ROBO CYLINDER

Controller

PS-24
RCM-PM
RCM-GW
PCON/ACON-ABU
ROBONET
ERC2
PCON
ACON
SCON
PSEL
ASEL
SSEL
XSEL

Controller Overview

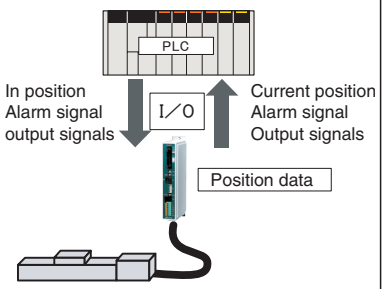
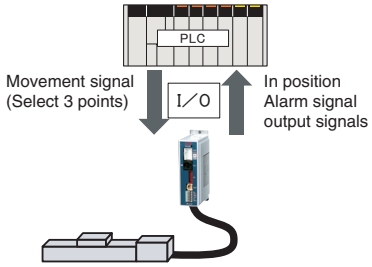
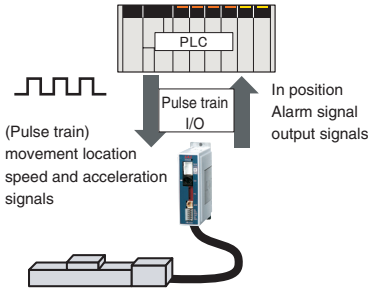
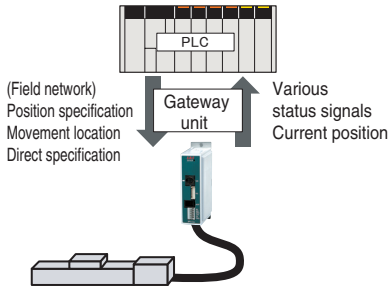
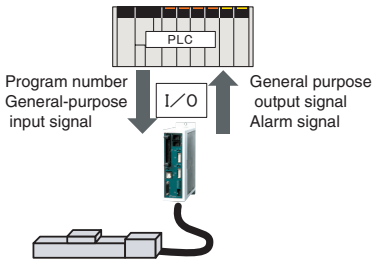
ROBO Cylinder controllers are determined by the type of actuator used and the operating method. Select the controller appropriate for each actuator from the table below, select the type corresponding to the desired operating method.

[Actuator Compatability Table]

Controllers are generally divided into two categories: [Positioner Type], which perform operations based on commands received from external equipment, such as PLC, etc., and [Program Type], which are able to operate independently by means of programs input to the controller. Positioner types are further classified into 4 types according to operating method (see next page).

Actuator Series	Controller Type	
	Positioner Type	Program Type
RCP3 RCP2	RPCON PCON	PSEL
RCA2 RCA	RACON ACON	ASEL
RCS2	SCON	XSEL SSEL

Corresponding Types by Operating Method

Controller Type	Operating Method	Features	
Positioner Type	Position Specification Operation	The actuator is moved by specifying a target position number. Suitable for controlling simple movements to many positions.	 To next page
	Solenoid Valve Operation	The actuator is moved only by ON/OFF of signals, just like an air cylinder with solenoid valve. Ideal for positioning operation involving two to three points.	 To next page
	Pulse Train Input	The user can control actuator operation (via pulses) without using position data. Use this type if you wish to control everything with pulses.	 To next page
	Field Network Serial Communication	Use to operate by field network, such as DeviceNet, CC-Link, or ProfilBus, etc., or by serial communication using a gateway unit.	 To next page
Program Type	Program Type	Programs input to the controller are used to perform various tasks such as operating the actuator and communicating with external equipment. Ideal for small systems where a PLC is not required.	 To next page

Model List by Controller Model

Type	Series Name	RPCON	RACON	ERC2	PCON	
	Compatible Actuators	RCP3/RCP2	RCA2/RCA	ERC2	RCP3/RCP2	
	Reference Pages	→P343	→P343	→P355	→P365	
Positioner Type	External View	(N/A)	(N/A)			
	Type code	—	—	**PN/NP**	**C**	
	Max. connectable axes	—	—	(-)	1 axis	
	Max. positioning points	—	—	16 points	512 points	
	Input power	—	—	DC24V	DC24V	
Solenoid Valve Type	External View	(N/A)	(N/A)			
	Type code	—	—	**PN/NP**	**CY**	
	Max. connectable axes	—	—	(-)	1 axis	
	Max. positioning points	—	—	3 points	3 points	
	Input power	—	—	DC24V	DC24V	
Pulse Train Input Type	External View	(N/A)	(N/A)	(N/A)		
	Type code	—	—	—	PL/PO	
	Max. connectable axes	—	—	—	1 axis	
	Max. positioning points	—	—	—	(-)	
	Input power	—	—	—	DC24V	
Network/Serial Communication Type	External View					
	Type code	**RPCON**	**RACON**	**SE**	**C/CG/SE(*3)**	
	Max. connectable axes	16 axes (*1)	16 axes (*1)	(-)	1 axis	
	Max. positioning points	768 points (*2)	768 points (*2)	64 points	768 points/64 points (*4)	
	Input power	DC24V	DC24V	DC24V	DC24V	
Program Type	External View	(N/A)	(N/A)	(N/A)	(N/A)	
	Type code	—	—	—	—	
	Max. connectable axes	—	—	—	—	
	Max. positioning points	—	—	—	—	
	Input power	—	—	—	—	

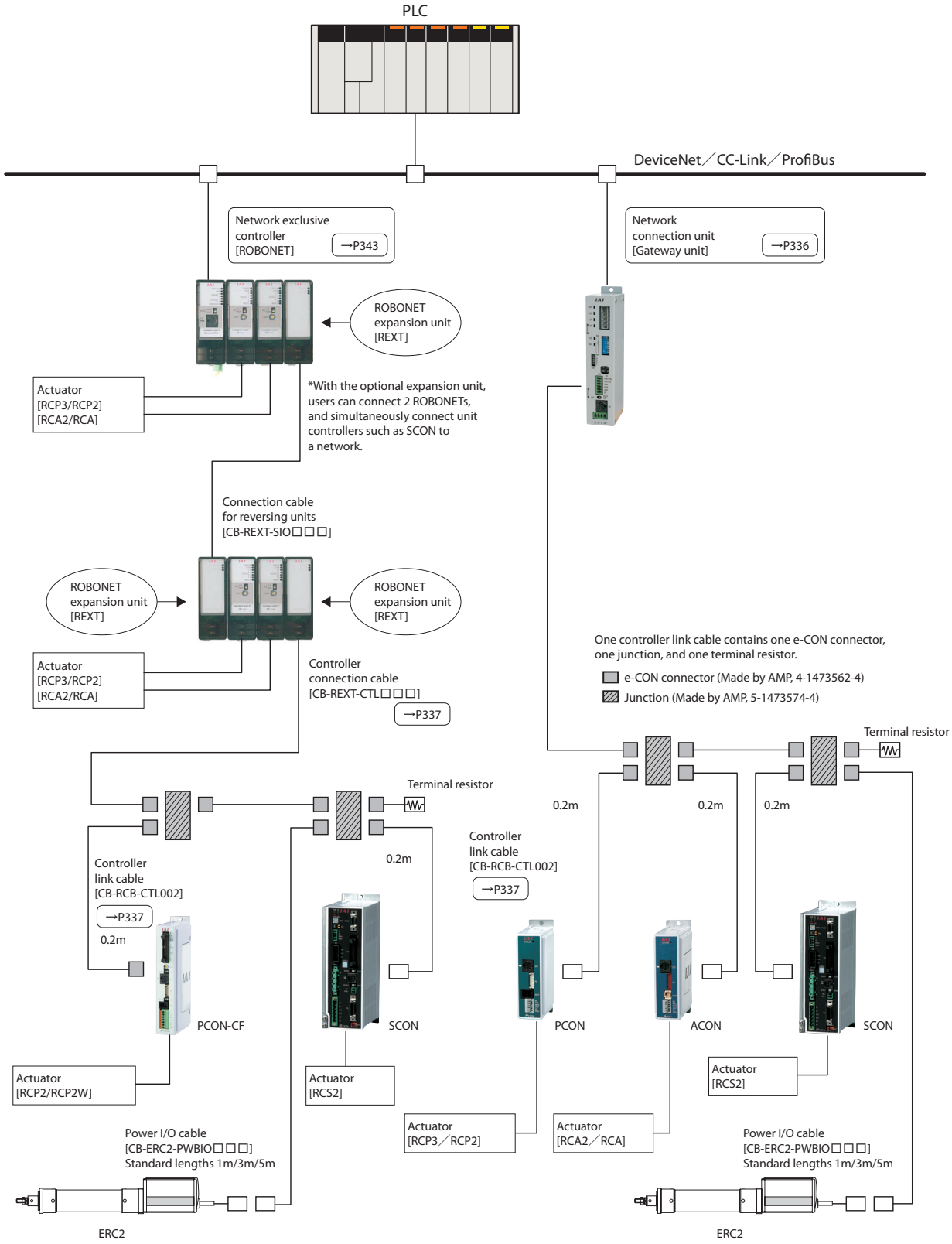
*1 One controller unit is required for one axis. Interpolation operation cannot be done for each axis.
*2 The number of points is not limited when operating in Direct Numeric Specification mode.
*3 When a C/CG type is the network connection specification, it can be directly connected to a field network. SE types are connected to a field network using a gateway unit.

	ACON RCA2/RCA →P375	SCON RCS2 →P385	PSEL RCP3/RCP2 →P395	ASEL RCA2/RCA →P405	SSEL RCS2 →P415	XSEL RCS2 →P425
						(N/A)
	C	**C**	**C**	**C**	**C**	—
	1 axis	1 axis	2 axes	2 axes	2 axes	—
	512 points	512 points	1500 points	1500 points	20000 points	—
	DC24V	AC100/200V	DC24V	DC24V	AC100/200V	—
			(N/A)	(N/A)	(N/A)	(N/A)
	CY	**C**	—	—	—	—
	1 axis	1 axis	—	—	—	—
	3 points	3 points/7 points	—	—	—	—
	DC24V	AC100/200V	—	—	—	—
			(N/A)	(N/A)	(N/A)	(N/A)
	PL/PO	**C**	—	—	—	—
	1 axis	1 axis	—	—	—	—
	(-)	(-)	—	—	—	—
	DC24V	AC100/200V	—	—	—	—
		 * Gateway unit not required. Direct network connection Enabled.			 * Photo shows the network specification and different connectors.	 * Gateway unit not required. Direct Network Connection Enabled.
	C/CG/SE(*3)	**C**	**C**	**C**	**C**	**J/K/P/Q**
	1 axis	1 axis	2 axes	2 axes	2 axes	6 axes
	768 points/64 points (*4)	512 points	1500 points	1500 points	20000 points	4000 points
	DC24V	AC100/200V	DC24V	DC24V	AC100/200V	AC100/200V
	(N/A)	(N/A)				
	—	—	**C**	**C**	**C**	**J/K/P/Q**
	—	—	2 axes	2 axes	2 axes	6 axes
	—	—	1500 points	1500 points	20000 points	4000 points
	—	—	DC24V	DC24V	AC100/200V	AC100/200V

*4 768 points can be operated in the Position No. Specification Mode under the C/CG network connection specification.
64 points can be operated in the Position No. Specification mode on a SE type gateway unit. There are no limitations to the number of points when operating in the Direct Numeric Specification mode.

Field Network System Configuration Diagram

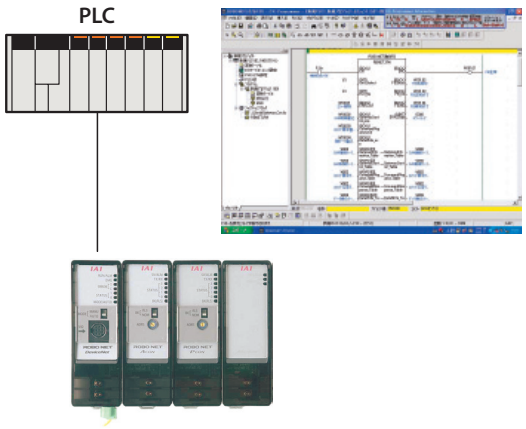
When operating ROBO Cylinders over a field network, a network-dedicated controller "ROBONET" can be used or stand-alone controllers (PCON/ACON/SCON) can be used connected to a "gateway unit."



Serial Communication System Configuration Diagram

[ROBONET Serial Communication – Function Block –]

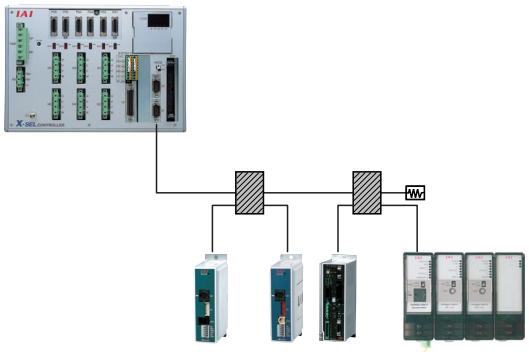
Various PCON/ACON/SCON/ROBONET controllers can be operated by serial communications with a Modbus-RTU protocol compatible communications unit.
Furthermore, when a Omron PLC CS/CG Series is combined with a ROBONET SIO type, a dedicated function block is available that makes communications programs unnecessary, making operation possible by simple serial communication.



[XSEL-P/Q Controller RC Gateway Function]

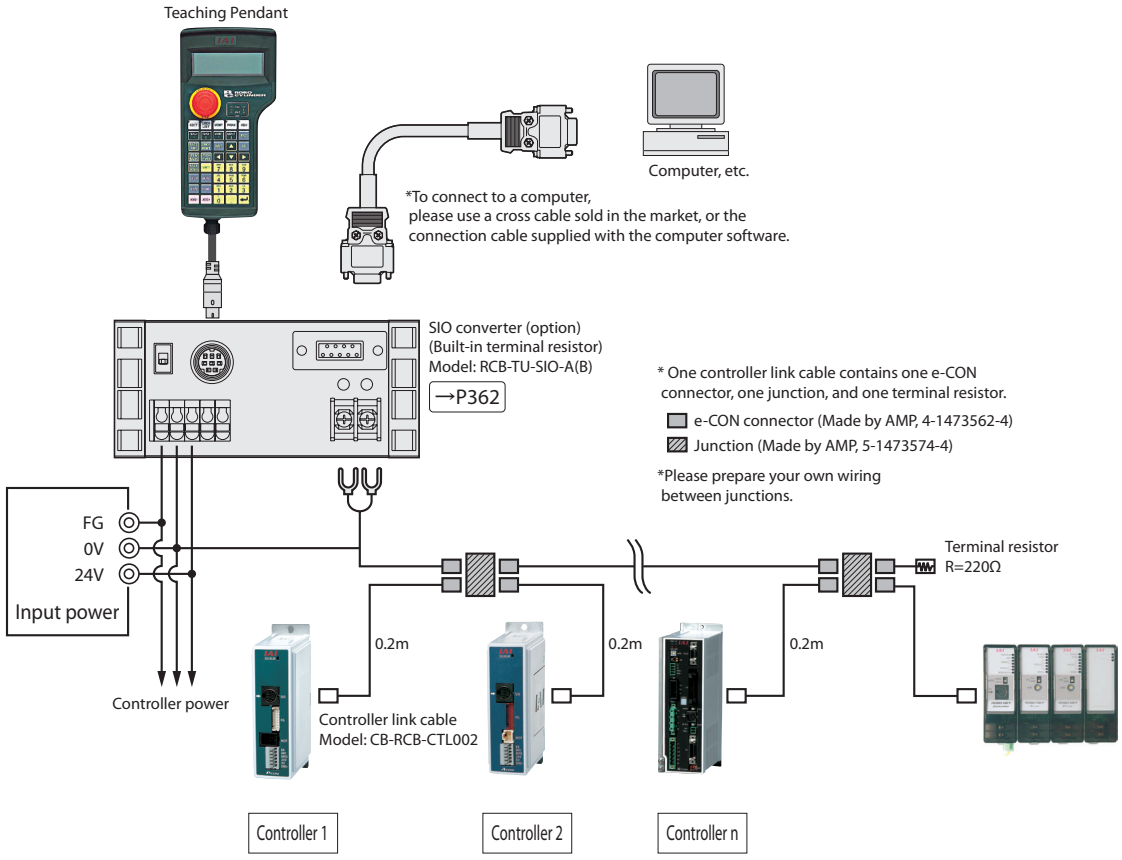
The RC gateway function of the XSEL-P/Q controller is a function that makes it possible to connect various PCON/ACON/SCON/ROBONET controllers to a XSEL controller with dedicated cables and operate ROBO Cylinders with SEL programs from the XSEL controller.

When using a 1-axis robot in combination with a ROBO Cylinder, it is possible to simply operate the ROBO Cylinder with a single program.
(*The RC gateway function cannot be used with the XSEL-J/K type.)



[Other Serial Communications]

When using a controller linked to multiple units, using a “SIO converter” overwrites data in the linked controller, making switchable operation possible without changing cables.



PS-24

Rated Output Current 8.5A
Maximum Momentary Output Current 17A

Features

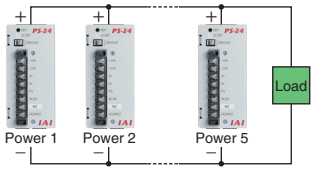
1 Maximum Momentary Output of 17 A

Up to 17A of maximum momentary output current is possible at 8.5A rated output current. This lets you select an appropriate power-supply capacity based on the total rated current of actuators, without having to consider the maximum momentary current that may be generated by the actuators during acceleration. Because you no longer need to use an expensive high-capacity power supply, cost can be reduced substantially.

* The maximum momentary output current must be considered if the actuator operating conditions are tight. See the "Selection Guide" at right for details.

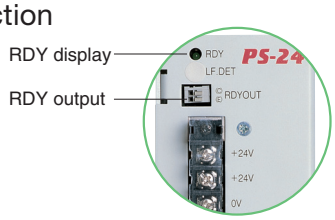
2 Parallel Operation Enabled

Up to 5 units can be operated in parallel. Therefore, even if the power capacity is insufficient with one unit, this can be easily remedied by adding one unit, without the need to replace the unit with a larger capacity power supply.



3 Load Detection Function

Load percentage can be detected by the RDY (Ready) display lamp and the RDY output signal.



Selection target Number of actuators connected

When selecting a power-supply unit for operating multiple actuators, normally a unitwith a capacity equal to or exceeding the total maximum current of all actuators ischosen. However, actuators generate their maximum current only momentarilyduring acceleration, etc., and in many cases the power-supply is over-specified.
On the other hand, the PS-24 power supply provides the following advantages:
1. Supporting maximum momentary current of up to twice the rated current.
2. If you need more power-supply capacity, you can simply add an extra unit or units.

The above features let you select an optimal power-supply capacity.

Number of Power-Supply Units

Basically, how many power-supply units you need should be determined in such a way that the total rated current of all actuators will remain within the rated current of the PS-24. If the load condition is tight, however, the power-supply capacity may still become inadequate. In such cases, add an extra power supply or supplies.

"Severe load conditions" refers to:

- Large load (load is approaching the rated load capacity
- High acceleration/deceleration
- High speed
- Simultaneous operation of multiple axes
- Use of the RB75 series (Structurally these actuators allow maximum current to flow for a longer period.)

Table 1. PS-24 Rated Current & Allowable Momentary Maximum Electric Current

No. of connected units	Rated current [A]	Momentary max. electric current [A]
1	8.5	17
2	15.3	30.6
3	22.95	45.9
4	30.6	61.2
5	38.25	76.5

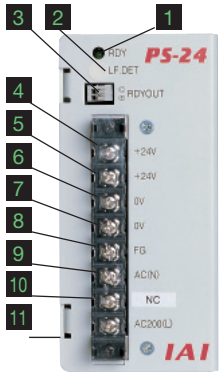
Note: For the second and subsequent units, add a 10% safety buffer (loss).

Table 2. Relationship Between Actuator & Power-Supply Current

Controller Type	Actuator Type	Power-supply current [A]		No. of units connected per PS-24 (reference)*1	
				If the servo is on for all axes simultaneously:	If the servo is not on for all axes simultaneously:
ERC2	ERC2	Rated (=maximum)	2	8	8
RPCON PCON PSEL	RCP3/RCA2, all models (*Except for the bottom 3 models)				
PCON-CF	PCP2-HS8C/HS8R RCP2/RCP2W-RA10C RCP2W-SA16C	Rated (=maximum)	6	2	2
RACON ACON ASEL	SA4,SA5 (20W)	Rated	1.3	3	6
		Maximum	4.4		
	SA6 (30W)	Rated	1.3	4	6
		Maximum	4		
	RA3 (20W)	Rated	1.7	3	5
		Maximum	5.1		
	RA4 (20W)	Rated	1.3	3	6
		Maximum	4.4		
	RA4 (30W)	Rated	1.3	4	6
		Maximum	4		

*1 The figures under "Number of connected axes per PS-24 (reference)", are calculated based on the assumption of "Rated current of axis x Number of axes < Rated current of PS-24 (8.5 A)" [or "Rated current of axis x Number of axes < Maximum momentary current of PS-24 (17 A).

Names of Each Part



1 Ready Display (RDY)

2 Overload Detection Level Setting Dial (LF.DET)

* The appropriate factory settings are applied to this part. No additional re-setting on your part is required.

3 Ready Output Signal (RDYOUT)

4 5 +24V Output Terminal (+24V)

* [4] and [5] are internally connected.

6 7 0V Output Terminal (0V)

* [6] and [7] are internally connected.

8 Frame Ground Terminal (FG)

Terminal for connecting to ground.

9 AV Input Terminal (AC(N))

10 AC (AC100V) Input Terminal (AC100(L))

11 AC (AC200V) Input Terminal (AC200(L))

* Connect the power source between [9] and [10] for a 100-V AC input specification, or between [9] and [11] for a 200-V AC specification. Terminals are not common between these two power input specifications.

Model/Price

Model	PS-241	PS-242
Standard price	-	-

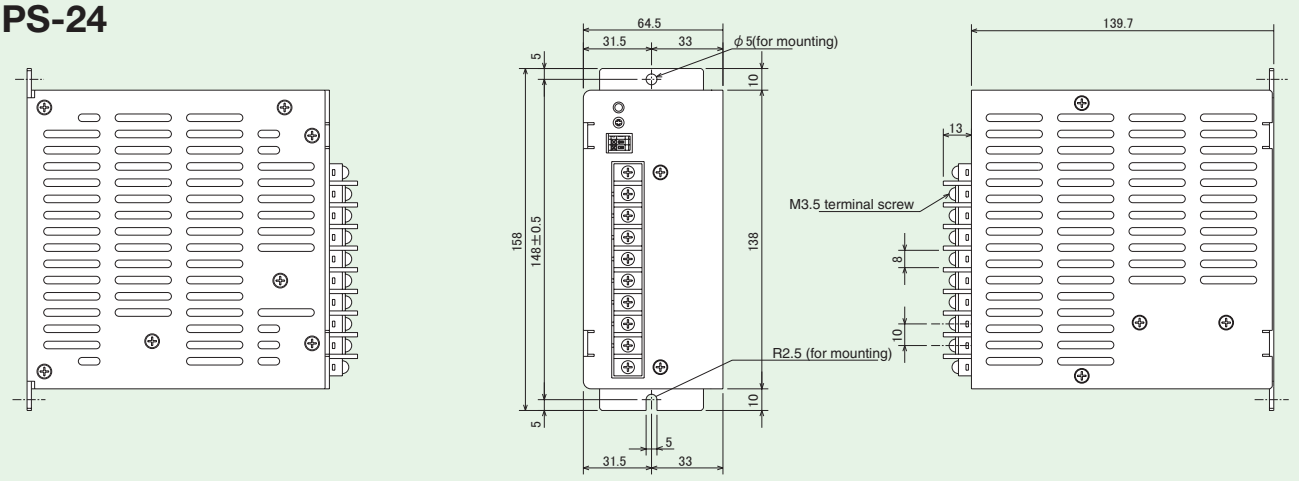
Specification Table

Item	PS-241	PS-242
Rated DC Output Voltage	24V±10% (Varies with the load)	
Rated DC Output Current	8.5A	
Instantaneous Max. DC Output Current	17A	
Rated Output Capacity	204W	
Efficiency	80%	80%
Rated Input Voltage (Frequency)	AC100 to 115V (50/60Hz)	AC200 to 230V (50/60Hz)
Input Voltage Range	AC85 to 125V	AC170 to 250V
Input Current	3.5A (at 100VAC full load)	1.8A (at 200VAC full load)
Output Hold Time	20 [msec] (At 25°C ambient temperature, rated input/output)	
Protection Circuit	Overcurrent protection, Over-voltage protection, Overheating protection, Overload protection	
Parallel Operation	Possible	
Ambient Service Temperature	0 to 50°C (derated)	
Ambient Service Humidity	30 to 85%RH (non-condensing)	
Cooling Method	Natural, air-cooled	
Withstand Voltage	Input–output… 20kVa 1 minute (20mA) Input–case … 20kVa 1 minute (20mA)	
Insulation Resistance	Output–case … Over 100MΩ (at 500V)	
Circuit Format	Separately excited flyback converter	
Weight	Approximately 0.9kg	

External Drawing

DC24V power supply

PS-24

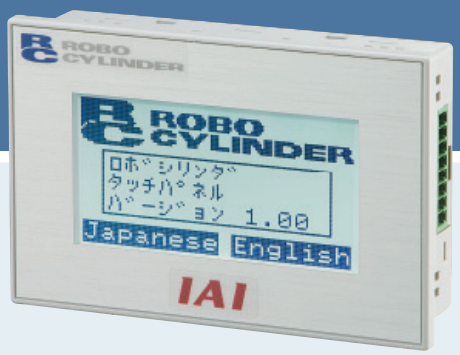


CAUTION

- The PS-24 is not a constant voltage power supply. The output voltage changes with the load (voltage decreases according to the load percentage). Therefore, do not connect any equipment other than ROBO Cylinder actuators.
- Up to 5 units can be operated in parallel. Do not use any power supplies other than the PS-24 at the same time for parallel operation.
- Note that serial operations are not possible.
- As a rule, when operating multiple units in a row, allow at least 20mm space between each power supply.
- This is a natural air-cooled power supply. Please give due consideration to natural convection so that heat does not build up around the power supply.
- The case of this product also has heat dissipating effect. Do not touch the case after installation as it may result in severe burns.

RCM-PM-01

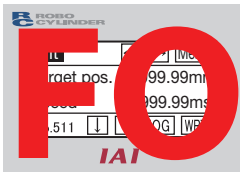
Touch Panel Display
For Position Controller

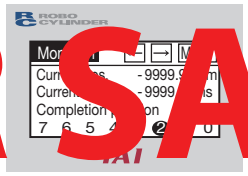


Features

1 Controller data can be easily entered, edited, and monitored

The built-in touch-panel display, makes it unnecessary to have a separate teaching pendant or PC software. Controller position data and parameters (*1) can be entered, edited, and monitored (current position, current speed, input/output status, etc.). Interactive screens make it possible for even novice operators to begin operation immediately.
(*1) Parameter editing is limited to some items.

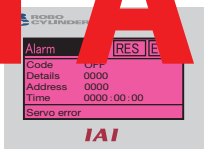




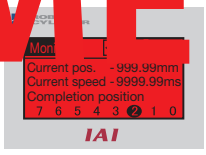
2 The current status can be checked at a glance with three highly visible backlight colors.

Bright, highly visible, backlit screen improves operability.
In addition, the backlight color changes from white, to pink, to red in coordination with the 3 operating states – normal, alarm mode, and emergency stop. The current status can be checked at a glance.

Normal (white)



Alarm (pink)



Emergency stop (red)

3 When connected to ROBONET, the current position, speed, electrical current level, and alarms can be simultaneously displayed for up to 4 actuators.

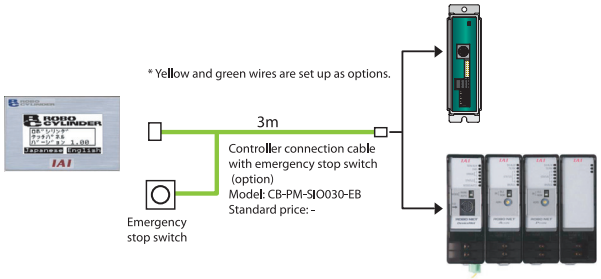
When connected to ROBONET Gateway unit, the ROBONET controller status can be simultaneously displayed for up to 4 actuators (Switch to screen and a maximum of 16 axes can be displayed).
The displayed content shows the current position, current speed, electrical current level, and alarm code, etc. for the actuators in operation.

Model/Price

Model	RCM-PM-01
Standard price	-

Connection Method

If connecting using the controller power:



RCM-PM-01

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

120Ω1/4W

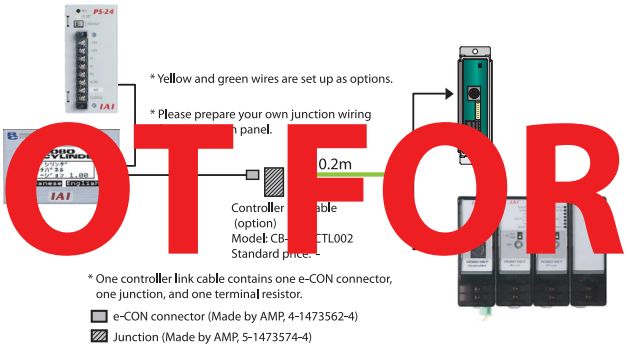
Emergency stop switch

Controller SIO port

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

[MiniDIN]

If connecting using other power:



24V power

+24V

GND

RCM-PM-01

Pin No.	Signal
1	DC24V
2	
3	
4	RS422 SD+
5	
6	
7	RS42
8	RS4

Controller SIO port

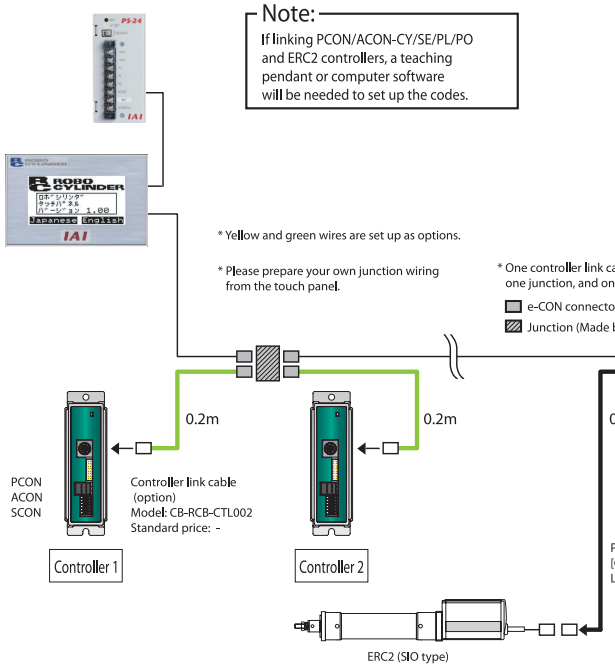
Pin No.	Signal
1	SGA
2	SG
3	5V
4	EN
5	EM
6	24V
7	GN
8	EM

DIN]

* The above connection drawing only lists serial lines. For information on connecting power and emergency stop lines, see the instruction manual for the controller.

If co ting ulti e co roller

Note:
If linking PCON/ACON-CY/SE/PL/PO and ERC2 controllers, a teaching pendant or computer software will be needed to set up the codes.



24V power

+24V

GND

RCM-PM-01

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

Controller 1 SIO port

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

[MiniDIN]

Controller 2 SIO port

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

[MiniDIN]

Terminal resistor

220Ω1/4W

Controller n SIO port

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

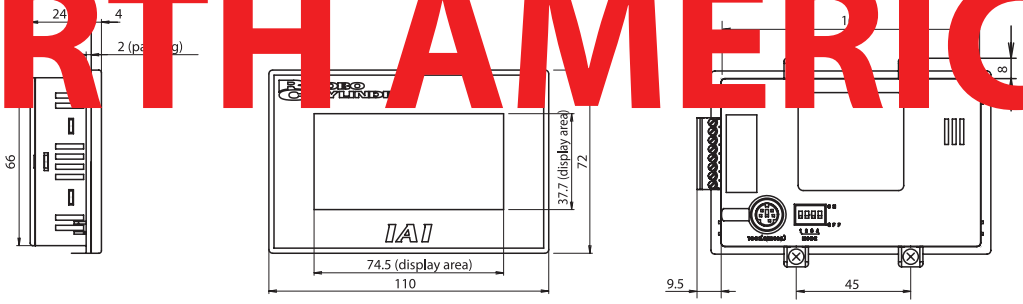
[MiniDIN]

* The above connection drawing only lists serial lines. For information on connecting power and emergency stop lines, see the instruction manual for the controller.

Model/Specifications

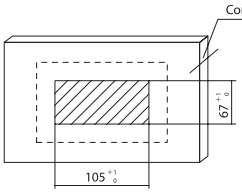
Model		RCM−PM−01
Standard price		-
Basic specifications	Rated voltage	DC24V
	Operating voltage range	DC21.6 to 26.4V
	Power consumption	Max. 2W (80mA or less)
	Ambient temperature and humidity specifications	0 to 50°C, 20 to 85% RH (non-condensing)
	Environmental resistance	Only the front of the panel is rated at IP65. (Rear IP65 is dependent on installation)
	Weight	Approx. 160g
Communication spec.	Communication Standard	RS485-compliant
	Communication conditions	Transmission speed: 115.200bps. Data bits: 8 bits. No parity. Stop bits: 1bit
	Protocol	Modbus/RTU
	Connectable Controllers	PCON/ACON/SCON/ERC2/ROBONET *Up to 16 units can be connected.
Functions	Monitor	Current position, current speed, alarm code, alarm message, PIO status bits, speed waves, electrical current waves, rated electrical current ratio
	Alarm list	No. of records: 16 (Description: code, detailed code, address of occurrence, time of occurrence, message)
	Editing the position table	Target position, speed, acceleration, positioning band, push, individual zone ±, incremental designation, threshold, acceleration and deceleration mode, stop mode, function that incorporates current position through JOG/inching/direct teach, warning function for abnormal input values
	Movement functions	Screen jump function for position movement, direct value movement, JOG movement, and when an alarm occurs
	Editing parameters	Zone signal, software limit, PIO pattern selection, JOG speed, inching distance, push speed, safety speed
	Ba	White ma nk (a n), emergen top)
	Display justment	Can ust cont an ckl t brightne
	Gatew onitor func	Curre positio axe mu eously), current ed ltan usly), cur electrical curren multa ously ectrical all es, alar mon ax y syste status

External View Diagram



Actuator Mounting Example

■Panel cut/hole dimensions

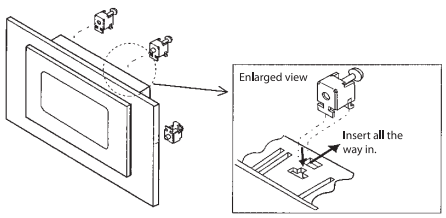


* When mounting, if other parts will be mounted to the panel or if other cables will be configured to the panel, we recommend that a clearance of about 30mm to 50mm be left around the RCM-PM-01, to prevent damage to the cable and improve ease of mounting work.

Note: Never allow the slit on the main unit to become clogged or closed.

■Mounting method (Included mounting jigs to be used: 4 locations)

Insert the (Sun)RCM-PM-01 main unit into the mounting plate.
Attach the (Mon) mounting jig to the groove on the RCM-PM-01 main unit, and tighten the screws to fix the RCM-PM-01 main unit to the mounting plate.
Note 1: Screw fastening torque: 0.1N·m to 0.25N·m
Note 2: If the screws are tightened too much, the front will deform and the touch switch will not operate normally. Mount the screws with appropriate torque.



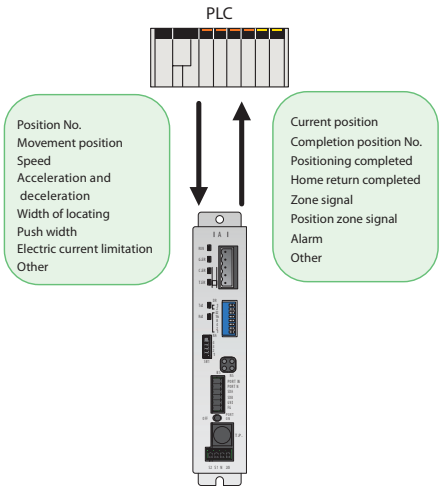
RCM-GW

Gateway Unit
For Position Controller

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

Features

1. Positions can be designated and movements affected from the PLC via network routing.
2. Pushing operations can be performed via network routing.
3. Numeric values for movement positions, speed, acceleration/deceleration, and positioning amplitude, etc. can be directly sent from the PLC.
4. It is possible to acquire the current actuator position and various signals from the PCL.
5. Can connect a maximum of 16 axes.



Functions

Can be operated selecting from the 3 modes below.

(1) Position Number Specification Mode

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

(2) Positioning-Data Specification Mode

Specify a desired target position, speed, acceleration/deceleration, positioning band, push band, currentlimiting value, etc., directly as numerical values to move the actuator or cause it to perform push-motion operation. Various status signals can be input/output and current position data read using a PLC. However, note that, for reasons related to the data area capacity specifications, CC-Link is limited by the maximum number of connected axes and maximum number of position data specifications.

(3) Command Specification Mode

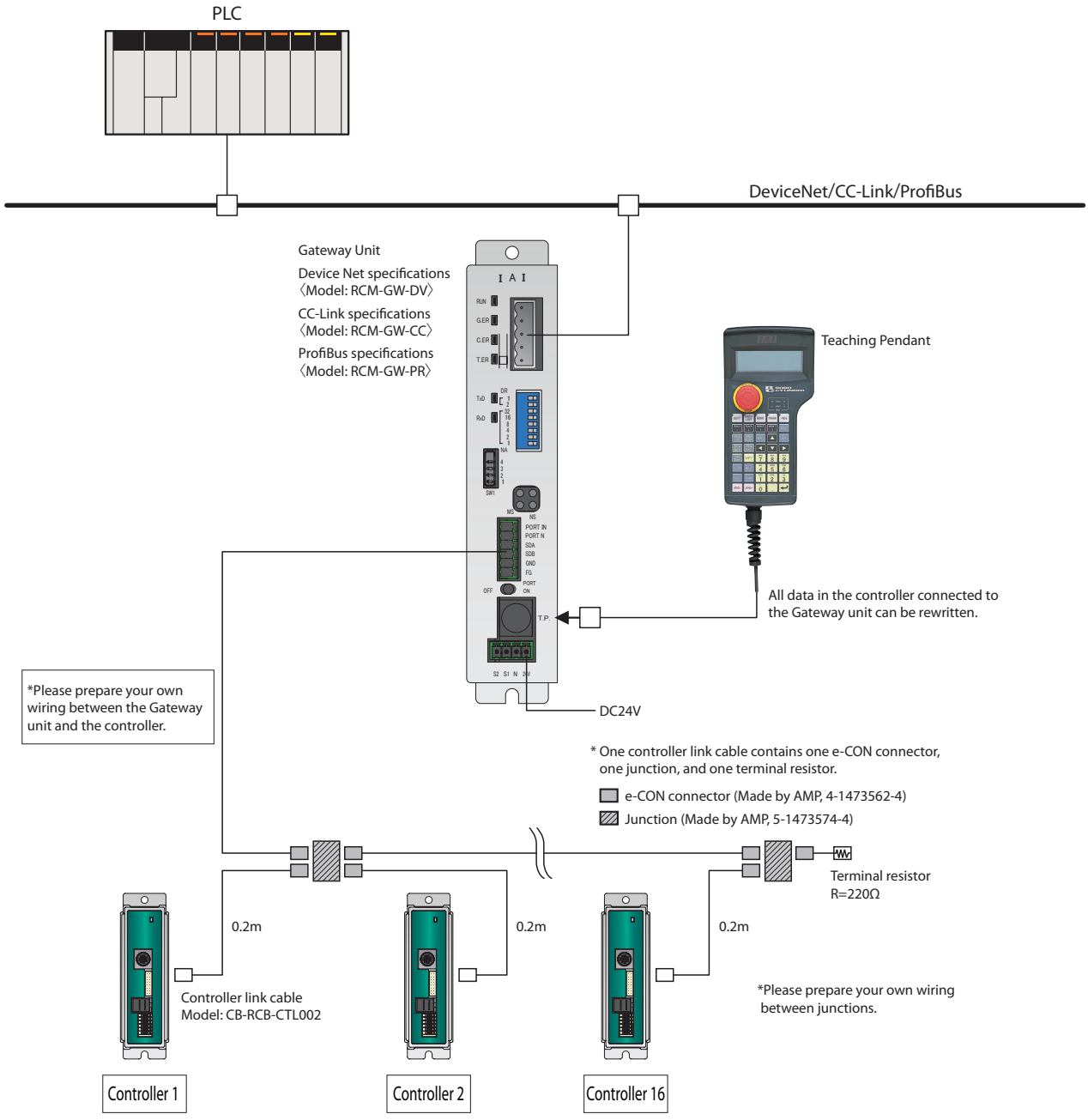
This mode makes it possible to have two operating patterns and to use them together.

(1) Positioner Operation — Enter data (movement position, speed, acceleration, etc.) to the position table,and then operate by designating the position number.

(2) Simple Direct Operation — Data other than movement position are entered to the position table, the movement position is directly numerically designated and other data (speed, acceleration, etc.) are designated by position No. and then operate by designating the position No. In any case, it is possible to use special commands to directly numerically overwrite the data in the position table. However, since there is a limit of 100,000 overwrites to the position table, use the direct numeric designation mode or simple direct operation (*1) when frequently overwriting numeric values.

(*1) Overwrite access restrictions are irrelevant if used in simple direct operation, without overwriting position table data.

System Configuration Diagram



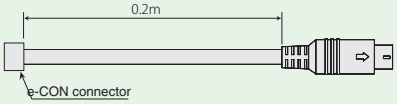
Connectable controllers ERC2/PCON/ACON/SCON (*1)

(*1) Even if a Gateway unit is not used, SCON can be directly connected to a field network.
If directly connected, it will be I/O level communication.
A Gateway unit needs to be used to conduct communication for position data.

■Controller Link Cable

(For e-CON connector, junction, terminal resistance)

Model CB-RCB-CTL002



Color	Signal	No.
Y	SGA	1
O	SGB	2
B	GND	3
		4

No.	Signal	Color
1	SGA	Y
2	SGB	O
3	+5V	
4	ENBL	
5	EMGA	
6	+24V	
7	GND	B
8	EMGB	

DeviceNet Compatible Gateway Unit

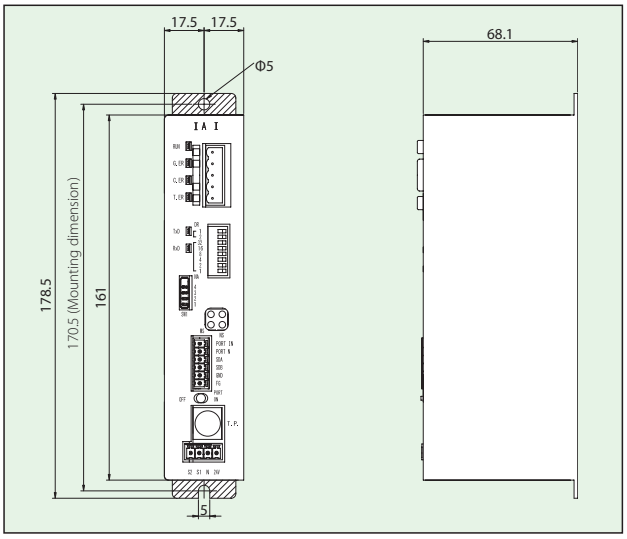
■Model RCM-GW-DV

Operating Modes and Key Functions

Key Functions	Position No. Specification Mode	Direct Value Specification Mode	Command Specification Mode	
			Positioning-data specification mode	Simple direct/position-number specification mode
Movement by position data specification	×	○	×(*)	○
Direct speed & acceleration/deceleration specification	×	○	×(*)	×(*)
Pushing operation	○	○	○(*)	○(*)
Current position read	×	○	×(*)	○
Position No. specification	○	×	○	×
Completed position number read acquisition	○	×	○	○
Various status signal read	○	○	○	○
Number of connectable axes	16	16	16	16
Max. specifiable position data (mm or deg)	Set to position table	9999.99	Set to position table (*)	9999.99

(*) Data in the position table can be read/write and overwritte from the PLC.

External Drawing



Model/Price

Model	RCM-GW-DV
Standard price	-

Specifications

Item		Specification			
Power Supply		DC24V±10%			
Consumption Current		Maximum 300mA			
DeviceNet Specifications	Communication Standard	Interface module certified under DeviceNet 2.0			
		Group 2 Only Server			
		Insulated node operating on network power supply			
	Communication specification	Master-Slave connection	Bit strobe		
			Polling		
			Cyclic		
	Baud rate	500k/250k/125kbps (Selectable by DIP switch)			
	Communication Cable Length (*1)	Baud rate	Max. network length	Max. branch length	Total branch length
		500kbps	100m	6m	39m
		250kbps	250m		78m
		125kbps	500m		156m
		Note) When a large-sized DeviceNet cable is used			
	Rserved nodes	1 node			

Item		Specification
SIO Communication Specifications	Transmission Path Configuration	ROBO Cylinder, dedicated multi-drop differential communication
	Communication method	Half-duplex
	Asynchronous	Synchronization method
	Transmission path type	EIA RS485 2-wire
	Baud rate	230.4kbps
	Error control method	No parity bit, CRC (*2)
	Communication cable length	Total cable length 100m or less
	Connected units	Maximum 16 axes
	Communication cable	2-pair of twisted-pair sealed cables (Recommended: Taiyo Electric Wire & Cable HK-SB/20276xL 2PxAWG22)
Ambient Conditions	Ambient Operating Temperature	0 to 40°C
	Ambient Operating Humidity	85% RH or less (no condensation)
	Operating ambience	Free from corrosive gas, flammable gas, oil mist, or dust
	Storage temperature	–10 to 65°C
	Storage humidity	90% RH or below (non- condensing)
	Vibration resistance	4.9m/s² (0.5G)
Protection Class		IP20
Weight		Max. 480g

*1 If you wish to use T-junction communication, refer to the operation manual for your master unit or PLC used.

*2 CRC (Cyclic Redundancy Check): A data error detection method widely used in synchronous transmission.

CC-Link Compatible Gateway Unit

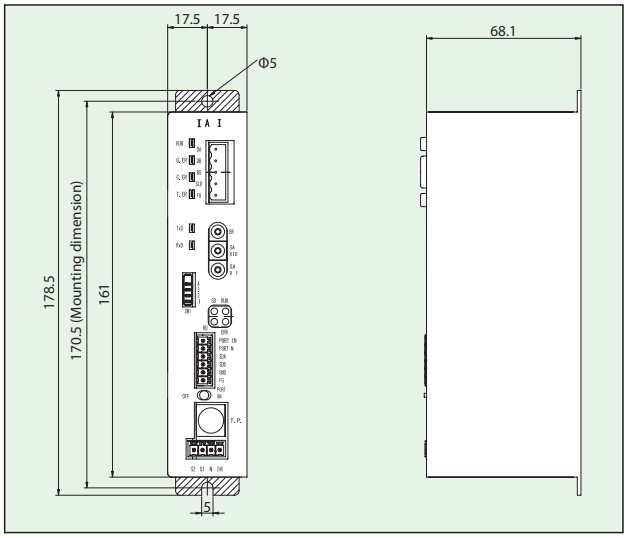
■Model RCM-GW-CC

Operating Modes and Key Functions

Key Functions	Position No. Specification Mode	Direct Value Specification Mode			Command Specification Mode	
		Limited Position Data Mode	Normal Positioning Mode	Pushing Enabled Mode	Positioning-data mode	Simple direct/ position-number mode
Movement by position data specification	×	○	○	○	×(*)	○
Direct speed & acceleration/deceleration specification	×	×	○	○	×(*)	×(*)
Pushing operation	○	×	×	○	○(*)	○(*)
Current position read	×	○	○	○	×(*)	○
Position number specification	○	×	×	×	○	×
Completed position number read acquisition	○	×	×	×	○	○
Various status signal read	○	○	○	○	○	○
Number of connectable axes	14	14	7	3	16	16
Maximum specifiable position data (mm or deg)	Set to position table	327.67	327.67	9999.99	Set to position table (*)	9999.99

(*) Data in the position table can be read/write and overwritte from the PLC.

External Drawing



Model/Price

Model	RCM-GW-CC
Standard price	-

Specifications

Item		Specification					
Power Supply		DC24V±10%					
Consumption Current		Maximum 300mA					
CC-Link specification	Communication standard	CC-Link Ver1.10/2.0(*1)					
	Baud rate	10M/5M/2.5M/625k/156kbps (selectable by rotary switch)					
	Communication method	Broadcast polling method					
	Asynchronous	Frame synchronization method					
	Encoding format	NRZI					
	Transmission path type	Bus Format(EIA RS485 Compliant)					
	Transmission format	HDLC Compliant					
	Error control system	CRC ($X^{16}+X^{12}+X^5+1$)					
	Reserved stations	Remote Device Stations 4 stations					
	Communication cable length (*2)	Communication Rate (bps)	10M	5M	2.5M	625k	156k
		Total Cable Length (m)	100	160	400	900	1200
	Communication cable	Dedicated CC-Link cable					

Item		Specification
SIOCommunication Specification	Transmission path configuration	ROBO Cylinder, dedicated multi-drop differential communication
	Communication method	Half-duplex
	Asynchronous	Synchronization method
	Transmission path type	EIA RS485 compatible 2-wire
	Baud rate	230.4kbps
	Error control method	No parity bit, CRC (*3)
	Communication cable length	Total cable length 100m or less
	Connected units	Between 3/7/14 and 16 axes (depending on operating mode)
	Communication cable	2-pair twisted-pair sealed cable (Recommended: Taiyo Electric Wire & Cable HK-SB/2027 6(L2 P(AWG22)
Ambient Conditions	Ambient operating temperature	0 to 40°C
	Ambient operating humidity	85% RH or less (no condensation)
	Operating ambience	Free from corrosive gas, flammable gas, oil mist, or dust
	Storage temperature	−10 to 65°C
	Storage humidity	90% RH or below (non- condensing)
	Vibration resistance	4.9m/s² (0.5G)
Protection Class		IP20
Weight		Max. 480g

*1 Some functions are enabled for Ver. 2.0 operation only.
*2 If you wish to use T-junction communication, refer to the operation manual for your master unit or PLC used.
*3 CRC (Cyclic Redundancy Check): Data error detection format commonly used with synchronized transmission.

ProfiBus Compatible Gateway Unit

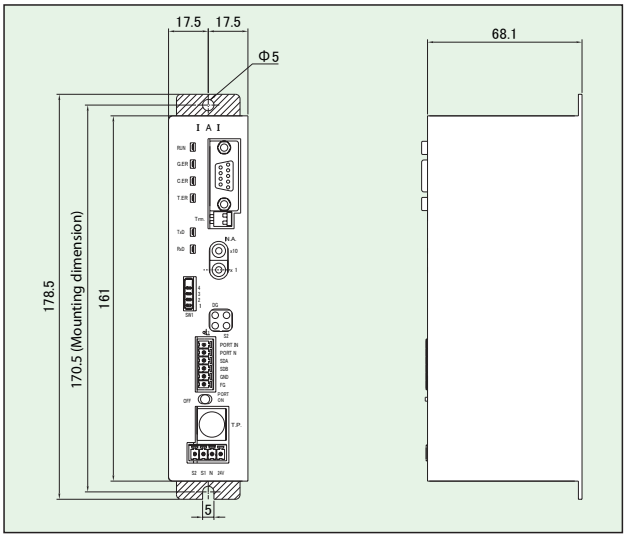
■Model RCM-GW-PR

Operating Modes and Key Functions

Key Functions	Position No. Specification Mode	Direct Value Specification Mode	Command Specification Mode	
			Positioning-data Specification Mode	Simple direct/position-number Specification Mode
Movement by position data specification	×	○	×(*)	○
Direct speed & acceleration/deceleration specification	×	○	×(*)	×(*)
Pushing operation	○	○	○(*)	○(*)
Current position read	×	○	×(*)	○
Position No. specification	○	×	○	×
Completed position number read acquisition	○	×	○	○
Various status signal read	○	○	○	○
Number of connectable axes	16	16	16	16
Max specifiable position data (mm or deg)	Set to position table	9999.99	Set to position table (*)	9999.99

(*) Data in the position table can be read/write and overwritte from the PLC.

External Drawing



Model/Price

Model	RCM-GW-PR
Standard price	-

Specifications

Item		Specification	
Power Supply		DC24V±10%	
Consumption Current		Maximum 300mA	
ProfiBus Specification	Communication Standard	DP slave	
	Baud rate	9.6kbps to 12Mbps	
	Communication Cable Length	9.6kbps	1500m
		500kbps	400m
		1.5Mbps	200m
		3Mbps	200m
		12Mbps	100m

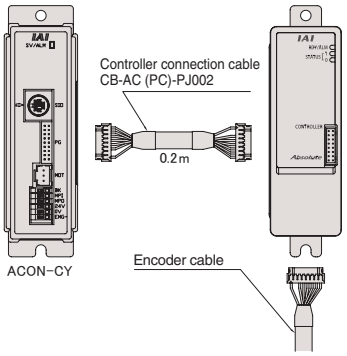
Item		Specification
SIO Communication Specification	Transmission Path Config.	ROBO Cylinder, dedicated multi-drop differential communication
	Communication method	Half-duplex
	Asynchronous	Synchronization method
	Transmission path type	EIA RS485 compatible 2-wire
	Baud rate	230.4kbps
	Error control method	No parity bit, CRC(*3)
	Communication cable length	Total cable length 100m or less
	Connected units	Up to 3, 7, 14, or 16 axes (depending on the operating mode)
	Communication cable	2-pair twisted-pair sealed cable (Recommended: Taiyo Electric Wire & Cable HK-SB/2027 6xL 2PxAWG22)
Ambient Conditions	Ambient operating temperature	0 to 40°C
	Ambient operating humidity	85% RH or less (no condensation)
	Operating ambience	Free from corrosive gas, flammable gas, oil mist, or dust
	Storage temperature	-10 to 65°C
	Storage humidity	90% RH or below (non-condensing)
	Vibration resistance	4.9m/s² (0.5G)
Protection Class		IP20
Weight		Max. 480g

PCON-ABU
ACON-ABU

Simple Absolute Unit
For PCON/ACON Controller

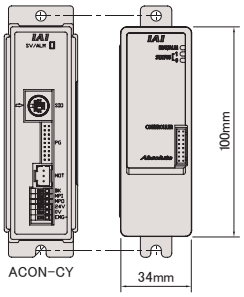
Features

1 When connecting to an ACON/PCON C, CG, CY, or SE type controller (incremental specifications), the data from the encoder are retained even when the main power to the controller is shut off, so these models can be used as absolute specification models that do not need to be restored to the original point.



2 The absolute models are the same size (34 mm wide x 100 mm high x 75.3 mm deep) as the compact CY and SE compact specification models, so they can even be installed in confined spaces.

3 Encoder data can be retained for up to 20 days.



Caution While the encoder data are retained, if the actuator slider or rod are moved faster than a certain speed, an error is generated. Please see the specification table on the back for the allowable speed (number of rotations).

Model/Price

	For PCON Controller	For ACON Controller
Model	PCON-ABU	ACON-ABU
Standard price	-	-

Specifications

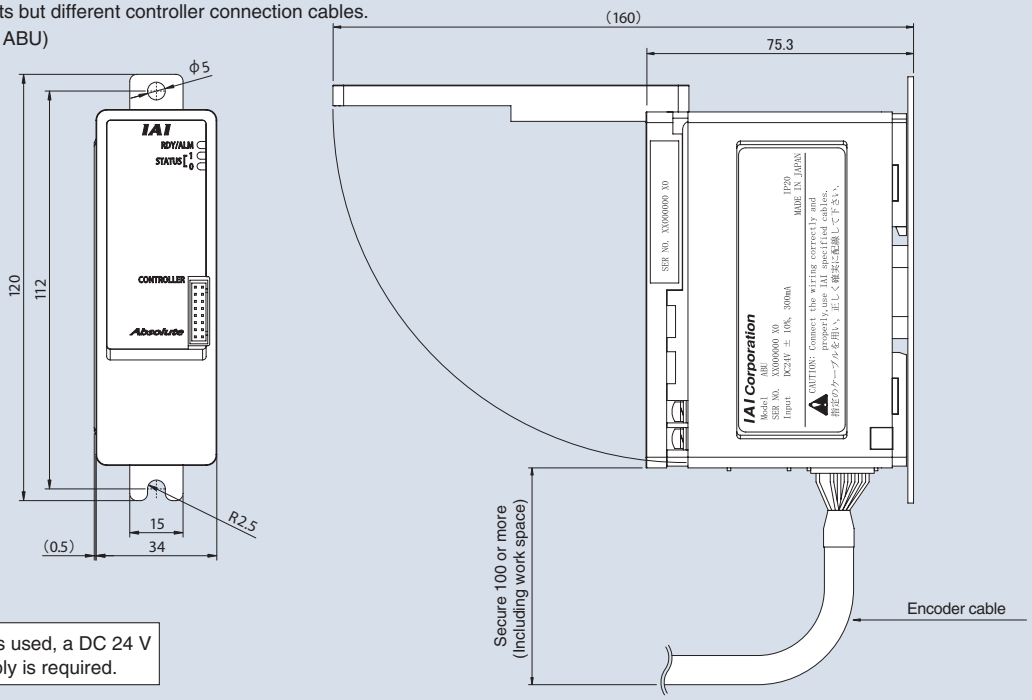
Item	Description	
Model	ACON-ABU	PCON-ABU
Connecting controller	ACON-C/CG/CY/SE	PCON-C/CG/CY/SE
	CAUTION When procuring a controller to connect with the simple absolute unit, add "-ABU" to the end of the controller model designation. Example: ACON-C-20I-NP-2-0-ABU	
Connected Actuator	RCA2/RCA Series	RCP3/RCP2 Series(*1)
Controller Connection Cable (1m)	Model CB-AC-PJ002 (0.2m)	Model CB-PC-PJ002 (0.2m)
Main unit, simple absolute unit	Model ABU	
Back-up battery (included)	Model AB-7 (Ni-MH battery, life of approximately 3 years)	
Power Supply Voltage	DC24V±10%	
Power supply current	Max. 300mA	
Ambient Operating Temperature	0 to 40°C (About 20°C is desirable)	
Ambient Operating Humidity	95% RH or less (non-condensing)	
Ambient operating environment	No corrosive gases, no dust	
Weight	330g	

Allowable encoder RPM during data retention (*2)	800rpm	400rpm	200rpm	100rpm
Position data retention time (*2)	120h	240h	360h	480h

(*1) Cannot be used with RCP2-RA2C/RA10C/HS8C/HS8R/GRS/RTB/RTC/RCP2W-SA16C.
(*2) Position data retention time changes with the allowable encoder RPMs during data retention.
(800rpm→120h/400rpm→240h/200rpm→360h/100rpm→480h)

External View Diagram

*ACON-ABU and PCON-ABU have the same specifications for their main units but different controller connection cables. (Main unit model ABU)



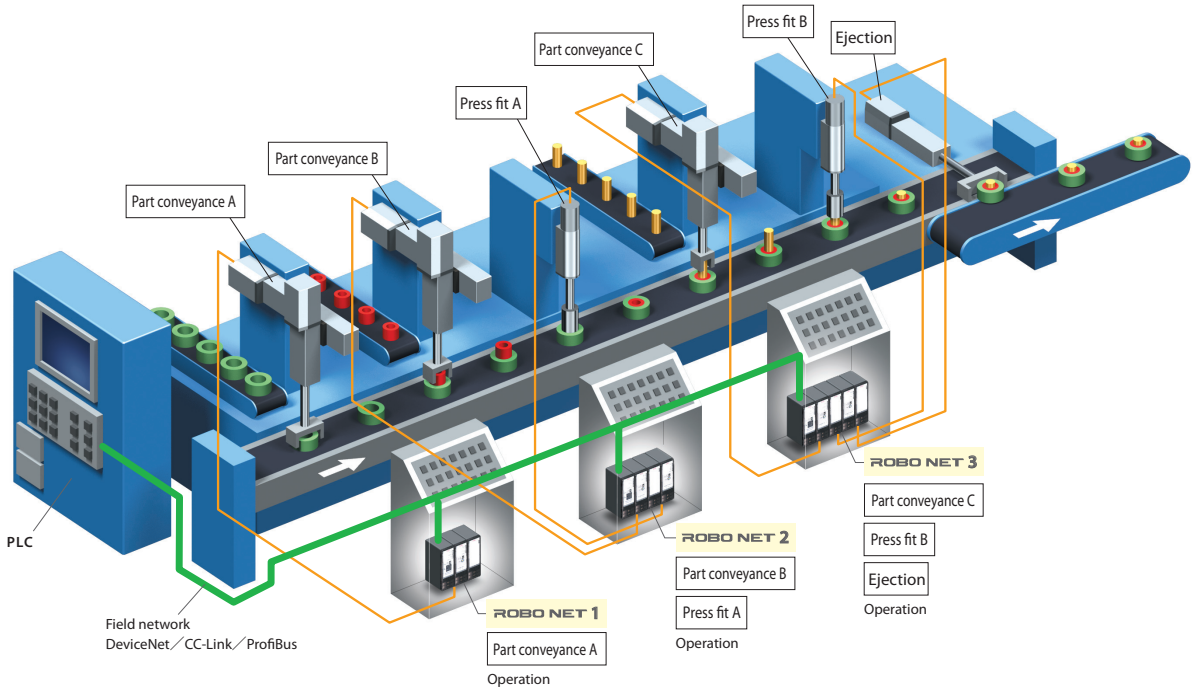
Caution: If this unit is used, a DC 24 V power supply is required.

