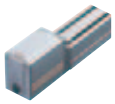
ROBO CYLINDER

Controller

PS-24 PSEL
ERC2 ASEL
PCON SSEL
ACON XSEL
SCON

Gateway unit	DeviceNet/CC-Link unit	RCM-GW-DV/CC	289
PS-24	24-VDC power supply for ROBO Cylinder	PS-241/242	293
ERC2	Controller module of ERC2	ERC2	295
PCON	Position controller for RCP2 series	PCON-C / CG / CY / PL / PO / SE	305
ACON	Position controller for RCA series	ACON-C / CG / CY / PL / PO / SE	315
SCON	Position controller for RCS2 series	SCON-C	325
PSEL	Program controller for RCP2 series	PSEL-C	335
ASEL	Program controller for RCA series	ASEL-C	345
SSEL	Program controller for RCS2 series	SSEL-C	355
XSEL	Multi-axis program controller for RCS2 series	X-SEL-J / K / P / Q	365

List of Controller Models by Function

Type	Features	Series	ERC2	PCON
		Applicable actuator	ERC2	RCP2
		Page	→P295	→P305
Positioner type	The actuator is moved by specifying a target position number. Suitable for controlling simple movements to many positions.	External view		
		Type code	PN/NP	C
		Maximum number of connectable axes	(—)	1 axis
		Maximum number of positioning points	16 points	512 points
		Input power supply	DC24V	DC24V
Solenoid valve type	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.	External view		
		Type code	PN/NP	CY
		Maximum number of connectable axes	(—)	1 axis
		Maximum number of positioning points	3 points	3 points
		Input power supply	DC24V	DC24V
Pulse-train input type	The user can control actuator operation (via pulses) without using position data. Use this type if you wish to control everything with pulses.	External view	(Not supported)	
		Type code	—	PL/PO
		Maximum number of connectable axes	—	1 axis
		Maximum number of positioning points	—	(—)
		Input power supply	—	DC24V
Serial communication type	Connectable to a field network, such as DeviceNet or CC-Link, using a gateway unit.	External view		
		Type code	SE	SE
		Maximum number of connectable axes	(—)	1 axis
		Maximum number of positioning points	64 points	64 points
		Input power supply	DC24V	DC24V
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.	External view	(Not supported)	(Not supported)
		Type code	—	—
		Maximum number of connectable axes	—	—
		Maximum number of positioning points	—	—
		Input power supply	—	—

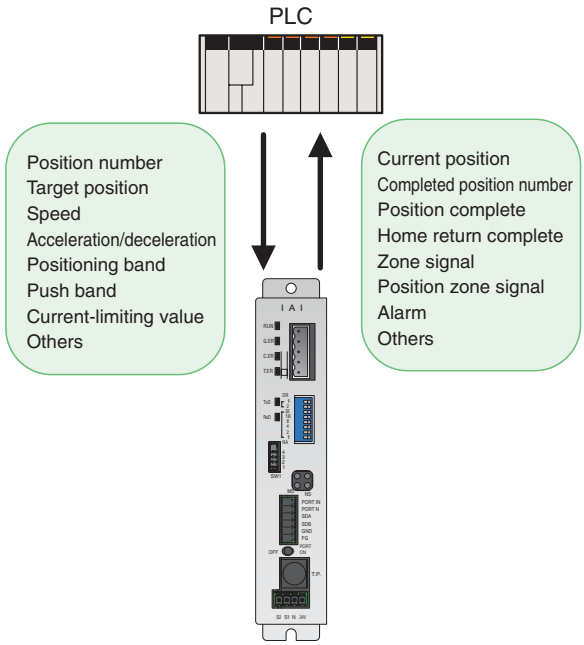
	ACON RCA →P315	SCON RCS2 →P325	PSEL RCP2 →P335	ASEL RCA →P345	SSEL RCS2 →P355	XSEL RCS2 →P365
						(Not supported)
	C	**C**	**C**	**C**	**C**	—
	1 axis	1 axis	2 axes	2 axes	2 axes	—
	512 points	512 points	1500 points	1500 points	1500 points	—
	DC24V	AC100/200V	DC24V	DC24V	AC100/200V	—
			(Not supported)	(Not supported)	(Not supported)	(Not supported)
	CY	**C**	—	—	—	—
	1 axis	1 axis	—	—	—	—
	3 points	7 points	—	—	—	—
	DC24V	AC100/200V	—	—	—	—
			(Not supported)	(Not supported)	(Not supported)	(Not supported)
	PL/PO	**C**	—	—	—	—
	1 axis	1 axis	—	—	—	—
	(—)	(—)	—	—	—	—
	DC24V	AC100/200V	—	—	—	—
		 * Gateway unit not required. Directly connectable to a network.	(Not supported)	(Not supported)	(Not supported)	 * Gateway unit not required. Directly connectable to a network.
	SE	**C**	—	—	—	**J/K/P/Q**
	1 axis	1 axis	—	—	—	6 axes
	64 points	512 points	—	—	—	4000 points
	DC24V	AC100/200V	—	—	—	AC100/200V
	(Not supported)	(Not supported)				
	—	—	**C**	**C**	**C**	**J/K/P/Q**
	—	—	2 axes	2 axes	2 axes	6 axes
	—	—	1500 points	1500 points	1500 points	4000 points
	—	—	DC24V	DC24V	AC100/200V	AC100/200V

Gateway Unit

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

Features

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



Functions

One of the following three operation modes can be selected.

(1) Position-number specification mode

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

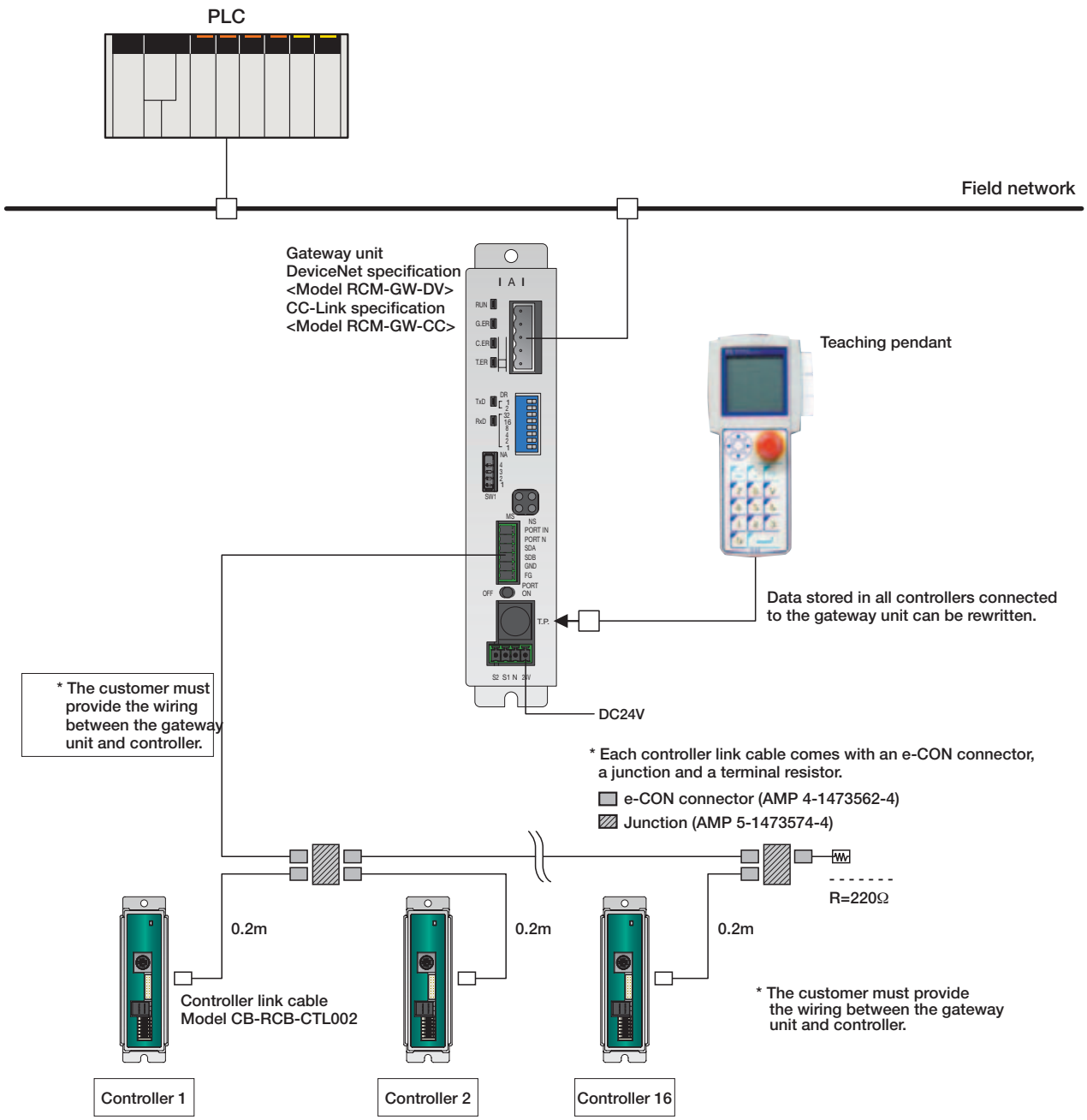
(2) Positioning-data specification mode

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

(3) Simple direct/position-number specification mode

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

System Configuration Diagram

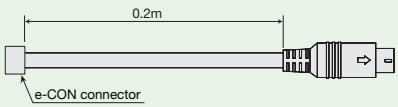


Connectable Controllers ERC2 / PCON / ACON / SCON (*1)
(*1) SCON will communicate at the I/O level when connected to the field network even if the gateway unit is not used.
It is necessary to use the gateway unit when communicating positional data.

■ Controller link cable

(Comes with e-CON connector, junction and terminal resistor)

Model CB-RCB-CTL002



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

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

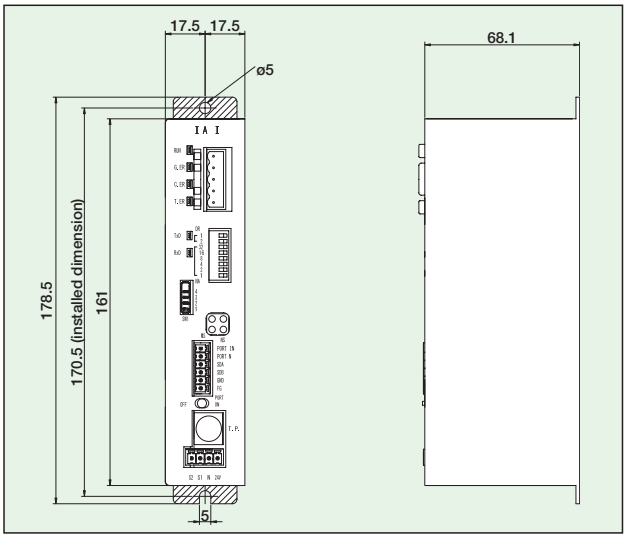
DeviceNet Gateway Unit

■ Model RCM-GW-DV

Operation Modes and Key Functions

Key functions	Position-number specification mode	Positioning-data specification mode	Simple direct/ position-number specification mode
Movement by position data specification	×	○	○
Direct speed & acceleration/deceleration specification	×	○	○
Push-motion operation	○	○	○
Current position read	×	○	○
Position number specification	○	×	○
Completed position number read	○	×	○
Various status signal read	○	○	○
Number of connectable axes	16	16	16
Maximum specifiable position data	Set as position data	999.99	999.99

External Dimensions



Specifications

Item		Specifications			
Power supply		DC24V ±10%			
Current consumption		300mA max.			
DeviceNet specifications	Communication standard	Interface module certified under DeviceNet 2.0			
		Group 2 only server			
		Insulated node operating on network power supply			
	Communication specifications	Master slave connection	Bit strobe		
			Polling		
			Cyclic		
	Baud rate	500k/250k/125kbps (switched using DIP switches)			
	Communication cable length (*1)	Baud rate	Maximum network length	Maximum branch length	Total branch length
		500kbps	100m	6m	39m
		250kbps	250m		78m
		125kbps	500m		156m
		Note) When a large-size DeviceNet cable is used.			
	Number of occupied nodes	1 node			

Item		Specifications
SIO communication specifications	Transmission path configuration	IAI's original multi-drop differential communication
	Communication method	Half-duplex
	Synchronization method	Asynchronous
	Transmission path type	EIA RS485, 2 wires
	Baud rate	230.4kbps
	Error control method	No parity bit, CRC (*2)
	Communication cable length	Total cable length 100m max.
	Number of connected units	Up to 16 axes
	Communication cable	2-pair twisted pair shield cable (Recommended: Taiyo Electric Wire & Cable HK-SB/20276xL 2PxAWG22)
Environmental conditions	Ambient operating temperature	0~40˚C
	Ambient operating humidity	85% RH or below (non-condensing)
	Operating ambience	Free from corrosive dust, flammable gases, oil mist or powder dust
	Storage temperature	–10~65˚C
	Storage humidity	90% RH or below (non-condensing)
	Vibration resistance	4.9m/s² (0.5G)
Protection class		IP20
Weight		480g or less

*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.

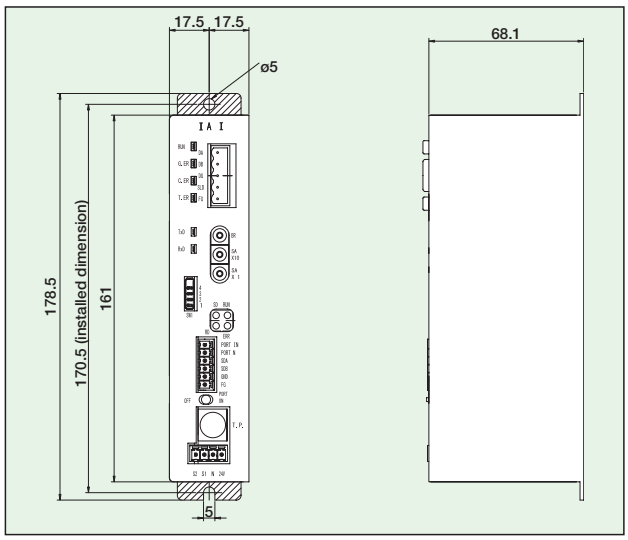
CC-Link Gateway Unit

■ Model RCM-GW-CC

Operation Modes and Key Functions

Key functions	Position-number specification mode	Position-data only specification mode	Positioning-data specification mode		Simple direct/ position-number specification mode
			Normal positioning mode	Push-motion operation mode	
Movement by position data specification	×	○	○	○	○
Direct speed & acceleration/deceleration specification	×	×	○	○	○
Push-motion operation	○	×	×	○	○
Current position read	×	○	○	○	○
Position number specification	○	×	×	×	○
Completed position number read	○	×	×	×	○
Various status signal read	○	○	○	○	○
Number of connectable axes	14	14	7	3	16
Maximum specifiable position data	Set as position data	327.67	327.67	999.99	999.99

External Dimensions



Specifications

Item		Specifications					
Power supply		DC24V ±10%					
Current consumption		300mA max.					
CC-Link specifications	Communication standard	CC-Link Ver1.10 (*1)					
	Baud rate	10M/5M/2.5M/625k/156kbps (switched using a rotary switch)					
	Communication method	Broadcast polling method					
	Synchronization method	Frame synchronization method					
	Encoding method	NRZI					
	Transmission path type	Bus type (conforming to EIA RS485)					
	Transmission format	Conforming to HDLC					
	Error control method	CRC($X^{16}+X^{12}+X^5+1$)					
	Number of occupied stations	Total cable length					
	Communication cable length (*2)	Baud rate (bps)	10M	5M	2.5M	625k	156k
		Total cable length(m)	100	160	400	900	1200
	Communication cable	CC-Link cable					

Item		Specifications
SIO communication specifications	Transmission path configuration	IAI's original multi-drop differential communication
	Communication method	Half-duplex
	Synchronization method	Asynchronous
	Transmission path type	EIA RS485, 2 wires
	Baud rate	230.4kbps
	Error control method	No parity bit, CRC (*2)
	Communication cable length	Total cable length 100m max.
	Number of connected units	Up to 3/7/14/16 axes (The exact number varies depending on the operation mode)
	Communication cable	2-pair twisted pair shield cable (Recommended: Taiyo Electric Wire & Cable HK-SB/20276xL 2PxAWG22)
Environmental conditions	Ambient operating temperature	0~40˚C
	Ambient operating humidity	85% RH or below (non-condensing)
	Operating ambience	Free from corrosive dust, flammable gases, oil mist or powder dust
	Storage temperature	–10~65˚C
	Storage humidity	90% RH or below (non-condensing)
	Vibration resistance	4.9m/s² (0.5G)
Protection class		IP20
Weight		480g or less

*1 Already certified.
*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. A data error detection method widely used in synchronous transmission.

PS-24

Rated output current 8.5A

Maximum momentary output current 17A

Features

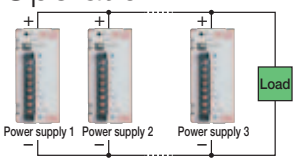
1 Maximum Momentary Output of 17 A

While the rated output current is 8.5 A, maximum momentary output current of up to 17 A is supported. 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. For details, refer to "Selection Guide" on the right.

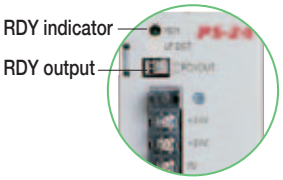
2 Supporting Parallel Operation

Up to five units can be operated in parallel. Even if any one unit is found short of power-supply capacity, all you need is to simply add one more unit without replacing the unit in question with a larger-capacity model.



3 Load Detection Function

The load factor can be detected using the RDY (ready) indicator lamp and RDY output signal.



Selection Guide: Number of Actuators Connected

When selecting a power-supply unit for operating multiple actuators, normally a unit with a capacity equal to or exceeding the total maximum current of all actuators is chosen. However, actuators generate their maximum current only momentarily during 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.

Examples of Tight Load Condition

- **Large load (close to the rated load capacity of the actuator)**
- **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. Rated Current of PS-24 and Allowable Maximum Momentary Current

Number of connected units	Rated current [A]	Maximum momentary current [A]
1 unit	8.5	17
2 unit	15.3	30.6
3 unit	22.95	45.9
4 unit	30.6	61.2
5 unit	38.25	76.5

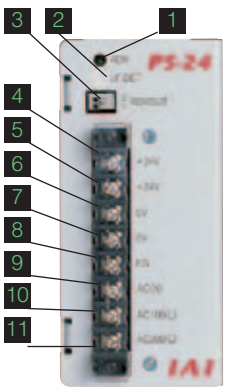
Note) Consider a safety factor (loss) of 10% for the second and subsequent units.

Table 1. Relationship of Actuator and Power-Supply Current

Controller type	Actuator type	Power-supply current [A]		Number of connected axes per PS-24 (reference) *1
ERC2	ERC2	Rating (= Max.)	2A	8
PCON PSEL	All RCP2 models			
ACON ASEL	SA4, SA5 (20W)	Rating	1.3A	6
		Max.	3.7A	
	SA6 (30W)	Rating	1.3A	6
		Max.	4.2A	
	RA3 (20W)	Rating	1.7A	5
		Max.	5A	
	RA4 (20W)	Rating	1.3A	6
		Max.	3.7A	
	RA4 (30W)	Rating	1.3A	6
		Max.	4.2A	

*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) for ERC2 and RCP2].

Name of Each Part



1 Ready indicator (RDY)

2 Overload-detection level setting dial (LF.DET)

* This dial has been set to an appropriate value prior to the shipment.

3 Ready output signal (RDYOUT)

4 5 +24-V output terminals (+24V)

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

6 7 0-V output terminals (0V)

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

8 Frame ground terminal (FG)

A grounding terminal.

9 AC input terminal (AC(N))

10 AC (100-VAC) input terminal (AC100(L))

11 AC (200-VAC) input terminal (AC200(L))

* Connect the power source between [9] and [10] for a 100-VAC input specification, or between [9] and [11] for a 200-VAC specification. The terminals are not common between the two power input specifications.

