C/SA6C/SA7C/RA5C/RA6C

Description

A mechanism to hold the slider in place when the actuator is used vertically, so that it will not drop and damage the work part, etc., when the power or servo is turned off.

Non-motor end specification Option code: NM

Applicable models

RCP4-SA5C/SA6C/SA7C/RA5C/RA6C

Description

Select this option if you want to change the home position of the actuator slider or rod from the normal position (motor end) to the front end.

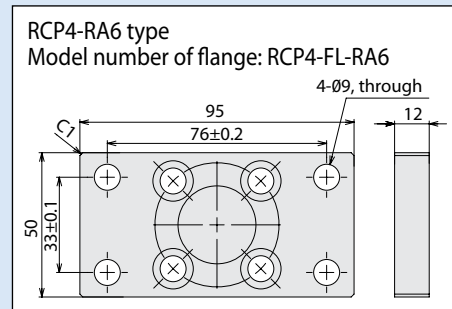
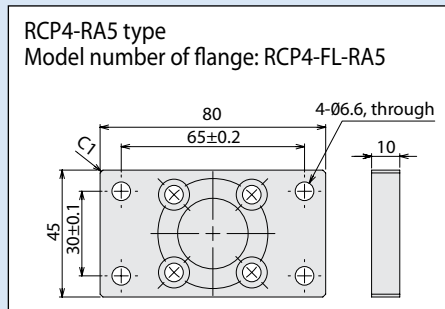
Flange Option code: FL

Applicable models

RCP4-SA5C/SA6C

Description

A bracket used to secure a rod actuator from the actuator side. The flange can be purchased separately later on.



Scraper Option code: SC

Applicable models

RCP4-RA5C/RA6C

Description

When a rod actuator is used, select this option if you want to prevent dust attached to the rod from entering the actuator.

RCP4-SA5C

ROBO Cylinder, Slider Type, Motor Unit Coupled, Actuator Width 52mm, 24-V Pulse Motor

Model Specification Items

RCP4 — **SA5C** — **I** — **42P** — — — **P3** — —

Series — Type — Encoder type — Motor type — Lead — Stroke — Applicable controller — Cable length — Options

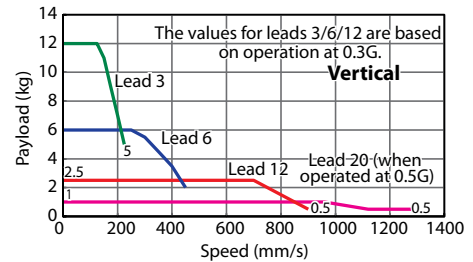
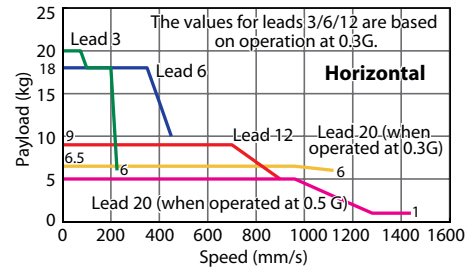
I: Incremental specification 42P: Pulse motor, size 42□ 20: 20mm 50: 50mm P3: PCON-CA N: None Refer to the options table below.
 12: 12mm ? 6: 6mm 800: 800mm (every 50mm) S: 3m M: 5m X□□: Specified length
 3: 3mm R□□: Robot cable



(1) The payload is the value when operated at 0.3 G acceleration. The upper limit of acceleration is 1 G (or 0.5 G in a vertical installation). Note that raising the acceleration causes the payload to drop. (Refer to P. 20.)

Correlation Diagrams of Speed and Payload

With the RCP4 series, due to the characteristics of the pulse motor, payload decreases as the speed increases. Use the chart below to confirm that the desired speed and payload requirements are met.



Actuator Specifications

Leads and Payloads

Model number	Lead (mm)	Maximum payload		Positioning repeatability (mm)	Stroke (mm)
		Horizontal (kg)	Vertical (kg)		
RCP4-SA5C-I-42P-20-①-P3-②-③	20	6.5	1	±0.03	50~800 (every 50mm)
RCP4-SA5C-I-42P-12-①-P3-②-③	12	9	2.5	±0.02	
RCP4-SA5C-I-42P-6-①-P3-②-③	6	18	6		
RCP4-SA5C-I-42P-3-①-P3-②-③	3	20	12		

Code explanation ① Stroke ② Cable length ③ Options

Stroke and Maximum Speed (See P20)

Stroke Lead	Stroke (mm)							
	50~450 (50mm)	500	550	600	650	700	750	800
20	1440 <1280>	1440 <1280>	1225	1045	900	785	690	610
12	900	795	665	570	490	425	375	330
6	450	395	335	285	245	215	185	165
3	225	195	165	140	120	105	90	80

The values in <> apply when the actuator is used vertically. (unit: mm/s)

① Stroke

Stroke (mm)	Standard price
50	—
100	—
150	—
200	—
250	—
300	—
350	—
400	—
450	—
500	—
550	—
600	—
650	—
700	—
750	—
800	—

③ Options

Name	Option code	See page	Standard price
Brake	B	—	—
Non-motor end specification	NM	—	—

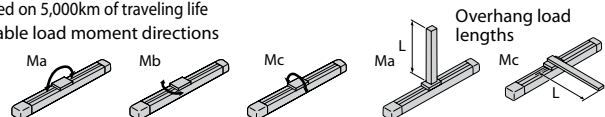
② Cable Length

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)	—

Actuator Specifications

Item	Description
Drive system	Ball screw Ø10mm, rolled C10
Lost motion	0.1mm or less
Base	Material: Aluminum with white alumite treatment
Guide	Linear guide
Dynamic allowable moment (*)	Ma: 4.9 N·m, Mb: 6.8 N·m, Mc: 11.7 N·m
Allowable overhang	150mm or less in Ma, Mb and Mc directions
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (Non-condensing)

(*) Based on 5,000km of traveling life
Allowable load moment directions



Dimensional Drawings

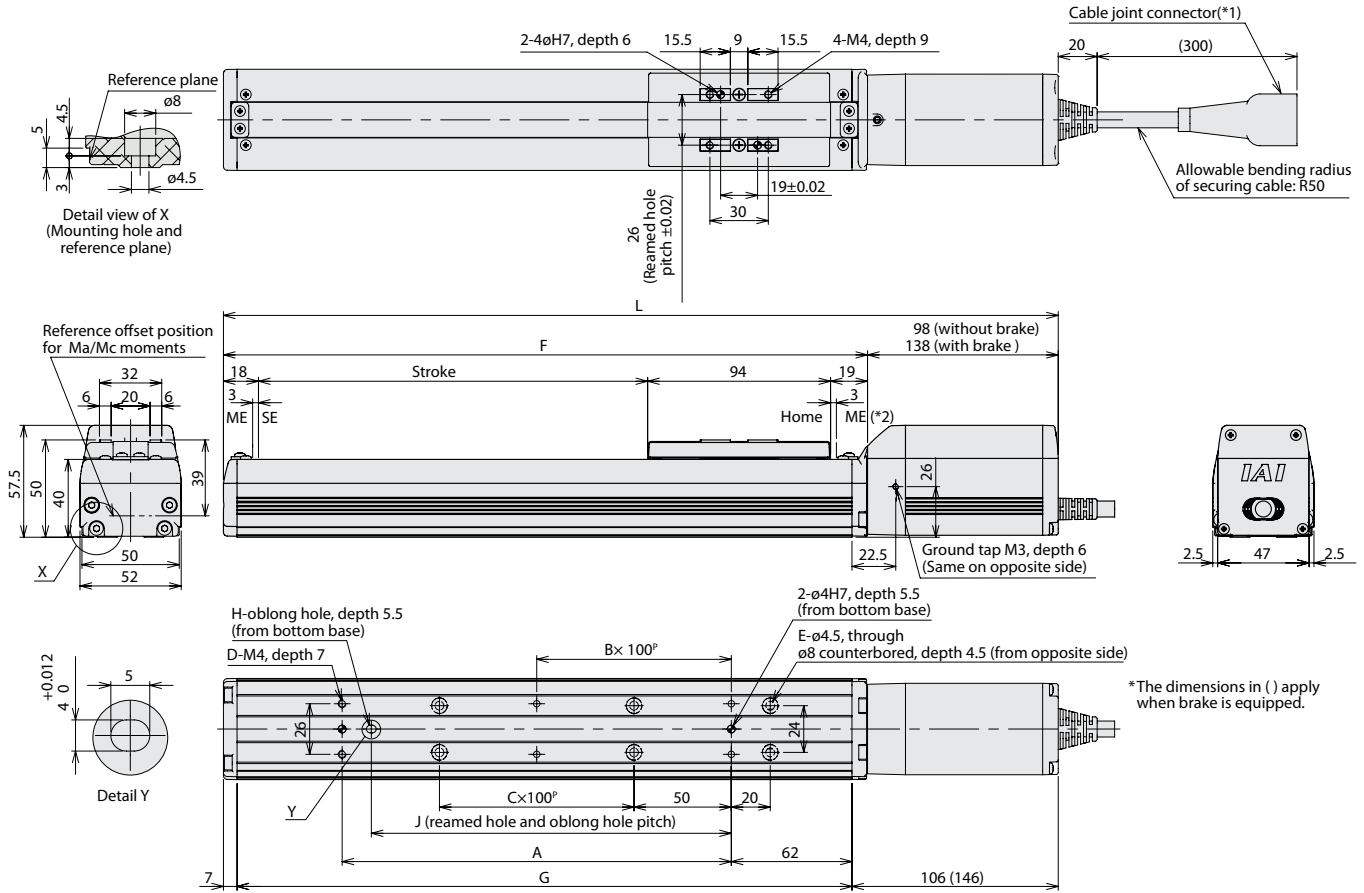
CAD drawings can be downloaded from the website.

www.intelligentactuator.com



*If the non-motor end specification is selected, reverse the dimension on motor end (distance to the home) and that on front end.

- *1 Connect the motor and encoder cables.
- *2 During home return, be careful to avoid interference from peripheral objects because the slider travels until the mechanical end.



■ Dimensions and Mass by Stroke

L	Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
	Without brake	279	329	379	429	479	529	579	629	679	729	779	829	879	929	979	1029
With brake	319	369	419	469	519	569	619	669	719	769	819	869	919	969	1019	1069	
A	73	100	100	200	200	300	300	400	400	500	500	600	600	700	700	800	
B	0	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	
C	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	
D	4	4	4	6	6	8	8	10	10	12	12	14	14	16	16	18	
E	4	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	
F	181	231	281	331	381	431	481	531	581	631	681	731	781	831	881	931	
G	166	216	266	316	366	416	466	516	566	616	666	716	766	816	866	916	
H	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
J	0	85	85	185	185	285	285	385	385	485	485	585	585	685	685	785	
Mass (kg)	Without brake	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.5	2.6	2.8	2.9	3.1	3.2	3.4	3.5	3.7
	With brake	1.7	1.9	2.0	2.1	2.3	2.4	2.6	2.7	2.9	3.0	3.2	3.3	3.5	3.6	3.7	3.9

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 (NPN specification)		PCON-CA-42PI-NP-□-0-□	Register positions to move the actuator into the controller beforehand, and specify the number corresponding to each desired position to operate the actuator.	512 points	DC24V	Refer to P. 27	—	P. 21
Positioner type (PNP specification)		PCON-CA-42PI-PN-□-0-□						
Pulse-train type (NPN specification)		PCON-CA-42PI-PLN-□-0-□	The actuator can be operated freely via pulse-train controller from an external output device.	—				
Pulse-train type (PNP specification)		PCON-CA-42PI-PLP-□-0-□						

* Refer to P. 22 for the details of the aforementioned model numbers.

RCP4-SA6C

ROBO Cylinder, Slider Type, Motor Unit Coupled, Actuator Width 58 mm, 24-V Pulse Motor

Model Specification Items

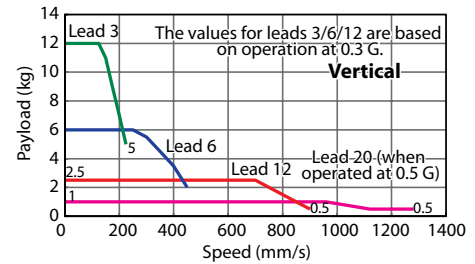
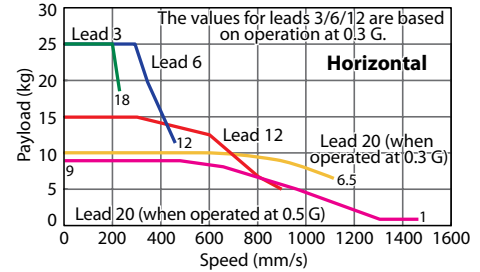
RCP4	SA6C	I	42P	<input type="checkbox"/>	<input type="checkbox"/>	P3	<input type="checkbox"/>	<input type="checkbox"/>
Series	Type	Encoder type	Motor type	Lead	Stroke	Applicable controller	Cable length	Options
		I: Incremental specification	42P: Pulse motor, size 42□	20: 20mm 12: 12mm 6: 6mm 3: 3mm	50: 50mm ? 800: 800mm (every 50mm)	P3: PCON-CA	N: None P: 1 m S: 3 m M: 5 m X□□: Specified length R□□: Robot cable	Refer to the options table below.