ROBO NET

Field Network
Dedicated Controller

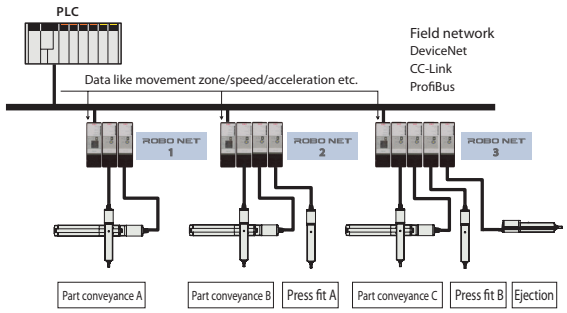
ROBONET is a new type of control unit that freely operates ROBO Cylinders via a field network. They have less wiring and are more compact than past controllers, and by DIN rail mounting make it possible to vastly reduce wiring and installation labor.

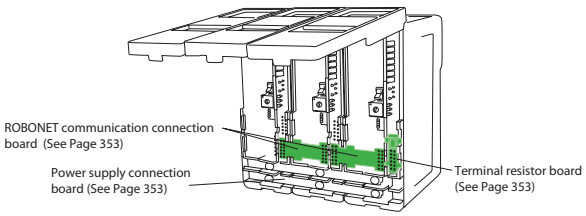
Features



1 Reduced Wiring

By connecting each line of the I/O cables to lines wired to the PLC terminals with the field network, wiring processing is completed with one dedicated cable.
Also, since the unit can be coupled by just connecting with the unit connection board, the controller wiring work is greatly simplified.





(Connected part in ROBONET unit)

2 The robot can be moved by directly specifying numeric values for the move position/velocity/acceleration and other data.

Besides the conventional method of moving the robot to pre-taught positions it is also possible to operate the robot by sending information as a string of numeric data that contains position, velocity, acceleration, etc. values. This is effective for cases such as when the move position changes with each piece or when one wants to move the robot to an arbitrary position.

	ROBONET controller	Standard controller (ACON／PCON)
Movement by specifying positions	○	○
Movement by specifying direct values	○	△ (Not for PIO) (Connectable with serial communication)
Specifying speed/acceleration	○	
Current value output	○	

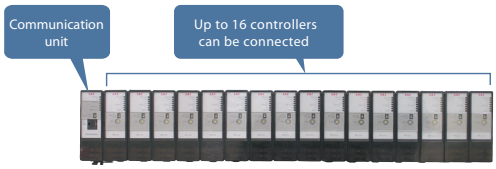
*ROBONET operates through a field network, and the standard controller operates with PIO.

3 Ultra-compact

Each unit is an ultra-compact size of 34mm wide by 100mm high x 73mm deep. Also, since there is no base unit and the main unit is coupled with connectors, the controller takes up little space for installation even if there are many units.

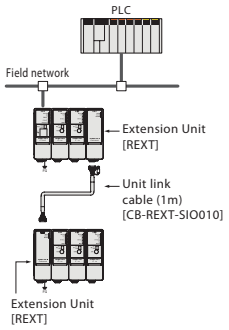
4 Can operate with a maximum of 16 axes.

Up to 16 controllers can be connected to one communication unit (Gateway R unit).
RACON units (controllers for RCA) and RPCON units (controllers for RCP2)
can also be used together.



5 Controllers can be multiplexed.

Controllers can be multiplexed using an optional extension unit, so many axes can be connected even if there isn't much horizontal space.
Also, non-ROBONET controllers (SCON, PCON-CF, ERC2) can be connected to a ROBONET Gateway unit using the same extension unit.



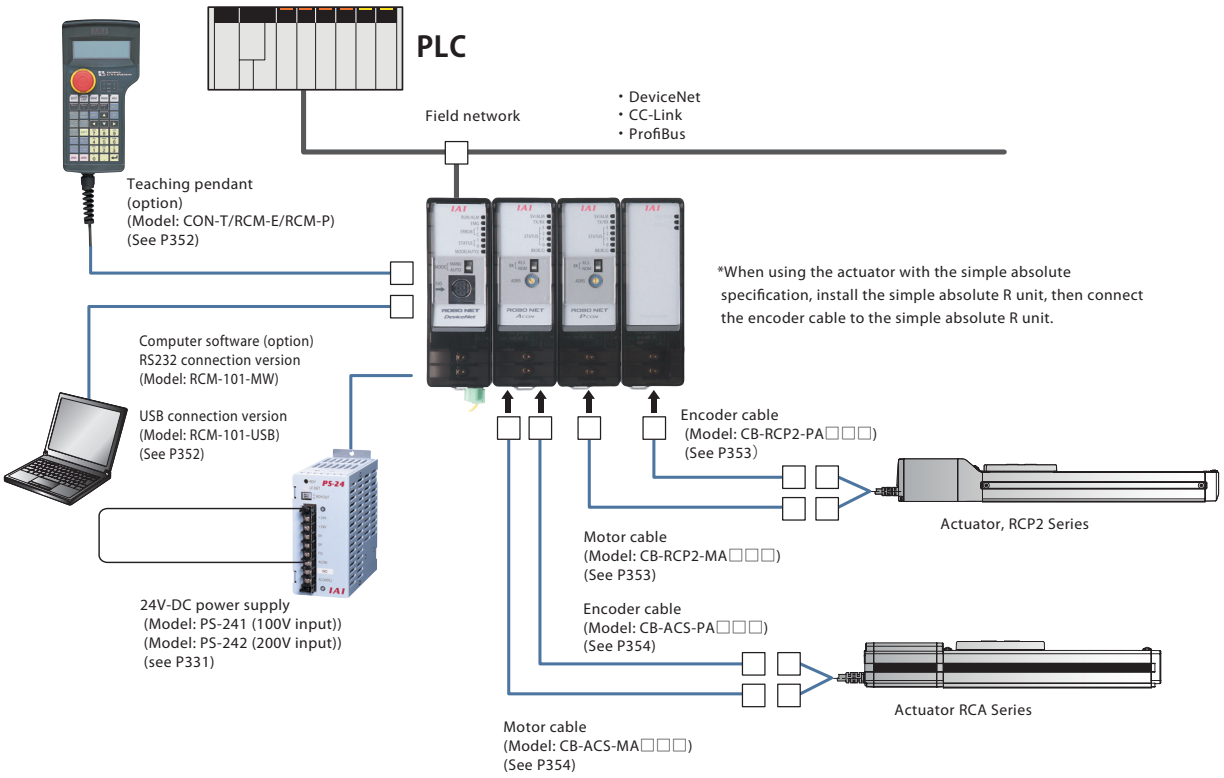
6 Simple absolute unit, when home return is not required

The simple absolute R unit allows operation for incremental specification axes without home return. Users can back up actuator encoder data even if the power is shut off, by installing a simple absolute R unit to a RACON unit (controller for RCA) or RPCON unit (controller for RCP2).

7 Mounting the DIN rail

The controller is installed with DIN rails, so it can be fastened and removed with one touch.

System Configuration



ROBONET Extension Unit

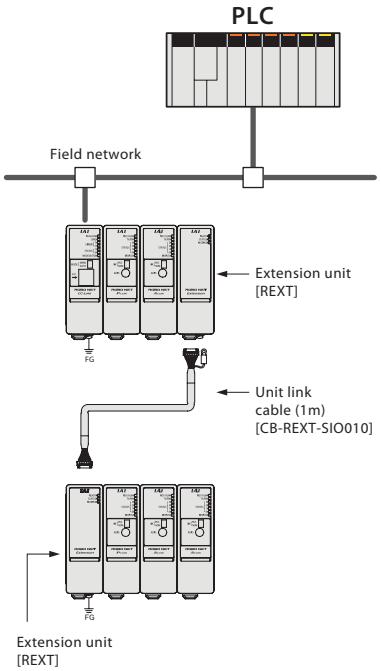
If multiple ROBONET extension units (optional) are linked together they can reduce the lateral width needed. It is also possible to connect individual controllers, such as SCON, etc. via the ROBONET.

[Unit Multiplexing Set]

Model: REXT–SIO

(Set Contents)

ROBONET Extension Unit (Model: REXT)	2
Unit Link Cable	1
(Model: CB-REXT-SIO010)	

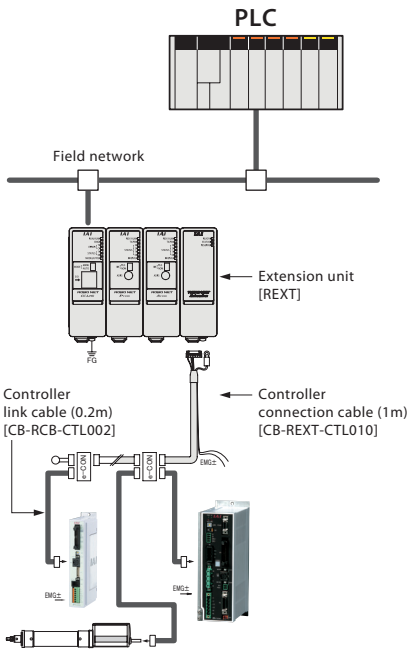


[Controller Connection Set]

Model: REXT–CTL

(Set Contents)

ROBONET Extension Unit (Model: REXT)	1
Controller Connection Cable	1
(Model: CB-REXT-CTL010)	



Structural Unit

Required ROBONET units are ordered individually, and assembled as you see fit. If actuators are added later, they can be easily added simply by adding a RACON/RPCON unit.

Gateway R unit | RACON unit | RPCON unit | Simple absolute R unit | Extension unit

Unit name	Description	See page
Gateway R unit	This unit is for connecting to a field network. Users can select from 4 types: DeviceNet, CC-Link, ProfiBus, and SIO. *This unit is required for using ROBONET.	P348 P349
RACON unit	Controller to operate the RCA actuator. (One unit is necessary per actuator axis.) The incremental specification is the standard, but the simple absolute specification can also be used if the simple absolute R unit is used with it.	P350
RPCON unit	This controller operates the RCP2 actuator. (One unit is necessary per actuator axis.) The incremental specification is the standard, but the simple absolute specification can also be used if the simple absolute R unit is used with it.	P350
Simple absolute R unit	This is the back-up battery unit that retains actuator encoder data when the power is turned off.	P351
Extension unit	This unit makes it possible to reverse ROBONET connections, connect unit controllers (SCON/PCON-CF) to ROBONET, and conduct operation from a network.	P351

Ordering Method/Precautions

Required ROBONET units are ordered individually and assembled by the customer. Consequently, they can be added to or changed later.

<Ordering example> The following 2 actuator axes can be operated through CC-Link.
The models that would be best operated with the absolute specification are as follows.

Actuator 1 Model/ RCA-RA3D onward	Actuator 2 Model/ RCP2-RA3C onward	CC-Link Gateway unit Model/ RGW-CC	Controller unit for actuator 1 Model/ RACON-20	Simple absolute unit Model/ RABU	For actuator 2 Controller unit Model/ RPCON-28SP	Simple absolute unit Model/ RABU

■User Manual

A ROBONET User Manual is included on a CD-ROM with the product. There is no printed version. If you would like a printed version of the user manual, request one when ordering and we will send one to you (the CD-ROM and printed manual are available free of charge). The user manual can also be downloaded from our website.

■Gateway Parameter Setting Tool

A gateway parameter setting tool is necessary to set up the network when ROBONET is connected to a field network. This tool can be acquired at no cost.
(1) Download from the IAI website, or
(2) Acquire PC compatible software (included on CD).
A cable (cable included with PC software, model: CB-RCA-SIO050+RCB-CV-MW) is required to connect the PC to the controller when using the gateway parameter setting tool. If you do not have the PC software, please purchase a cable.

■PC Compatible Software Teaching Pendant

Compatible PC software or a teaching pendant is required to enter position data, etc. to a ROBONET controller unit. ROBONET compatible PC software (Model: RCM-101-MW/USB) version is Ver. 6.00.04.00 or later. Teaching pendant compatible models and versions include: RCM-T and Ver. 2.06 and later, model: RCM-E/RCM-P and Ver. 2.08 and later. Model: CON-T is compatible with all versions from the earliest version.

Consult with our Sales Division if the version your equipment has needs to be updated.

Operating Mode Descriptions

ROBONET operates by receiving commands from the PLC via network routing. Operating methods can be used by switching among the following 3 modes. Use them to match the device operating content and control method.

	Name	Details
1	Positioner mode	Position No. In this mode, operation is based on specifying position numbers and the position data, speed, and acceleration/deceleration speed are input into the position table in advance. A maximum of 768 position points can be set.
2	Simple direct mode	In this mode, operation is based on specifying direct values for position data only, and other parameters such as speed, acceleration/deceleration speed, positioning band, and electric current limitation values while pushing are all specified by the position number. A maximum of 768 position points can be set.
3	Direct-number specification mode	In this mode, operation is based on directly specifying values for speed, acceleration/deceleration speed, positioning band, and electric current limitation values. There is no limit on the number of position points that can be specified numerically.

List of Functions by Operating Mode

	Positioner mode	Single direct value mode	Direct Value Specification Mode
No. of set positions	768 points	768 points	—
Position No. specified movement	○	×	×
Direct position data specification	×	○	○
Direct speed & acceleration/deceleration specification	× (specify in position table)	× (specify in position table)	○
Direct positioning band specification	× (specify in position table)	× (specify in position table)	○
Pushing operation	○ (specify in position table)	○ (specify in position table)	○
Completed position number monitor	○	○	×
Zone output monitor	○	○	○
Position zone output monitor	○	○	×
Teaching function	○	×	×
Jog operation	○	○	○
Incremental operation	○	○	○
Status signal monitor (*)	○	○	○
Current position data (*)	○	○	○
Alarm code monitor (*)	○	○	○
Speed/current value monitor(*)	×	×	○
Maximum value for position data specification	9999.99mm	9999.99mm	9999.99mm
No. of axes that can be connected	16	16	8

*The status signal monitor, current position monitor, alarm code monitor, and speed/current value monitor can access each Gateway R unit address from the PLC and monitor them.

Gateway R unit, DeviceNet specification

This is a communication unit for operating a ROBONET through DeviceNet.

Model RGW-DV

Spec.

Item			Specifications
Power Supply			DC24V ±10%
Consumption Current			Max. 600mA
DeviceNet Specifications	Comm. Standard		Uses an interface module certified under DeviceNet 2.0
			Group 2 Only Server
			Insulated node operating on network power supply
	Comm. Spec.	Master-slave connection	Bit strobe
			Polling
			Cyclic
	Com. Speed		500k/250k/125kbps(switching is conducted by proprietary software)

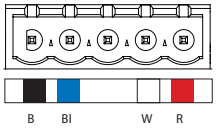
Item					Specifications
DeviceNet Specifications	Comm. cable length (*1)	Com. speed	Max. network length	Max. branch length	Total branch length
		500kbps	100m	6m	39m
		250kbps	250m		78m
		125kbps	500m		156m
		Note: When using a large cable for DeviceNet			
	No. of reserved nodes	1 node			
Amb. Conditions	Ambient op. temperature	0~40℃			
	Ambient op. humidity	95% RH or less (non-condensing)			
	Op. ambience	Free from corrosive gas, flammable gas, oil mist, or dust			
Protection class		IP20			
Weight		140g			
Accessories		Terminal resistor board (Model TN-1) Network connector/emergency stop connector			

*1 If you wish to use T-junction communication, see the instruction manual for your master unit or PLC.

Network connector

Gateway connector
MSTBA2.5/5-G-5.08 ABGY AU
(Made by Phoenix Contact)

Cable connector
MSTB2.5/5-ST-5.08 ABGY AU
(Made by Phoenix Contact)
'= Standard accessories



Pin color	Description
Black	Power supply cable, - side
Blue	Communication data, low side
–	Shield
White	Communication data, high side
Red	Power supply cable, + side

Cable connector-compatible wiring

Item	Description
Compatible wiring diameter	Twisted wire : AWG24-12(0.2~2.5mm²)
Stripped wire length	7mm

Gateway R unit, CC-Link specification

This is a communication unit for operating a ROBONET through a CC-Link.

Model RGW-CC

Spec.

Item		Specifications
Power Supply		DC24V ±10%
Consumption Current		Max. 600mA
CC-Link specification	Comm. Std.	CC-Link Ver2.0 (*1)
	Comm. Speed	10M/5M/2.5M/625k/156kbps (switching conducted by proprietary software)
	Comm. Method	Broadcast polling method
	Syn. Method	Frame synchronization method
	Encode Formatt	NRZI
	Trans. Type	Bus Format(EIA RS485 Compliant)
	Trans. Format	HDLC Compliant

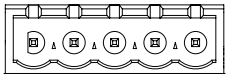
Item							Specifications
CC-Link specification	Error control method	CRC ($X^{16}+X^{12}+X^5+1$)					
	No. of Reserved ST	Remote device station: 1x4 st., 4x,2 st., 8x, 2 st.					
	Comm. cable length (*2)	Comm. speed (bps)	10M	5M	2.5M	625k	156k
		Total Length (m)	100	160	400	900	1200
	Comm. cable	Dedicated CC-Link cable					
Amb. Conditions	Ambient op. temperature	0~40℃					
	Ambient op. humidity	95% RH or less (non-condensing)					
	Op. ambience	Free from corrosive gas, flammable gas, oil mist, or dust					
Protection class		IP20					
Weight		140g					
Accessories		Terminal resistor board (Model TN-1) Network connector/emergency stop connector terminal resistor cable (110Ω/130Ω)					

*1 Certification acquired.
*2 If you wish to use T-junction communication, see the instruction manual for your master unit or PLC.

Network connector

Gateway connector
MSTBA2.5/5-G-5.08AU
(Made by Phoenix Contact)

Cable connector :
MSTB2.5/5-ST-5.08 ABGY AU
(Made by Phoenix Contact)
'= Standard accessories



Signal	Description
D A	Communication line A
D B	Communication line B
D G	Ground
S L D	Connect the shield and cable shield. Connected to the connection FG and enclosure.
F G	Frame ground Connected to the frame ground SLD and enclosure.

Cable connector-compatible wiring

Item	Description
Compatible wiring diameter	Twisted wire : AWG24-12 (0.2~2.5mm²)
Stripped wire length	7mm

Gateway R Unit, ProfiBus Specification

This is a communication unit for operating ROBONET through ProfiBus.

Model RGW-PR

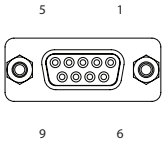
Spec.

Item		Specifications	
Power Supply		DC24V ±10%	
Consumption Current		Max. 600mA	
ProfiBus specification	Comm. Stand	DP slave	
	Comm. Speed	9.6kbps～12Mbps	
	Com. Cable Length	9.6kbps	1500m
		500kbps	400m
		1.5Mbps	200m
		3Mbps	200m
		12Mbps	100m

Item		Specifications
Amb. Conditions	Amb. op. temp	0～40℃
	Amb.op.humidity	95% RH or less (non-condensing)
	Op. amb.	Free from corrosive gas, flammable gas, oil mist, or dust
Protection class		IP20
Weight		140g
Accessories		Terminal resistor board (Model TN-1) Emergency stop connector

Network connector

Gateway connector:
D-Sub connector, 9-pin
socket side



Pin No.	Signal	Description	Pin No.	Signal	Description
3	B-Line	Communication line B (RS485)	6	+5V	+5V output (insulated)
4	RTS	Sending request	8	A-Line	Communication line A (RS485)
5	GND	Signal ground (insulated)	Housing	Shield	Cable ground, Connected to the enclosure.

*The matching connector (D-sub 9-pin connector) is not provided. *1-pin, 2-pin, 7-pin, and 9-pin are not connected

Gateway R Unit, SIO Specification

This is a communication unit for operating ROBONET using serial communication through XSEL controllers (*1) or Modbus-compatible communication units, etc.
*1 A model with the XSEL Gateway function is scheduled to be released soon.

Model RGW-SIO

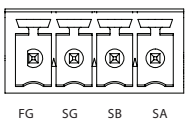
Spec.

Item		Specifications	Item		Specifications
SIO specification	Power Supply	DC24V ±10%	Amb. Conditions	Amb. op. temp	0～40℃
	Consumption Current	Max. 600mA		Amb.op.humidity	95% RH or less (non-condensing)
	Comm. type	RS485-compliant (Modbus protocol) 1:1 communication connection		Op. amb.	Free from corrosive gas, flammable gas, oil mist, or dust
	Comm. method	Asynchronous method, half-duplex		Protection class	IP20
	Comm. speed	Max. 230.4kbps	Weight		140g
	Cable length	100m or less	Accessories		Terminal resistor board (Model TN-1) Network connector/emergency stop connector
	Rec. cable	Twisted pair cable with 2 pairs (shielded)			

Network connector

Gateway connector:
MC1.5/4-G-3.5
(Made by Phoenix Contact):

Cable connector:
MC1.5/4-ST-3.5
(Made by Phoenix Contact)
= Standard accessories



Signal	Description	
SA	Communication line A +	RS485-compliant Built-in terminal resistor (220Ω)
SB	Communication line B-	
SG	Signal ground	
FG	Frame ground, Connected to enclosure.	

Cable connector-compatible wiring

Item	Details
Compatible wiring diameter	Twisted wire : AWG28-16(0.14～1.5mm²)
Stripped wire length	7mm

RACON Unit, Controller for RCA2/RCA Series

Controller to operate RCA2/RCA actuators with ROBONET.

Model **RACON-①②-③**

* For format ①, enter the number of motor W. (See table below)
② For entering the code when specifying high-acceleration/deceleration applications or low-power applications (HA/LA). (Don't list if this is not the specification)
For ③, only enter "ABU" if a simple absolute unit will be used. (Don't list if this will not be used)

Model	Compatible Actuators
RACON-10-②-③	RCA2-SA3C
RACON-20-②-③	RCA-SA4□ ／ SS4□ ／ SA5□ ／ SS5□ ／ RA4□-20 ／ RG□4□-20 ／ A4R ／ A5R RCACR-SA4C ／ SA5□ RCAW-RA4□-20 RCA2-SA4C ／ SA5C ／ TA6C
RACON-20S-②-③	RCA-RA3□ ／ RG□3□ RCAW-RA3□ RCA2-TA5C
RACON-30-②-③	RCA-SA6□ ／ SS6□ ／ RA4□-30 ／ RG□4□-30 ／ A6R RCACR-SA6□ RCAW-RA4□-30 RCA2-SA6C ／ TA7C

Spec.

	Item	Specification		Item	Specification
General specifications	Power Supply	DC24V ±10%	Amb. Conditions	Amb. op. temp	0～50℃
	Power-supply capacity	Max. 5.1A (depends on actuator)		Amb. op. humidity	95% RH or less (non-condensing)
	Operating actuator	RCA Series		Op. amb.	Free from corrosive gas, flammable gas, oil mist, or dust
	Number of positions	768 points		Protection class	IP20
	Backup memory	EEPROM	Weight		200g
	Position detection method	Incremental encoder	Accessories		ROBONET communication connection board (Model JB-1), power supply connection board (Model PP-1)
	Forced release of electromagnetic brake	Brake release switch			
	Motor cable	Model CB-ACS-MA□□□			
	Encoder cable	Model CB-ACS-PA□□□			

RPCON Unit, Controller for RCP3/RCP2 Series

Controller to operate an RCP3/RCP2 actuator with ROBONET.

Model **RPCON-①-②**

For format ①, enter the motor type. (See table below)

For ②, only enter "ABU" if a simple absolute unit will be used. (Don't list if this will not be used)

* The simple absolute unit cannot be used with RCP2-RA2C/GRS/RTB/RTC.

Model	Compatible Actuators
RPCON-20P	RCP2-RA2C ／ GRS
RPCON-28P-②	RCP2-GRM ／ GR3LS ／ GR3SS ／ RTB ／ RTC ／ RTBL ／ RTCL RCP3-SA3C
RPCON-28SP-②	RCP2-RA3C ／ RGD3C
RPCON-35P-②	RCP3-SA4C ／ TA5C
RPCON-42P-②	RCP2-SA5□ ／ SA6□ ／ SS7□ ／ BA6□ ／ BA7□ ／ RA4C ／ RG□4C ／ GR3LM ／ GR3SM RCP3-SA5C ／ SA6C ／ TA6C ／ TA7C RCP2CR-SA5C ／ SA6C ／ SS7C RCP2W-RA4C
RPCON-56P-②	RCP2-SA7□ ／ SS8□ ／ RA6C ／ RG□6C ／ RCP2CR-SA7C ／ SS8C RCP2W-RA6C

*This can be operated with older RCP2 type actuators. (Please ask for details.)

Spec.

	Item	Specification		Item	Specification
General specifications	Power Supply	DC24V ±10%	Amb. Conditions	Amb. op. temp	0～50℃
	Power-supply capacity	Max. 2A		Amb. op. humidity	95% RH or less (non-condensing)
	Operating actuator	RCP2 Series		Op. amb.	Free from corrosive gas, flammable gas, oil mist, or dust
	Number of positions	768 points		Protection class	IP20
	Backup memory	EEPROM	Weight		200g
	Position detection method	Incremental encoder	Accessories		ROBONET communication connection board (Model JB-1), power supply connection board (Model PP-1)
	Forced release of electromagnetic brake	Brake release switch			
	Motor cable	Model CB-RCP2-MA□□□			
	Encoder cable	Model CB-RCP2-PA□□□			

Simple Absolute R Unit

This data back-up battery unit makes it possible to use the incremental specification actuator as the absolute specification by connecting to RACON/RPCON (*1).

*1 One simple absolute R unit is required per RACON/RPCON unit.

Model RABU (common for RACON/RPCON)

* If the simple absolute R unit is arranged with the controller unit (RACON/RPCON), enter "-ABU" as the format suffix of the controller to install with the simple absolute unit.

Spec.

	Item	Specification					Item	Specification
General specifications	Power Supply	DC24V ±10%				Amb. Conditions	Amb. op. temp	0～40℃
	Consumption Current	Max. 300mA					Amb.op.humidity	95% RH or less (non-condensing)
	Battery use	Ni-MH battery, nickel-hydrogen storage cell					Op. amb.	Free from corrosive gas, flammable gas, oil mist, or dust
	Charging time	Approx. 78 hours					Protection class	IP20
	Battery life	3 years				Weight		330g
	Can retain absolute data Maximum rpm	800	400	200	100	Accessories		ROBONET communication connection board (Model JB-1), Simple absolute connection board (Model JB-1), Power supply connection board (Model PP-1)
	Absolute data retension time (h)	120	240	360	480			

Extension Unit

When so many ROBONET units are layed out and connected horizontally such that they cannot fit into a control panel, use this unit to connect them in the middle with a cable and reverse the in a line. Install an extension unit at the end of the ROBONET connections and use an external controller cable, for controllers such as SCON to use them the same way as ROBONET controllers, to operate on a network.

Model REXT (common for RPCON/RACON)

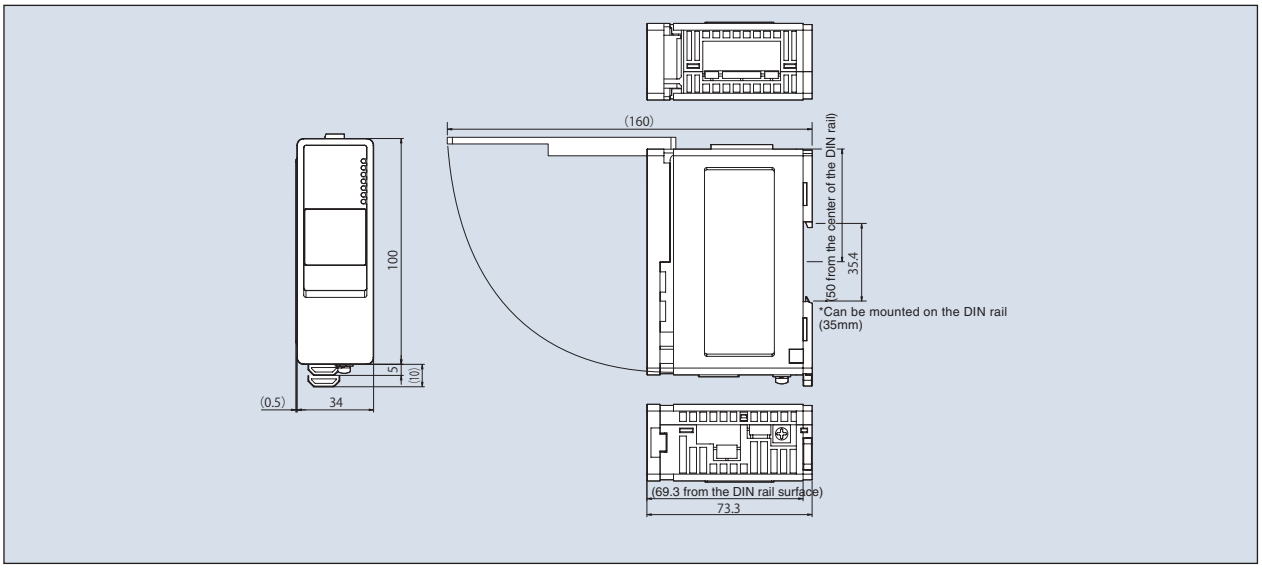
Spec.

	Item	Specification
General spec.	Power Supply	DC24V ±10%
	Consumption Current	Max. 100mA
Amb. Conditions	Amb. op. temp	0～40℃
	Amb.op.humidity	95% RH or less (non-condensing)
	Op. amb.	Free from corrosive gas, flammable gas, oil mist, or dust
	Protection class	IP20
Weight		140g
Accessories		ROBONET communication connection board (Model JB-1) Power supply connection board (Model PP-1)

Note:
When ROBONET unit connections are reversed, if unit controllers are connected, different cables are used.
For details, see System Configuration (ROBONET Exptension Unit) on P345.

External Drawing

Gateway R Unit/RACON Unit/RPCON Unit/Simple Absolute R Unit/Extension Unit all share the same external dimensions.



Option

Teaching Pendant

Features: This is a teaching device that provides information on functions such as position input, running tests, and monitoring.

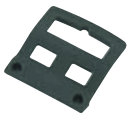
Model: CON-T (standard type)
RCM-E (simple absolute teaching pendant)
RCM-P (data setting device)

Configuration

Note
Only Versions 2.08 and later versions of RCM-E and RCM-P can be used with ROBONET.

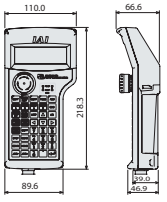
CON-T option

- For wall mounting Model HK-1

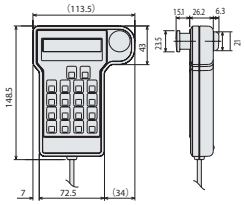


- Strap Model STR-1

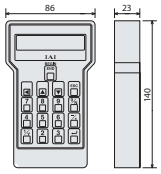
CON-T



RCM-E



RCM-P



Specifications

Item	CON-T	RCM-E	RCM-P
Data input	○	○	○
Actuator operation	○	○	×
Amb. op. temp., humidity	Temperature: 0 to 40°C. Humidity: 85% RH or less.		
Amb. op. env.	Free from corrosive gases and especially dust.		
Protection class	IP54	–	–
Weight	Approx. 400g	Approx. 400g	Approx. 360g
Cable length	5m		
Display	20 char. x 4 rows, LCD	16 char. x 2 rows, LCD	16 char. x 2 rows, LCD
Standard price	-	-	-

Computer software (Windows only)

Features: A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.

Model: RCM-101-MW (with external device communication cable + RS232 conversion unit)

Configuration

PC software (CD)

RS232 conversion adapter RCB-CV-MW

0.3m

5m

External device communication cable CB-RCA-SIO050

Note
Only Version 6.00.04.00 and later versions versions can be used with ROBONET.

Model: RCM-101-USB (with external device communication cable + USB conversion adapter + USB cable)

Configuration

PC software (CD)

USB conversion adapter RCB-CV-USB

1m

USB cable CB-SEL-USB010

5m

External device communication cable CB-RCA-SIO050

Note
Only Version 6.00.04.00 and later versions versions can be used with ROBONET.

Option

24V-DC power supply

Features

This is the 24-V power supply for ROBO Cylinders that can have a maximum momentary output of 17A.
The power can be run parallel, so even if the capacity is insufficient with 1 unit, up to 5 units can be added.

Model

PS-241
(100V input specification)
PS-242
(200V input specification)

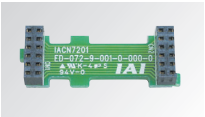
Relationship Between Actuator & Power-Supply Current

Controller Type	Actuator Type	Power-supply current [A]		No. of units that can be connected per PS-24	
				If the servo is on for all axes simultaneously*	If the servo is not on for all axes simultaneously*
RPCON PCON PSEL	All RCP2 models (Note)	Rated (=Max.)	2	8	8
RACON ACON ASEL	SA4, SA5 (20W)	Rated	1.3	6	3
		Max.	4.4		
	SA6 (30W)	Rated	1.3	6	4
		Max.	4		
	RA3 (20W)	Rated	1.7	5	3
		Max.	5.1		
	RA4 (20W)	Rated	1.3	6	3
		Max.	4.4		
	RA4 (30W)	Rated	1.3	6	4
		Max.	4		

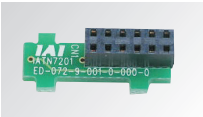
*This refers to the first time the servo comes on after the power is turned on
Note: except for HS8C, HS8R, and RAIOC.

Spare Parts

Should you require spare parts after the purchase of your product for replacing the original cables, etc., refer to the following model names.



ROBONET communication connection board (Simple absolute connection board)
Model JB-1



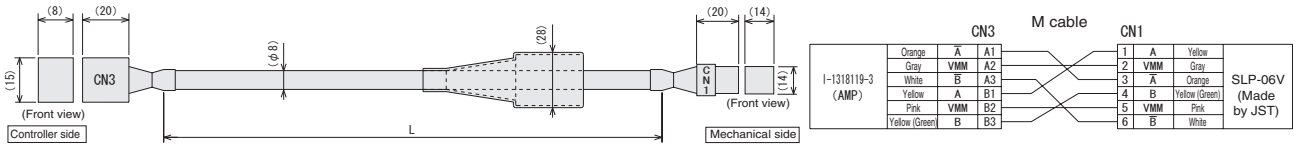
Terminal resistor board
Model TN-1

Power supply connection board
Model PP-1
(2 per set)

RCP2 Motor Cable

Model **CB-RCP2-MA□□□**

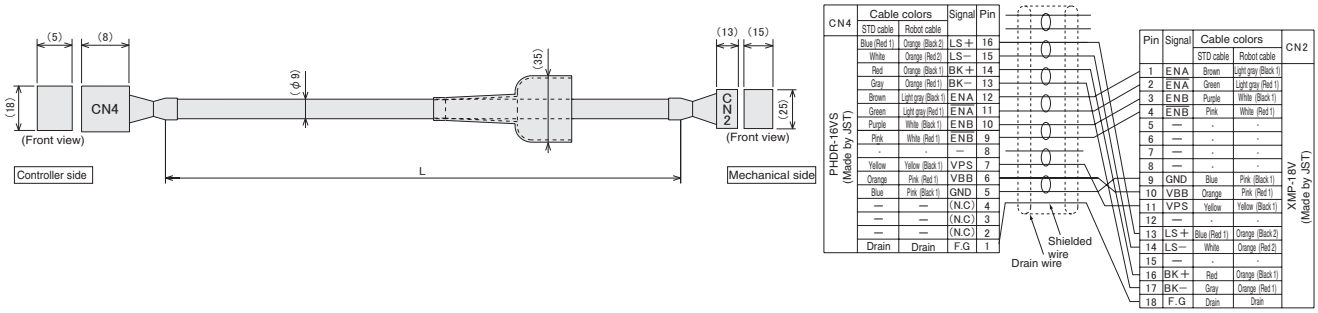
*The standard robot cable for the RCA2 is a robot cable. A robot cable can be specified as an option.
*□□□indicates the cable length (L). Lengths up to 20 m can be specified.



RCP2 Encoder Cable/Encoder Robot Cable

Model **CB-RCP2-PB□□□/CB-RCP2-PB□□□-RB**

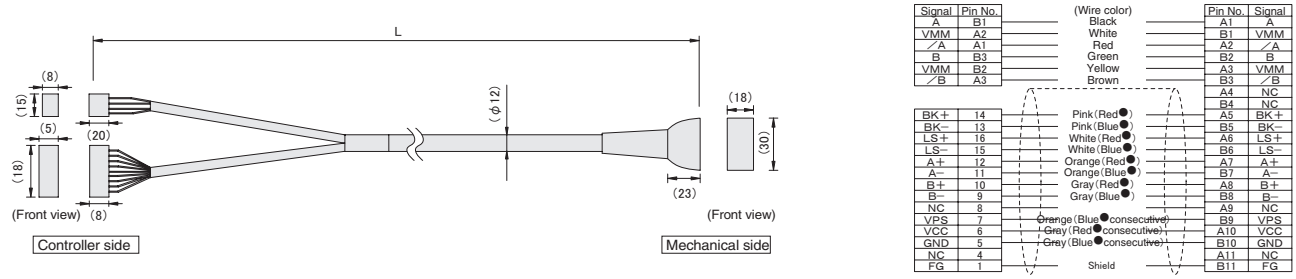
*The standard robot cable for the RCA2 is a robot cable. A robot cable can be specified as an option.
*□□□indicates the cable length (L). Lengths up to 20 m can be specified.



RCP3 Motor-Encoder Integration Cable

Model **CB-PCS-MPA□□□**

*□□□indicated the cable length (L) Lengths up to 20m can be specified
Example) 080=8m

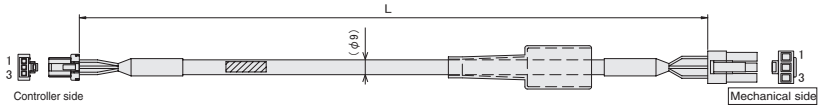


Spare Parts

RCA Motor Cable

Model **CB-ACS-MA□□□**

*□□□indicated the cable length (L). Lengths up to 20m can be specified
Example) 080=8m



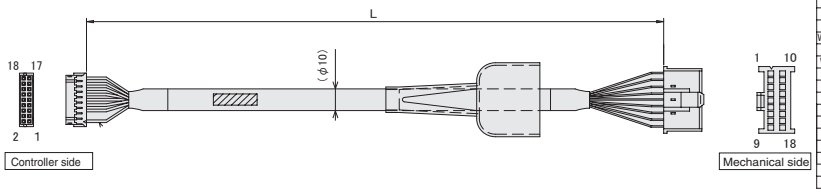
Wiring	Color	Signal	NO
AWG22 (Crimped)	Red	U	1
	White	V	2
	Black	W	3

No	Signal	Color	Wiring
1	U	Red	AWG22 (Crimped)
2	V	White	
3	W	Black	

RCA Encoder Cable/Encoder Robot Cable

Model **CB-ACS-PA□□□/CB-ACS-PA□□□-RB**

*A standard normal cable or optional robot cable can be selected as the encoder cable.
*□□□indicates the cable length (L). Lengths up to 20 m can be specified.



CN2

Cable color		Signal	Pin No.
Robot cable	Standard cable		
White/Purple	Blue	LS+	18
White/Gray	Orange	LS−	17
Yellow	Green	BK+	16
Blue	Brown	BK−	15
White/Blue	Gray	ENA	14
White/Yellow	Red	ENA	13
White/Red	Black	ENB	12
White/Black	Yellow	ENB	11
Orange	Pink	ENZ	10
Green	Purple	ENZ	9
Purple	White	—	8
Gray	Blue/Red	VPS	7
Red	Orange/White	5V	6
Black	Green/White	GND	5
—	—	—	4
—	—	—	3
—	—	—	2
Drain	Drain	F.G	1

Housing: PHDR-18VR (Made by JST)
Contact: SPHD-001T-P0.5 (Made by JST)

CN1

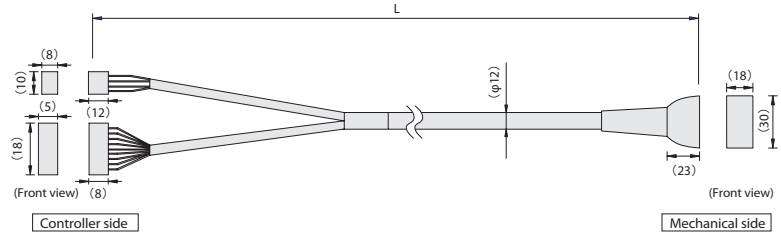
Pin No.	Signal	Cable color	
		Standard cable	Robot cable
1	ENA	Gray	White/Blue
2	ENA	Red	White/Yellow
3	ENB	Black	White/Red
4	ENB	Yellow	White/Black
5	—	—	—
6	—	—	—
7	LS+	Blue	White/Purple
8	—	—	—
9	FG	Drain	Drain
10	ENZ	Pink	Orange
11	ENZ	Purple	Green
12	—	White	Purple
13	VPS	Blue/Red	Gray
14	5V	Orange/White	Red
15	GND	Green/White	Black
16	LS−	Orange	White/Gray
17	BK−	Brown	Blue
18	BK+	Green	Yellow

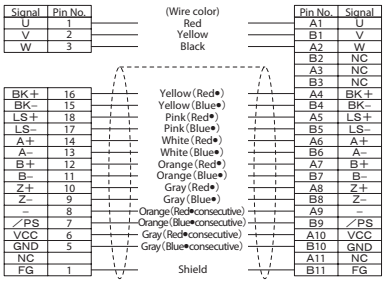
Plug housing: XMP-18V (Made by JST)
Socket contact: BXA-001T-P0.6 (Made by JST
Retainer : XMS-09V (Made by JST)

Motor–Encoder Integration Cable for RCA2

Model **CB-ACS-MPA□□□**

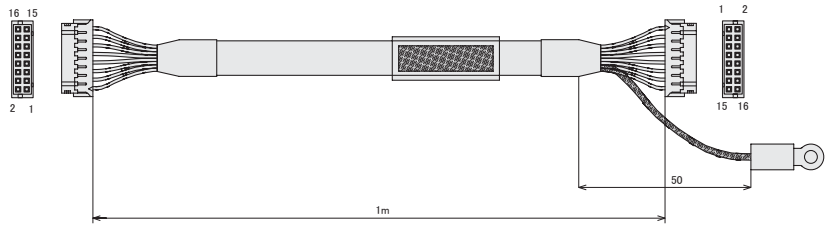
*□□□indicated the cable length (L) Lengths up to 20m can be specified
Example) 080=8m

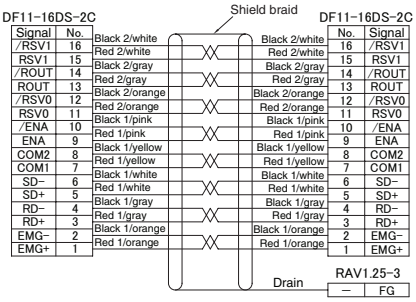




Controller Connection Cable for Extension Unit

Model **CB-REXT-SIO010**

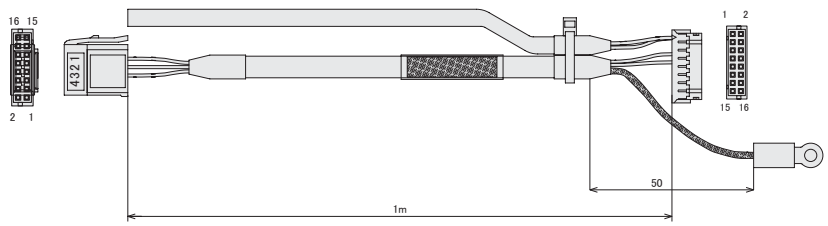


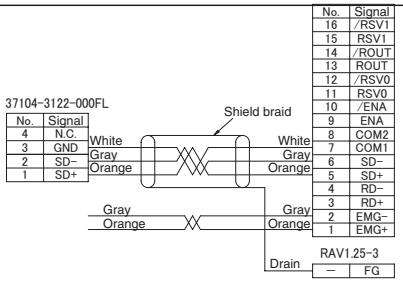


Wire color legend: Dot color number/insulator color

Controller Connection Cable for Extension Unit

Model **CB-REXT-CTL010**

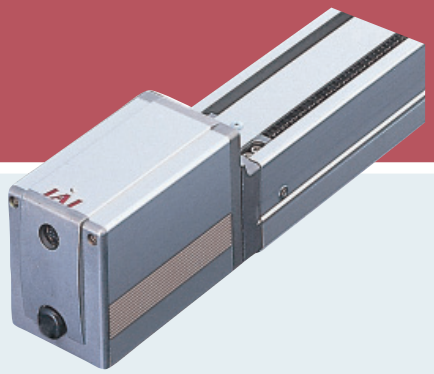




ERC2

■Models NP/PN/SE

Controller module of controller-integrated actuator



Model List/Price

I/O Type		NP	PN	SE
Title		PIO Type (NPN Specification)	PIO Type (PNP Specification)	Serial Communication Type
External View				
Description		Type in which PLC designates the position number in PIO before it moves	NP-type PNP specification (overseas specification)	Uses a gateway unit type to connect to a field network
Positioning Points		16 points	16 points	64 points
Standard price (*)	SA6C	-		
	SA7C	-		
	RA6C	-		
	RA7C	-		
	RGS6C	-		
	RGS7C	-		
	RGD6C	-		
	RGD7C	-		

(*) Prices include an actuator with a built-in controller. The amounts are displayed from minimum stroke to maximum stroke.

Model

ERC2 – [ ] – I – PM – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

Series | Type | Encoder type | Motor type | Lead | Stroke | I/O type | Cable length | Option

Motor type:
- PM: Pulse motor

Encoder type:
- I: Incremental

Type:
- SA6C: Slider type (Width 52mm)
- SA7C: Slider type (Width 58mm)
- RA6C: Rod type (Width 52mm)
- RA7C: Rod type (Width 58mm)
- RGS6C: Single-guide rod type (Width 52mm)
- RGS7C: Single-guide rod type (Width 58mm)
- RGD6C: Double-guide rod type (Width 52mm)
- RGD7C: Double-guide rod type (Width 58mm)

Lead:
- 16: 16mm
- 12: 12mm
- 8: 8mm
- 6: 6mm
- 4: 4mm
- 3: 3mm

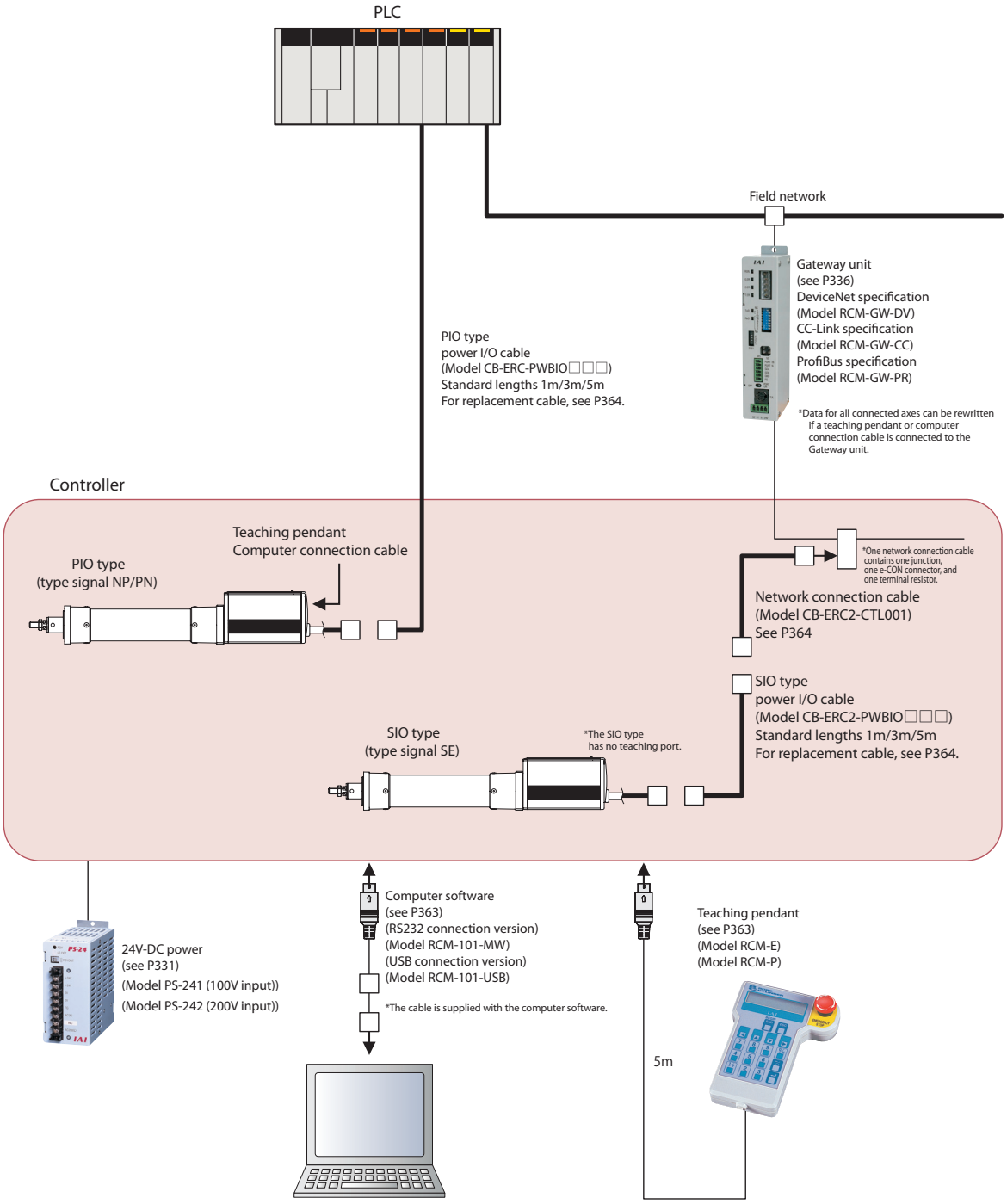
Stroke:
- 50 ~ 600: 50mm ~ 600mm (Set every 50mm)

I/O type:
- NP: PIO type (for NPN)
- PN: PIO type (for PNP)
- SE: SIO type

Cable length:
- N: No cable
- P: 1m
- S: 3m
- M: 5m
- X??: Length Designation
- R??: Robot cable
- W??: Cable with connectors at both ends
- RW??: Robot cable with connectors at both ends

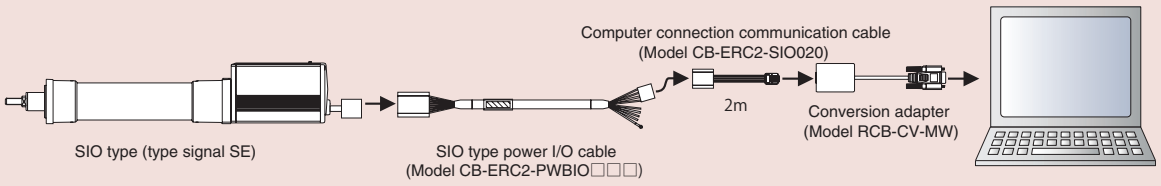
Option:
- B: Blake
- NM: Reversed-home specification
- FT: Foot bracket

System Configuration



Wiring Diagram to Connect to a PC

Use the following cables when connecting the SIO type to a computer.



I/O Specification (PIO Type)

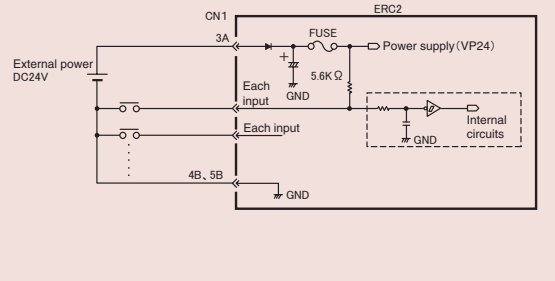
■Input area External input specifications

Item	Specifications
Input points	6 points
Input voltage	DC24V±10%
Input current	4mA/circuit
Leak current	Max. 1mA/point
Operating voltage	ON Voltage: 18V Min. (3.5mA) OFF Voltage: 6V Max. (1mA)

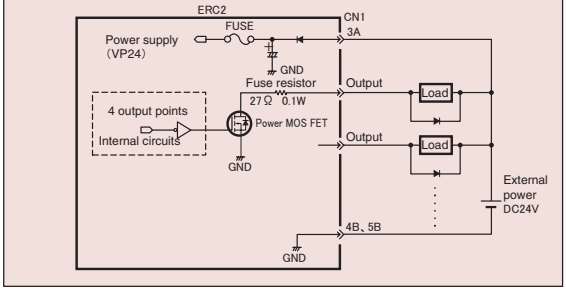
■Output area External output specifications

Item	Specifications
Input points	4 points
Rated load voltage	DC24V
Max. current	60mA /point
Residual voltage	Max. 2V
Short-circuit, reverse-voltage protection	Fuse resistance (27Ω 0.1W)

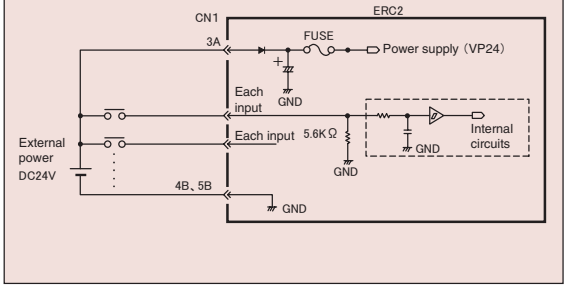
NPN Specification



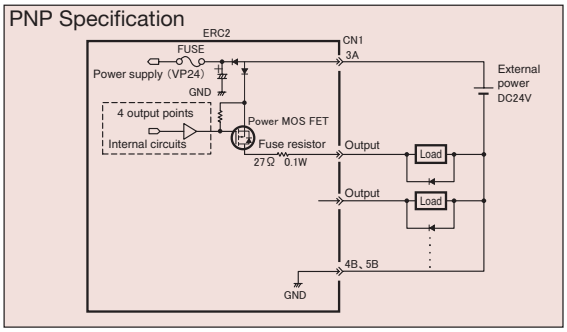
NPN Specification



PNP Specification



PNP Specification



I/O Signal Table (PIO Type)

Parameters (select PIO patterns)	PIO pattern	Pin number
0	8-point type	A standard specification providing eight positioning points, plus a home return signal, zone signal,etc. (The parameter has been set to this pattern prior to the shipment.)
1	3-point type (Solenoid valve type)	Simply turn ON three signals of ST0 to ST2 to move the actuator to the corresponding positions (0 to 2), just like you do with solenoid valves (This allows for easy conversion from air cylinders).
2	16-point type (Zone signal type)	Can be positioned for up to 16 points. (Same as the 8-point type, except that this pattern provides no home return signal.)
3	16-point type (Position zone signal type)	A 16-point pattern with a position zone signal instead of a zone signal.