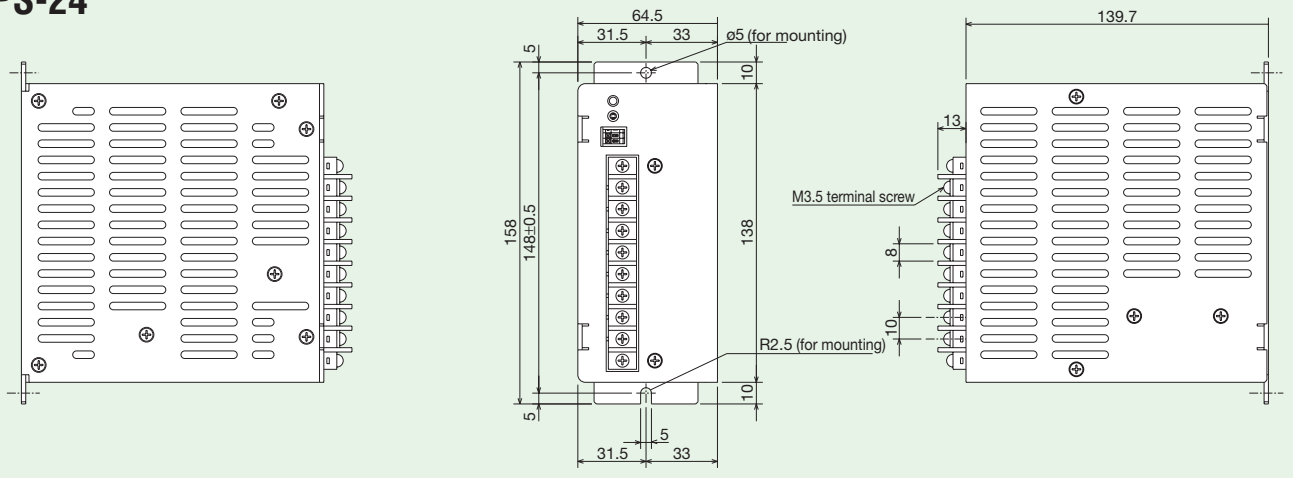
Specification Table

Item	PS-241	PS-242
Rated DC output voltage	24V±10% (Varies depending on the load)	
Rated DC output current	8.5A	
Maximum momentary DC output current	17A	
Rated output capacity	204W	
Efficiency	80%	80%
Rated input voltage (frequency)	AC100~115V (50/60Hz)	AC200~230V (50/60Hz)
Input voltage range	AC85~125V	AC170~250V
Input current	3.5A (100VAC, full load)	1.8A (200VAC, full load)
Output retention time	20 [msec] (at ambient temperature of 25°C and rated input/output conditions)	
Protective circuit	Overcurrent protection, overvoltage protection, overheat protection, overload protection	
Parallel operation	Supported	
Ambient operating temperature	0~50°C (subject to derating)	
Ambient operating humidity	30~85% RH (non-condensing)	
Cooling method	Natural air cooling	
Breakdown voltage	Between input and output --- 2.0kVA, 1 minute (20mA) Between input and enclosure --- 2.0kVA, 1 minute (20mA)	
Insulation resistance	Between output and enclosure --- 100MΩ min. at 500VDC	
Circuit method	Externally excited fly-back converter	
Weight	Approx. 0.9kg	

External Dimensions

24-VDC Power Supply

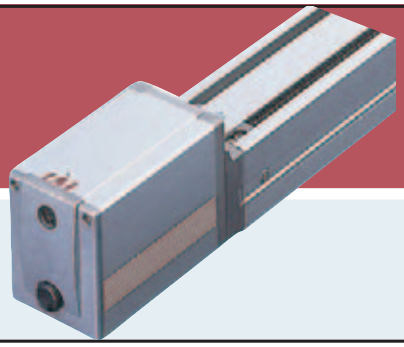
PS-24



Note

- The PS-24 is not a constant-voltage power supply. Its output voltage changes in accordance with the load (the voltage will drop in accordance with the load factor). Therefore, do not connect the PS-24 to equipment other than IAI's actuators.
- Keep the maximum number of actuators operated in parallel to five. Do not use PS-24 and other power supplies together for parallel operation.
- Take note that the PS-24 does not support series operation.
- If multiple units are used side by side, provide a minimum clearance of approx. 20 mm between the adjacent units.
- The PS-24 is naturally cooled by air. Accordingly, when installing the PS-24 give full consideration to ensuring natural convection in order to prevent heat from collecting around the power supply.
- The enclosure of this product also serves as heat sink. Since the surface may be heated to very high temperatures, once the unit has been installed do not touch the enclosure to prevent burns.

ERC2



■ Model NP / PN / SE

Controller module of controller-integrated actuator

Type List

I/O type	NP	PN	SE
Name	PIO type (NPN specification)	PIO type (PNP specification)	Serial communication type
External view			
Description	Move the actuator by specifying position numbers from PLC via PIO	PNP specification of the NP type (overseas specification)	Connected to a field network via a gateway unit
Number of position points	16 points	16 points	64 points

Model

ERC2 — [Type] — I — PM — [Lead] — [Stroke] — [I/O type] — [Cable length] — [Options]

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

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	Rod type with single guide (width 52mm)
RGS7C	Rod type with single guide (width 58mm)
RGD6C	Rod type with double guides (width 52mm)
RGD7C	Rod type with double guides (width 58mm)

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

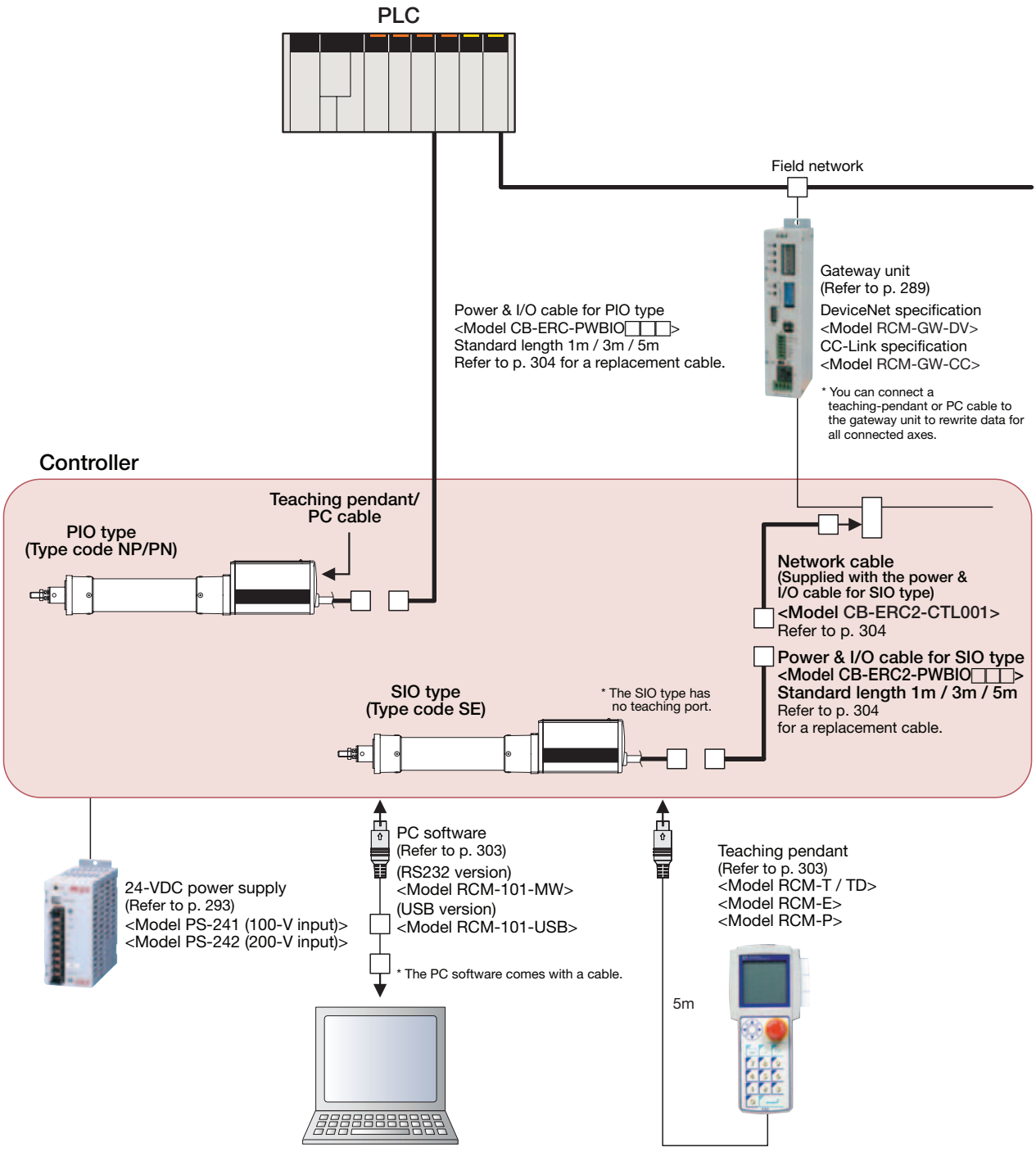
Stroke	
50 ∫ 600	50mm ∫ (Set in 50-mm steps) 600mm

I/O type	
NP	PIO type (NPN specification)
PN	PIO type (PNP specification)
SE	SIO type

Cable length	
N	No cable
P	1m
S	3m
M	5m
X□□□	Specified length
R□□	Robot cable
W□□	Cable with connectors on both ends
RW□□	Robot cable with connectors on both ends

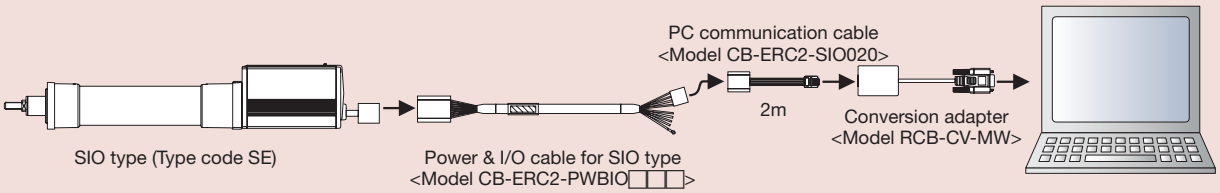
Options	
B	Brake
NM	Reversed-home specification
FT	Foot bracket

System Configuration



PC Connection Diagram

Use the following cables to connect the SIO type directly to a PC.



I/O Specifications (PIO Type)

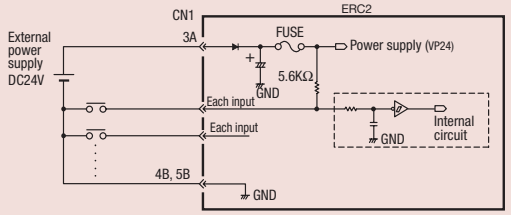
■ Input Part External input specifications

Item	Specification
Number of input points	6 points
Input voltage	24VDC ± 10%
Input current	4mA/circuit
Leak current	1mA max./point
Operating voltage	ON voltage: 18V min. (3.5mA) OFF voltage: 6V max. (1mA)

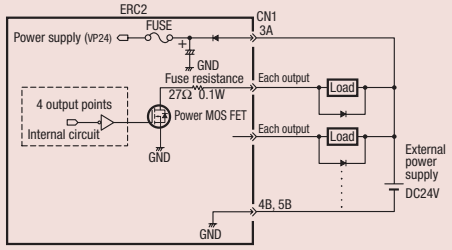
■ Output Part External output specifications

Item	Specification
Number of input points	4 points
Rated load voltage	DC24V
Maximum current	60mA/point
Residual voltage	2V max.
Short-circuit, reverse-voltage protection	Fuse resistance (27Ω0.1W)

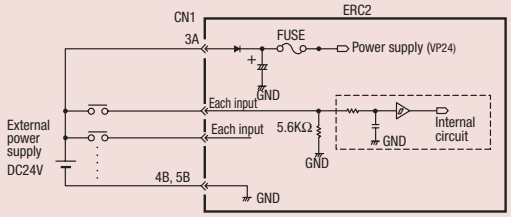
NPN specification



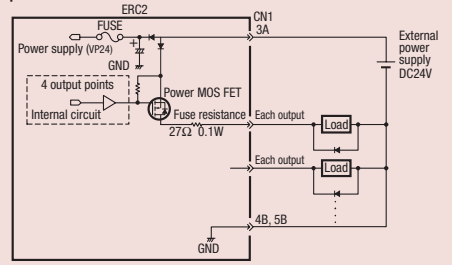
NPN specification



PNP specification



PNP specification



I/O Signal Table (PIO Type)

Parameter (PIO pattern selection)	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)	Up to 16 positioning points can be set. (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	Category	Wire color	Parameter (PIO pattern selection)			
			0	1	2	3
			Conventional 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	24V	Light blue (red 1)	EMS1			
2B	0V	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) The signals denoted by an asterisk (*) (ALM/STP) are negative-logic signals that always remain ON.

System Configuration

Category	Signal name	Abbreviation	Function overview
SIO	Serial communication	SGA SGB	Used in serial communication.
24V 0V	Emergency stop	EMS1 EMS2	These signals are wired to enable the emergency stop switch on the teaching pendant. (Refer to p. 301)
	Brake release	BKR	Connection to 0 V forcibly releases the brake. (150 mA is required)
Input	Command position number	PC1 PC2 PC4 PC8	Specify a target position number using 4-bit binary signals (or 3-bit binary signals 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 ST0 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.
	Pause	*STP	This signal is always ON while the actuator is operating normally (negative logic). The actuator starts to decelerate to a stop at the ON → OFF leading edge of this signal.
Output	Position complete	PEND	This signal turns ON once the actuator has moved to the target position and completed the positioning by entering the specified positioning band. Used to determine if positioning has completed.
	Completed position number	PE0 PE1 PE2	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	This 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. (A green light stays on in normal conditions, and a red light comes on upon generation of an alarm.)

(Note) The signals denoted by an asterisk (*) (ALM/STP) are negative-logic signals that always remain ON.

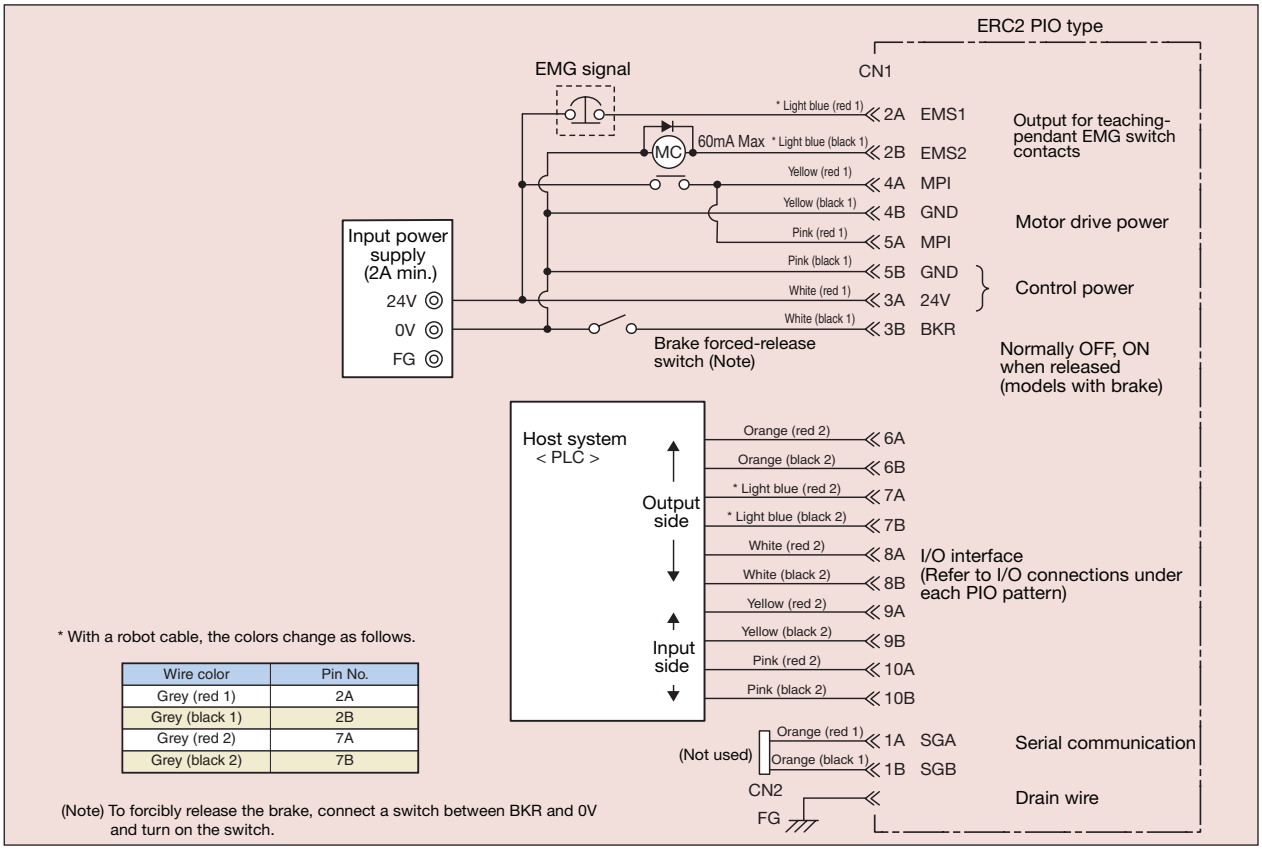
Specification Table

Specification item		Description	
Type		PIO specification (NP/PN)	SIO specification (SE)
Control method		Field-weakening vector control (patent pending)	
Positioning command		Position number specification	Position number specification/direct numerical specification
Position numbers		Maximum 16 points	Maximum 64 points
Backup memory		Position number data and parameters are stored in nonvolatile memory. Serial EEPROM with a rewrite life of 100,000 times.	
PIO		6 dedicated input points / 4 dedicated output points	None
Electromagnetic brake		Built-in circuit, 24VDC ± 10%, 0.15A max.	
2-color LED indicator		Servo ON (green), alarm/motor drive-power cutoff (red)	
I/F power supply (Note 1)		Same as the control power supply (not insulated)	
Serial communication		RS485, 1 channel (terminated externally)	
Absolute function		None	
Forced release of electromagnetic brake		Forcibly released upon connection to 0V (NP) or 24V (PN)	Forcibly released upon 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-supply voltage		24V±10%	
Power-supply current		2A max.	
Environment	Ambient operating temperature	0~40˚C	
	Ambient operating humidity	85% RH or below (non-condensing)	
	Operating ambience	Free from corrosive gases	
Protection class		IP20	

(Note 1) Use an insulated PIO terminal block (optional, refer to p. 302) to insulate the I/F power supply.

I/O Wiring Diagram

PIO Type NP (NPN Specification)

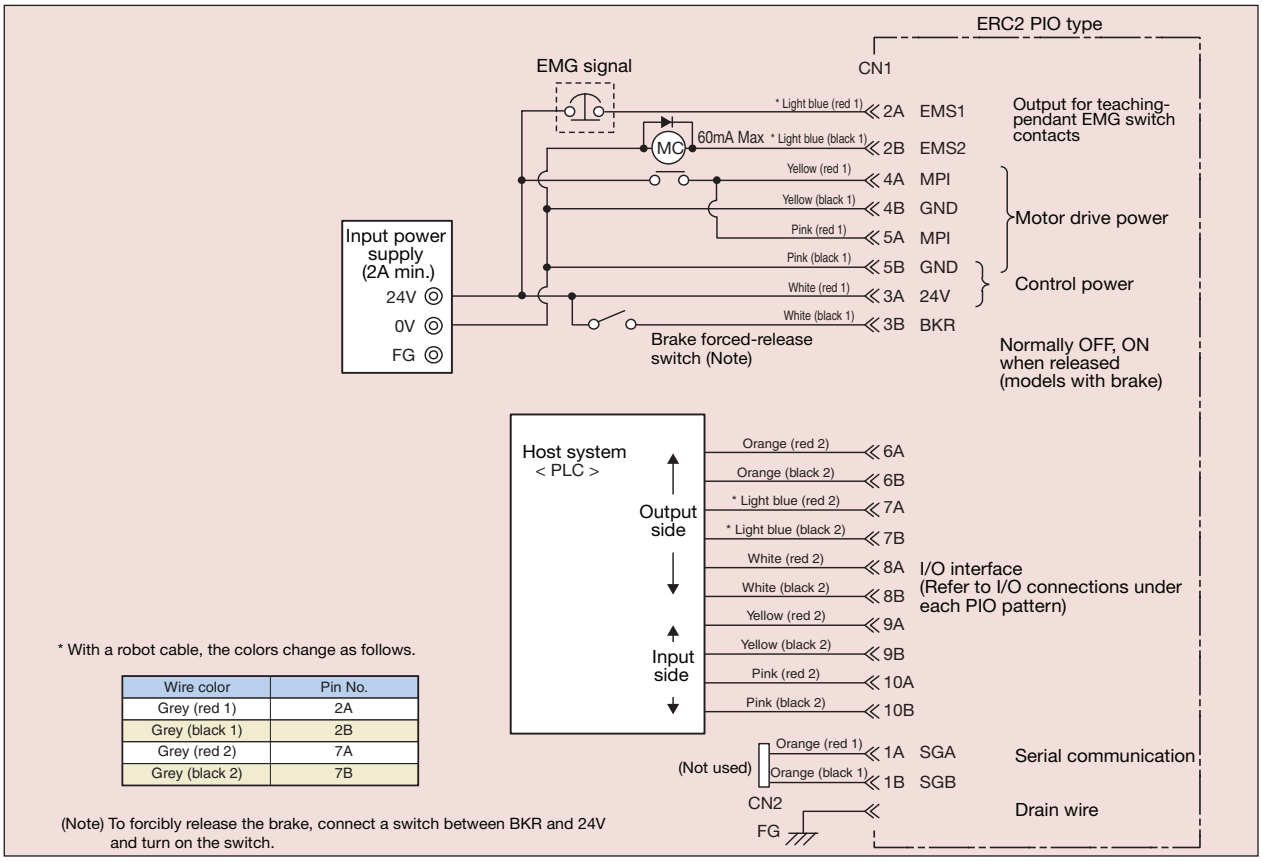


* With a robot cable, the colors change as follows.