(1) The payload is the value when operated at 0.3 G acceleration. The upper limit of acceleration is 1 G (or 0.5 G in a vertical installation). Note that raising the acceleration causes the payload to drop. (Refer to P. 20.)

Correlation Diagrams of Speed and Payload

With the RCP4 series, due to the characteristics of the pulse motor, payload decreases as the speed increases. Use the chart below to confirm that the desired speed and payload requirements are met.



Actuator Specifications

Leads and Payloads

Model number	Lead (mm)	Maximum payload		Positioning repeatability (mm)	Stroke (mm)
		Horizontal (kg)	Vertical (kg)		
RCP4-SA6C-I-42P-20-①-P3-②-③	20	10	1	±0.03	50~800 (every 50mm)
RCP4-SA6C-I-42P-12-①-P3-②-③	12	15	2.5	±0.02	
RCP4-SA6C-I-42P-6-①-P3-②-③	6	25	6		
RCP4-SA6C-I-42P-3-①-P3-②-③	3	25	12		

Code explanation ① Stroke ② Cable length ③ Options

Stroke and Maximum Speed (See P20)

Stroke / Lead	Maximum Speed (mm/s)							
	50-450 (50mm)	500 (mm)	550 (mm)	600 (mm)	650 (mm)	700 (mm)	750 (mm)	800 (mm)
20	1440 <1280>	1440 <1280>	1230	1045	905	785	690	615
12	900	795	670	570	490	430	375	335
6	450	395	335	285	245	215	185	165
3	225	195	165	140	120	105	90	80

The values in <> apply when the actuator is used vertically.

(unit: mm/s)

① Stroke

Stroke (mm)	Standard price
50	—
100	—
150	—
200	—
250	—
300	—
350	—
400	—
450	—
500	—
550	—
600	—
650	—
700	—
750	—
800	—

③ Options

Title	Option code	See page	Standard price
Brake	B	—	—
Non-motor end specification	NM	—	—

② Cable Length

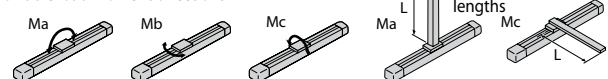
Type	Cable symbol	Standard price
Standard type	P (1m)	—
	S (3m)	—
	M (5m)	—
Special length	X06 (6m) ~X10 (10m)	—
	X11 (11m) ~X15 (15m)	—
	X16 (16m) ~X20 (20m)	—
	R01 (1m) ~R03 (3m)	—
Robot cable	R04 (4m) ~R05 (5m)	—
	R06 (6m) ~R10 (10m)	—
	R11 (11m) ~R15 (15m)	—
	R16 (16m) ~R20 (20m)	—

Actuator Specifications

Item	Description
Drive system	Ball screw ϕ 10mm, rolled C10
Lost motion	0.1mm or less
Base	Material: Aluminum with white alumite treatment
Guide	Linear guide
Dynamic allowable moment (*)	Ma: 8.9 N·m, Mb: 12.7 N·m, Mc: 18.6 N·m
Allowable overhang	220mm or less in Ma, Mb and Mc directions
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (Non-condensing)

(*) Based on 5,000km of traveling life

Allowable load moment directions



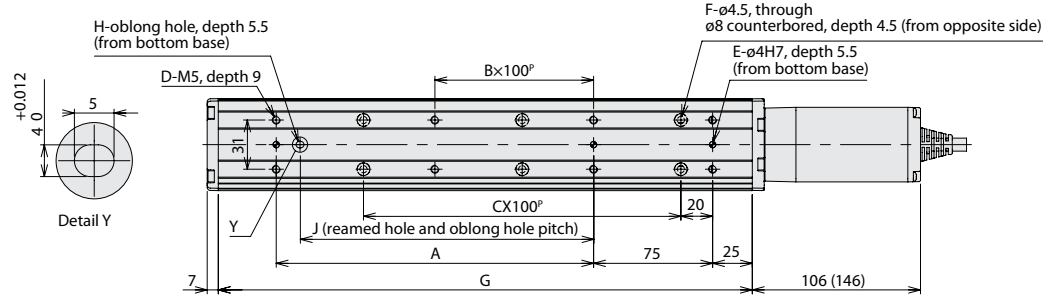
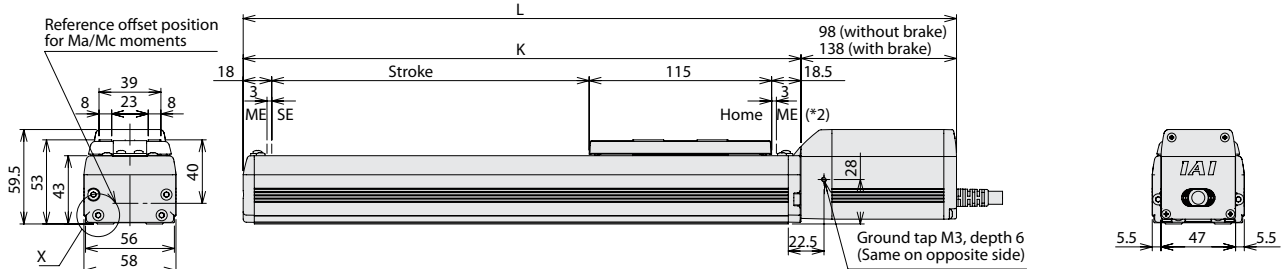
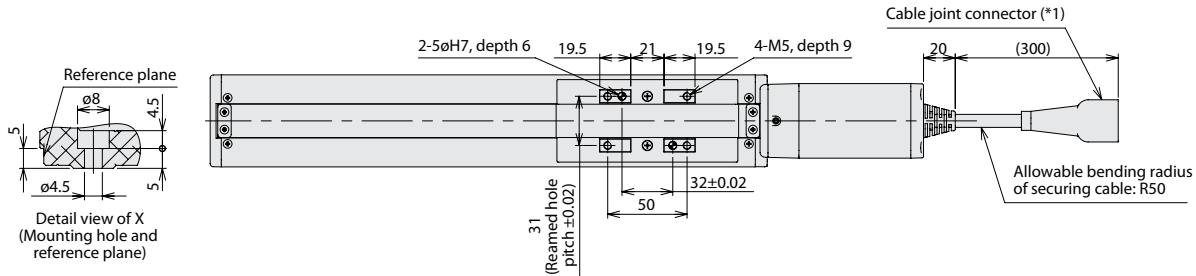
CAD drawings can be downloaded from the website.

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*If the non-motor end specification is selected, reverse the dimension on motor end (distance to the home) and that on front end.

- *1 Connect the motor and encoder cables.
- *2 During home return, be careful to avoid interference from peripheral objects because the slider travels until the mechanical end.



* The dimensions in () apply when a brake is equipped.

■ Dimensions and Mass by Stroke

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	
L	Without brake	299.5	349.5	399.5	449.5	499.5	549.5	599.5	649.5	699.5	749.5	799.5	849.5	899.5	949.5	999.5	1049.5
	With brake	339.5	389.5	439.5	489.5	539.5	589.5	639.5	689.5	739.5	789.5	839.5	889.5	939.5	989.5	1039.5	1089.5
A	0	100	100	200	200	300	300	400	400	500	500	600	600	700	700	800	
B	0	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	
C	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	
D	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	
E	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
F	4	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	
G	186.5	236.5	286.5	336.5	386.5	436.5	486.5	536.5	586.5	636.5	686.5	736.5	786.5	836.5	886.5	936.5	
H	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
J	0	85	85	185	185	285	285	385	385	485	485	585	585	685	685	785	
K	201.5	251.5	301.5	351.5	401.5	451.5	501.5	551.5	601.5	651.5	701.5	751.5	801.5	851.5	901.5	951.5	
Mass (kg)	Without brake	2.0	2.1	2.3	2.4	2.6	2.7	2.9	3.0	3.2	3.4	3.5	3.7	3.8	4.0	4.1	4.3
	With brake	2.2	2.3	2.5	2.6	2.8	3.0	3.1	3.3	3.4	3.6	3.7	3.9	4.1	4.2	4.4	4.5

Applicable Controller

PCP4 series actuators can be operated with the controller indicated below. Select the type according to your intended application.

Title	External view	Model number	Features	Maximum number of positioning points	Input power	Power supply capacity	Standard price	Reference page
Positioner type (NPN specification)		PCON-CA-42PI-NP-□-0-□	Register positions to move the actuator into the controller beforehand, and specify the number corresponding to each desired position to operate the actuator.	512 points	DC24V	Refer to P.27	—	P. 21
Positioner type (PNP specification)		PCON-CA-42PI-PN-□-0-□						
Pulse-train type (NPN specification)		PCON-CA-42PI-PLN-□-0-□	The actuator can be operated freely via pulse-train controller from an external output device.	—			—	
Pulse-train type (PNP specification)		PCON-CA-42PI-PLP-□-0-□						

* Refer to P.22 for the details of the aforementioned model numbers.

RCP4-SA7C

ROBO Cylinder, Slider Type, Motor Unit Coupled, Actuator Width 73mm, 24-V Pulse Motor

Model Specification Items

RCP4 — **SA7C** — **I** — **56P** — — — **P3** — —

Series — Type — Encoder type — Motor type — Lead — Stroke — Applicable controller — Cable length — Options

I: Incremental specification 56P: Pulse motor, size 56□ 24: 24mm
16: 16mm 8: 8mm 4: 4mm 50: 50mm ?
800: 800mm (every 50mm)

P3: PCON-CA N: None P: 1m S: 3m M: 5m X□□: Specified length R□□: Robot cable

Refer to the options table below.

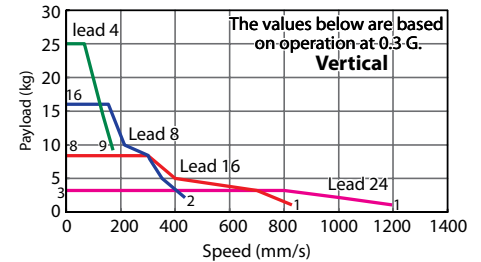
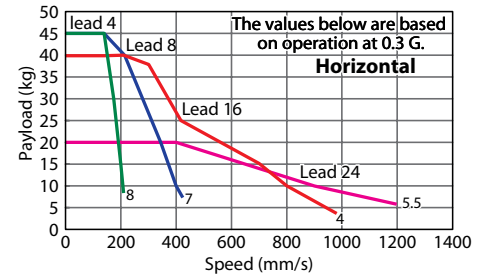


POINT
Notes on selection

(1) The payload is the value when operated at 0.3 G acceleration. The upper limit of acceleration is 1 G (or 0.5 G in a vertical installation). Note that raising the acceleration causes the payload to drop. (Refer to P. 20.)

Correlation Diagrams of Speed and Payload

With the RCP4 series, due to the characteristics of the pulse motor, payload decreases as the speed increases. Use the chart below to confirm that the desired speed and payload requirements are met.