Pin number	Classification	Line color	Parameters (select PIO pattern)			
			0	1	2	3
			Existing type	3-point type (Solenoid valve type)	16-point Type (Zone signal type)	16-point Type (Position zone signal type)
1A	SIO	Orange (Red 1)	SGA			
1B		Orange (Black 1)	SGB			
2A	Signal	Light blue (Red 1)	EMS1			
2B	Signal	Light blue (Black 1)	EMS2			
3A	24V	White (Red 1)	24V			
3B	0V	White (Black 1)	BLK			
4A	24V	Yellow (Red 1)	MPI			
4B	0V	Yellow (Black 1)	GND			
5A	24V	Pink (Red 1)	MPI			
5B	0V	Pink (Black 1)	GND			
6A	Input	Orange (Red 2)	PC1	ST0	PC1	PC1
6B		Orange (Black 2)	PC2	ST1	PC2	PC2
7A		Light blue (Red 2)	PC4	ST2	PC4	PC4
7B		Light blue (Black 2)	HOME	–	PC8	PC8
8A		White (Red 2)	CSTR	RES	CSTR	CSTR
8B		White (Black 2)	*STP	*STP	*STP	*STP
9A	Output	Yellow (Red 2)	PEND	PE0	PEND	PEND
9B		Yellow (Black 2)	HEND	PE1	HEND	HEND
10A		Pink (Red 2)	ZONE	PE2	ZONE	PZONE
10B		Pink (Black 2)	*ALM			

(Note) Asterisked (*) signals (ALM/STP) are negative logic, so they are normally on.

Explanation of Signal Names

Category	Signal name	Signal abbreviations	Function overview
SIO	Serial communications	SGA SGB	Used for serial communication.
24V 0V	Emergency stop	EMS1 EMS2	These signals are wired to enable the emergency stop switch on the teaching pendant (see P301).
	Break release	BKR	Connection to 0 V (150mA needed) forcibly releases the brake.
Input	Command position number	PC1 PC2 PC4 PC8	Designates the position number using 4-bit binary signals (or 3-bit binarysignals if the 8-point PIO pattern is selected). (Example) Position 3 → Input PC1 and PC2 Position 7 → Input PC1, PC2, and PC4
	Position movement	ST0 ST1 ST2	Turn the STO signal on to move the actuator to position 0. Same for ST1 and ST2 (Operation can be started with these signals alone. No need to input a start signal).
	Home return	HOME	Home-return operation starts at the leading edge of this signal.
	Start	CSTR	Input a command position number signal and turn this signal ON, and the actuator will start moving to the specified position.
	Reset signal	RES	When the signal comes on, the alarm is reset. When it is paused (*STP is off), and it is possible to cancel the residual movement.
	Pause	*STP	A normal operation begins when the actuator comes on normally (negative logic) The actuator starts to decelerate to a stop at the ON → OFF leading edge of this signal.
Output	In position	PEND	This signal turns ON once the actuator has moved to the target position and completed the positioning by entering the specified positioning band.
	Completed position number	PE0 PE1 PE2	Used to determine if positioning has completed. PE0 is output upon completion of movement to position 0. Same for PE1 and PE2. (These signals are valid only when the 3-point PIO pattern is selected.)
	Home return complete	HEND	This signal turns ON upon completion of home return.
	Zone	ZONE	This signal turns ON upon entry into the zone signal range set by parameters.
	Position zone	PZONE	This signal turns ON upon entry into the zone signal range set by position data.
	Alarm	*ALM	The signal remain ON in normal conditions and turns OFF upon generation of an alarm (negative logic). Synchronized with the LED at the top of the motor cover (green: normal state, red: alarm on).

(Note) Signals marked with an asterisk (*) (ALM/STP) are negative logic signals that always remain on.

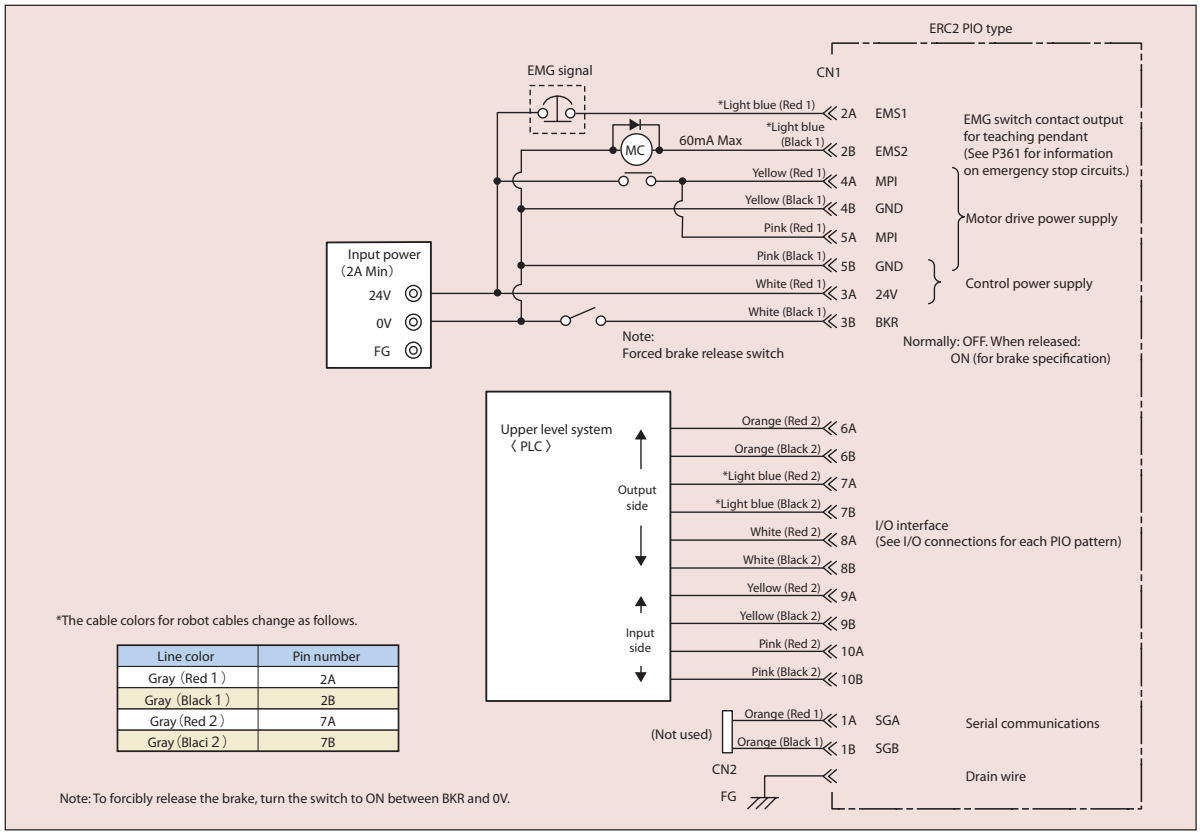
Specification Table

Specification item		Details	
Type		PIO specification (NP/PN)	SIO specification (SE)
Control method		Low field vector control (patent pending)	
Positioning command		Position number specification	Position number specification/direct numerical specification
Position number		Maximum 16 points	Maximum 64 points
Backup memory		Position number data and parameters are stored in nonvolatile memory. Serial E^2PROM with a rewrite life of 100,000 times	
PIO		6 dedicated input points/4 dedicated output points	None
Electromagnetic brake		Built-in circuit, 24V-DC ±10%, 0.15A max.	
2-color LED display		Servo ON (green), alarm/motor drive power cutoff (red)	
I/F power (Note 1)		Shared with control power (not insulated)	
Serial communications		RS485, 1 ch. (terminated externally)	
Absolute function		None	
Forced release of electromagnetic brake		Forcibly released on connection to 0V (NP) or 24V (PN).	Forcibly released on connection to 24V
Cable Length		I/F cable: 10m max.	
		SIO connector communication cable: 5m max.	
Dielectric strength voltage		DC500V, 10MΩ	
EMC		EN55011, Class A Group1 (3m)	
Power voltage source		24V±10%	
Power supply current		Maximum 2A	
Environment	Ambient operating temperature	0 to 40°C	
	Ambient operating humidity	85% RH or less (non-condensing)	
	Ambient operating environment	Free from corrosive gases	
Protection class		IP20	

(Note 1) Use the insulated PIO terminal block (see Options, P302) to insulate the I/F power supply.

I/O Wiring Diagram

PIO Type NP (NPN Specification)

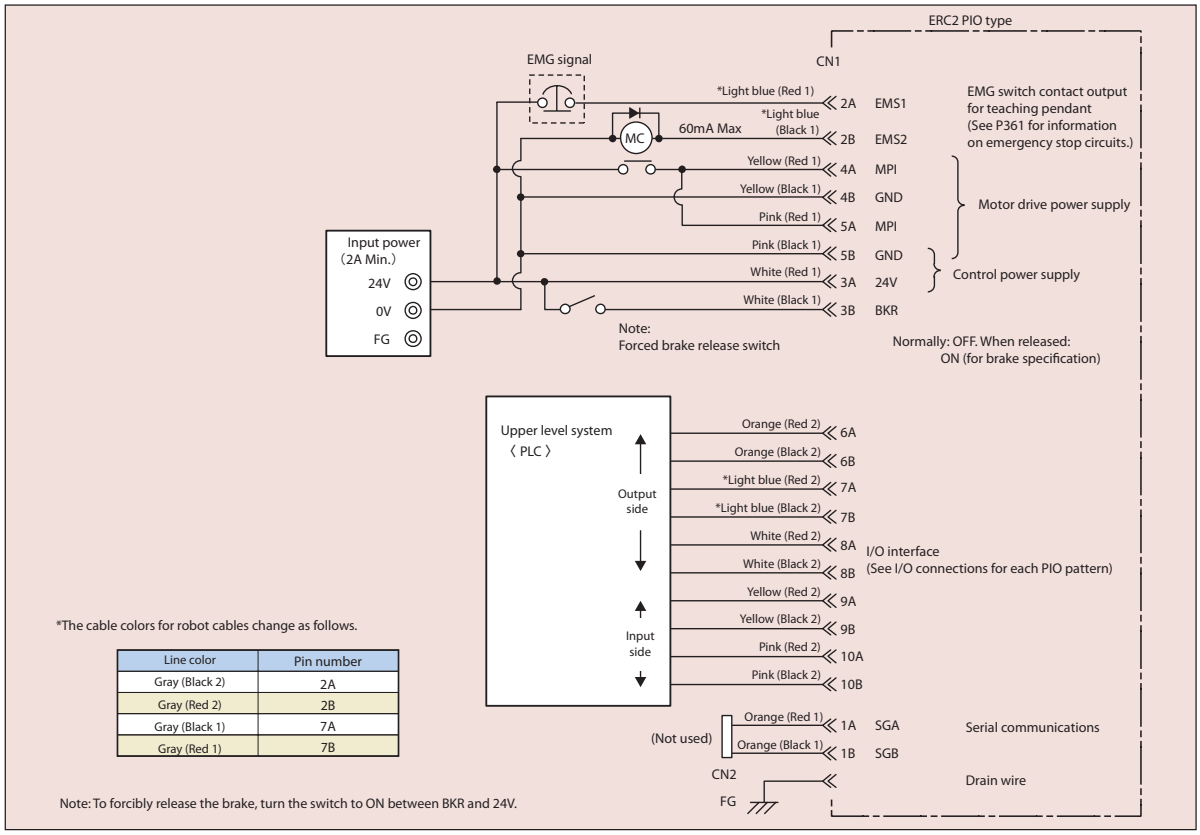


*The cable colors for robot cables change as follows.

Line color	Pin number
Gray (Red 1)	2A
Gray (Black 1)	2B
Gray (Red 2)	7A
Gray (Blaci 2)	7B

Note: To forcibly release the brake, turn the switch to ON between BKR and 0V.

PIO Type PN (PNP Specification)

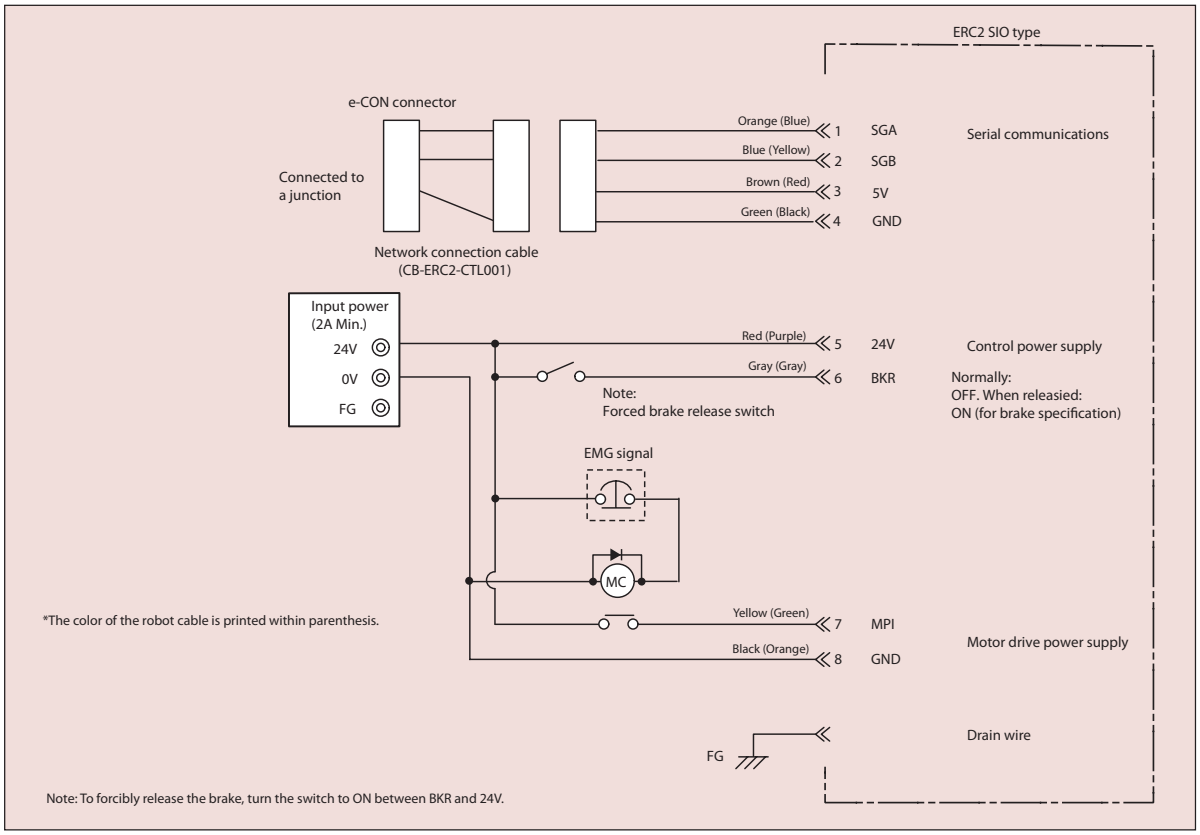


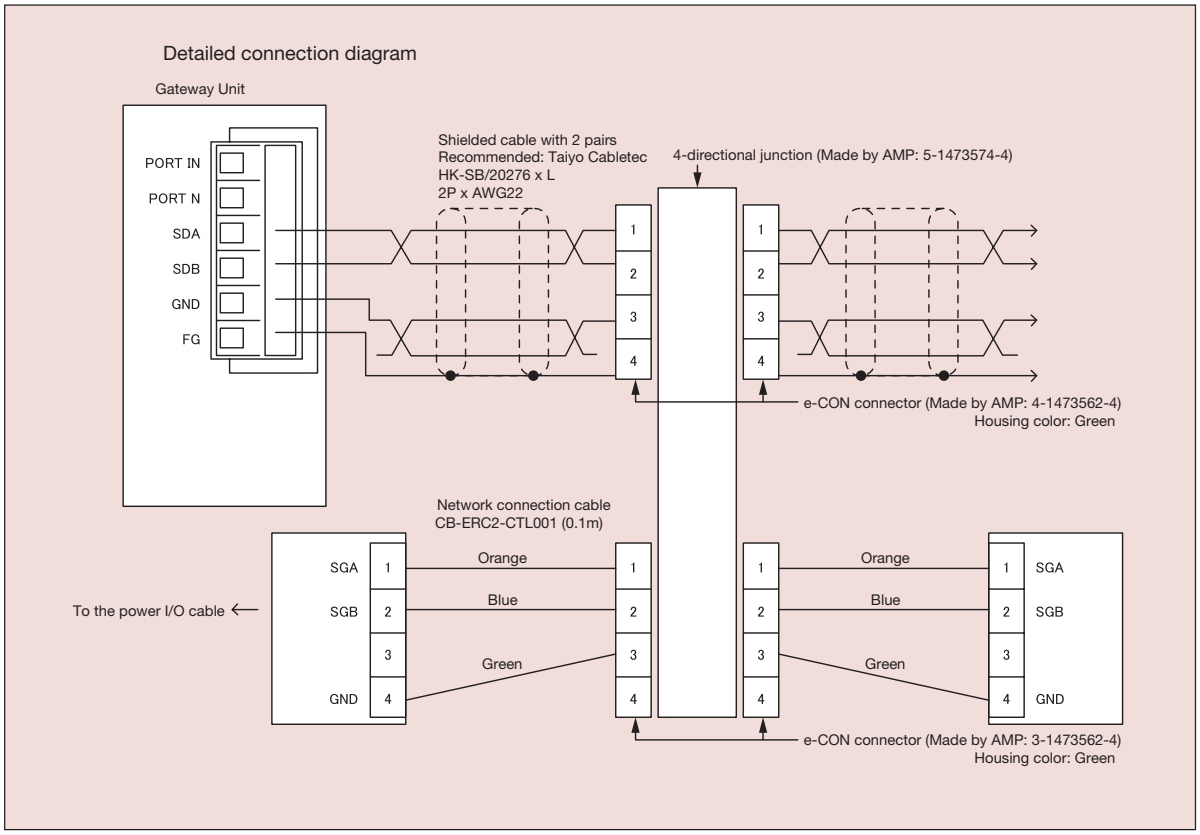
*The cable colors for robot cables change as follows.

Line color	Pin number
Gray (Black 2)	2A
Gray (Red 2)	2B
Gray (Black 1)	7A
Gray (Red 1)	7B

Note: To forcibly release the brake, turn the switch to ON between BKR and 24V.

SIO Type SE


ERC2 SIO type
e-CON connector
Connected to a junction
Network connection cable (CB-ERC2-CTL001)
Orange (Blue) 1 SGA
Blue (Yellow) 2 SGB
Brown (Red) 3 5V
Green (Black) 4 GND
Serial communications
Input power (2A Min.)
24V
0V
FG
Red (Purple) 5 24V
Gray (Gray) 6 BKR
Control power supply
Normally: OFF. When releasied: ON (for brake specification)
Note: Forced brake release switch
EMG signal
MC
*The color of the robot cable is printed within parenthesis.
Yellow (Green) 7 MPI
Black (Orange) 8 GND
Motor drive power supply
FG
Drain wire
Note: To forcibly release the brake, turn the switch to ON between BKR and 24V.

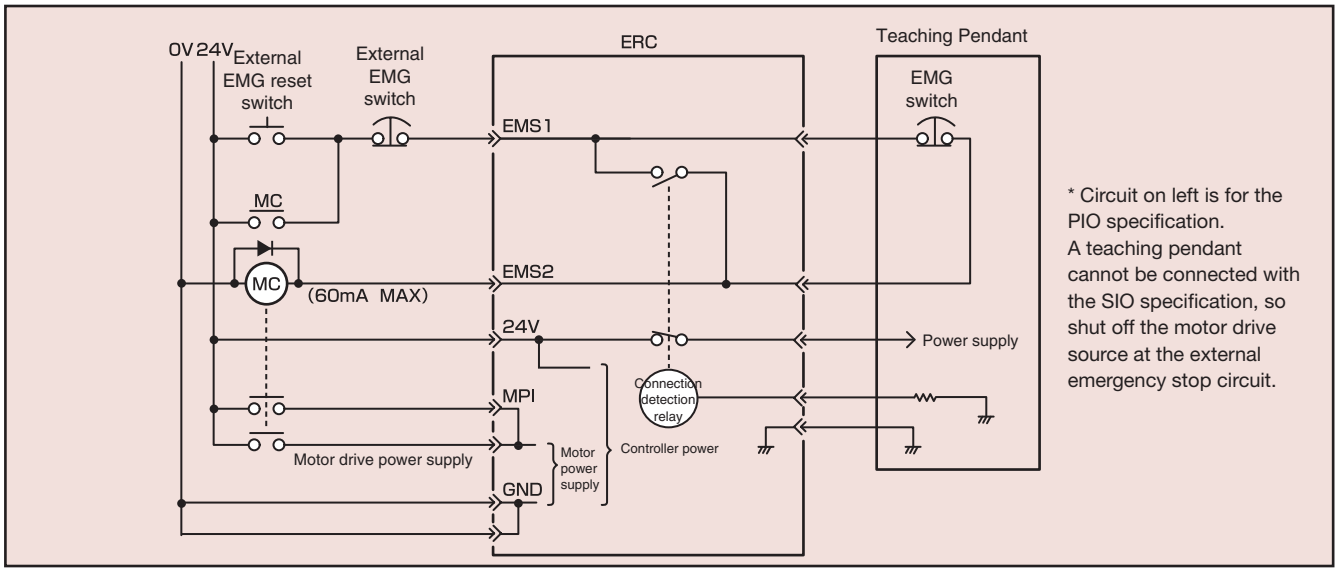

Detailed connection diagram
Gateway Unit
PORT IN
PORT N
SDA
SDB
GND
FG
Shielded cable with 2 pairs
Recommended: Taiyo Cabletec
HK-SB/20276 x L
2P x AWG22
4-directional junction (Made by AMP: 5-1473574-4)
e-CON connector (Made by AMP: 4-1473562-4)
Housing color: Green
Network connection cable
CB-ERC2-CTL001 (0.1m)
To the power I/O cable
SGA
SGB
GND
Orange
Blue
Green
e-CON connector (Made by AMP: 3-1473562-4)
Housing color: Green

Emergency Stop Circuit

The ERC2 series has no built-in emergency stop circuit, so the customer must provide an emergency stop circuit based on the logic explained below.
(The circuit below is simplified for explanation purposes. Provide a ready circuit, etc., according to your specification.)

Single Axis:

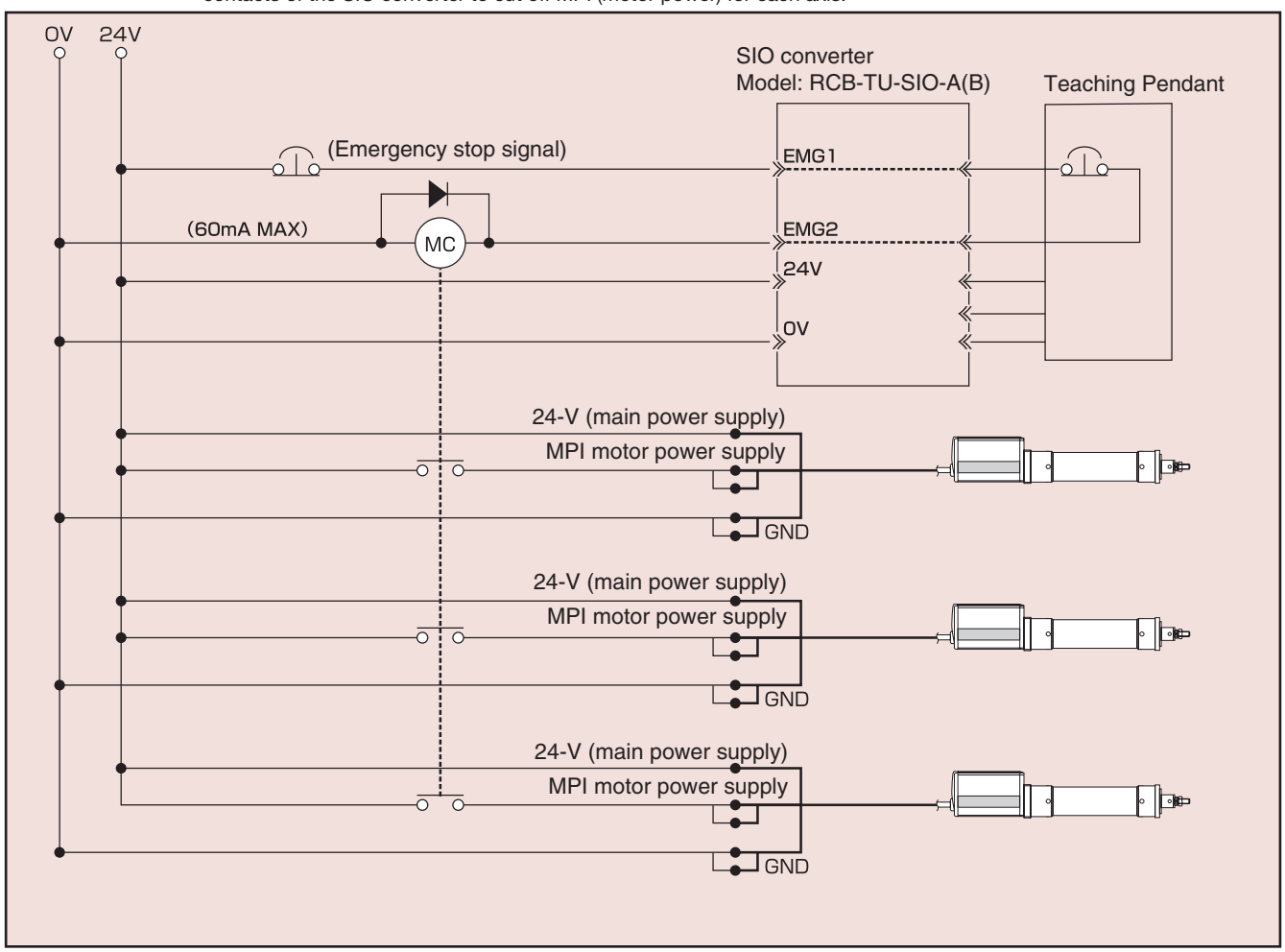
To provide an emergency stop circuit for a single-axis configuration, operate a relay using the EMS1 and EMS2 contacts of the power & I/O cable to cut off MPI (motor power).



* Circuit on left is for the PIO specification.
A teaching pendant cannot be connected with the SIO specification, so shut off the motor drive source at the external emergency stop circuit.

Multiple Axes:

To provide an emergency stop circuit for a multiple-axes configuration, operate a relay using the EMG1 and EMG2 contacts of the SIO converter to cut off MPI (motor power) for each axis.



Option

Insulated PIO Terminal Block

This terminal block is used to insulate the I/O power or simplify the wiring with a PLC.
*When a terminal block is used, the optional power & I/O cable with connectors on both ends must be used.

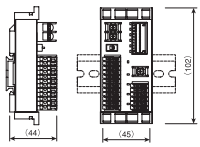
Features - The input and output ports are non-polar, so both NPN and PNP are compatible with the I/O specifications on the PLC side.
- An input/output-signal monitor LED is equipped to check the ON/OFF status of signals.

Specifications

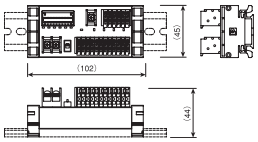
Item		Specifications
Voltage power source		DC24V±10%
Ambient operating temperature and humidity		0 to 55°C, 85% RH or below (non-condensing)
Input area	Input points	6 points
	Input voltage	DC24V±10%
	Input current	7mA/circuit (bipolar)
	Allowable leaked current	1mA/point (at room temperature, about 2mA)
	Operating voltage (with respect to ground)	Input on: Min. 16V (4.5mA) off: Max. 5V (1.3mA)
Output area	Output points	4 points
	Rated load voltage	DC24V
	Max. current	60mA/point
	Residual voltage	2V or less/60mA
	Short circuit Overcurrent protection	Fuse resistance (27Ω 0.1W)

CAUTION
If you are using the ERC2-PN (PNP specification), use RCB-TU-PIO-AP/BP (compatible with PNP specification).

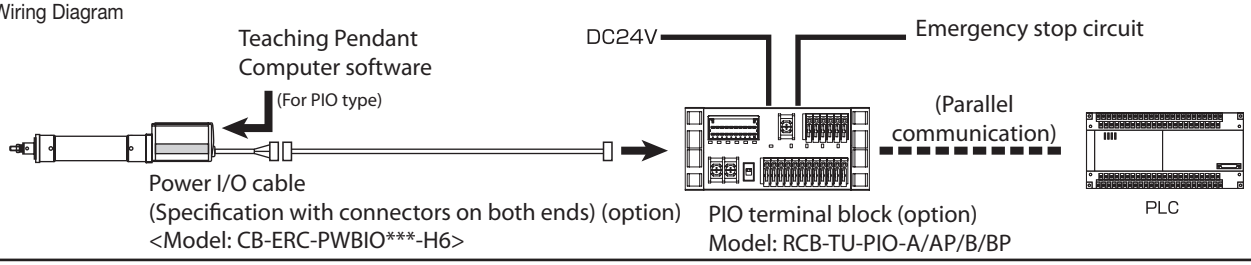
■ Vertical specification Model: RCB-TU-PIO-A/AP



■ Horizontal specification Model: RCB-TU-PIO-B/BP



Wiring Diagram



SIO Converter

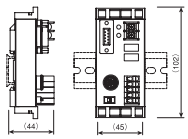
This converter can be used for RS232 communication by connecting a serial communication wire (SGA, SGB) for the power-I/O cable, and using a D-sub 9-pin cross cable to connect a computer.

Features - The connection port for teaching-pendant or PC cable can be installed at any position away from the actuator.
- Multiple axes can be connected and operated from a PC via serial communication.

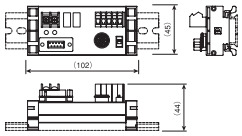
Specifications

Item	Specifications
Voltage power source	DC24V±10%
Ambient operating temperature and humidity	0 to 55°C, 85% RH or below (non-condensing)
Terminal resistor	120Ω (built-in)

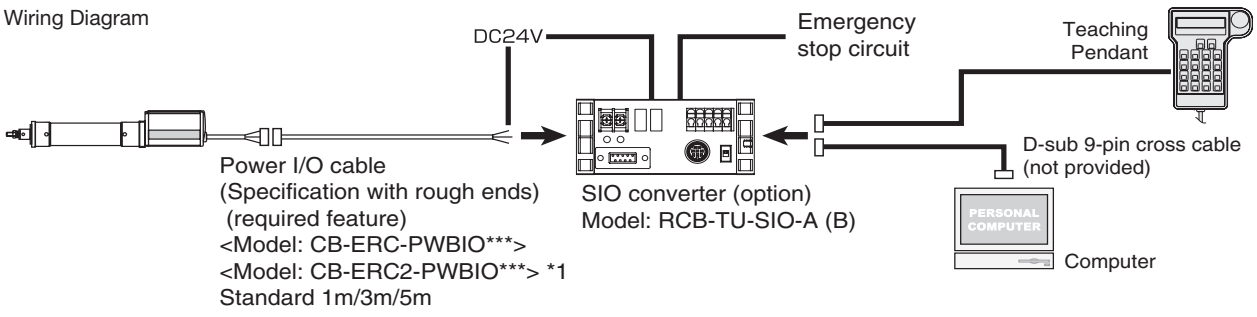
■ Vertical specification Model: RCB-TU-SIO-A



■ Horizontal specification Model: RCB-TU-SIO-B



Wiring Diagram



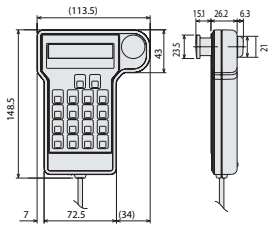
Options

Teaching pendant

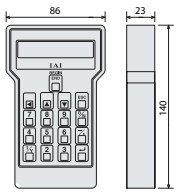
Features: This is a teaching device that provides information on functions such as position input, running tests, and monitoring.

Model: **RCM-E** (simple teaching pendant)
RCM-P (data setting device)

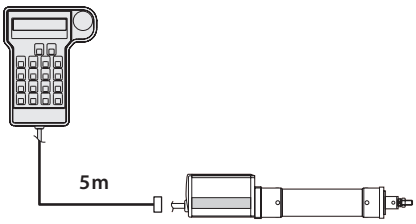
RCM-E



RCM-P



Configuration



Specifications

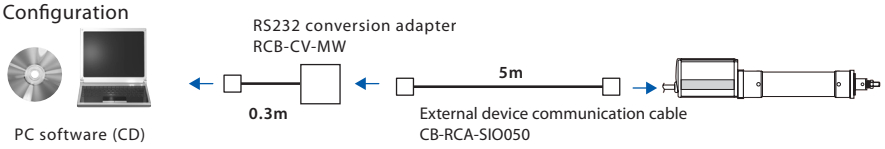
Item	RCM-E	RCM-P
Data input	○	○
Actuator operation	○	×
Amb. Op. Temp. Humid	Temperature: 0 to 40°C. Humidity: 85% RH or less.	
Amb. Op. Env.	Free from corrosive gases and especially dust.	
Weight	Approx. 400g	Approx. 360g
Cable length	5m	
Display	16 char x 2 lines, LCD	16 char x 2 lines, LCD
Standard price	-	-

Computer software (Windows only)

Features: A startup support software program offering program/position input function, test operation function, monitoring function, and more.

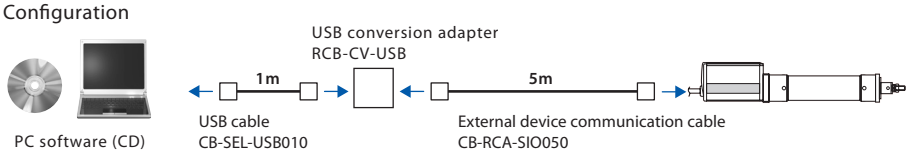
Model: **RCM-101-MW** (with external device communication cable + RS232 conversion unit)

Configuration



Model: **RCM-101-USB** (with external device communication cable + USB conversion adapter + USB cable)

Configuration

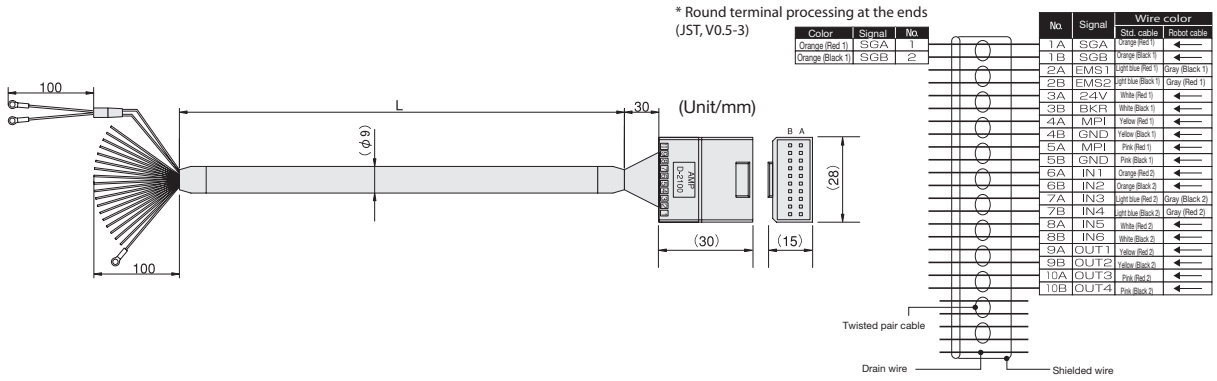


Cables & Spare Parts

Power & I/O Cable, Power & I/O Robot Cable For PIO

Model **CB-ERC-PWBIO□□□/CB-ERC-PWBIO□□□-RB**

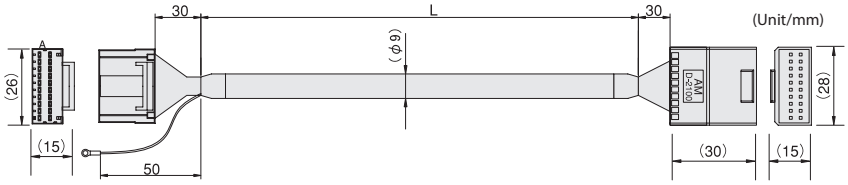
*Enter the cable length (L) for□□□, up to a maximum compatible length of 10m.
Example: 080=8m



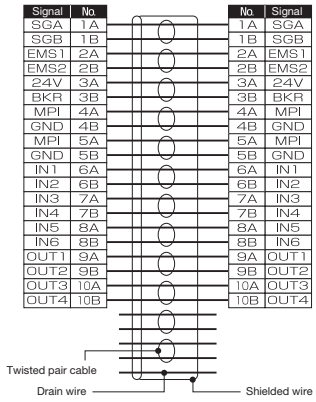
Power & I/O Cable, Power-I/O Robot Cable (Connectors on Both Ends)

Model **CB-ERC-PWBIO□□□-H6/CB-ERC-PWBIO□□□-RB-H6**

*Enter the cable length (L) for□□□, up to a maximum compatible length of 10m.
Example: 080=8m



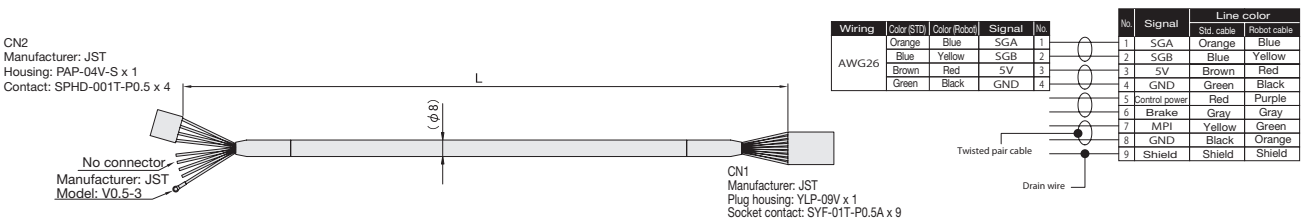
Receptacle housing: 1-1318118-9 (AMP)
Receptacle contact: 1318108-1 (AMP)



Power & I/O Cable, Power & I/O Robot Cable For SIO Type

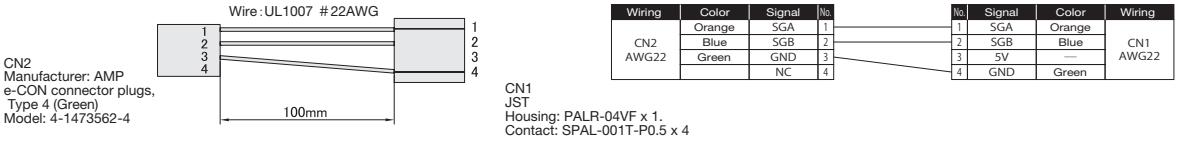
Model **CB-ERC2-PWBIO□□□/CB-ERC2-PWBIO□□□-RB**

*Enter the cable length (L) for□□□, up to a maximum compatible length of 10m.
Example: 080=8m



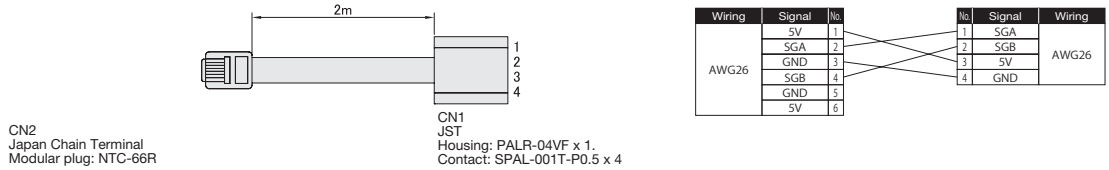
Network Connection Cable

Model **CB-ERC2-CTL001**



Communcation Cable to Connect to PC

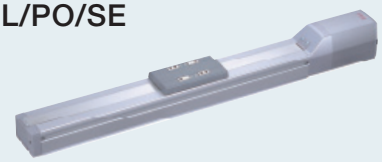
Model **CB-ERC2-SIO020**



PCON

■Models C/CG/CF/CY/PL/PO/SE

Position Controller
For RCP3/RCP2 Series



Model List/Prices

These are the position controllers that can be used with the RCP3/RCP2 Series actuators. Our line-up has 6 types, which are compatible with various control systems.

Type	C	CG	CF	CY	PL/PO	SE
Title	Positioner type	Conforming to safety category compatible type	High-thrust motor compatible type	Solenoid valve type	Pulse train control type	Serial communication type
External View						
Description	Positioner capable of a maximum of 512 points	Conforming to type C safety category specifications	Dedicated controller for RCP2 high-speed type/high-thrust type/ waterproof type	Can be operated using the same control as the air cylinder type	For pulse train control controller	Serial communication controller
Positioning Points	512 points	512 points	512 points	3 points	–	64 points
Standard Price	- (*1)	- (*1)	-	-	-	-

(*1) Network connection specifications are designated by the I/O type symbols for the model.

Model

PCON — [Type] — [Motor type] — I — [I/O type] — [I/O cable length] — 0 — [Simple Absolute Unit]

Series | Type | Motor type | Encoder type | I/O type | I/O cable length | Power voltage | Simple Absolute Unit

C	Positioner type
CG	Conforming to safety category compatible type
CF	High-thrust motor compatible type
CY	Solenoid valve type
SE	Serial communication type
PL	Pulse in-line control type (differential receiver type)
PO	Pulse in-line control type (open collector type)

20P	20 square pulse motor compatible
28P	28 square pulse motor compatible
28SP	28 square pulse motor compatible (RCP2-RA3C only)
35P	35 square pulse motor compatible
42P	42 square pulse motor compatible
56P	56 square pulse motor compatible
86P	86 square pulse motor compatible

*The motot type when connecting a RCP2-RA3C/RGD3C, is 28SP.

I	Incremental

NP	NPN specification (standard)
PN	PNP specification
DV	DeviceNet connection specification
CC	CC-Link connection specification
PR	ProfiBus connection specification
N	No I/O (SE type only)

*The network connection specification (DV/CC/PR) is only compatible with the C/CG type.
*When the SE (serial communication) type is selected, the standard I/O will be N (no I/O).

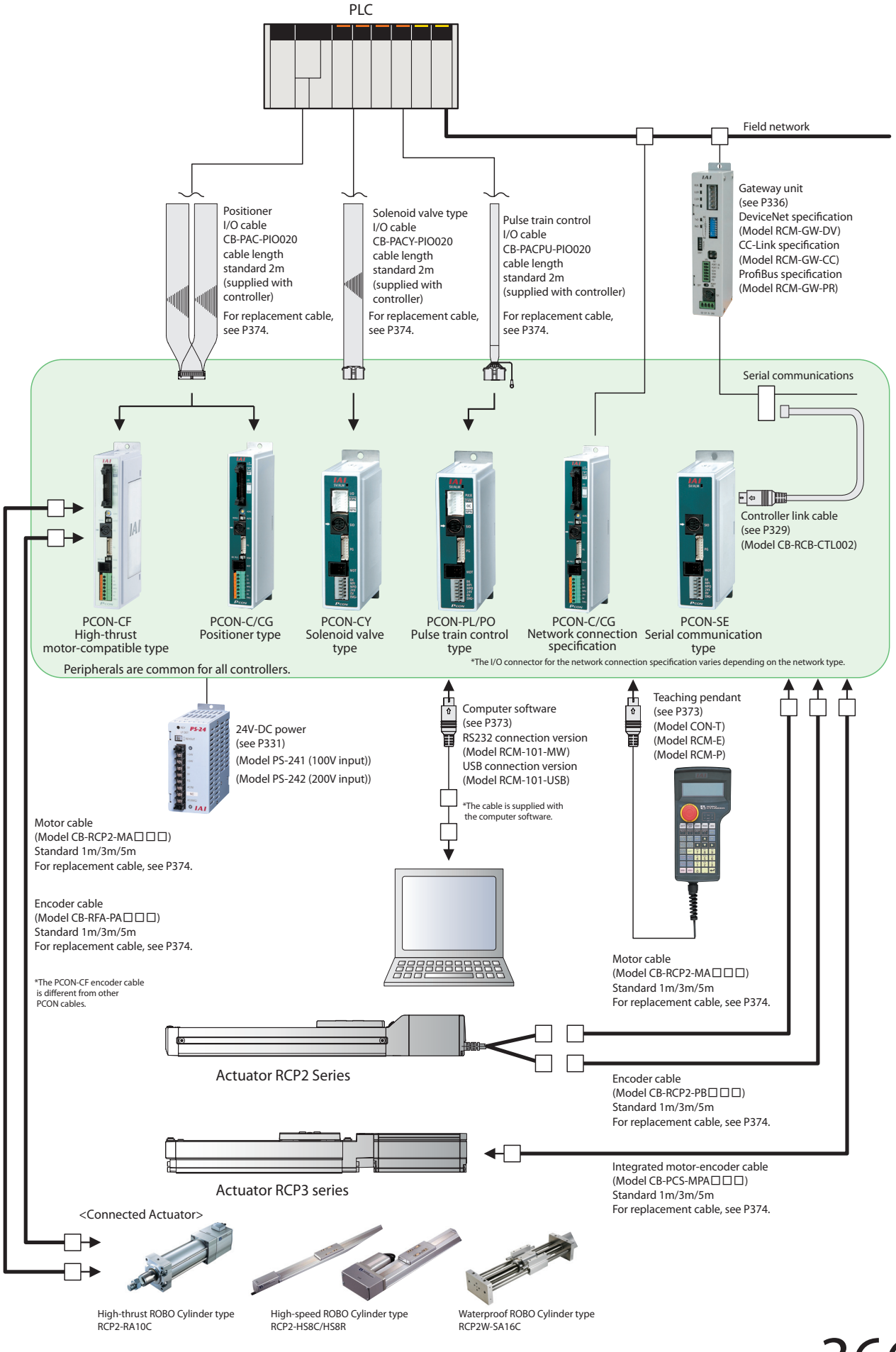
0	No cable
2	2m (standard)
3	3m
5	5m

*When SE (serial communication type) is selected, or when the network connection specification (I/O type is DV, CC, or PR) is selected, the I/O cable is O (no cable).

0	DC24V

Blank	Not used
ABU	Used

System Configuration



I/O Specifications

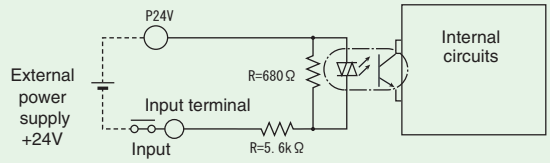
■Input Area External input specifications

Item	Specifications
Input voltage	DC24V±10%
Input current	4mA per circuit
Leak current	Max. 1mA /point
Insulation method	Photo coupler

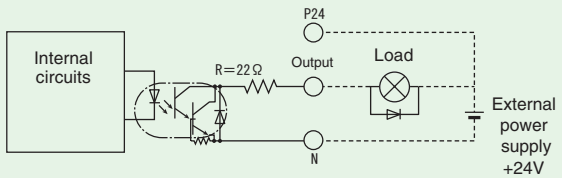
■Output Area External output specifications

Item	Specifications
Load voltage	DC24V
Max. load current	50mA per point
Residual voltage	Max. 2V
Insulation method	Photo coupler

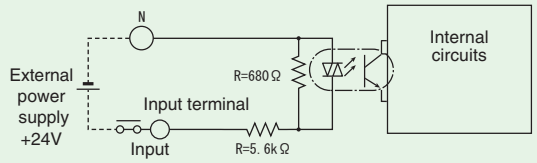
NPN Specification



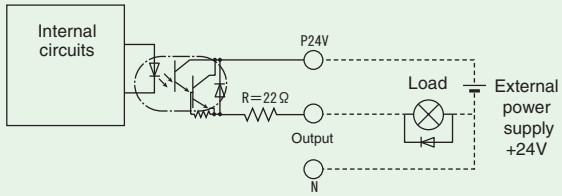
NPN Specification



PNP Specification



PNP Specification



I/O Specifications

The 4 types of controllers (C/CG, CY, PL/PO, and SE) are classified by their respective I/O specifications. Also, for the positioned type and solenoid valve type, the I/O signal information can be changed in the controller settings, so multiple functions can be effectively used.

■Functions by Controller Type

Type	C/CG	CY	PL/PO	SE	Features
Title	Positioner type	Solenoid valve type	Pulse train control type	Serial communication type	
Positioner mode	○	○	×	○ (*1)	This is the basic operating mode, in which the user designates position numbers and inputs start signals.
Teaching mode	○	×	×	○ (*1)	In this mode, the slider (rod) moves based on an external signal, and the stopped positions can be registered as position data.
Solenoid valve mode	○	○	×	○ (*1)	The actuator can be moved simply by ON/OFF of position signals. This mode supports the same control actions you are already familiar with on solenoid valves of air cylinders.
Pulse train mode	×	×	○	×	In this mode, you can operate the actuator freely using pulse trains without inputting position data.
Network-compatible	○ (*2)	×	×	○ (*3)	The controller can be connected to a DeviceNet or CC-Link network.

*1 Operates using network communications or serial communications.
*2 The network specification can be connected to a direct field network.
*3 A Gateway unit can be used to connect to a field network.

Explanation of I/O Signal Functions

The table below explains the functions that are assigned to the controller's I/O signals.
The signals that can be used differ based on the controller type and settings, so please check the functions that can be used in the controller signal table.

■Signal Function Description

Classification	Signal abbreviations	Signal name	Function description
Input	CSTR	PTP strobe signal (start signal)	Input this signal to cause the actuator to start moving to the position set by the command position number signal.
	PC1 to PC256	Command position number signal	This signal is used to input a target position number (binary input).
	BKRL	Brake forced release signal	This signal forcibly releases the brake.
	RMOD	Running mode switching signal	This signal can switch the running mode when the MODE switch on the controller is set to AUTO (AUTO when this signal is OFF, or MANU when the signal is ON).
	*STP	Pause signal	Turning this signal OFF causes the moving actuator to decelerate to a stop. The actuator will resume the remaining movement if the signal is turned OFF during the pause.
	RES	Reset signal	Turning this signal ON resets the alarms that are present. If this signal is turned ON while the actuator is paused (*STP is OFF), the remaining movement can be cancelled.
	SON	Servo ON signal	The servo remains on while this signal is ON, or off while the signal is OFF.
	HOME	Home return complete signal	This signal turns ON upon completion of home return.
	MODE	Teaching mode signal	Turning this signal ON switches the controller to the teaching mode (provided that CSTR, JOG+ and JOG- are all OFF and the actuator is not moving).
	JISL	JOG/INJOG switching signal	When the main signal is off, the JOG operation will be conducted for JOG+ andJOG-. When the signal is on, the unit will do the inching operation for JOG+ andJOG-.
	JOG+, JOG–	JOG signal	When the JISL signal is off, when the edge of the main signal turning on is detected and the unit is in the + direction, the JOG operation is conducted toward the – direction. During the JOG operation, the unit slows to a stop when the edge of off is detected.
	PWRT	Teaching mode signal	In the teaching mode, specify a desired position number and then turn this signal ON for at least 20 ms to write the current position under the specified position number.
	ST0 to ST6	Start position command	Turning this signal ON in the solenoid valve mode causes the actuator to move to thespecified position (Start signal is not required).
	TL	Torque limit selection signal	While this signal is ON, torque is limited by the value set by a parameter. The TLR signal turns on if torque has reached the specified value.
	DCLR	Deviation counter clear signal	The position deviation counter is continuously cleared while this signal is ON.
Output	PEND/INP	In position signal	This signal turns ON when the actuator has entered the positioning band after movement. If the actuator has exceeded the positioning band, PEND does not turn OFF, but INP does. PEND and INP can be swapped within parameters.
	PM1 to PM256	Position complete signal	This signal is used to output the position number achieved at completion of positioning (binary output)
	HEND	Home return completion signal	This signal turns ON upon completion of home return.
	ZONE1	Zone signal	This signal turns ON when the current actuator position has entered the rangespecified by parameters.
	PZONE	Position zone signal	Turns on when actuator moves into a position within the range of the target position data that was set. TPZONE can be used together with ZONE1, but PZONE is valid only during movement to a specified position.
	RMDS	Running mode status signal	This outputs the operation mode status.
	*ALM	Controller alarm status signal	This signal remains ON while the controller is not in the emergency stop mode, and turns OFF once an emergency stop has been actuated.
	MOVE	Signal while moving	Turns ON while the actuator is moving (home return), including when there is push force.
	SV	Servo ON status signal	Turns ON when Servo is ON.
	*EMGS	Emergency stop status signal	This signal remains ON while the controller is not in the emergency stop mode, and turns OFF once an emergency stop has been actuated.
	MODES	Mode status signal	The mode signal input turns it on when it goes into teaching mode. It turns off when it goes into normal mode.
	WEND	Write complete signal	After moving in teaching mode, it is off. It turns on at the point when the PWRT signal is finished writing. The main signal also turns off when the PWRT signal turns off.
	PE0 to PE6	Signal for current position number	Turning this signal ON in the solenoid valve mode causes the actuator to move to thespecified position.
	TLR	Torque limiting signal	While this signal is ON, torque is limited by the TL signal, and the torque of the motor reaches the set value.
	LSO to LS2	Limit switch output signal	Each signal turns ON when the current actuator position has entered the positioning band before or after the target position. If the actuator has already completed home return, these signals are output even before a movement command is issued or while the servo is OFF.
	LOAD	Load output determination status	This signal turns ON once the motor torque has reached the specified value (*PCON-CF dedicated signal).
	TRQS	Torque level status signal	Turns on when the motor current reaches the threshold (*PCON-CF dedicated signal).

I/O Signal Table

■Positioner Type (PCON-C/CG/CF)

Pin No.	Classification		Parameters (select PIO patterns)					
			0	1	2	3	4	5
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2
		Positioning points	64 points	64 points	256 points	512 points	7 points	3 points
		Zone signal	○	×	×	×	○	○
		P-zone signal	○	○	○	×	○	○
1A	24V		P24					
2A	24V		P24					
3A	–		NC					
4A	–		NC					
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	PM1	PM1	PM1	PE0	LSO
2B		OUT1	PM2	PM2	PM2	PM2	PE1	LS1 (TRQS)
3B		OUT2	PM4	PM4	PM4	PM4	PE2	LS2 (–)
4B		OUT3	PM8	PM8	PM8	PM8	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	PZONE	PZONE	PM256	PZONE	PZONE
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	–	LOAD/TRQS	LOAD/TRQS	LOAD/TRQS	–
17B	–		NC					
18B	–		NC					
19B	0V		N					
20B	0V		N					

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

■Solenoid Valve Type (PCON-CY)

Pin No.	Classification		Parameters(select PIO patterns)	
			0	1
			Solenoid valve mode 0	Solenoid Valve Mode 1
		Positioning points	3 points	3 points
		Zone signal	×	×
		P-zone signal	×	○
1	24V			
2	0V			
3	Input	IN0	ST0	ST0
4		IN1	ST1 (JOG+)	ST1 (JOG+)
5		IN2	ST2 (RES)	ST2(RES)
6		IN3	SON	SON
7	Output	OUT0	LS0	PE0
8		OUT1	LS1 (TRQS)	PE1 (TRQS)
9		OUT2	LS2 (–)	PE2(–)
10		OUT3	SV	PZONE
11		OUT4	HEND	HEND
12		OUT5	*ALM	*ALM

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

■Pulse Train Type (PCON-PL/PO)

Pin No.	Classification		Parameters(select PIO patterns)	
			0	1
			Standard mode	Push mode
		Positioning points	—	—
		Zone signal	×	×
		P-zone signal	×	×
1	24V			
2	0V			
3	Input	IN0	SON	SON
4		IN1	TL	TL
5		IN2	HOME	HOME
6		IN3	RES	RES/DCLR
7	Output	OUT0	SV	SV
8		OUT1	INP	INP/TLR
9		OUT2	HEND	HEND
10		OUT3	*ALM	*ALM
11	Input		*PP	*PP
12			PP	PP
13			*NP	*NP
14			NP	NP

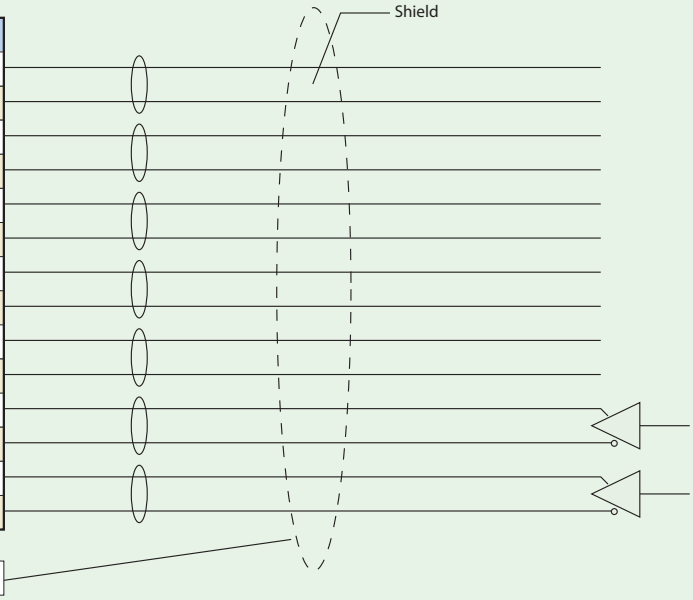
Wiring Diagram for Pulse-Train Input Type

■Differential Receiver Method (PCON-PL)

Max. input pulse frequency : Max. 200kpps
Cable length : Max. 10m

PIO connector

Pin No.	Classification	Signal
1	External 24V	24V
2	External 0V	0V
3	Input	SON
4	Input	TL
5	Input	HOME
6	Input	RES
7	Output	SV
8	Output	INP
9	Output	HEND
10	Output	* ALM
11	Differential input	/PP
12		PP
13		/NP
14		NP



Mounting plate	FG

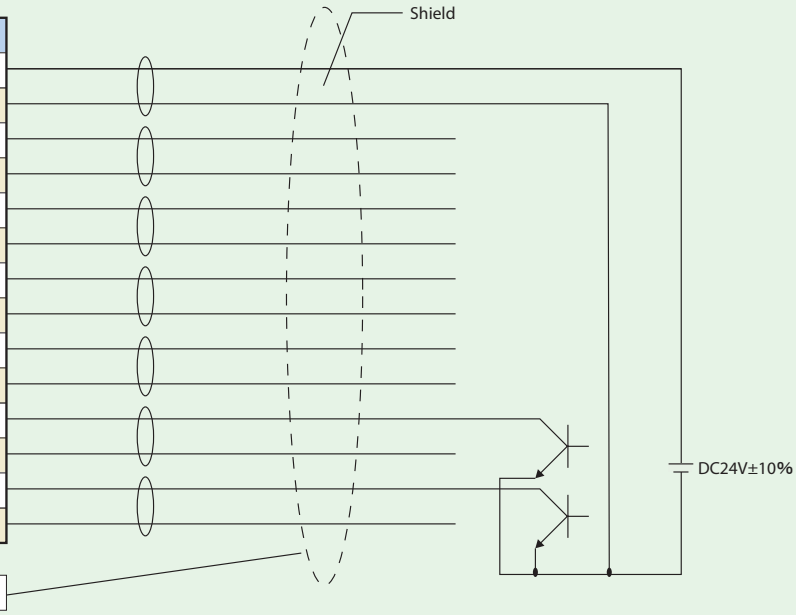
*The shield on the twisted pair cable connected to the pulse connector must always be connected to the mounting plate.