Wire color	Pin No.
Grey (red 1)	2A
Grey (black 1)	2B
Grey (red 2)	7A
Grey (black 2)	7B

(Note) To forcibly release the brake, connect a switch between BKR and 0V and turn on the switch.

PIO Type NP (PNP Specification)

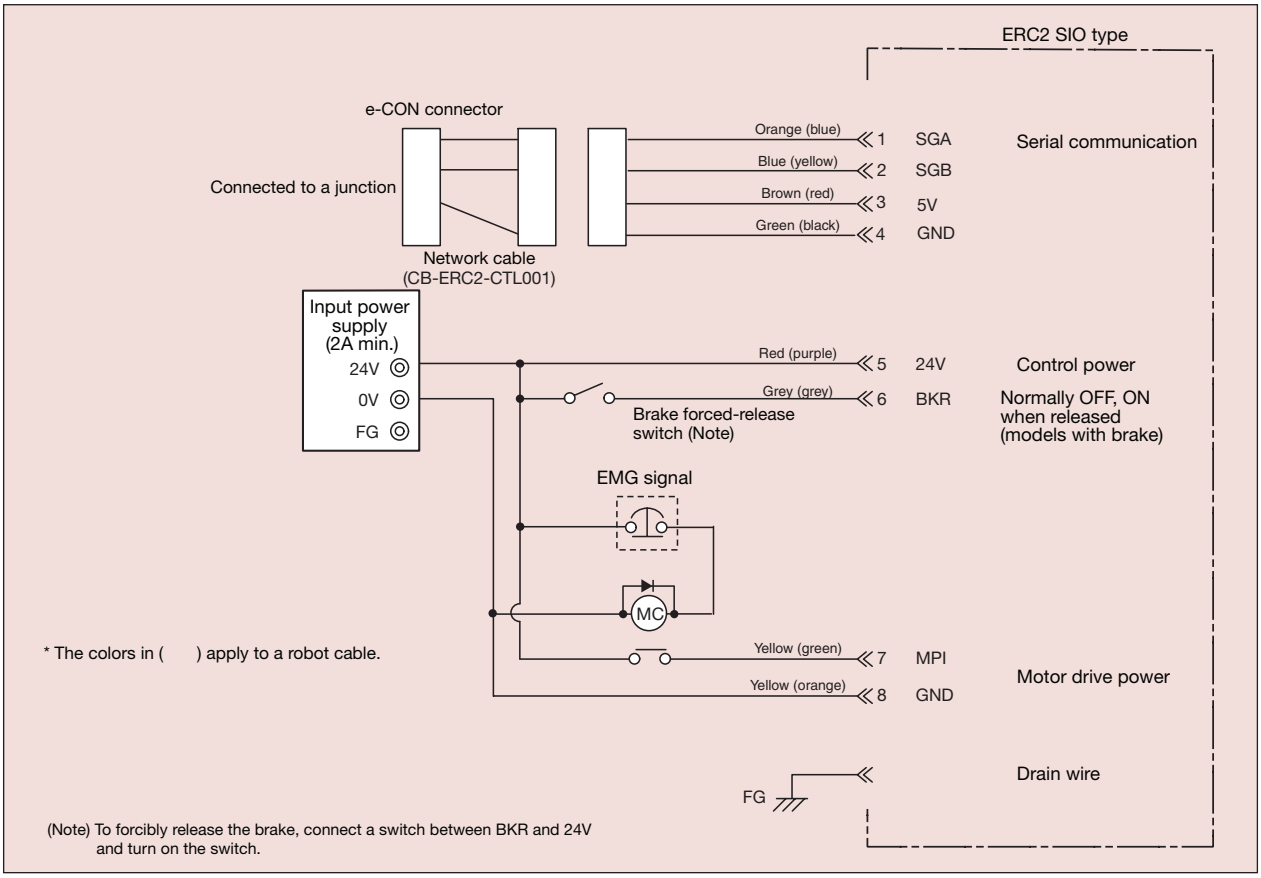


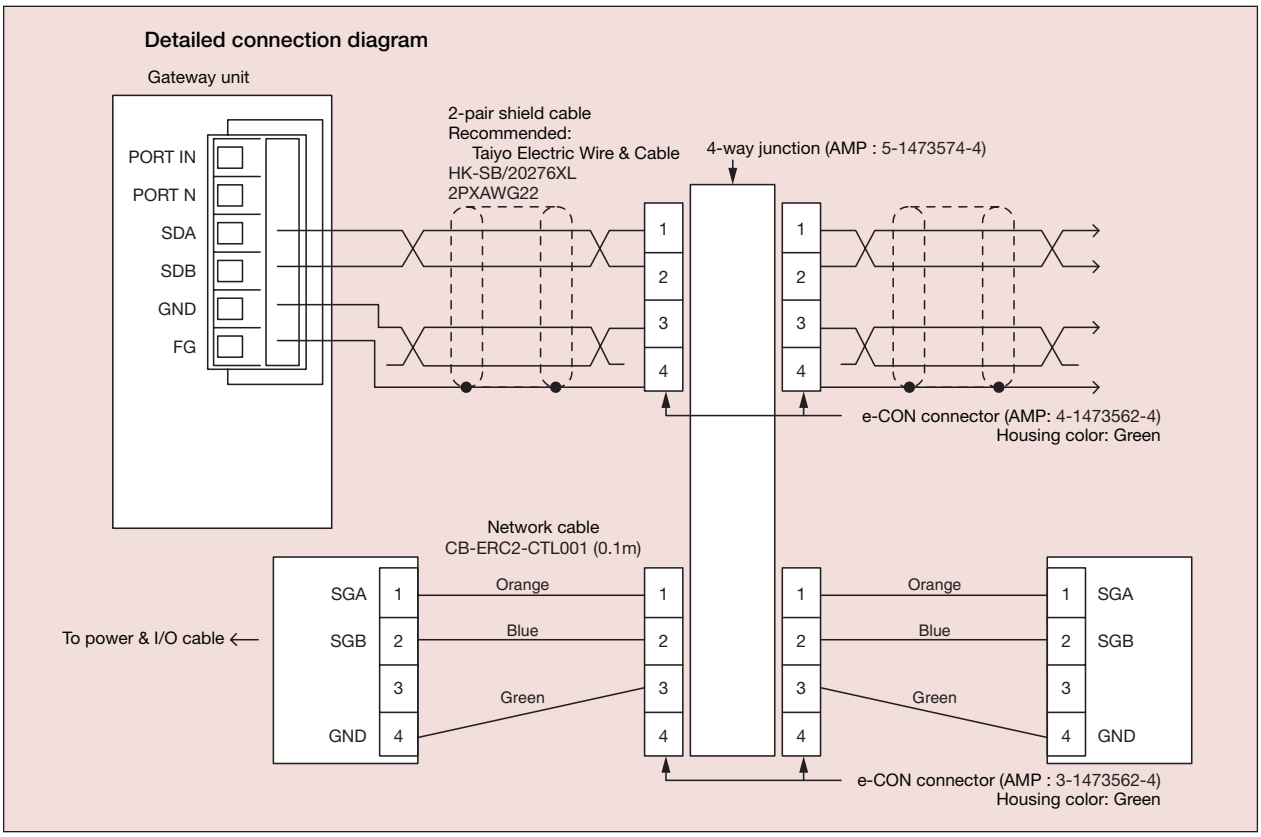
* With a robot cable, the colors change as follows.

Wire color	Pin No.
Grey (red 1)	2A
Grey (black 1)	2B
Grey (red 2)	7A
Grey (black 2)	7B

(Note) To forcibly release the brake, connect a switch between BKR and 24V and turn on the switch.

SIO Type SE


ERC2 SIO type
e-CON connector
Connected to a junction
Network cable
(CB-ERC2-CTL001)
Orange (blue)
Blue (yellow)
Brown (red)
Green (black)
1 SGA
2 SGB
3 5V
4 GND
Serial communication
Input power supply (2A min.)
24V
0V
FG
Red (purple)
Grey (grey)
5 24V
6 BKR
Control power
Normally OFF, ON when released (models with brake)
Brake forced-release switch (Note)
EMG signal
MC
* The colors in ( ) apply to a robot cable.
Yellow (green)
Yellow (orange)
7 MPI
8 GND
Motor drive power
FG
Drain wire
(Note) To forcibly release the brake, connect a switch between BKR and 24V and turn on the switch.

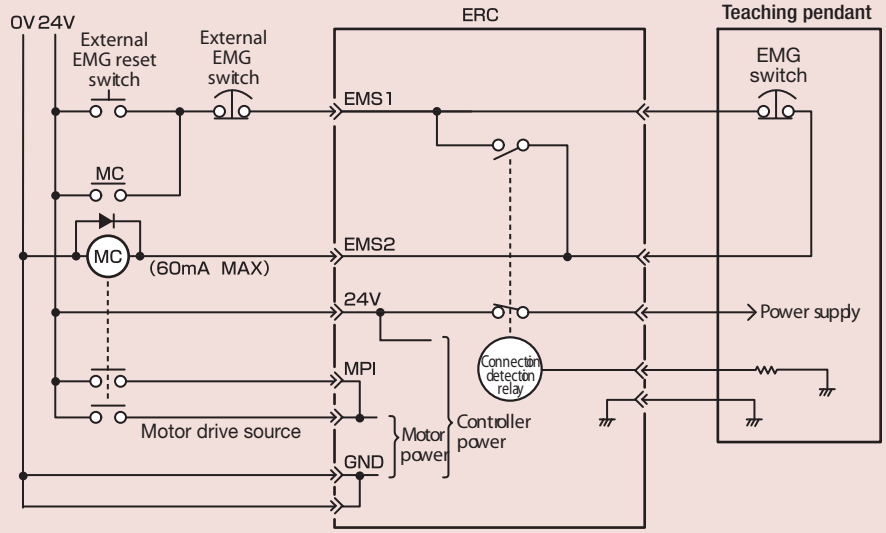

Detailed connection diagram
Gateway unit
PORT IN
PORT N
SDA
SDB
GND
FG
2-pair shield cable
Recommended:
Taiyo Electric Wire & Cable
HK-SB/20276XL
2PXAWG22
4-way junction (AMP : 5-1473574-4)
e-CON connector (AMP: 4-1473562-4)
Housing color: Green
Network cable
CB-ERC2-CTL001 (0.1m)
To power & I/O cable
SGA
SGB
GND
Orange
Blue
Green
e-CON connector (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 purpose. Provide a ready circuit, etc., according to your specification.)

Single Axis

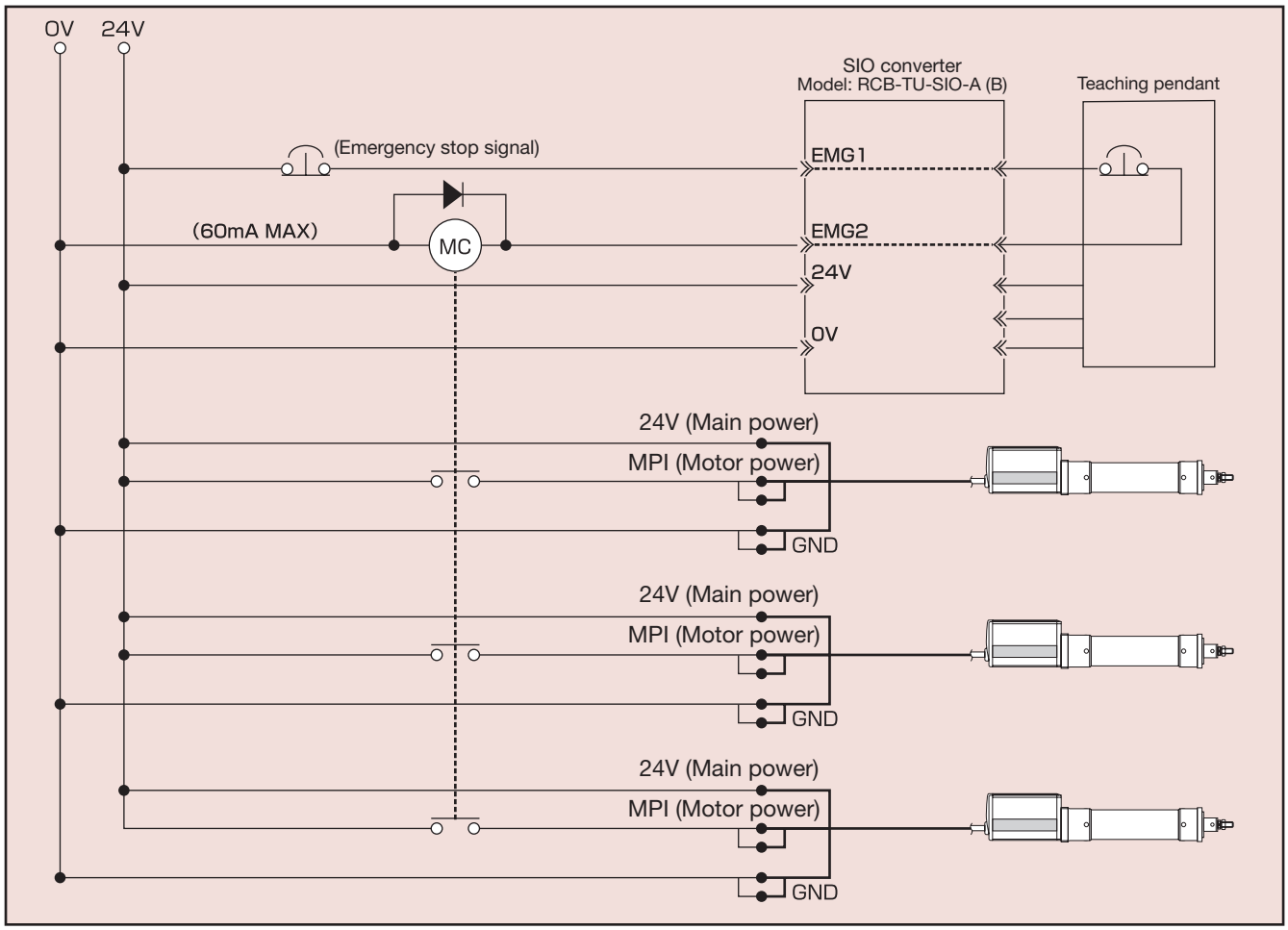
To provide an emergency stop circuit for a single-axis configuration, operate a relay using the EMS1 and EMS2 contacts of the power & I/O cable to cut off MPI (motor power).



* The circuit shown to the left applies to the PIO specification. With the SIO specification, cut off the motor drive source using an external emergency stop circuit because a teaching pendant cannot be connected.

Multiple Axes

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



Options

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/output ports are non-polar, so the I/O specification of the PLC can be either NPN or PNP.
- An input/output-signal monitor LED is equipped to check the ON/OFF status of signals.

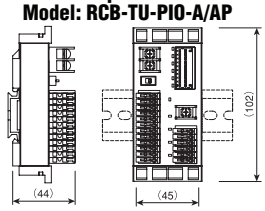
Specifications

Item		Specification
Power-supply voltage		DC24V±10%
Ambient operating temperature, humidity		0~55°C, 85% RH or below (non-condensing)
Input part	Number of input points	6 points
	Input voltage	DC24V±10%
	Input current	7mA/circuit (bipolar)
	Allowable leak current	1mA/point (approx. 2mA at normal temperature)
	Operating voltage (with respect to ground)	Input ON: Min16V (4.5mA) Input OFF: Max5V (1.3mA)
Output part	Number of output points	4 points
	Rated load voltage	DC24V
	Maximum current	60mA/point
	Residual voltage	2V max./60mA
	Short-circuit, overcurrent protection	Fuse resistance (27Ω, 0.1W)

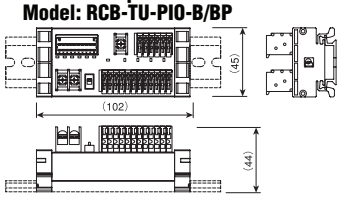
Note

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

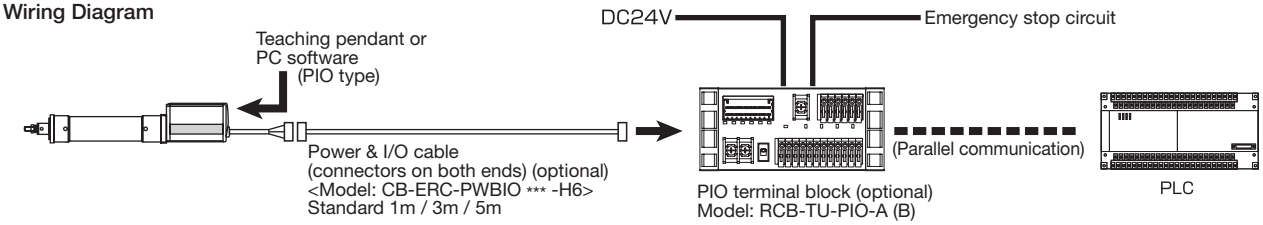
■ **Vertical Specification**
Model: RCB-TU-PIO-A/AP



■ **Horizontal Specification**
Model: RCB-TU-PIO-B/BP



Wiring Diagram



SIO Converter

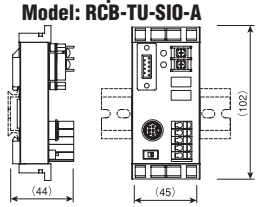
This converter permits RS232 communication by connecting the serial communication line (SGA, SGB) of the power & I/O cable and using a D-sub, 9-pin crossing cable for PC connection.

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.

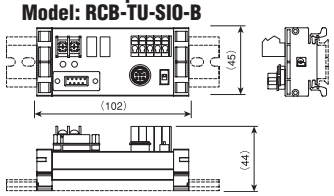
Specifications

Item	Specification
Power-supply voltage	DC24V±10%
Ambient operating temperature, humidity	0~55°C, 85% RH or below (non-condensing)
Terminal resistor	120Ω(built-in)

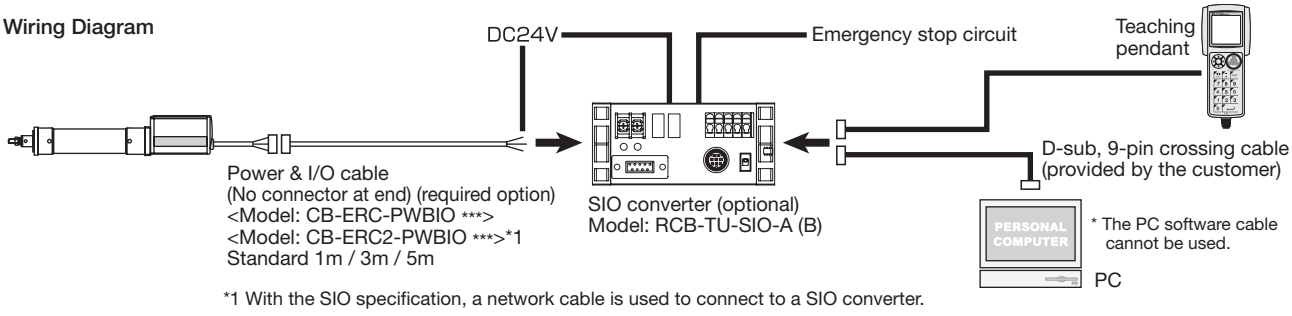
■ **Vertical Specification**
Model: RCB-TU-SIO-A



■ **Horizontal Specification**
Model: RCB-TU-SIO-B



Wiring Diagram

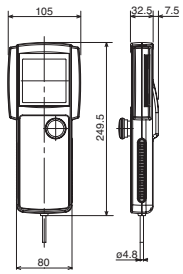
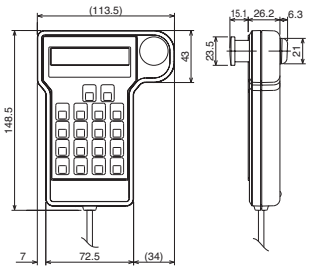
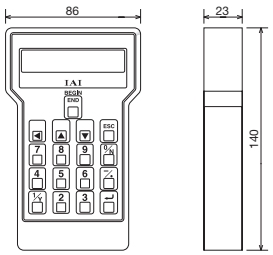


*1 With the SIO specification, a network cable is used to connect to a SIO converter.