Actuator Specifications

Leads and Payloads

Model number	Lead (mm)	Maximum payload		Positioning repeatability (mm)	Stroke (mm)
		Horizontal (kg)	Vertical (kg)		
RCP4-SA7C-I-56P-24-①-P3-②-③	24	20	3	±0.03	50~800 (every 50mm)
RCP4-SA7C-I-56P-16-①-P3-②-③	16	40	8	±0.02	
RCP4-SA7C-I-56P-8-①-P3-②-③	8	45	16		
RCP4-SA7C-I-56P-4-①-P3-②-③	4	45	25		

Code explanation ① Stroke ② Cable length ③ Options

Stroke and Maximum Speed (See P20)

Stroke / Lead	50~550 (50mm)	600 (mm)	650 (mm)	700 (mm)	750 (mm)	800 (mm)
	24	1200	1200	1155	1010	890
16	980 <840>	865 <840>	750	655	580	515
8	490	430	375	325	290	255
4	245 <210>	215 <210>	185	160	145	125

The values in < > apply when the actuator is used vertically. (Unit: mm/s)

① Stroke

Stroke (mm)	Standard price
50	—
100	—
150	—
200	—
250	—
300	—
350	—
400	—
450	—
500	—
550	—
600	—
650	—
700	—
750	—
800	—

③ Options

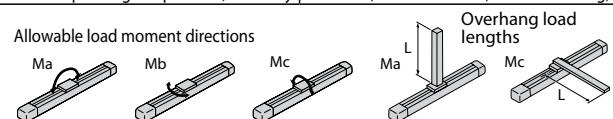
Name	Option code	See page	Standard price
Brake	B	—	—
Non-motor end specification	NM	—	—

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)	—

Actuator Specifications

Item	Description
Drive system	Ball screw Ø12mm, rolled C10
Lost motion	0.1mm or less
Base	Material: Aluminum with white alumite treatment
Guide	Linear guide
Dynamic allowable moment (*)	Ma: 13.9 N·m, Mb: 19.9 N·m, Mc: 38.3 N·m
Allowable overhang	230mm or less in Ma, Mb and Mc directions
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (Non-condensing)



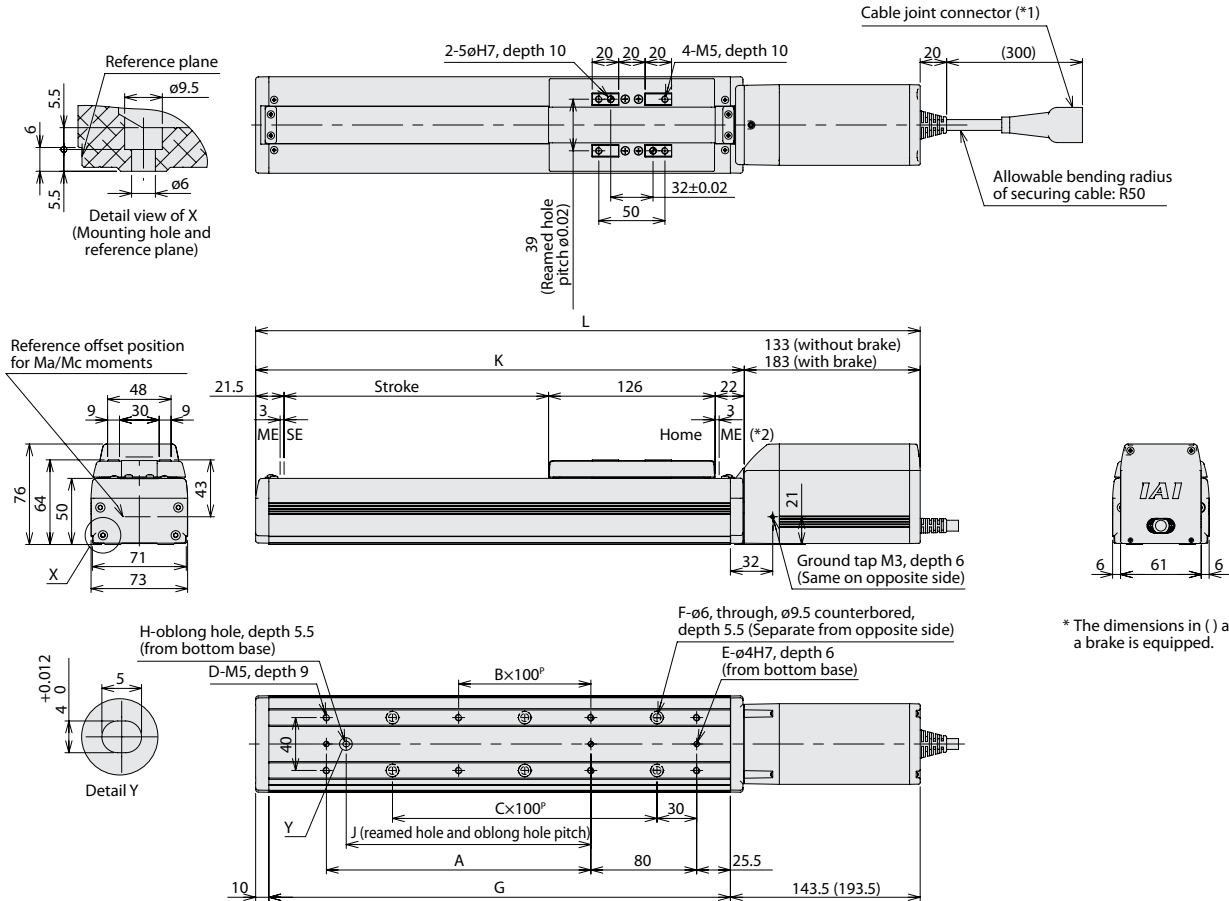
CAD drawings can be downloaded from the website.

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*If the non-motor end specification is selected, reverse the dimension on motor end (distance to the home) and that on front end.

- *1 Connect the motor and encoder cables.
- *2 During home return, be careful to avoid interference from peripheral objects because the slider travels until the mechanical end.



* The dimensions in () apply when a brake is equipped.

■ Dimensions and Mass by Stroke

L	Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
	Without brake	352.5	402.5	452.5	502.5	552.5	602.5	652.5	702.5	752.5	802.5	852.5	902.5	952.5	1002.5	1052.5	1102.5
With brake	402.5	452.5	502.5	552.5	602.5	652.5	702.5	752.5	802.5	852.5	902.5	952.5	1002.5	1052.5	1102.5	1152.5	1152.5
A	0	100	100	200	200	300	300	400	400	500	500	600	600	700	700	800	800
B	0	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7
C	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	8
D	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
E	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
F	4	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	18
G	199	249	299	349	399	449	499	549	599	649	699	749	799	849	899	949	949
H	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
J	0	85	85	185	185	285	285	385	385	485	485	585	585	685	685	785	785
K	219.5	269.5	319.5	369.5	419.5	469.5	519.5	569.5	619.5	669.5	719.5	769.5	819.5	869.5	919.5	969.5	969.5
Mass (kg)	Without brake	3.4	3.6	3.8	4.1	4.3	4.6	4.8	5.1	5.3	5.6	5.8	6.0	6.3	6.5	6.8	7.0
	With brake	3.9	4.1	4.3	4.6	4.8	5.1	5.3	5.6	5.8	6.1	6.3	6.5	6.8	7.0	7.3	7.5

Applicable Controller

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

Title	External view	Model number	Features	Maximum number of positioning points	Input power	Power supply capacity	Standard price	Reference page
Positioner type (NPN specification)		PCON-CA-56PI-NP-□-0-□	Register positions to move the actuator into the controller beforehand, and specify the number corresponding to each desired position to operate the actuator.	512 points	DC24V	Refer to P.27	—	P. 21
Positioner type (PNP specification)		PCON-CA-56PI-PN-□-0-□						
Pulse-train type (NPN specification)		PCON-CA-56PI-PLN-□-0-□	The actuator can be operated freely via pulse-train controller from an external output device.	—			—	
Pulse-train type (PNP specification)		PCON-CA-56PI-PLP-□-0-□						

* Refer to P.22 for the details of the aforementioned model numbers.

RCP4-RA5C

ROBO Cylinder, Rod Type, Motor Unit Coupled, Actuator Width 52 mm, 24-V Pulse Motor

Model Specification Items

RCP4	RA5C	I	42P			P3		
Series	Type	Encoder type	Motor type	Lead	Stroke	Applicable controller	Cable length	Options
		I: Incremental specification	42P: Pulse motor, size 42□	20: 20 mm 12: 12 mm 6: 6 mm 3: 3 mm	50: 50 mm 400: 400mm (every 50mm)	P3: PCON-CA	N: None P: 1 m S: 3 m M: 5 m X□: Specified length R□: Robot cable	Refer to the options table below.

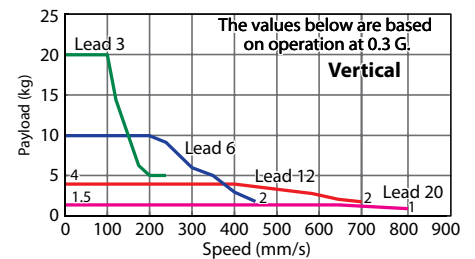
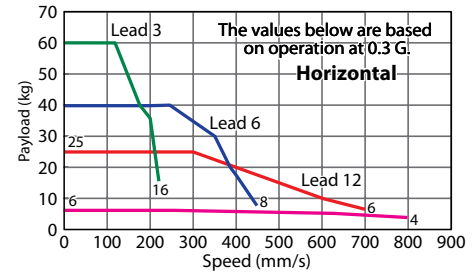
Built-in guide mechanism



(1) The payload is the value when operated at 0.3 G acceleration. The upper limit of acceleration is 1 G (or 0.5 G in a vertical installation). Note that raising the acceleration causes the payload to drop. (Refer to P. 20.)

Correlation Diagrams of Speed and Payload

With the RCP4 series, due to the characteristics of the pulse motor, payload decreases as the speed increases. Use the chart below to confirm that the desired speed and payload requirements are met.



Actuator Specifications

Leads and Payloads

Model number	Lead (mm)	Maximum payload		Maximum push force (N)	Positioning repeatability (mm)	Stroke (mm)
		Horizontal (kg)	Vertical (kg)			
RCP4-RA5C-I-42P-20-①-P3-②-③	20	6	1.5	56	±0.03	50~400 (every 50mm)
RCP4-RA5C-I-42P-12-①-P3-②-③	12	25	4	93	±0.02	
RCP4-RA5C-I-42P-6-①-P3-②-③	6	40	10	185		
RCP4-RA5C-I-42P-3-①-P3-②-③	3	60	20	370		

Stroke and Maximum Speed (See P20)

Lead	Stroke	50~400 (every 50mm)
		Maximum Speed (mm/s)
20	800	
12	700	
6	450	
3	225	

(unit: mm/s)

Code explanation ① Stroke ② Cable length ③ Options

① Stroke

Stroke (mm)	Standard price
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)	—

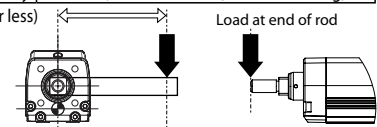
③ Options

Name	Option code	See page	Standard price
Brake	B	—	—
Flange bracket	FL	—	—
Non-motor end specification	NM	—	—
Scraper	SC	—	—

Actuator Specifications

Item	Description
Drive system	Ball screw Ø10 mm, rolled C10
Lost motion	0.1mm or less
Rod	Ø22 stainless steel pipe
Rod non-rotation precision	±0.1 deg
Allowable load/torque at end of rod	Refer to the table on the facing page.
Load offset distance at end of rod	100mm or less
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

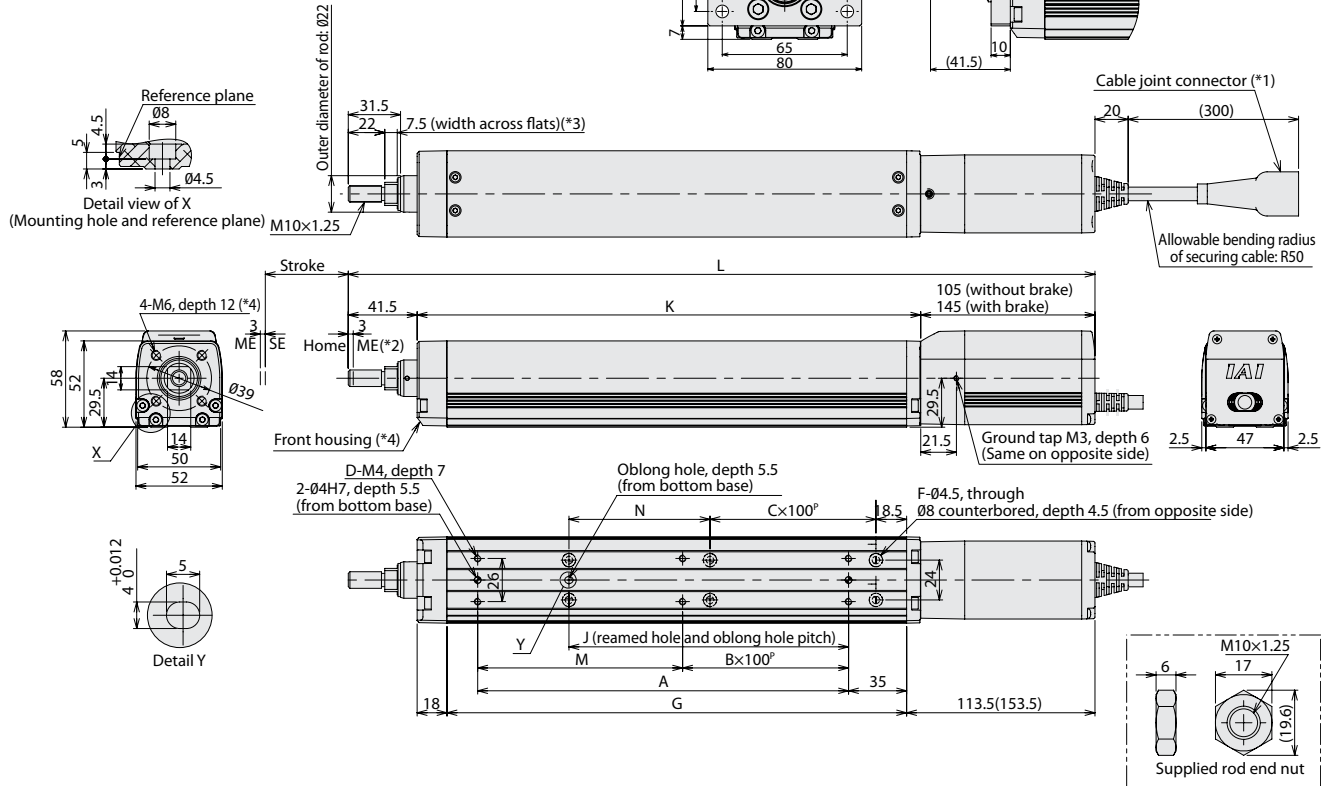
CAD drawings can be downloaded from the website.