■Open Collector Method (PCON-PO)

Max. input pulse frequency : Max. 60kpps
Cable length : Max. 2m

PIO connector

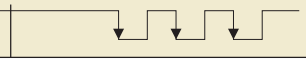
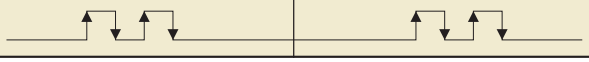
Pin No.	Classification	Signal
1	External 24V	24V
2	External 0V	0V
3	Input	SON
4	Input	TL
5	Input	HOME
6	Input	RES
7	Output	SV
8	Output	INP
9	Output	HEND
10	Output	* ALM
11	Open collector input	/PP
12	N.C.	PP
13	Open collector input	/NP
14	N.C	NP



Mounting plate	FG

*The shield on the twisted pair cable connected to the pulse connector must always be connected to the mounting plate.
*Connect the external 0V to the common command pulse.

Command Pulse Input State

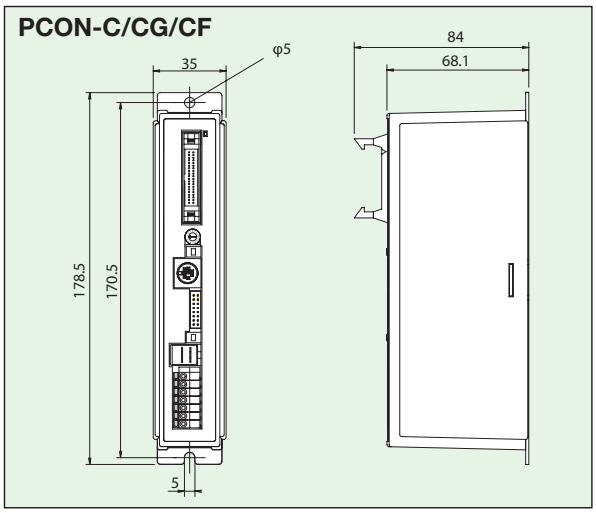
	Command pulse train state	Input terminal	During forward operation	During reversed operation
Negative logic	Forward pulse train	PP·/PP		
	Reversed pulse train	NP·/NP		
	The forward pulse train causes the motor to rotate in the normal direction, and the reverse pulse train causes the motor to rotate in the reverse direction.			
	Pulse train	PP·/PP		
	Symbols	NP·/NP	Low	High
	The command pulse is used for the amount of motor rotation, and the command symbol is used for rotational direction.			
	A/B phase pulse train	PP·/PP		
		NP·/NP		
	An A/B phase pulse with 90° phase difference (multiplier is 4) is used to generate commands for amount of rotation and rotational direction.			
Positive logic	Forward pulse train	PP·/PP		
	Reversed pulse train	NP·/NP		
	Pulse train	PP·/PP		
	Symbols	NP·/NP	High	Low
	A/B phase pulse train	PP·/PP		
		NP·/NP		

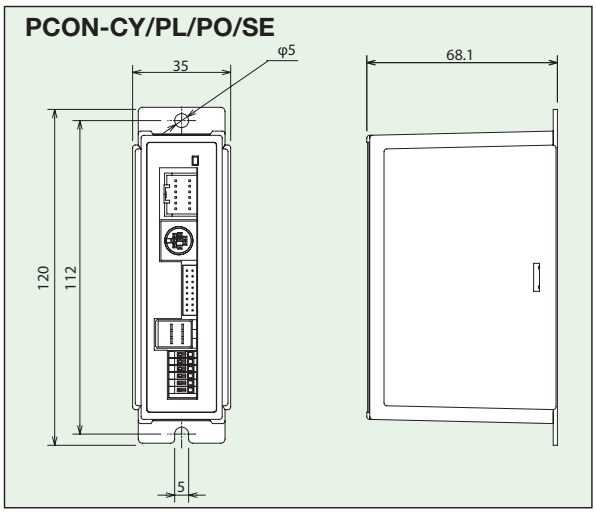
Specification Table

Item	Specifications						
Controller type	CF	C	CG	CY	PL	PO	SE
Connected actuator (*1)	RCP2-RA10C RCP2-HS8C (R) RCP2W-SA16C	RCP2 Series actuator (Note 1)					
Number of control axes	1-axis						
Operating method	Positioner type			Solenoid valve type	Pulse series input type		Serial communication type
Number of positions	512 points			3 points	—		64 points
Backup memory	EEPROM						
I/O connector	40-pin connector			12-pin connector	14-pin connector		None
Number of I/O	16 input points/16 output points			4 input points/6 output points	4 input points/4 output points		None
I/O power	External supply DC24V±10%						—
Serial communications	RS485 1ch						
Peripheral device communication cable	CB-PAC-PIO□□□			CB-PACY-PIO□□□	CB-PACPU-PIO□□□		CB-RCB-CTL002
Command pulse train input method	—				Differential line driver	Open collector	—
Max. input pulse frequency (Note 2)	—				Max 200kpps	Max 60kpps	—
Position detection method	Incremental encoder						
Shutdown relay for the drive source during emergency stop	integrated		External				
Forced release of electromagnetic brake	Brake release switch ON/OFF		ON/OFF terminal signal inside the power terminal for brake release				
Motor cable	CB-RCP2-MA□□□ (Max. length 20m)						
Encoder cable	CB-RFA-PA□□□	CB-RCP2-PA□□□ (Max. length 20m)					
Input power	DC24V±10%						
Power-supply capacity	Max. 6A (*2)	Maximum 2A					
Dielectric strength voltage	DC500V 1MΩ						
Vibration resistance	XYZ directions: 10 to 57Hz, One side amplitude: 0.035mm (continuous), 0.075mm (intermittent) 58 to 150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)						
Ambient temperature	0 to 40°C						
Ambient humdidity	10 to 95% (non-condensing)						
Ambient atmosphere	Free from corrosive gases.						
Protection class	IP20						
Weight	Approx. 320g	Approx. 300g		Approx. 130g			

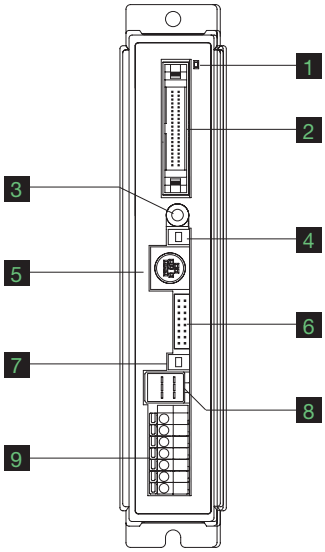
(Note 1) The high-thrust type (RFA), high-speed type (HS8C/HS8R) and waterproof type (RCP2W-SA16) cannot be operated.
(Note 2) With the open collector specification, keep the maximum input frequency to 60 kpps or below to prevent malfunction. For applications exceeding 60kpps, use the differential line driver.
(*1) RCP2-RA10C/HS8C/HS8R and RCP2W-SA16C can only operate with PCON-CF.
Other RCP2/RCP3 Series actuators can be operated with C/CG/CY/PL/PO/SE.
(*2) Inrush current peak: 10A

External Dimensions

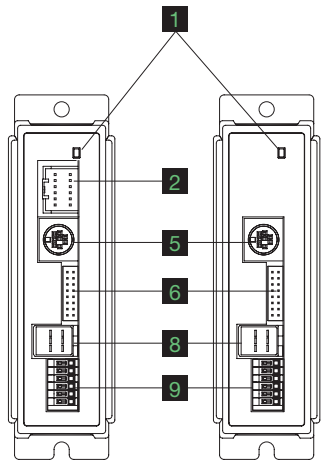




Name of Each Part



C/CG/CF type



CY/PL/PO type　　SE type

*PIO connectors are:
CY: 12 pin
PL/PO: 14 pin

1 LED display

These LED indicate the condition of the controller.

Lit (green) Servo on　Lit (red) Alarm activated　Unlit Servo off　Blinking (green) Automatic servo-off mode
Emergency stop

2 PIO connector

Connects a cable for communicating with a PLC or other external equipment.

3 Rotary switch that sets axis numbers

This switch sets the addresses for controllers used when the unit is linked with controllers.

4 Mode switch

Switches between manual teaching pendant operations (MAN) and automatic operations (AUTO).

Operation details

MANU	I/O commands are not accepted. Data can be written from a teaching pendant.
AUTO	I/O commands are valid, while operationsfrom a teaching pendant are not accepted. Monitoring is possible.

5 SIO connector

Connects a teaching pendant, PC cable, controller, or gateway unit to a controller.

Operation details

Pin No.	Signal	Title	Reference
1	SGA	Positive side, RS485 differential signal	
2	SGB	Negative side, RS485 differential signal	
3	5V	+5V output	For RS232/485 conversion
4	ENBL	Enable signal	
5	EMGA	EMG line connection to external equipment	
6	24V	24-V power for T/P	For T/P
7	0V	GND	
8	EMGB	EMG line connection to external equipment	
9	0V	EMG line connection to external equipment ground	

6 Encoder-brake connector

Connects the encoder/brake cable for the actuator.

7 Brake release switch

This switch forces the brake to release

8 Motor connector

Connects the motor cable for the actuator.

9 Power terminal block

Main power for controller (s),emergency stop

C/CG type

Terminal number	Signal name	Reference
7	S1	TP~sep~EMG external drive-source cutoff terminal
6	S2	
5	MPI	Motor drive-source cutoff terminal
4	MPO	Motor drive-source cutoff terminal
3	24V	Positive side of the 24-V power supply
2	0V	Negative side of the 24-V power supply
1	EMG	EMG signal (application of 24 V)

CY/PL/PO/SE type

Terminal number	Signal name	Reference
6	BK	Brake release
5	MPI	Motor drive-source cutoff terminal
4	MPO	Motor drive-source cutoff terminal
3	24V	Positive side of the 24-V power supply
2	0V	Negative side of the 24-V power supply
1	EMG	EMG signal (application of 24 V)

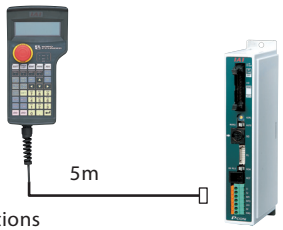
Options

Teaching Pendant

Features: This is a teaching device that provides information on functions such as position input, running tests, and monitoring.

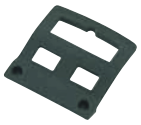
Model
CON-T (standard type)
RCM-E (simple absolute teaching pendant)
RCM-P (data setting device)

Configuration



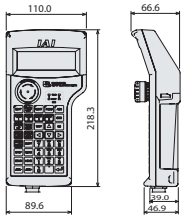
CON-T options

- Wall-mounting hook Model HK-1

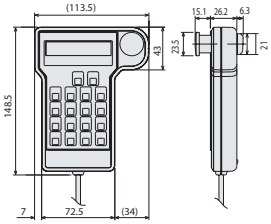


- Strap Model STR-1

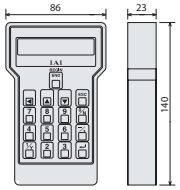
CON-T



RCM-E



RCM-P



Specification

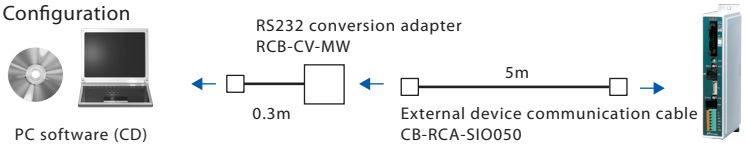
Item	CON-T	RCM-E	RCM-P
Data input	O	O	O
Actuator operation	O	O	×
Amb.op.temp, humid	Temperature: 0 to 40°C. Humidity: 85% RH or less.		
Amb. op. env.	Free from corrosive gases and especially dust.		
Protection class	IP54	-	-
Weight	Approx. 400g	Approx. 400g	Approx. 360g
Cable length	5m		
Display	20 char x 4 lines, LCD	16 char x 2 lines, LCD	16 char x 2 lines, LCD
Standard price	-	-	-

Computer software (Windows only)

Features: A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.

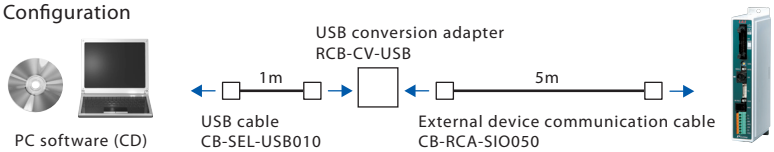
Model RCM-101-MW (with external device communication cable + RS232 conversion unit)

Configuration



Model RCM-101-USB (with external device communication cable + USB conversion adapter + USB cable)

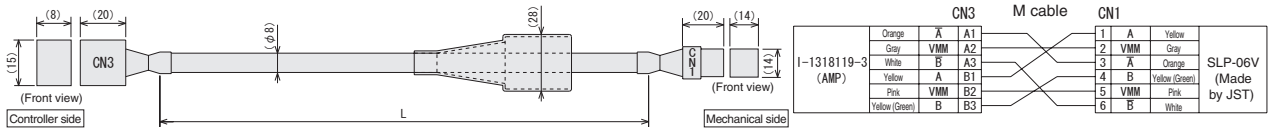
Configuration



RCP2 Motor Cable

Model **CB-RCP2-MA□□□** * The standard motor cable is a robot cable.

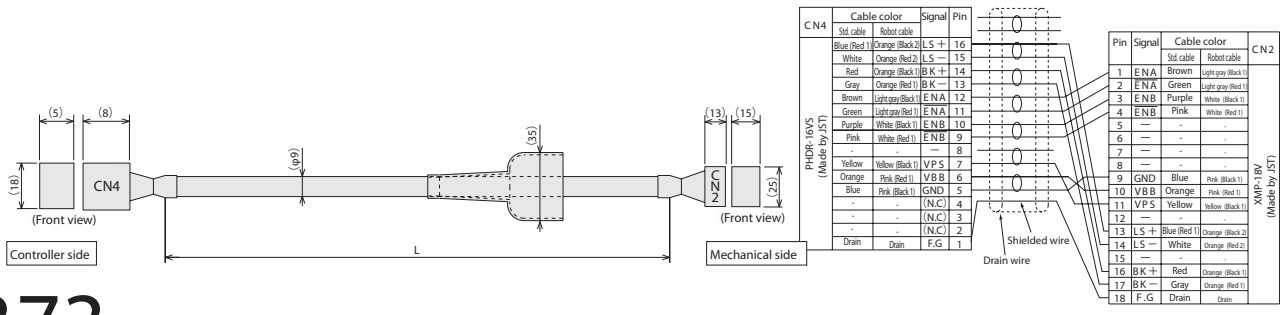
* □□□ indicaztes the canble length (L). Lengths up to 20m can be specified. Example: 080=8m



RCP2 Encoder Cable/Encoder Robot Cable

Model **CB-RCP2-PB□□□/CB-RCP2-PB□□□-RB** * The standard encoder cable is a normal cable. A robot cable can be specified as an option.

* □□□ indicaztes the canble length (L). Lengths up to 20m can be specified. Example: 080=8m



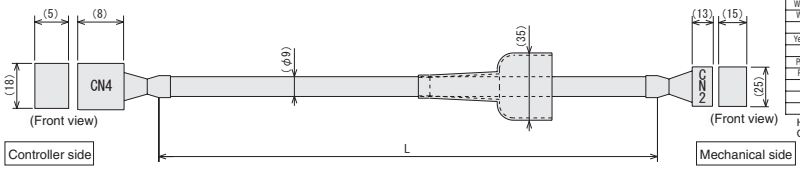
Spare Parts

Refer to the models below if it is necessary to replace cables for your purchase.

Encoder Cable/Encoder Robot Cable for the RCP2 High-speed Type/High-thrust Type/Waterproof Type

Model **CB-RFA-PA□□□/CB-RFA-PA□□□-RB** * The standard encoder cable is a normal cable. A robot cable can be specified as an option.

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



CN2

Cable color: Robot cable	Cable color: Std. cable	Signal	Pin No.
-	-	Spare	16
-	-	Spare	15
Orange (Black 1)	Red	BK+	14
Orange (Red 1)	Gray	BK−	13
Light gray (Black 1)	Brown	ENA	12
Light gray (Red 1)	Green	ENA	11
White (Black 1)	Purple	ENB	10
White (Red 1)	Pink	ENB	9
-	-	Spare	8
Yellow (Black 1)	Yellow	VPS	7
-	-	–	6
Pink (Black 1)	Blue	GND	5
Pink (Red 1)	Orange	5V	4
-	-	–	3
-	-	–	2
Drain	Drain	F.G	1

Housing: PHDR-16VS (Made by JST)
Contact: SPHD-001T-P0.5

CN1

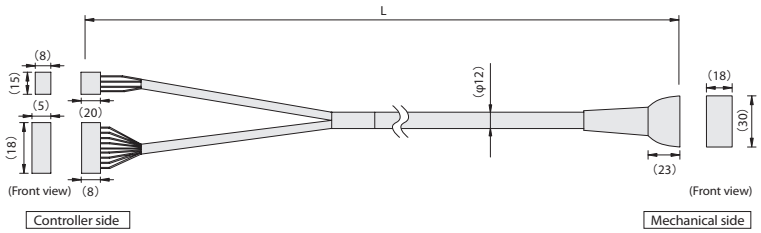
Pin No.	Signal	Cable color: Robot cable	Cable color: Std. cable
1	ENA	Brown	Light gray (Black 1)
2	ENA	Green	Light gray (Red 1)
3	ENB	Purple	White (Black 1)
4	ENB	Pink	White (Red 1)
5	—	-	-
6	—	-	-
7	—	-	-
8	—	-	-
9	GND	Blue	Pink (Red 1)
10	—	-	-
11	VPS	Yellow	Yellow (Black 1)
12	5V	Orange	Pink (Red 1)
13	—	-	-
14	—	-	-
15	—	-	-
16	BK+	Red	Orange (Black 1)
17	BK−	Gray	Orange (Red 1)
18	F. G	Drain	Drain

Housing: XMP-18V (Made by JST)
Contact: BXA-001T-P0.6
Retainer: MS-09V

Integrated Motor/Encoder Cable for RCP3

Model **CB-PCS-MPA□□□**

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



Signal	Pin No.
A	B1
VMM	A2
/A	A1
B	B3
VMM	B2
/B	A3
BK+	14
BK−	13
LS+	16
LS−	15
A+	12
A−	11
B+	10
B−	9
NC	8
VPS	7
VCC	6
GND	5
NC	4
FG	1

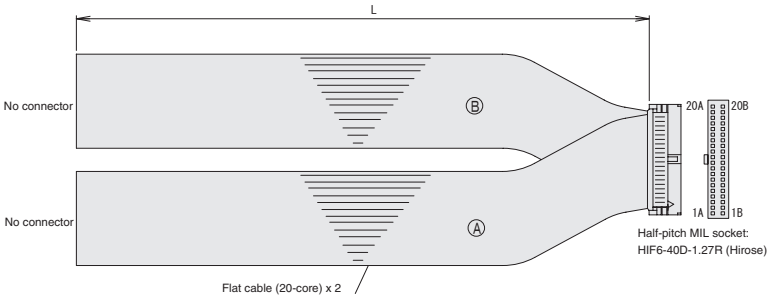
(Wire color)
Black
White
Red
Green
Yellow
Brown
Pink (Red ●)
Pink (Blue ●)
White (Red ●)
White (Blue ●)
Orange (Red ●)
Orange (Blue ●)
Gray (Red ●)
Gray (Blue ●)
Orange (Blue ● consecutive)
Gray (Red ● consecutive)
Gray (Blue ● consecutive)
Shield

Pin No.	Signal
A1	A
B1	VMM
A2	/A
B2	B
A3	VMM
B3	/B
A4	NC
B4	NC
A5	BK+
B5	BK−
A6	LS+
B6	LS−
A7	A+
B7	A−
A8	B+
B8	B−
A9	NC
B9	VPS
A10	VCC
B10	GND
A11	NC
B11	FG

Positioner I/O Cable (for PCON-C/CG)

Model **CB-PAC-PIO□□□**

*Enter the cable length (L) for□□□, up to a maximum compatible length of 10m.
Example: 080=8m



HIF6−40D−1.27R

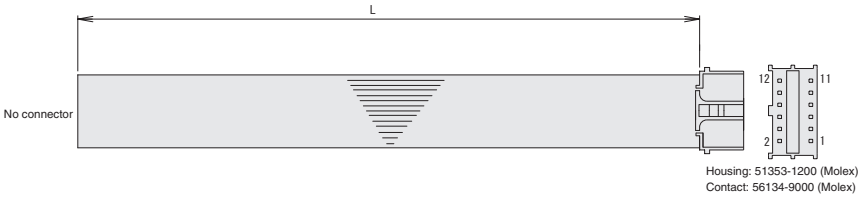
No.	Signal	Cable color	Wiring
1A	24V	Brown-1	A flat cable (crimped)
2A	24V	Red-1	
3A	—	Orange-1	
4A	—	Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	Gray-1	
9A	IN4	White-1	
10A	IN5	Black-1	
11A	IN6	Brown-2	
12A	IN7	Red-2	
13A	IN8	Orange-2	
14A	IN9	Yellow-2	
15A	IN10	Green-2	
16A	IN11	Blue-2	
17A	IN12	Purple-2	
18A	IN13	Gray-2	
19A	IN14	White-2	
20A	IN15	Black-2	

No.	Signal	Cable color	Wiring
1B	OUT0	Brown-3	B flat cable (crimped) AWG28
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Gray-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B	OUT15	Blue-4	
17B	—	Purple-4	
18B	—	Gray-4	
19B	0V	White-4	
20B	0V	Black-4	

Solenoid Valve Type I/O Cable (for PCON-CY)

Model **CB-PACY-PIO□□□**

*Enter the cable length (L) for□□□ up to a maximum compatible length of 10m.
Example: 080=8m



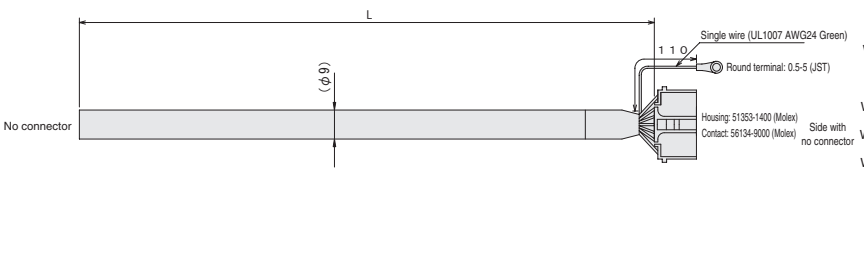
51353-1200 (MOLEX)

No.	Signal	Cable color	Wiring
1	24V	Brown-1	B flat cable (crimped) AWG28
2	0V	Red-1	
3	IN0	Orange-1	
4	IN1	Yellow-1	
5	IN2	Green-1	
6	IN3	Blue-1	
7	OUT0	Purple-1	
8	OUT1	Gray-1	
9	OUT2	White-1	
10	OUT3	Black-1	
11	OUT4	Brown-2	
12	OUT5	Red-2	

Pulse Train Control I/O Cable (for PCON-PL/PO)

Model **CB-PACPU-PIO□□□**

*Enter the cable length (L) for□□□ up to a maximum compatible length of 10m.
Example: 080=8m



51353-1400 (MOLEX)

No.	Signal	Cable color	Wiring
1	IO_24V	Black	0.2sq
2	IO_24G	White/Black	
3	IN0	Red	
4	IN1	White/Red	
5	IN2	Green	
6	IN3	White/Green	
7	OUT0	Yellow	
8	OUT1	White/Yellow	
9	OUT2	Brown	
10	OUT3	White/Brown	
11	PP	Blue	
12	PG	White/Blue	
13	NP	Gray	
14	NG	White/Gray	

0.5-5 (JST)

1	FG	White/Gray	AWG24

ACON

■Model C/CG/CY/PL/PO/SE

Position Controller
For RCA2/RCA Series

C/CG CY PL/PO SE

Model List/Prices

This position controller enables movement of the RCA2/RCA series actuators. 5 types are available, to suit various styles of control.

Type	C	CG	CY	PL/PO	SE
Title	Positioner type	Safety category compliant	Solenoid valve type	Pulse train control type	Serial communications type
External View					
Description	Can use up to 512 positioning points with this positioner	Safety category type C compliant	Can operate under the same control as with an air cylinder	Controller for pulse train control	Controller for network
Positioning Points	512 points	512 points	3 points	(–)	64 points
Standard Price	-	-	-	-	-

Model

ACON – [Series] – [Type] – [Motor type] [Encoder type] I [Option] – [I/O type] – [I/O cable length] – [Power voltage] 0 – [Simple Absolute Unit]

Type	
C	Positioner type
CG	Conforming to safety category compatible type
CY	Solenoid valve type
SE	Serial communication type
PL	Pulse in-line control type (differential receiver type)
PO	Pulse in-line control type (open collector type)

Motor type	
10	10W motor
20S	20W motor (*)
20	20W motor
30	30W motor

*When connecting RCA-RA3C/RA3D/ RA3R/RGS3C/RGS3D/RGD3C/ RGD3D and RCA2-SA4C/ TA5C, the motor type will be 20S.

Encoder type	
I	Incremental

Option	
HA	High-speed acceleration and deceleration specification
LA	Low-power specification

I/O type	
NP	NPN specification (standard)
PN	PNP specification
DV	DeviceNet connection specification
CC	CC-Link connection specification
PR	ProfiBus connection specification
N	No I/O (SE type only)

*The network specification (DV/CC/PR) is only compatible with the C/CG type.
*When the SE (serial communication) type is selected, the standard I/O will be N (no I/O).

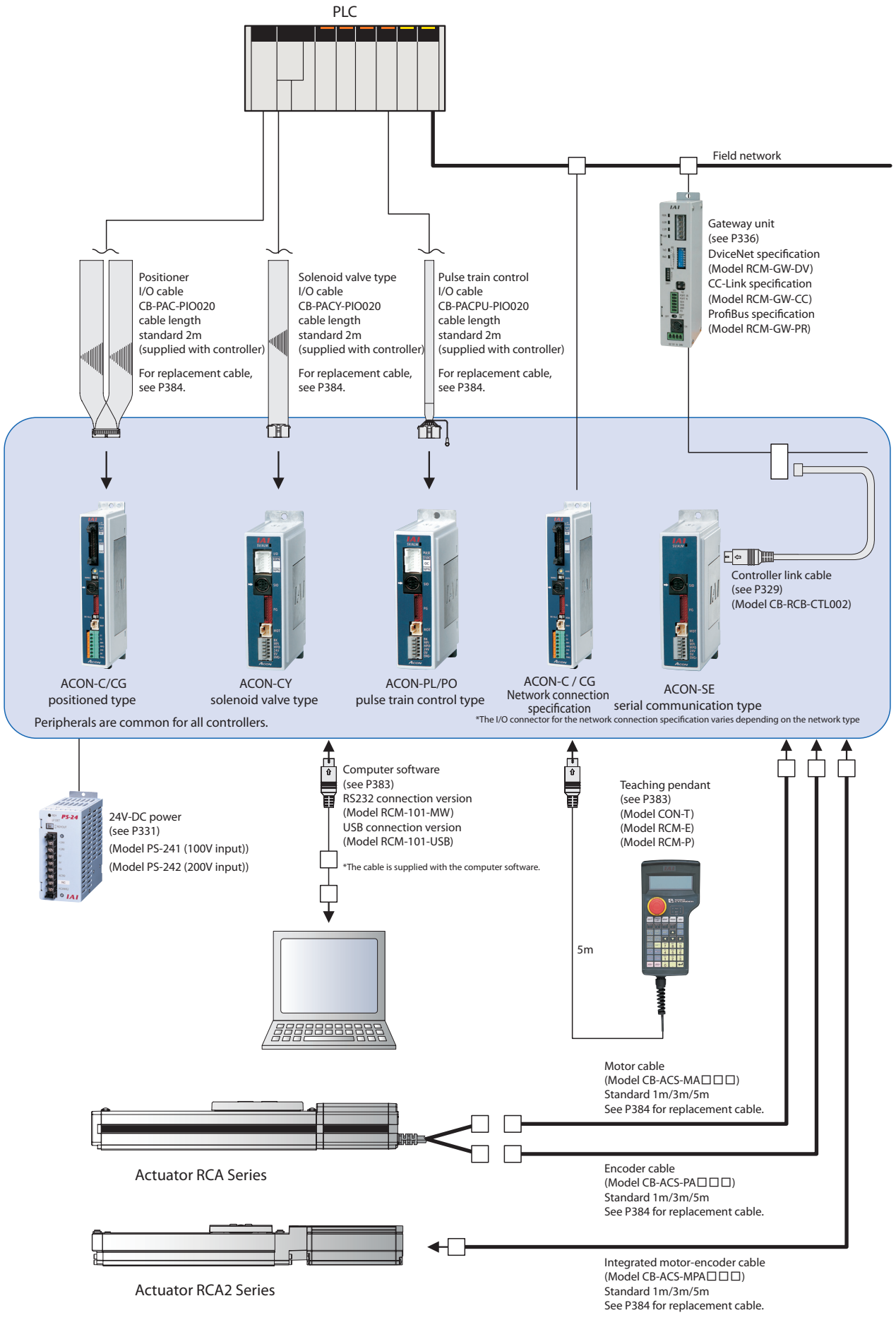
I/O cable length	
0	No cable
2	2m (standard)
3	3m
5	5m

*When SE (serial communication type) is selected, or when the network connection specification (I/O type is DV, CC, or PR) is selected, the I/O cable is O (no cable).

Power voltage	
0	DC24V

Simple Absolute Unit	
Blank	Not used
ABU	Used

System Configuration



I/O Specifications

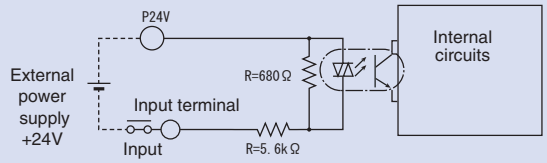
■Input Part External input specifications

Item	Specifications
Input voltage	DC24V±10%
Input current	4mA / circuit
Leak current	1mA max. / point
Insulation method	Photocoupler

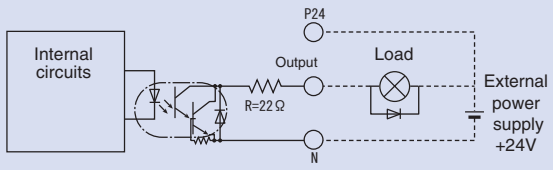
■Output External output specifications

Item	Specifications
Load Voltage	DC24V
Max. load current	50mA / point
Residual voltage	2V or less
Insulation method	Photocoupler

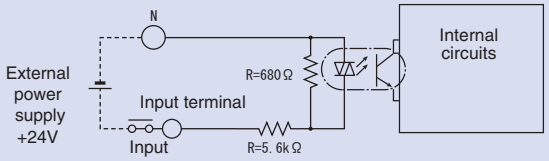
NPN Specifications



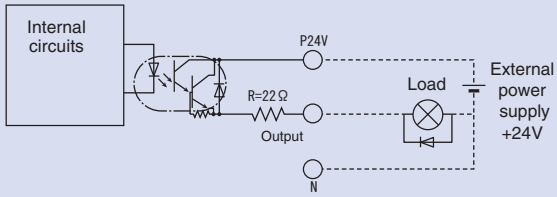
NPN Specifications



PNP Specifications



PNP Specifications



I/O Specifications

The 4 types of controller (C/CG, CY, PL/PO, and SE) are classified by their respective I/O specifications. In addition, with the positioner type and solenoid valve type, the I/O signal details can be changed via the controller settings. As a result, a number of functions can be used.

■Control Function by Type

Type Name	C/CG	CY	PL/PO	SE	Features
Title	Positioner type	Solenoid valve type	Pulse train control type	Serial communication type	
Positioner mode	○	○	×	○ (*1)	A basic operation mode in which the actuator is operated by specifying a position number and then inputting a start signal. Teaching mode x x x In this mode, the slider (rod) can be moved
Teaching mode	○	×	×	○ (*1)	In this mode, it is possible to move the slide (rod) via external signal, and then register the stop position as position data.
Solenoid valve mode	○	○	×	○ (*1)	You can ope rate the actuator f re el y according to your control needs, without inputting position data. The air cylinder solenoid valve can be replaceed.
Pulse train mode	×	×	○	×	Can operate freely under user control, with no position data entered.
Network compatible	○ (*2)	×	×	○ (*3)	Can be connected to DeviceNet, CC-Link and other field networks for use.

*1 Will operate via network and serial communications.
*2 Can make direct connection to a field network with the network specifications.
*3 Can be connected to a field network using a gateway unit.

Explanation of I/O Signal Functions

The table below explains the functions allocated to the controller's I/O signal. Since the signals that can be used vary depending on the controller type and settings, check the signal table for each controller to confirm the available functions.

■Signal Function Description

Division	Signal Abbreviation	Signal Name	Function Description
Input	CSTR	PTP strobe signal (start signal)	Input this signal to cause the actuator to start moving to the position set by the command position number signal.
	PC1 to PC256	Command position number signal	This signal is used to input a target position number (binary input).
	BKRL	Brake forced release signal	This signal forcibly releases the brake.
	RMOD	Running mode switching signal	Operations mode can be switched when the controller's MODE switch is set to AUTO (AUTO if this signal is OFF, MANU if the signal is ON).
	*STP	Pause signal	Turning this signal OFF causes the moving actuator to decelerate to a stop. The actuator will resume the remaining movement if the signal is turned OFF during the pause.
	RES	Reset signal	With the signal ON, the alarm is reset. If this signal is turned ON while the actuator is paused (*STP is OFF), the remaining movement can be cancelled.
	SON	Servo ON signal	Servo is ON while signal is ON and OFF while signal is OFF.
	HOME	Home return signal	Turning this signal ON performs home-return operation.
	MODE	Teaching mode signal	Turning this signal ON switches the controller to the teaching mode (provided that CSTR, JOG+ and JOG- are all OFF and the actuator is not moving).
	JISL	Jog/inching switch signal	The actuator can be jogged with JOG+ and JOG- while this signal is OFF. The actuator performs inching operation with JOG+ and JOG- while this signal is ON.
	JOG+, JOG–	Jog signal	When the JISL signal is OFF, the jogging operation is performed in the + and – directions with this signal's edge detection ON. Decelerates to a stop with edge detection OFF during jog operation.
	PWRT	Teaching signal	In the teaching mode, specify a desired position number and then turn this signal ON for at least 20 ms to write the current position under the specified position number.
	ST0 to ST6	Start position command	Turning this signal ON in the solenoid valve mode causes the actuator to move to the specified position (start signal is not required).
	TL	Torque limit selection signal	The position deviation counter is continuously cleared while this signal is ON. When the torque reaches the set value, the TRL signal turns ON.
	DCLR	Deviation counter clear signal	When this signal is ON, the position deviation counter is cleared continuously.
Output	PEND/INP	In position signal	This signal turns ON when the actuator has entered the positioning band after movement. If the actuator has exceeded the positioning band, PEND does not turn OFF, but INP does. PEND and INP can be swapped using a parameter.
	PM1 to PM256	Position complete signal	This signal is used to output the position number achieved at completion of positioning (binary output).
	HEND	Home return complete signal	Turns ON when home return is complete.
	ZONE1	Zone signal	Turns ON if the actuator's current position is within the range set by the parameter.
	PZONE	Position zone signal	This signal turns ON when the current actuator position has entered the range specified by position data during position movement. PZONE can be used together with ZONE1, but PZONE is valid only during movement to a specified position.
	RMDS	Running mode status signal	This signal is used to output the running mode status.
	*ALM	Controller alarm status signal	Turns ON when controller is in normal condition, and turns OFF when an alarm occurs.
	MOVE	Moving signal	This signal remains ON while the actuator is moving (including the periods during home return and push-motion operation).
	SV	Servo ON status signal	This signal remains ON while the servo is on.
	*EMGS	Emergency stop status signal	This signal remains ON while the controller is not in the emergency stop mode, and turns OFF once an emergency stop has been actuated.
	MODES	Mode status signal	Turns ON when entering teaching mode via MODE signal input. Turns OFF when entering normal mode.
	WEND	Write complete signal	This signal remains OFF after the controller has switched to the teaching mode. It turns ON upon completion of data write using the PWRT signal. If the PWRT signal is turned OFF, this signal also turns OFF.
	PE0 to PE6	Current position number signal	This signal turns ON after the controller has completed moving to the target position in the solenoid valve mode.
	TLR	Torque limiting signal	This signal turns ON once the motor torque has reached the specified value in a condition where torque is being limited by the TL signal.
	LSO to LS2	Limit switch output signal	Each signal turns ON when the current actuator position has entered the positioning band before or after the target position. If the actuator has already completed home return, these signals are output even before a movement command is issued or while the servo is OFF.
	TRQS	Torque level status signal	This signal outputs when the current value of the motor reaches the limitation value, before the JOG operation returns to the starting point and the slider (rod) collides to the mechanical end or an obstacle.

I/O Signal Table

■Positioner Type (ACON-C/CG)

Pin No.	Division		Parameter (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
		Positioning points	64 points	64 points	256 points	512 points	7 points	3 points
		Zone signal	○	×	×	×	○	○
		P-zone signal	○	○	○	×	○	○
1A	24V		P24					
2A	24V		P24					
3A	–		NC					
4A	–		NC					
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	PM1	PM1	PM1	PE0	LS0
2B		OUT1	PM2	PM2	PM2	PM2	PE1	LS1(TRQS)
3B		OUT2	PM4	PM4	PM4	PM4	PE2	LS2(–)
4B		OUT3	PM8	PM8	PM8	PM8	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	PZONE	PZONE	PM256	PZONE	PZONE
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	–	–	–	–	–	–
17B	–		NC					
18B	–		NC					
19B	0V		N					
20B	0V		N					

(Note) Code that appears in parentheses above indicates the function prior to home return.

■Solenoid Valve Type (ACON-CY)

Pin No.	Division		Parameter (PIO pattern selection)	
			0	1
			Solenoid valve mode 0	Solenoid valve mode 1
		Positioning points	3 points	3 points
		Zone signal	×	×
		P-zone signal	×	○
1	24V			
2	0V			
3	Input	IN0	ST0	ST0
4		IN1	ST1 (JOG+)	ST1 (JOG+)
5		IN2	ST2 (RES)	ST2 (RES)
6		IN3	SON	SON
7	Output	OUT0	LS0	PE0
8		OUT1	LS1(TRQS)	PE1(TRQS)
9		OUT2	LS2(–)	PE2(–)
10		OUT3	SV	PZONE
11		OUT4	HEND	HEND
12		OUT5	*ALM	*ALM

(Note) Code that appears in parentheses above indicates the function prior to home return.

■Pulse Train Type (ACON-PL/PO)

Pin No.	Division		Parameter (PIO pattern selection)	
			0	1
			Standard mode	Push mode
		Positioning points	—	—
		Zone signal	×	×
		P-zone signal	×	×
1	24V			
2	0V			
3	Input	IN0	SON	SON
4		IN1	TL	TL
5		IN2	HOME	HOME
6		IN3	RES	RES/DCLR
7	Output	OUT0	SV	SV
8		OUT1	INP	INP/TLR
9		OUT2	HEND	HEND
10		OUT3	*ALM	*ALM
11	Input		*PP	*PP
12			PP	PP
13			*NP	*NP
14			NP	NP

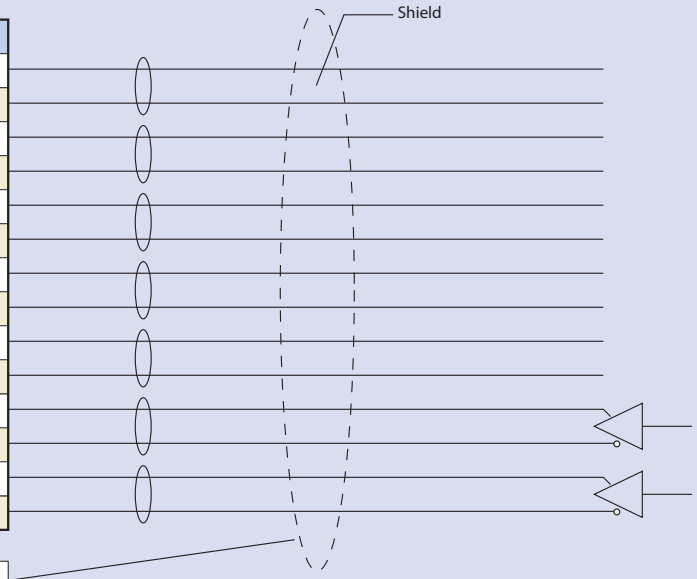
Pulse Train Input Type Wiring Diagram

■Differential Receiver Method (ACON-PL)

Maximum input pulse frequency	: Max. 200kpps
Cable length	: Max. 10m

PIO connector

Pin No.	Classification	Signal
1	External 24V	24V
2	External 0V	0V
3	Input	SON
4	Input	TL
5	Input	HOME
6	Input	RES
7	Output	SV
8	Output	INP
9	Output	HEND
10	Output	* ALM
11	Differential input	/PP
12		PP
13		/NP
14		NP



Mounting plate	FG

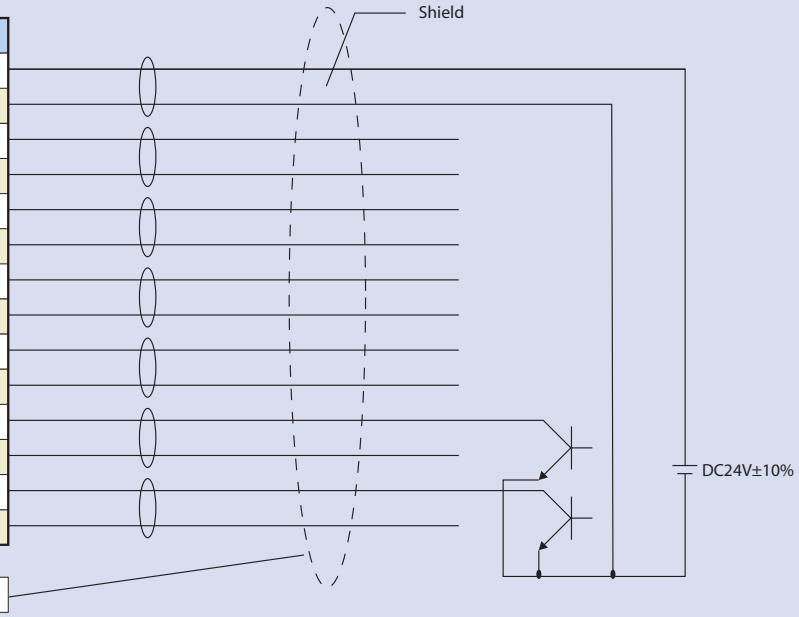
*The shield on the twisted pair cable connected to the pulse connector must always be connected to the mounting plate.

■Open Collector Method (ACON-PO)

Maximum input pulse frequency	: Max. 60kpps
Cable length	: Max. 2m

PIO connector

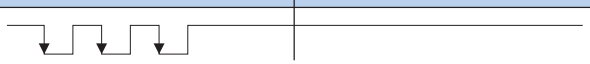
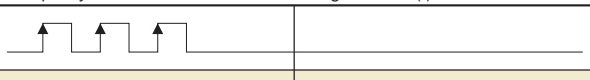
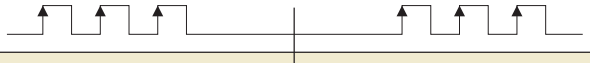
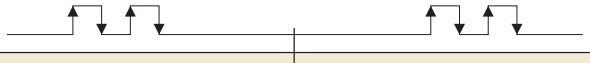
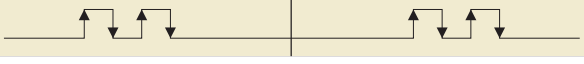
Pin No.	Classification	Signal
1	External 24V	24V
2	External 0V	0V
3	Input	SON
4	Input	TL
5	Input	HOME
6	Input	RES
7	Output	SV
8	Output	INP
9	Output	HEND
10	Output	* ALM
11	Open collector input	/PP
12	N.C	PP
13	Open collector input	/NP
14	N.C	NP



Mounting plate	FG

*The shield on the twisted pair cable connected to the pulse connector must always be connected to the mounting plate.
*Connect the external 0V to the common command pulse.

Command Pulse Input Patterns

Command pulse train pattern		Input terminal	Forward	Reverse
Negative logic	Forward pulse train	PP·/PP		
	Reverse pulse train	NP·/NP		
	The forward pulse train will be the amount of motor rotation in the forward direction.The reverse pulse train will be the amount of motor rotation in the reverse direction.			
	Pulse train	PP·/PP		
	Sign	NP·/NP	Low	High
	The command pulse will be the amount of motor rotationand the command sign will be the direction of motor rotation.			
	Phase A/B pulse train	PP·/PP		
		NP·/NP		
	Phase-A/B (x4) pulses with a 90° phase difference specify both the revolutions and rotating direction.( )			
Positive logic	Forward pulse train	PP·/PP		
	Reverse pulse train	NP·/NP		
	Pulse train	PP·/PP		
	Sign	NP·/NP	High	Low
	Phase A/B pulse train	PP·/PP		
		NP·/NP		

Specification Table

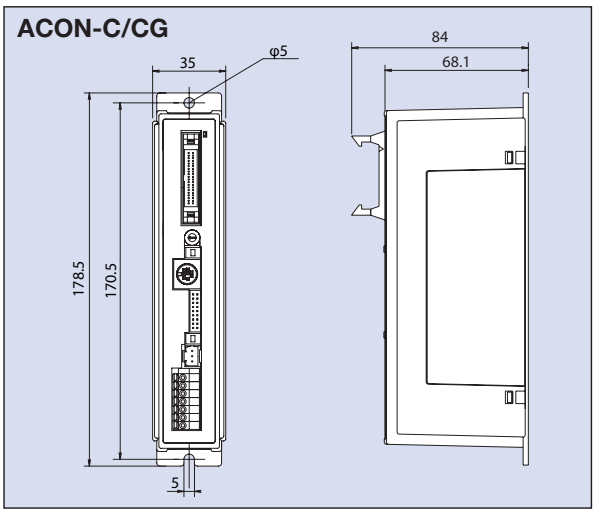
Item	Specifications					
Controller type	C	CG	CY	PL	PO	SE
Connection actuator	RCA series actuator					
Number of controlled axes	1 axis					
Operating method	Positioner type		Solenoid valve type	Pulse series input type		Serial communication type
Number of positioning points	512 points		3 points	—		64 points
Backup memory	EEPROM					
I/O connector	40pin connector		12 pin connector	14 pin connector		None
I/O number	16 input points/16 output points		4 input points/6 output points	4 input points / 4 output points		None
I/O power supply	External supply DC24V±10%					—
Serial communications	RS485 1ch					
Peripheral communications cable	CB-PAC-PIO□□□		CB-PACY-PIO□□□	CB-PACPU-PIO□□□		CB-RCB-CTL002
Command pulse train input type	—			Differential line driver	Open collector	—
Maximum input pulse frequency(*1)	—			Max 200kpps	Max 60kpps	—
Position detection method	Incremental encoder					
Drive-source cutoff relay at emergency stop	integrated	External				
Forced release of electromagnetic brake	Brake release switch ON/OFF		BK-release terminal signal ON/OFF on power connector			
Motor cable	CB-ACS-MA □□□(maximum length 20m)					
Encoder cable	CB-ACS-PA □□□(maximum length 20m)					
Input power	DC24V±10%					
Dielectric strength voltage	DC500V 1MΩ					
Vibration resistance	XYZ directions	10 to 57Hz One-side amplitude 0.035mm (continuous), 0.075mm (intermittent) 58 to 150Hz 4.9m/s2 (continous), 9.8m/s2 (intermittent)				
Ambient operating temperature	0 to 40℃					
Ambient operating humidity	10 to 95% RH (non-condensing)					
Operating ambience	Free from corrosive gases					
Protection class	IP20					
Weight	Approximately 300g		Approximately 130g			

(Note 1) With the open collector specification, keep the maximum input frequency to 60 kpps or below to prevent malfunction. If exceeding 60kpps, use a differential line driver.

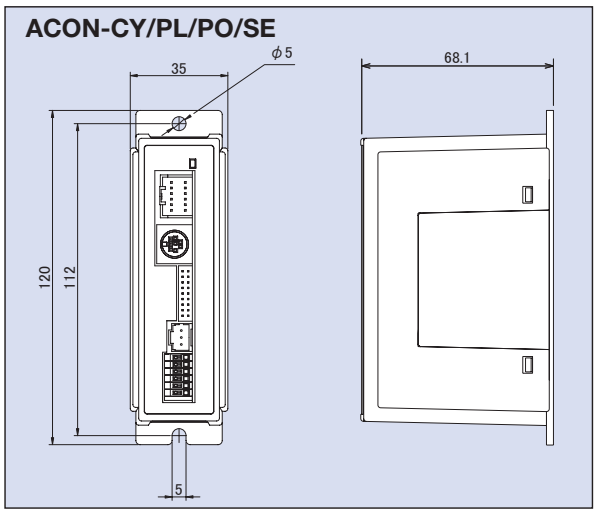
	Actuator type	High speed adjustable specifications	Power saving specifications
Power Capacity	SA4SA5RA4(20W)	Rated 1.3A/maximum 4.4A	Rated 1.3A/maximum 2.5A
	SA6RA4(30W)	Rated 1.3A/maximum 4.0A	Rated 1.3A/maximum 2.2A
	RA3(20W)	Rated 1.7A/maximum 5.1A	Rated 1.7A/maximum 3.4A

External Dimensions

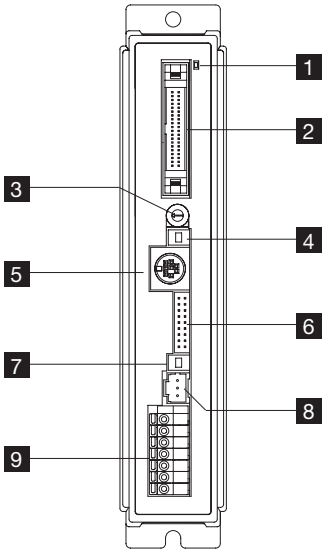
ACON-C/CG



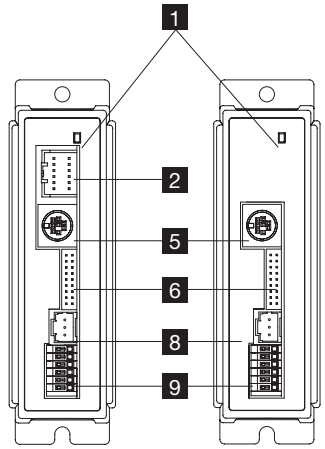
ACON-CY/PL/PO/SE



Name of Each Part



C/CG type



CY/PL/PO Type **SE Type**

*PIO connector
CY:12pin
PL / PO:14pin

1 LED display

These LED indicate the condition of the controller.

Lit (green) Servo on | Lit (red) Alarm activated, Emergency stop | Unlit Servo off | Blinking (green) Automatic servo-off mode

2 PIO connector

Connect a cable for communicating with a PLC or other external equipment.

3 Address-setting rotary switch

This switch sets the addresses for controllers used when the unit is linked with controllers.

4 Mode switch

Switches between manual teaching pendant operations (MAN) and automatic operations (AUTO).

Operation details

MANU	I/O commands are not accepted. Data can be written from a teaching pendant.
AUTO	I/O commands are valid, while operations from a teaching pendant are not accepted. Monitoring is possible however.

5 SIO connector

Connects a teaching pendant, PC cable, controller, or gateway unit to a controller.

Operation details

Pin No.	Signal	Title	Name
1	SGA	RS485 differential signal +	
2	SGB	RS485 differential signal -	
3	5V	+5V Output	For RS232/485 converter
4	ENBL	Enable signal	
5	EMGA	EMG line connections to external machines	
6	24V	24-V power for T/P	For T/P
7	0V	GND	
8	EMGB	EMG line connections to external machines	
9	0V	EMG line connection GND to external machines	

6 Encoder/brake connector

Connect the encoder/brake cable for the actuator.

7 Brake release switch

This switch forces the brake to release.

8 Motor connector

Connect the motor cable for the actuator.

9 Power terminal box

Main power for controller (s),emergency stop.

C/CG type

Terminal number	Signal name	Name
7	S1	TP_EMG external drive-source cutoff terminal
6	S2	
5	MPI	Motor drive source cutoff terminal
4	MPO	Motor drive source cutoff terminal
3	24V	Positive side of 24V power supply
2	0V	Negative side of 24V power supply
1	EMG	EMG signal (24V applied)

CY/PL/PO/SE type

Terminal number	Signal name	Name
6	BK	Brake release
5	MPI	Motor drive source cutoff terminal
4	MPO	Motor drive source cutoff terminal
3	24V	Positive side of 24V power supply
2	0V	Negative side of 24V power supply
1	EMG	EMG signal (24V applied)

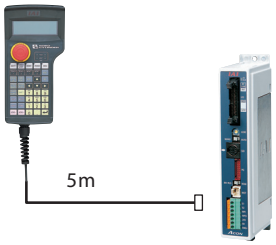
Options

Teaching Pendant

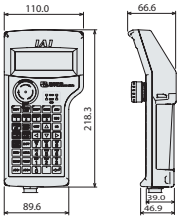
Features This is a teaching device that provides information on functions such as position input, running tests, and monitoring.

Model
CON-T (standard type)
RCM-E (simple absolute teaching pendant)
RCM-P (data setting device)

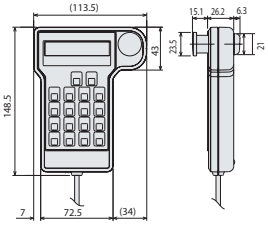
Configuration



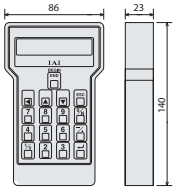
CON-T



RCM-E



RCM-P

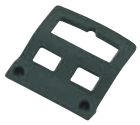


Specifications

Item	CON-T	RCM-E	RCM-P
Data input	○	○	○
Actuator operation	○	○	×
Amb. op. temp., humid	Temperature: 0 to 40°C. Humidity: 85% RH or less.		
Amb. op. env.	Free from corrosive gases and especially dust.		
Protection class	IP54	-	-
Weight	Approx. 400g	Approx. 400g	Approx. 360g
Cable length	5m		
Display	20 char x 4 lines, LCD	16 char x 2 lines, LCD	16 char x 2 lines, LCD
Standard price	-	-	-

CON-T options

- Wall-mounting hook Model HK-1



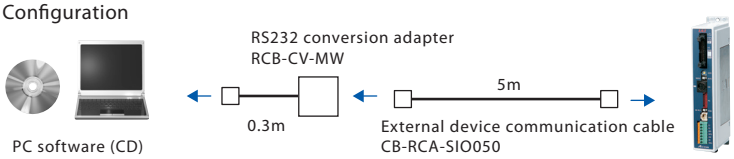
- Wall-mounting hook Model STR-1

Computer software (Windows only)

Features A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.

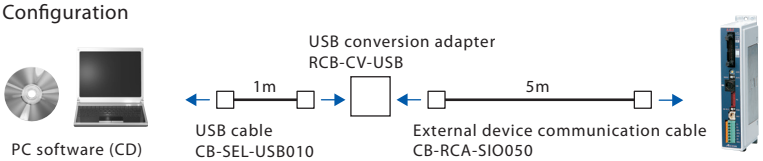
Model RCM-101-MW (with external device communication cable + RS232 conversion unit)

Configuration



Model RCM-101-USB (with external device communication cable + USB conversion adapter + USB cable)

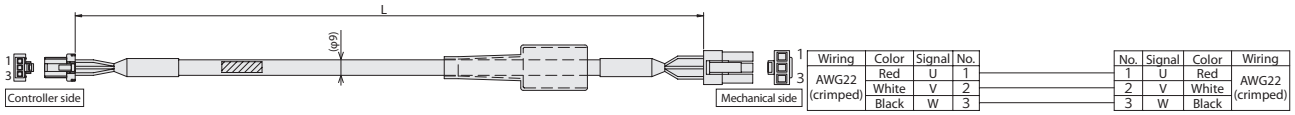
Configuration



RCA Motor Cable

Model CB-ACS-MA□□□

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



Wiring	Color	Signal	No.
AWG22 (crimped)	Red	U	1
	White	V	2
	Black	W	3

No.	Signal	Color	Wiring
1	U	Red	AWG22 (crimped)
2	V	White	
3	W	Black	

Spare Parts

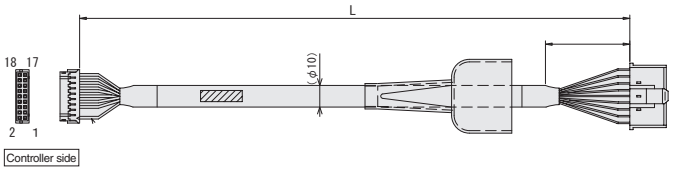
Should you require spare parts after the purchase of your product for replacing the original cables, etc., refer to the model names specified below.

RCA Encoder Cable/Encoder Robot Cable

Model **CB-ACS-PA□□□/CB-ACS-PA□□□-RB**

*The standard encoder cable is a normal cable. A robot cable can be specified as an option.