Options

■ Teaching Pendant

An input device that provides all functions you need for trial operation and adjustment, such as position data input, test operation, as well as monitoring of current axis positions and input/output signals.

Name	Teaching Pendant	Simple teaching pendant	Data setting unit
Model	RCM-T (standard specification) RCM-TD (with deadman switch *1)	RCM-E	RCM-P
Standard price	—	—	—
External view			
Features	A standard, user-friendly teaching pendant equipped with a large LCD screen. A deadman switch type ensuring added safety is also available.	An economical type offering the same functions as the RCA-T at a substantially lower price.	An affordable data setting unit that provides all editing functions other than those relating to axis operation. * This unit does not support operations relating to axis movement.
Display	21 characters x 16 lines on LCD	16 characters x 2 lines on LCD	16 characters x 2 lines on LCD
Weight	Approx. 550g	Approx. 400g	Approx. 360g
Cable length	5m	5m	5m
Ambient operating temperature, humidity	Temperature: 0~40°C, Humidity: 85% RH or below		
External dimensions			

*1 The deadman switch is a safety switch that cuts off the drive source when released to disable operation.

■ PC Software

A software program that helps input position data and perform test operation.
It significantly facilitates debugging operation by offering wide-ranging functions including jogging, inching, step operation and continuous operation.

■ RS232 Communication Type

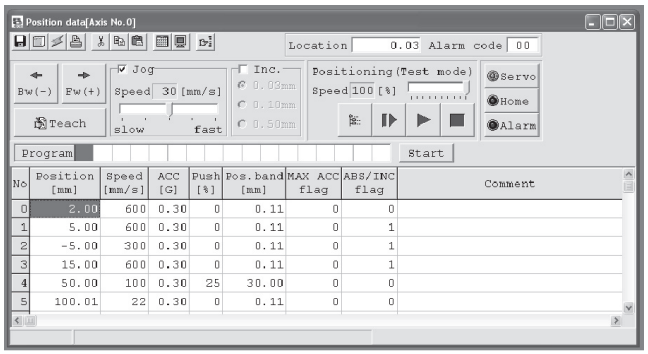
Model RCM-101-MW

<Content>PC software (CD-ROM), PC cable (communication cable + RS232 conversion unit)

■ USB Communication Type

Model RCM-101-USB

<Content>PC software (CD-ROM), PC cable (communication cable + USB conversion unit + USB cable)

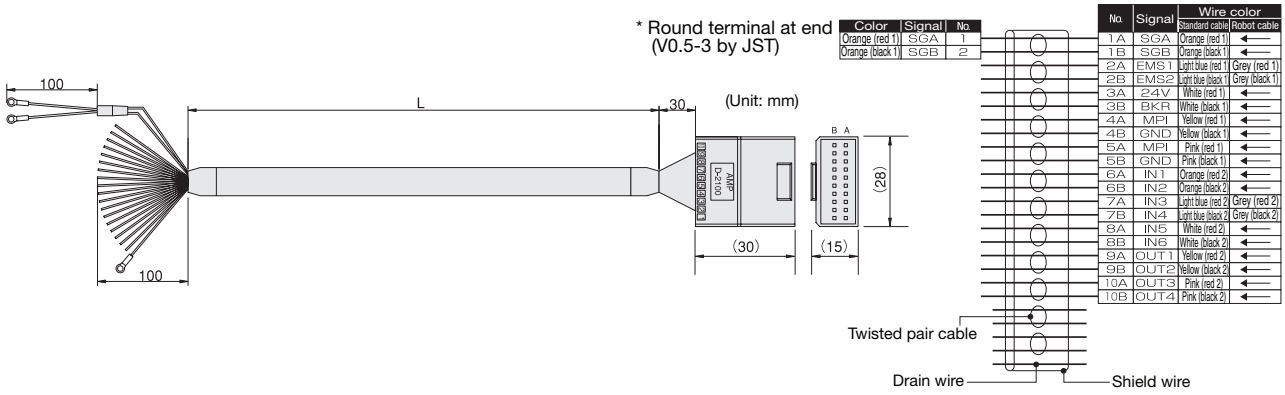


Cables and Spare Parts

Power & I/O Cable / Power & I/O Robot Cable for PIO Type

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

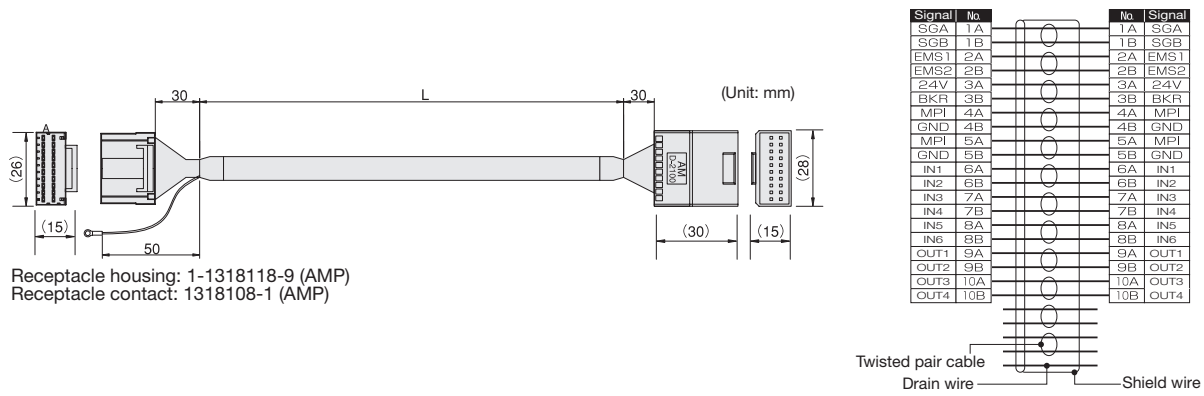
* □□□ indicates the cable length (L). Lengths up to 10 m can be specified. Example) 080 = 8 m



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

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

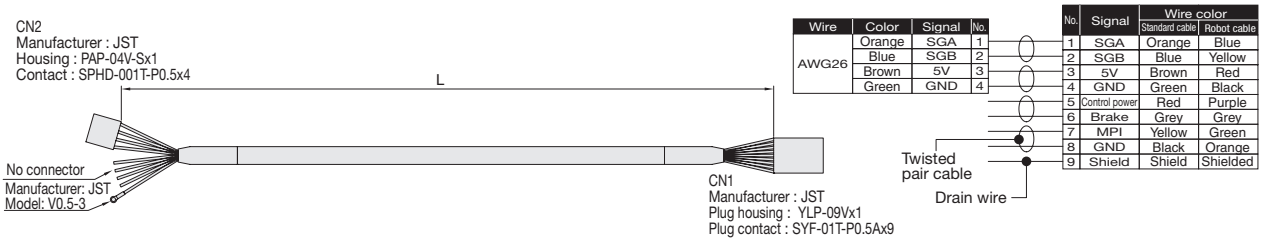
* □□□ indicates the cable length (L). Lengths up to 10 m can be specified. Example) 080 = 8 m



Power & I/O Cable / Power & I/O Robot Cable for SIO Type

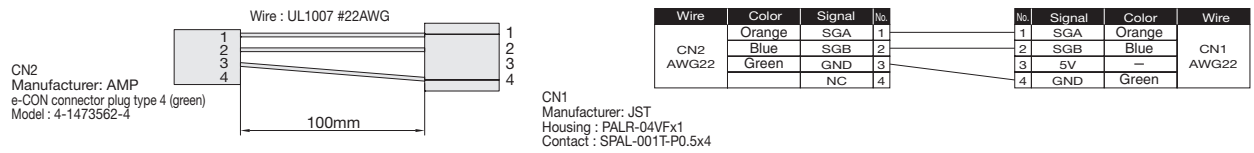
Model CB-ERC2-PWBIO□□□/CB-ERC2-PWBIO□□□-RB

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



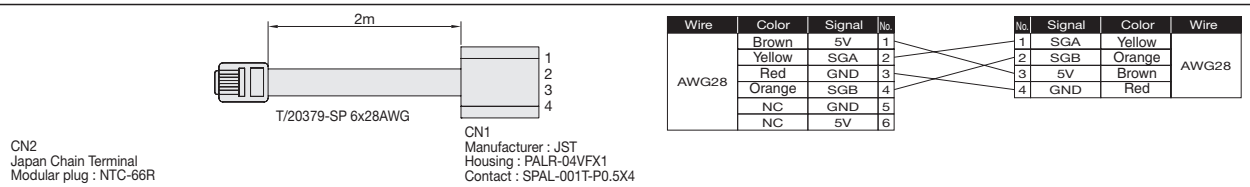
Network Cable

Model CB-ERC2-CTL001



PC Communication Cable

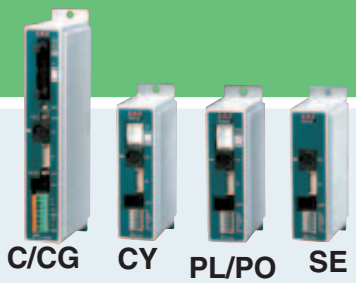
Model CB-ERC2-SIO020



PCON

■ **Model C / CG / CY / PL / PO / SE**

Position controller
for RCP2 series



Type List

Position controller capable of operating RCP2 series actuator. Select from five types each supporting a different control mode.

Type	C	CG	CY	PL / PO	SE
Name	Positioner type	Safety category type	Solenoid valve type	Pulse-train control type	Serial communication type
External view					
Description	Positioner supporting up to 512 positioning points	C type conforming to safety category	Same control actions as those used on air cylinders	Controller for pulse-train control	Network controller
Number of position points	512 points	512 points	3 points	—	64 points
	—	—	—	—	—

Model

PCON — Series | Type | Motor type | Encoder type | **I** | Standard I/O | I/O cable length | Power-supply voltage | **0**

C	Positioner type
CG	Safety category type
CY	Solenoid valve type
SE	Serial communication type
PL	Pulse-train control type (differential receiver type)
PO	Pulse-train control type (open collector type)

20P	20 square pulse motor type
28P	28 square pulse motor type
42P	42 square pulse motor type
56P	56 square pulse motor type

I	Incremental

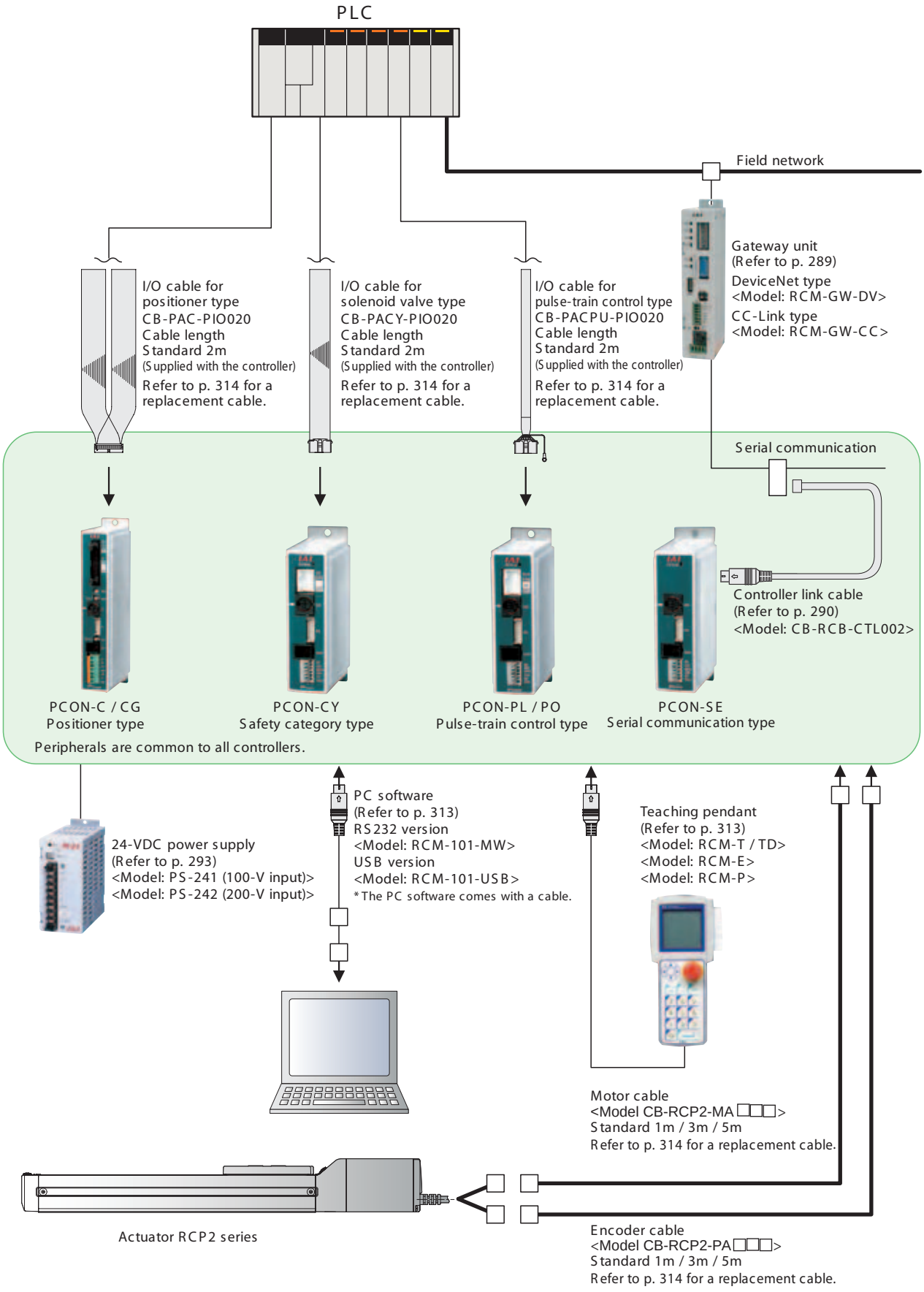
NP	NPN specification (standard)
PN	PNP specification

* If SE (serial communication type) is specified, "0" is automatically specified for the I/O cable option (no cable).

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

0	DC24V

System Configuration



I/O Specifications

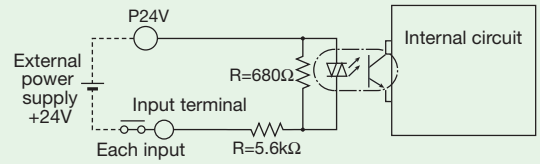
■ Input Part External input specifications

Item	Specification
Input voltage	24VDC ± 10%
Input current	4mA/circuit
Leak current	1mA max./point
Insulation method	Photocoupler

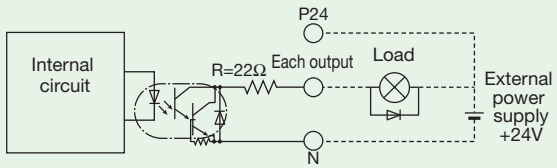
■ Output Part External output specifications

Item	Specification
Load voltage	DC24V
Maximum load current	50mA/point
Residual voltage	2V max.
Insulation method	Photocoupler

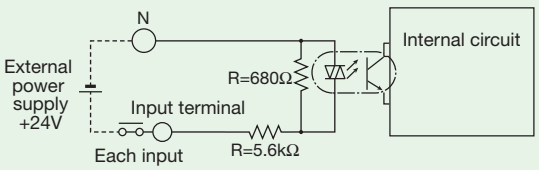
NPN specification



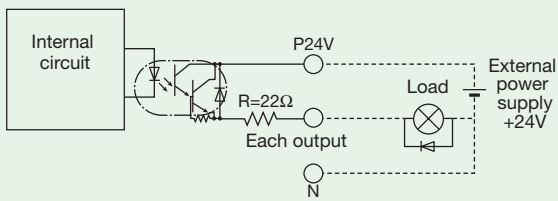
NPN specification



PNP specification



PNP specification



I/O Specifications

The four controller types (C/CG, CY, PL/PO and SE) are differentiated by their I/O specifications. Since the positioner type and solenoid valve type allow the I/O signal settings to be changed through the controller, multiple functions can be provided for selection as needed.

■ Controller Functions by Type

Type	C / CG	CY	PL / PO	SE	Features
Name	Positioner type	Solenoid valve type	Pulse-train control type	Serial communication type	
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, the slider (rod) can be moved by means of an external signal to store the achieved 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 support	○	○	×	○	The controller can be connected to a DeviceNet or CC-Link network using a gateway unit.

Explanation of I/O Signal Functions

The table below explains the functions assigned to the respective I/O signals of the controller.
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.

■ Controller Functions by Type

Category	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~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 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 switching 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–	------	----
	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~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	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	Position complete 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~PM256	Completed position number signal	This signal is used to output the position number achieved at completion of positioning (binary output).
	HEND	Home return complete 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 range specified by parameters.
	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	This signal remains ON while the controller is normal, and turns OFF if an alarm has generated.
	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	This signal turns ON when the controller has switched to the teaching mode via MODE signal input. It turns OFF upon returning to the 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~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~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 (PCON-C / CG)

Pin number	Category		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
		Number of 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			–	–	–	–	–	–
17B	–		NC					
18B	–		NC					
19B	0V		N					
20B	0V		N					

(Note) The signal names inside the parenthesis become the function before returning to the starting point.

■ Solenoid valve type (PCON-CY)

Pin number	Category		Parameter (PIO pattern) selection	
			0	1
			Solenoid valve mode 0	Solenoid valve mode 1
		Number of 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(–)	ST2(–)
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 signal names inside the parenthesis become the function before returning to the starting point.

■ Pulse-train type (PCON-PL/PO)

Pin number	Category		Parameter (PIO pattern) selection	
			0	1
			Standard mode	Push mode
		Number of 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

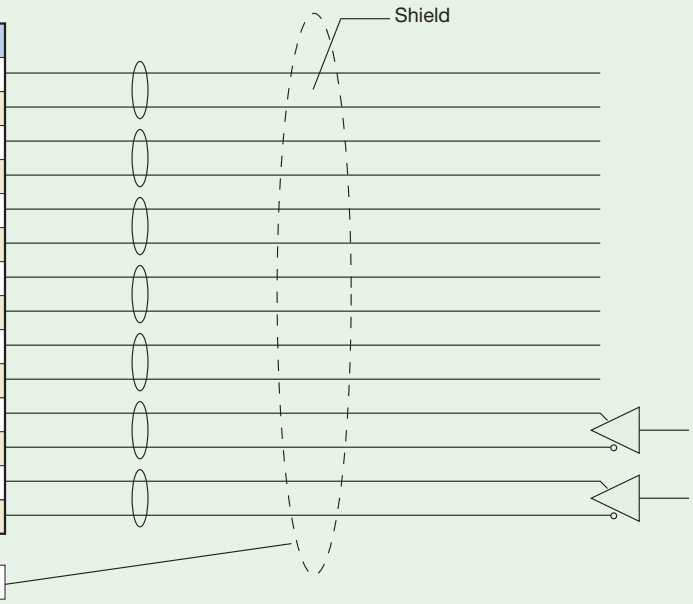
■ Differential Receiver Method (PCON-PL)

Maximum input pulse frequency	: MAX 200kpps
Cable length	: MAX 10m

PIO connector

Pin number	Category	Signal name
1	External 24 V	24V
2	External 0 V	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 of the twisted pair cable connected to the PULSE connector must be connected to the mounting plate.