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2D CAD

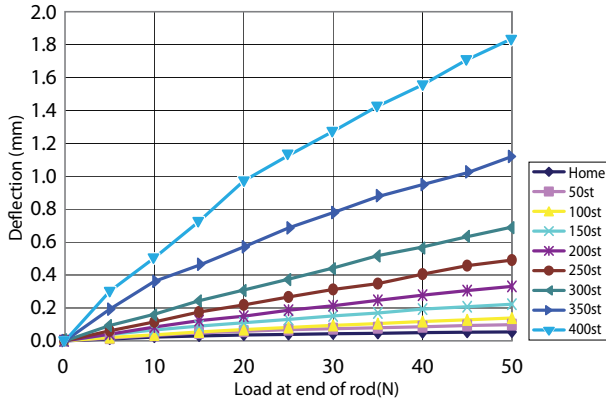
*If the non-motor end specification is selected, reverse the dimension on motor end (distance to the home) and that on front end.

- *1 Connect the motor and encoder cables.
- *2 During home return, be careful to avoid interference from peripheral objects because the slider travels until the mechanical end.
- *3 The direction of width across flats varies depending on the product.
- *4 If the actuator is installed using the front housing and flange, make sure the actuator will not receive any external force.
(For details, refer to "Notes on Installing Rod Actuators" on P. 19.)



■ Rod Deflection of RCP4-RA5C (Reference Values)

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



■ Dimensions and Mass by Stroke

Stroke	50	100	150	200	250	300	350	400	
L	Without brake	300	350	400	450	500	550	600	650
	With brake	340	390	440	490	540	590	640	690
A	73.5	123.5	173.5	223.5	273.5	323.5	373.5	423.5	
B	0	0	1	1	2	2	3	3	
C	0	0	0	1	1	2	2	3	
D	4	4	6	6	8	8	10	10	
F	4	4	4	6	6	8	8	10	
G	127	177	227	277	327	377	427	477	
J	18.5	68.5	118.5	168.5	218.5	268.5	318.5	368.5	
K	153.5	203.5	253.5	303.5	353.5	403.5	453.5	503.5	
M	73.5	123.5	73.5	123.5	73.5	123.5	73.5	123.5	
N	35	85	135	85	135	85	135	85	
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 offset 0mm	32.4	23.6	18.1	14.4	11.6	9.5	7.7	6.2	
load at end of rod (N) Load offset 100mm	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	1.9	2.1	2.4	2.7	2.9	3.2	3.4	3.7
	With brake	2.1	2.4	2.6	2.9	3.1	3.4	3.7	3.9

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 (NPN specification)		PCON-CA-42PI-NP-□-0-□	Register positions to move the actuator to in the controller beforehand, and specify the number corresponding to each desired position to operate the actuator.	512 points	DC24V	Refer to P. 27	—	P. 21
Positioner type (PNP specification)		PCON-CA-42PI-PN-□-0-□						
Pulse-train type (NPN specification)		PCON-CA-42PI-PLN-□-0-□	The actuator can be operated freely via pulse-train controller from an external output device.					
Pulse-train type (PNP specification)		PCON-CA-42PI-PLP-□-0-□						

* Refer to P. 22 for the details of the aforementioned model numbers.

RCP4-RA6C

ROBO Cylinder, Rod Type, Motor Unit Coupled, Actuator Width 61mm, 24-V Pulse Motor

Model Specification Items

RCP4 — **RA6C** — **I** — **56P** — — — **P3** — —

Series — Type — Encoder type — Motor type — Lead — Stroke — Applicable controller — Cable length — Options

I: Incremental specification
56P: Pulse motor, size 56□
24: 24mm
16: 16mm
8: 8mm
4: 4mm
50: 50mm
500: 500mm (every 50mm)
P3: PCON-CA
N: None
P: 1 m
S: 3 m
M: 5 m
X□□: Specified length
R□□: Robot cable
Refer to the options table below.

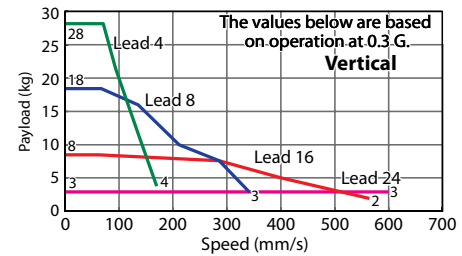
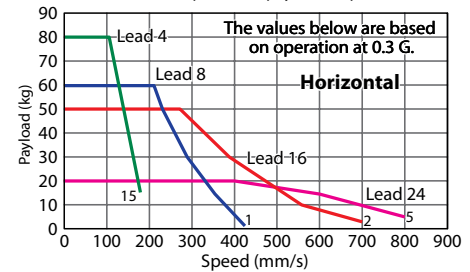
Built-in guide mechanism



(1) The payload is the value when operated at 0.3 G acceleration. The upper limit of acceleration is 1 G (or 0.5 G in a vertical installation). Note that raising the acceleration causes the payload to drop. (Refer to P. 20.)

Correlation Diagrams of Speed and Payload

With the RCP4 series, due to the characteristics of the pulse motor, payload decreases as the speed increases. Use the chart below to confirm that the desired speed and payload requirements are met.



Actuator Specifications

Leads and Payloads

Model number	Lead (mm)	Maximum payload		Maximum push force (N)	Positioning repeatability (mm)	Stroke (mm)
		Horizontal (kg)	Vertical (kg)			
RCP4-RA6C-I-56P-24-①-P3-②-③	24	20	3	182	±0.03	50~500 (every 50mm)
RCP4-RA6C-I-56P-16-①-P3-②-③	16	50	8	273	±0.02	
RCP4-RA6C-I-56P-8-①-P3-②-③	8	60	18	547		
RCP4-RA6C-I-56P-4-①-P3-②-③	4	80	28	1094		

Code explanation ① Stroke ② Cable length ③ Options

Stroke and Maximum Speed (See P20)

Lead	Stroke	50~500 (every 50mm)
		24
16	700 <560>	
8	420	
4	210	

The values in <> apply when the actuator is used vertically. (Unit: mm/s)

① Stroke

Stroke (mm)	Standard price
50	—
100	—
150	—
200	—
250	—
300	—
350	—
400	—
450	—
500	—

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)	—

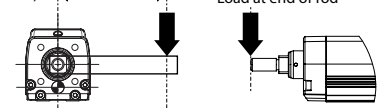
③ Options

Name	Option code	See page	Standard price
Brake	B	—	—
Flange bracket	FL	—	—
Non-motor end specification	NM	—	—
Scraper	SC	—	—

Actuator Specifications

Item	Description
Drive system	Ball screw ϕ 12 mm, rolled C10
Lost motion	0.1mm or less
Rod	ϕ 25 stainless steel pipe
Rod non-rotation precision	±0.1 deg
Allowable load/torque at end of rod	Refer to the table on the facing page.
Load offset distance at end of rod	100mm or less
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

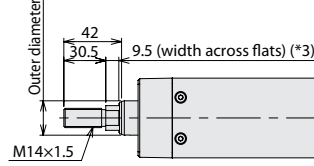
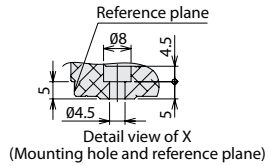
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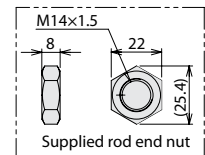
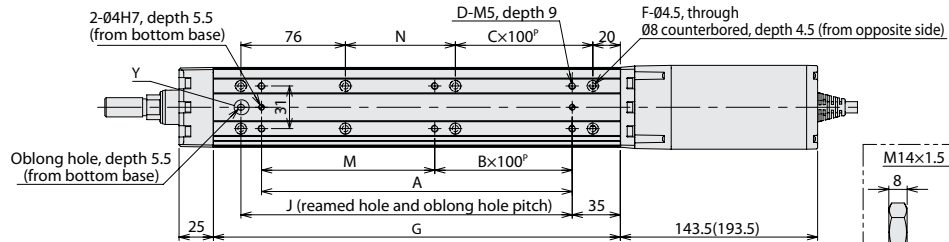
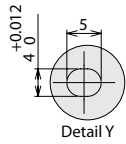
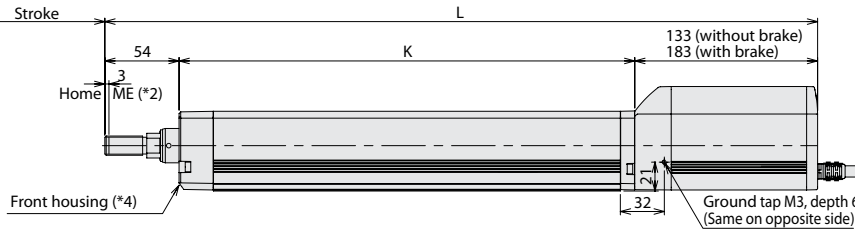
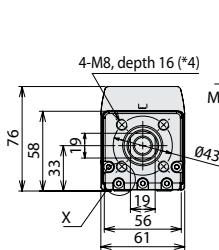
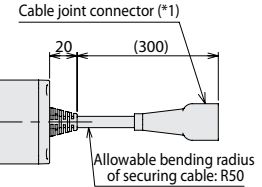
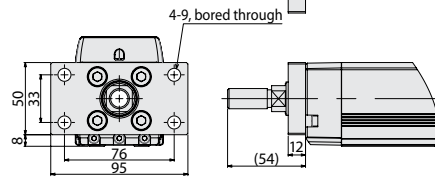
2D CAD

*If the non-motor end specification is selected, reverse the dimension on motor end (distance to the home) and that on front end.

- *1 Connect the motor and encoder cables.
- *2 During home return, be careful to avoid interference from peripheral objects because the slider travels until the mechanical end.
- *3 The direction of width across flats varies depending on the product.
- *4 If the actuator is installed using the front housing and flange, make sure the actuator will not receive any external force.
(For details, refer to "Notes on Installing Rod Actuators" on P. 19.)

