

RCP6S Gateway Controllers

First Step Guide First Edition

Thank you for purchasing our product.

Make sure to read the Safety Guide and detailed Instruction Manual as well as this First Step Guide to ensure correct use. This Instruction Manual is original.

Warning : Read the instruction manual carefully and follow the instruction manual when handling this equipment. Please downloaded the user's manual from our website.
 You can download it free of charge. User registration is required for first time users.
 URL: www.iai-robot.co.jp/data_dl/CAD_MANUAL/
 Keep a printout of the introduction manual near the equipment in which this product is installed so that it can be checked at all times, or display it on your computer, tablet terminal, etc. so that you can check it immediately.
 If you need a bound copy of the instruction manual, order it from the nearest sales office listed in the First Step Guide or at the end of the instruction manual. It will be provided for a fee.

- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

Refer to the instruction manual and first step guide of RCP6S Fieldbus as well as this guide for installation, calculation of number of connectable axes and current amperage capacity, power supply and emergency stop circuits, startup, operation and so on of RCP6S Gateway System including this device.
 Also refer to Serial Communication [Modbus Version] Instruction Manual when operation is to be conducted with serial communication.

Product Check

This product is comprised of the following parts if it is of standard configuration.
 If you find any fault in the contained model or any missing parts, contact us or our distributor.

1. Parts

No.	Part Name	Model	Number	Remarks
1	Actuator Main Body	Refer to each instruction manual of an actuator.	-	
2	RCP6S Gateway Controllers	RCM-P6PC	-	Pulse Motor Type
3		RCM-P6AC	-	Servo Motor Type
4		RCM-P6DC	-	Brushless DC Electric Motor
5	Connector Conversion Unit	RCM-CV-APCS	-	To be prepared separately
Accessories				
6	Safety Guide	M0194	1	
7	First Step Guide	ME0370	1	

* Prepare necessary number of units for RCP6S Gateway controllers and connector conversion units.

Pulse Motor Type
RCM-P6PC



Servo Motor Type
RCM-P6AC



Brushless DC Electric Motor
RCM-P6DC



Model	Type	Applicable Actuator
RCM-P6PC	Pulse Motor Type	RCP2 to 6
RCM-P6AC	Servo Motor Type	RCA, RCA2
RCM-P6DC	Brushless DC Electric Motor	RCD

Connector
Conversion Unit



2. Teaching Tool (Please purchase separately)

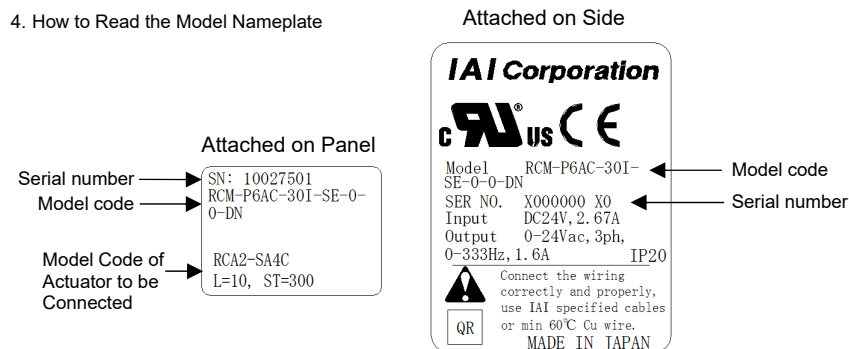
A teaching tool such as PC software is necessary when performing the setup for position setting, parameter setting, etc. that can only be done on the teaching tool. Please prepare either of the following teaching tools.

No.	Part Name	Model
1	PC Software (Includes RS232C exchange adapter + Peripheral communication cable)	RCM-101-MW
2	PC Software (Includes USB exchange adapter + USB cable + Peripheral communication cable)	RCM-101-USB
3	Teaching Pendant (Touch panel teaching)	TB-02
4	Teaching Pendant (Touch panel teaching with dead man's switch)	TB-02D
5	Teaching Pendant (Touch panel teaching)	TB-01
6	Teaching Pendant (Touch panel teaching with dead man's switch)	TB-01D
7	Teaching Pendant (Dead man's switch right mounted touch panel teaching)	TB-01DR
8	Teaching Pendant (Touch panel teaching)	CON-PTA
9	Teaching Pendant (Touch panel teaching with dead man's switch)	CON-PDA
10	Teaching Pendant (Touch panel teaching with dead man's switch + TP adapter (RCB-LB-TG))	CON-PGA(S)