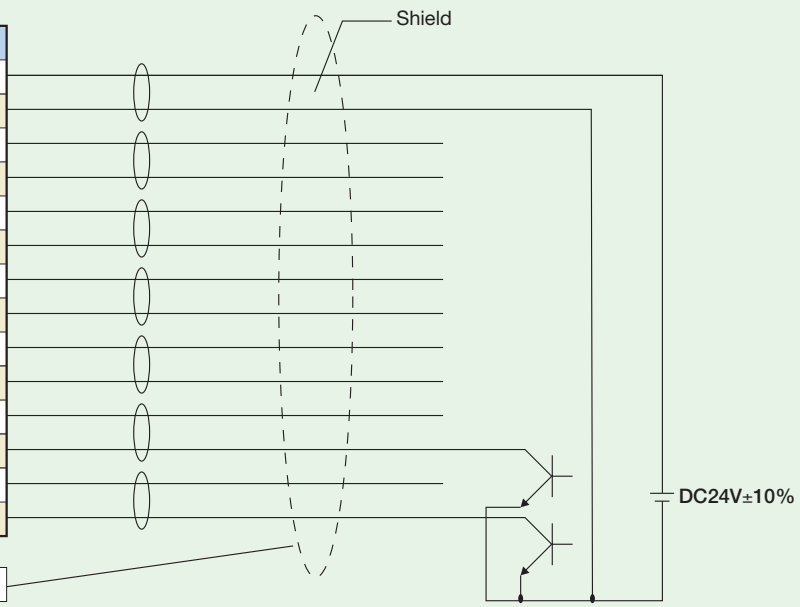
■ Open Collector Method (PCON-PO)

Maximum input pulse frequency	: MAX 60kpps
Cable length	: MAX 2m

PIO connector

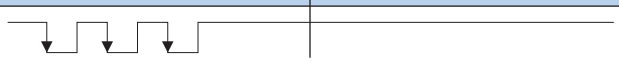
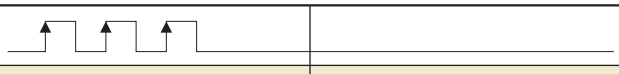
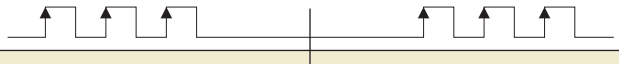
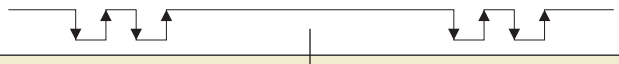
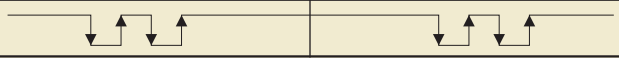
Pin number	Category	Signal name
1	External 24 V	24V
2	External 0 V	0V
3	Input	SON
4	Input	TL
5	Input	HOME
6	Input	RES
7	Output	SV
8	Output	INP
9	Output	HEND
10	Output	* ALM
11	N.C	/PP
12	Open collector input	PP
13	N.C	/NP
14	Open collector input	NP

Mounting plate	FG



* The shield of the twisted pair cable connected to the PULSE connector must be connected to the mounting plate.
* Connect the external 0-V pin (common) to the ground for controller power.

Command Pulse Input Patterns

Command pulse train pattern		Input terminal	Forward	Reverse
Negative logic	Forward pulse train	PP・/PP		
	Reverse pulse train	NP・/NP		
	Forward pulse trains and reverse pulse trains indicate the motor revolutions in forward direction and reverse direction, respectively.			
	Pulse train	PP・/PP		
	Sign	NP・/NP	Low	High
	Command pulses indicate the motor revolutions, while the sign of the command indicates the rotating direction.			
	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		

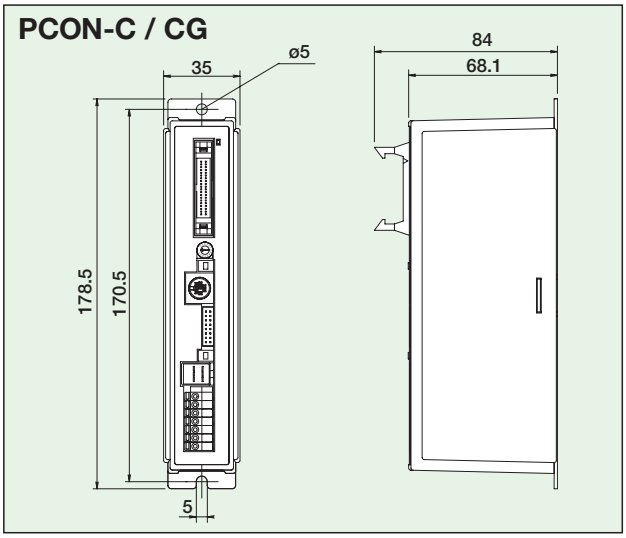
Specification Table

Item	Specification					
Controller type	C	CG	CY	PL	PO	SE
Connectable actuators	RCP2 series actuator (Note 1)					
Number of controlled axes	1 axis					
Operation method	Positioner type		Solenoid valve type	Pulse-train control type		Serial communication type
Number of positioning points	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 points	16 input points / 16 output points		4 input points / 6 output points	4 input points / 4 output points		None
I/O power supply	Externally supplied 24VDC ± 10%					—
Serial communication	RS485 1ch					
Peripheral communication cable	CB-PAC-PIO □□□		CB-PACY-PIO □□□	CB-PACPU-PIO □□□		CB-RCB-CTL002
Command pulse-train input method	—			Differential line driver	Open collector	—
Maximum input pulse frequency (Note 2)	—			Max 200kpps	Max 60kpps	—
Position detection method	Incremental encoder					
Drive-source cutoff relay at emergency stop	Built-in	External				
Forced release of electromagnetic brake	Brake release switch ON/OFF		BK-release terminal signal ON/OFF on power connector			
Motor cable	CB-RCP2-MA □□□ (20m max.)					
Encoder cable	CB-RCP2-PA □□□ (20m max.)					
Input power supply	DC24V±10%					
Power-supply capacity	2A max.					
Dielectric strength voltage	DC500V 1MΩ					
Vibration resistance	XYZ directions	10~57Hz One-side amplitude 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)				
Ambient operating temperature	0~40℃					
Ambient operating humidity	10~95% (non-condensing)					
Operating ambience	Free from corrosive gases					
Protection class	IP20					
Weight	Approx. 300g		Approx. 130g			

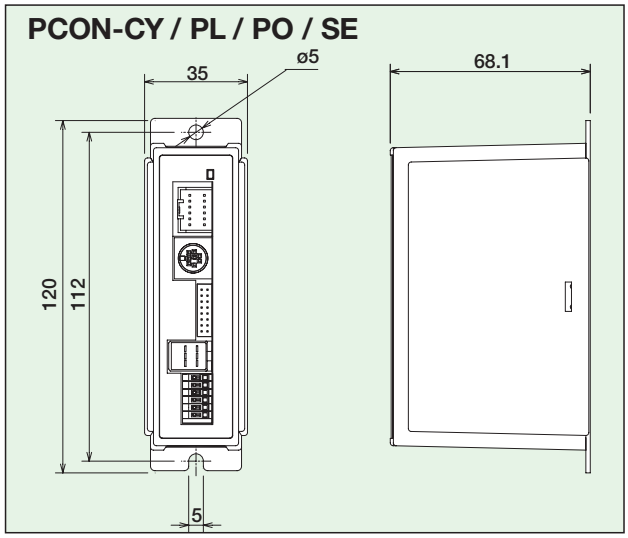
(Note 1) The high-thrust type (RFA), high-speed type (HS8C/HS8R) and waterproof type (RCP2W-SA16) cannot be operated.
(Note 2) With the open collector specification, keep the maximum input frequency to 60 kpps or below to prevent malfunction.

External Dimensions

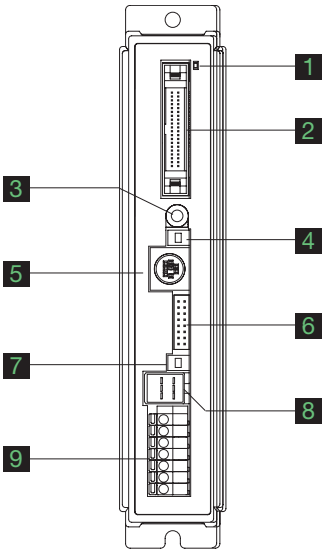
PCON-C / CG



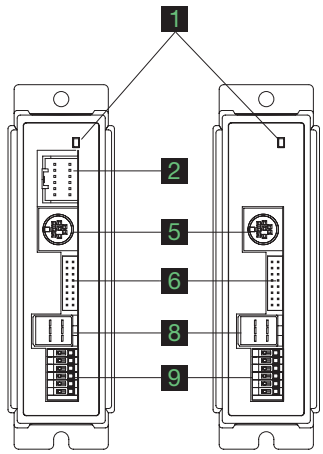
PCON-CY / PL / PO / SE



Name of Each Part



C / CG type



CY / PL / PO type　　SE type

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

Blinking (green) **LED indicators**

These LED indicate the condition of the controller.

Unlit Servo on　Lit (red) Alarm present　Lit (green) Servo off　1 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 is used to set the address of each controller when multiple controllers are linked.

4 Mode switch

This switch is used to switch between teaching operation (MANU) and automatic operation (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.

5 SIO connector

Connect a teaching-pendant or PC cable, or a controller to connect to a gateway unit.

Operation details

Pin number	Signal	Pin	Remarks
1	SGA	RS485 differential signal+	
2	SGB	RS485 differential signal-	
3	5V	+5-V 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	Ground	
8	EMGB	EMG line connection to external equipment	
9	0V	Ground for EMG line connection to external equipment	

6 Encoder/brake connector

Connect the encoder/brake cables of the actuator.

7 Brake release switc

A switch to forcibly release the brake

8 Motor connector

Connect the motor cable of the actuator.

9 Power terminal block

Supplies the main controller power and actuates an emergency stop.

C/CG types

Pin 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 the 24-V power supply
2	0V	Negative side of the 24-V power supply
1	EMG	EMG signal (application of 24 V)

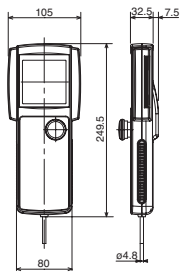
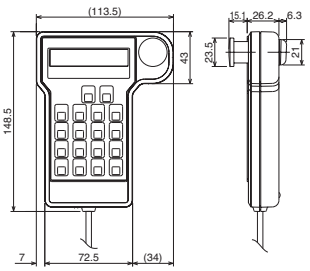
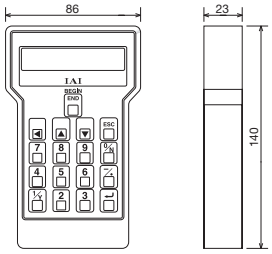
CY / PL / PO / SE types

Pin 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 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

An input device that provides all functions you need for trial operation and adjustment, such as position data input, test operation, as well as monitoring of current axis positions and input/output signals.

Name	Teaching Pendant	Simple teaching pendant	Data setting unit
Model	RCM-T (standard specification) RCM-TD (with deadman switch *1)	RCM-E	RCM-P
Standard price	—	—	—
External view			
Features	A standard, user-friendly teaching pendant equipped with a large LCD screen. A deadman switch type ensuring added safety is also available.	An economical type offering the same functions as the RCA-T at a substantially lower price.	An affordable data setting unit that provides all editing functions other than those relating to axis operation. * This unit does not support operations relating to axis movement.
Display	21 characters x 16 lines on LCD	16 characters x 2 lines on LCD	16 characters x 2 lines on LCD
Weight	Approx. 550g	Approx. 400g	Approx. 360g
Cable length	5m	5m	5m
Ambient operating temperature, humidity	Temperature: 0~40°C, Humidity: 85% RH or below		
External dimensions			

*1 The deadman switch is a safety switch that cuts off the drive source when released to disable operation.

■ PC Software

A software program that helps input position data and perform test operation.
It significantly facilitates debugging operation by offering wide-ranging functions including jogging, inching, step operation and continuous operation.

■ RS232 Communication Type

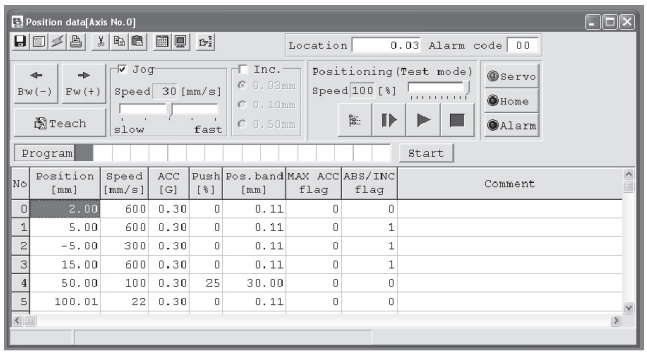
Model RCM-101-MW

<Content>PC software (CD-ROM),
PC cable
(communication cable + RS232 conversion unit)

■ USB Communication Type

Model RCM-101-USB

<Content>PC software (CD-ROM),
PC cable
(communication cable + USB conversion unit + USB cable)



Spare Parts

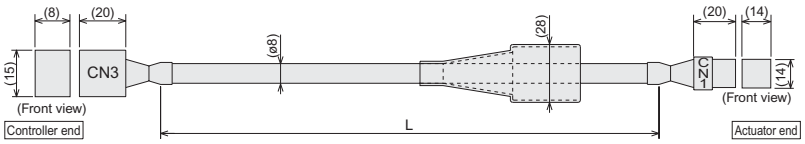
Should you require spare parts after the purchase of your product for replacing the original cables, etc., refer to the model names specified below.

Motor Cable

CB-RCP2-MA□□□

* The standard motor cable is a robot cable.

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



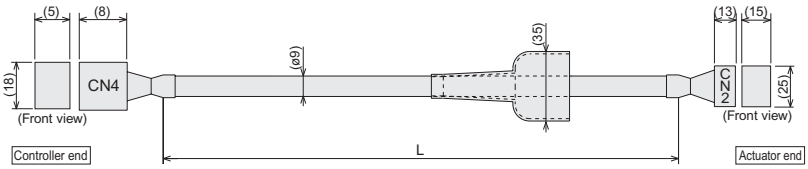
I-1318119-3 (AMP)				CN3 M cable	CN1			SLP-06V (JST)
	Orange	Ā	A1		1	A	Yellow	
	Grey	VMM	A2		2	VMM	Grey	
	White	B̄	A3		3	Ā	Orange	
	Yellow	A	B1		4	B	Orange (black 1)	
	Pink	VMM	B2		5	VMM	Pink	
	Orange (black 1)	B	B3		6	B̄	White	

Encoder Cable / Encoder Robot Cable

CB-RCP2-PA□□□/CB-RCP2-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 20 m can be specified. Example) 080 = 8 m



CN4	Cable color	Signal name	Pin number
PHDR-16VS (JST)	–	(BAT2)	16
	–	(BAT1)	15
	Red	BK+	14
	Grey	BK–	13
	Brown	ENA	12
	Green	ENA	11
	Purple	ENB	10
	Pink	ENB	9
	Black	–	8
	Yellow	VPS	7
	Orange	VBB	6
	Blue	GND	5
	–	(N.C)	4
	–	(N.C)	3
	–	(N.C)	2
	Drain	F.G	1

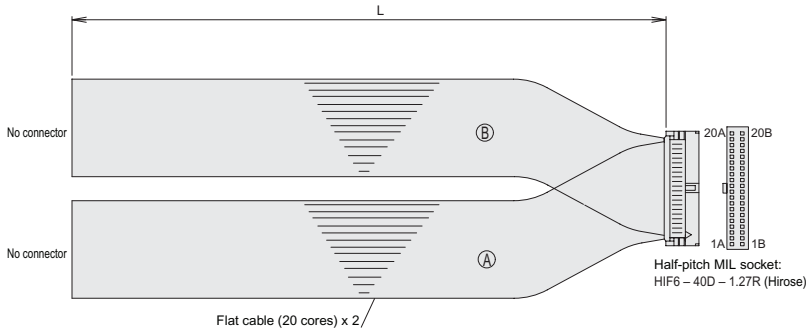
Shield wire
Drain wire

CN2	Pin number	Signal name	Cable color
XMP-18V (JST)	1	ENA	Brown
	2	ENA	Green
	3	ENB	Purple
	4	ENB	Pink
	5	–	–
	6	–	–
	7	–	–
	8	–	–
	9	GND	Blue
	10	VBB	Orange
	11	VPS	Yellow
	12	–	–
	13	–	–
	14	–	–
	15	–	–
	16	BK+	Red
	17	BK–	Grey
	18	F.G	Drain

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

CB-PAC-PIO□□□

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



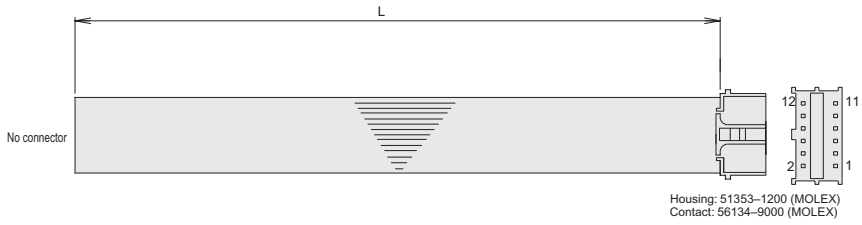
HIF6 – 40D – 1.27R

No.	Signal name	Cable color	Wire	No.	Signal name	Cable color	Wire
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded) AWG28	1B	OUT0	Brown-3	Flat cable Ⓑ (pressure-welded) AWG28
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	Grey-1		8B	OUT7	Grey-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	Grey-2		18B	—	Grey-4	
19A	IN14	White-2		19B	0V	White-4	
20A	IN15	Black-2		20B	0V	Black-4	

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

CB-PACY-PIO□□□

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



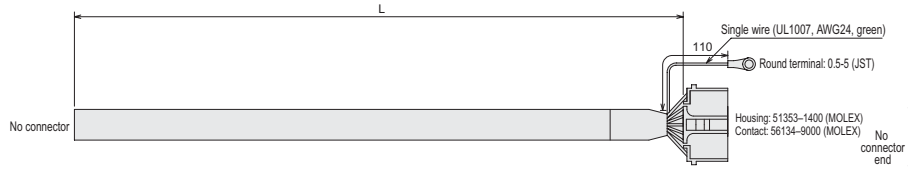
51353-1200 (MOLEX)

No.	Signal name	Cable color	Wire
1	24V	Brown	Flat cable (pressure-welded) 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	Grey-1	
9	OUT2	White-1	
10	OUT3	Black-1	
11	OUT4	Brown-2	
12	OUT5	Red-2	

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

CB-PACPU-PIO□□□

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



51353-1400 (MOLEX)

No.	Signal name	Cable color	Wire
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	Grey	
14	NG	White / Grey	

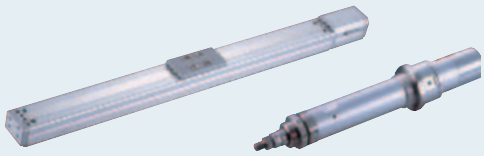
0.5-5 (JST)

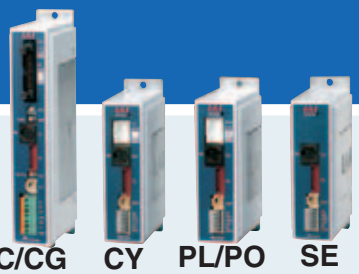
1	FG	White / Grey	AWG24

ACON

■ Model C / CG / CY / PL / PO / SE

Position controller
for RCA series





Type List

Position controller capable of operating RCA series actuator. Select from five types each supporting a different control mode.

Type	C	CG	CY	PL / PO	SE
Name	Positioner type	Safety category type	Solenoid valve type	Pulse-train control type	Serial communication type
External view					
Description	Positioner supporting up to 512 positioning points	C type conforming to safety category	Same control actions as those used on air cylinders	Controller for pulse-train control	Network controller
Number of position points	512 points	512 points	3 points	(Unlimited)	64 points
	—	—	—	—	—

Model

ACON — Type — Motor type — **I** — Standard I/O — I/O cable length — **0**

Series | Type | Motor type | Encoder type | Standard I/O | I/O cable length | Power-supply voltage

C	Positioner type
CG	Safety category type
CY	Solenoid valve type
SE	Serial communication type
PL	Pulse-train control type (differential receiver type)
PO	Pulse-train control type (open collector type)

20S	20-W motor (RA3 only)
20	20-W motor (other than RA3)
30	30-W motor

I	Incremental

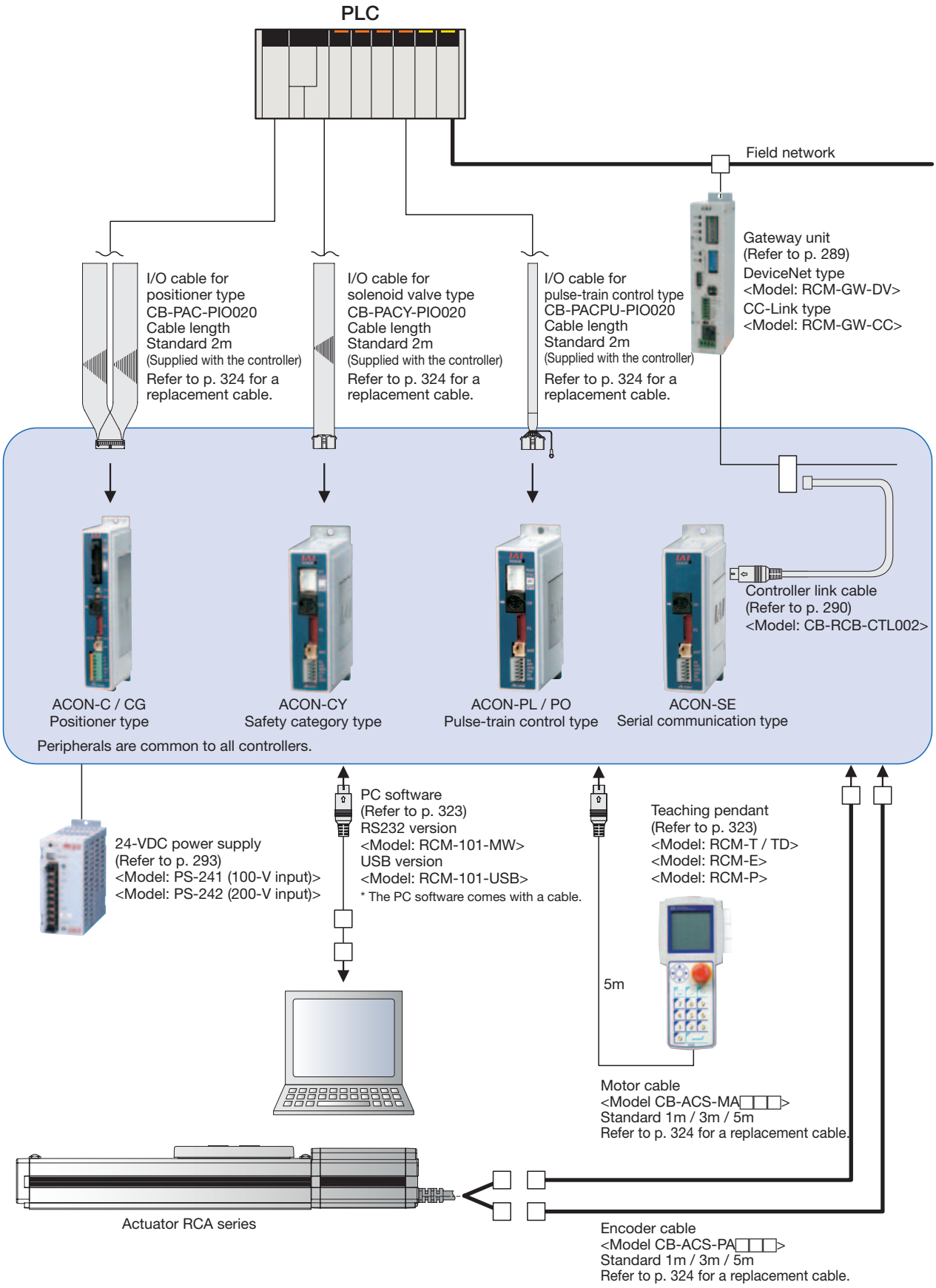
NP	NPN specification (standard)
PN	PNP specification
N	No I/O (SE type)

* If SE (serial communication type) is specified, "0" is automatically specified for the I/O cable option (no cable).