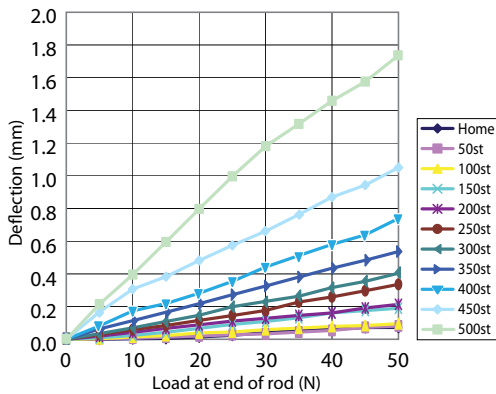


Dimensions with Flange (Optional) (*4)



Rod Deflection of RCP4-RA6C (Reference Values)

(The graph below plots deflection as measured by installing the actuator vertically and applying a radial 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	368.5	418.5	468.5	518.5	568.5	618.5	668.5	718.5	768.5	818.5
	With brake	418.5	468.5	518.5	568.5	618.5	668.5	718.5	768.5	818.5	868.5
A	76	126	176	226	276	326	376	426	476	526	
B	0	0	1	1	2	2	3	3	4	4	
C	0	0	0	1	1	2	2	3	3	4	
D	4	4	6	6	8	8	10	10	12	12	
F	6	6	6	8	8	10	10	12	12	14	
G	146	196	246	296	346	396	446	496	546	596	
J	91	141	191	241	291	341	391	441	491	541	
K	181.5	231.5	281.5	331.5	381.5	431.5	481.5	531.5	581.5	631.5	
M	76	126	176	226	276	326	376	426	476	526	
N	30	80	130	80	130	80	130	80	130	80	
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
	Load offset 0mm	49.0	37.4	29.9	24.5	20.4	17.1	14.5	12.3	10.3	8.6
Allowable dynamic load at end of rod (N)		38.7	31.0	25.5	21.4	18.1	15.4	13.2	11.2	9.5	8.0
	Load offset 100mm	11.4	9.3	7.9	6.8	6.0	5.4	4.9	4.5	4.1	3.8
Allowable static 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
		3.9	3.1	2.5	2.1	1.8	1.5	1.3	1.1	1.0	0.8
Mass (kg)		3.4	3.7	4.1	4.4	4.7	5.0	5.4	5.7	6.0	6.3
	With brake	3.9	4.2	4.6	4.9	5.2	5.5	5.9	6.2	6.5	6.8

Applicable Controller

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

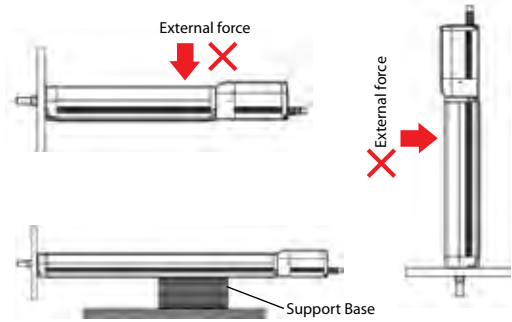
Name	External view	Model number	Features	Maximum number of positioning points	Input power	Power supply capacity	Standard price	Reference page
Positioner type (NPN specification)		PCON-CA-56PI-NP-□-0-□	Register positions to move the actuator to in the controller beforehand, and specify the number corresponding to each desired position to operate the actuator.	512 points	DC24V	Refer to P. 27	—	P. 21
Positioner type (PNP specification)		PCON-CA-56PI-PN-□-0-□						
Pulse-train type (NPN specification)		PCON-CA-56PI-PLN-□-0-□	The actuator can be operated freely via pulse-train controller from an external output device.	—			—	
Pulse-train type (PNP specification)		PCON-CA-56PI-PLP-□-0-□						

* Refer to P. 22 for the details of the aforementioned model numbers.

Notes on Installing Rod Actuators

When installing the actuator using the front housing or with a flange (optional), make sure the actuator will not receive external forces. (External forces may cause malfunction or damaged parts.) If the actuator will receive external forces or when the actuator is combined with a Cartesian robot, etc., use the mounting holes on the actuator base to secure the actuator.

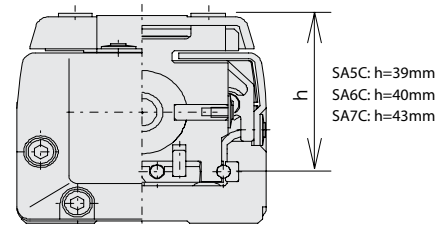
Even if the actuator will not receive external forces, provide a support base as shown in the figure on the right to support the actuator if the actuator is installed horizontally and operated over a stroke of 150 or more. (It is recommended that a support base be installed whenever possible even if the stroke is 150 or less.)



Selection Guideline (Correlation Diagram of Push Force and Current-limiting Value)

In push-motion operation, the push force can be used by changing the current-limiting value of the controller over a range of 20% to 70%. The maximum push-force varies depending on the model, so check the required push force from the table below and select an appropriate type meeting the purpose of use.

When performing push-motion operation using a slider actuator, limit the push current so that the reactive force moment generated by the push force will not exceed 80% of the rated moment (M_a , M_b) specified in the catalog. To help with the moment calculations, the application position of the guide moment is shown in the figure below. Calculate the necessary moment by considering the offset of the push force application position.

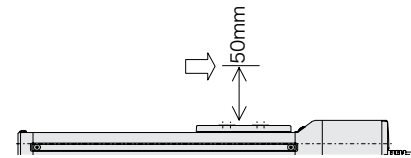


Note that if an excessive force exceeding the rated moment is applied, the guide may be damaged and the life may become shorter. Accordingly, include a sufficient safety factor when deciding on the push force.

Calculation example)

If push-motion operation is performed with a RCP4-SA7C by applying 100 N at the position shown to the right, the moment received by the guide, or M_a , is calculated as $(43 + 50) \times 100 = 9300 \text{ (N}\cdot\text{mm)} = 9.3 \text{ (N}\cdot\text{m)}$.

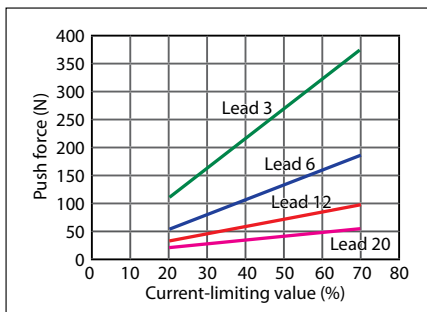
Since the rated moment M_a of the SA7C is 13.9 (N·m), $13.9 \times 0.8 = 11.12 > 9.3$, suggesting that this selection is acceptable. If a M_b moment generates due to push-motion operation, calculate the moment from the overhang and confirm, in the same way, that the calculated moment is within 80% of the rated moment.



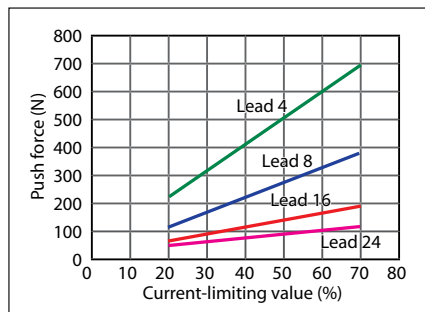
Correlation Diagrams of Push Force and Current-limiting value

The table below is only a reference, and the graphs may vary slightly from the actual values.

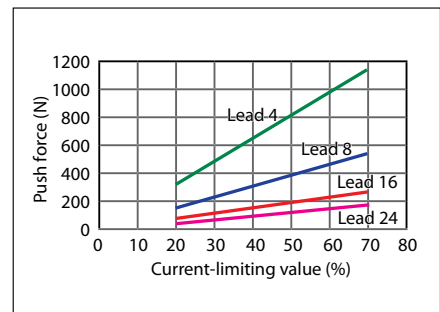
SA5C/SA6C/RA5C type



SA7C type



RA6C type

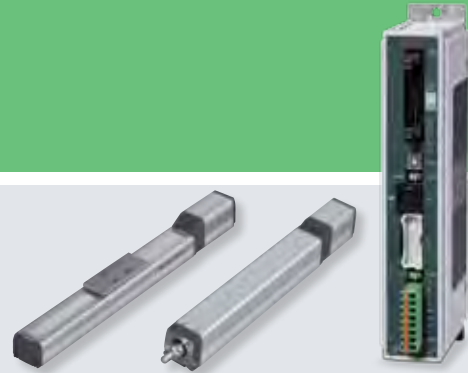


Notes on Use

- The relationship of push force and current-limiting value is only a reference, and the graphs may vary slightly from the actual values.
- If the current-limiting value is less than 20%, the push force may vary. Make sure the current-limiting value remains 20% or more.
- The graphs assume a traveling speed of 20 mm/s during push-motion operation.

PCON-CA

Positioner / Pulse-train Type
Controller with High-output Driver for RCP4
<Power CON 150>



1 Built-in high-output driver designed exclusively for RCP4 generates greater torque at high speed

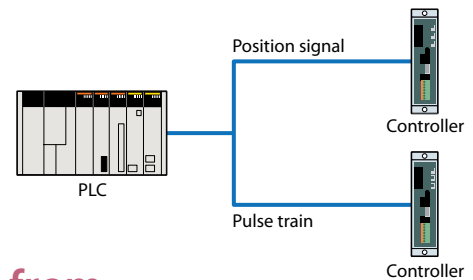
The newly developed high-output driver (patent pending) achieves significantly improved specifications compared to conventional models (RCP2 series), with the acceleration/deceleration higher by 1.4 times, maximum speed by 1.5 times, and payload twice as large.

(*) The rates of improvement vary depending on the type.

Acceleration/ deceleration	RCP2	0.7G		
	RCP4	1.0G	1.4 times	
Maximum speed	RCP2	1000mm/s		
	RCP4	1440mm/s	1.5 times	
Payload	RCP2	6kg		
	RCP4	12kg	2 times	

2 Positioner type and pulse-train type to choose from

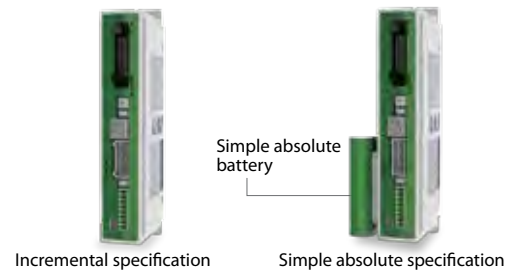
You can select a controller of one of two types: the positioner type where position numbers are specified by I/Os (input/output signals) from a PLC, etc., and the pulse-train type where the actuator is operated by sending pulses. (Pulse-train controllers also support positioner operation using I/Os.)



3 Incremental specification and simple absolute specification to choose from

Instead of the simple absolute unit which was offered as an option for the conventional PCON series, two types of controllers are now available including the incremental specification and simple absolute specification. The simple absolute specification comes standard with a battery, so it can be used as a simple absolute unit to facilitate the startup process without having to add a separate device.

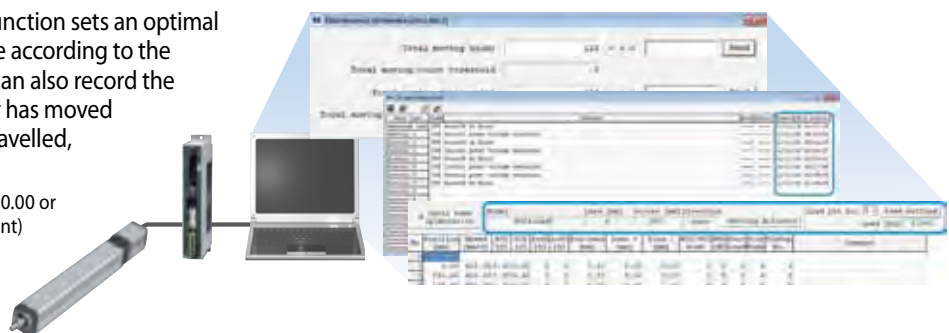
(Note) All pulse-train Power CON controllers are of the incremental specification.




4 Takt time minimization function, maintenance information, calendar function

The takt time minimization function sets an optimal acceleration/deceleration rate according to the load that is available (*). You can also record the number of times the actuator has moved and the distance that it has travelled, for use in maintenance.