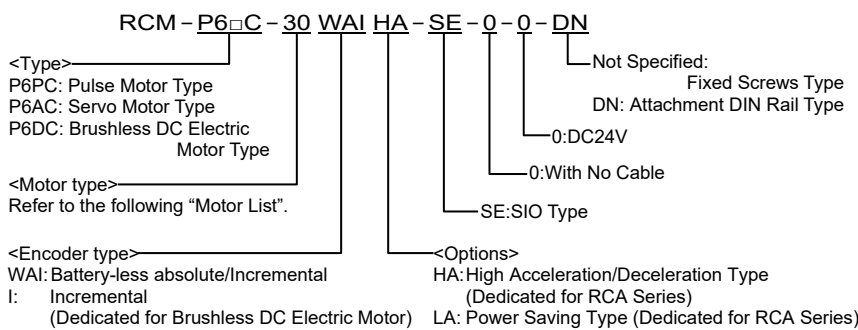
3. Instruction manuals related to this product

No.	Part Name	Model
1	Instruction Manual for the RCP6S Fieldbus Communication	ME0349
2	Instruction Manual for the Serial Communication [for Modbus]	ME0162
3	PC Software RCM-101-MW/RCM-101-USB Instruction Manual	ME0155
4	Touch Panel Teaching TB-02/TB-02D Applicable for Position Controller Instruction Manual	ME0355
5	Touch Panel Teaching TB-01/TB-01D/TB-01DR Applicable for Position Controller Instruction Manual	ME0324
6	Touch Panel Teaching CON-PTA/PDA/PGA(S) Instruction Manual	ME0295

4. How to Read the Model Nameplate



5. How to Read the Model



* Not applicable for servomotor absolute type

"Motor List."

Pulse Motor Type (RCM-P6PC)		Servo Motor Type (RCM-P6AC)	
20P	20□Pulse Motor	2	2W Servo Motor
20SP	20□Pulse Motor (For RA2AC/RA2BC)	5	5W Servo Motor
28P	28□Pulse Motor	5S	5W Servo Motor (For SA2A/RA2A)
28SP	28□Pulse Motor (For RA3C)	10	10W Servo Motor
35P	35□Pulse Motor	20	20W Servo Motor
42P	42□Pulse Motor	20S	20W Servo Motor (For RCA2-SA4/RCA-RA3)
42SP	42□Pulse Motor (For RCP4-RA5C)	30	30W Servo Motor
56P	56□Pulse Motor	Brushless DC Electric Motor Type (RCM-P6DC)	
		3D	3W Brushless DC Electric Motor

Basic Specifications

Pulse Motor Type RCM-P6PC

Specification Item			Details of Specifications	
Number of Controlled Axes			1-axis	
Controller Power-supply			DC24V ± 10%	
Applicable Motor Rated Current			Rated at 1.2A, Rated at 0.4A	
Control Power Capacity			0.3A (It is necessary to have 0.7A for 0.2s at brake release when RCP6 actuator is equipped with a brake.)	
Motor Power Capacity	Motor Type	20P, 20SP, 28P	Not applicable for high-output setting	1.0A max.
		28SP, 35P, 42P, 42SP, 56P	High-thrust function is disabled	1.7A max.
			High-thrust function is enabled	Rated at 3.2A, 4.2A max.
Controller Heat Generation			5W (8W when PC in use)	
Controller Power-supply Rush Current			8.3A (with in-rush current control circuit)	
Cooling Method			Natural air-cooling	
Drive Cutoff System			Drive cutoff by semiconductor	
Emergency-stop Input			B contact input	
Emergency Stop Operation			Servo OFF + Drive Cutoff	
Enable Input			None	
T.P. Enable Input			Equipped	
Enable Operation			Servo OFF	
Motor Control System			Field Weakening Vector Control	
Motor Noise Reduction			Equipped	
Tuning			Smart Tuning	
High-Output Setting (PowerCON)			Equipped	
Corresponding Encoder			Incremental/Battery-less absolute encoder: Resolution 800 pulse/rev High-resolution battery-less absolute encoder: Resolution 8192 pulse/rev (13bit)	
Appliance to Absolute			Battery-less absolute, Applicable for high-resolution battery-less absolute	
Backup Memory			FRAM (256kbit) No limit in number of overwriting	
Calendar Function			None (Available when gateway unit is connected)	
LED Display			SV (GR) / ALM (RD): Servo ON / Alarm generated and emergency stop	
Serial Communication (SIO Port)			RS485 2CH (Based on Modbus protocol)	
Electromagnetic Brake Compulsory Release Feature			Brake release input (inside I/F connector)	
Protection Function against Electric Shock			Class I basic insulation	
Insulation Strength			DC500V 10MΩ	
Mass			200g (215g) Mass described in brackets is for DIN rail type	
External Dimensions			30W × 115H × 58D (66.5D) Dimension described in brackets is for DIN rail type	