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



CN2 Cable color (Robot cable)	CN2 Cable color (Std. cable)	CN2 Pin No.	CN2 Signal
White/Purple	Blue	LS+	18
White/Gray	Orange	LS−	17
Yellow	Green	BK+	16
Blue	Brown	BK−	15
White/Blue	Gray	ENA	14
White/Yellow	Red	ENA	13
White/Red	Black	ENB	12
White/Black	Yellow	ENB	11
Orange	Pink	ENZ	10
Green	Purple	ENZ	9
Purple	White	—	8
Gray	Blue/Red	VPS	7
Red	Orange/White	5V	6
Black	Green/White	GND	5
-	-	—	4
-	-	—	3
-	-	—	2
Drain	Drain	FG	1

Housing: PHDR-18VR (Made by JST)
Contact: SPHD-001T-P0.5 (Made by JST)

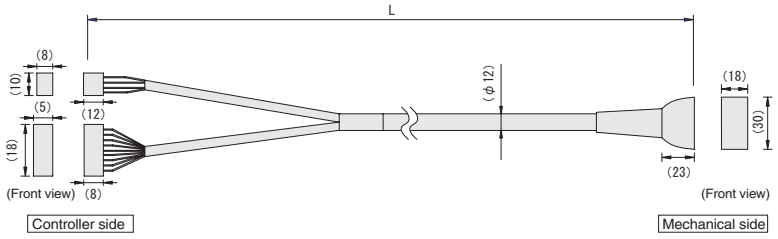
ON1 Pin No.	ON1 Signal	ON1 Cable color (Robot cable)	ON1 Cable color (Std. cable)
1	ENA	Gray	White/Blue
2	ENA	Red	White/Yellow
3	ENB	Black	White/Red
4	ENB	Yellow	White/Black
5	—	-	-
6	—	-	-
7	LS+	Blue	White/Purple
8	—	-	-
9	FG	Drain	Drain
10	ENZ	Pink	Orange
11	ENZ	Purple	Green
12	—	White	Purple
13	VPS	Blue/Red	Gray
14	5V	Orange/White	Red
15	GND	Green/White	Black
16	LS−	Orange	White/Gray
17	BK−	Brown	Blue
18	BK+	Green	Yellow

Plug housing: XMP-18V (Made by JST)
Socket contact: BXA-001T-P0.6 (Made by JST)
Retainer: XMS-09V (Made by JST)

RCA2 Motor Encoder-Built-in Type Cable

Model **CB-ACS-MPA□□□**

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



Single	Pin No.
U	1
V	2
W	3
BK+	16
BK−	15
LS+	18
LS−	17
A+	14
A−	13
B+	12
B−	11
Z+	10
Z−	9
—	8
⁄PS	7
VCC	6
GND	5
NC	
FG	1

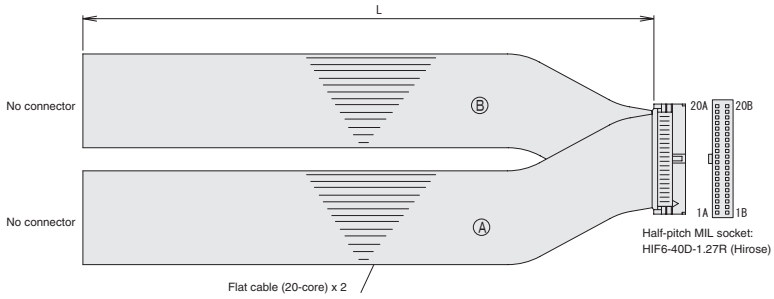
(Wire color)
Red
Yellow
Black
Yellow (Red ●)
Yellow (Blue ●)
Pink (Red ●)
Pink (Blue ●)
White (Red ●)
White (Blue ●)
Orange (Red ●)
Orange (Blue ●)
Gray (Red ●)
Gray (Blue ●)
Orange (Red ● consecutive)
Orange (Blue ● consecutive)
Gray (Red ● consecutive)
Gray (Blue ● consecutive)
Shield

Pin No.	Single
A1	U
B1	V
A2	W
B2	NC
A3	NC
B3	NC
A4	BK+
B4	BK−
A5	LS+
B5	LS−
A6	A+
B6	A−
A7	B+
B7	B−
A8	Z+
B8	Z−
A9	—
B9	⁄PS
A10	VCC
B10	GND
A11	NC
B11	FG

I/O Flat Cable (ACON-C/CG)

Model **CB-PAC-PIO□□□**

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



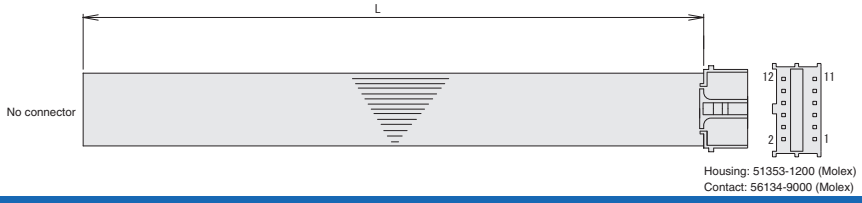
HIF6−40D−1.27R

No.	Signal	Cable color	Wirng	No.	Signal	Cable color	Wirng
1A	24V	Brown-1	Flat cable (A) (crimped)	1B	OUT0	Brown-3	Flat cable (B) (crimped)
2A	24V	Red-1		2B	OUT1	Red-3	
3A	—	Orange-1		3B	OUT2	Orange-3	
4A	—	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	—	Purple-4	
18A	IN13	Gray-2		18B	—	Gray-4	
19A	IN14	White-2		19B	0V	White-4	
20A	IN15	Black-2		20B	0V	Black-4	

Solenoid Valve Type I/O Cable (ACON–CY)

Model **CB-PACY-PIO□□□**

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



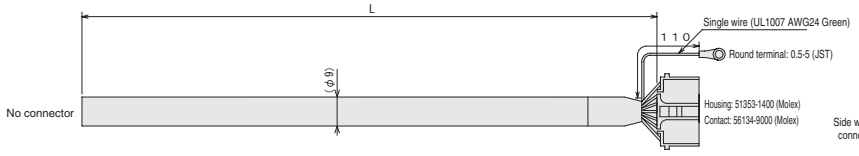
51353-1200 (MOLEX)

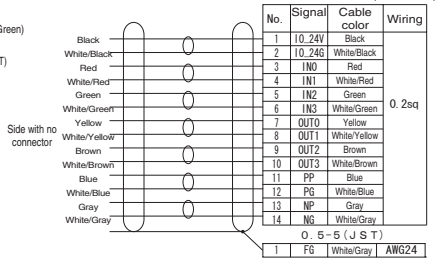
No.	Signal	Cable color	Wiring
1	24V	Brown-1	Flat cable (crimped) AWG28
2	0V	Red-1	
3	IN0	Orange-1	
4	IN1	Yellow-1	
5	IN2	Green-1	
6	IN3	Blue-1	
7	OUT0	Purple-1	
8	OUT1	Gray-1	
9	OUT2	White-1	
10	OUT3	Black-1	
11	OUT4	Brown-2	
12	OUT5	Red-2	

Pulse Train Control I/O Cable (ACON-PL/PO)

Model **CB-PACPU-PIO□□□**

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





51353-1400 (MOLEX)

No.	Signal	Cable color	Wiring
1	IO_24V	Black	0.2sq
2	IO_24G	White/Black	
3	IN0	Red	
4	IN1	White/Red	
5	IN2	Green	
6	IN3	White/Green	
7	OUT0	Yellow	
8	OUT1	White/Yellow	
9	OUT2	Brown	
10	OUT3	White/Brown	
11	PP	Blue	
12	PG	White/Blue	
13	NP	Gray	
14	NG	White/Gray	

0.5-5 (JST)

1	FG	White/Gray	AWG24

SCON

Position Controller
For RCS2 Series

Model List/Prices

There are 2 types of SCON controller: standard specifications in which operation is performed via PIO or pulse train input, and network specifications for operation via connection to a field network. Incremental specifications and absolute specifications are available for both types. However, only incremental specified operations are available when operating via pulse train input.

Type Name		C								
Title		Standard specification			Network connection specification (optional)					
External View										
Description		Positioning mode, teaching mode, Solenoid		Pulse train mode	DeviceNet Connection specifications		CC-Link Connection specifications		ProfiBus Connection specifications	
Positioning points		Up to 512 points		(–)	Up to 512 points					
I/O type symbol		NP/PN			DV		CC		PR	
Compatible encoder		Incremental	Absolute	Incremental	Incremental	Absolute	Incremental	Absolute	Incremental	Absolute
Std. Price	20 to 150W	-	-	-	-	-	-	-	-	-
	200W	-	-	-	-	-	-	-	-	-
	300 to 400W	-	-	-	-	-	-	-	-	-
	600W	-	-	-	-	-	-	-	-	-
	750W	-	-	-	-	-	-	-	-	-

(Caution) Note that with the network specifications, neither control via pulse train nor PIO is available.

Model

SCON – C – [Motor type] [Encoder type] [Option] – [I/O type] – [I/O cable length] – [Power voltage]

Series: SCON
Type: C
- C: Standard type

Motor type:
- 20: 20W motor
- 30D: 30W motor (for RCS2)
- 30R: 30W motor (for RS)
- 60: 60W motor
- 100: 100W motor
- 150: 150W motor
- 200: 200W motor
- 300: 300W motor
- 400: 400W motor
- 600: 600W motor
- 750: 750W motor

Encoder type:
- I: Incremental
- A: Absolute

Option:
- HA: High-speed acceleration and deceleration specification

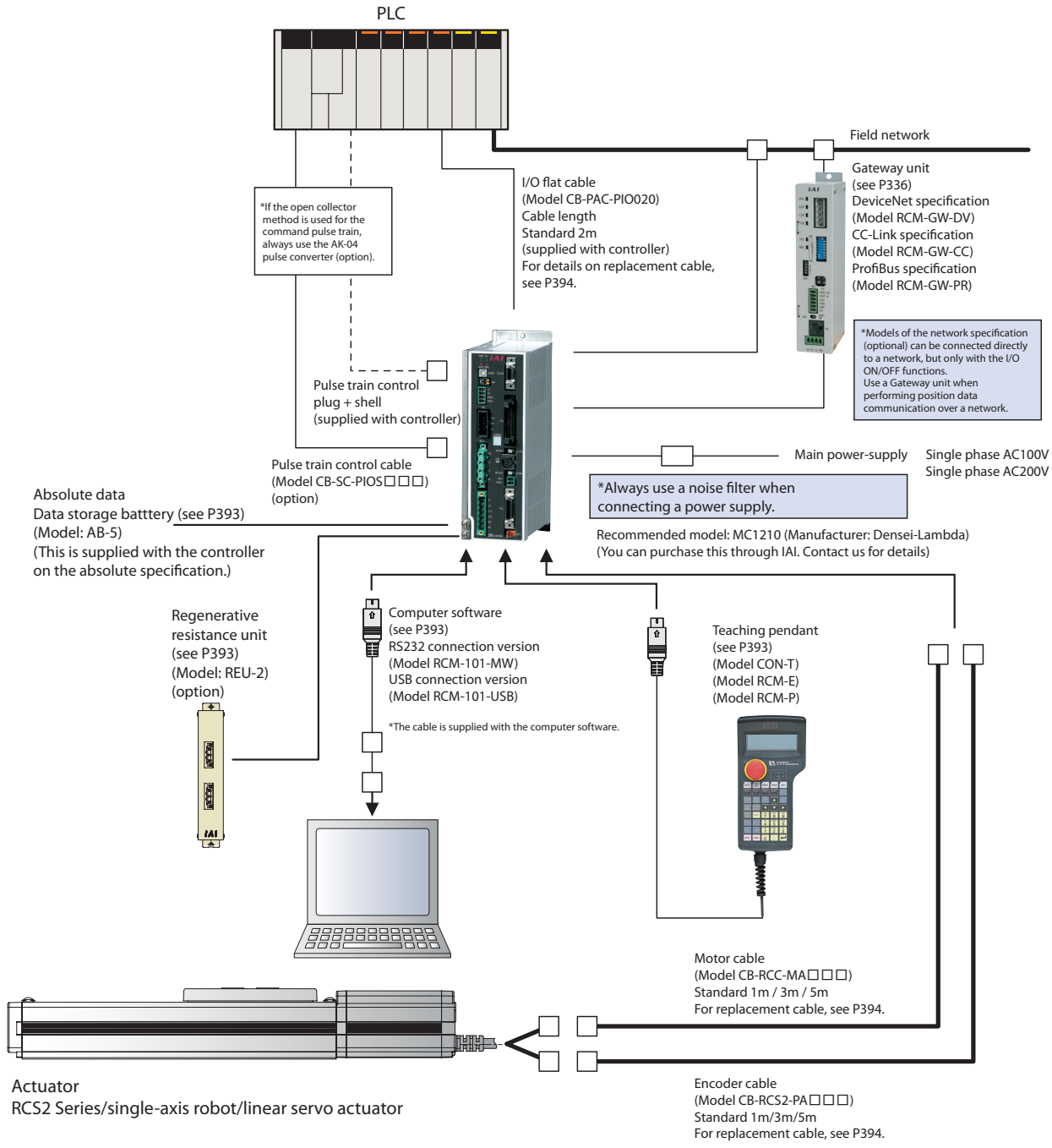
I/O type:
- NP: PIO NPN specification (standard)
- PN: PIO PNP specification
- DV: DeviceNet connection specification
- CC: CC-Link connection specification
- PR: ProfiBus connection specification

I/O cable length:
- 0: No cable
- 2: 2m (standard)
- 3: 3m
- 5: 5m

*If DV, CC, or PR is selected for the I/O type, select 0 for the I/O cable length.

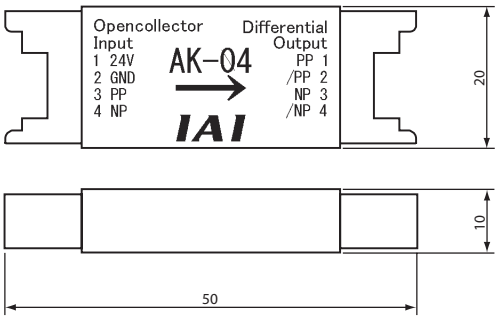
Power voltage:
- 1: Single phase AC100V
- 2: Single phase AC200V

System Configuration



Pulse Converter AK-04(Option)

Details: pulse converter (model AK-04) + I/O e-CON connector
Use this converter if pulses output from the host controller are of open collector specification.
This converter is used to convert the open-collector command pulses output from the host controller to differential pulses. Converting open collector pulses to differential pulses improves noise resistance.
Two phases of differential pulses equivalent to those from the line driver 26C31 are output. The e-CON connector is used as an input/output connector to simplify the field wiring.



Basic Specifications

· Input power	DC24V±10% (Max. 50mA)
· Input pulse	Open collector (collector current Max. 12mA)
· Input frequency	200kHz or less
· Output pulse	26C31 equivalent differential output (MAX 10mA)
· External dimensions	See the figure at right (cable connector not included)
· Weight	10g or less (cable connector not included)
· Accessories	I/O e-CON connector , 3M 37104-3122-000FL (Applicable wire: AWG No. 24 to 26, 0.14 to less than 0.3mm² Outer diameter of finished wire 1.0 to 1.2mm)

I/O Specifications

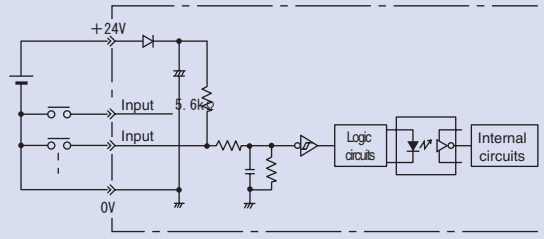
■Input Part External input specifications

Item	Specifications
Input voltage	DC24V±10%
Input current	4mA/point
ON/OFF voltage	ON voltage ··· Min DC18.0V (3.5mA) OFF voltage ··· Max DC6.0V (1mA)
Insulation Method	Photocoupler

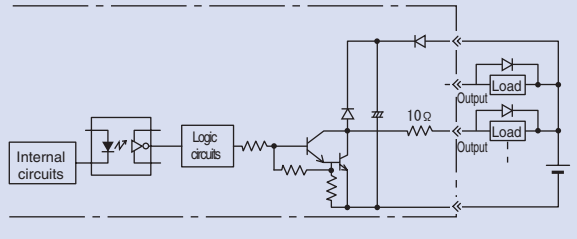
■Output External output specifications

Item	Specifications
Load Voltage	DC24V
Max. Load Current	100mA/point, 400mA/8 points
Leak current	Max 0.1mA/point
Insulation Method	Photocoupler

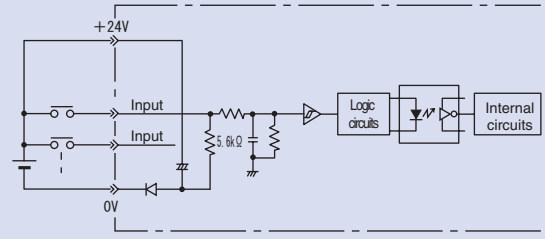
NPN Specification



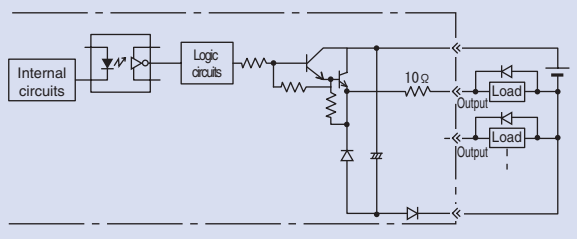
NPN Specification



PNP Specification



PNP Specification



I/O Function Description

SCON-C is compatible with all of the following control methods. Positioning is possible with up to 512 points in positioner mode and up to 7 points in solenoid valve mode.

■Control Function by Type

Type Name	SCON-C	Features
Positioner mode	○	A basic operation mode in which the actuator is operated by specifying a position number and then inputting a start signal.
Teaching mode	○	In this mode, it is possible to move the slide (rod) via external signal, and then register the stop position as position data.
Solenoid valve mode	○	The actuator can be moved simply by ON/OFF of position signals. This mode supports the same control actions you are already familiar with on solenoid valves of air cylinders.
Pulse train mode	○	In this mode, you can operate the actuator freely using pulse trains without inputting position data.
Network compatible	○	If the optional network specifications are selected, direct connection to a field network is possible.

CAUTION

Note that for network compatible types, PIO and pulse train communication are not available.

Explanation of I/O Signal Functions

The table below explains the functions allocated to the controller's I/O signal. Since the signals that can be used vary depending on the controller type and settings, check the signal table for each controller to confirm the available functions.

■Signal Function Description

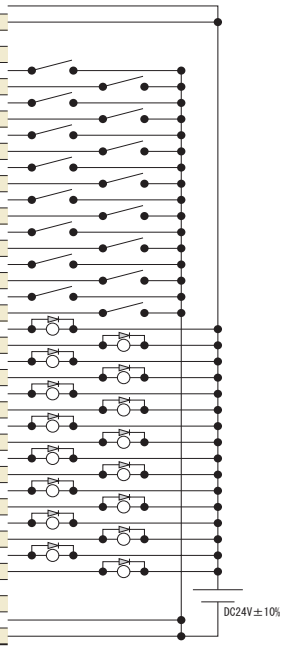
Division	Signal Abbreviation	Signal Name	Function Description
Input	CSTR	PTP strobe signal (start signal)	Input this signal to cause the actuator to start moving to the position set by the command position number signal.
	PC1 to PC256	Command position number signal	This signal is used to input a target position number (binary input).
	BKRL	Brake forced release signal	This signal forcibly releases the brake.
	RMOD	Running mode switching signal	Operations mode can be switched when the controller's MODE switch is set to AUTO. (AUTO if this signal is OFF, MANU if the signal is ON))
	*STP	Pause signal	Turning this signal OFF causes the moving actuator to decelerate to a stop. The actuator will resume the remaining movement if the signal is turned OFF during the pause.
	RES	Reset signal	With the signal ON, the alarm is reset. If this signal is turned ON while the actuator is paused (*STP is OFF), the remaining movement can be cancelled.
	SON	Servo ON signal	Servo is ON while signal is ON and OFF while signal is OFF.
	HOME	Home return signal	Turning this signal ON performs home-return operation.
	MODE	Teaching mode signal	Turning this signal ON switches the controller to the teaching mode ((provided that CSTR, JOG+ and JOG- are all OFF and the actuator is not moving).
	JISL	Jog/inching switch signal	The actuator can be jogged with JOG+ and JOG- while this signal is OFF. The actuator performs inching operation with JOG+ and JOG- while this signal is ON.
	JOG+, JOG–	Jog signal	When the JISL signal is OFF, the jogging operation is performed in the + and – directions with this signal's edge detection ON. Decelerates to a stop with edge detection OFF during jog operation
	PWRT	Teaching signal	When a writing position is specified in teaching mode and this signal is ON for more than 20ms, the current position is written to the specified position.
	ST0 to ST6	Start position command	Turning this signal ON in the solenoid valve mode causes the actuator to move to the specified position. (Start signal is not required.)
	TL	Torque limit selection signal	The position deviation counter is continuously cleared while this signal is ON. TML signal turns ON when the torque value reaches the set value.
	CSTP	Forced Stop Signal	Servo OFF is performed when this signal is ON for more than 10ms.
	DCLR	Deviation counter clear signal	When this signal is ON, the position deviation counter is cleared continuously.
Output	PEND/INP	In position signal	This signal turns ON when the actuator has entered the positioning band after movement. If the actuator has exceeded the positioning band, PEND does not turn OFF, but INP does. PEND and INP can be swapped using a parameter.
	PM1 to PM256	Position complete signal	This signal is used to output the position number achieved at completion of positioning (binary output).
	HEND	Home return complete signal	Turns ON when home return is complete.
	ZONE1	Zone signal	Turns ON if the actuator's current position is within the range set by the parameter.
	PZONE	Position zone signal	This signal turns ON when the current actuator position has entered the range specified by position data during position movement. PZONE can be used together with ZONE1, but PZONE is valid only during movement to a specified position.
	RMDS	Running mode status signal	This signal is used to output the running mode status.
	*ALM	Controller alarm status signal	Turns ON when controller is in normal condition, and turns OFF when an alarm occurs.
	MOVE	Moving signal	This signal remains ON while the actuator is moving (including the periods during home return and push-motion operation).
	SV	Servo ON status signal	This signal remains ON while the servo is on.
	*EMGS	Emergency stop status signal	This signal remains ON while the controller is not in the emergency stop mode, and turns OFF once an emergency stop has been actuated.
	*BALM	Absolute battery voltage drop warning signal	With the absolute specifications for the controller, turns OFF when the absolute battery voltage drops.
	MODES	Mode status signal	Turns ON when entering teaching mode via MODE signal input. Turns OFF when entering normal mode.
	WEND	Write complete signal	This signal remains OFF after the controller has switched to the teaching mode. It turns ON upon completion of data write using the PWRT signal. If the PWRT signal is turned OFF, this signal also turns OFF.
	PE0 to PE6	Current position number signal	This signal turns ON after the controller has completed moving to the target position in the solenoid valve mode.
	PWR	System Ready Signal	Turns ON when it starts up normally after turning ON the controller.
	TLR	Torque limiting signal	This signal turns ON once the motor torque has reached the specified value in a condition where torque is being limited by the TL signal.
	ALM1 to ALM8	Alarm Code Output Signal	During a controller alarm, the alarm details are output in code.
	LSO to LS2	Limit switch output signal	Each signal turns ON when the current actuator position has entered the positioning band before or after the target position. If the actuator has already completed home return, these signals are output even before a movement command is issued or while the servo is OFF.
	TRQS	Torque level status signal	This signal outputs when the current value of the motor reaches the limitation value, before the JOG operation returns to the starting point and the slider (rod) collides to the mechanical end or an obstacle.

I/O Wiring Diagram

■ Positioning mode/teaching mode/solenoid valve mode

PIO connector (NPN specification)

Pin No.	Classification	Signal
1A	Power supply	24V
2A		24V
3A	—	Not used
4A	—	Not used
5A	Input	IN0
6A		IN1
7A		IN2
8A		IN3
9A		IN4
10A		IN5
11A		IN6
12A		IN7
13A		IN8
14A		IN9
15A		IN10
16A		IN11
17A		IN12
18A		IN13
19A		IN14
20A		IN15
1B	Output	OUT0
2B		OUT1
3B		OUT2
4B		OUT3
5B		OUT4
6B		OUT5
7B		OUT6
8B		OUT7
9B		OUT8
10B		OUT9
11B		OUT10
12B		OUT11
13B		OUT12
14B		OUT13
15B		OUT14
16B		OUT15
17B	—	Not used
18B	—	Not used
19B	Power supply	0V
20B		0V

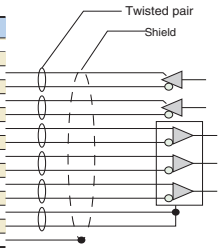


*Connect 24V between pins 1A and 2A, and connect 0V between pins 19B and 20B.

■ Pulse train mode (differential output)

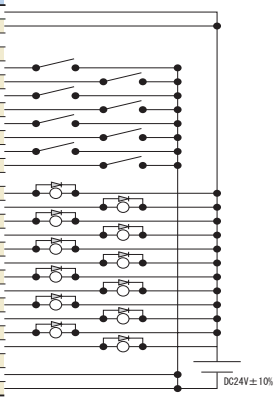
PULSE connector

Pin No.	Classification	Signal
1		Not used
2		Not used
3	Input	PP
4		/PP
5		NP
6		/NP
7	Output	AFB
8		/AFB
9		BFB
10		/BFB
11		ZFB
12		/ZFB
13	Ground	GND
14		GND
Shell	Shield	Shield



PIO connector (NPN specification)

Pin No.	Classification	Signal
1A	Power supply	24V
2A		24V
3A		Not used
4A		Not used
5A	Input	SON
6A		RES
7A		HOME
8A		TL
9A		CSTP
10A		DCLR
11A		BKRL
12A		RMOD
13A～20A	—	Not used
1B	Output	PWR
2B		SV
3B		INP
4B		HEND
5B		TLR
6B		*ALM
7B		*EMGS
8B		RMDS
9B		ALM1
10B		ALM2
11B		ALM4
12B		ALM8
13B～18B	—	Not used
19B	Power supply	0V
20B		0V



*The shield on the twisted pair cable connected to the pulse connector must always be connected to the shell. Also, the cable length must not be longer than 10m.
*Connect 24V between pins 1A and 2A, and 0V between pins 19B and 20B.

I/O Signal Table *Choose from 7 types of signal allocation.

Pin Number	Class		Parameters (select PIO patterns)						Pulse train mode
			0	1	2	3	4	5	0
		Number of positions	Positioning mode 64 points	Teaching mode 64 points	256 points mode 256 points	512 points mode 512 points	Solenoid valve mode 1 7 points	Solenoid valve mode 2 3 points	Pulse train mode —
		Zone signal	○	×	×	×	○	○	×
		P-zone signal	○	○	○	×	○	○	×
1A	24V		P24						P24
2A	24V		P24						P24
3A	—		NC						NC
4A	—		NC						NC
5A	Input	IN0	PC1	PC1	PC1	PC1	STO	STO	SON
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)	RES
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (–)	HOME
8A		IN3	PC8	PC8	PC8	PC8	ST3	—	TL
9A		IN4	PC16	PC16	PC16	PC16	ST4	—	CSTP
10A		IN5	PC32	PC32	PC32	PC32	ST5	—	DCLR
11A		IN6	—	MODE	PC64	PC64	ST6	—	BKRL
12A		IN7	—	JISL	PC128	PC128	—	—	RMOD
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	PM1	PM1	PM1	PE0	LS0	PWR
2B		OUT1	PM2	PM2	PM2	PM2	PE1	LS1 (TRQS)	SV
3B		OUT2	PM4	PM4	PM4	PM4	PE2	LS2	INP
4B		OUT3	PM8	PM8	PM8	PM8	PE3	—	HEND
5B		OUT4	PM16	PM16	PM16	PM16	PE4	—	TLR
6B		OUT5	PM32	PM32	PM32	PM32	PE5	—	*ALM
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	—	*EMGS
8B		OUT7	ZONE1	MODES	PM128	PM128	ZONE1	ZONE1	RMDS
9B		OUT8	PZONE	PZONE	PZONE	PM256	PZONE	PZONE	ALM1
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	ALM2
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND	ALM4
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—	ALM8
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	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM	—
17B	—		—						—
18B	—		—						—
19B	0V		N						N
20B	0V		N						N

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

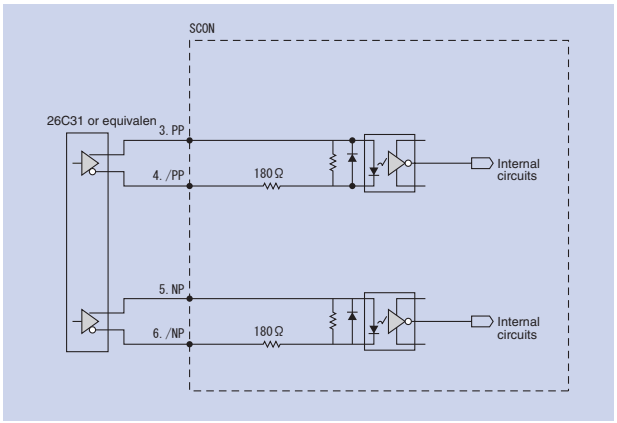
Pulse Train Type I/O Specifications (differential line driver specifications)

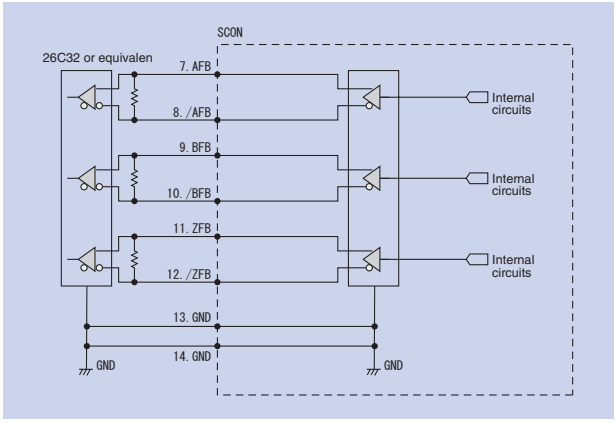
■ Input area

Max. No. of input pulses	Line-driver interface: 500kpps Open collector interface: 200kpps (AK-04 required)
Insulation method:	Insulated photocoupler

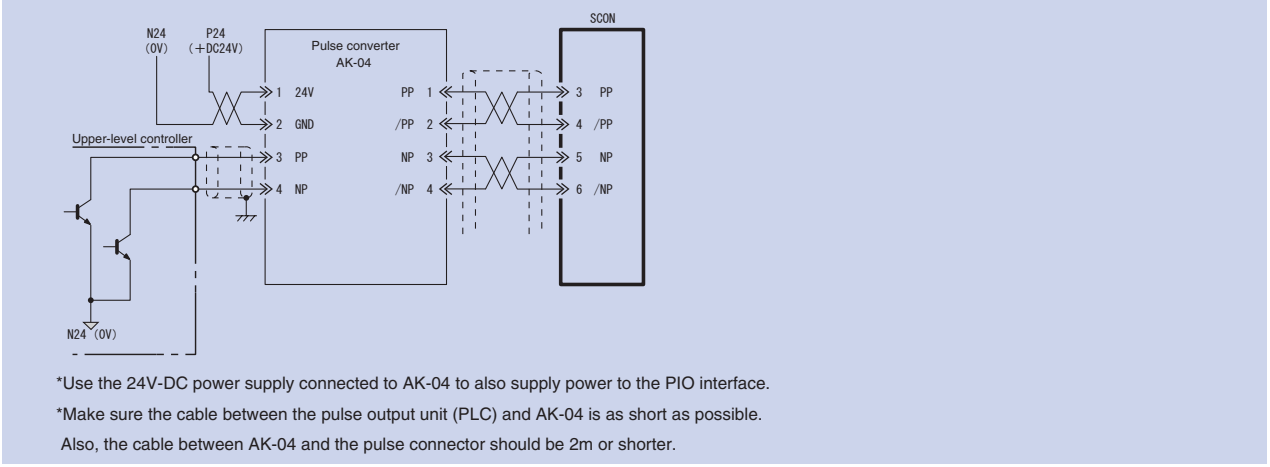
■ Output area

Output method:	Line-driver output
Insulated/non-insulated:	Not insulated





Pulse Train Ttype I/O Specifications (open collector specifications)



*Use the 24V-DC power supply connected to AK-04 to also supply power to the PIO interface.

*Make sure the cable between the pulse output unit (PLC) and AK-04 is as short as possible.
Also, the cable between AK-04 and the pulse connector should be 2m or shorter.

Command Pulse Input Patterns

Command pulse train state		Input terminal	During forward operation	During reversed operation
Negative logic	Forward pulse train	PP・/PP		
	Reversed pulse train	NP・/NP		
	The forward pulse train causes the motor to rotate clockwise, and the reverse pulse train causes the motor to rotate counter clockwise.			
	Pulse train	PP・/PP		
	Symbols	NP・/NP	Low	High
	The command pulse is used for the amount of motor rotation, and the command symbol is used for rotational direction.			
	A/B phase pulse train	PP・/PP		
		NP・/NP		
	An A/B phase pulse with a 90° phase difference (and a multiplier of 4) is used to generate commands for rotational amount and directions.			
Positive logic	Forward pulse train	PP・/PP		
	Reversed pulse train	NP・/NP		
	Pulse train	PP・/PP		
	Symbols	NP・/NP	High	Low
	A/B phase pulse train	PP・/PP		
		NP・/NP		

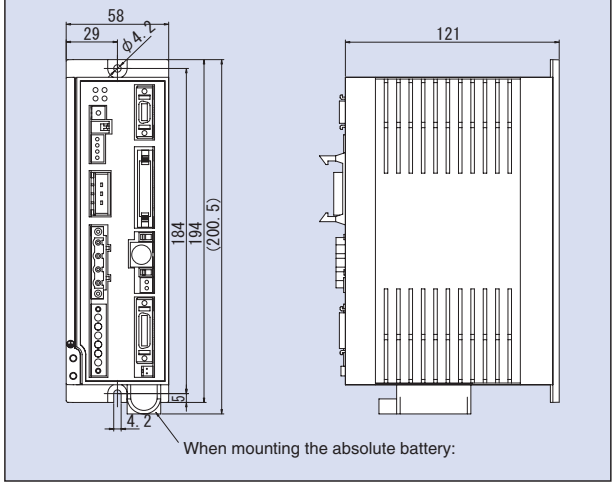
Specification Table

Item	Specifications	
Motor Capacity	Less than 400W	400W or more
Connection actuator	RCS2 series actuator / single axis robot / linear servo actuator	
Number of controlled axes	1 axis	
Operating method	Positioner type / pulse train type	
Number of positioning points	512 points	
Backup memory	EEPROM	
I/O connector	40pin connector	
I/O number	16 input points / 16 output points	
I/O power supply	External supply DC24V±10%	
Serial communications	RS485 1ch	
Peripheral communications cable	CB-PAC-PIO□□□	
Command pulse train input type	Differential line drive method / open collector method (converted to differential with the pulse converter *1)	
Maximum Input Pulse Frequency	Differential line driver method: up to 500kpps / open collector method (using pulse converter): up to 200kpps)	
Position detection method	Incremental encoder / absolute encoder	
Emergency Stop Function	Y (integrated relay)	
Forced release of electromagnetic brake	Brake release switch ON/OFF	
Motor cable	CB-RCC-MA□□□ (Maximum length 20m)	
Encoder cable	CB-RCS2-PA□□□ (Maximum length 20m)	
Input power	Single phase AC100 to 115V±10℃ Single phase AC200 to 230V±10℃	Single phase AC200 to 230V±10℃
Power-supply capacity	20W/74VA 30W/94VA 60W/186VA 100W/282VA 150W/376VA 200W/469VA	400W/844VA 600W/1212VA 750W/1569VA
Dielectric strength voltage	DC500V, 100MΩ or more	
Vibration resistance	XYZ directions 10 to 57Hz One-side amplitude 0.035mm (continuous), 0.075mm (intermittent) 58 to 150Hz 4.9m/s2 (continous), 9.8m/s2 (intermittent)	
Ambient operating temperature	0 to 40℃	
Ambient operating humidity	10 to 95% RH (non-condensing)	
Operating ambience	Free from corrosive gases	
Protection class	IP20	
Weight	Approximately 800g (plus 25g for the absolute specifications)	Approximately 1.1kg (plus 25g for absolute specifications)
External Dimensions	58mm (W) x 194mm (H) x 121mm (D)	72mm (W) x 194mm (H) x 121mm (D)

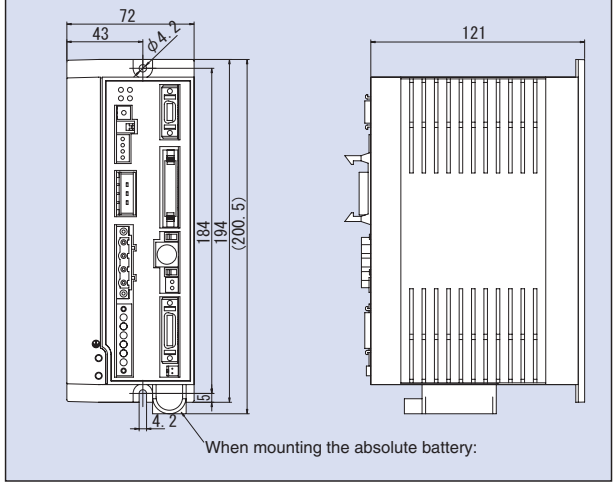
(Note 1) For the command-pulse input method, use the differential line driver method offering higher noise resistance. If the open collector method must be used, convert the pulse to differential using the optional pulse converter (AK-04).

External Dimensions

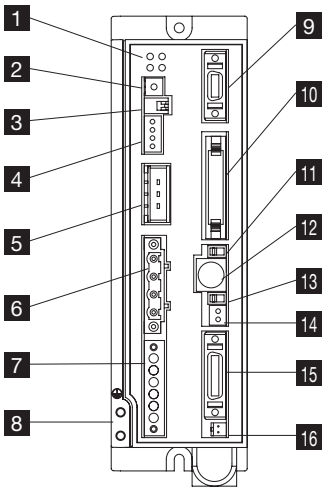
Less than 400W

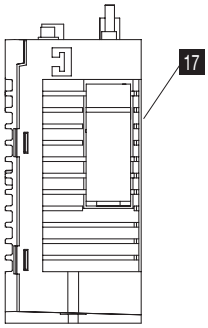


400W or more



Name of Each Part





1 LED display

This shows the controller status.

Title	Color	Description
PWR	Green	Lit when the system is ready (after power is ON, CPU normal functions)
SV	Green	Lit when servo ON
ALM	Orange	Lit during an alarm
EMG	Red	Lit during an emergency stop

2 Rotary switch

This is the address setting switch for identifying each controller when they are linked.

3 Piano switch

Controller system switch.

Name	Description
1	Operating mode switch OFF: positioner mode ON: pulse train control mode *Enabled at power ON.
2	Remote update switch (normally set to OFF) OFF: normal operating mode ON: update mode *Enabled when power is ON or during soft reset.

4 System I/O connector

Connector for emergency stop switch etc.

5 Regeneration unit connector

Connector for resistance unit that absorbs regeneration current produced when the actuator decelerates to a stop.

6 Motor connector (X-SEL, ECON, RCS compatible)

Actuator motor cable connector.

7 Power supply connector

AC power connector. Divided into the control power input and motor power input.

8 Grounding screw

Protective grounding screw. Always connect this screw to ground.

9 Pulse train control connector

This connector is used during pulse train control mode operations. It is disconnected during operations in positioner mode.

10 PIO connector

Connector for the cable for parallel communications with the PLC and other peripheral devices.

11 Operating mode switch

Title	Description
MANU	Do not receive PI commands
AUTO	Accept PI commands

*The emergency stop switch on the teaching pendant becomes effective when the line is connected, regardless of whether this switch is set to AUTO or MANU. Take note that an emergency stop will be actuated momentarily when the teaching-pendant or SIO communication cable is disconnected. This is a normal phenomenon and does not indicate an error.

12 SIO connector

Connector for the teaching pendant or PC communications cable.

13 Brake release switch

This is the electromagnetic brake forced release switch, integrated with the actuator.

*It is necessary to connect the DC 24V power for the brake drive.

14 Brake power connector

Brake power DC 24V supply connector (only required when brake equipped actuator is connected)

15 Encoder sensor connector (X-SEL-P/Q compatible)

Encoder sensor cable connector

16 Absolute battery connector

Connector for the absolute data backup battery. (Required only for absolute encoder specifications)

17 Absolute battery holder

Battery holder for installing the absolute data backup battery

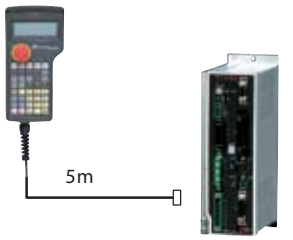
Options

Teaching Pendant

Features: This is a teaching device that provides information on functions such as position input, running tests, and monitoring.

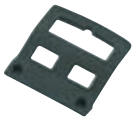
Model: CON-T (standard type)
RCM-E (simple absolute teaching pendant)
RCM-P (data setting device)

Configuration



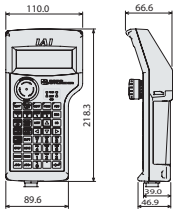
CON-T options

- Wall-mounting hook
  Model HK-1
  Standard price –

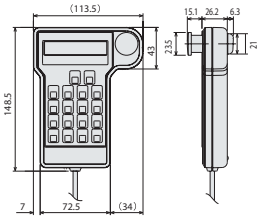


- Strap
  Model STR-1
  Standard price –

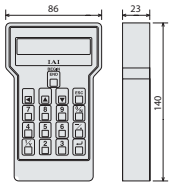
CON-T



RCM-E



RCM-P



Specifications

Item	CON-T	RCM-E	RCM-P
Data input	O	O	O
Actuator operation	O	O	×
Amb. op. temp., humid	Temperature: 0 to 40°C. Humidity: 85% RH or less.		
Amb. op. env.	Free from corrosive gases and especially dust.		
Protection class	IP54	–	–
Weight	Approx. 400g	Approx. 400g	Approx. 360g
Cable length	5m		
Display	20 char x 4 lines, LCD	16 char x 2 lines, LCD	16 chara x 2 lines, LCD
Standard price	-	-	-

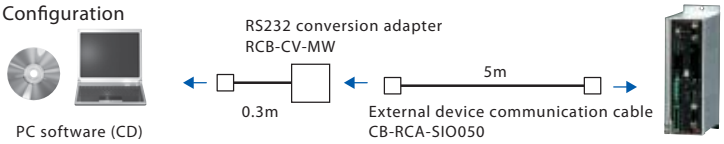
Computer software (Windows only)

Features: A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.

Model: RCM-101-MW (with external device communication cable + RS232 conversion unit)

Standard price –

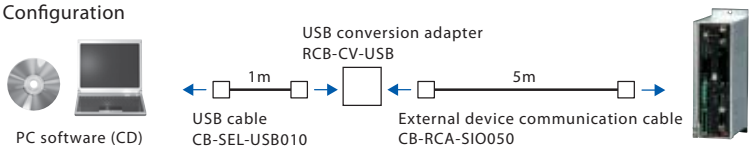
Configuration



Model: RCM-101-USB (with external device communication cable + USB conversion adapter + USB cable)

Standard price –

Configuration



Regenerative Resistor Unit

Features: This unit returns regenerative electric current when the motor builds heat as it decelerates.
Please verify the total wattage of the actuator from the chart at the right, as it is necessary to make preparations to the regenerative resistance.

Model: REU-2 (for SCON/SSEL) Standard price –

Specifications

Weight of main unit	0.9kg
Built-in regenerative resistor	220Ω 80W
Main unit-controller connection cable (provided)	CB-SC-REU010 (for SSEL)

Required number of targets

	Horizontal	Vertical
0	~100W	~100W
1	~400W	~400W
2	~750W	~750W

*Depending on the operating conditions, there may be times when more regenerativeresistance is needed.

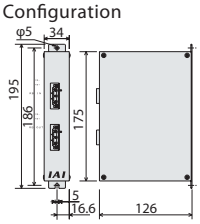
Required number of targets (for RCS2-RA13R)

	Lead2.5	Lead 1.25
Horizontal	1	0
Vertical	1	1

*Depending on the operating conditions, there may be times when more regenerativeresistance is needed.

* If 2 regenerative units are required, configure one each for REU-2 and REU-1 (see P432)

Configuration



Absolute Data Storage Battery

Features: This battery is for storing absolute data for the operating actuator.

Model: AB–5

Standard price –

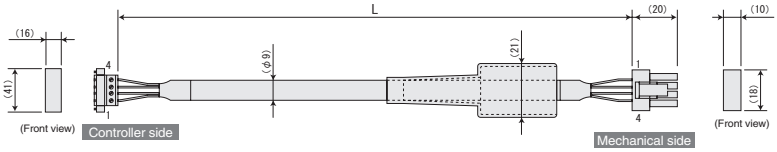
Spare Parts

Should you require spare parts after the purchase of your product for replacing the original cables, etc., refer to the model names specified below.

Motor Cable/Motor Robot Cable

Model **CB-RCC-MA□□□/CB-RCC-MA□□□-RB**

*□□□ indicates the cable length (L), up to a maximum of 30m
Example: 080=8m



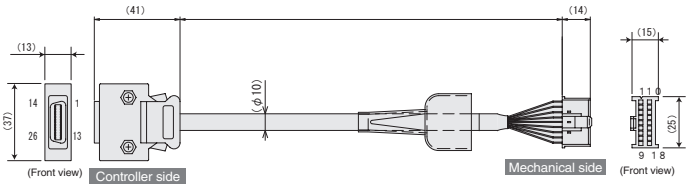
Wiring	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

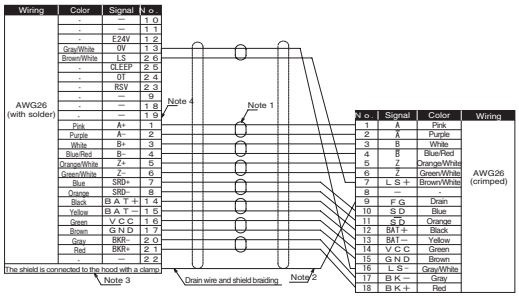
No.	Signal	Color	Wiring
1	U	Red	0.75sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Encoder Cable/Encoder Robot Cable

Model **CB-RCS2-PA□□□/CB-X3-PA□□□**

*□□□ indicates the cable length (L), up to a maximum of 30m
Example: 080=8m





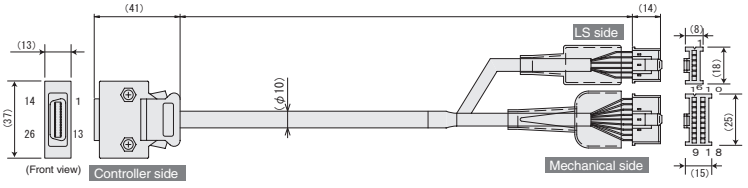
Wiring	Color	Signal	No.
	-	—	10
	-	—	11
		E24V	12
Gray/White		0V	13
Brown/White		LS	26
		CLEEP	25
		0T	24
		RSV	23
	-	—	9
	-	—	18
	-	—	19
Pink		A+	1
Purple		A−	2
White		B+	3
Blue/Red		B−	4
Orange/White		Z+	5
Green/White		Z−	6
Blue		SRD+	7
Orange		SRD−	8
Black		BAT+	14
Yellow		BAT−	15
Green		VCC	16
Brown		GND	17
Gray		BKR−	20
Red		BKR+	21
-		—	22

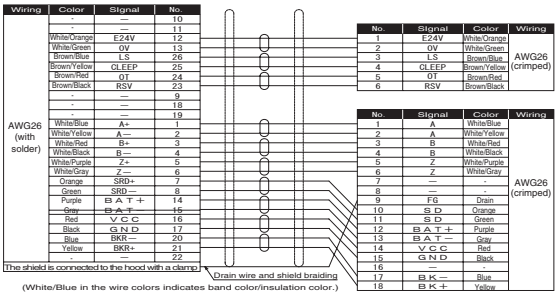
No.	Signal	Color	Wiring
1	A	Pink	AWG26 (crimped)
2	Ā	Purple	
3	B	White	
4	B̄	Blue/Red	
5	Z	Orange/White	
6	Z̄	Green/White	
7	LS+	Brown/White	
8	—		
9	FG	Drain	
10	SD	Blue	
11	S̄D	Orange	
12	BAT+	Black	
13	BAT−	Yellow	
14	VCC	Green	
15	GND	Brown	
16	LS−	Gray/White	
17	BK−	Gray	
18	BK+	Red	

RCS2-RT6/RT6R/RT7 Encoder Cable/Encoder Robot Cable

Model **CB-RCS2-PLA□□□/CB-X2-PLA□□□**

*□□□ indicates the cable length (L), up to a maximum of 30m
Example: 080=8m





Wiring	Color	Signal	No.
	-	—	10
	-	—	11
White/Orange		E24V	12
White/Green		0V	13
Brown/Blue		LS	26
Brown/Yellow		CLEEP	25
Brown/Red		0T	24
Brown/Black		RSV	23
	-	—	9
	-	—	18
	-	—	19
White/Blue		A+	1
White/Yellow		A−	2
White/Red		B+	3
White/Black		B−	4
White/Purple		Z+	5
White/Gray		Z−	6
Orange		SRD+	7
Green		SRD−	8
Purple		BAT+	14
Gray		BAT−	15
Red		VCC	16
Black		GND	17
Blue		BKR−	20
Yellow		BKR+	21
-		—	22

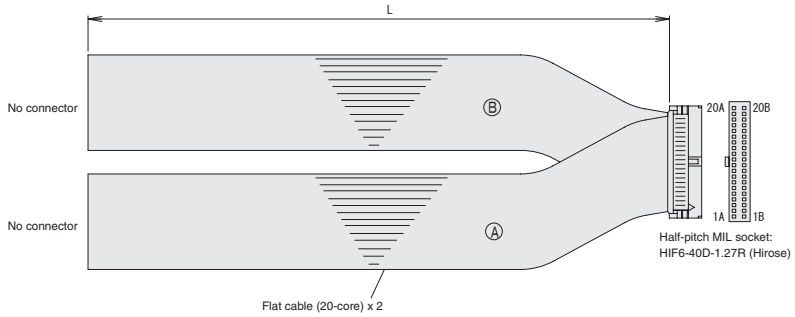
No.	Signal	Color	Wiring
1	E24V	White/Orange	AWG26 (crimped)
2	0V	White/Green	
3	LS	Brown/Blue	
4	CLEEP	Brown/Yellow	
5	0T	Brown/Red	
6	RSV	Brown/Black	

No.	Signal	Color	Wiring
1	A	White/Blue	AWG26 (crimped)
2	Ā	White/Yellow	
3	B	White/Red	
4	B̄	White/Black	
5	Z	White/Purple	
6	Z̄	White/Gray	
7	-	-	
8	—	-	
9	FG	Drain	
10	SD	Orange	
11	S̄D	Green	
12	BAT+	Purple	
13	BAT−	Gray	
14	VCC	Red	
15	GND	Black	
16	-	-	
17	BK−	Blue	
18	BK+	Yellow	

I/O Flat Cable

Model **CB-PAC-PIO□□□**

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



HIF6−40D−1.27R

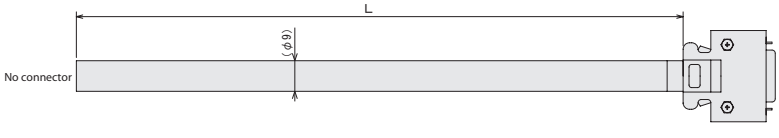
No.	Signal	Cable color	Wirng
1A	24V	Brown-1	Flat cable (A) (crimped)
2A	24V	Red-1	
3A	—	Orange-1	
4A	—	Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	Gray-1	
9A	IN4	White-1	
10A	IN5	Black-1	
11A	IN6	Brown-2	
12A	IN7	Red-2	
13A	IN8	Orange-2	
14A	IN9	Yellow-2	
15A	IN10	Green-2	
16A	IN11	Blue-2	
17A	IN12	Purple-2	
18A	IN13	Gray-2	
19A	IN14	White-2	
20A	IN15	Black-2	

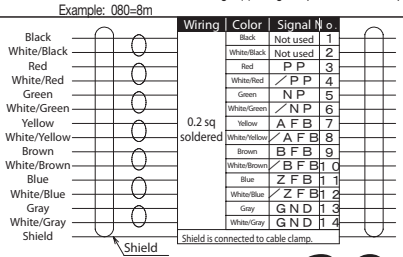
No.	Signal	Cable color	Wirng
1B	OUT0	Brown-3	Flat cable (B) (crimped)
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Gray-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B	OUT15	Blue-4	
17B	—	Purple-4	
18B	—	Gray-4	
19B	0V	White-4	
20B	0V	Black-4	

SCON Pulse Train Control Cable

Model **CB-SC-PIOS□□□**

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





Wiring	Color	Signal	No.
0.2 sq soldered	Black	Not used	1
	White/Black	Not used	2
	Red	PP	3
	White/Red	/PP	4
	Green	NP	5
	White/Green	/NP	6
	Yellow	AFB	7
	White/Yellow	/AFB	8
	Brown	BFB	9
	White/Brown	/BFB	10
	Blue	ZFB	11
	White/Blue	/ZFB	12
	Gray	GND	13
	White/Gray	GND	14
Shield is connected to cable clamp.			

PSEL

Used with RCP3/RCP2 Series—
Program Controller

Model List/Prices

Program controller capable of operating RCP3/RCP2 series actuators. Various controls are combined into a single unit.

Type name		C	
Title		Program mode	Positioner mode
External View			
Description		Both actuator operation and communication with external equipment can be handled by a single controller. When two axes are connected, arc interpolation and path operation can be performed.	Up to 1,500 positioning points are supported. Push-motion operation and teaching operation are also possible.
Number of positions		1500 points	
Standard price	1-axis	—	
	2 axes	—	

Model

*When 1- axis is specified, a description for a second axis is not required.

PSEL – C – □ – □ I □ – (□ I □) – □ – □ – 0

Series: PSEL

Type: C Standard type

Number of axes for connection: 1 1-axis specification; 2 2-axis specification

(Description for Axis-1) Motor type: I Incremental

(Description for Axis-1) Encoder type: 20P 20° angle pulse motor compatible; 28P 28° angle pulse motor compatible; 28SP 28° angle pulse motor compatible (RCP2-RA3C only); 35P 35° angle pulse motor compatible; 42P 42° angle pulse motor compatible; 56P 56° angle pulse motor compatible

*When connecting RCP2-RA3C/RGD3C, the motor type is 28SP.

(Description for Axis-1) Option: B Brake

(Description for Axis-2) Motor type: I Incremental

(Description for Axis-2) Encoder type: 20P 20° angle pulse motor compatible; 28P 28° angle pulse motor compatible; 28SP 28° angle pulse motor compatible (RCP2-RA3C only); 35P 35° angle pulse motor compatible; 42P 42° angle pulse motor compatible; 56P 56° angle pulse motor compatible

*When connecting RCP2-RA3C/RGD3C, the motor type is 28SP.

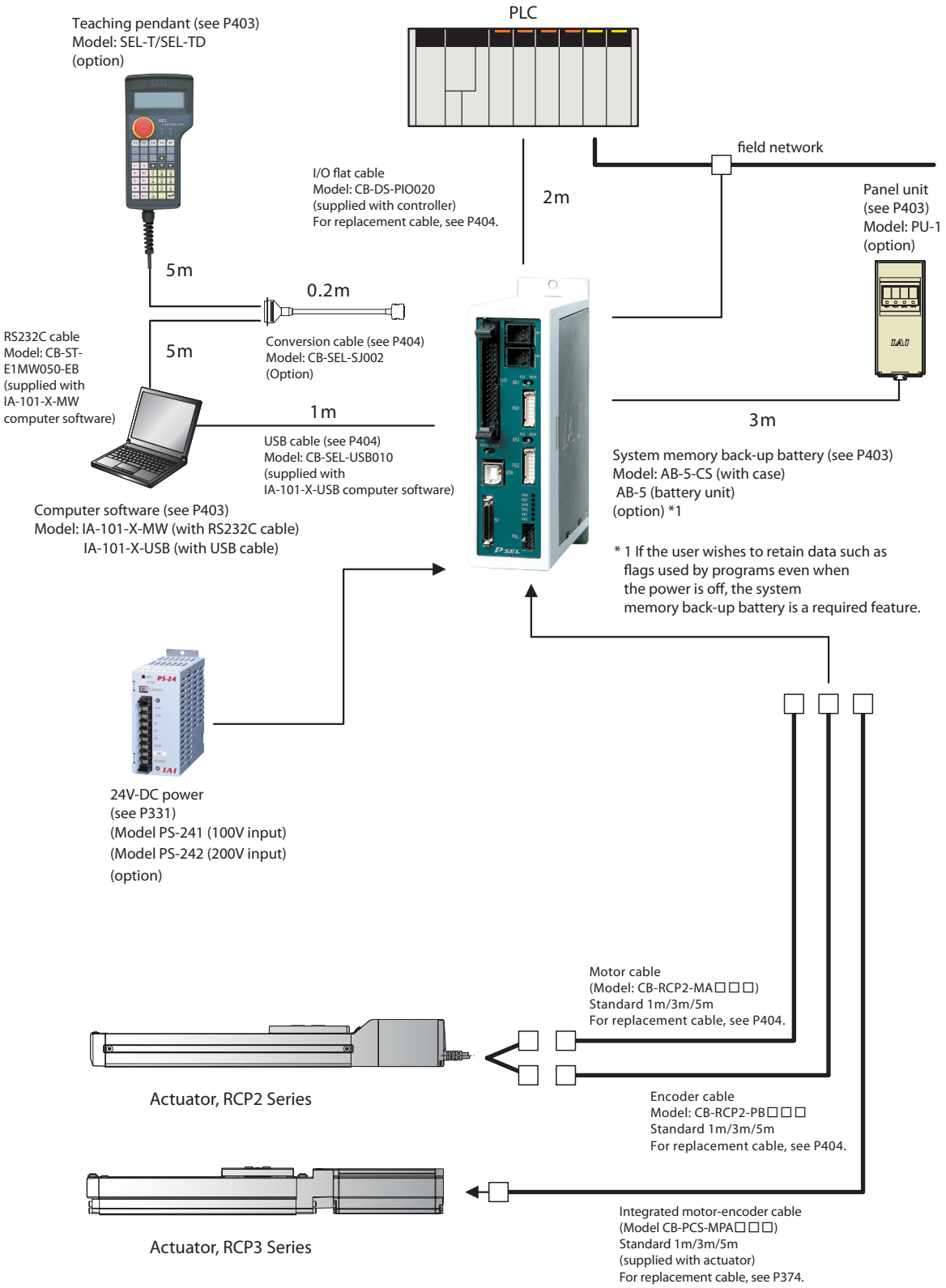
(Description for Axis-2) Option: B Brake

I/O Type: NP PIO NPN spec (standard); PN PIO PNP specification; DV DeviceNet connection spec; CC CC-Link connection spec; PR ProfiBus connection spec

I/O Cable Length: 0 No cable; 2 2m (standard); 3 3m; 5 5m

Power Voltage: 0 DC24V

System Configuration



I/O Specifications

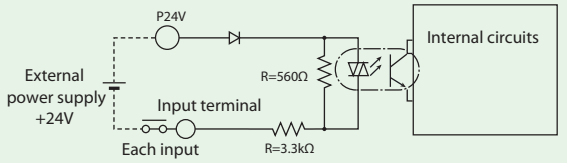
■Input area External input specifications

Item	Specifications
Input voltage	DC24V ±10%
Input current	7mA/circuit
ON/OFF Voltage	ON Voltage (Min.) NPN: DC16V/PNP: DC8V OFF Voltage (Max.) NPN: DC5V/PNP: DC19V
Insulation method	Photocoupler

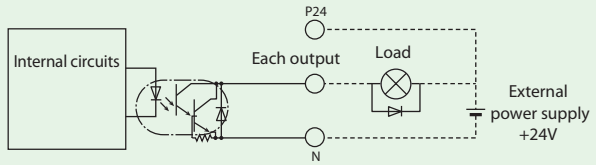
■Output area External output specifications

Item	Specifications
Load voltage	DC24V
Maximum load current	100mA/ point 400mA/8 points total
Residual voltage (Max.)	Max 0.1mA/point
Insulation method	Photocoupler

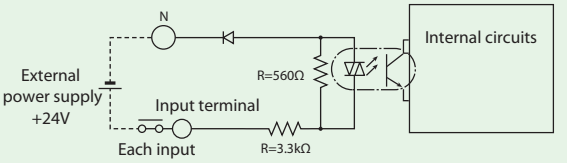
NPN specification



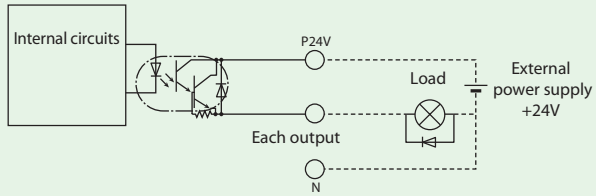
NPN specification



PNP specification



PNP specification



Explanation of I/O Functions

With the PSEL Controller, you can select two modes: one to input the program for operations (Program Mode) and one to receive superior PLC signals for movement to designated positions (Positioner Mode).
The Positioner Mode has the five input patterns listed below to enable various applications.