0	No cable
2	2m
3	3m
5	4m

0	DC24V

System Configuration



I/O

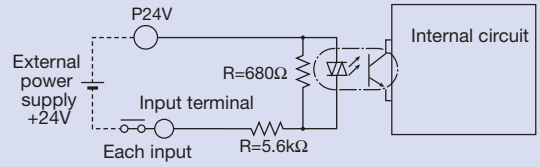
■ Input Part External input specifications

Item	Specification
Input voltage	24VDC ± 10%
Input current	4mA/circuit
Leak current	1mA max./point
Insulation method	Photocoupler

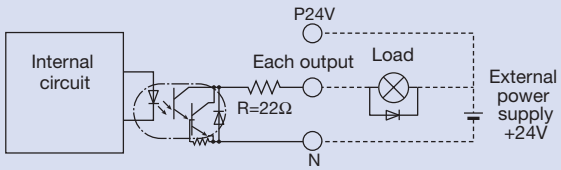
■ Output Part External output specifications

Item	Specification
Load voltage	DC24V
Maximum load current	50mA/point
Residual voltage	2V max.
Insulation method	Photocoupler

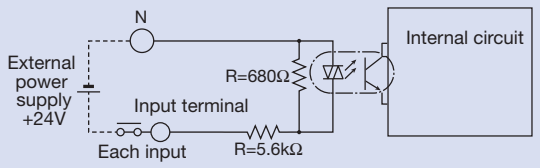
NPN specification



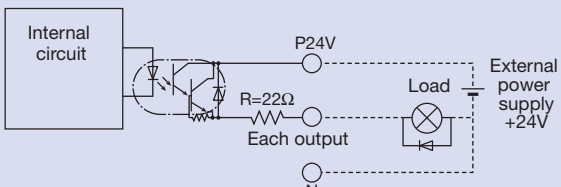
NPN specification



PNP specification



PNP specification



I/O Specifications

The four controller types (C/CG, CY, PL/PO and SE) are differentiated by their I/O specifications. Since the positioner type and solenoid valve type allow the I/O signal settings to be changed through the controller, multiple functions can be provided for selection as needed.

■ Controller Functions by Type

Type	C / CG	CY	PL / PO	SE	Features
Name	Positioner type	Solenoid valve type	Pulse-train control type	Serial communication type	
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, the slider (rod) can be moved by means of an external signal to store the achieved position as position data.
Solenoid valve mode	○	○	×	×	The actuator can be moved simply by ON/OFF of position number signals. This mode makes it easy to convert applications previously using air cylinders with solenoid valves.
Pulse train mode	×	×	○	×	You can operate the actuator freely according to your control needs, without inputting position data.
Network support	○	○	×	○	The controller can be connected to a network via a gateway unit and serial communication function.

Explanation of I/O Signal Functions

The table below explains the functions assigned to the respective I/O signals of the controller.
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.

■ Controller Functions by Type

Category	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~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 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 switching 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–	------	----
	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~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	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	Position complete 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~PM256	Completed position number signal	This signal is used to output the position number achieved at completion of positioning (binary output).
	HEND	Home return complete 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 range specified by parameters.
	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	This signal remains ON while the controller is normal, and turns OFF if an alarm has generated.
	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	This signal turns ON when the controller has switched to the teaching mode via MODE signal input. It turns OFF upon returning to the 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~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~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 number	Category		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
		Number of 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			–	–	–	–	–	–
17B	–		NC					
18B	–		NC					
19B	0V		N					
20B	0V		N					

■ Solenoid valve type (ACON-CY)

Pin number	Category		Parameter (PIO pattern) selection	
			0	1
			Solenoid valve mode 0	Solenoid valve mode 1
		Number of 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(–)	ST2(–)
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

■ Pulse-train type (ACON-PL/PO)

Pin number	Category		Parameter (PIO pattern) selection	
			0	1
			Standard mode	Push mode
		Number of 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

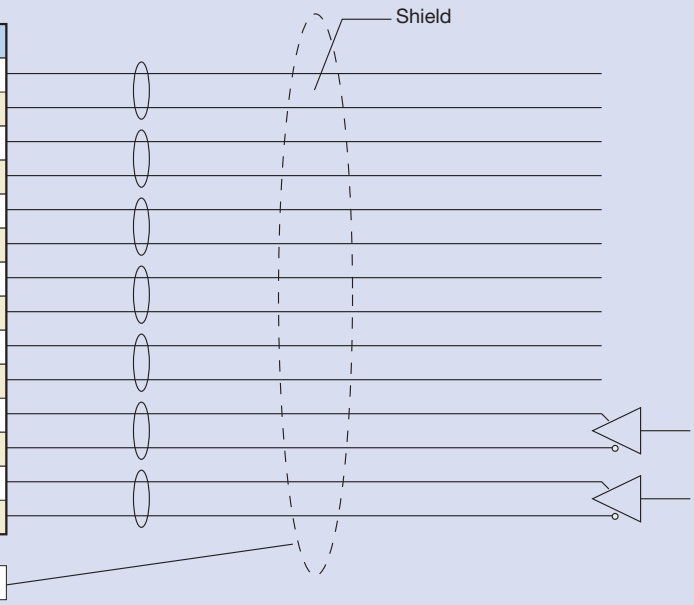
■ Differential Receiver Method (ACON-PL)

Maximum input pulse frequency	: MAX 200kpps
Cable length	: MAX 10m

PIO connector

Pin number	Category	Signal name
1	External 24 V	24V
2	External 0 V	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 of the twisted pair cable connected to the PULSE connector must be connected to the mounting plate.

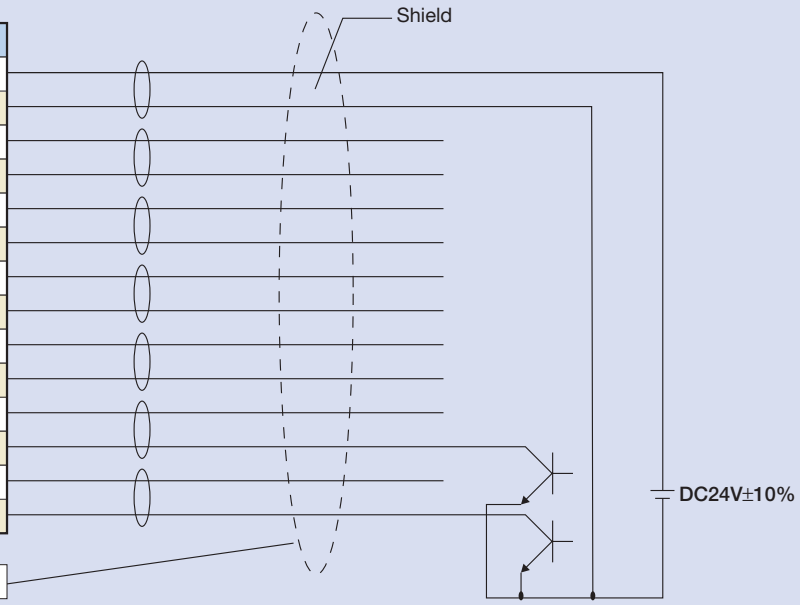
■ Open Collector Method (ACON-PO)

Maximum input pulse frequency	: MAX 60kpps
Cable length	: MAX 2m

PIO connector

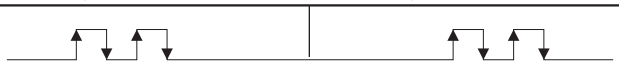
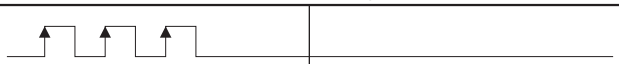
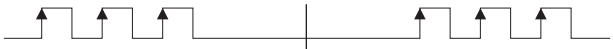
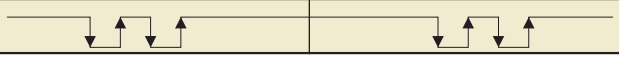
Pin number	Category	Signal name
1	External 24 V	24V
2	External 0 V	0V
3	Input	SON
4	Input	TL
5	Input	HOME
6	Input	RES
7	Output	SV
8	Output	INP
9	Output	HEND
10	Output	* ALM
11	N.C	/PP
12	Open collector input	PP
13	N.C	/NP
14	Open collector input	NP

Mounting plate	FG



* The shield of the twisted pair cable connected to the PULSE connector must be connected to the mounting plate.
* Connect the external 0-V pin (common) to the ground for controller power.

Command Pulse Input Patterns

	Command pulse train pattern	Input terminal	Forward	Reverse
Negative logic	Forward pulse train	PP•/PP		
	Reverse pulse train	NP•/NP		
	Forward pulse trains and reverse pulse trains indicate the motor revolutions in forward direction and reverse direction, respectively.			
	Pulse train	PP•/PP		
	Sign	NP•/NP	(Low)	(High)
	Command pulses indicate the motor revolutions, while the sign of the command indicates the rotating direction.			
	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		

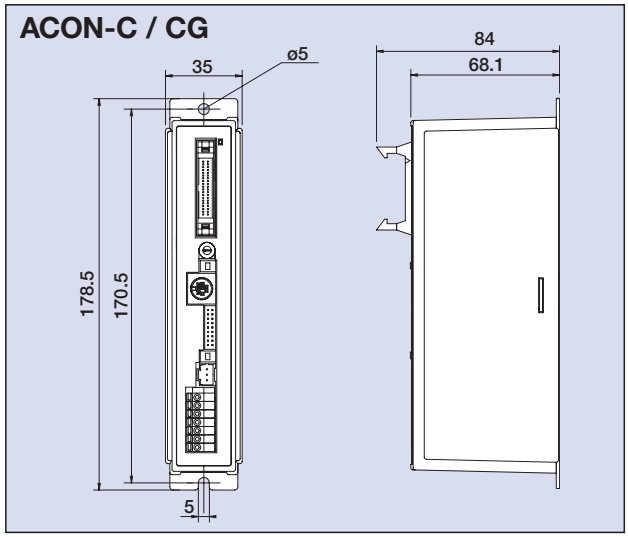
Specification Table

Item	Specification					
Controller type	C	CG	CY	PL	PO	SE
Connectable actuators	RCA series actuator					
Number of controlled axes	1 axis					
Operation method	Positioner type		Solenoid valve type	Pulse-train control type		Serial communication type
Number of positioning points	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 points	16 input points / 16 output points		4 input points / 6 output points	4 input points / 4 output points		None
I/O power supply	Externally supplied 24VDC ± 10%					—
Serial communication	RS485 1ch					
Peripheral communication cable	CB-PAC-PIO □□□		CB-PACY-PIO □□□	CB-PACPU-PIO □□□		CB-RCB-CTL002
Command pulse-train input method	—			Differential line driver	Open collector	—
Maximum input pulse frequency (Note 1)	—			Max 200kpps	Max 60kpps	—
Position detection method	Incremental encoder					
Drive-source cutoff relay at emergency stop	Built-in	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 □□□ (20m max.)					
Encoder cable	CB-ACS-PA □□□ (20m max.)					
Input power supply	DC24V±10%					
Power-supply capacity	SA4 • SA5 20W (Rating 1.3A / Peak 5.1A) SA6 30W (Rating 1.3A / Peak 5.1A) RA3 20W (Rating 1.7A / Peak 5.1A) RA4 20W (Rating 1.3A / Peak 5.1A) RA4 30W (Rating 1.3A / Peak 5.1A)					
Dielectric strength voltage	DC500V 1MΩ					
Vibration resistance	XYZ directions	10~57Hz One-side amplitude 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)				
Ambient operating temperature	0~40°C					
Ambient operating humidity	10~95% (non-condensing)					
Operating ambience	Free from corrosive gases					
Protection class	IP20					
Weight	Approx. 300g		Approx. 130g			

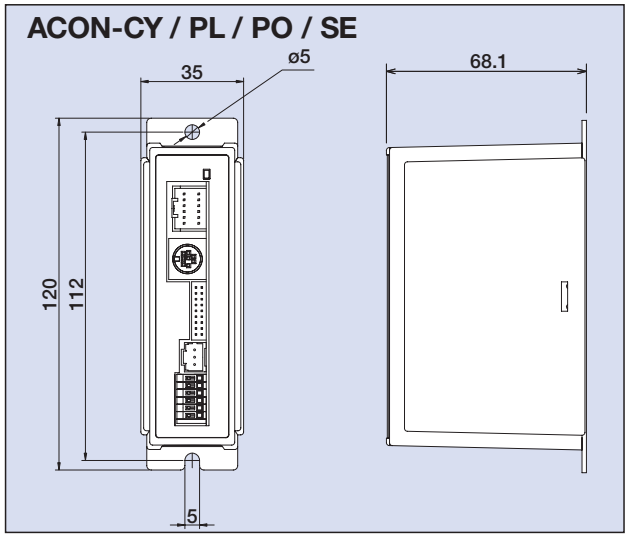
(Note 1) With the open collector specification, keep the maximum input frequency to 60 kpps or below to prevent malfunction. Use a differential line driver if 60 kpps is exceeded.

External Dimensions

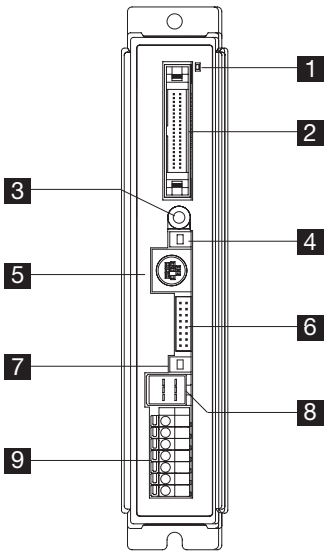
ACON-C / CG



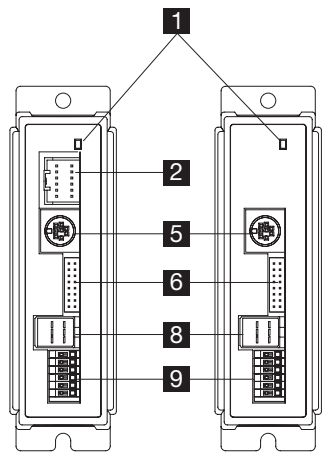
ACON-CY / PL / PO / SE



Name of Each Part



C / CG type



CY / PL / PO type

SE type

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

Blinking (green) LED indicators

These LED indicate the condition of the controller.

Unlit Servo on Lit (red) Alarm present Lit (green) Servo off 1 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 is used to set the address of each controller when multiple controllers are linked.

4 Mode switch

This switch is used to switch between teaching operation (MANU) and automatic operation (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.

5 SIO connector

Connect a teaching-pendant or PC cable, or a controller to connect to a gateway unit.

Operation details

Pin number	Signal	Pin	Remarks
1	SGA	RS485 differential signal+	
2	SGB	RS485 differential signal-	
3	5V	+5-V output	For RS232/485 conversion
4	ENBL	Enable signal	
5	EMGA	EMG line connection to external equipment	
6	24V	24-V power for Teach pendant	For Teach pendant
7	0V	Ground	
8	EMGB	EMG line connection to external equipment	
9	0V	Ground for EMG line connection to external equipment	

6 Encoder/brake connector

Connect the encoder/brake cables of the actuator.

7 Brake release switch

A switch to forcibly release the brake

8 Motor connector

Connect the motor cable of the actuator.

9 Power terminal block

Supplies the main controller power and actuates an emergency stop.

C/CG types

Pin 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 the 24-V power supply
2	0V	Negative side of the 24-V power supply
1	EMG	EMG signal (application of 24 V)

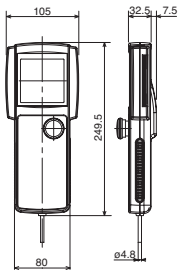
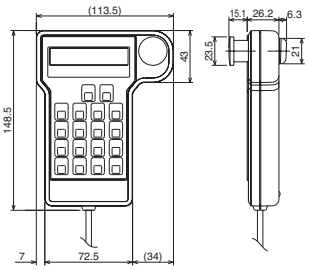
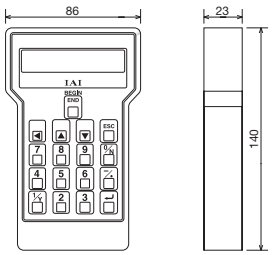
CY / PL / PO / SE types

Pin 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 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

An input device that provides all functions you need for trial operation and adjustment, such as position data input, test operation, as well as monitoring of current axis positions and input/output signals.

Name	Teaching Pendant	Simple teaching pendant	Data setting unit
Model	RCM-T (standard specification) RCM-TD (with deadman switch *1)	RCM-E	RCM-P
Standard price	—	—	—
External view			
Features	A standard, user-friendly teaching pendant equipped with a large LCD screen. A deadman switch type ensuring added safety is also available.	An economical type offering the same functions as the RCA-T at a substantially lower price.	An affordable data setting unit that provides all editing functions other than those relating to axis operation. * This unit does not support operations relating to axis movement.
Display	21 characters x 16 lines on LCD	16 characters x 2 lines on LCD	16 characters x 2 lines on LCD
Weight	Approx. 550g	Approx. 400g	Approx. 360g
Cable length	5m	5m	5m
Ambient operating temperature, humidity	Temperature: 0~40°C, Humidity: 85% RH or below		
External dimensions			

*1 The deadman switch is a safety switch that cuts off the drive source when released to disable operation.

■ PC Software

A software program that helps input position data and perform test operation.
It significantly facilitates debugging operation by offering wide-ranging functions including jogging, inching, step operation and continuous operation.