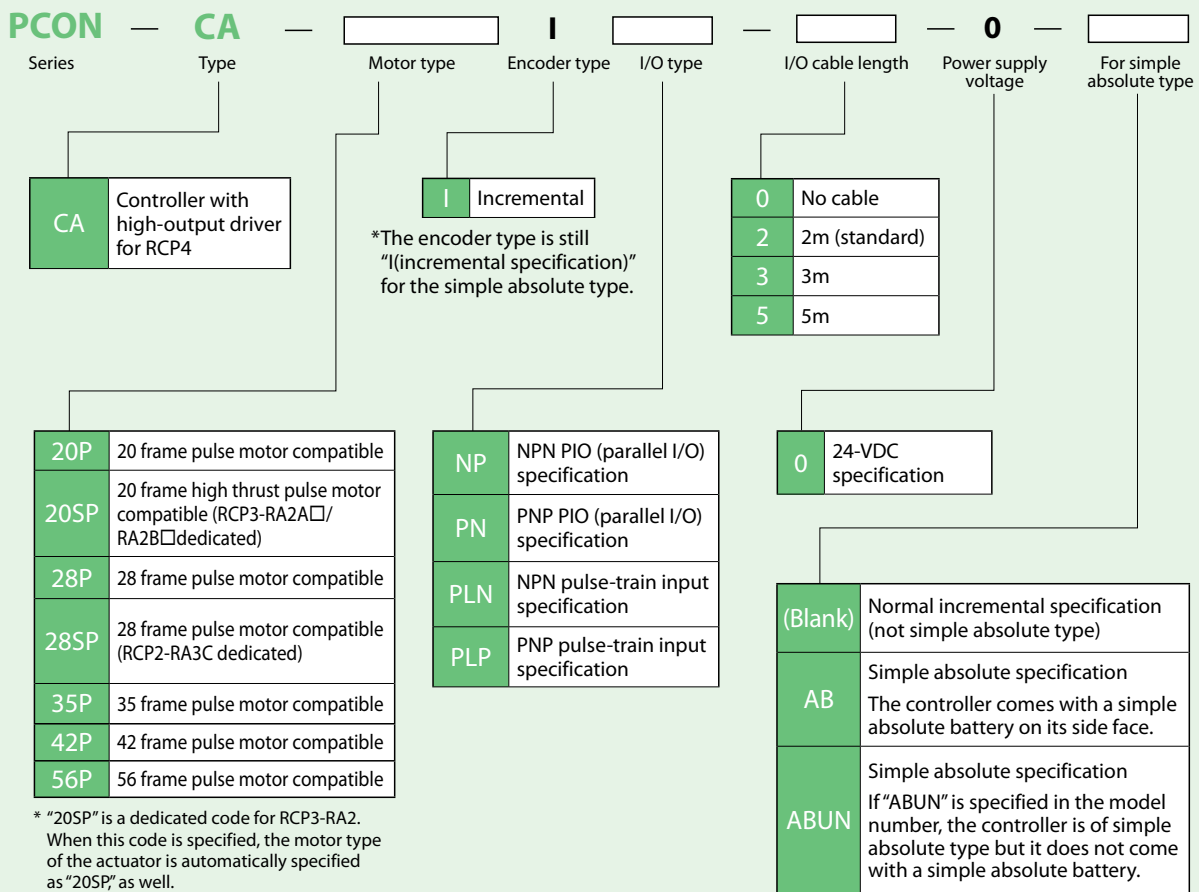
(*) You need PC software Ver. 8.03.00.00 or later or a CON-PTA (teaching pendant) to use the takt time minimization function.



List of Models

Series name	PCON		
Type name	CA		
Description	Controller with high-output driver for RCP4		
External view			
Control method	Positioner type		Pulse-train type
Positioning method	Incremental specification	Simple absolute specification	Incremental specification
Position points	512 points	512 points	—
Standard price	—	—	—

Model Number

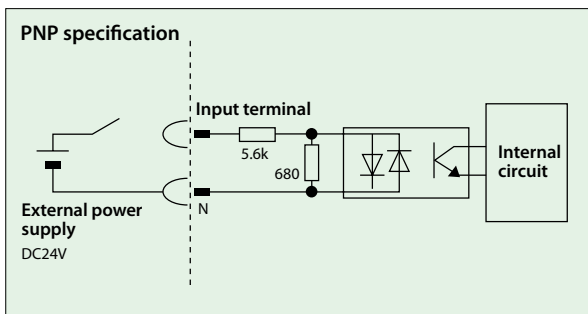
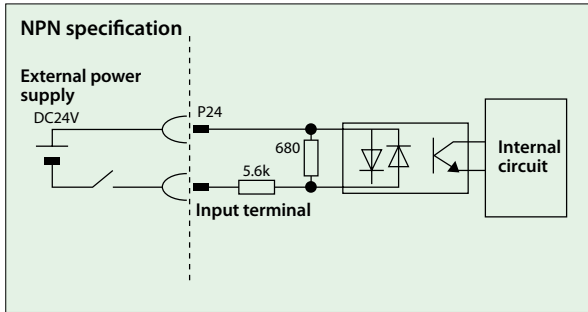


Note: The PCON-CA controller can operate actuators of the RCP2/RCP3/RCP4 series. The controller settings are fixed for each actuator. If you wish to connect an actuator different from the one initially set, please contact IAI.

PIO I/O Interface

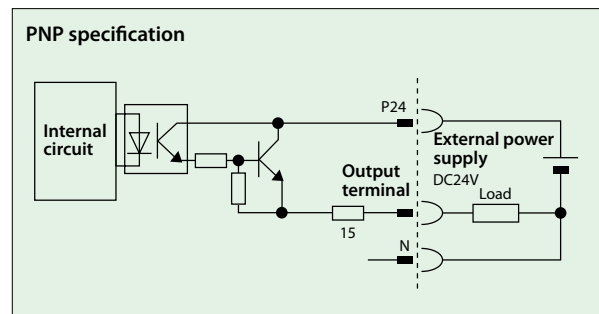
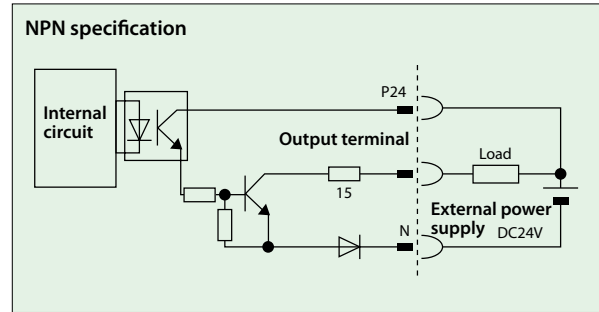
Input Part External Input Specifications

Item	Specification
Input voltage	24 VDC \pm 10%
Input current	5mA, 1 circuit
ON/OFF voltage	ON voltage: 18 VDC min. OFF voltage: 6 VDC max.



Output Part External Output Specifications

Item	Specification
Load voltage	24 VDC
Maximum load current	50mA, 1 circuit
Leak current	2mA max. per point



Types of PIO Patterns (Control Patterns)

This controller supports seven types of control methods. Select in Parameter No. 25, "PIO pattern selection" the PIO pattern that best suits your purpose of use.

Type	Set value of Parameter No. 25	Mode	Overview
PIO pattern 0	0 (factory setting)	Positioning mode (standard type)	<ul style="list-style-type: none"> Number of positioning points: 64 points Position number command: Binary Coded Decimal (BCD) Zone signal output*: 1 point Position zone signal output*: 1 point
PIO pattern 1	1	Teaching mode (teaching type)	<ul style="list-style-type: none"> Number of positioning points: 64 points Position number command: Binary Coded Decimal (BCD) Position zone signal output*: 1 point Jog (inching) operation using PIO signals is supported. Current position data can be written to the position table using PIO signals.
PIO pattern 2	2	256-point mode (256 positioning points)	<ul style="list-style-type: none"> Number of positioning points: 256 points Position number command: Binary Coded Decimal (BCD) Position zone signal output*: 1 point
PIO pattern 3	3	512-point mode (512 positioning points)	<ul style="list-style-type: none"> Number of positioning points: 512 points Position number command: Binary Coded Decimal (BCD) No zone signal output
PIO pattern 4	4	Solenoid valve mode 1 (7-point type)	<ul style="list-style-type: none"> Number of positioning points: 7 points Position number command: Individual number signal ON Zone signal output*: 1 point Position zone signal output*: 1 point
PIO pattern 5	5	Solenoid valve mode 2 (3-point type)	<ul style="list-style-type: none"> Number of positioning points: 3 points Position number command: Individual number signal ON Completion signal: A signal equivalent to a LS (limit switch) signal can be output. Zone signal output*: 1 point Position zone signal output*: 1 point
PIO pattern 6 (Note)	6	Pulse-train control mode	<ul style="list-style-type: none"> Differential pulse input (200 kpps max.) Home return function Zone signal output*: 2 points No feedback pulse output

* 1 Zone signal output: A desired zone is set by Parameter Nos. 1 and 2 or 23 and 24, and the set zone always remains effective once home return has completed.

* 2 Position zone signal output: This function is available as part of a position number. A desired zone is set in the position table and becomes effective only when the corresponding position is specified, but not with commands specifying other positions.

(Note) Pulse Train Control Mode is available only if the pulse train control type is indicated (from PCON-CA-*-PLN and PLP) at the purchase.

PIO Patterns and Signal Assignments

The table below lists the signal assignments for the I/O flat cable under different PIO patterns. Connect an external device (such as a PLC) according to this table.

Pin number	Category	PIO function	Parameter No. 25, "PIO pattern selection"					
			0	1	2	3	4	5
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2
	Input	Number of positioning points	64 points	64 points	256 points	512 points	7 points	3 points
		Home return signal	○	○	○	○	○	×
		Jog signal	×	○	×	×	×	×
		Teaching signal (writing of current position)	×	○	×	×	×	×
		Brake release	○	×	○	○	○	○
	Output	Moving signal	○	○	×	×	×	×
		Zone signal	○	×	×	×	○	○
Position zone signal		○	○	○	×	○	○	
1A	24V	P24						
2A	24V	P24						
3A	Pulse input	—						
4A		—						
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1(JOG+)
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2(-)
8A		IN3	PC8	PC8	PC8	PC8	ST3	—
9A		IN4	PC16	PC16	PC16	PC16	ST4	—
10A		IN5	PC32	PC32	PC32	PC32	ST5	—
11A		IN6	—	MODE	PC64	PC64	ST6	—
12A		IN7	—	JISL	PC128	PC128	—	—
13A		IN8	—	JOG+	—	PC256	—	—
14A		IN9	BKRL	JOG-	BKRL	BKRL	BKRL	BKRL
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD
16A		IN11	HOME	HOME	HOME	HOME	HOME	—
17A		IN12	*STP	*STP	*STP	*STP	*STP	—
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—
19A		IN14	RES	RES	RES	RES	RES	RES
20A	IN15	SON	SON	SON	SON	SON	SON	
1B	Output	OUT0	PM1(ALM1)	PM1(ALM1)	PM1(ALM1)	PM1(ALM1)	PE0	LOS
2B		OUT1	PM2(ALM2)	PM2(ALM2)	PM2(ALM2)	PM2(ALM2)	PE1	LS1(TRQS)
3B		OUT2	PM4(ALM4)	PM4(ALM4)	PM4(ALM4)	PM4(ALM4)	PE2	LS2(-)
4B		OUT3	PM8(ALM8)	PM8(ALM8)	PM8(ALM8)	PM8(ALM8)	PE3	—
5B		OUT4	PM16	PM16	PM16	PM16	PE4	—
6B		OUT5	PM32	PM32	PM32	PM32	PE5	—
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	—
8B		OUT7	ZONE1	MODES	PM128	PM128	ZONE1	ZONE1
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—
13B		OUT12	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B	OUT15	LOAD/TRQS *ALML	*ALML	LOAD/TRQS *ALML	LOAD/TRQS *ALML	LOAD/TRQS *ALML	*ALML	
17B	Pulse input	—						
18B		—						
19B	0V	N						
20B	0V	N						

Note: In the table above, asterisk * symbol accompanying each code indicates a negative logic signal. PM1 to PM8 are alarm binary code output signals that are used when an alarm generates.

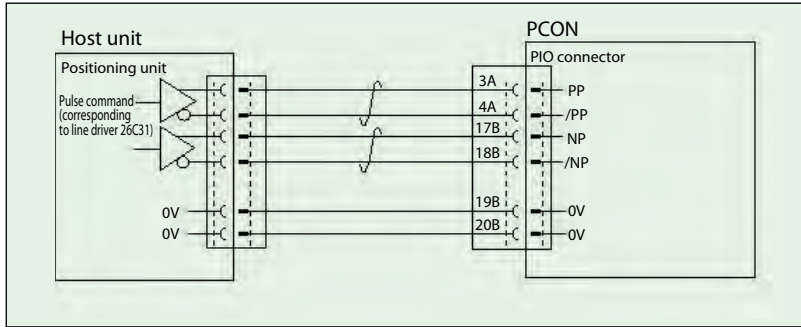
Reference) Negative logic signal

Signals denoted by * are negative logic signals. Negative logic input signals are processed when turned OFF. Negative logic output signals normally remain ON while the power is supplied, and turn OFF when the signal is output.

Note: The names of the signals above inside () are functions before the unit returns home.

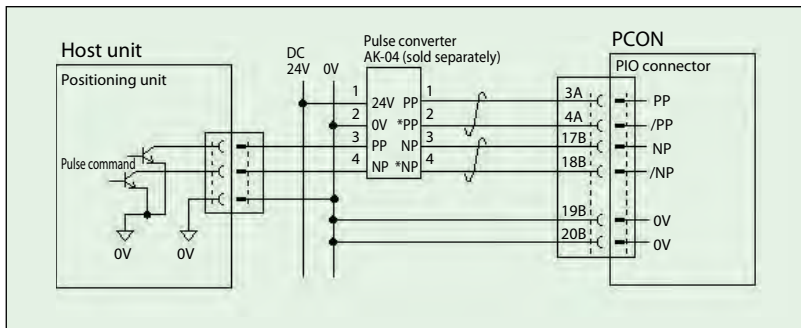
Pulse-train Control Circuit

■ **Host Unit = Differential Type**



■ **Host Unit = Open Collector Type**

The AK-04 (optional) is needed to input pulses.