■Functions by Controller Type

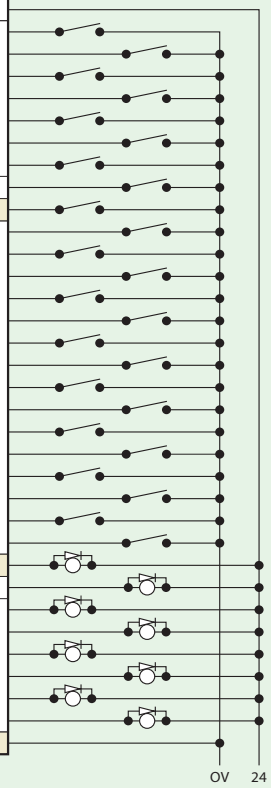
Operation mode		Features
Program mode		Various operations including linear/arc interpolation operation, path operation ideal for coating processes, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode	This is the basic mode from which operations can be conducted by designating position numbers and inputting the start signal. Push operations and 2-axes straight-line supplementary operations possible.
	Switch over mode	Multiple works of the same shape with slightly different hole positions can be handled using movement commands to the same position numbers by simply changing the product type number.
	2-axes independent mode	With a 2-axes controller, each axis can be commanded and operated separately.
	Teaching mode	The slider (rod) can be moved via an external signal to store the achieved position as position data.
	DS-S-C1 compatible mode	If you were using a DS-S-C1 controller before, you can replace it with a PSEL controller without having to change the host programs. *This mode does not ensure actuator compatibility.

Explanation of I/O Functions

Program mode

Pin number	Classification	Port No.	Program mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Program No. Select 1	This selects the program number to start up. (Input BCD values for ports 016 to 022.)
2A		017	Program No. Select 2	
2B		018	Program No. Select 4	
3A		019	Program No. Select 8	
3B		020	Program No. Select 10	
4A		021	Program No. Select 20	
4B		022	Program No. Select 40	
5A		023	CPU reset	This resets the system and puts it back into the same state as when the power is turned on.
5B		000	Start	Port No. This starts up the programs selected for port numbers 016 to 022.
6A		001	General-purpose input	The system waits for external input based on the program instructions.
6B		002	General-purpose input	
7A		003	General-purpose input	
7B		004	General-purpose input	
8A		005	General-purpose input	
8B		006	General-purpose input	
9A		007	General-purpose input	
9B		008	General-purpose input	
10A		009	General-purpose input	
10B		010	General-purpose input	
11A		011	General-purpose input	
11B		012	General-purpose input	
12A		013	General-purpose input	
12B		014	General-purpose input	
13A		015	General-purpose input	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	General-purpose output	Program instructions can be used to turn it ON and OFF as desired.
15A		303	General-purpose output	
15B		304	General-purpose output	
16A		305	General-purpose output	
16B		306	General-purpose output	
17A		307	General-purpose output	
17B	N		0V input	Connect 0V.

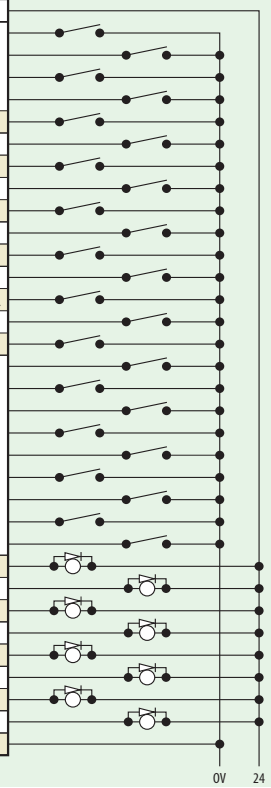
Wiring Diagram



Standard Positioner Mode

Pin number	Classification	Port No.	Positioner standard mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position input 10	Port Nos. 007 to 019 are used to specify a target position number. Numbers can be specified as either BCD or binary.
2A		017	Position input 11	
2B		018	Position input 12	
3A		019	Position input 13	
3B		020	–	–
4A		021	–	–
4B		022	–	–
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This is used to perform a return to home.
6B		002	Servo ON	This is used to switch the servo between ON and OFF.
7A		003	Pressing	This is used to perform the push motion operation.
7B		004	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancel	When this is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation settings	With a 2-axes specification, when the main signal is ON, the actuator moves via linear interpolation.
9A		007	Position input 1	Port Nos. 007 to 019 are used to specify a target position number. Numbers can be specified as either BCD or binary.
9B		008	Position input 2	
10A		009	Position input 3	
10B		010	Position input 4	
11A		011	Position input 5	
11B		012	Position input 6	
12A		013	Position input 7	
12B		014	Position input 8	
13A		015	Position input 9	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	Push motion complete	This is output when the push move operation is complete.
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	–	–
17B	N		0V input	Connect 0V.

Wiring Diagram

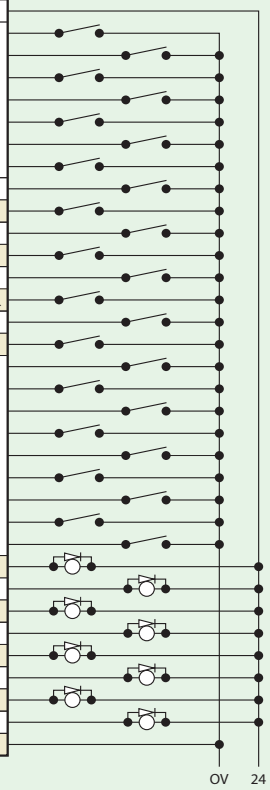


Explanation of I/O Functions

Positioner, Product-Type Switchover Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position/part type input 10	Port Nos. 007 to 022 are used to specify a target position number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified as either BCD or binary.
2A		017	Position/part type input 11	
2B		018	Position/part type input 12	
3A		019	Position/part type input 13	
3B		020	Position/part type input 14	
4A		021	Position/part type input 15	
4B		022	Position/part type input 16	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This is used to perform a return to home.
6B		002	Servo ON	This is used to switch the servo between ON and OFF.
7A		003	Pressing	This is used to perform the push motion operation.
7B		004	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancel	When this is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
9A		007	Position/part type input 1	This specifies the position numbers to move to using port numbers 007 to 022 and the position numbers input. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified as either BCD or binary.
9B		008	Position/part type input 2	
10A		009	Position/part type input3	
10B		010	Position/part type input 4	
11A		011	Position/part type input 5	
11B		012	Position/part type input 6	
12A		013	Position/part type input 7	
12B		014	Position/part type input8	
13A		015	Position/part type input 9	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	Push motion complete	This is output when the push move operation is complete.
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	–	–
17B	N		0V input	Connect 0V.

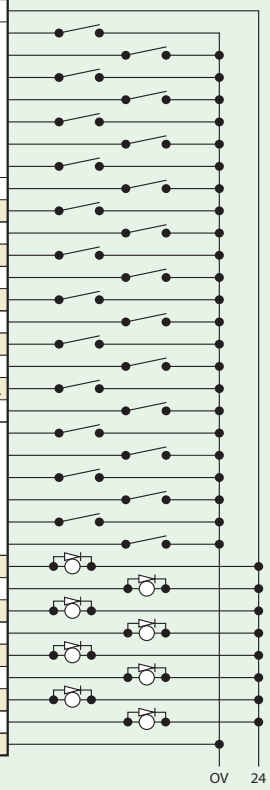
Wiring Diagram



Positioner, 2-axes Independent Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position input 7	Port Nos. 010 to 022 are used to specify a target position number. The Axis-1position number and Axis-2 position number are assigned in the parameters. Numbers can be specified as either BCD or binary.
2A		017	Position input 8	
2B		018	Position input 9	
3A		019	Position input 10	
3B		020	Position input 11	
4A		021	Position input 12	
4B		022	Position input 13	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start 1	This starts movement toward the position number selected for the Axis-1 to start moving to the selected position.
6A		001	Home return 1	This is used to return Axis-1 to home.
6B		002	Servo ON 1	This switches the servo for Axis-1 ON and OFF.
7A		003	Pause 1	This pauses Axis-1 when the movement signal turns off, and continues movement when the signal turns on.
7B		004	Cancel 1	This cancels movement for Axis-1.
8A		005	Start 2	This starts moving Axis-2 to the selected position. to start moving to the selected position.
8B		006	Home return 2	This returns Axis-2 to home.
9A		007	Servo ON 2	This switches the servo ON and OFF for Axis-2.
9B		008	Pause 2	This pauses Axis-2 when the movement signal turns OFF, and continues the remaining movement when the signal turns on.
10A		009	Cancel 2	This cancels movement for Axis-2.
10B		010	Position input 1	Port Nos. 010 to 022 are used to specify a target position number. The Axis-1position number and Axis-2 position number are assigned in the parameters. Numbers can be specified as either BCD or binary.
11A		011	Position input 2	
11B		012	Position input 3	
12A		013	Position input 4	
12B		014	Position input 5	
13A		015	Position input 6	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	Positioning complete 1	This is output when movement of Axis-1 to the specified position is complete.
15A		303	Home return complete 1	This is output when Axis-1has completed returning to home.
15B		304	Servo ON output 1	This is output when the servo for Axis-1comes ON.
16A		305	Positioning complete 2	This is output when movement of Axis-2 to the specified position is complete.
16B		306	Home return complete 2	This is output when Axis-2 has completed returning to home.
17A		307	Servo ON output 2	This is output when the servo for Axis-2 comes ON.
17B	N		0V input	Connect 0V.

Wiring Diagram

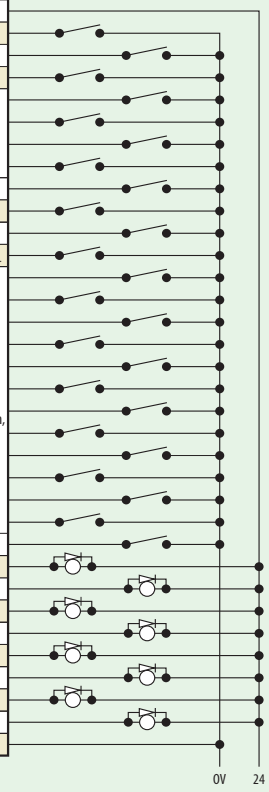


Explanation of I/O Functions

Positioner, Teaching Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Axis-1, JOG -	This moves the Axis-1in the negative direction between the signal inputs.
2A		017	Axis-2, JOG +	This moves Axis-2 in the positive direction between the signal inputs.
2B		018	Axis-2, JOG -	This moves Axis-2 in the negative direction between the signal inputs.
3A		019	Inching specification (0.01mm)	This specifies how much to move during inching. (This is the total amount of movement for values specified for port numbers 019 to 022.)
3B		020	Inching specification (0.1mm)	
4A		021	Inching specification (0.5mm)	
4B		022	Inching specification (1mm)	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Servo ON	This is used to switch the servo between ON and OFF.
6B		002	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
7A		003	Position input 1	This specifies the position numbers to move to using port numbers 003 to 013 and the position numbers input to specify a target position number. Port No. When the 014 teaching mode specification is on, when the port number 000 status signal comes on, the current value is written to the specified position number.
7B		004	Position input 2	
8A		005	Position input 3	
8B		006	Position input 4	
9A		007	Position input 5	
9B		008	Position input 6	
10A		009	Position input 7	
10B		010	Position input 8	
11A		011	Position input 9	
11B		012	Position input 10	
12A		013	Position input 11	
12B		014	Teaching mode specification	
13A		015	Axis-1, JOG +	This moves the Axis-1in the positive direction between the signal inputs.
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	Positioning complete	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	–	–
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	–	–
17B	N		0V input	Connect 0V.

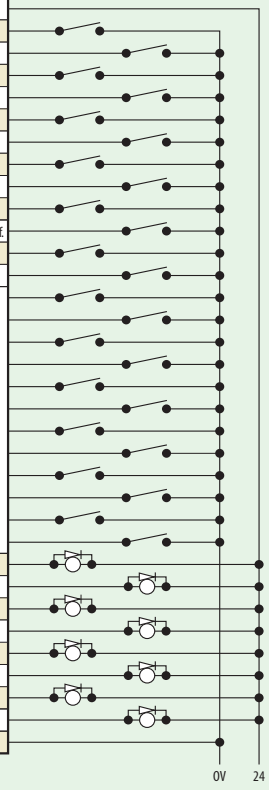
Wiring Diagram



Positioner, DS-S-C1 Compatible Mode

Pin number	Classification	Port No.	Positioner standard mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position No. 1000	(Same as port numbers 004 to 015)
2A		017	–	–
2B		018	–	–
3A		019	–	–
3B		020	–	–
4A		021	–	–
4B		022	–	–
5A		023	CPU reset	This resets the system and puts it back into the same state as when the power is turned on.
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Hold (pause)	The system pauses when the movement signal comes on, and continues the remaining movement when the signal turns off.
6B		002	Cancel	The system stops when the movement signal comes on, and cancels the remaining movement.
7A		003	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
7B		004	Position No. 1	This specifies the position numbers to move to using port numbers 004 to 016 to specify a target position number. Numbers should be specified in BCD.
8A		005	Position No. 2	
8B		006	Position No. 4	
9A		007	Position No. 8	
9B		008	Position No. 10	
10A		009	Position No. 20	
10B		010	Position No. 40	
11A		011	Position No. 80	
11B		012	Position No. 100	
12A		013	Position No. 200	
12B		014	Position No. 400	
13A		015	Position No. 800	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact point A)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	–	–
15B		304	–	–
16A		305	–	–
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	–	–
17B	N		0V input	Connect 0V.

Wiring Diagram



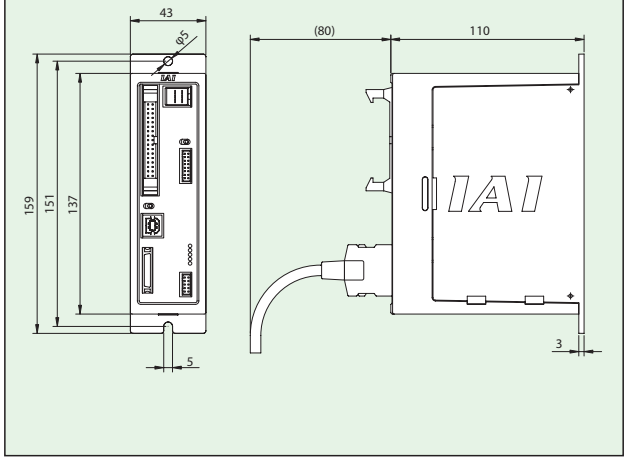
Specification Table

	Item	Specifications
Basic specifications	Connected Actuator	RCP2 Series actuator (Note 1)
	Input voltage	DC24V±10%
	Power-supply capacity	Maximum 5.5A
	Dielectric strength voltage	500VDC, 10MΩ or above
	Withstand Voltage	500VAC, 1 minute
	Rush current	30A max.
	Vibration resistance	XYZ directions 10 to 57Hz One side amplitude: 0.035mm (continuous) 0.075mm (intermittent) 58 to 150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)
Control specifications	Number of control axes	1 axis/2 axes
	Maximum total output of connected axis	–
	Position detection method	Incremental encoder
	Speed setting	From 1mm/s. The maximum limit varies depending on the actuator.
	Acceleration setting	From 0.01G. The maximum limit varies depending on the actuator.
	Operating method	Program operation / Positioner operation (switchable)
Program	Programming language	Super SEL language
	Number of programs	64 points
	Number of program steps	2,000 steps
	Number of multi-tasking programs	8 programs
	Number of positions	1500 points
	Data memory device	Flash ROM (A system-memory backup battery can be added as an option)
	Data input method	Teaching pendant or PC software
Communication	Number of I/O	24 input points / 8 output points (NPN or PNP selectable)
	I/O power	Externally supplied 24VDC ± 10%
	PIO cable	CB-DS-PIO□□□ (supplied with the controller)
	Serial communications function	(D-sub, half-pitch connector) / USB connector
	Field network	(To be supported in the future)
	Motor cable	CB-RCP2-MA□□□ (Max. length 20m)
	Encoder cable	CB-RCP2-PA□□□ (Max. length 20m)
General specifications	Protective function	Motor driver temperature check, encoder open-circuit check soft limit over, system error, battery error, etc.
	Ambient operating humidity and temperature	0 to 40°C 10 to 95% (non-condensing)
	Ambient atmosphere	Free from corrosive gases. In particular, there shall be no significant powder dust.
	Protection class	IP20
	Weight	Approx. 450g
	Exterior dimensions	43mm (W)×159mm (H)×110mm (D)

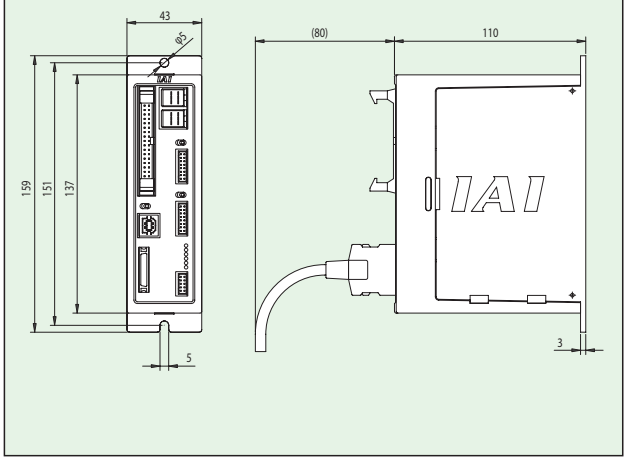
(Note 1) Cannot operate High-Thrust type (RA10C), High-Speed type (HS8C/HS8R), or Waterproof type (RCP2W-SA16).

External Dimensions

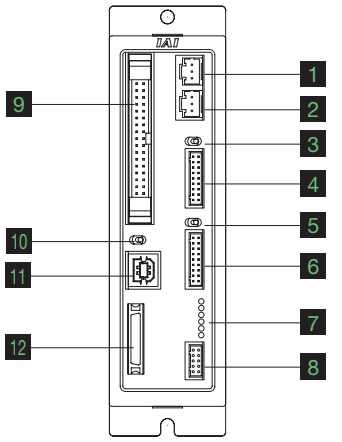
PSEL 1-Axis Controller

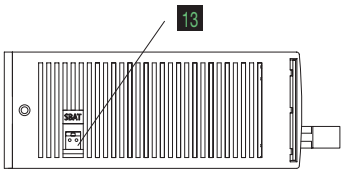


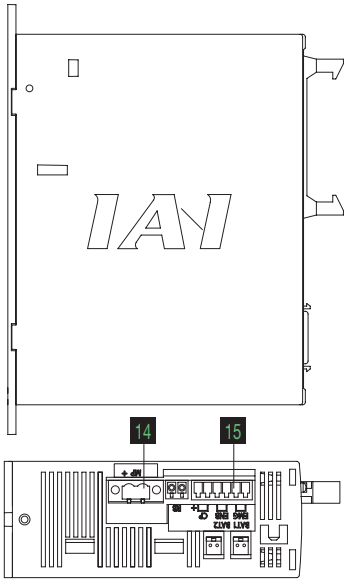
PSEL 2-Axis Controller



Name of Each Part







1 Motor connector for axis 1

Connect the motor cable of the axis 1 actuator.

2 Motor connector for axis 2

Connect the 2nd axis actuator motor cable.

3 Brake switch for axis 1

This switch is used to release the axis brake. Setting it to the left position (RLS side) forcibly releases the brake, while setting it to the right position (NOM side) causes the controller to automatically control the brake.

4 Encoder connector for axis 1

Connect the encoder cable of the axis 1 actuator.

5 Brake switch for axis 2

This switch is used to relaeas the axis brake. Setting it to the left position (RLS side) forcibly releases the brake, while setting it to the right position (NOM)

6 Encoder connector for axis 2

Connect the encoder cable of the axis 2 actuator.

7 Status indicator LEDs

These LEDs are used to indicate the operating condition of the controller. Indication details are as follows:

PWR : This LED indicates that the controller is receiving power
RDY : This LED indicates that the controller is ready to perform program operation.
ALM : This LED indicates that the controller is abnormal.
EMG : This LED indicates that an emergency stop is actuated and the drive source is cut off.
SV1 : This LED indicates that the axis 1 actuator servo is on.
SV2 : This LED indicates that the axis 2 actuator servo is on.

8 Panel unit connector

A connector for the panel unit (optional) that displays the controller status and error numbers.

9 IO connector

A connector for interface I/Os. A 34-pin flat connector is used for the DIO (24 IN/8OUT) interface. The I/O power is also supplied to the controller through this connector (pins 1 and 34).

10 Mode switch

This switch is used to specify the running mode of the controller. The left position indicates the MANU (manual operation) mode, while the right position indicates the AUTO (automatic operation) mode. Teaching can only be performed as manual operation, and automatic operation using external I/Os is not possible in the MANU mode.

11 USB connector

A connector for PC connection via USB. If the USB connector is connected, the TP connector is disabled and all communication inputs to the TP connector are cut off.

12 Teaching pendant connector

A half-pitch I/O 26-pin connector that connects a teaching pendant when the running mode is MANU.
A special conversion cable is needed to connect a conventional D-sub, 25-pin connector.

13 System-memory backup battery connector

If you wish to retain the various data recorded in the SRAM of the controller even after the power is cut off, connect the necessary battery to this connector. This battery is installed externally to the unit. The controller does not come standard with the battery (it must be specified as an option).

14 Motor power input connector

This connector is used to input the motor power.
It consists of a 2-pin, 2-piece connector by Phoenix Contact.

15 Control power/system input connector

This connector is used to connect the control power input, emergency stop switch, and enable switch.
It consists of a 6-pin, 2-piece connector by Phoenix Contact.

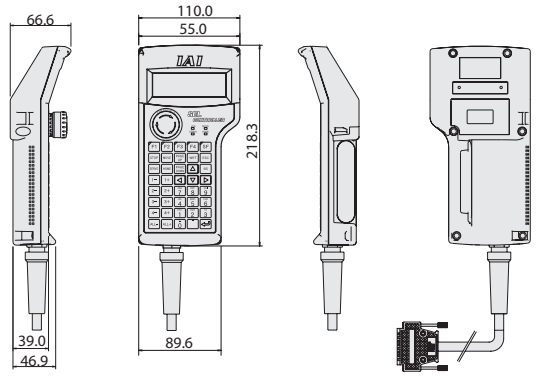
Options

Teaching pendant

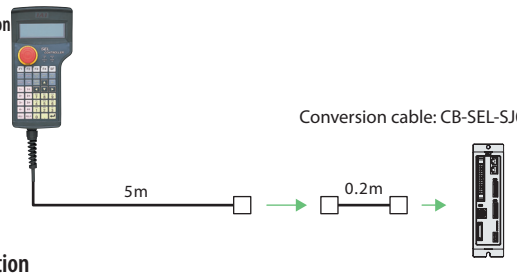
Features This is a teaching device that provides information on functions such as programs, position input, running tests, and monitoring.

Model/price

Model	Description	Standard price
SEL–T–J	Standard type with connector conversion cable	-
SEL–TD–J	Deadman's switch type with connector conversion cable	-



Configuration



SEL-T option

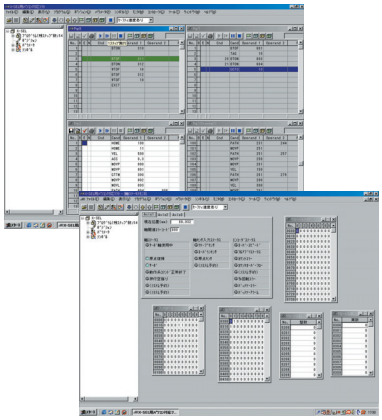
- Wall-mounting hook Model HK-1
- Strap Model STR-1

Specifications

Item	SEL–T–J	SEL–TD–J
3 position enabling switch	No	Yes
ANSI/UL standards	Not compatible	Compatible
CE mark	Compatible	
Display	20 characters x 4 lines	
Ambient operating temperature, humidity	0 to 40°C, 10 to 90% RH (non-condensing)	
Protective structure	IP54	
Weight	Approx. 0.4kg (excluding cable)	

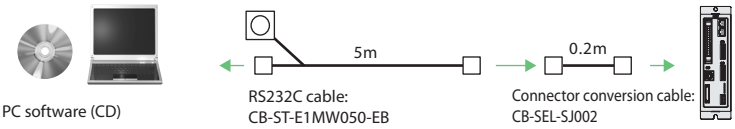
Computer software (Windows only)

Features A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.



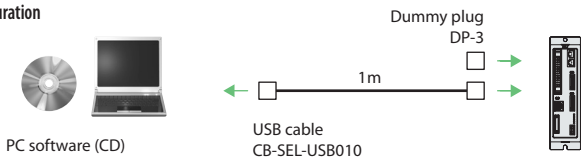
Model **IA-101-X-MW-J** (comes with RS232C cable + connector conversion cable)

Configuration



Model **IA-101-X-USB** (for USB cable)

Configuration

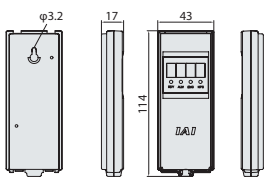


Note:
Only Ver. 7.0.0.0 and later versions can be used with the PSEL controller. can be used with the PSEL controller.

Panel unit

Features This is a display device that can be used to verify controller error codes and operating program numbers.

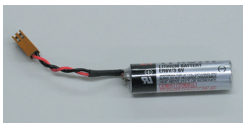
Model **PU-1** (cable length 3m)



System memory back-up battery

Features This battery is required if data such as global flags in programs will need to be retained even when the power is shut off.

Model **AB-5-CS (with case)**
AB-5 (battery unit)



Dummy plug

Features When connecting a PSEL controller to a computer with a USB cable, this plug is inserted in the teaching port to shut off the enable circuit.
(This is supplied with computer software IA-101-X-USB.)

Model **DP–3**

Options

USB cable

Features This cable is for connecting a controller with a USB port to a computer.
A controller without a USB port (XSEL) can be connected to the USB port of a computer if a RS232C cable is connected to the USB cable via a USB conversion adapter.
(See computer software IA-101-X-USBMW)

Model **CB-SEL-USB010** (cable length 1m)

Connector conversion cable

Features This is a conversion cable for connecting D-sub 25-pin connectors for teaching pendants and computer software to a PSEL controller teaching connector (half-pitch).

Model **CB-SEL-SJ002** (cable length 0.2m)

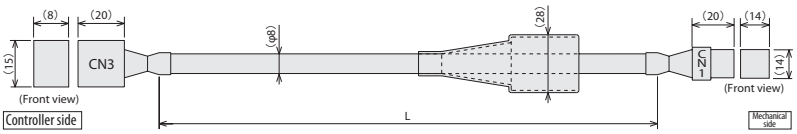
Maintenance Parts

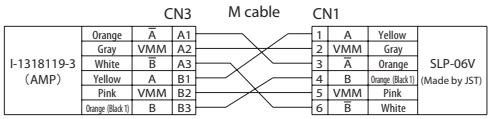
Refer to the models below if it is necessary to replace cables for your purchase.

Motor Cable

Model **CB-RCP2-MA□□□** *The standard motor cable is a robot cable.

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



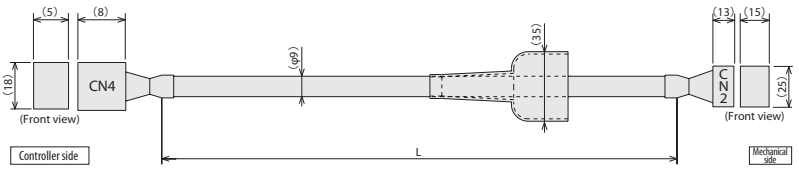


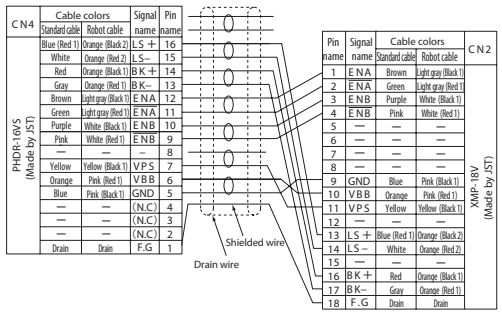
Encoder Cable/Encoder Robot Cable

Model **CB-RCP2-PB□□□/CB-RCP2-PB□□□-RB**

* An encoder cable comes standard.
A robot cable can be specified as an option.

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

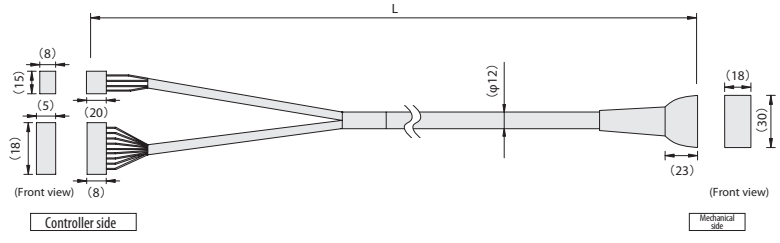


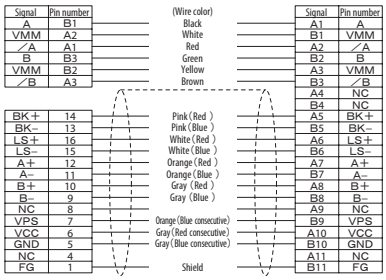


Integrated Motor/Encoder Cable for RCP3

Model **CB-PCS-MPA□□□**

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

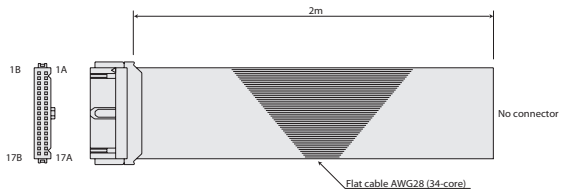




I/O Flat Cable

Model **CB-DS-PIO□□□**

*Enter the cable length (L) for □□□, up to a maximum compatible length of 10m.
Example: 080=8m



No.	Color	Wiring	No.	Color	Wiring
1A	Brown 1	Flat cable crimped	9B	Gray 2	Flat cable crimped
1B	Red 1		10A	White2	
2A	Orange 1		10B	Black 2	
2B	Yellow 1		11A	Brown-3	
3A	Green 1		11B	Red 3	
3B	Blue 1		12A	Orange 3	
4A	Purple 1		12B	Yellow 3	
4B	Gray 1		13A	Green 3	
5A	White 1		13B	Blue 3	
5B	Black 1		14A	Purple 3	
6A	Brown-2		14B	Gray 3	
6B	Red 2		15A	White 3	
7A	Orange 2		15B	Black 3	
7B	Yellow 2		16A	Brown-4	
8A	Green 2		16B	Red 4	
8B	Blue 2		17A	Orange 4	
9A	Purple 2		17B	Yellow 4	

ASEL

RCA2/RCA Series
Program Controller

Model List/Prices

Program Controller that enables operation of RCA2/RCA Series Actuators. One unit can handle various controls.

Type name			C	
Title			Program mode	Positioner mode
External View				
Description			Both actuator operation and communication with external equipment can be handled by a single controller. When two axes are connected, arc interpolation and path operation can be performed.	Up to 1,500 positioning points are supported. Push-motion operation and teaching operation are also possible.
Number of positions			1500 points	
Standard price	1-axis	Incremental	–	
		Absolute	–	
	2 axes	Incremental	–	
		Absolute	–	

Model

*When 1- axis is specified, a description for a second axis is not required.

ASEL – C – ☐ – ☐ ☐ ☐ – (☐ ☐ ☐) – ☐ – ☐ – 0

Series | Type | Number of axes for connection | (Description for Axis-1): Motor type, Encoder type, Option | (Description for Axis-2): Motor type, Encoder type, Option | I/O Type | I/O Cable Length | Power Voltage

Type
- C: Standard type

Number of axes for connection
- 1: 1-axis specification
- 2: 2-axis specification

(Description for Axis-1) Motor type
- 10: 10W motor
- 20S: 20W motor (*)
- 20: 20W motor
- 30: 30W motor

* When connecting a RCA-RA3C/RA3D/RA3R/ RGS3C/RGS3D/RGD3C/ RGD3D, the motor type is 20S.

(Description for Axis-1) Encoder type
- I: Incremental
- A: Absolute

(Description for Axis-1) Option
- B: Brake
- H: Home sensor compatible
- HA: High-acceleration/ deceleration spec
- LA: Power saving spec

(Description for Axis-2) Motor type
- 10: 10W motor
- 20S: 20W motor (for RA3 only)
- 20: 20W motor (not for RA3)
- 30: 30W motor

* When connecting a RCA-RA3C/RA3D/RA3R/ RGS3C/RGS3D/RGD3C/ RGD3D, the motor type is 20S.

(Description for Axis-2) Encoder type
- I: Incremental
- A: Absolute

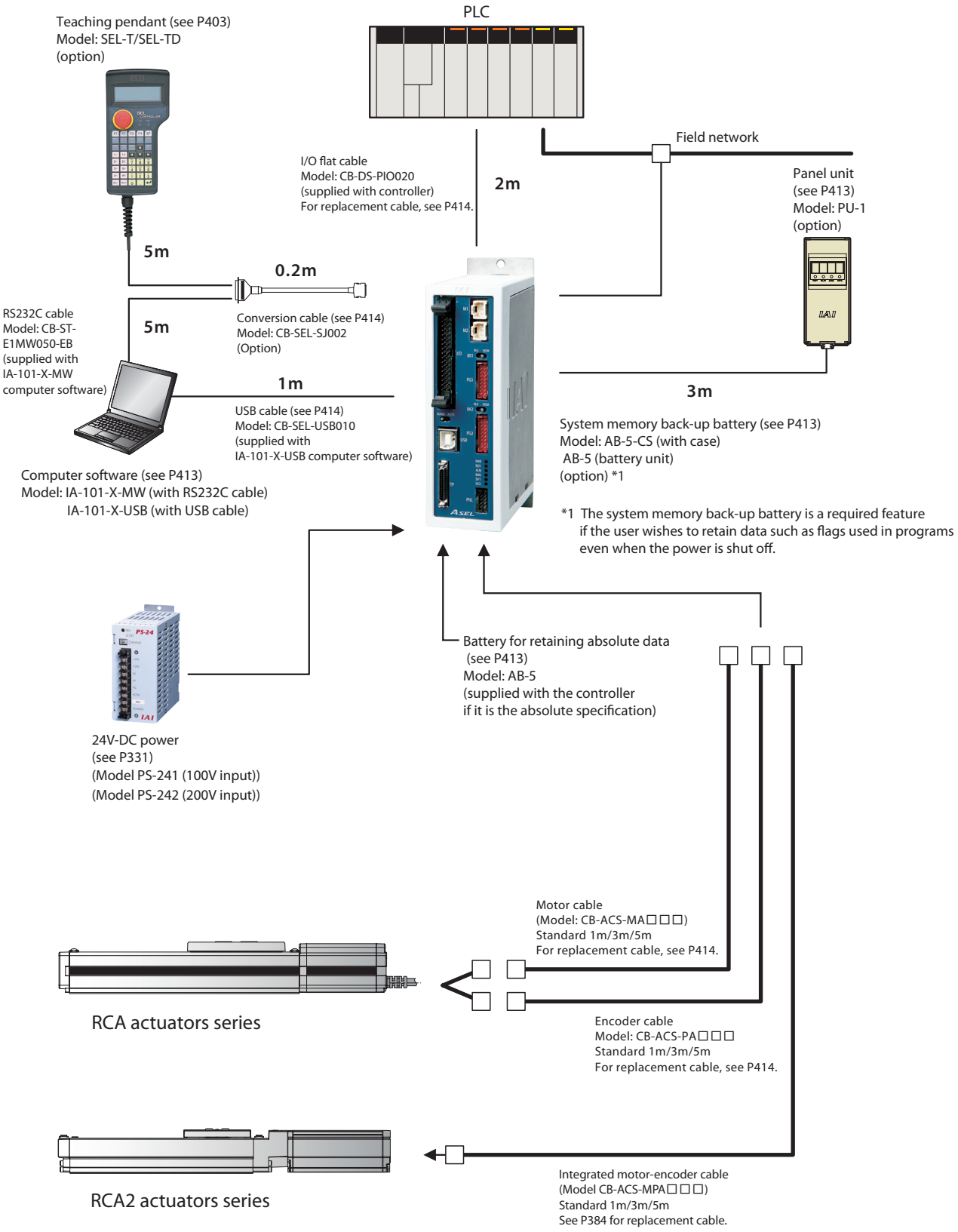
(Description for Axis-2) Option
- B: Brake
- H: Home sensor compatible
- HA: High-acceleration/ deceleration spec
- LA: Power saving spec

I/O Type
- NP: PIO NPN spec (standard)
- PN: PIO PNP specification
- DV: DeviceNet connection spec
- CC: CC-Link connection spec
- PR: ProfiBus connection spec

I/O Cable Length
- 0: No cable
- 2: 2m (standard)
- 3: 3m
- 5: 5m

Power Voltage
- 0: DC24V

System Configuration



I/O Specifications

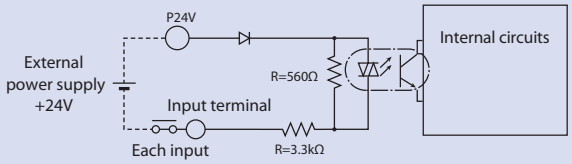
■Input area External input specifications

Item	Specifications
Input voltage	DC24V±10%
Input current	7mA/circuit
ON/OFF Voltage	ON Voltage (Min.) NPN: DC16V/PNP: DC8V OFF Voltage (Max.) NPN: DC5V/PNP: DC19V
Insulation method	Photocoupler

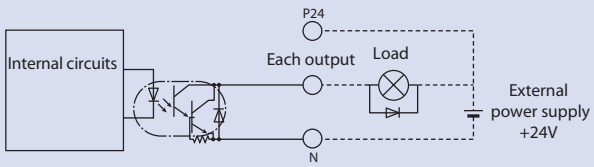
■Output area External output specifications

Item	Specifications
Load voltage	DC24V
Maximum load current	100mA/point 400mA/8 points total
Residual voltage (Max.)	Max 0.1mA/point
Insulation method	Photocoupler

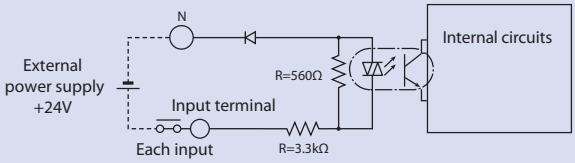
NPN specification



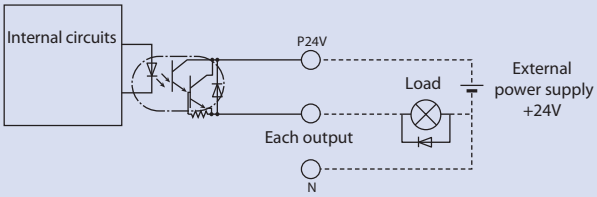
NPN specification



PNP specification



PNP specification



Explanation of I/O Functions

The ASEL controller lets you select either the “program mode” in which the actuator is operated by programs input to the controller, or the “positioner mode” in which the actuator moves to the positions specified by PLC signals received from the host.
The Positioner Mode has the five input patterns listed below to enable various applications.

■Functions by Controller Type

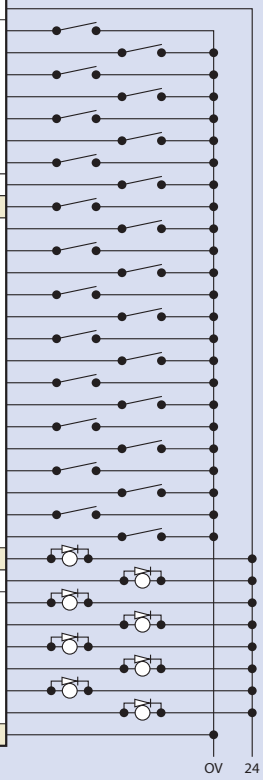
Operation mode		Features
Program mode		Various operations including linear/arc interpolation operation, path operation ideal for coating processes, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode	This is the basic mode from which operations can be conducted by designating position numbers and inputting the start signal. Push operations and 2-axis straight-line supplementary operations possible.
	Switch over mode	Multiple works of the same shape with slightly different hole positions can be handled using movement commands to the same position numbers by simply changing the product type number.
	2-axis independent mode	With a 2-axis controller, each axis can be commanded and operated separately.
	Teaching mode	The slider (rod) can be moved via an external signal to store the achieved position as position data.
	DS-S-C1 compatible mode	If you were using a DS-S-C1 controller before, you can replace it with a PSEL controller without having to change the host programs. *This mode does not ensure actuator compatibility.

Explanation of I/O Functions

Program mode

Pin number	Classification	Port No.	Program mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Program No. Select 1	This selects the program number to start up. (Input BCD values for ports 016 to 022.)
2A		017	Program No. Select 2	
2B		018	Program No. Select 4	
3A		019	Program No. Select 8	
3B		020	Program No. Select 10	
4A		021	Program No. Select 20	
4B		022	Program No. Select 40	
5A		023	CPU reset	This resets the system and puts it back into the same state as when the power is turned on.
5B		000	Start	Port No. This starts up the programs selected for port numbers 016 to 022.
6A		001	General-purpose input	The system waits for external input based on the program instructions.
6B		002	General-purpose input	
7A		003	General-purpose input	
7B		004	General-purpose input	
8A		005	General-purpose input	
8B		006	General-purpose input	
9A		007	General-purpose input	
9B		008	General-purpose input	
10A		009	General-purpose input	
10B		010	General-purpose input	
11A		011	General-purpose input	
11B		012	General-purpose input	
12A		013	General-purpose input	
12B		014	General-purpose input	
13A		015	General-purpose input	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	General-purpose output	Program instructions can be used to turn it ON and OFF as desired.
15A		303	General-purpose output	
15B		304	General-purpose output	
16A		305	General-purpose output	
16B		306	General-purpose output	
17A		307	General-purpose output	
17B	N		0V input	Connect 0V.

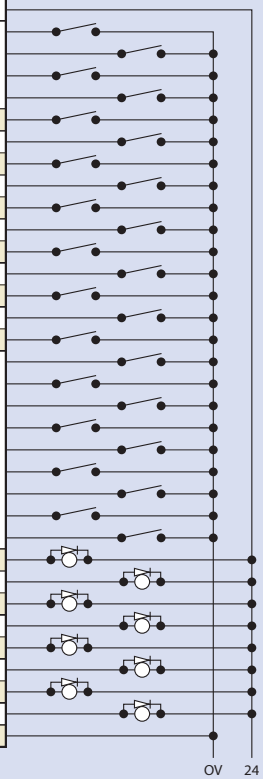
Wiring Diagram



Standard Positioner Mode

Pin number	Classification	Port No.	Positioner standard mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position input 10	Port Nos. 007 to 019 are used to specify a target position number. Numbers can be specified as either BCD or binary.
2A		017	Position input 11	
2B		018	Position input 12	
3A		019	Position input 13	
3B		020	–	–
4A		021	–	–
4B		022	–	–
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This is used to perform a return to home.
6B		002	Servo ON	This is used to switch the servo between ON and OFF.
7A		003	Pressing	This is used to perform the push motion operation.
7B		004	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancel	When this is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
9A		007	Position input 1	Port Nos. 007 to 019 are used to specify a target position number. Numbers can be specified as either BCD or binary.
9B		008	Position input 2	
10A		009	Position input 3	
10B		010	Position input 4	
11A		011	Position input 5	
11B		012	Position input 6	
12A		013	Position input 7	
12B		014	Position input 8	
13A		015	Position input 9	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	Push motion complete	This is output when the push move operation is complete.
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

Wiring Diagram

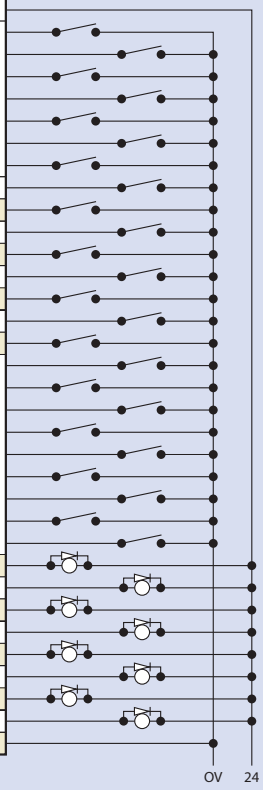


Explanation of I/O Functions

Positioner, Product-Type Switchover Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position/part type input 10	Port Nos. 007 to 022 are used to specify a target position number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified as either BCD or binary.
2A		017	Position/part type input 11	
2B		018	Position/part type input 12	
3A		019	Position/part type input 13	
3B		020	Position/part type input 14	
4A		021	Position/part type input 15	
4B		022	Position/part type input 16	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This is used to perform a return to home.
6B		002	Servo ON	This is used to switch the servo between ON and OFF.
7A		003	Pressing	This is used to perform the push motion operation.
7B		004	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancel	When this is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
9A		007	Position/part type input 1	This specifies the position numbers to move to using port numbers 007 to 022 and the position numbers input. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified as either BCD or binary.
9B		008	Position/part type input 2	
10A		009	Position/part type input3	
10B		010	Position/part type input 4	
11A		011	Position/part type input 5	
11B		012	Position/part type input 6	
12A		013	Position/part type input 7	
12B		014	Position/part type input8	
13A		015	Position/part type input 9	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	Push motion complete	This is output when the push move operation is complete.
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

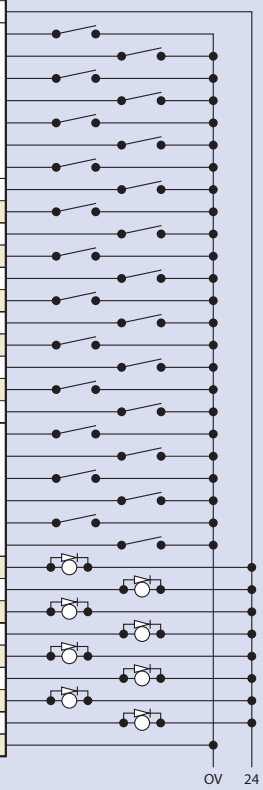
Wiring Diagram



Positioner, 2-axis Independent Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position input 7	Port Nos. 010 to 022 are used to specify a target position number. The Axis-1position number and Axis-2 position number are assigned in the parameters. Numbers can be specified as either BCD or binary.
2A		017	Position input 8	
2B		018	Position input 9	
3A		019	Position input 10	
3B		020	Position input 11	
4A		021	Position input 12	
4B		022	Position input 13	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start 1	This starts movement toward the position number selected for the Axis-1 to start moving to the selected position.
6A		001	Home return 1	This is used to return Axis-1 to home.
6B		002	Servo ON 1	This switches the servo for Axis-1 ON and OFF.
7A		003	Pause 1	This pauses Axis-1 when the movement signal turns off, and continues movement when the signal turns on.
7B		004	Cancel 1	This cancels movement for Axis-1.
8A		005	Start 2	This starts moving Axis-2 to the selected position. to start moving to the selected position.
8B		006	Home return 2	This returns Axis-2 to home.
9A		007	Servo ON 2	This switches the servo ON and OFF for Axis-2.
9B		008	Pause 2	This pauses Axis-2 when the movement signal turns OFF, and continues the remaining movement when the signal turns on.
10A		009	Cancel 2	This cancels movement for Axis-2.
10B		010	Position input 1	Port Nos. 010 to 022 are used to specify a target position number. The Axis-1position number and Axis-2 position number are assigned in the parameters. Numbers can be specified as either BCD or binary.
11A		011	Position input 2	
11B		012	Position input 3	
12A		013	Position input 4	
12B		014	Position input 5	
13A		015	Position input 6	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	Positioning complete 1	This is output when movement of Axis-1 to the specified position is complete.
15A		303	Home return complete 1	This is output when Axis-1has completed returning to home.
15B		304	Servo ON output 1	This is output when the servo for Axis-1comes ON.
16A		305	Positioning complete 2	This is output when movement of Axis-2 to the specified position is complete.
16B		306	Home return complete 2	This is output when Axis-2 has completed returning to home.
17A		307	Servo ON output 2	This is output when the servo for Axis-2 comes ON.
17B	N		0V input	Connect 0V.

Wiring Diagram

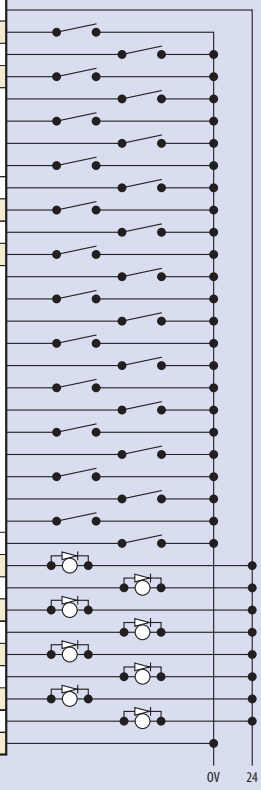


Explanation of I/O Functions

Positioner, Teaching Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Axis-1, JOG -	This moves the Axis-1in the negative direction between the signal inputs.
2A		017	Axis-2, JOG +	This moves Axis-2 in the positive direction between the signal inputs.
2B		018	Axis-2, JOG -	This moves Axis-2 in the negative direction between the signal inputs.
3A		019	Inching specification (0.01mm)	This specifies how much to move during inching. (This is the total amount of movement for values specified for port numbers 019 to 022.)
3B		020	Inching specification (0.1mm)	
4A		021	Inching specification (0.5mm)	
4B		022	Inching specification (1mm)	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Servo ON	This is used to switch the servo between ON and OFF.
6B		002	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
7A		003	Position input 1	This specifies the position numbers to move to using port numbers 003 to 013 and the position numbers input to specify a target position number. When the 014 teaching mode specification is on, when the port number 000 status signal comes on, the current value is written to the specified position number.
7B		004	Position input 2	
8A		005	Position input 3	
8B		006	Position input 4	
9A		007	Position input 5	
9B		008	Position input 6	
10A		009	Position input 7	
10B		010	Position input 8	
11A		011	Position input 9	
11B		012	Position input 10	
12A		013	Position input 11	
12B		014	Teaching mode specification	
13A		015	Axis-1, JOG +	This moves the Axis-1in the positive direction between the signal inputs.
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	Positioning complete	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	–	–
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

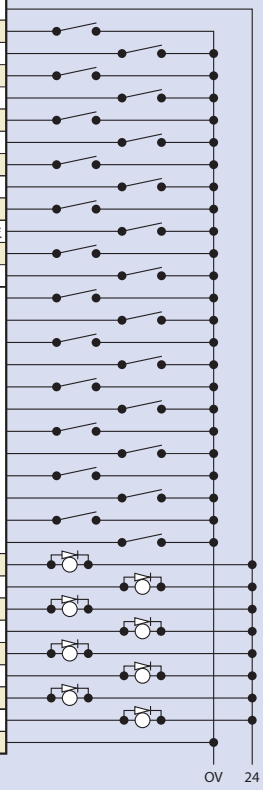
Wiring Diagram



Positioner, DS-S-C1 Compatible Mode

Pin number	Classification	Port No.	Positioner standard mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position No. 1000	(Same as port numbers 004 to 015)
2A		017	–	–
2B		018	–	–
3A		019	–	–
3B		020	–	–
4A		021	–	–
4B		022	–	–
5A		023	CPU reset	This resets the system and puts it back into the same state as when the power is turned on.
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Hold (pause)	The system pauses when the movement signal comes on, and continues the remaining movement when the signal turns off.
6B		002	Cancel	The system stops when the movement signal comes on, and cancels the remaining movement.
7A		003	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
7B		004	Position No. 1	This specifies the position numbers to move to using port numbers 004 to 016 to specify a target position number. Numbers should be specified in BCD.
8A		005	Position No. 2	
8B		006	Position No. 4	
9A		007	Position No. 8	
9B		008	Position No. 10	
10A		009	Position No. 20	
10B		010	Position No. 40	
11A		011	Position No. 80	
11B		012	Position No. 100	
12A		013	Position No. 200	
12B		014	Position No. 400	
13A		015	Position No. 800	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact point A)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	–	–
15B		304	–	–
16A		305	–	–
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

Wiring Diagram



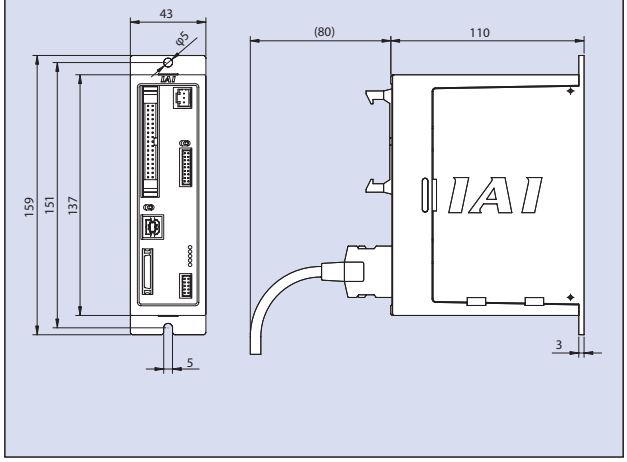
Specification Table

	Item	Specifications
Basic specifications	Connected actuator	RCA Series Acutators
	Input power	DC24V±10%
	Power-supply capacity	Control power source (Max. 1.2A) + Motor power supply (Power capacity per axis as listed below × No. of axes used)
	Dielectric strength voltage	500VDC, 10MΩ or above
	Withstand voltage	500VAC, 1 minute
	Rush current	30A max.
	Vibration resistance	XYZ directions 10 to 57Hz One side amplitude: 0.035mm (continuous) 0.075mm (intermittent) 58 to 150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)
Control specifications	Number of control axes	1 axis/2 axes
	Maximum total output of connected axis	60W (30W+30W)
	Position detection method	Incremental Encoder/Absolute Encoder
	Speed setting	From 1mm/s. The maximum limit varies depending on the actuator.
	Acceleration setting	From 0.01G. The maximum limit varies depending on the actuator.
	Operating method	Program operation / Positioner operation (switchable)
Program	Programming language	Super SEL language
	Number of programs	64 points
	Number of program steps	2,000 steps
	Number of multi-tasking programs	8 programs
	Number of positions	1500 points
	Data memory device	Flash ROM (A system-memory backup battery can be added as an option)
	Data input method	Teaching pendant or PC software
Communication	Number of I/O	24 input points / 8 output points (NPN or PNP selectable)
	I/O power	Externally supplied 24VDC ± 10%
	PIO cable	CB-DS-PIO□□□ (supplied with the controller)
	Serial communications function	RS232C (D-Sub half-pitch connector)/USB connector
	Field network	(To be supported in the future)
	Motor cable	CB-ACS-MA□□□ (Max. length 20m)
	Encoder cable	CB-ACS-PA□□□ (Max. length 20m)
General specifications	Protective function	Motor overcurrent, motor driver temperature check, overload check, encoder open-circuit check soft limit over, system error, battery error, etc.
	Ambient operating humidity and temperature	0 to 40°C 10 to 95°C (non-condensing)
	Ambient atmosphere	Free from corrosive gases. In particular, there shall be no significant powder dust.
	Protection class	IP20
	Weight	Approx. 450g
	Exterior dimensions	43mm (W)×159mm (H)×110mm (D)

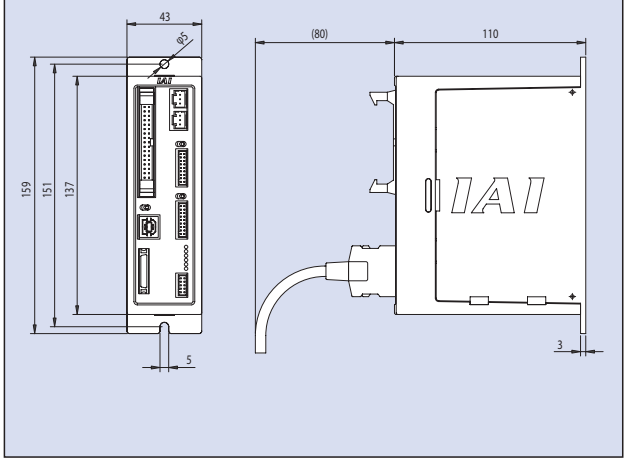
	Actuator type	High-acceleration/deceleration specification	Power saving specifications
Power-supply capacity (per axis)	SA4 · SA5 · RA4 (20W)	Rated1.3A/Max.4.4A	Rated1.3A/Max.2.5A
	SA6 · RA4 (30W)	Rated1.3A/Max.4.0A	Rated1.3A/Max.2.2A
	RA3 (20W)	Rated1.7A/Max.5.1A	Rated1.7A/Max.3.4A

Exterior Dimensional Drawing

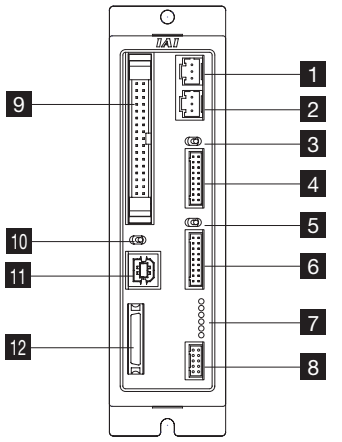
ASEL 1-axis Controller

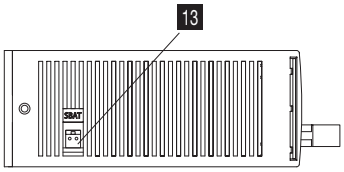


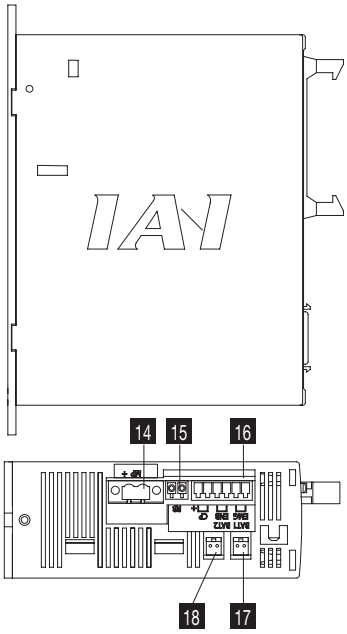
ASEL 2-axis Controller



Area Names







1 1st axis motor connector

Connect the motor cable of the axis 1 actuator.