■ RS232 Communication Type

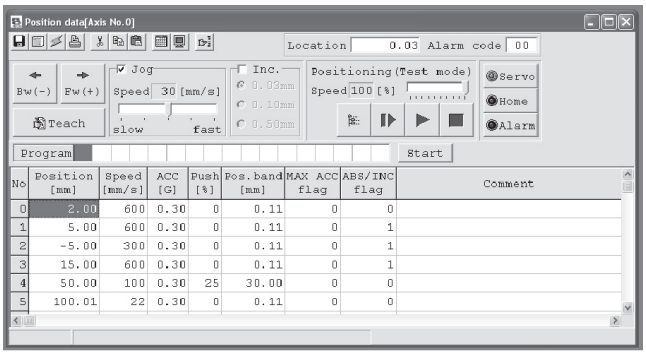
Model RCM-101-MW

<Content>PC software (CD-ROM), PC cable (communication cable + RS232 conversion unit)

■ USB Communication Type

Model RCM-101-USB

<Content>PC software (CD-ROM), PC cable (communication cable + USB conversion unit + USB cable)



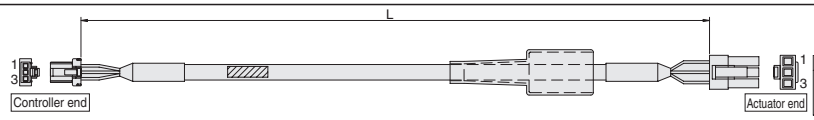
Spare Parts

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

Model CB-ACS-MA□□□

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



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

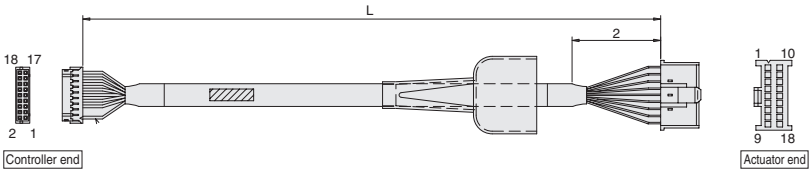
No.	Signal	Color	Wire
1	U	Red	AWG22 (crimped)
2	V	White	
3	W	Black	

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 20 m can be specified. Example) 080 = 8 m



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

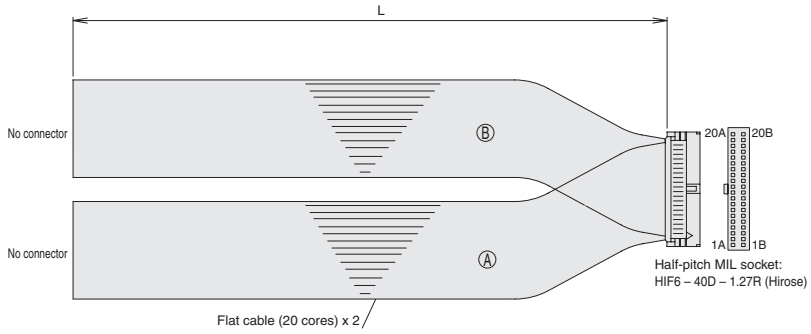
No.	Signal ABZ	Signal Serial	Color	Wire
1	A+	—	White / Blue	AWG26 (crimped)
2	A–	—	White / Yellow	
3	B+	—	White / Red	
4	B–	—	White / Black	
5	—	—	–	
6	—	—	–	
7	LS+	LS+	White / Purple	
8	—	—	–	
9	FG	FG	Drain	
10	Z+	SD+	Orange	
11	Z–	SD–	Green	
12	—	BAT+	Purple	
13	/PS	BAT–	Grey	
14	VCC	VCC	Red	
15	GND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

("White/blue" and other designations under "Wire color" indicate the band color(insulator color).)

I/O Cable for Positioner Type (ACON-C/CG)

Model CB-PAC-PIO□□□

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



HIF6 – 40D – 1.27R

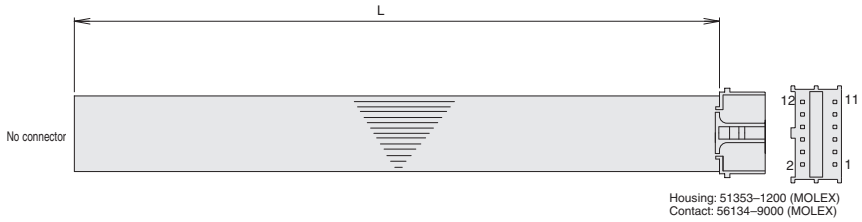
No.	Signal name	Cable color	Wire
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded)
2A	24V	Red-1	
3A	—	Orange-1	
4A	—	Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	Grey-1	
9A	IN4	White-1	
10A	IN5	Black-1	
11A	IN6	Brown-2	
12A	IN7	Red-2	
13A	IN8	Orange-2	
14A	IN9	Yellow-2	
15A	IN10	Green-2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

No.	Signal name	Cable color	Wire
1B	OUT0	Brown-3	Flat cable Ⓑ (pressure-welded) 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	Grey-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	—	Grey-4	
19B	0V	White-4	
20B	0V	Black-4	

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

Model CB-PACY-PIO□□□

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



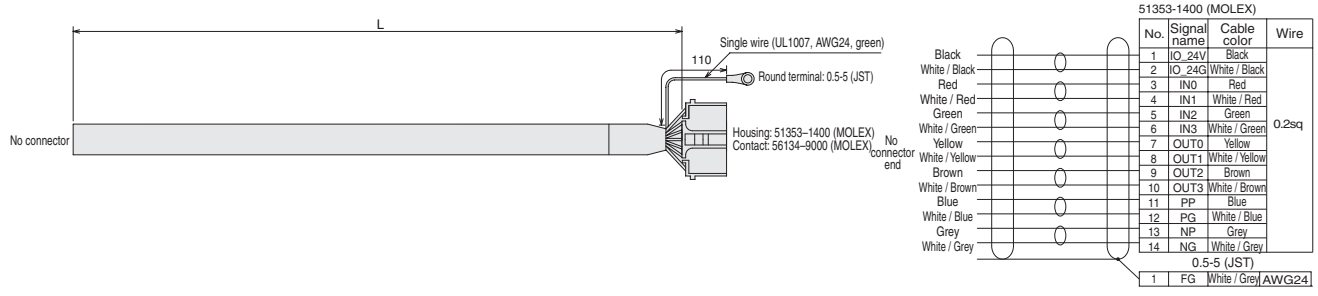
51353-1200 (MOLEX)

No.	Signal name	Cable color	Wire
1	24V	Brown	Flat cable (pressure-welded) 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	Grey-1	
9	OUT2	White-1	
10	OUT3	Black-1	
11	OUT4	Brown-2	
12	OUT5	Red-2	

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

Model CB-PACPU-PIO□□□

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



51353-1400 (MOLEX)

No.	Signal name	Cable color	Wire
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	Grey	
14	NG	White / Grey	

No.	Signal name	Cable color	Wire
1	FG	White / Grey	AWG24

SCON

Position controller
for RCS2 series

Type List

Position controller capable of operating RCP2 series actuator. Various control functions are combined into a single unit.

Type	C				
Name	Positioner mode	Solenoid valve mode	Pulse-train control mode	Network specification (DeviceNet)	Network specification (CC-Link)
External view					
Description	Positioner supporting up to 512 positioning points	Same control actions as those used on air cylinders	Controller for pulse-train control	DeviceNet connection specification (optional)	CC-Link connection specification (optional)
Number of position points	512 points	7 points	(–)	512 points	512 points
Type of I/O	NP/PN			DV	CC

Model

SCON — C — [ ] — [ ] — [ ] — [ ] — [ ]

Series: SCON
Type: C
Motor type
Encoder type
I/O type
I/O cable length
Power-supply voltage

C	Standard type

Motor type

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

Encoder type

I	Incremental
A	Absolute

I/O type

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

I/O cable length

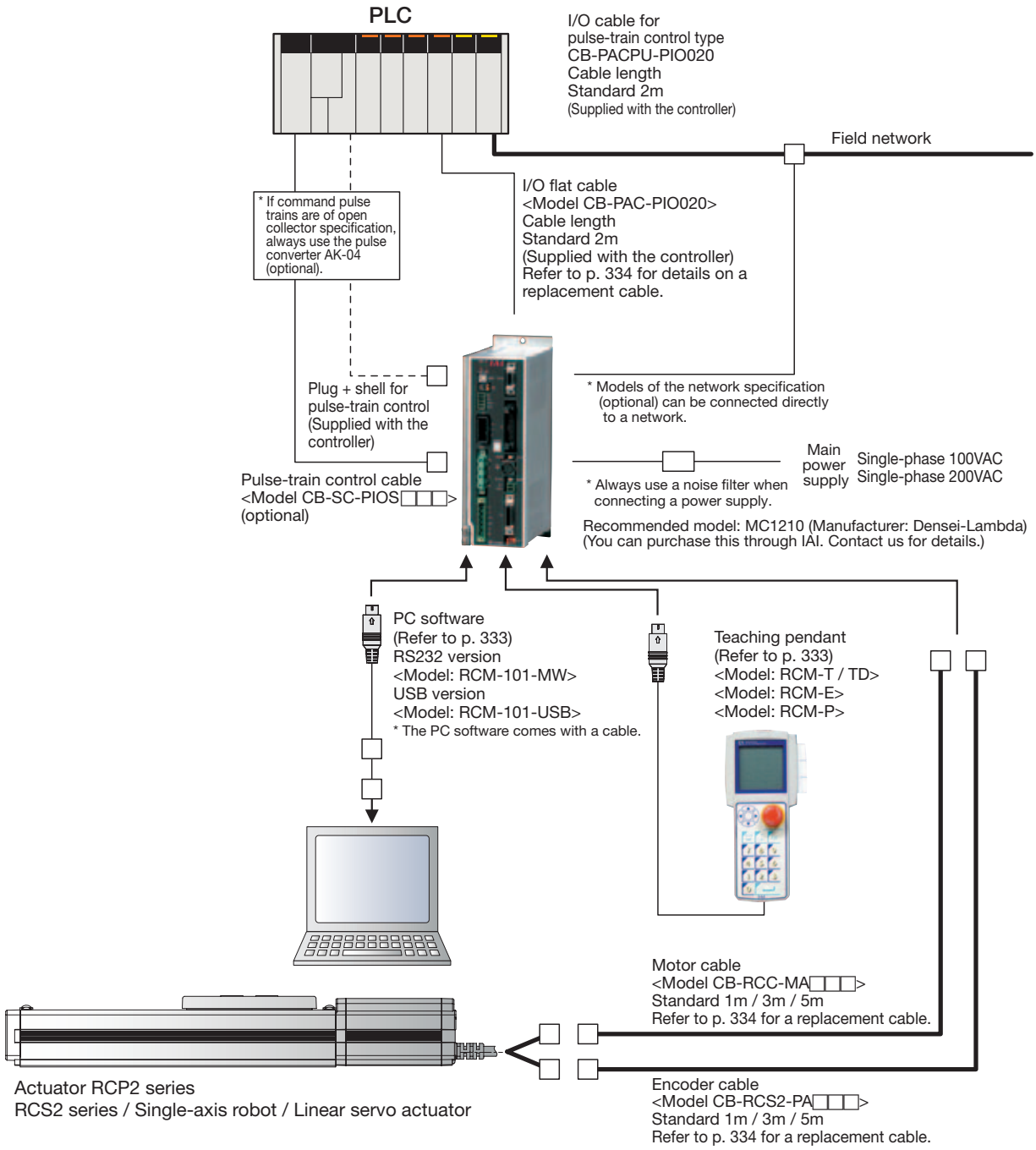
0	No cable
2	2m
3	3m
5	5m

* When selecting DV or CC as the I/O type, please select 0 for the cable length.

Power-supply voltage

1	Single-phase 100VAC
2	Single-phase 200VAC

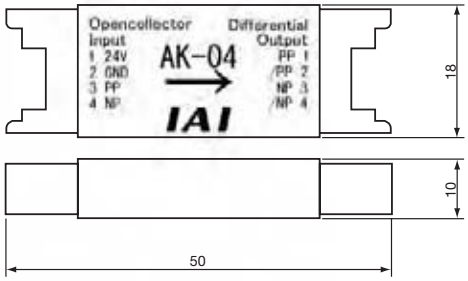
System Configuration



Pulse Converter AK-04 (Optional)

Content: Pulse converter (AK-04) + e-CON input/output 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 supply: DC24V±10% (Max 50mA)
- Input pulses: Open collector (collector current 12mA max.)
- Input frequency: 200kHz max.
- Output pulses: 26C31-equivalent differential output (Max 10mA)

(Applicable wire: AWG 24~26, 0.14~0.3 mm² (max.)
Outer diameter of finished wire ø1.0~1.2mm)

I/O Specifications

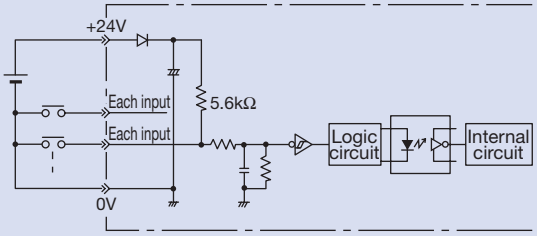
■ Input Part External input specifications

Item	Specification
Input voltage	24VDC ± 10%
Input current	4mA/point
ON/OFF voltage	ON voltage ··· Min DC18.0V (3.5mA) OFF voltage ··· Max DC6.0V (1mA)
Insulation method	Photocoupler

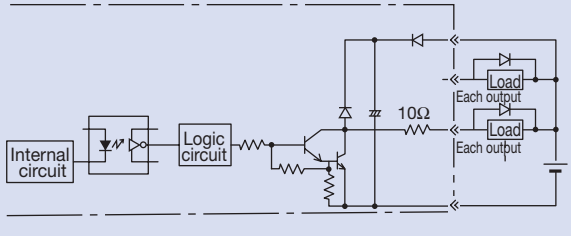
■ Output Part External output specifications

Item	Specification
Load voltage	DC24V
Maximum load current	100mA/point 400mA/8 points
Residual voltage	Max 0.1mA/point
Insulation method	Photocoupler

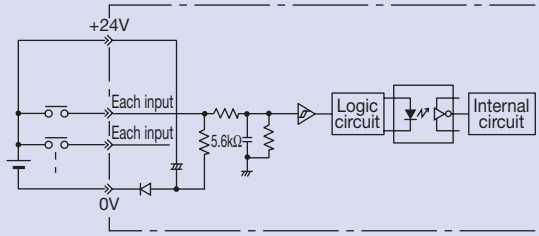
NPN specification



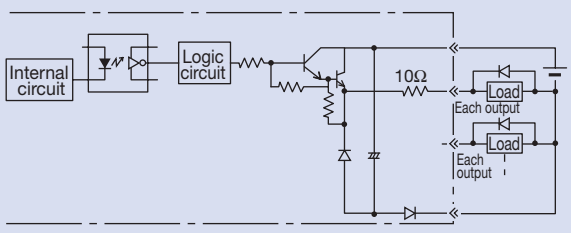
NPN specification



PNP specification



PNP specification



I/O Specifications

The SCON-C supports all of the control methods shown below.
It supports a maximum of 512 positioning points in the positioner mode and up to seven points in the solenoid valve mode.

■ Controller Functions by Type

Type	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, the slider (rod) can be moved by means of an external signal to store the achieved 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 support	○	The controller can be connected directly to a field network by selecting an applicable network option.

Explanation of I/O Signal Functions

The table below explains the functions assigned to the respective I/O signals of the controller.
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.

■ Controller Functions by Type

Category	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~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 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 switching 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–	------	----
	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~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	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	Position complete 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~PM256	Completed position number signal	This signal is used to output the position number achieved at completion of positioning (binary output).
	HEND	Home return complete 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 range specified by parameters.
	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	This signal remains ON while the controller is normal, and turns OFF if an alarm has generated.
	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	This signal turns ON when the controller has switched to the teaching mode via MODE signal input. It turns OFF upon returning to the 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~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~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	---	--------

I/O Signal Table

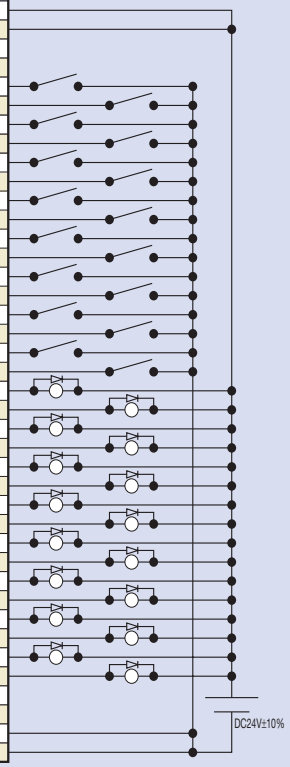
Pin number	Category		Parameter (PIO pattern) selection						Pulse train mode
			0	1	2	3	4	5	0
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2	Pulse train mode
		Number of positioning points	64 points	64 points	256 points	512 points	7 points	3 points	–
		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	ST0	ST0	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	LSO	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	* BLM	* BLM	* BLM	* BLM	* BLM	* BLM	–
17B			–						–
18B			–						–
19B	0V		N						N
20B	0V		N						N

Wiring Diagram

■ Connection Diagram for Positioner Mode

PIO connector (NPN)

Pin number	Category	Signal name
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

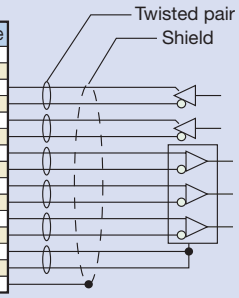


* Connect 24V between pins 1A and 2A, and 0V between pins 19B and 20B.

■ Connection Diagram for Pulse-Train Control Mode (Differential Output)

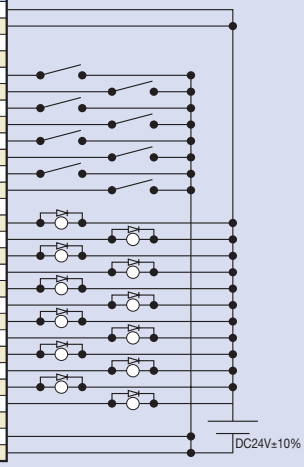
PULSE connector (NPN)

Pin number	Category	Signal name
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)

Pin number	Category	Signal name
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

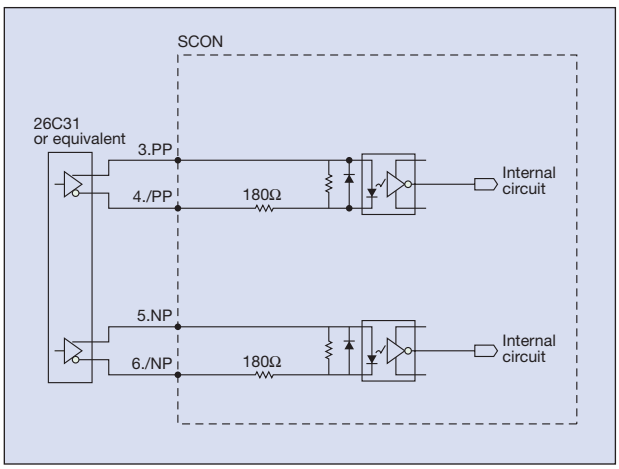


* The shield of the twisted pair cable connected to the PULSE connector must be connected to the shell. Keep the cable length to 10 m or less.
* Connect 24V between pins 1A and 2A, and 0V between pins 19B and 20B.

Input/Output Specifications of Pulse-Train Control Type (Differential Line Driver Specifications)

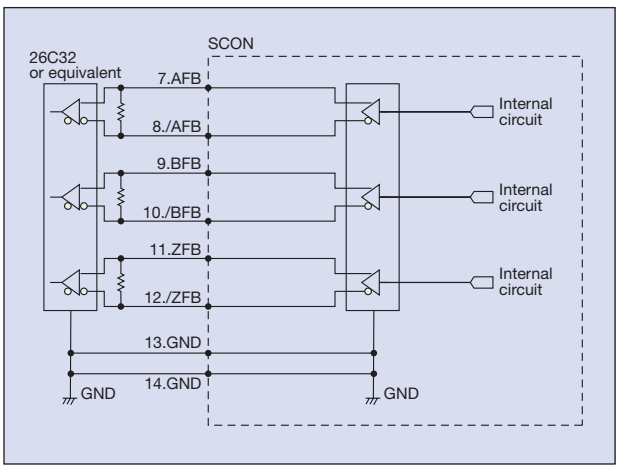
■ Input Part

Maximum input pulses:	Line driver interface 500kpps
	Open collector interface 200kpps (AK-04 is needed)
Insulation method:	Photocoupler insulation

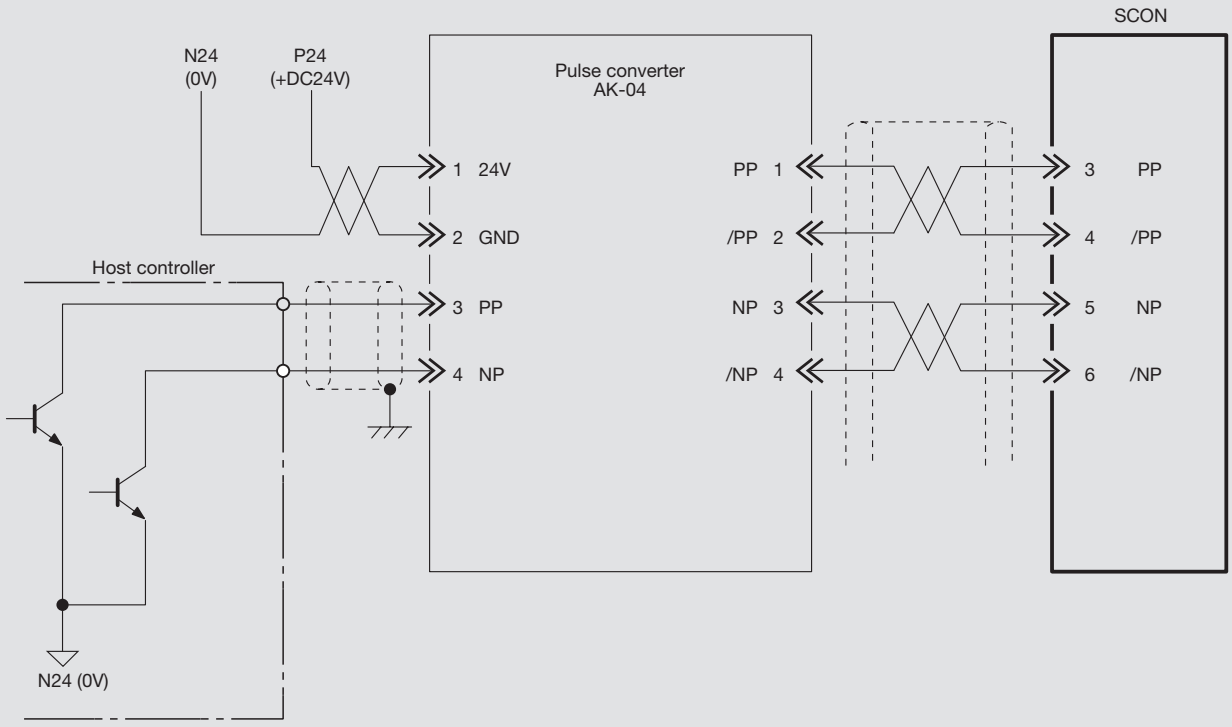


■ Output Part

Output method:	Line driver output
Insulated/not insulated:	Not insulated



Input/Output Specifications of Pulse-Train Control Type (Open Collector Specifications)



* Use the PIO interface power supply as the 24-VDC power supply to be connected to the AK-04.
* Minimize the cable length between the pulse output unit (PLC) and AK-04. Also keep the cable length between the AK-04 and PULSE connector to 2 m or less.