Servo Motor Type RCM-P6AC

Specification Item		Details of Specifications	
Number of Controlled Axes		1-axis	
Controller Power-supply		DC24V ± 10%	
Control Power Capacity		0.3A	
Motor Power Capacity	RCL	2W	Rated at 0.8A, 4.6A max.
		5W	Rated at 1.0A, 6.4A max.
		10W	Rated at 1.3A, 6.4A max.
	RCA RCA2	10W	Rated at 1.3A, 2.5A max. for power saving, 4.4A max.
		20W	Rated at 1.3A, 2.5A max. for power saving, 4.4A max.
		20W(20S)	Rated at 1.7A, 3.4A max. for power saving, 5.1A max.
		30W	Rated at 1.3A, 2.2A max. for power saving, 4.0A max.
Controller Heat Generation		8.4W	
Controller Power-supply Rush Current		10A (with in-rush current control circuit)	
Cooling Method		Natural air-cooling	
Drive Cutoff System		Drive cutoff by semiconductor	
Emergency-stop Input		B contact input	
Emergency Stop Operation		Servo OFF + Drive Cutoff	
Enable Input		None	
T.P. Enable Input		Equipped	
Enable Operation		Servo OFF	
Motor Control System		Sine Wave (AC) Drive	
Additional Functions		Anti-Vibration Control	

Specification Item			Details of Specifications	
Tuning			Off-board Tuning, Smart Tuning	
Corresponding Encoder	Equipped with Battery-less Absolute		16384 pulse/rev	
	RCA	Incremental	800 pulse / rev	
		RCA2-***N	1048 pulse / rev	
	RCA2	Other than RCA2-***N		800 pulse / rev
		RA1L, SA1L, SA4L, SM4L	715 pulse / rev	
		RA2L, SA2L, SA5L, SM5L	855 pulse / rev	
		RA3L, SA3L, SA6L, SM6L	1145 pulse / rev	
Appliance to Absolute			Battery-less absolute, Applicable for high-resolution battery-less absolute	
Backup Memory			FRAM (256kbit) No limit in number of overwriting	
Calendar Function			None (Available when gateway unit is connected)	
LED Display			SV (GR) / ALM (RD): Servo ON / Alarm generated and emergency stop	
Serial Communication (SIO Port)			RS485 2CH (based on Modbus protocol)	
Electromagnetic Brake Compulsory Release Feature			Brake release input (inside I/F connector)	
Protection Function against Electric Shock			Class I basic insulation	
Insulation Strength			DC500V 10MΩ	
Mass			200g (215g) Mass described in brackets is for DIN rail type	
External Dimensions			30W × 115H × 58D (66.5D) Dimension described in brackets is for DIN rail type	

Brushless DC Electric Motor RCM-P6DC

Specification Item	Details of Specifications
Number of Controlled Axes	1-axis
Controller Power-supply	DC24V ± 10%
Control Power Capacity	0.3A
Motor Power Capacity	Rated at 0.7A, 1.5A max.
Controller Heat Generation	4W
Controller Power-supply Rush	10A (with in-rush current control circuit)
Cooling Method	Natural air-cooling
Drive Cutoff System	Drive cutoff by semiconductor
Emergency-stop Input	B contact input
Emergency Stop Operation	Servo OFF + Drive Cutoff
Enable Input	None
T.P. Enable Input	Equipped
Enable Operation	Servo OFF
Motor Control System	Rectangular Wave (DC) Drive
Corresponding Encoder	Incremental Encoder AB Phase Differential Output: Resolution 400 pulse / rev
Appliance to Absolute	None
Backup Memory	FRAM (256kbit) No limit in number of overwriting
Calendar Function	None (Available when gateway unit is connected)
LED Display	SV (GR) / ALM (RD): Servo ON / Alarm generated and emergency stop
Serial Communication (SIO Port)	RS485 2CH (based on Modbus protocol)
Electromagnetic Brake Compulsory	Brake release input (inside I/F connector)
Protection Function against Electric	Class I basic insulation
Insulation Strength	DC500V 10MΩ
Mass	200g (215g) Mass described in brackets is for DIN rail type
External Dimensions	30W × 115H × 58D (66.5D) Dimension described in brackets is for DIN rail type