Caution: Use the same power supply for open collector input/output to/from the host and for the AK-04.

Command Pulse Input Patterns

	Command pulse-train pattern	Input terminal	Forward	Reverse	
Negative logic	Forward pulse-train	PP-/PP			
	Reverse pulse-train	NP-/NP			
	A forward pulse-train indicates the amount of motor rotation in the forward direction, while a reverse pulse-train indicates the amount of motor rotation in the reverse direction.				
	Pulse-train	PP-/PP			
	Sign	NP-/NP	Low	High	
	The command pulses indicate the amount of motor rotation, while the sign indicates the rotating direction.				
Positive logic	Forward pulse train	PP-/PP			
	Reverse pulse-train	NP-/NP			
	Command phases A and B having a 90° phase difference (multiplier is 4) indicate the amount of rotation and the rotating direction.				
	Pulse-train	PP-/PP			
	Sign	NP-/NP	High	Low	
	The command pulses indicate the amount of motor rotation, while the sign indicates the rotating direction.				
	Phase A/B pulse-train	PP-/PP			
		NP-/NP			

I/O Signals in Pulse-train Control Mode

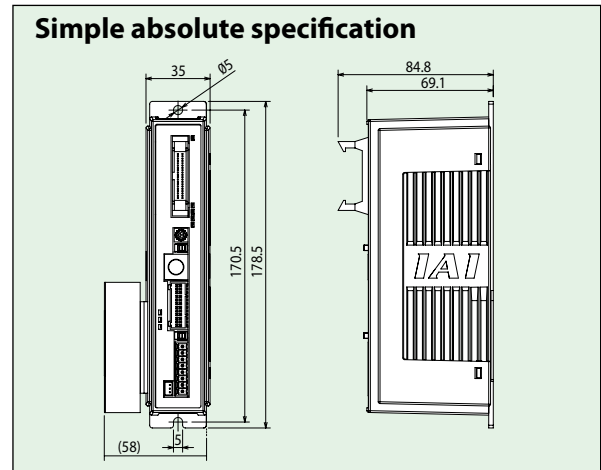
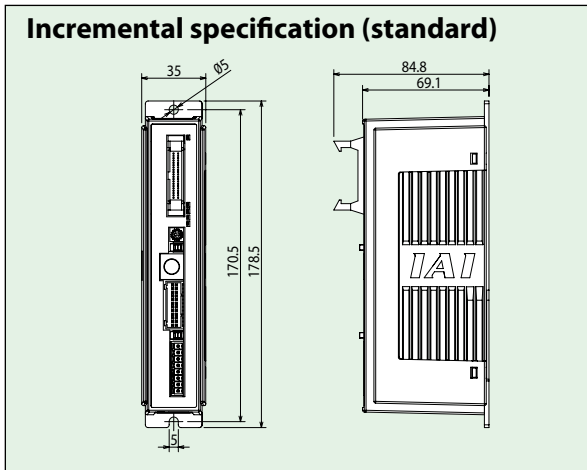
The table below lists the signal assignments for the flat cable in the pulse-train control mode. Connect an external device (such as PLC) according to this table.

Pin number	Category	I/O number	Signal abbreviation	Signal name	Parameter No. 25, "PIO pattern 6"
1A	24V		P24	Power supply	I/O power supply +24 V
2A	24V		P24	Power supply	I/O power supply +24 V
3A	Pulse input		PP	Differential pulse-train input (+)	Differential pulses are input from the host. Up to 200 kpps can be input.
4A			/PP	Differential pulse-train input (-)	
5A	Input	IN0	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
6A		IN1	RES	Reset	Present alarms are reset when this signal is turned ON.
7A		IN2	HOME	Home return	Home return operation is performed when this signal is turned ON.
8A		IN3	TL	Torque limit selection	When this signal is turned ON, the motor torque is limited to the value set by the parameter.
9A		IN4	CSTP	Forced stop	The actuator is forcibly stopped when this signal has remained ON for 16 ms or more. The actuator decelerates to a stop at the torque set in the controller and the servo turns OFF.
10A		IN5	DCLR	Deviation counter clear	This signal clears the deviation counter.
11A		IN6	BKRL	Forced brake release	The brake is forcibly released.
12A		IN7	RMOD	Operation mode switching	The operation mode can be switched when the MODE switch on the controller is set to AUTO. (AUTO when this signal is OFF, and to MANU when the signal is ON.)
13A		IN8	NC	—	Not used
14A		IN9	NC	—	Not used
15A		IN10	NC	—	Not used
16A		IN11	NC	—	Not used
17A		IN12	NC	—	Not used
18A		IN13	NC	—	Not used
19A		IN14	NC	—	Not used
20A	IN15	NC	—	Not used	
1B	Output	OUT0	PWR	System ready	This signal turns ON when the controller becomes ready after the main power has been turned on.
2B		OUT1	SV	Servo ON status	This signal turns ON when the servo is ON.
3B		OUT2	INP	Positioning complete	This signal turns ON when the amount of remaining travel pulses in the deviation counter falls within the in-position band.
4B		OUT3	HEND	Home return complete	This signal turns ON upon completion of home return.
5B		OUT4	TLR	Torque limited	This signal turns ON upon reaching the torque limit while the torque is limited.
6B		OUT5	*ALM	Controller alarm status	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.
7B		OUT6	*EMGS	Emergency stop status	This signal turns ON when the emergency stop of the controller is cancelled, and turns OFF when an emergency stop is actuated.
8B		OUT7	RMDS	Operation mode status	The operation mode status is output. This signal turns ON when the controller is in the manual mode.
9B		OUT8	ALM1	Alarm code output signal	An alarm code is output when an alarm generates. For details, refer to the operation manual.
10B		OUT9	ALM2		
11B		OUT10	ALM4		
12B		OUT11	ALM8		
13B		OUT12	*ALML	Minor failure alarm	This signal is output when a message-level alarm generates.
14B		OUT13	NC	—	Not used
15B		OUT14	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
16B	OUT15	ZONE2	Zone signal 2		
17B	Pulse input		NP	Differential pulse-train input (+)	Differential pulses are input from the host. Up to 200 kpps can be input.
18B			/NP	Differential pulse-train input (-)	
19B	0V		N	Power supply	I/O power supply 0 V
20B	0V		N	Power supply	I/O power supply 0 V

Note) * indicates a negative logic signal. Negative logic signals are normally ON while the power is supplied, and turn OFF when the signal is output.

(Note) The number of encoder pulses is 800 with all RCP4 series models. For details, refer to the operation manual.

External Dimensions



Specification Table

Item		Description
Number of controlled axes		1 axis
Power supply voltage		24VDC \pm 10%
Load capacity	RCP2 Motor type	20P, 20SP, 28P, 28SP
	RCP3 Motor type	42P, 56P
	RCP4 Motor type	42P, 56P
Power supply for electromagnetic brake (for actuators with brake)		24VDC \pm 10%, 0.15A (max.)
Heat output		RCP2, RCP3
		RCP4
Rush current (Note 1)		8.3A
Momentary power failure resistance		500 μ s max.
Emergency stop input		1 dedicated circuit (in the power supply connector), contact B input (24VDC)
Actuator cable length		20m max.
Serial communication interface (SIO port)		RS485: 1 channel (conforming to Modbus protocol RTU/ASCII) / Speed: 9.6 to 230.4kbps Actuators can be controlled via serial communication in a mode other than pulse-train (cable length: 100m).
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.
Data setting/input method		PC software, touch-panel teaching pendant
Data retention memory		Position data and parameters are saved in the non-volatile memory (rewrite life: unlimited)
Number of positions in positioner mode		Standard 64 points, maximum 512 points (PIO specification) Note) Positioning points vary depending on the selected PIO pattern.
Pulse-train interface	Input pulse	Differential method (line driver method): 200kpps max. / Cable length: 10m max. Open collector method: Not supported (Note 2)
	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
LED display (installed on the front panel)		SV (green)/ALM (red): Servo ON/alarm generation STS0 to 3: Status indication RDY (green)/ALM (red): Absolute function normal/absolute function abnormal (simple absolute specification) 1 (green), 0 (red): Absolute function status indication (simple absolute specification)
Electromagnetic brake forced release switch (installed on the front panel)		Switched between NOM (standard) and BK RLS (forced release)
Isolation resistance		500VDC, 10M Ω or more
Electric shock protection mechanism		Class I basic isolation
Environment	Ambient operating temperature	0 ~ 40°C
	Ambient operating humidity	85%RH or less (non-condensing)
	Operating ambience	Not exposed to corrosive gases
	Maximum operating altitude	1000m
	Protection degree	IP20
	Cooling method	Natural air cooling
	Vibration	10 to 57 Hz / Amplitude: 0.075mm 57 to 150 Hz / Acceleration: 9.8m/s ² Sweep time in X/Y/Z directions: 10 minutes / Number of sweeps: 10 times
Weight	300g or less, or 500g (including 190g for the battery) or less for the simple absolute specification	

(Note 1) Rush current will flow for approx. 1 to 2 msec after the power is turned on (at 40°C). Take note that the rush current value varies depending on the impedance of the power supply line.

(Note 2) If the host implements open collector output, use the separately sold AK-04 (optional) to convert the signals to differential output signals.

Option

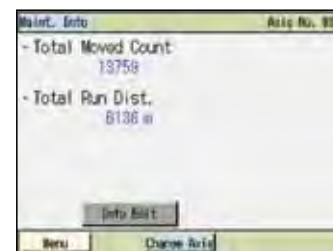
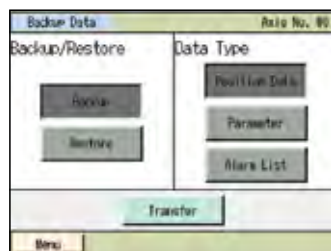
● Touch-panel Teaching Pendant for Position Controller

Developed based on the design of the popular CON-PT series adopting an easy-to-use interactive touch-panel menu screen, this new data input device supports various functions offered by the PCON-CA controller.

1. Color screen for greater ease of view
2. Supporting the takt time minimization function and maintenance information checking/ input functions of the PCON-CA
3. Position, parameters and other data can be saved in a SD card
4. Built-in clock function records the date & time of each event; data can then be saved in a SD card.



CON-PTA



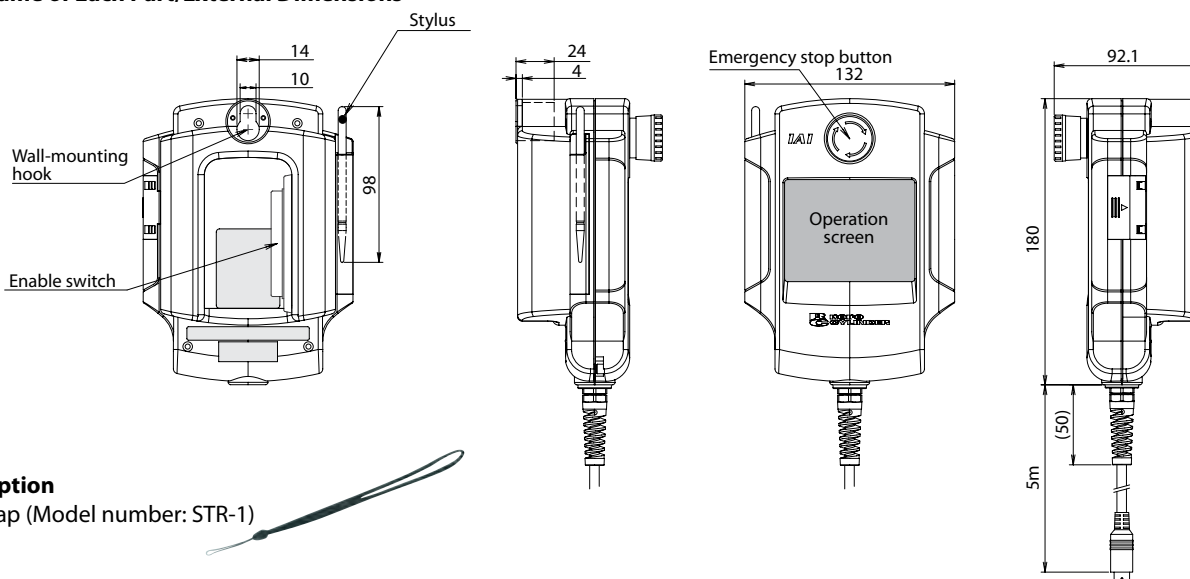
Model Numbers/Specifications

Item	Description		
Model number	CON-PTA-C-ENG	CON-PDA-C-ENG	CON-PGA-C-S-ENG
Type	Standard type	Enable switch type	Safety-category compliant type
Connectable controllers	ACON/PCON/SCON/RACON/RPCON ASEP/PSEP AMEC/PMEC ERC2 (*1)/ERC3		
3-position enable switch	×	○	○
Functions	<ul style="list-style-type: none"> • Position data input/editing • Moving function (moving to set positions, jogging/inching) • Parameter editing • Monitoring (current position, current speed, I/O signals, alarm code, alarm generation time) • Saving/reading data to/from external SD cards (position data parameters, alarm list) • Takt time minimization function • Maintenance information (total number of movements, total distance travelled, etc.) 		
Display	65536 colors (16-bit colors), white LED backlight		
Ambient operating temperature/humidity	0 to 50°C, 20 to 80% RH (non-condensing)		
Environmental resistance	IP40 or equivalent		
Mass	Approx. 570g	Approx. 600g	
Cable length	5m		
Accessories	Stylus	Stylus	Stylus, TP adapter (Model number: RCB-LB-TG) Dummy plug (Model number: DP-4) Controller cable (Model number: CB-CON-LB005)

*1 Among the ERC2 series, only the actuators bearing 4904 or greater number stamped on the serial number label can be connected.