2 Motor connector for axis 2

Connect the 2nd axis actuator motor cable.

3 Brake switch for axis 1

This switch is used to release the axis brake. Setting it to the left position (RLS side) forcibly releases the brake, while setting it to the right position (NOM side) causes the controller to automatically control the brake

4 Encoder connector for axis 1

Connect the encoder cable of the axis 1 actuator.

5 2nd axis brake switch

This switch is used to release the axis brake. Setting it to the left position (RLS side) forcibly releases the brake, while setting it to the right position (NOM side) causes the controller to automatically control the brake.

6 Encoder connector for axis 2

Connect the encoder cable of the axis 2 actuator.

7 Status indicator LEDs

These LEDs are used to indicate the operating condition of the controller.
The LED status indicators are as follow:

PWR	:	Indicates power is input to controller.
RDY	:	This LED indicates that the controller is ready to perform program operation.
ALM	:	This LED indicates that the controller is abnormal.
EMG	:	This LED indicates that an emergency stop is actuated and the drive source is cut off.
SV1	:	This LED indicates that the axis 1 actuator servo is on.
SV2	:	This LED indicates that the axis 2 actuator servo is on.

8 Panel unit connector

A connector for the panel unit (optional). This is a connector used to connect the panel unit (optional) used for display.

9 IO connector

A connector for interface I/Os. A 34-pin flat connector is used for the DIO (24 IN/8OUT) interface. The I/O power is also supplied to the controller through this connector (pins 1 and 34).

10 Mode switch

This switch is used to specify the running mode of the controller. The left position indicates the MANU (manual operation) mode, while the right position indicates the AUTO (automatic operation) mode. Teaching can only be performed as manual operation, and automatic operation using external I/Os is not possible in the MANU mode.

11 USB connector

A connector for PC connection via USB. If the USB connector is connected, the TP connector is disabled and all communication inputs to the TP connector are cut off.

12 Teaching pendant connector

A half-pitch I/O 26-pin connector that connects a teaching pendant when the running mode is MANU.
A special conversion cable is needed to connect a conventional D-sub, 25-pin connector.

13 System-memory backup battery connector

If you wish to retain the various data recorded in the SRAM of the controller even after the power is cut off, connect the necessary battery to this connector. This battery is installed externally to the unit. The controller does not come standard with the battery (optional).

14 Motor power input connector

This connector is used to input the motor power. Itconsists of a 2-pin, 2-piece connector by Phoenix Contact.

15 External regenerative resistor connector

A connector for the regenerative resistor that must be connected when the built-in regenerative resistor alone does not offer sufficient capacity in high-acceleration/ high-load operation, etc. Whether or not an external regenerative resistor is necessary depends on the conditions of your specific application such as the axis configuration.

16 Control power/System input connector

This connector is used to connect the control power input, emergency stop switch, and enable switch. It consists of a Phoenix Contact 6-pin 2-piece connector.

17 Absolute-data backup battery connector for axis 1

A connector for the battery that backs up absolute data when the actuator uses an absolute encoder. Secure installation of the battery is the customer's responsibility.

18 Absolute-data backup battery connector for axis 2

A connector for the battery that backs up absolute data when the actuator uses an absolute encoder. Secure installation of the battery is the customer's responsibility.

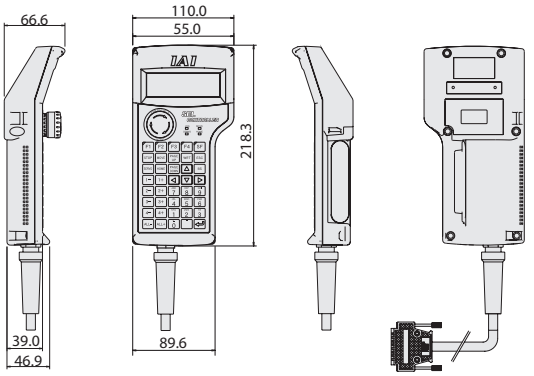
Options

Teaching pendant

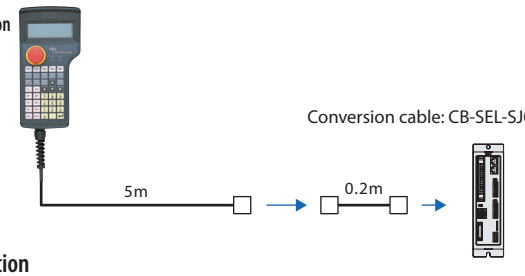
Features This is a teaching device that provides information on functions such as programs, position input, running tests, and monitoring.

Model/price

Model	Description	Standard price
SEL–T–J	Standard type with connector conversion cable	-
SEL–TD–J	Deadman's switch type with connector conversion cable	-

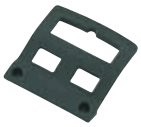


Configuration



SEL-T option

- Wall-mounting hook
  Model HK-1
- Strap
  Model STR-1

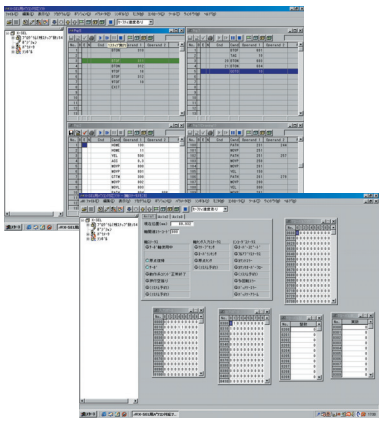



Specifications

Item	SEL–T–J	SEL–TD–J
3 position enabling switch	No	Yes
ANSI/UL standards	Not compatible	Compatible
CE mark	Compatible	
Display	20 characters x 4 lines	
Ambient operating temperature, humidity	0 to 40°C, 10 to 90% RH (non-condensing)	
Protective structure	IP54	
Weight	Approx. 0.4kg (excluding cable)	

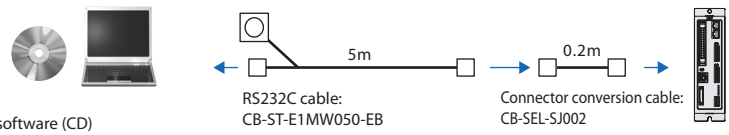
Computer software (Windows only)

Features A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.



Model **IA-101-X-MW-J** (comes with RS232C cable + connector conversion cable)

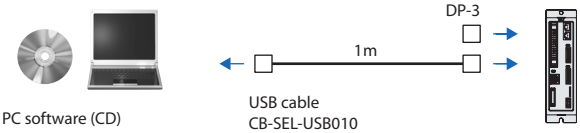
Configuration



Model **IA-101-X-USB** (for USB cable)

Note:
Only Ver. 7.0.0.0 and later versions can be used with the PSEL controller. can be used with the PSEL controller.

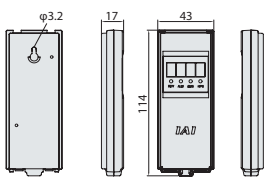
Configuration



Panel unit

Features This is a display device that can be used to verify controller error codes and operating program numbers.

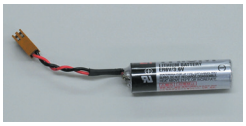
Model **PU-1** (cable length 3m)



Battery for retaining absolute data

Features This battery is for storing absolute data for the operating actuator.
This is common with the system memory back-up battery.

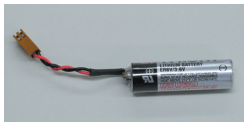
Model **AB-5**



System memory back-up battery

Features This battery is required if data such as global flags in programs will need to be retained even when the power is shut off.

Model **AB-5-CS (with case)**
AB-5 (battery unit)



Options

Dummy plug

Features When connecting the SSEL controller to a computer with a USB cable, this plug is inserted into the teaching port to shut off the enable circuit.
(This is supplied with computer software IA-101-X-USB.)

Model **DP–3**

USB cable

Features This cable is for connecting a controller with a USB port to a computer.
A controller without a USB port (XSEL) can be connected to the USB port of a computer if a RS232C cable is connected to the USB cable via a USB conversion adapter.
(See computer software IA-101-X-USBMW)

Model **CB-SEL-USB010** (cable length 1m)

Connector conversion cable

Features This is a conversion cable for connecting D-sub 25-pin connectors for teaching pendants and computer software to a PSEL controller teaching connector (half-pitch).

Model **CB-SEL-SJ002** (cable length 0.2m)

Maintenance Parts

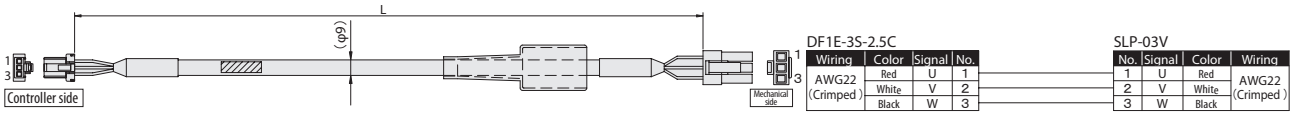
Refer to the models below if it is necessary to replace cables for your purchase.

Motor Cable

Model **CB-ACS-MA□□□**

* The standard motor cable is a robot cable.

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



DF1E-3S-2.5C

Wiring	Color	Signal	No.
AWG22 (Crimped)	Red	U	1
	White	V	2
	Black	W	3

SLP-03V

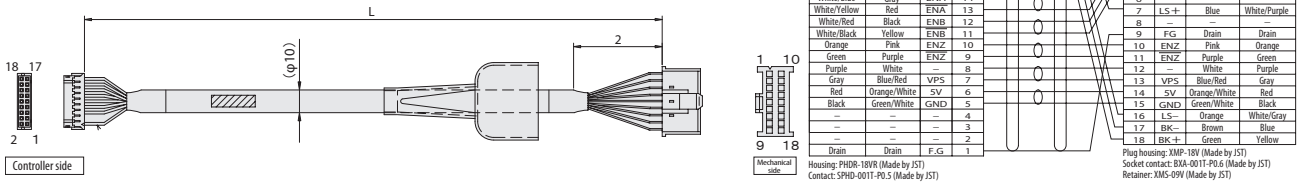
No.	Signal	Color	Wiring
1	U	Red	AWG22 (Crimped)
2	V	White	
3	W	Black	

Encoder Cable/Encoder Robot Cable

Model **CB-ACS-PA□□□ / CB-ACS-PA□□□-RB**

An encoder cable comes standard. A robot cable can be specified as an option.

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



CN2

Cable colors: Robot cable	Cable colors: Standard cable	Pin number	Signal abbreviation
White/Purple	Blue	LS+	18
White/Gray	Orange	LS−	17
Yellow	Green	BK+	16
Blue	Brown	BK−	15
White/Blue	Gray	ENA	14
White/Yellow	Red	ENA	13
White/Red	Black	ENB	12
White/Black	Yellow	ENB	11
Orange	Pink	ENZ	10
Green	Purple	ENZ	9
Purple	White	–	8
Gray	Blue/Red	VPS	7
Red	Orange/White	5V	6
Black	Green/White	GND	5
–	–	–	4
–	–	–	3
–	–	–	2
Drain	Drain	F.G	1

Housing: PHDR-18VR (Made by JST)
Contact: SPHD-001T-P0.5 (Made by JST)

CN1

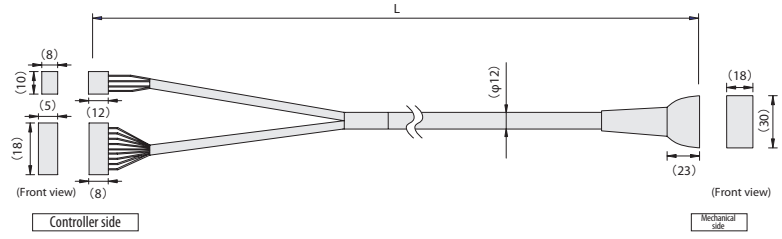
Pin number	Signal abbreviation	Cable colors: Robot cable	Cable colors: Standard cable
1	ENA	Gray	White/Blue
2	ENA	Red	White/Yellow
3	ENB	Black	White/Red
4	ENB	Yellow	White/Black
5	–	–	–
6	–	–	–
7	LS+	Blue	White/Purple
8	–	–	–
9	FG	Drain	Drain
10	ENZ	Pink	Orange
11	ENZ	Purple	Green
12	–	White	Purple
13	VPS	Blue/Red	Gray
14	5V	Orange/White	Red
15	GND	Green/White	Black
16	LS−	Orange	White/Gray
17	BK−	Brown	Blue
18	BK+	Green	Yellow

Plug housing: XMP-18V (Made by JST)
Socket contact: BXA-001T-P0.6 (Made by JST)
Retainer: XMS-09V (Made by JST)

Motor Encoder Integration Cable for RCA2

Model **CB-ACS-MPA□□□**

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



Signal	Pin number
U	1
V	2
W	3
BK+	16
BK−	15
LS+	18
LS−	17
A+	14
A−	13
B+	12
B−	11
Z+	10
Z−	9
–	8
/PS	7
VCC	6
GND	5
NC	
FG	1

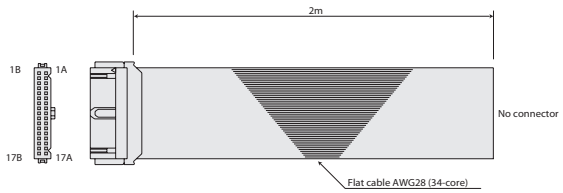
(Wire color)
Red
Yellow
Black
Yellow (Red)
Yellow (Blue)
Pink (Red)
Pink (Blue)
White (Red)
White (Blue)
Orange (Red)
Orange (Blue)
ray (Red)
Gray (Blue)
Orange (Red consecutive)
Orange (Blue consecutive)
Gray (Red consecutive)
Gray (Blue consecutive)
Shield

Pin number	Signal
A1	U
B1	V
A2	W
B2	NC
A3	NC
B3	NC
A4	BK+
B4	BK−
A5	LS+
B5	LS−
A6	A+
B6	A−
A7	B+
B7	B−
A8	Z+
B8	Z−
A9	–
B9	/PS
A10	VCC
B10	GND
A11	NC
B11	FG

I/O Flat Cable

Model **CB-DS-PIO□□□**

*Enter the cable length (L) for □□□, up to a maximum compatible length of 10m.
Example: 080=8m



No.	Color	Wiring	No.	Color	Wiring
1A	Brown 1	Flat cable crimped	9B	Gray 2	Flat cable crimped
1B	Red 1		10A	White2	
2A	Orange 1		10B	Black 2	
2B	Yellow 1		11A	Brown-3	
3A	Green 1		11B	Red 3	
3B	Blue 1		12A	Orange 3	
4A	Purple 1		12B	Yellow 3	
4B	Gray 1		13A	Green 3	
5A	White 1		13B	Blue 3	
5B	Black 1		14A	Purple 3	
6A	Brown-2		14B	Gray 3	
6B	Red 2		15A	White 3	
7A	Orange 2		15B	Black 3	
7B	Yellow 2		16A	Brown-4	
8A	Green 2		16B	Red 4	
8B	Blue 2		17A	Orange 4	
9A	Purple 2		17B	Yellow 4	

SSEL

For RCS2 Series
Program Controller

Model List/Prices

Program controller for operating RCS2 Series actuators. Various control functions are combined into a single unit.

Type name	C	
Title	Program mode	Positioner mode
External View		
Description	Both actuator operation and communication with external equipment can be handled by a single controller. When two axes are connected, arc interpolation, path operations, and sychronization can be performed.	Up to 20,000 positioning points are supported. Push-motion operation and teaching operation are also possible.
Number of positions	20000 points	

			20 to 150W	200W	300 to 400W	600W	750W
Standard price	1-axis	Incremental	—	—	—	—	—
		Absolute	—	—	—	—	—
	2 axes	Incremental	—	—	—	—	—
		Absolute	—	—	—	—	—

* For 2-axis specification, select the axis with the highest motor wattage.

Model

*When 1- axis is specified, a description for a second axis is not required.

SSEL - C - □ - □ □ □ - (□ □ □) - □ - □ - □

Series | Type | Number of axes for connection | (Description for Axis-1): Motor type, Encoder type, Option | (Description for Axis-2): Motor type, Encoder type, Option | I/O Type | I/O Cable Length | Power Voltage

Type	
C	Standard type

Number of axes for connection	
1	1-axis spec
2	2-axis spec

Motor type

20	20W servo motor
30D	30W servo motor for RCS2
30R	30W servo motor for RS
60	60W servo motor
100	100W servo motor
150	150W servo motor
200	200W servo motor
300	300W servo motor
400	400W servo motor
600	600W servo motor
750	750W servo motor

Encoder type

I	Incremental
A	Absolute

Option

B	Brake
C	Creep sensor
HA	High-acceleration/ deceleration spec
L	Home sensor/ LS-compatible
M	Master axis spec
S	Master axis spec

I/O Type

NP	PIO NPN spec (standard)
PN	PIO PNP specification
DV	DeviceNet connection spec
CC	CC-Link connection spec
PR	ProfiBus connection spec

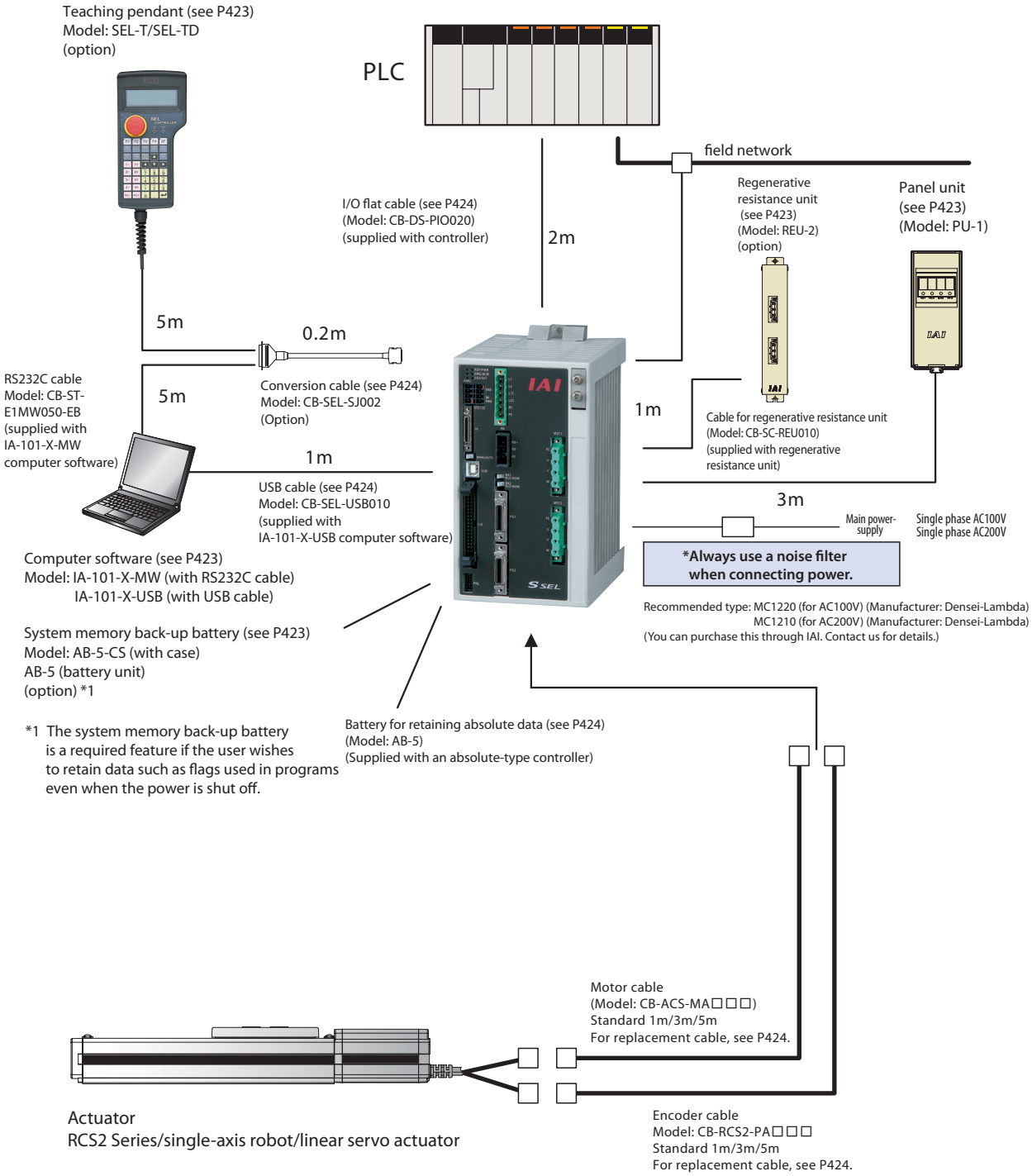
I/O Cable Length

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

Power Voltage

1	Single phase AC100V
2	Single phase AC200V

System Configuration



I/O Specifications

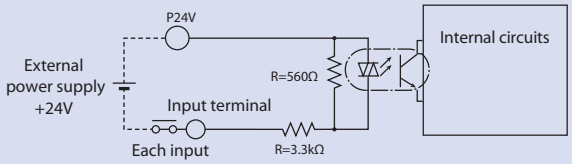
■Input area External input specifications

Item	Specifications
Input voltage	DC24V±10%
Input current	7mA/circuit
ON/OFF Voltage	ON Voltage (Min.) NPN: DC16V/PNP: DC8V OFF Voltage (Max.) NPN: DC5V/PNP: DC19V
Insulation method	Photocoupler

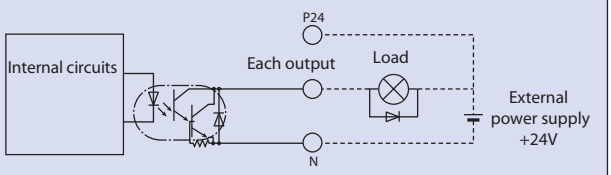
■Output area External output specifications

Item	Specifications
Load voltage	DC24V
Maximum load current	100mA/point 400mA/8 points total
Residual voltage (Max.)	Max 0.1mA/point
Insulation method	Photocoupler

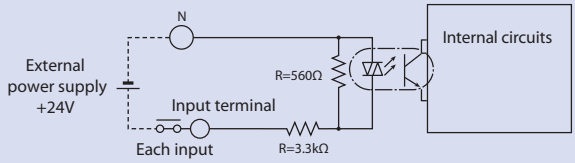
NPN specification



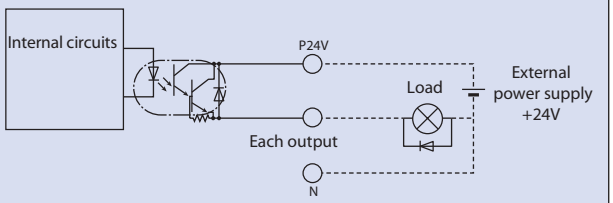
NPN specification



PNP specification



PNP specification



Explanation of I/O Functions

Two modes can be selected for the SSEL controller: “Program Mode,” in which the actuator is operated by entering a program, and “Positioner Mode,” in which up-stream PLC signals are received and the actuator is moved to designated positions.
The Positioner Mode has the five input patterns listed below to enable various applications.

■Functions by Controller Type

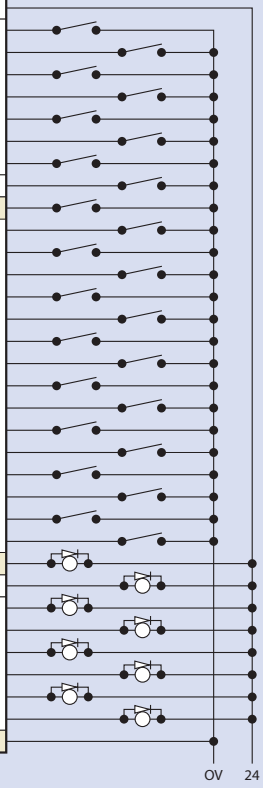
Operation mode		Features
Program mode		Various operations including linear/arc interpolation operation, path operation ideal for coating processes, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode	This is the basic mode from which operations can be conducted by designating position numbers and inputting the start signal. Push operations and 2-axis straight-line supplementary operations possible.
	Switch over mode	Multiple works of the same shape with slightly different hole positions can be handled using movement commands to the same position numbers by simply changing the product type number.
	2-axis independent mode	With a 2-axis controller, each axis can be commanded and operated separately.
	Teaching mode	The slider (rod) can be moved via an external signal to store the achieved position as position data.
	DS-S-C1 compatible mode	If you were using a DS-S-C1 controller before, you can replace it with a PSEL controller without having to change the host programs. *This mode does not ensure actuator compatibility.

Explanation of I/O Functions

Program mode

Pin number	Classification	Port No.	Program mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Program No. Select 1	This selects the program number to start up. (Input BCD values for ports 016 to 022.)
2A		017	Program No. Select 2	
2B		018	Program No. Select 4	
3A		019	Program No. Select 8	
3B		020	Program No. Select 10	
4A		021	Program No. Select 20	
4B		022	Program No. Select 40	
5A		023	CPU reset	This resets the system and puts it back into the same state as when the power is turned on.
5B		000	Start	Port No. This starts up the programs selected for port numbers 016 to 022.
6A		001	General-purpose input	The system waits for external input based on the program instructions.
6B		002	General-purpose input	
7A		003	General-purpose input	
7B		004	General-purpose input	
8A		005	General-purpose input	
8B		006	General-purpose input	
9A		007	General-purpose input	
9B		008	General-purpose input	
10A		009	General-purpose input	
10B		010	General-purpose input	
11A		011	General-purpose input	
11B		012	General-purpose input	
12A		013	General-purpose input	
12B		014	General-purpose input	
13A		015	General-purpose input	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	General-purpose output	Program instructions can be used to turn it ON and OFF as desired.
15A		303	General-purpose output	
15B		304	General-purpose output	
16A		305	General-purpose output	
16B		306	General-purpose output	
17A		307	General-purpose output	
17B	N		0V input	Connect 0V.

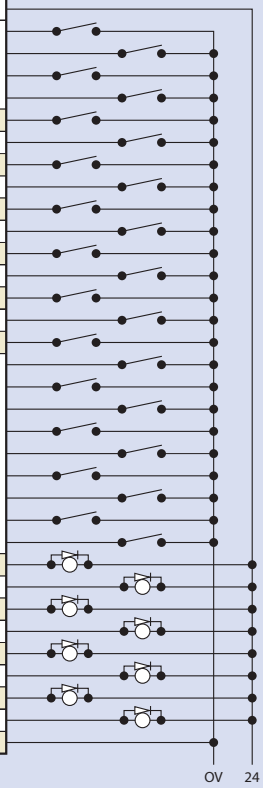
Wiring Diagram



Standard Positioner Mode

Pin number	Classification	Port No.	Positioner standard mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position input 10	Port Nos. 007 to 019 are used to specify a target position number. Numbers can be specified as either BCD or binary.
2A		017	Position input 11	
2B		018	Position input 12	
3A		019	Position input 13	
3B		020	Position input 14	–
4A		021	Position input 15	–
4B		022	Position input 16	–
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This is used to perform a return to home.
6B		002	Servo ON	This is used to switch the servo between ON and OFF.
7A		003	Pressing	This is used to perform the push motion operation.
7B		004	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancel	When this is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
9A		007	Position input 1	Port Nos. 007 to 019 are used to specify a target position number. Numbers can be specified as either BCD or binary.
9B		008	Position input 2	
10A		009	Position input 3	
10B		010	Position input 4	
11A		011	Position input 5	
11B		012	Position input 6	
12A		013	Position input 7	
12B		014	Position input 8	
13A		015	Position input 9	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	Push motion complete	This is output when the push move operation is complete.
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

Wiring Diagram

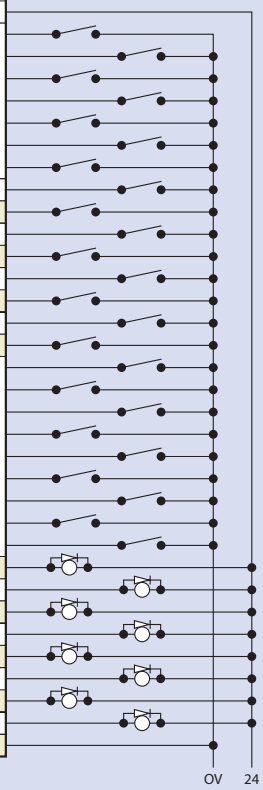


Explanation of I/O Functions

Positioner, Product-Type Switchover Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position/part type input 10	Port Nos. 007 to 022 are used to specify a target position number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified as either BCD or binary.
2A		017	Position/part type input 11	
2B		018	Position/part type input 12	
3A		019	Position/part type input 13	
3B		020	Position/part type input 14	
4A		021	Position/part type input 15	
4B		022	Position/part type input 16	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This is used to perform a return to home.
6B		002	Servo ON	This is used to switch the servo between ON and OFF.
7A		003	Pressing	This is used to perform the push motion operation.
7B		004	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancel	When this is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
9A		007	Position/part type input 1	This specifies the position numbers to move to using port numbers 007 to 022 and the position numbers input. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified as either BCD or binary.
9B		008	Position/part type input 2	
10A		009	Position/part type input3	
10B		010	Position/part type input 4	
11A		011	Position/part type input 5	
11B		012	Position/part type input 6	
12A		013	Position/part type input 7	
12B		014	Position/part type input8	
13A		015	Position/part type input 9	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	Push motion complete	This is output when the push move operation is complete.
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

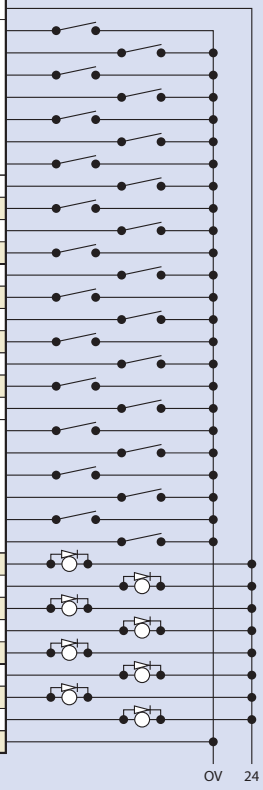
Wiring Diagram



Positioner, 2-axis Independent Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position input 7	Port Nos. 010 to 022 are used to specify a target position number. The Axis-1position number and Axis-2 position number are assigned in the parameters. Numbers can be specified as either BCD or binary.
2A		017	Position input 8	
2B		018	Position input 9	
3A		019	Position input 10	
3B		020	Position input 11	
4A		021	Position input 12	
4B		022	Position input 13	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start 1	This starts movement toward the position number selected for the Axis-1 to start moving to the selected position.
6A		001	Home return 1	This is used to return Axis-1 to home.
6B		002	Servo ON 1	This switches the servo for Axis-1 ON and OFF.
7A		003	Pause 1	This pauses Axis-1 when the movement signal turns off, and continues movement when the signal turns on.
7B		004	Cancel 1	This cancels movement for Axis-1.
8A		005	Start 2	This starts moving Axis-2 to the selected position. to start moving to the selected position.
8B		006	Home return 2	This returns Axis-2 to home.
9A		007	Servo ON 2	This switches the servo ON and OFF for Axis-2.
9B		008	Pause 2	This pauses Axis-2 when the movement signal turns OFF, and continues the remaining movement when the signal turns on.
10A		009	Cancel 2	This cancels movement for Axis-2.
10B		010	Position input 1	Port Nos. 010 to 022 are used to specify a target position number. The Axis-1position number and Axis-2 position number are assigned in the parameters. Numbers can be specified as either BCD or binary.
11A		011	Position input 2	
11B		012	Position input 3	
12A		013	Position input 4	
12B		014	Position input 5	
13A		015	Position input 6	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	Positioning complete 1	This is output when movement of Axis-1 to the specified position is complete.
15A		303	Home return complete 1	This is output when Axis-1has completed returning to home.
15B		304	Servo ON output 1	This is output when the servo for Axis-1comes ON.
16A		305	Positioning complete 2	This is output when movement of Axis-2 to the specified position is complete.
16B		306	Home return complete 2	This is output when Axis-2 has completed returning to home.
17A		307	Servo ON output 2	This is output when the servo for Axis-2 comes ON.
17B	N		0V input	Connect 0V.

Wiring Diagram

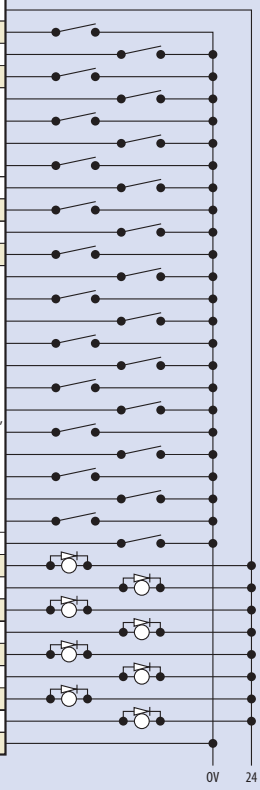


Explanation of I/O Functions

Positioner, Teaching Mode

Pin number	Classification	Port No.	Positioner item type switching mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Axis-1, JOG -	This moves Axis-1 in the negative direction between the signal inputs.
2A		017	Axis-2, JOG +	This moves Axis-2 in the positive direction between the signal inputs.
2B		018	Axis-2, JOG -	This moves Axis-2 in the negative direction between the signal inputs.
3A		019	Inching specification (0.01mm)	This specifies how much to move during inching. (This is the total amount of movement for values specified for port numbers 019 to 022.)
3B		020	Inching specification (0.1mm)	
4A		021	Inching specification (0.5mm)	
4B		022	Inching specification (1mm)	
5A		023	Error reset	This resets minor errors. (The power supply must be restarted for critical errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Servo ON	This is used to switch the servo between ON and OFF.
6B		002	Pause	When turned OFF while the actuator is moving, the actuator will pause. When turned ON, the actuator will resume and complete the remaining operation.
7A		003	Position input 1	This specifies the position numbers to move to using port numbers 003 to 013 and the position numbers input to specify a target position number. Port No. When the 014 teaching mode specification is on, when the port number 000 status signal comes on, the current value is written to the specified position number.
7B		004	Position input 2	
8A		005	Position input 3	
8B		006	Position input 4	
9A		007	Position input 5	
9B		008	Position input 6	
10A		009	Position input 7	
10B		010	Position input 8	
11A		011	Position input 9	
11B		012	Position input 10	
12A		013	Position input 11	
12B		014	Teaching mode specification	
13A		015	Axis-1, JOG +	This moves Axis-1 in the positive direction between the signal inputs.
13B	Output	300	Alarm	This is output when an alarm goes off. (Contact B)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	Positioning complete	This is output when movement to the specified position is complete.
15A		303	Home return complete	This is output when return to home is complete.
15B		304	Servo ON output	This is output when the servo turns ON.
16A		305	–	–
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

Wiring Diagram

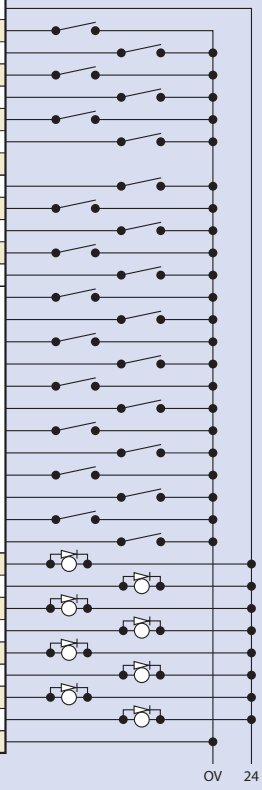


Positioner, DS-S-C1 Compatible Mode

Pin number	Classification	Port No.	Positioner standard mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position No. 1000	(Same as port numbers 004 to 015)
2A		017	Position No. 2000	–
2B		018	Position No. 4000	–
3A		019	Position No. 8000	–
3B		020	Position No. 10000	–
4A		021	Position No. 20000	–
4B		022	NC (*1)	–
5A		023	CPU reset	This resets the system and puts it back into the same state as when the power is turned on.
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Hold (pause)	The system pauses when the movement signal comes on, and continues the remaining movement when the signal turns off.
6B		002	Cancel	The system stops when the movement signal comes on, and cancels the remaining movement.
7A		003	Interpolation settings	With a 2-axis specification, when the main signal is ON, the actuator moves via linear interpolation.
7B		004	Position No. 1	This specifies the position numbers to move to using port numbers 004 to 016 to specify a target position number. Numbers should be specified in BCD.
8A		005	Position No. 2	
8B		006	Position No. 4	
9A		007	Position No. 8	
9B		008	Position No. 10	
10A		009	Position No. 20	
10B		010	Position No. 40	
11A		011	Position No. 80	
11B		012	Position No. 100	
12A		013	Position No. 200	
12B		014	Position No. 400	
13A		015	Position No. 800	
13B	Output	300	Alarm	This outputs when an alarm goes off. (Contact point A)
14A		301	Ready	This is output when the controller starts up normally and enters an operating state.
14B		302	In position	This is output when movement to the specified position is complete.
15A		303	–	–
15B		304	–	–
16A		305	–	–
16B		306	System battery error	This is output when the system battery voltage is low (warning level).
17A		307	Absolute battery error	This is output when the absolute battery voltage is low (warning level).
17B	N		0V input	Connect 0V.

(*1) The input needs to be set to OFF. Always leave this disconnected.

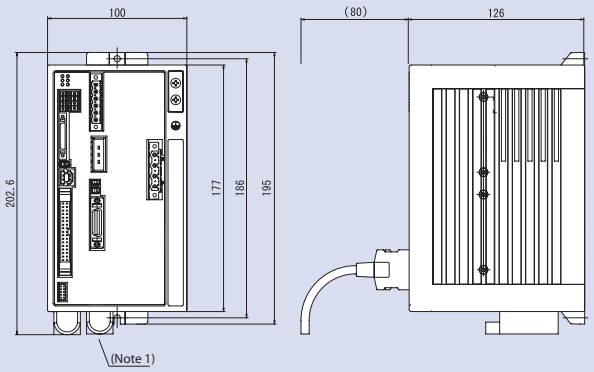
Wiring Diagram



	Item	Specifications	
Basic specifications	Connected Actuator	RCS2 Series Actuator / Single-Shaft Robot / Linear Servo Actuator	
	Input power	Single-Phase AC100 to 115V ±10%	Single-Phase AC200 to 240V ±10%
	Power-supply capacity	Max. 1660VA (for 400W, 2-shaft operation)	
	Dielectric strength voltage	500VDC, 10MΩ or above	
	Withstand Voltage	500VAC, 1 minute	
	Rush current	Control Power 15A / Motor Power 37.5A	Control power supply 30A / Motor Power 75A
	Vibration resistance	XYZ directions 10 to 57Hz One side amplitude: 0.035mm (continuous) 0.075mm (intermittent) 58 to 150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)	
Control specifications	Number of control axes	1 axis/2 axes	
	Maximum total output of connected axis	400W	800W
	Position detection method	Incremental Encoder/Absolute Encoder	
	Speed setting	From 1mm/s. The maximum limit varies depending on the actuator.	
	Acceleration setting	From 0.01G. The maximum limit varies depending on the actuator.	
	Operating method	Program operation / Positioner operation (switchable)	
Program	Programming language	Super SEL language	
	Number of programs	128 points	
	Number of program steps	9,999 steps	
	Number of multi-tasking programs	8 programs	
	Number of positions	20000 points	
	Data memory device	Flash ROM (A system-memory backup battery can be added as an option)	
	Data input method	Teaching pendant or PC software	
Communication	Number of I/O	24 input points / 8 output points (NPN or PNP selectable)	
	I/O power	Externally supplied 24VDC ± 10%	
	PIO cable	CB-DS-PIO□□□ (supplied with the controller)	
	Serial communications function	RS232C (D-Sub half-pitch connector)/USB connector	
	Field network	(To be supported in the future)	
	Motor cable	CB-RCP2-MA□□□ (Max. length 20m)	
	Encoder cable	CB-RCS2-PA□□□ (Max. length 20m)	
General specifications	Protective function	Motor overcurrent, motor driver temperature check, overload check, encoder open-circuit check soft limit over, system error, battery error, etc.	
	Ambient operating humidity and temperature	0 to 40°C 10 to 95°C (non-condensing)	
	Ambient atmosphere	Free from corrosive gases. In particular, there shall be no significant powder dust.	
	Protection class	IP20	
	Weight	1.4kg	
	Exterior dimensions	100mm (W)×202.6mm (H)×126mm (D)	

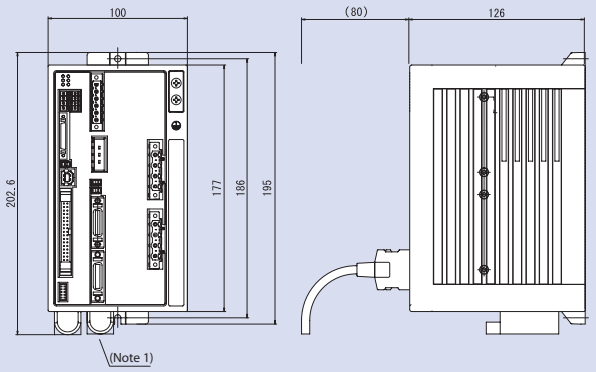
Exterior dimensional drawing

SSEL 1-axis controller



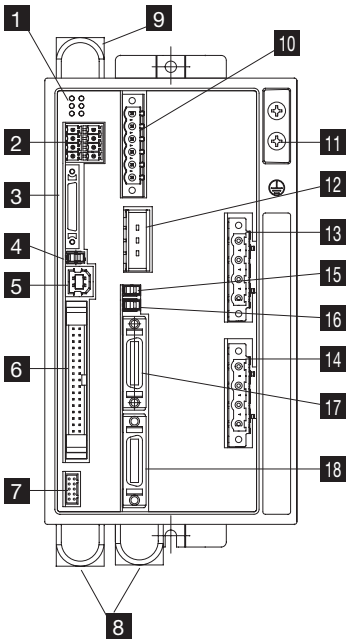
(Note 1) Absolute data back-up battery. Not installed with incremental specification.

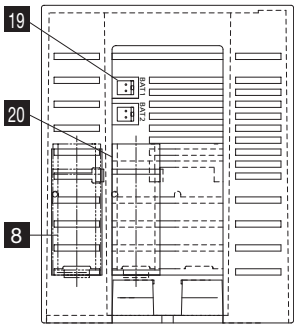
SSEL 2-axis controller

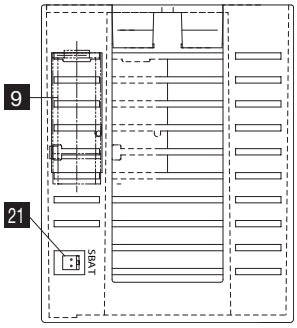


(Note 1) Absolute data back-up battery. Not installed with incremental specification.

Name of Each Part







1 Status Indicator LED

These LEDs are used to indicate the operating condition of the controller.
The displayed content is as follows

PWR : Indicates power is input to controller.
RDY : This LED indicates that the controller is ready to perform program operation.
ALM : This LED indicates that the controller is abnormal.
EMG : This LED indicates that an emergency stop is actuated and the drive source is cut off.
SV1 : This LED indicates that the axis 1 actuator servo is on.
SV2 : This LED indicates that the axis 2 actuator servo is on.

2 System I/O connector

Connector for emergency stop / enable input / brake power input, etc.

3 Teaching pendant connector

A half-pitch I/O 26-pin connector that connects a teaching pendant when the running mode is MANU.
A special conversion cable is needed to connect a conventional Dsub, 25-pin connector.

4 Mode switch

This switch is used to specify the running mode of the controller. The left position indicates the MANU (manual operation) mode, while the right position indicates the AUTO (automatic operation) mode. Teaching can only be performed as manual operation, and automatic operation using external I/Os is not possible in the MANU mode.

5 USB connector

A connector for PC connection via USB. If the USB connector is connected, the TP connector is disabled and all communication inputs to the TP connector are cut off.

6 IO connector

A connector for interface I/Os. 34-pin flat cable connector for DIO (24IN/8OUT) interface. IO power is also supplied to the controller via this connector (Pin No. 1 and Pin No. 34).

7 Panel unit connector

A connector for the panel unit (optional) that displays the controller status and error numbers.

8 Absolute data backup battery

When an absolute-type axis is operated, this battery retains position data even after the power is cut off.

9 System memory backup battery(optional)

This battery is needed if you wish to retain various data recorded in the SRAM of the controller even after the power is cut off. This battery is optional. Specify it if necessary.

10 Power Supply Connector

An AC Power supply connector. Divided into the control power input and motor power input.

11 Ground Screw

Protective Ground Screw. Always connect this screw to ground.

12 External regenerative resistor connector

A connector for the regenerative resistor that must be connected when the built-in regenerative resistor alone does not offer sufficient capacity in high-acceleration/ high-load operation, etc. Whether or not an external regenerative resistor is necessary depends on the conditions of your specific application such as the axis configuration.

13 Motor connector for axis 1

Connects the motor cable of the axis 1 actuator.

14 Motor connector for axis 2

Connects the encoder cable of the axis 2 actuator.

15 Brake switch for axis 1

This switch is used to release the axis brake. Setting it to the left position (RLS side) forcibly releases the brake, while setting it to the right position (NOM side) causes the controller to automatically control the brake

16 Brake switch for axis 2

This switch is used to release the axis brake. This switch is used to release the axis brake. Setting it to the left position (RLS side) forcibly releases the brake, while setting it to the right position (NOM side) causes the controller to automatically control the brake.

17 Encoder connector for axis 1

Connects the encoder cable of the axis 1 actuator.

18 Encoder connector for axis 2

Connects the encoder cable of the axis 2 actuator.

19 Absolute-data backup battery connector for axis 1

A connector for the battery that backs up absolute data when the actuator uses an absolute encoder.

20 2nd Shaft Absolute Battery Connection Cable

A connector for the battery that backs up absolute data when the actuator uses an absolute encoder.

21 System-memory backup battery connector

A connector for the system-memory backup battery.

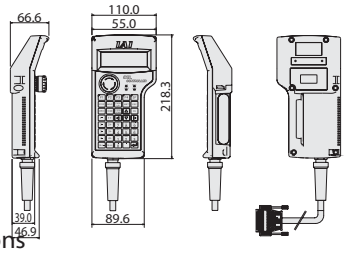
Options

Teaching pendant

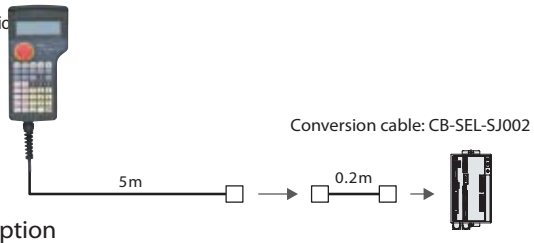
Features This is a teaching device that provides information on functions such as programs, position input, running tests, and monitoring.

Model/price

Model	Description	Standard price
SEL–T–J	Standard type with connector conversion cable	—
SEL–TD–J	Deadman's switch type with connector conversion cable	—



Configuration

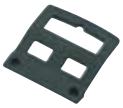


Specifications

Model	SEL–T–J	SEL–TD–J
3 position enabling switch	No	Yes
ANSI/UL standards	Not compatible	Compatible
CE mark	Compatible	
Display	20 characters x 4 lines	
Ambient operating temperature, humidity	0 to 40°C, 10 to 90% RH (non-condensing)	
Protective structure	IP54	
Weight	Approx. 0.4kg (excluding cable)	

SEL-T option

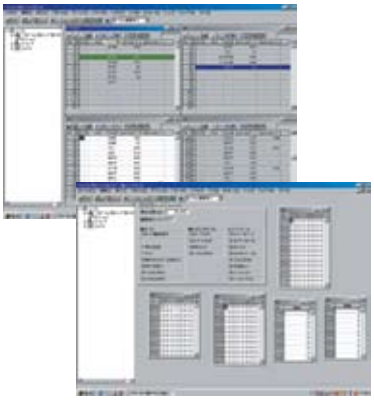
- Wall-mounting hook
  Model HK-1



- Strap
  Model STR-1

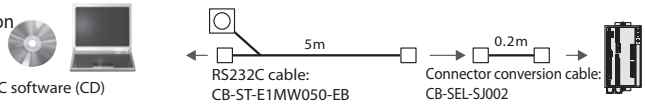
Computer software (Windows only)

Features A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.



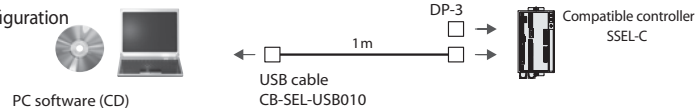
Model **IA-101-X-MW-J** (comes with RS232C cable + connector conversion cable)
IA-101–X–MW (with RS232C cable)

Configuration



Model **IA-101-X-USB** (for USB cable)

Configuration



Note:
Only Ver. 6.0.0.0 and later versions can be used with the PSEL controller. can be used with the PSEL controller.

Regenerative resistance unit

Features This unit converts the regenerated current that is generated when the motor decelerates to heat. Please verify the total wattage of the actuator from the chart at the right, as it is necessary to make preparations to the regenerative resistance.

Model **REU-2** (for SCON/SSEL)

Specifications

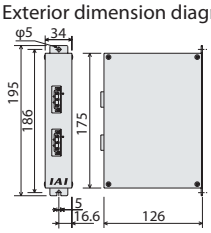
Weight of main unit	0.9kg
Built-in regenerative resistor	220Ω 80W
Main unit-controller connection cable (provided)	CB-SC-REU010 (for SSEL)

Required number of targets

	Horizontal	Vertical
0	~ 200W	~ 200W
1	~ 800W	~ 600W
2		~ 800W

* Depending on the operating conditions, there may be times when more regenerativeresistance is needed.

Exterior dimension diagram

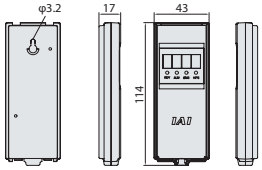


*If 2 regenerative units are needed, use REU-2 and REU-1 (see P432), one each.

Panel unit

Features This is a display device that can be used to verify controller error codes and operating program numbers.

Model **PU-1** (cable length 3m)



Battery for retaining absolute data

Features This battery is for storing absolute data for the operating actuator.
This is common with the system memory back-up battery.

Model **AB-5**

System memory back-up battery

Features This battery is required if data such as global flags in programs will need to be retained even when the power is shut off.

Model **AB-5-CS (with case)**
AB-5 (battery unit)

Options

Dummy plug

Features When connecting the SSEL controller to a computer with a USB cable, this plug is inserted into the teaching port to shut off the enable circuit.
(This is supplied with computer software IA-101-X-USB.)

Model DP–3

USB cable

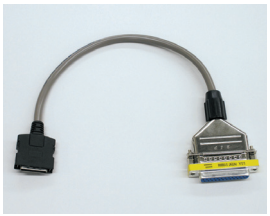
Features This cable is for connecting a controller with a USB port to a computer.
A controller without a USB port (XSEL) can be connected to the USB port of a computer if a RS232C cable is connected to the USB cable via a USB conversion adapter.
(See computer software IA-101-X-USBMW)

Model **CB-SEL-USB010** (cable length 1m)

Connector conversion cable

Features This is a conversion cable for connecting a D-sub 25-pin connector for a teaching pendant or computer software to a SSEL controller teaching connector (half-pitch).

Model **CB-SEL-SJ002** (cable length 0.2m)



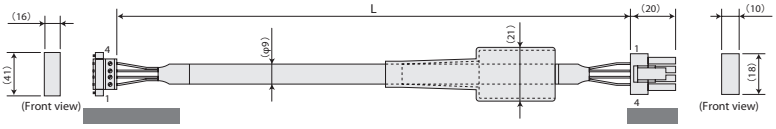
Maintenance Parts

Refer to the models below if it is necessary to replace cables for your purchase.

Motor Cable/Motor Robot Cable

Model **CB-RCC-MA□□□ / CB-RCC-MA□□□-RB**

* Enter the cable length (L) for □□□, up to a maximum compatible length of 30m.
Example: 080=8m



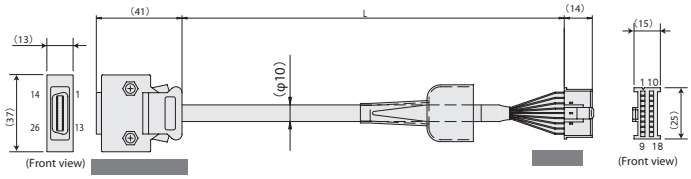
Wiring	Color	Signal	
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

	Signal	Color	Wiring
1	U	Red	0.75sq (Crimped)
2	V	White	
3	W	Black	
4	PE	Green	

RCA Encoder Cable/Encoder Robot Cable

Model **CB-RCS2-PA□□□ / CB-X3-PA□□□**

* Enter the cable length (L) for □□□, up to a maximum compatible length of 30m.
Example: 080=8m



Wiring	Color	Signal	No.
AWG26 (with solder)	–	–	10
	–	–	11
	–	E24V	12
	Gray/White	0V	13
	Brown/White	LS	26
	–	CLEEP	25
	–	OT	24
	–	RSV	23
	–	–	9
	–	–	18
	–	–	19
	Pink	A+	1
	Purple	A-	2
	White	B+	3
	Blue/Red	B-	4
	Orange/White	Z+	5
	Green/White	Z-	6
	Blue	SRD+	7
	Orange	SRD-	8
	Black	BAT+	14
	Yellow	BAT+	15
	Green	VCC	16
	Brown	GND	17
	Gray	BKR-	20
	Red	BKR+	21
	–	–	22

The shield is connected to the hood with a clamp

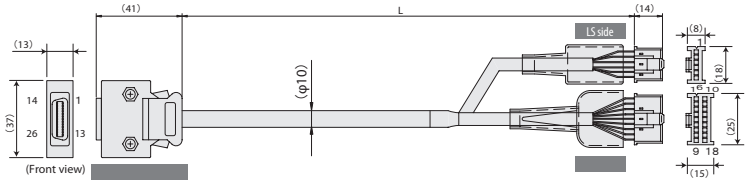
Drain wire and shield braiding

No.	Signal	Color	Wiring
1	A	Pink	AWG26 (crimped)
2	A	Purple	
3	B	White	
4	B	Blue/Red	
5	Z	Orange/White	
6	Z	Green/White	
7	LS+	Brown/White	
8	–	–	
9	FG	Drain	
10	SD	Blue	
11	SD	Orange	
12	BAT+	Black	
13	BAT-	Yellow	
14	VCC	Green	
15	GND	Brown	
16	LS-	Gray/White	
17	BK-	Gray	
18	BK+	Red	

RCA Encoder Cable/Encoder Robot Cable

Model **CB-RCS2-PLA□□□ / CB-X2-PLA□□□**

* Enter the cable length (L) for □□□, up to a maximum compatible length of 30m.
Example: 080=8m



Wiring	Color	Signal	No.
AWG26 (with solder)	–	–	10
	–	–	11
	White/Orange	E24V	12
	White/Green	0V	13
	Brown/Blue	LS	26
	Brown/Yellow	CLEEP	25
	Brown/Red	OT	24
	Brown/Black	RSV	23
	–	–	9
	–	–	18
	–	–	19
	White/Blue	A+	1
	White/Yellow	A–	2
	White/Red	B+	3
	White/Black	B–	4
	White/Purple	Z+	5
	White/Gray	Z–	6
	Orange	SRD+	7
	Green	SRD–	8
	Purple	BAT+	14
	Gray	BAT-	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

The shield is connected to the hood with a clamp

Drain wire and shield braiding

(White/Blue in the wire colors indicates band color/insulation color.)

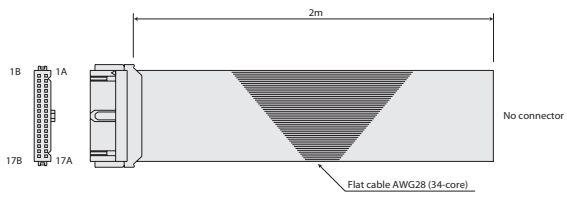
No.	Signal	Color	Wiring
1	E24V	White/Orange	AWG26 (crimped)
2	0V	White/Green	
3	LS	Brown/Blue	
4	CLEEP	Brown/Yellow	
5	OT	Brown/Red	
6	RSV	Brown/Black	

No.	Signal	Color	Wiring
1	A	White/Blue	AWG26 (crimped)
2	A	White/Yellow	
3	B	White/Red	
4	B	White/Black	
5	Z	White/Purple	
6	Z	White/Gray	
7	–	–	
8	–	–	
9	FG	Drain	
10	SD	Orange	
11	SD	Green	
12	BAT+	Purple	
13	BAT-	Gray	
14	VCC	Red	
15	GND	Black	
16	–	–	
17	BK–	Blue	
18	BK+	Yellow	

I/O Flat Cable

Model **CB-DS-PIO□□□**

* Enter the cable length (L) for □□□, up to a maximum compatible length of 10m.
Example: 080=8m



No.	Color	Wiring	No.	Color	Wiring
1A	Brown 1	Flat cable crimped	9B	Gray 2	Flat cable crimped
1B	Red 1		10A	White2	
2A	Orange 1		10B	Black 2	
2B	Yellow 1		11A	Brown-3	
3A	Green 1		11B	Red 3	
3B	Blue 1		12A	Orange 3	
4A	Purple 1		12B	Yellow 3	
4B	Gray 1		13A	Green 3	
5A	White 1		13B	Blue 3	
5B	Black 1		14A	Purple 3	
6A	Brown-2		14B	Gray 3	
6B	Red 2		15A	White 3	
7A	Orange 2		15B	Black 3	
7B	Yellow 2		16A	Brown-4	
8A	Green 2		16B	Red 4	
8B	Blue 2		17A	Orange 4	
9A	Purple 2		17B	Yellow 4	

X-SEL

For RCS2 Series
Program Controller

Model List/Prices

Multi-axis program controller for RCS2 series actuator. Up to 6 axes can be simultaneously controlled.