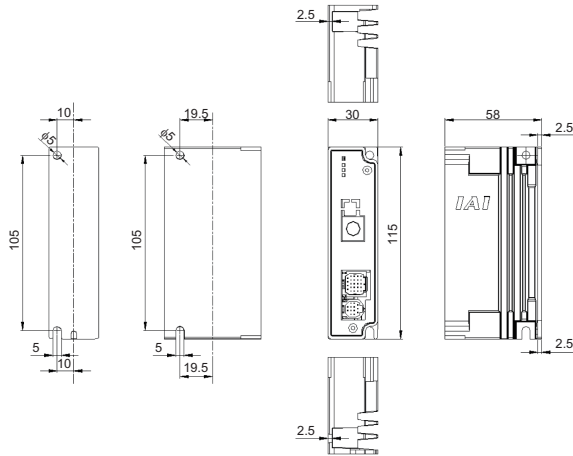
Specification of Environment (RCM-P6PC, RCM-P6AC, RCM-P6DC and Connector Conversion Unit in Common)

Environment	Specification Item	Details of Specifications
	Surrounding Air Temperature	0 to 40 °C
	Surrounding Humidity	85%RH or less (non-condensing)
	Surrounding Environment	Refer to Installation Environment
	Surrounding Storage Temperature	-20 to 70 °C
	Usage Altitude	85%RH or less (non-condensing)
	Protection Class	1,000m or lower above sea level
	Vibration Durability	Frequency 10 to 57Hz / Swing width: 0.075mm
		Frequency 57 to 150Hz / Acceleration: 9.8m/s2
	Shock Resistance	XYZ Each direction Sweep time: 10 min. Number of sweep: 10 times
	Pollution Degree	Pollution degree 2
	Protection Class	IP20

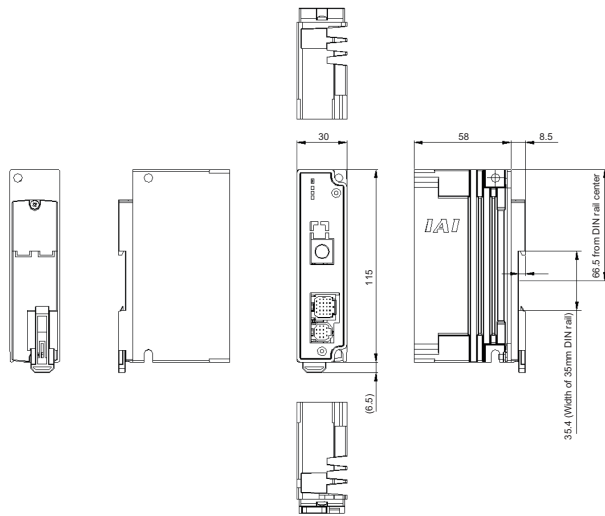
External Dimensions

Dimensions for RCM-P6PC, RCM-P6AC and RCM-P6DC should be the same.

[1] Fixed Screws Type



[2] Attachment DIN Rail Type



Installation Environment

This product is capable for use in the environment of pollution degree 2*1 or equivalent.

*1 Pollution Degree 2: Environment that may cause non-conductive pollution or transient conductive pollution by frost (IEC60664-1).

1. Installation Environment

Do not use this product in the following environment.

- Location where the surrounding air temperature exceeds the range of 0 to 40°C
- Location where condensation occurs due to abrupt temperature changes
- Location where relative humidity exceeds 85%RH
- Location exposed to corrosive gases or combustible gases
- Location exposed to significant amount of dust, salt or iron powder
- Location subject to direct vibration or impact
- Location exposed to direct sunlight
- Location where the product may come in contact with water, oil or chemical droplets
- Environment that blocks the air vent [Refer to Installation Method]

When using the product in any of the locations specified below, provide a sufficient shield.