Name of Each Part

■ Name of Each Part/External Dimensions



■ Option

- Strap (Model number: STR-1)



Option

●PC Software (Windows Only)

This startup support software provides functions to input positions, perform test operations and monitor data, among others. It also supports the takt time minimization function, calendar function, maintenance information, etc., so, for example, you can set optimal operating conditions for your actuator and carry out preventive maintenance.

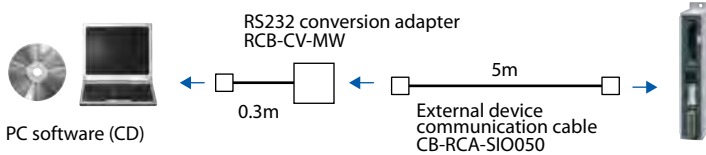
* The above functions are supported by software versions of 8.03.00.00 and later.

Features

Startup support software with functions to program and input positions, perform test operations and monitor data, among others. It enhances the functions needed for debugging to help shorten the startup time.

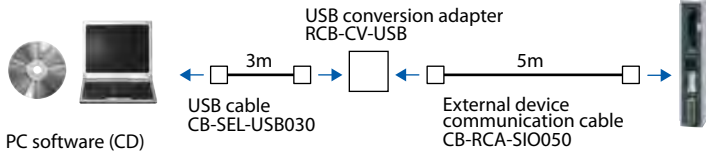
- Model number With external device communication cable + RS232 conversion unit
RCM-101-MW

■ Configuration



- Model number With external equipment communication cable + USB conversion adapter + USB cable
RCM-101-USB

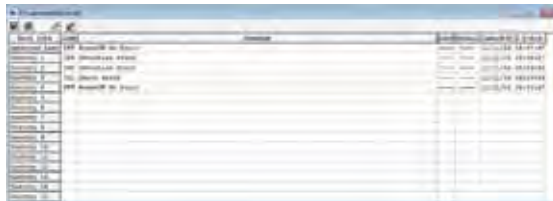
■ Configuration



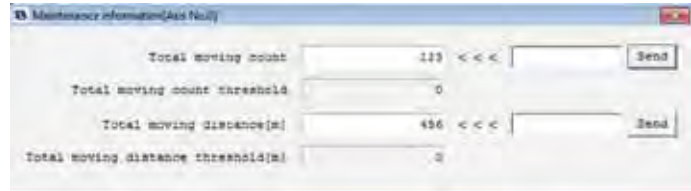
Example of position input



Alarm list



Maintenance information



Service part

Simple absolute battery

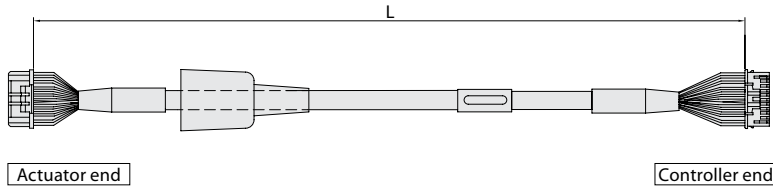
- Model number **AB-7**



Integrated Motor/Encoder Cable & Integrated Motor/Encoder Robot Cable for RCP4

Model number **CB-CA-MPA**□□□/ **CB-CA-MPA**□□□-**RB**

*□□□ indicates the cable length (L). A desired length can be specified up to 20m. Example: 080=8m



* Robot cables are cables resistant to flexing forces. If the cable must be guided in a cable track, use a robot cable.

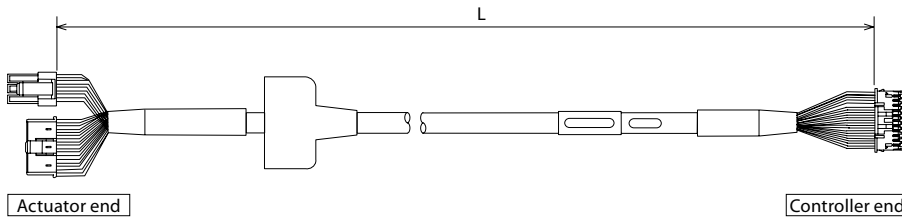
Actuator end 1-1827863-1 (AMP)			Controller end PADP-24V-1-S (UST)		
Pin No.	Signal name	Color	Pin No.	Signal name	Color
A1	0A/U	Blue(Black)	1	0A/U	Blue (Black)
B1	VMM/V	Orange (White)	2	VMM/V	Orange (White)
A2	0 A/W	Green (Brown)	5	0 A/W	Green (Brown)
B2	0B/-	Brown (Green)	3	0B/-	Brown (Green)
A3	VMM/-	Gray (Yellow)	4	VMM/-	Gray (Yellow)
B3	0 B/-	Red (Red)	6	0 B/-	Red (Red)
A4	LS+/BK+	Black (Orange)	7	LS+/BK+	Black (Orange)
B4	LS-/BK-	Yellow (Gray)	8	LS-/BK-	Yellow (Gray)
A6	-A+	Blue (White)	11	-A+	Blue (White)
B6	-A-	Orange (Yellow)	12	-A-	Orange (Yellow)
A7	A+/B+	Green (Red)	13	A+/B+	Green (Red)
B7	A-/B-	Brown (Green)	14	A-/B-	Brown (Green)
A8	B+/Z+	Gray (Black)	15	B+/Z+	Gray (Black)
B8	B-/Z-	Red (Brown)	16	B-/Z-	Red (Brown)
A5	BK+/LS+	Blue (Black)	9	BK+/LS+	Blue (Black)
B5	BK-/LS-	Orange (Brown)	10	BK-/LS-	Orange (Brown)
A9	LS_GND	Green (Green)	20	LS_GND	Green (Green)
B9	VPS	Brown (Red)	18	VPS	Brown (Red)
A10	VCC	Gray (White)	17	VCC	Gray (White)
B10	GND	Red (Yellow)	19	GND	Red (Yellow)
A11	-	-	21	-	-
B11	FG	Black (-)	22	-	-
			23	-	-
			24	FG	Black (-)

* Colors of robot cables are shown in ().

Integrated Motor/Encoder Cable for RCP2

Model number **CB-PSEP-MPA**□□□ *The default specification of this cable is robot cable.

*□□□ indicates the cable length (L). A desired length can be specified up to 20m. Example: 080=8m

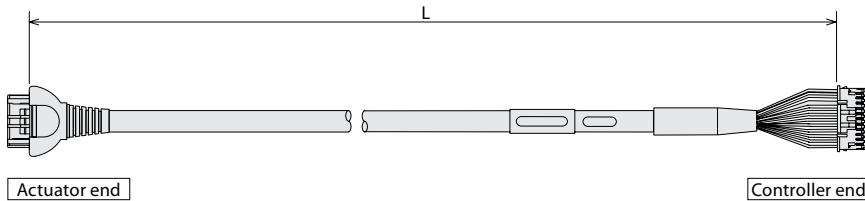


Actuator end Terminal number		Controller end Terminal number
1	Black (0A)	1
2	White (VMM)	2
4	Red (0B)	3
5	Green (VMM)	4
3	Brown (0/A)	5
6	Yellow (0/B)	6
16	Orange (BK+)	9
17	Gray (BK-)	10
5	NC	11
5	NC	12
13	Black (LS+)	7
14	Brown (LS-)	8
1	White (A+)	13
2	Yellow (A-)	14
3	Red (B+)	15
4	Green (B-)	16
10	White (identification tape) [VCC]	17
11	Yellow (identification tape) [VPS]	18
9	Red (identification tape) [GND]	19
12	Green (identification tape) [Shield]	20
15	NC	21
7	NC	22
8	NC	23
18	Shield [FG]	24

Integrated Motor/Encoder Cable for RCP3

Model number **CB-APSEP-MPA**□□□ *The default specification of this cable is robot cable.

*□□□ indicates the cable length (L). A desired length can be specified up to 20m. Example: 080=8m

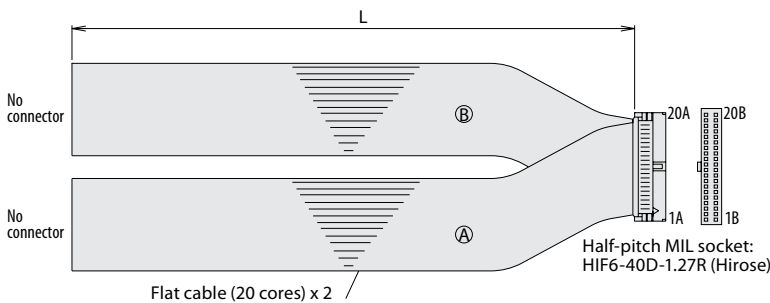


Actuator end Terminal number		Controller end Terminal number
A1	[PCON] (ACON)	1
B1	Black (0A) (U)	1
A2	White (VMM) (V)	2
B2	Brown (0/A) (W)	5
A3	Green (0B) (-)	3
B3	Yellow (VMM) (-)	4
A4	Red (0/B) (-)	6
B4	Orange (LS+) (BK+)	7
A6	Gray (LS-) (BK-)	8
B6	White (-) (A+)	11
A7	Yellow (-) (A-)	12
B7	Red (A+) (B+)	13
A8	Green (A-) (B-)	14
B8	Black (B+) (Z+)	15
A5	Brown (B-) (Z-)	16
B5	Black (identification tape) [BK+] (LS+)	9
A9	Brown (identification tape) [BK-] (LS-)	10
B9	Green (identification tape) [GNDLS] (GNDLS)	20
A10	Red (identification tape) [VPS] (VPS)	18
B10	White (identification tape) [VCC] (VCC)	17
A11	Yellow (identification tape) [GND] (GND)	19
B11	NC	21
	NC	22
	Shield [FG] (FG)	24
	NC	23
	NC	23

I/O Flat Cable

Model number **CB-PAC-PIO**□□□

*□□□ indicates the cable length (L). A desired length can be specified up to 10m. Example: 080=8m



HIF6-40D-1.27R				HIF6-40D-1.27R			
No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
1A	24V	Brown -1		1R	OUT0	Brown -3	
2A	24V	Red -1		2B	OUT1	Red -3	
3A	Pulse	Orange -1		3B	OUT2	Orange -3	
4A	input	Yellow -1		4B	OUT3	Yellow -3	
5A	IN0	Green -1		5B	OUT4	Green -3	
6A	IN1	Blue -1		6B	OUT5	Blue -3	
7A	IN2	Purple -1		7B	OUT6	Purple -3	
8A	IN3	Gray -1		8B	OUT7	Gray -3	
9A	IN4	White -1		9B	OUT8	White -3	
10A	IN5	Black -1		10B	OUT9	Black -3	
11A	IN6	Brown -2		11B	OUT10	Brown -4	
12A	IN7	Red -2		12B	OUT11	Red -4	
13A	IN8	Orange -2		13B	OUT12	Orange -4	
14A	IN9	Yellow -2		14B	OUT13	Yellow -4	
15A	IN10	Green -2		15B	OUT14	Green -4	
16A	IN11	Blue -2		16B	OUT15	Blue -4	
17A	IN12	Purple -2		17B	Pulse	Purple -4	
18A	IN13	Gray -2		18B	input	Gray -4	
19A	IN14	White -2		19B	0V	White -4	
20A	IN15	Black -2		20B	0V	Black -4	

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