Type Name	J	K	P	Q
Title	Compact Type	General Purpose Type	Large-Capacity Type	Large-capacity Type (meeting safety category)
External View				
Description	Compact, low-cost type ideal for operating low-output actuators	Standard type offering excellent expandability	Large-capacity type capable of controlling up to six axes or 2,400W	Large-capacity type conforming to safety category 4
Maximum number of control axes	4 axes		6 axes	
Number of positions	3,000 positions		20,000 positions	
Total Number of Connectable W	800W	1600W	2400W	
Power Supply	Single-phase AC100V/Single-phase AC200V		Single-phase AC200V/3-phase AC200V	
Safety Category	B		B	4 Applications Enabled
Safety Rating	–	–	CE	CE, ANSI
Standard Price	—			

(*1) Maximum output for 1 shaft during vertical operation is limited to less than 600W.

Model

[XSEL-J/K Type]

*To specify multiple options, enter them in alphabetical order. (Example: Brake + Home sensor BL)

*The specifications for axes 2 to 4 depends on how many axes are being used.

XSEL – ☐ – ☐ – ☐ ☐ ☐ –(☐ ☐ ☐)– ☐ – ☐ ☐ ☐ – ☐ – ☐

Series: J Small type; K General purpose type

Type: 1 1-axis spec; 2 2-axis spec; 3 3-axis spec; 4 4-axis spec

Number of axes for connection

(Description for Axis-1) Motor type: 20 20W servo motor; 30D 30W servo motor for RCS2; 30R 30W servo motor for RS; 60 60W servo motor; 100 100W servo motor; 150 150W servo motor; 200 200W servo motor; 300 300W servo motor; 400 400W servo motor; 600 600W servo motor; 750 750W servo motor

(Description for Axis-1) Encoder type: I Incremental; A Absolute

(Description for Axis-1) Option: B Brake; C Creep sensor; HA High-acceleration/deceleration spec; L Home sensor/LS-compatible; M Master axis spec; S Slave axis spec

(Description for 2 to 4 axes) Motor type: 20 20W servo motor; 30D 30W servo motor for RCS2; 30R 30W servo motor for RS; 60 60W servo motor; 100 100W servo motor; 150 150W servo motor; 200 200W servo motor; 300 300W servo motor; 400 400W servo motor; 600 600W servo motor; 750 750W servo motor

(Description for 2 to 4 axes) Encoder type: I Incremental; A Absolute

(Description for 2 to 4 axes) Option: B Brake; C Creep sensor; HA High-acceleration/deceleration spec; L Home sensor/LS-compatible; M Master axis spec; S Slave axis spec

(Slot 1) Standard I/O: *E (not used) is only for the expansion I/O.
E Not used; N1 Input 32/output 16 (NPN); N2 Input 16/output 32 (NPN); N3 Input 48/output 48 (NPN); P1 Input 32/output 16 (PNP); P2 Input 16/output 32 (PNP); P3 Input 48/output 48 (PNP); DV DeviceNet connection board; CC CC-Link connection board; PR ProfiBus connection board; ET Ethernet connection board

(Slot 2) / (Slot 3) Expansion I/O: E Not used; N1 Input 32/output 16 (NPN); N2 Input 16/output 32 (NPN); N3 Input 48/output 48 (NPN); P1 Input 32/output 16 (PNP); P2 Input 16/output 32 (PNP); P3 Input 48/output 48 (PNP); SA Expansion SIO, A-type; SB Expansion SIO, B-type; SC Expansion SIO, C-type

(Slot 4) Expansion I/O: E Not used; N1 Input 32/output 16 (NPN); N2 Input 16/output 32 (NPN); N3 Input 48/output 48 (NPN); P1 Input 32/output 16 (PNP); P2 Input 16/output 32 (PNP); P3 Input 48/output 48 (PNP); SA Expansion SIO, A-type; SB Expansion SIO, B-type; SC Expansion SIO, C-type

*The J type cannot be extended for 1-axis and 2-axes specifications. Expansion slot 2 can only be used for 3-axes and 4-axes specifications.
*The expansion SIO board is for the K type only. (It cannot be used for the J type.)

I/O Cable Length: 0 No cable; 2 2m (standard); 3 3m; 5 5m
* When DV, CC, PR, or ET is selected as the standard I/O or expansion I/O, select 0 (no cable) for the I/O cable length.

Power Voltage: 1 Single phase AC100V; 2 Single phase AC200V

[XSEL-P/Q Type]

*The descriptions for 2 to 6 axes differs based on the number of axes being used.

XSEL – ☐ – ☐ – ☐ ☐ ☐ –(☐ ☐ ☐)– ☐ – ☐ ☐ ☐ ☐ – ☐ – ☐

Series: P Large capacity type; Q Large capacity type (safety category compatible)

Type: 1 1-axis spec; 2 2-axis spec; 3 3-axis spec; 4 4-axis spec; 5 5-axis spec; 6 6-axis spec

Number of axes for connection

(Description for Axis-1) Motor type: 20 20W servo motor; 30D 30W servo motor for RCS2; 30R 30W servo motor for RS; 60 60W servo motor; 100 100W servo motor; 150 150W servo motor; 200 200W servo motor; 300 300W servo motor; 400 400W servo motor; 600 600W servo motor; 750 750W servo motor

(Description for Axis-1) Encoder type: I Incremental; A Absolute

(Description for Axis-1) Option: B Brake; C Creep sensor; HA High-acceleration/deceleration spec; L Home sensor/LS-compatible; M Master axis spec; S Slave axis spec

(Description for 2 to 6 axes) Motor type: 20 20W servo motor; 30D 30W servo motor for RCS2; 30R 30W servo motor for RS; 60 60W servo motor; 100 100W servo motor; 150 150W servo motor; 200 200W servo motor; 300 300W servo motor; 400 400W servo motor; 600 600W servo motor; 750 750W servo motor

(Description for 2 to 6 axes) Encoder type: I Incremental; A Absolute

(Description for 2 to 6 axes) Option: B Brake; C Creep sensor; HA High-acceleration/deceleration spec; L Home sensor/LS-compatible; M Master axis spec; S Slave axis spec

Dedicated network slot: Not entered Not used; DV DeviceNet connection board; CC CC-Link connection board; PR ProfiBus connection board; ET Ethernet connection board

(Slot 1) Standard I/O: E Not used; N1 Input 32/output 16 (NPN); N2 Input 16/output 32 (NPN); N3 Input 48/output 48 (NPN); P1 Input 32/output 16 (PNP); P2 Input 16/output 32 (PNP); P3 Input 48/output 48 (PNP); S With expansion I/O base

(Slot 2) / (Slot 3) / (Slot 4) Expansion I/O: E Not used; N1 Input 32/output 16 (NPN); N2 Input 16/output 32 (NPN); N3 Input 48/output 48 (NPN); P1 Input 32/output 16 (PNP); P2 Input 16/output 32 (PNP); P3 Input 48/output 48 (PNP); S With expansion I/O base

*If the expansion I/O is not used, enter E (not used) for slots 2 to 4.
If the expansion I/O is used, enter the number of expansion I/Os on the left for the slot position you wish to use.
If the expansion I/O is specified, the controller enclosure is the expansion I/O base. (see P429)
If the expansion I/O will not be used at first, but will be installed later, install only the I/O expansion board for the enclosure, and enter S for slots 2 to 4.

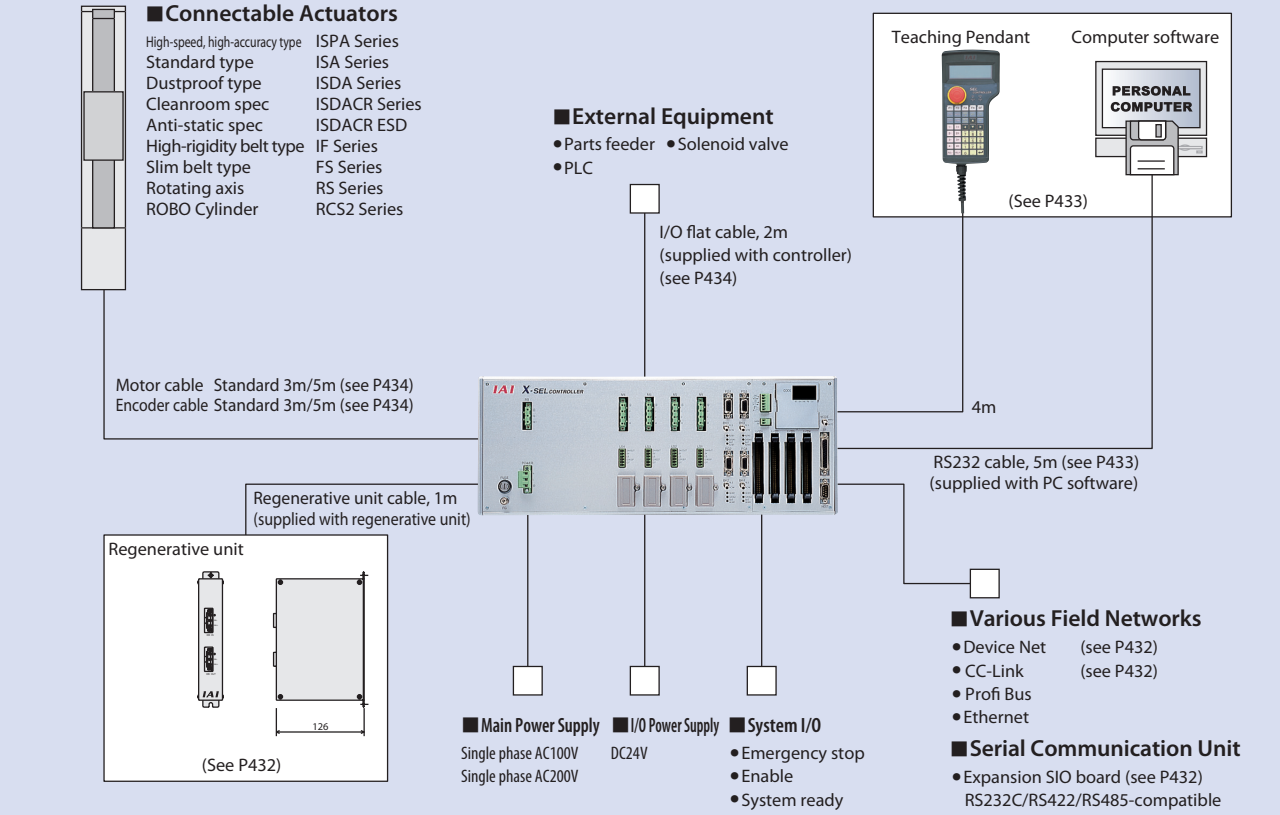
I/O Cable Length: 0 No cable; 2 2m (standard); 3 3m; 5 5m

Power Voltage: 2 Single phase AC200V; 3 Three phase AC200V

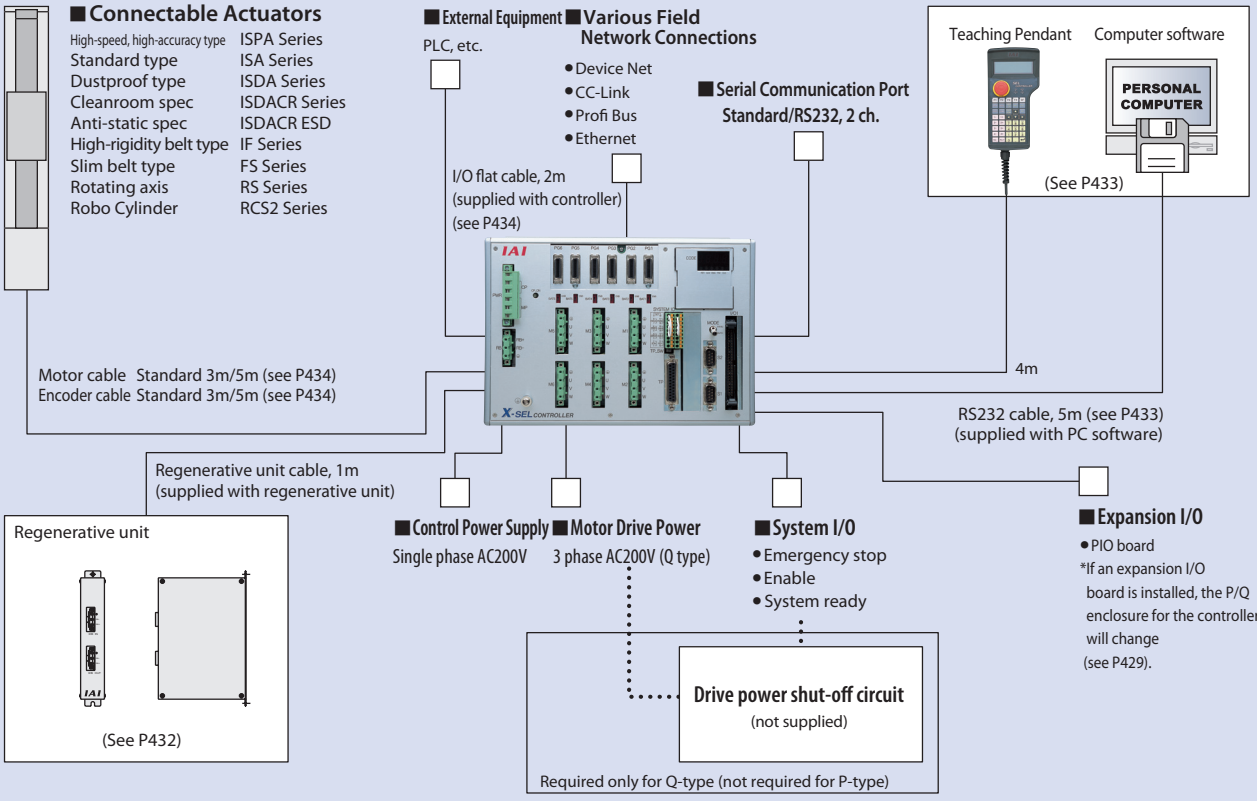
Example: If the expansion I/O is inserted into slot 2, and none of the other slots are used: XSEL-P-2-100A-100A-N1-N1EE-2-3
If the expansion I/O is not used and only the expansion I/O base is used XSEL-P-2-100A-100A-N1-SSS-2-3

System Configuration

J (Compact)/K (General Purpose)/KE (CE type)



J (Compact)/K (General Purpose)/KE (CE type)

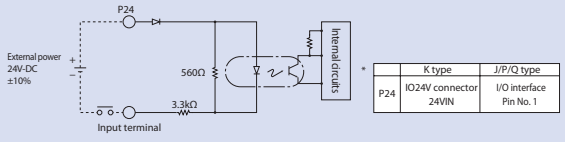


I/O Wiring Diagram

■Input External Input Specification (NPN Specification)

Item	Specifications
Input voltage	DC24V±10%
Input current	7mA 1 circuit
ON/OFF Voltage	ON Voltage... Min DC 16.0V, OFF Voltage... Max DC5.0V
Insulation method	Photocoupler Insulation
Externally Connected Equipment	(1) Non-Voltage Contact (Minimum load around DC5V, 1mA) (2) Photoelectric Proximity Sensor (NPN Type) (3) Sequencer Transistor Output (Open Collector Type) (4) Sequencer Contact Output (Minimum Load around DC5V, 1mA)

[Input circuits]

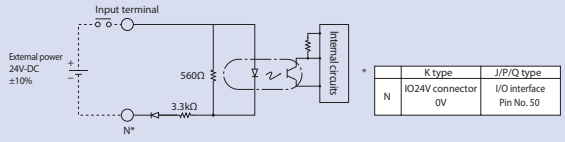


	K type	J/P/Q type
P24	IO24V connector 24VIN	I/O interface Pin No. 1

■Input External Input Specification (PNP Specification)

Item	Specifications
Input voltage	DC24V±10%
Input current	7mA 1 circuit
ON/OFF Voltage	ON Voltage... Min DC8V OFF Voltage... Max DC19V
Insulation method	Photocoupler Insulation
Externally Connected Equipment	(1) Non-Voltage Contact (Minimum load around DC5V, 1mA) (2) Photoelectric Proximity Sensor (PNP Type) (3) Sequencer Transistor Output (Open Collector Type) (4) Sequencer Contact Output (Minimum Load around DC5V, 1mA)

[Input circuits]

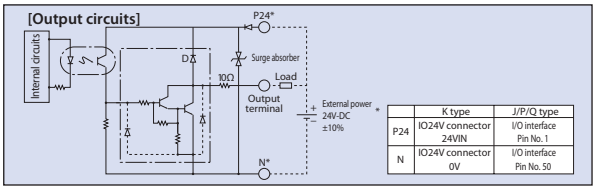


	K type	J/P/Q type
N	IO24V connector 0V	I/O interface Pin No. 50

■Output External Input Specification (NPN Specification)

Item	Specifications	
Load voltage	DC24V	TD62084 (or equivalent)
Maximum load current	100mA/1 point 400mA Peak (Total Current)	
Leak current	Max 0.1mA/ point	
Insulation method	Photocoupler Insulation	
Externally Connected Equipment	(1) Miniature Relay, (2) Sequencer Input Unit	

[Output circuits]



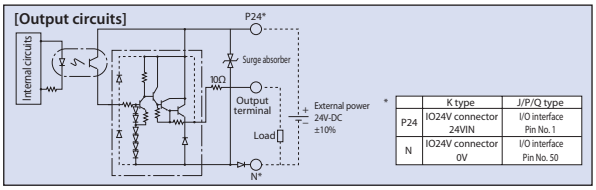
	K type	J/P/Q type
P24	IO24V connector 24VIN	I/O interface Pin No. 1
N	IO24V connector 0V	I/O interface Pin No. 50

■Output External Input Specification (PNP Specification)

Item	Specifications	
Load voltage	DC24V	TD62784 (or equivalent)
Maximum load current	100mA/1 point 400mA/8 ports (Note)	
Leak current	Max 0.1mA/ point	
Insulation method	Photocoupler Insulation	
Externally Connected Equipment	(1) Miniature Relay, (2) Sequencer Input Unit	

(Note) 400 mA is the maximum total load current for each set of the eight ports from output port No. 300. (The maximum total current output for output port No. 300+n to No. 300+n+7 must be 400 mA, where n = 0 or a multiple of eight.)

[Output circuits]



	K type	J/P/Q type
P24	IO24V connector 24VIN	I/O interface Pin No. 1
N	IO24V connector 0V	I/O interface Pin No. 50

I/O Signal Table

Standard I/O Signal Table (when N1 or P1 is selected)

Pin No.	Classification	Port No.	Standard Settings
1		-	(J/P/Q Type: 24V connection/K Type: NC)
2		000	Start Program
3		001	General Purpose Input
4		002	General Purpose Input
5		003	General Purpose Input
6		004	General Purpose Input
7		005	General Purpose Input
8		006	General Purpose Input
9		007	Program Specification (PRG No. 1)
10		008	Program Specification (PRG No. 2)
11		009	Program Specification (PRG No. 4)
12		010	Program Specification (PRG No. 8)
13		011	Program Specification (PRG No. 10)
14		012	Program Specification (PRG No. 20)
15		013	Program Specification (PRG No. 40)
16		014	General Purpose Input
17	Input	015	General Purpose Input
18		016	General Purpose Input
19		017	General Purpose Input
20		018	General Purpose Input
21		019	General Purpose Input
22		020	General Purpose Input
23		021	General Purpose Input
24		022	General Purpose Input
25		023	General Purpose Input
26		024	General Purpose Input
27		025	General Purpose Input
28		026	General Purpose Input
29		027	General Purpose Input
30		028	General Purpose Input
31		029	General Purpose Input
32		030	General Purpose Input
33		031	General Purpose Input
34		300	Alarm Output
35		301	Ready Output
36		302	Emergency Stop Output
37		303	General Purpose Output
38		304	General Purpose Output
39		305	General Purpose Output
40		306	General Purpose Output
41		307	General Purpose Output
42	Output	308	General Purpose Output
43		309	General Purpose Output
44		310	General Purpose Output
45		311	General Purpose Output
46		312	General Purpose Output
47		313	General Purpose Output
48		314	General Purpose Output
49		315	General Purpose Output
50		-	(J/P/Q Type: 0V connection/K Type: NC)

Expansion I/O Signal Table (when N1 or P1 is selected)

Pin No.	Classification	Standard Settings
1		(J/P/Q Type: 24V connection/K Type: NC)
2		General Purpose Input
3		General Purpose Input
4		General Purpose Input
5		General Purpose Input
6		General Purpose Input
7		General Purpose Input
8		General Purpose Input
9		General Purpose Input
10		General Purpose Input
11		General Purpose Input
12		General Purpose Input
13		General Purpose Input
14		General Purpose Input
15		General Purpose Input
16		General Purpose Input
17	Input	General Purpose Input
18		General Purpose Input
19		General Purpose Input
20		General Purpose Input
21		General Purpose Input
22		General Purpose Input
23		General Purpose Input
24		General Purpose Input
25		General Purpose Input
26		General Purpose Input
27		General Purpose Input
28		General Purpose Input
29		General Purpose Input
30		General Purpose Input
31		General Purpose Input
32		General Purpose Input
33		General Purpose Input
34		General Purpose Output
35		General Purpose Output
36		General Purpose Output
37		General Purpose Output
38		General Purpose Output
39		General Purpose Output
40		General Purpose Output
41		General Purpose Output
42	Output	General Purpose Output
43		General Purpose Output
44		General Purpose Output
45		General Purpose Output
46		General Purpose Output
47		General Purpose Output
48		General Purpose Output
49		General Purpose Output
50		(J/P/Q Type: 0V connection/K Type: NC)

Extension I/O Signal Table (when N2 or P2 is selected)

Pin No.	Classification	Standard Settings
1		(J/P/Q Type: 24V connection/K Type: NC)
2		General Purpose Input
3		General Purpose Input
4		General Purpose Input
5		General Purpose Input
6		General Purpose Input
7		General Purpose Input
8		General Purpose Input
9	Input	General Purpose Input
10		General Purpose Input
11		General Purpose Input
12		General Purpose Input
13		General Purpose Input
14		General Purpose Input
15		General Purpose Input
16		General Purpose Input
17		General Purpose Input
18		General Purpose Output
19		General Purpose Output
20		General Purpose Output
21		General Purpose Output
22		General Purpose Output
23		General Purpose Output
24		General Purpose Output
25		General Purpose Output
26		General Purpose Output
27		General Purpose Output
28		General Purpose Output
29		General Purpose Output
30		General Purpose Output
31		General Purpose Output
32		General Purpose Output
33		General Purpose Output
34	Output	General Purpose Output
35		General Purpose Output
36		General Purpose Output
37		General Purpose Output
38		General Purpose Output
39		General Purpose Output
40		General Purpose Output
41		General Purpose Output
42		General Purpose Output
43		General Purpose Output
44		General Purpose Output
45		General Purpose Output
46		General Purpose Output
47		General Purpose Output
48		General Purpose Output
49		General Purpose Output
50		(J/P/Q Type: 0V connection/K Type: NC)

Specification Table

■J (Compact)/K (General Purpose)

Item	Description							
Controller Series, Type	J (Compact) Type				K (General Purpose) Type/KE (CE Compatible) Type			
Connected Actuator	RCS2/ISA/ISPA/ISP/ISDA/ISDACR/ISPDACR/IF/FS/RS							
Compatible motor output (W)	20/30/60/100/150/200/300/400/600/750							
Number of control axes	1-axis	2 axes	3 axes	4 axes	1-axis	2 axes	3 axes	4 axes
Max Connected Axes Output (W)	Max800 (When power supply voltage is 200V) Max400 (When power supply voltage is 100V)				Max 800	Max1600 (When power supply voltage is 200V) Max800 (When power supply voltage is 100V)		
Input power supply	100V Specification: Single-phase AC100 to 115V 200V Specification: Single-phase AC200 to 230V							
Operating power-supply voltage range	±10%							
Power Supply Frequency	50Hz/60Hz							
Power-supply capacity	Max 1670VA		Max 1720VA	Max 1810VA	Max 1670VA	Max 3120VA	Max 3220VA	Max 3310VA
Position Detection Method	Incremental Encoder (Minimal Wiring Model) Absolute encoder with rotation data backup (wire-saving type)							
Speed setting	1mm/sec and up, maximum depends on actuator specifications							
Acceleration setting	0.01G and up, maximum depends on actuator							
Programming language	Super SEL language							
Number of programs	64 Programs							
Number of program steps	6,000 Steps (total)							
Number of multi-tasking programs	16 Programs							
Number of Positions	3,000 positions							
Data memory device	FLASH ROM+SRAM Battery Backup							
Data input method	Teaching pendant or PC software							
Standard Input/Output	32 points (total of dedicated inputs + general-purpose inputs) / 16 points (total of dedicated outputs + general-purpose outputs)							
Expansion Input/Output	No		48 points per unit (1 more unit can be installed)		48 points per unit (3 more units can be installed)			
Serial communications function	Teaching Port (25-pin D-sub) Standard Equipment				Teaching Pendant+ Expansion SIO Board Installable (optional)			
Other Input/Output	System I/O (Emergency Stop Input, Enable Input, System Ready Output)							
Protective Function	Motor overcurrent, overload, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, battery error, etc.							
Ambient operating temperature, humidity	Temperature 0 to 40°C, Humidity 30 to 85%							
Ambient operating environment	Free from corrosive gases. In particular, there shall be no significant powder dust.							
Weight	2.6kg	3.3kg	5.0kg		6.0kg	7.0kg		
Accessory	I/O Flat Cable							

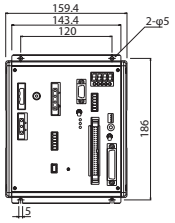
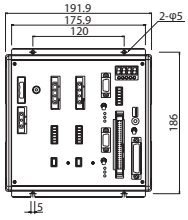
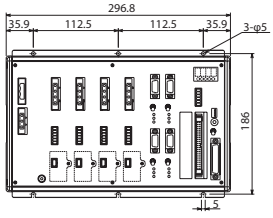
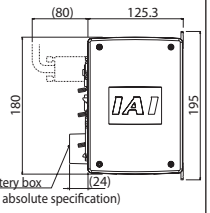
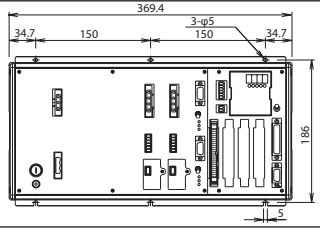
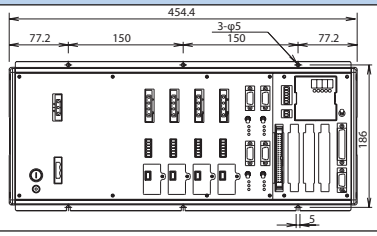
■P (Large-Capacity Standard Type), Q (Large-Capacity Global Type)

Item	Description											
Controller Series, Type	P (Standard) Type						Q (Global) Type					
Connected Actuator	RCS2/ISA/ISPA/ISP/ISDA/ISDACR/ISPDACR/IF/FS/RS/LSA											
Compatible Motor Output	20/30/60/100/150/200/300/400/600/750											
Number of Controlled Axes	1-axis	2 axes	3 axes	4 axes	5 axes	6 axes	1-axis	2 axes	3 axes	4 axes	5 axes	6 axes
Maximum Connected Axes Output (W)	Max 2400W (Single-phase AC200V specification is 1600W)											
Control Power Input	AC200/230 Single-phase –15%, +10%						AC200/230 Single-phase –15%, +10%					
Motor Power Input	AC200/230 Single-phase/3-phase –10%, +10%						AC200/230 Single-phase/3-phase –10%, +10%					
Power Supply Frequency	50/60Hz											
Insulation Resistance	10MΩ or more (between the power-supply terminal and I/O terminals, and between all external terminals and case, at 500VDC)											
Withstand Voltage	AC1500V (1 minute)						AC1500V (1 minute)					
Power Supply Capacity (*1)	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA
Position Detection Method	Incremental Encoder (Minimal Wiring Model) Absolute encoder with rotation data backup (wire-saving type)											
Safety Circuit Configuration	Redundancy not supported						Duplex Enabled					
Drive Source Breaker System	Internal cutoff relay						External Safety Circuit					
Enable Input	B Contact Input (Internal Power Supply Model)						B Contact Input (External Power Supply Model, Duplex)					
Speed setting	1mm/sec and up, Max. depends on actuator used											
Accleration/Deceleration Setting	From 0.01G. The maximum limit varies depending on the actuator.											
Programming language	Super SEL language											
Number of programs	128 Programs											
Number of program steps	9,999 Steps (Total)											
Number of multi-tasking programs	16 Programs											
Number of Positions	2,000 Positions (Total)											
Data memory device	FLASH ROM+SRAM Battery Backup											
Data input method	Teaching pendant or PC software											
Standard Input/Output	48-point I/O PIO Board (NPN/PNP), 96-point I/O PIO Board (NPN/PNP), 1 board can be installed											
Expansion Input/Output	48-point I/O PIO Board (NPN/PNP), 96-point I/O PIO Board (NPN/PNP), Up to 3 boards can be installed											
Serial communications function	Teaching Pendant (25-pin D-sub) Port + 2ch RS232C Port (9-pin D-sub (2)											
Protective Function	Motor overcurrent, overload, motor driver temperature check, overload check encoder open-circuit check, soft limit over, system error, battery error, etc.											
Ambient Operating Temperature, Humidity, Atmosphere	0 to 40°C, 10 to 95% (non- condensing). Free from corrosive gases. In particular, there shall be no significant powder dust.											
Weight (*2)	5.2kg					5.7kg	4.5kg					5kg
Accessory	I/O Flat Cable											

*1 When the connected axes represent the maximum wattage.
*2 Including the absolute-data backup battery, brake mechanism and expansion I/O box.

Exterior Dimensional Drawings

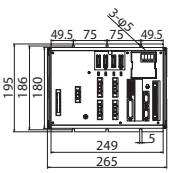
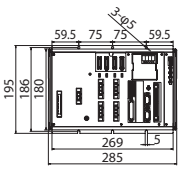
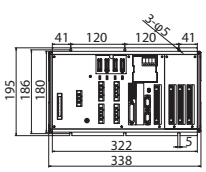
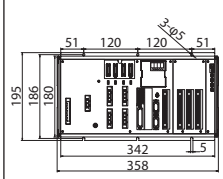
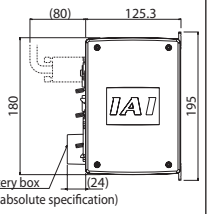
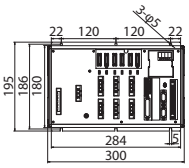
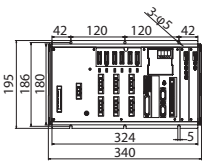
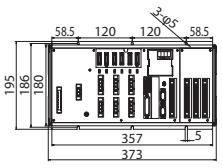
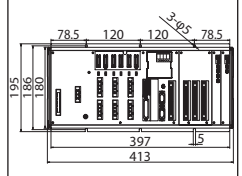
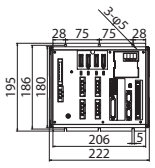
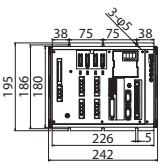
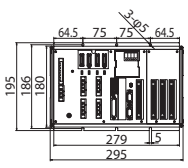
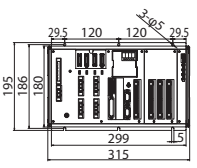
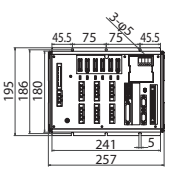
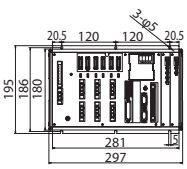
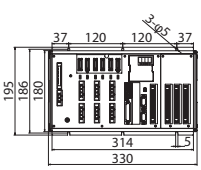
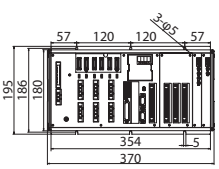
■J (Compact) Type/K (General Purpose) Type

	1-axis specification	2-axis specification	3/4-axis specification	Side View
J Type (Compact Type)				
	1/2-axis specification	3/4-axis specification		
K Type (General Purpose Type)				

■P (Large-Capacity Standard) Type/Q (Large-Capacity Global) Type

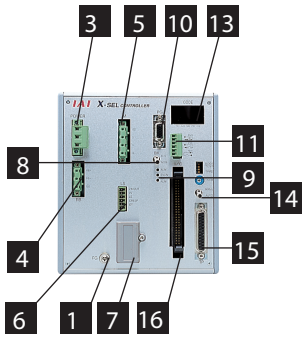
The XSEL-P/Q types have different shapes and dimensions in accordance with the controller specifications (encoder type, with/without brake, and with/without I/O expansion).
The 4 layouts below are available. Confirm the dimensions to match the desired type and number of axes.

Caution
Please note that the Q Type single-phase 200V specifications are the external dimensions for the P Type.

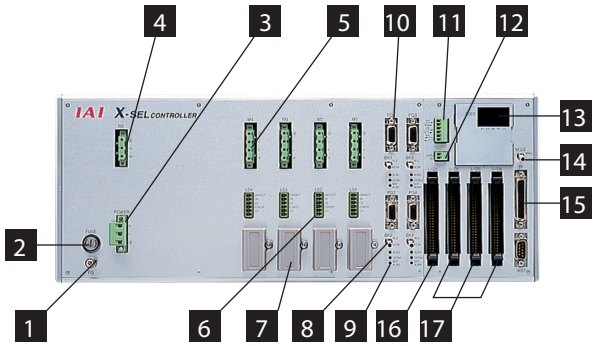
		Basic Layout (Incremental Specification)	With brake/absolute unit	With I/O Expansion Base	With brake/absolute unit + I/O expansion base	Side View
Controller Specifications	Encoder	Incremental	Absolute	Incremental	Absolute	
	Brake	No	Yes	No	Yes	
	I/O	Standard Only	Standard Only	Standard + Expansion	Standard + Expansion	
P Type (Single-Phase Specification 3-Phase Specification)	1 to 4-axis Specifications					
Q Type (Single-Phase Specification)	5 to 6-axis Specifications					
Q Type (3-phase Specification)	1 to 4-axis Specifications					
	5 to 6-axis Specifications					

Part Names

J Type (Compact)



K Type (General Purpose)



1 FG Connection Terminal

A terminal for connecting to the FG terminal on the enclosure.
The PE of the AC input are connected to the enclosure inside the controller.

2 Fuse Holder (K Type only)

This is the single-pole fuse holder for overcurrent protection in the AC input.

3 Main Power Input Connector

This connector is for AC100/200V single-phase input.
(See page at right for cable-side plug accessories)

4 Regeneration Resistance Unit Connector

This connector is for the regenerative resistance unit (optional/REU-1) that is connected when there is insufficient capacity with the built-in regenerative resistor for high-acceleration/high-loads, etc.

5 Motor Cable Connector

A connector for the motor power-supply cable of the actuator.

6 Actuator Sensor Input Connector

A connector for axis sensors such as LS, CREEP and OT.

7 Absolute-data backup battery

This is the encoder backup battery unit when an absolute encoder is used.
This battery is not connected for a non-absolute axis.

8 Brake Release Switch (Brake-equipped specification only)

Locking alternative switch for releasing the axis brake.
Pull the switch forward and then tilt it up or down.
Set the switch to the top position (RLS) to forcibly release the brake, or to the bottom position (NOM) to have the brake automatically controlled by the controller.

9 Axis Driver Status LED

This LED is for monitoring the operating status of the driver CPU that controls motor drive.
Features the following 3 LEDs.

Title	Color	Description when lit
ALM	Orange	Indicates when an error has been detected by the driver.
SVON	Green	Indicates the servo ON and the motor is driven.
BATT ALM	Orange	Indicates low absolute battery charge.

10 Encoder Cable Connector

15-pin D-sub connector for the actuator encoder cable.

11 System IO Connector

A connector for three input/output points including two inputs used to control controller operation, and one system status output.
(See page at right for cable-side plug accessories)

Title		
EMG	Emergency Stop Input	ON=operation enabled, OFF=emergency stop
ENB	Safety Gate Input	ON=operation enabled, OFF=servo OFF
RDY	System Ready Relay Output	This signal outputs the status of this controller. Cascade connection is supported. Short=ready, Open=not ready

12 I/O 24V Power Connector (K Type only)

This connector is for supplying external I/O power to the insulator when DIs and DOs are installed in the I/O boards.

13 Panel Window

This window has a 4-digit, 7-segment LED and five LED lamps showing the system status.

14 Mode Switch

This is a locking alternate switch for designating the controller operating mode. Pull the switch forward and then tilt it up or down. The top position indicates the MANU (manual operation) mode, while the bottom position indicates the AUTO (automatic operation) mode. Teaching can only be performed as manual operation, and automatic operation using external I/Os is not possible in the MANU mode.

15 Teaching Connector

This is a 25-pin D-sub connector for connecting a teaching pendant or PC and inputting programmed positions.

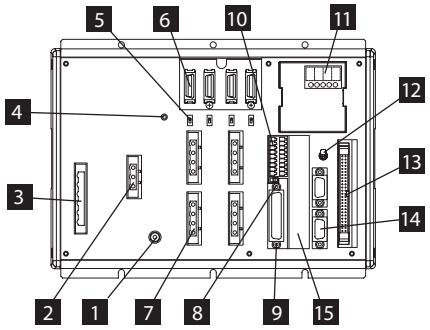
16 Standard I/O Slot (Slot 1)

A 32-point input/16-point output PI board is installed as standard equipment.

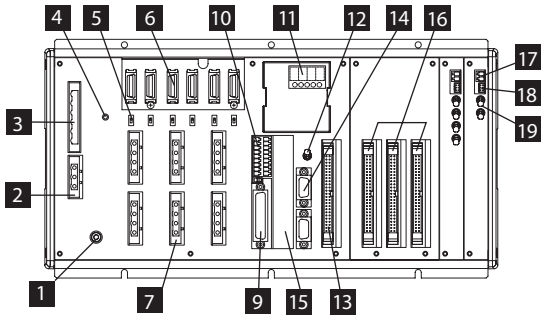
17 Expansion I/O Slots (Slot 2, Slot 3, Slot 4)

Install an expansion I/O board. (Option)

P Type (standard 4 axes)



Q Type (Absolute brake unit + 6 axes on an expansion basis)



1 FG Connection Terminal

This is the connection terminal when connecting to the FG terminal on the enclosure. The PE of the AC input are connected to the enclosure inside the controller.

2 External Regenerative Unit Connector

A connector for the regenerative resistor that must be connected when the built-in regenerative resistor alone does not offer sufficient capacity in high acceleration/high-load operation, etc. Whether or not an external regenerative resistor is necessary depends on the conditions of your specific application such as the axis configuration.

3 AC Power Input Connector

AC200V 3-phase input connector. It consists of six terminals including motor power-supply, control power-supply and PE terminals.
Standard equipment only includes terminal block.
Caution Due to risk of electrical shock, do not touch this connector while power is supplied.

4 Control Power Monitor LED

A green light illuminates while the control power supply is properly generating internal controller power.

5 Enable/Disable Switch for Absolute Battery

This switch is for enabling/disabling encoder backup using the absolute data backup battery. Encoder backup has been disabled prior to shipment. After connecting the encoder/axis-sensor cables, turn on the power, and then set this switch to the top position.

6 Encoder/Axis Sensor Connector

A connector for axis sensors such as LS, CREEP and OT. *: LS, CREEP, and OT are options.

7 Motor Connector

A connector for driving the motor in the actuator.

8 Teaching Pendant Type Selection Switch

9 This switch is for selecting the type of teaching pendant to connect to the teaching connector. Switch between an IAI standard teaching pendant and the ANSI-compatible teaching pendant. Operate the switch on the front face of the board in accordance with the teaching pendant used.

9 Teaching Connector

The teaching interface is used for connecting the IAI teaching pendant or the software on a PC to operate and configure the system, etc.

10 System I/O Connector

A connector for managing the safety operation functions of the controllers. Controllers of the global specification let you configure a safety circuit conforming to safety categories of up to 4 using this connector and an external safety circuit.

11 Panel Window

This window consists of a 4-digit, 7-segment LED and five LED lamps showing the system status.

Description of 5 LEDs

Name	Status when LED Is lit
RDY	CPU Ready (programs can be run)
ALM	CPU Alarm (System Down Level Error) CPU Hardware Problem
EMG	Emergency stop status, CPU hardware problem, or power system hardware problem
PSE	A power supply hardware problem is present
CLK	There is a system clock problem

12 Mode Switch

This is a locking alternate switch for designating the controller operating mode. Pull the switch forward and then tilt it up or down. Pull the switch forward and then tilt it up or down. Teaching can only be performed as manual operation, and automatic operation using externall/Os is not possible in the MANU mode

13 Standard I/O Connector

50-pin flat connector structure, comprising 32 input/16 output DIOs.
Overview of Standard I/O Interface Specifications

Item	Details
Connector Name	I/O
Applicable connector	50-Pins, Flat Connector
Power Supply	Power is supplied through connector pins No. 1 and No. 50.
Input	32 points (including general-purpose and dedicated inputs)
Output	16 points (including general-purpose and dedicated inputs)
Connected to	External PLC, sensors, etc.

14 General-purpose RS232C Port Connector

This port is for connecting general-purpose RS232C equipment.
(2-channels are available)

15 Field network board slot

A slot that accepts a fieldbus interface module.

16 Expansion I/O Board (optional)

Slots that accept optional expansion I/O boards.

17 Brake Power Input Connector

A power input connector for driving the actuator brake. 24 VDC must be supplied externally. If this power supply is not provided, the actuator brake cannot be released. Be certain that power is supplied to brake-equipped axis. Use a shielded cable for the brake power cable, and connect the shielding on the 24V power supply side.

18 Brake Release Switch Connector

A connector for the switch that releases the actuator brake externally to the controller. Shorting the COM terminal and BKMRL* terminal of this connector will release the brake. Use this method if you wish to manually operate the actuator after the controller has experienced a power failure or malfunction.

19 Brake Switch

Locking alternative switch for releasing the axis brake. Pull the switch forward and then tilt it up or down. Set the switch to the top position (RLS) to forcibly release the brake, or to the bottom position (NOM) to have the brake automatically controlled by the controller.

Options

Regeneration Resistance Unit

Model **REU-1**

Details

This unit converts to heat the regenerative current produced when the motor decelerates. Although the controller has a built-in regenerative resistor, its capacity may not be enough if the axis is positioned vertically and the load is large. In this case, one or more regenerative units will be required. (Refer to the table shown to the right.)

Specification

Item	Specifications
Actuator dimensions	W34mm×H195mm×D126mm
Actuator Unit Weight	0.9kg
Built-in regenerative resistor	220Ω 80W
Accessory	Controller Connection Cable (Model No. CB-ST-REU010) 1m

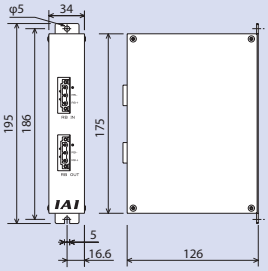
Installation Standard: Determined by total motor capacity of vertical axes connected.

Horizontal Application

Attached Axis	P/Q Type	J Type	K Type
0 Unit	~100W	~200W	~800W
1 Unit	~600W	~800W	~1200W
2 Units	~1200W	–	~1600W
3 Units	~1800W	–	–
4 Units	~2400W	–	–

Vertical Application

Attached Axis	P/Q Type	J Type	K Type
0 Unit	~100W	~200W	~400W
1 Unit	~600W	~600W	~800W
2 Units	~1000W	~800W	~1200W
3 Units	~1400W	–	Please contact IAI for applications beyond 1200W
4 Units	~2000W	–	
5 Units	~2400W	–	



Absolute Data Retention Battery (For XSEL-J/K/KE/KT/KET)

Model **IA-XAB-BT**

Features: A battery that retains the data stored in an absolute type controller. Replace when controller battery alarm sounds.

Packaging: 1 Unit(One battery is required for each axis. Specify a quantity for the number of axes used.)

Absolute Data Backup Battery

Model **AB-5**

Features: Absolute data retention battery for operating actuators under absolute specification.

Expansion PIO Board

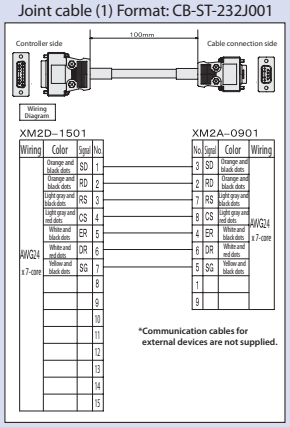
Details: An optional board for adding I/O (input/output) points.
With the general-purpose and large-capacity types, up to three expansion PIO boards can be installed in the expansion slots.
(With the compact types, only one expansion PIO board can be installed in the expansion slot provided that the controller is of 3 or 4-axis specification.)

Expansion SIO Board (General-Purpose Type)

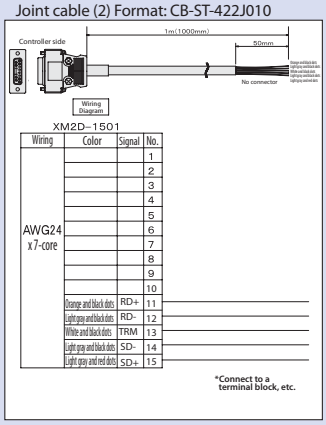
Model/ Specifications:
IA-105-X-MW-A (for RS232C connection) (Board + joint cables (1), 2 included)
IA-105-X-MW-B (for RS232C connection) (Board + joint cables (2), 1 included)
IA-105-X-MW-C (for RS232C connection) (Board + joint cables (2), 1 included)

Details: Board for serial communications with external equipment.
This board has two port channels and implements three communication modes using the supplied joint cable(s).

Joint cable (1) Format: CB-ST-232J001



Joint cable (2) Format: CB-ST-422J010



DeviceNet Connection Board

A board for connecting the XSEL controller to Device Net.

Item	Specifications			
Number of I/O Points	1 board, 256 input points/256 output points *Only 1 board can be installed			
Communication Standard	Interface module certified under Device Net 2.0 (certification to be obtained)			
	Group 2 Only Server 2			
	Insulated node operating on network power supply			
Communication Specification	Master-Slave connection	Bit strobe		
		Boring		
		Cyclic		
Communication Rate	500k/250k/125kbps (Selectable by DIP switch)			
Communication Cable Length	Communication Rate	Maximum network length	Maximum branch length	Total branch length
	500kbps	100m	6m	39m
	250kbps	250m		78m
	125kbps	500m		156m
	Note) When large Device Net cable is used			
Communication Power Supply	24VDC (supplied from Device Net)			
Low Current Communication Power Supply	60mA or higher			
Number of Reserved Nodes	1 node			
Connector	MSTBA2.5/5-G. Phoenix Contact Co., MSTBA2.5/5-G.08AUM (*1)			

(*1) The connector on the cable (SMSTB2.5/5-ST-5.08AU by Phoenix Contact) is a standard accessory.

CC-Link Connection Board

A board for connecting the XSEL controller to CC-Link.

Item	Specifications					
Number of I/O Points	1 board, 256 input points/256 output points *Only 1 can be installed					
Communication Standard	CC-Link Ver1.10 (already certified)					
Communication Rate	10M/5M/2.5M/625k/156kbps (switched using a rotary switch)					
Communication method	Broadcast polling method					
Asynchronous	Frame synchronization method					
Encoding Format	NRZI					
Transmission path type	Bus Format (EIA RS485 Compliant)					
Transmission Format	HDLC Compliant					
Error control method	CRC($X^{16}+X^{12}+X^5+X^1$)					
Number of Reserved Stations	1 to 3 Stations (Remote Device Stations)					
Communication cable length	Baud rate	10M	5M	2.5M	625k	156k
	Cable Length (m)	100	160	400	900	1200
Connector (Controller-side)	MSTBA2.5/5-G.08AUM by Phoenix Contact (*1)					

(*1) The connector on the cable (SMSTB2.5/5-ST-5.08AU by Phoenix Contact) is a standard accessory.

Options

Teaching Pendant

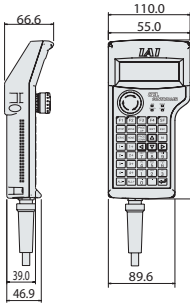
Features This is a teaching device that provides information on functions such as programs, position input, running tests, and monitoring.

Model/price

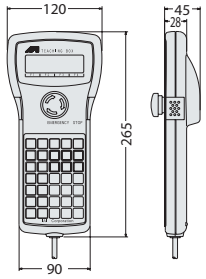
Model	Description	Standard price
SEL–T	Standard type	—
SEL–TD	Deadman's switch type	—
IA–T–X	Standard type (for XSEL-J type)	—
IA–T–XD	With deadman's switch (for XSEL-J type)	—

Note:
SEL-T/SEL-TD cannot be used for the XSEL-J type. If you want to use the XSEL-J type, use IA-T-X/IA-T-XD.

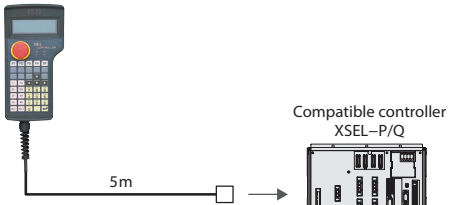
SEL–T
SEL–TD



IA–T–X/XD



Configuration



SEL-T option

- Wall-mounting hook
  Model HK-1

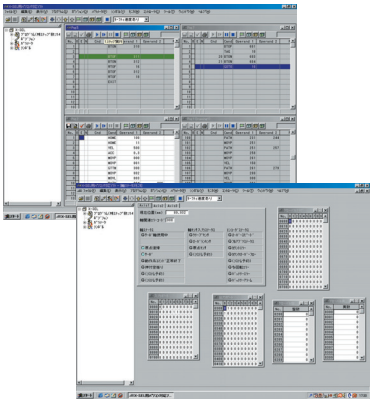
- Strap
  Model STR-1

Specifications

Model	SEL–T	SEL–TD	IA–T–X/XD
3 position enabling switch	No	Yes	No
ANSI/UL standards	Not compatible	Compatible	Not compatible
CE mark	Compatible		Not compatible
Display	20 characters x 4 lines		
Ambient operating temperature, humidity	0 to 40°C, 10 to 90% RH (non-condensing)		0 to 40°C, humidity 85% RH or less
Protective structure	IP54		IP20
Weight	Approx. 0.4kg (excluding cable)		Approx. 0.7kg

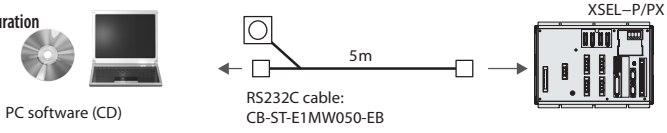
Computer Software (Windows only)

Features A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time.



Model IA-101-X-MW (with RS232C cable)

Configuration

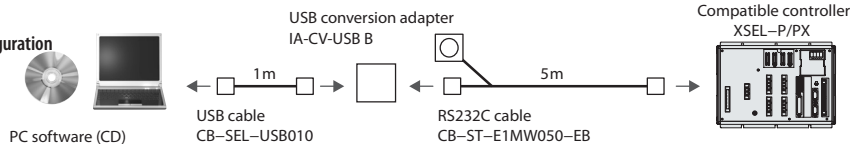


Model IA-101-XA-MW (with Safety Category 4-compatible cable)

Configuration

Model IA-101-X-USBMW (with USB conversion adapter + cable)

Configuration



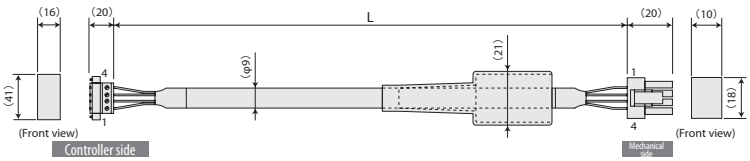
Maintenance Parts

Refer to the models below if it is necessary to replace cables for your purchase.

Motor Cable/Motor Robot Cable

Model **CB-RCC-MA□□□ / CB-RCC-MA□□□-RB**

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



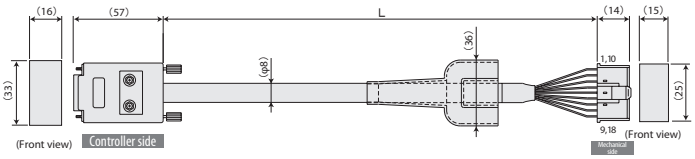
Wiring	Signal			Signal	Wiring
0.75sq	PE	1	1	U	0.75sq (crimped)
	U	2	2	V	
	V	3	3	W	
	W	4	4	PE	

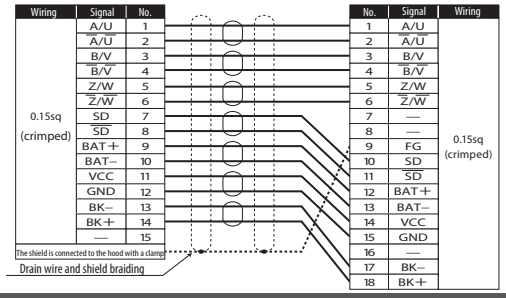
Maintenance Parts

Encoder Cable/Encoder Robot Cable (for XSEL-J/K Type)

Model CB-RCBC-PA□□□ / CB-RCBC-PA□□□-RB

* □□□ indicates the cable length (L). Lengths up to 15m can be specified
Example: 080=8m

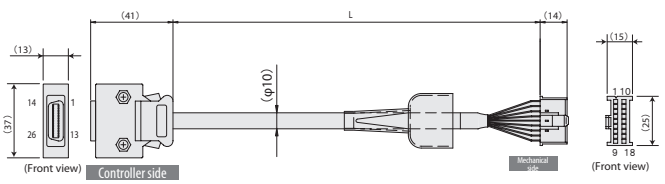


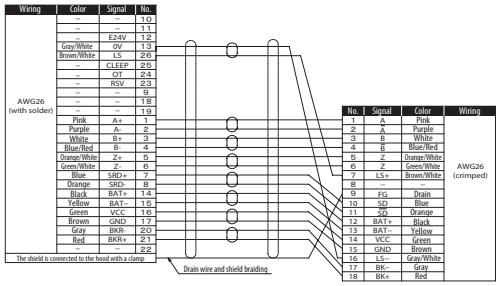


Encoder Cable/Encoder Robot Cable (for XSEL-P/Q Type)

Model CB-RCS2-PA□□□ / CB-X3-PA□□□

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

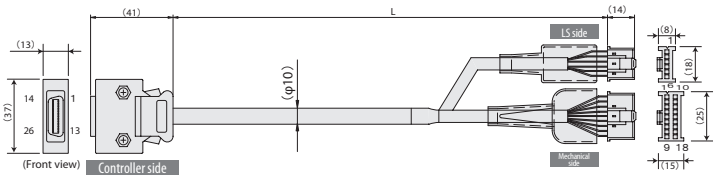


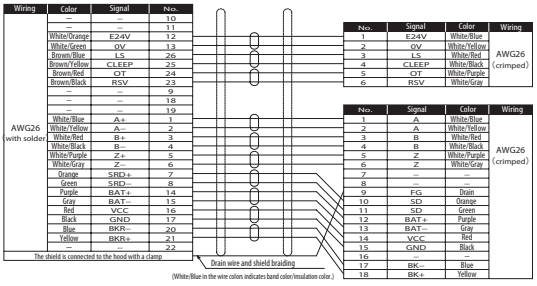


Rotary Dedicated Encoder Cable/Encoder Robot Cable

Model CB-RCS2-PLA□□□ / CB-X2-PLA□□□

* Enter the cable length (L) for □□□, up to a maximum compatible length of 30m.
Example: 080=8m

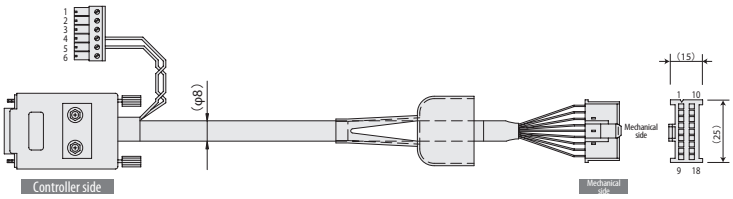


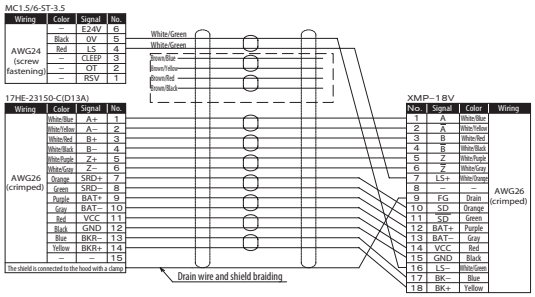


Encoder Cable (XSEL-J/K Type for Use with Home Check Sensor)

Model CB-RCBC-PLA□□□

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

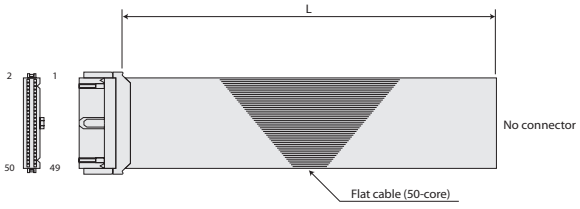




I/O Flat Cable (for XSEL-J/K/P/Q)

Model CB-X-PIO□□□

* Enter the cable length (L) for □□□, up to a maximum compatible length of 10m.
Example: 080=8m



No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown 1	Flat cable crimped	18	Gray 2	Flat cable crimped	35	Green 4	Flat cable crimped
2	Red 1		19	White2		36	Blue 4	
3	Orange 1		20	Black 2		37	Purple 4	
4	Yellow 1		21	Brown-3		38	Gray 4	
5	Green 1		22	Red 3		39	White 4	
6	Blue 1		23	Orange 3		40	Black 4	
7	Purple 1		24	Yellow 3		41	Brown-5	
8	Gray 1		25	Green 3		42	Red 5	
9	White 1		26	Blue 3		43	Orange 5	
10	Black 1		27	Purple 3		44	Yellow 5	
11	Brown-2		28	Gray 3		45	Green 5	
12	Red 2		29	White 3		46	Blue 5	
13	Orange 2		30	Black 3		47	Purple 5	
14	Yellow 2		31	Brown-4		48	Gray 5	
15	Green 2		32	Red 4		49	White 5	
16	Blue 2		33	Orange 4		50	Black 5	
17	Purple 2		34	Yellow 4				