- Location subject to electrostatic noise
- Location where high electrical or magnetic field is present
- Location with the mains or power lines passing nearby

2. Storage and Preservation Environment

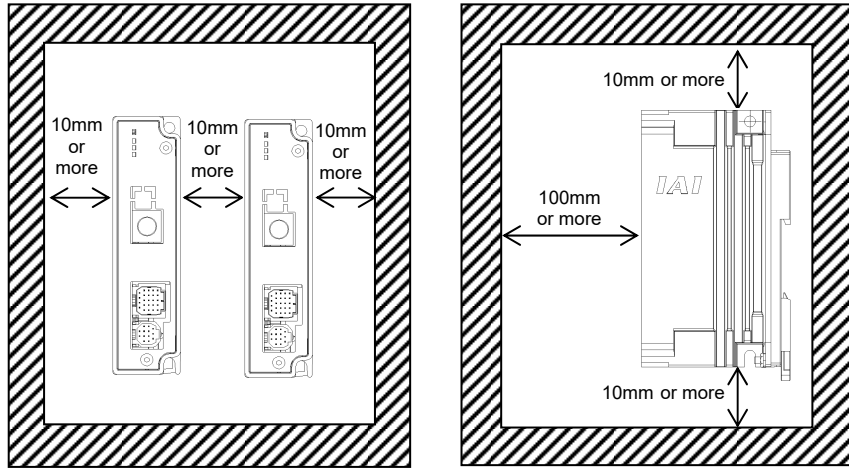
- Storage and preservation environment follows the installation environment. Especially in a long-term storage, consider to avoid condensation of surrounding air. Unless specially specified, moisture absorbency protection is not included in the package when the machine is delivered. In the case that the machine is to be stored in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.

Installation

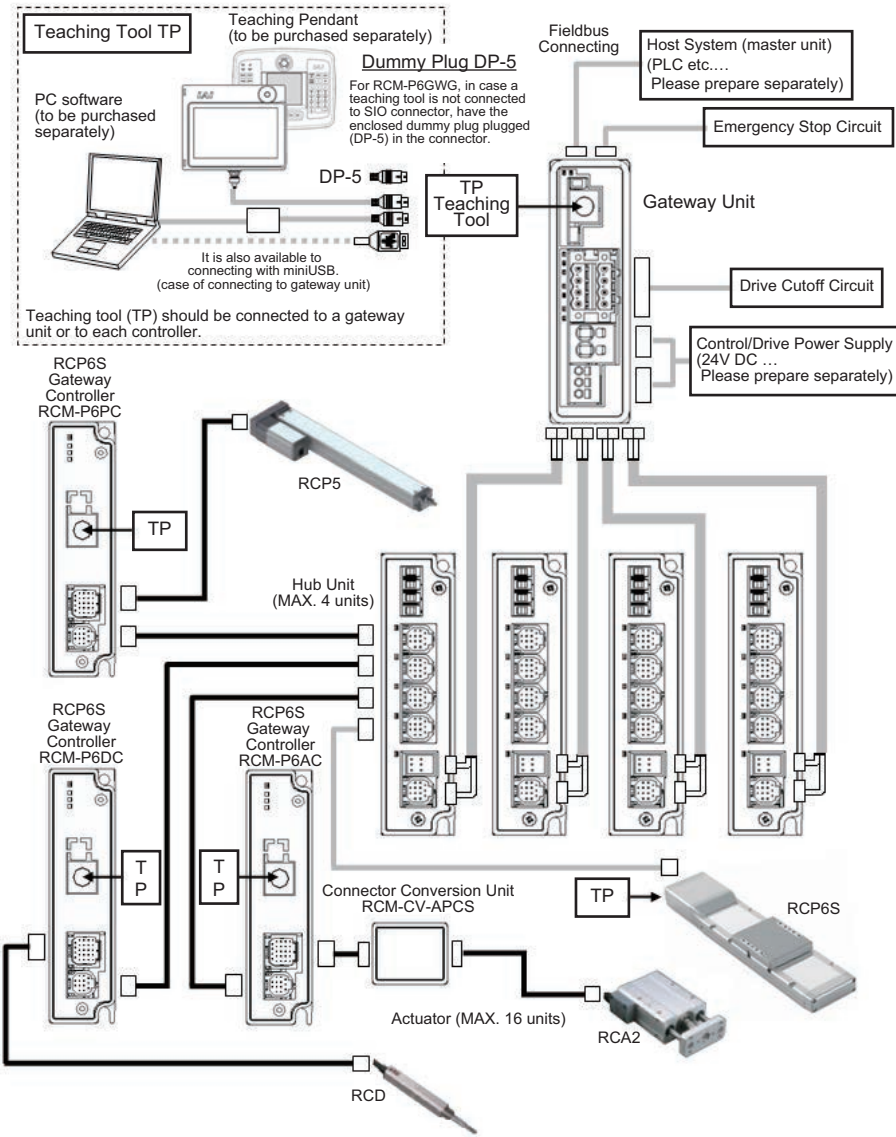
1. Heat Radiation and Installation

Design and Build the system considering the size of the controller box, location of the controller and cooling factors to keep the surrounding temperature around the controller below 40°C.

To fix the units in the control box, use the attachment holes on top and bottom of the unit for the fixed screws type, and use the DIN rails for the attachment DIN rail type.

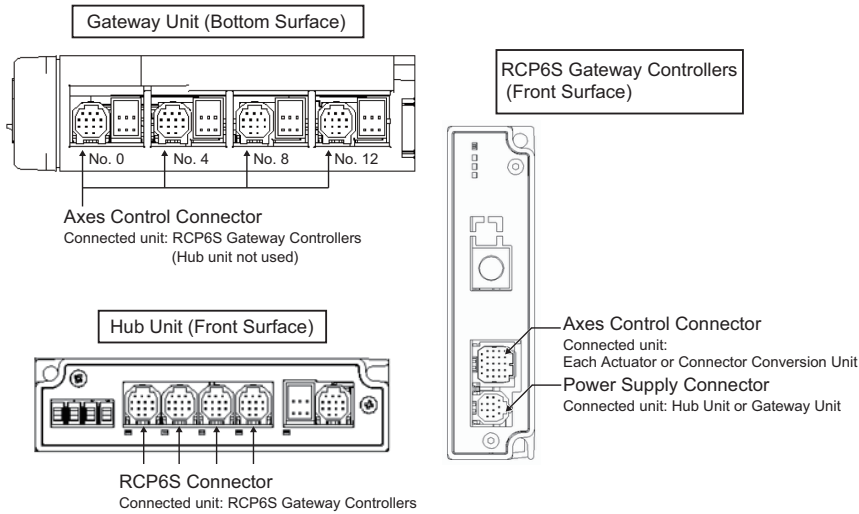


Wiring Diagram (Connection of Construction Devices)

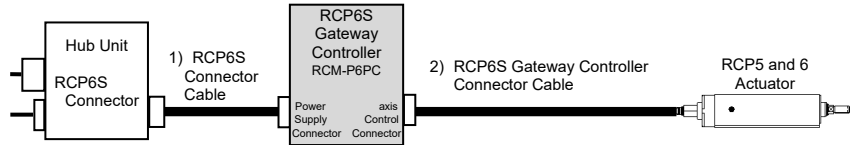


■ Connection among Hub Unit, RCP6S Gateway Controller and Actuators

Shown below are the positions of connectors, connection layout and model codes of cables when a controller for RCP6S Gateway is to be connected to a hub unit.
It is available that a controller for RCP6 Gateway is connected directly to the gateway unit without using a hub unit.
In this case, the controller should be connected to the axis control connector.

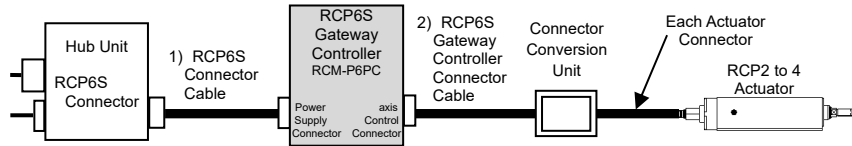


[A] When connection is established with a pulse motor type actuator (RCP5 or 6)



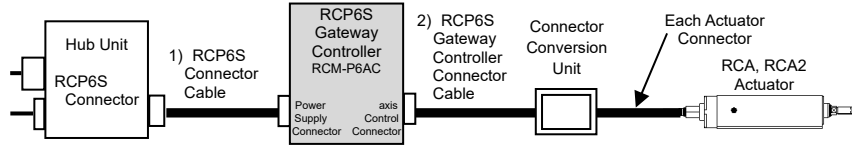
Connect a controller for RCP6S Gateway (RCM-P6PC) to the hub unit (or a gateway unit) and connect a RCP5 or 6 actuator on the further end.

[B] When connection is established with a pulse motor type actuator (RCP2 to 4)



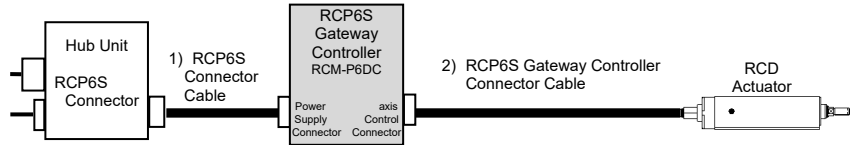
Connect a controller for RCP6S Gateway (RCM-P6PC) to the hub unit (or a gateway unit) and connect a RCP2 to 4 actuator on the further end via a connector conversion unit.

[C] When connection is established with a servo motor type actuator (RCA or RCA2)



Connect a controller for RCP6S Gateway (RCM-P6AC) to the hub unit (or a gateway unit) and connect a RCA or RCA2 actuator on the further end via a connector conversion unit.

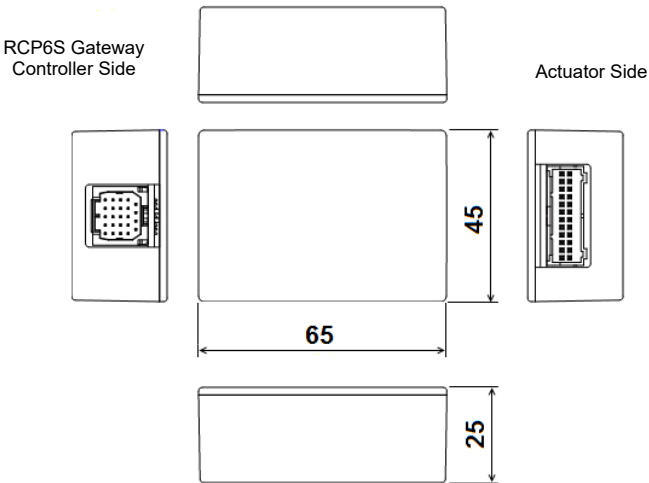
[D] When connection is established with a brushless DC electric motor type actuator (RCD)



Connect a controller for RCP6S Gateway (RCM-P6DC) to the hub unit (or a gateway unit) and connect a RCD actuator on the further end.

Connector Conversion Unit

Use this connector conversion unit in case of actuators not being able to connect to the connection cable for RCP6S Gateway Controller in 2) in order to convert it to the existing controller connector (PADP-24V-1-S) and connect the connection cables to each actuator.

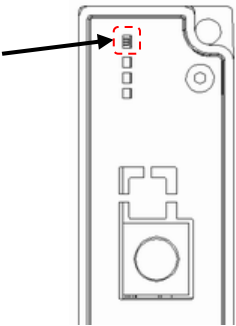


Status Indicator LED

Following show the RCP6S Gateway Controller operation status:

LED Status	Operation Status
OFF	Power Supply OFF Servo OFF
Red Illuminating	Alarm (Operation cancellation level or more) In the emergency stop
Red Flashing	During crash detection (For RCM-P6PC only)
Green Illuminating	Servo ON
Green Flashing	Motor driving power supply OFF
Orange Illuminating	In initializing process when the power is turned on

Status Indicator LED



RCP6S Gateway Controllers (Front Surface)

Connectable Actuators

Refer to [10.4 List of Connectable Actuators] in the instruction manual for the models of actuator available to connect.
Also, refer to the instruction manual of each actuator for the specifications of each actuator.

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Symbol	Cable Name	Cable Model	Remarks
1)	RCP6S Connector Cable	CB-RCP6S-PWBIO□□□	Max.20m ^(Note 1)
2)	RCP6S Gateway Controller Connector Cable	CB-ADPC-MPA□□□	Max.20m ^(Note 1) Max.10m (RCM-P6DC used)

Note 1 The maximum length from the gateway unit to each actuator should be 20m regardless of a hub unit or connector conversion unit being used or not used. However, the maximum length should be 10m from the gateway unit to RCD actuator when RCM-P6DC is used.