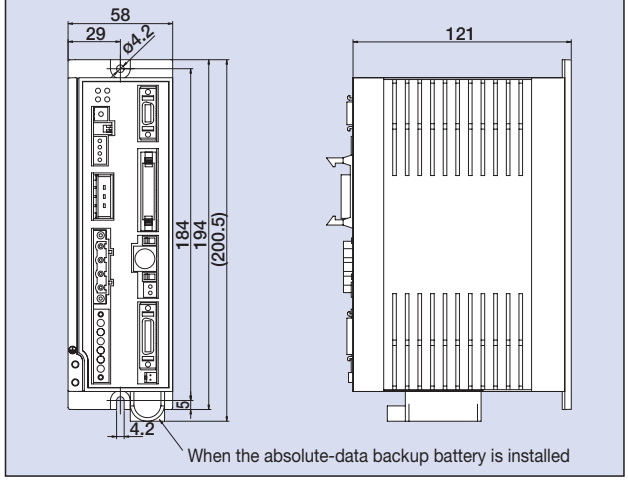
Specification Table

Item	Specification	
Motor capacity	Less than 400W	400W or more
Connectable actuators	RCS2 series actuator / Single-axis robot / Linear servo actuator	
Number of controlled axes	1 axis	
Operation method	Positioner type / Pulse-train control type	
Number of positioning points	512 points	
Backup memory	EEPROM	
I/O connector	40-pin connector	
Number of I/O points	16 input points / 16 output points	
I/O power supply	Externally supplied 24VDC ± 10%	
Serial communication	RS485 1ch	
Peripheral communication cable	CB-PAC-PIO □□□	
Command pulse-train input method	Differential line driver method / Open collector method (Conversion of open collector pulses to differential pulses using a pulse converter (Note 1))	
Maximum input pulse frequency	Differentia line driver method: 500kpps max. / Open collector method (with a pulse converter): 200kpps max.	
Position detection method	Incremental encoder / Absolute encoder	
Emergency stop function	Available (built-in relay)	
Forced release of electromagnetic brake	Brake release switch ON/OFF	
Motor cable	CB-RCC-MA □□□ (20m max.)	
Encoder cable	CB-RCS2-PA □□□ (20m max.)	
Input power supply	Single-phase 100~115VAC±10% Single-phase 200~230VAC±10%	Single-phase 200~230VAC±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 10~57Hz One-side amplitude 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)	
Ambient operating temperature	0~40°C	
Ambient operating humidity	10~95% (non-condensing)	
Operating ambience	Free from corrosive gases	
Protection class	IP20	
Weight	Approx. 800g (+25g for absolute specification)	Approx. 1.1kg
External dimensions	58mm(W) ×194mm(H) ×121mm(D)	72mm(W) ×194mm(H) ×121mm(D)

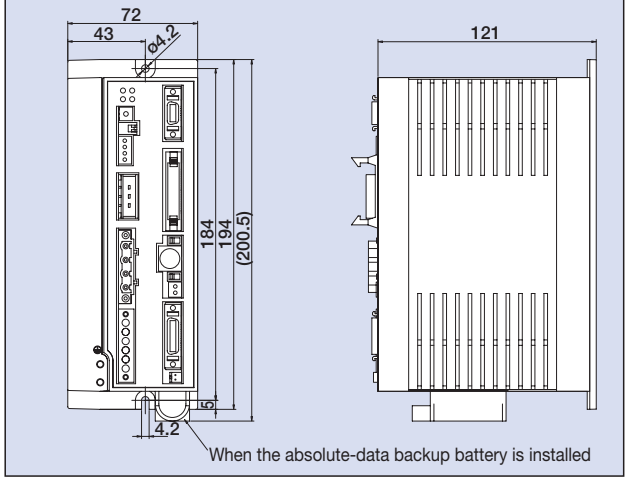
(Note 1) For the command-pulse input method, use the differential line driver method offering higher noise resistance. If the open collector method must be used, use an optional pulse converter (AK-04) to convert open collector pulses to differential pulses.

External Dimensions

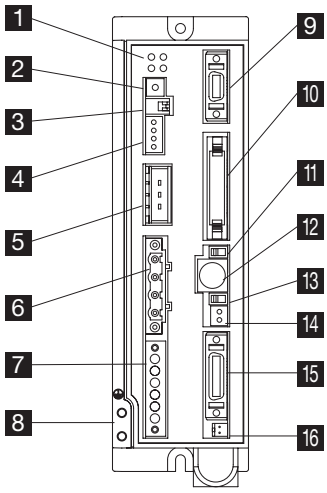
Less than 400W

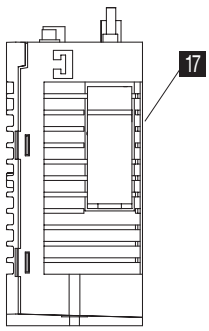


400W or more



Name of Each Part





1 LED indicators

These LED indicate the condition of the controller.

Name	Color	Description
PWR		This LED comes on when the system becomes ready (= the CPU is functioning properly after the power has been turned on).
SV		This LED comes on when the servo turns on.
ALM		This LED remains lit while an alarm is present.
EMG		This LED remains lit while an emergency stop is actuated.

2 Rotary switch

This switch sets an address to identify each controller when multiple controllers are linked.

3 Piano switches

Controller system switches.

Name	Description
1	Operation mode selector switch OFF: Positioner mode, ON: Pulse-train control mode * The setting will become effective after the power is reconnected.
2	Remote update switch (normally set to OFF) OFF: Normal operation mode, ON: Update mode * The setting will become effective after the power is reconnected or following a software reset.

4 System I/O connector

A connector for the emergency stop switch, etc.

5 Regenerative unit connector

A connector for the resistor unit that absorbs regenerative current produced when the actuator decelerates to a stop.

6 Motor connector

(compatible with XSEL, ECON and RCS)

A connector for the actuator's motor cable.

7 Power-supply connector

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

8 Grounding screw

A screw for protective grounding. Always connect this screw to ground.

9 Dedicated pulse-train control connector

A connector used to operate the controller in the pulse-train control mode. It remains unconnected if the controller is operated in the positioner mode.

10 PIO connector

A connector for a cable used to perform parallel communication with a PLC and other peripherals.

11 Running mode selector switch

Name	Description
MANU	Do not accept 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

A connector for a teaching-pendant or PC communication cable.

13 Brake release switch

A switch to forcibly release the electromagnetic brake equipped on the actuator.

* A 24-VDC power supply for driving the brake must be connected.

14 Brake power-supply connector

A connector for supplying 24-VDC brake power. (Required only when an actuator with brake is connected.)

15 Encoder/sensor connector (compatible with XSEL-P/Q)

A connector for the encoder/sensor cables.

16 Absolute-data backup battery connector

A connector for the absolute-data backup battery. (Required only when an absolute-encoder actuator is used.)

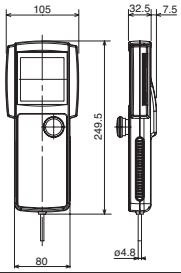
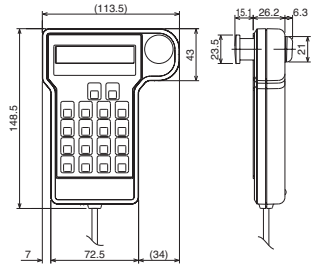
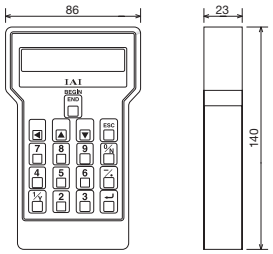
17 Absolute-data backup battery holder

A battery holder into which the absolute-data backup battery is set.

Options

■ Teaching Pendant

An input device that provides all functions you need for trial operation and adjustment, such as position data input, test operation, as well as monitoring of current axis positions and input/output signals.

Name	Teaching Pendant	Simple teaching pendant	Data setting unit
Model	RCM-T (standard specification) RCM-TD (with deadman switch *1)	RCM-E	RCM-P
Standard price	—	—	—
External view			
Features	A standard, user-friendly teaching pendant equipped with a large LCD screen. A deadman switch type ensuring added safety is also available.	An economical type offering the same functions as the RCA-T at a substantially lower price.	An affordable data setting unit that provides all editing functions other than those relating to axis operation. * This unit does not support operations relating to axis movement.
Display	21 characters x 16 lines on LCD	16 characters x 2 lines on LCD	16 characters x 2 lines on LCD
Weight	Approx. 550g	Approx. 400g	Approx. 360g
Cable length	5m	5m	5m
Ambient operating temperature, humidity	Temperature: 0~40°C, Humidity: 85% RH or below		
External dimensions			

*1 The deadman switch is a safety switch that cuts off the drive source when released to disable operation.

■ PC Software

A software program that helps input position data and perform test operation.
It significantly facilitates debugging operation by offering wide-ranging functions including jogging, inching, step operation and continuous operation.

■ RS232 Communication Type

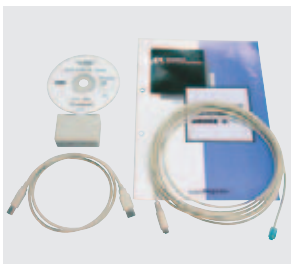
Model RCM-101-MW

<Content>PC software (CD-ROM),
PC cable
(communication cable + RS232 conversion unit)

■ USB Communication Type

Model RCM-101-USB

<Content>PC software (CD-ROM),
PC cable
(communication cable + USB conversion unit + USB cable)



■ Regenerative Resistance Unit

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

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

Specifications

Weight	0.9kg
Built-in regenerative resistor	220Ω 80W
Unit-controller connection cable (supplied)	CB-SC-REU010 (SSEL)

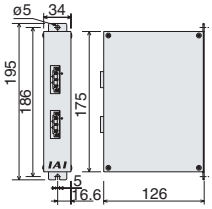
* Please arrange one each of REU-2 and REU-1 (page 372), when two regenerative units are necessary.

Guide for Determining Necessary Number of Units

	Horizontal	Vertical
0 unit	~200W	~100W
1 unit	~750W	~400W
2 units		~750W

* There may be times when more regenerative resistance is needed than listed above depending on operating conditions.

External Dimensions



■ Battery for Absolute Data Storage

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

Model AB-5

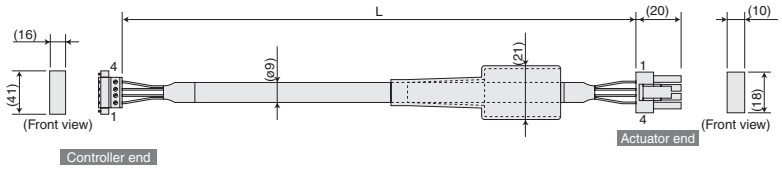
Spare Parts

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). Lengths up to 30 m can be specified. Example) 080 = 8 m



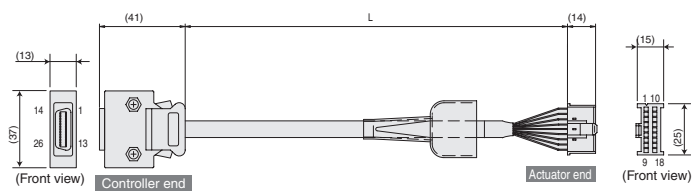
Wire	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

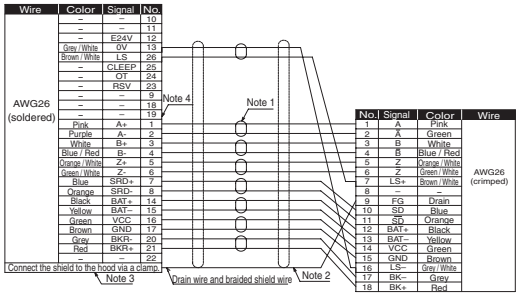
No.	Signal	Color	Wire
1	U	Red	0.75sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Encoder Cable / Encoder Robot Cable

Model CB-RCS2-PA□□□/CB-X2-PA□□□

* □□□ indicates the cable length (L). Lengths up to 30 m can be specified. Example) 080 = 8 m





Wire	Color	Signal	No.
AWG26 (soldered)	–	–	10
	–	–	11
	–	E24V	12
	Grey / 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
	Grey	BKR-	20
	Red	BKR+	21
	–	–	22

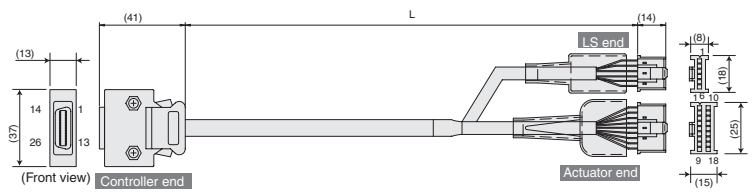
Connect the shield to the hood via a clamp.

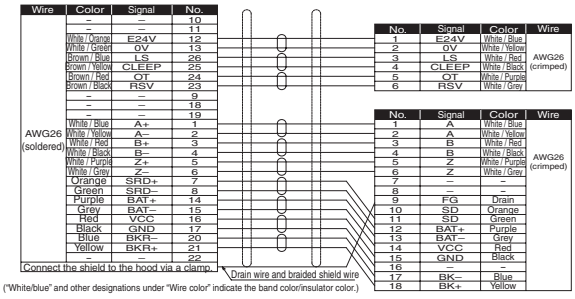
No.	Signal	Color	Wire
1	A	Pink	AWG26 (crimped)
2	Ā	Green	
3	B	White	
4	B̄	Blue / Red	
5	Z	Orange / White	
6	Z̄	Green / White	
7	LS+	Brown / White	
8	–	–	
9	FG	Drain	
10	SD	Blue	
11	SD	Orange	
12	BAT+	Black	
13	BAT–	Yellow	
14	VCC	Green	
15	GND	Brown	
16	LS–	Grey / White	
17	BK–	Grey	
18	BK+	Red	

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

Model CB-RCS2-PLA□□□/CB-X2-PLA□□□

* □□□ indicates the cable length (L). Lengths up to 30 m can be specified. Example) 080 = 8 m





Wire	Color	Signal	No.
AWG26 (soldered)	–	–	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 / Grey	Z–	6
	Orange	SRD+	7
	Green	SRD–	8
	Purple	BAT+	14
	Grey	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

Connect the shield to the hood via a clamp.

No.	Signal	Color	Wire
1	E24V	White / Blue	AWG26 (crimped)
2	0V	White / Yellow	
3	LS	White / Red	
4	CLEEP	White / Black	
5	OT	White / Purple	
6	RSV	White / Grey	

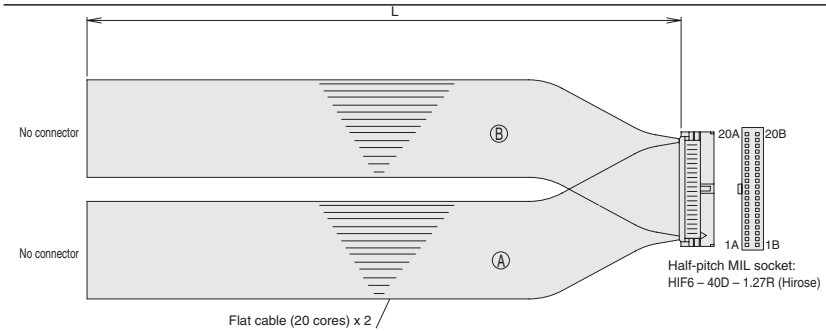
No.	Signal	Color	Wire
1	A	White / Blue	AWG26 (crimped)
2	Ā	White / Yellow	
3	B	White / Red	
4	B̄	White / Black	
5	Z	White / Purple	
6	Z̄	White / Grey	
7	–	–	
8	–	–	
9	FG	Drain	
10	SD	Orange	
11	SD	Green	
12	BAT+	Purple	
13	BAT–	Grey	
14	VCC	Red	
15	GND	Black	
16	–	–	
17	BK–	Blue	
18	BK+	Yellow	

("White/blue" and other designations under "Wire color" indicate the band color/insulator color.)

I/O Flat Cable

Model CB-PAC-PIO□□□

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



HIF6 – 40D – 1.27R

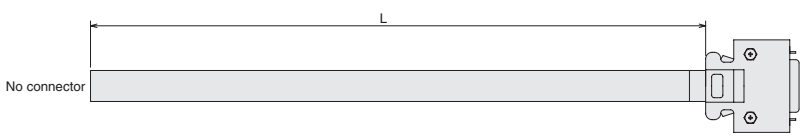
No.	Signal name	Cable color	Wire
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded) AWG28
2A	24V	Red-1	
3A	—	Orange-1	
4A	—	Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	Grey-1	
9A	IN4	White-1	
10A	IN5	Black-1	
11A	IN6	Brown-2	
12A	IN7	Red-2	
13A	IN8	Orange-2	
14A	IN9	Yellow-2	
15A	IN10	Green-2	
16A	IN11	Blue-2	
17A	IN12	Purple-2	
18A	IN13	Grey-2	
19A	IN14	White-2	
20A	IN15	Black-2	

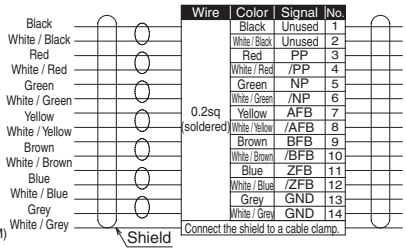
No.	Signal name	Cable color	Wire
1B	OUT0	Brown-3	Flat cable Ⓑ (pressure-welded) AWG28
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Grey-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B	OUT15	Blue-4	
17B	—	Purple-4	
18B	—	Grey-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 10 m can be specified. Example) 080 = 8 m





Wire	Color	Signal	No.
0.2sq (soldered)	Black	Unused	1
	White / Black	Unused	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
	Grey	GND	13
	White / Grey	GND	14

PSEL

Program controller
for RCP2 series

Type List

Program controller capable of operating RCP2 series actuator. Various control functions are combined into a single unit.

Type	C	
Name	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 position points	1500 points	

Model

* With a 1-axis specification, the section denoted by (Axis 2) need not be specified.

PSEL — C — ☐ — ☐ I ☐ — (☐ I ☐) — ☐ — ☐ — 0

Series: PSEL
Type: C
Number of connected axes: 1, 2
(Axis 1) Motor type: 20P, 28P, 42P, 56P
(Axis 1) Encoder type: I
(Axis 1) Options: B
(Axis 2) Motor type: 20P, 28P, 42P, 56P
(Axis 2) Encoder type: I
(Axis 2) Options: B
I/O type: NP, PN
I/O cable length: 0, 2, 3, 5
Power-supply voltage: 0

C	Standard type

1	1-axis specification
2	2-axis specification

I	Incremental

20P	20 square pulse motor type
28P	28 square pulse motor type
42P	42 square pulse motor type
56P	56 square pulse motor type

B	Brake

I	Incremental

20P	20 square pulse motor type
28P	28 square pulse motor type
42P	42 square pulse motor type
56P	56 square pulse motor type

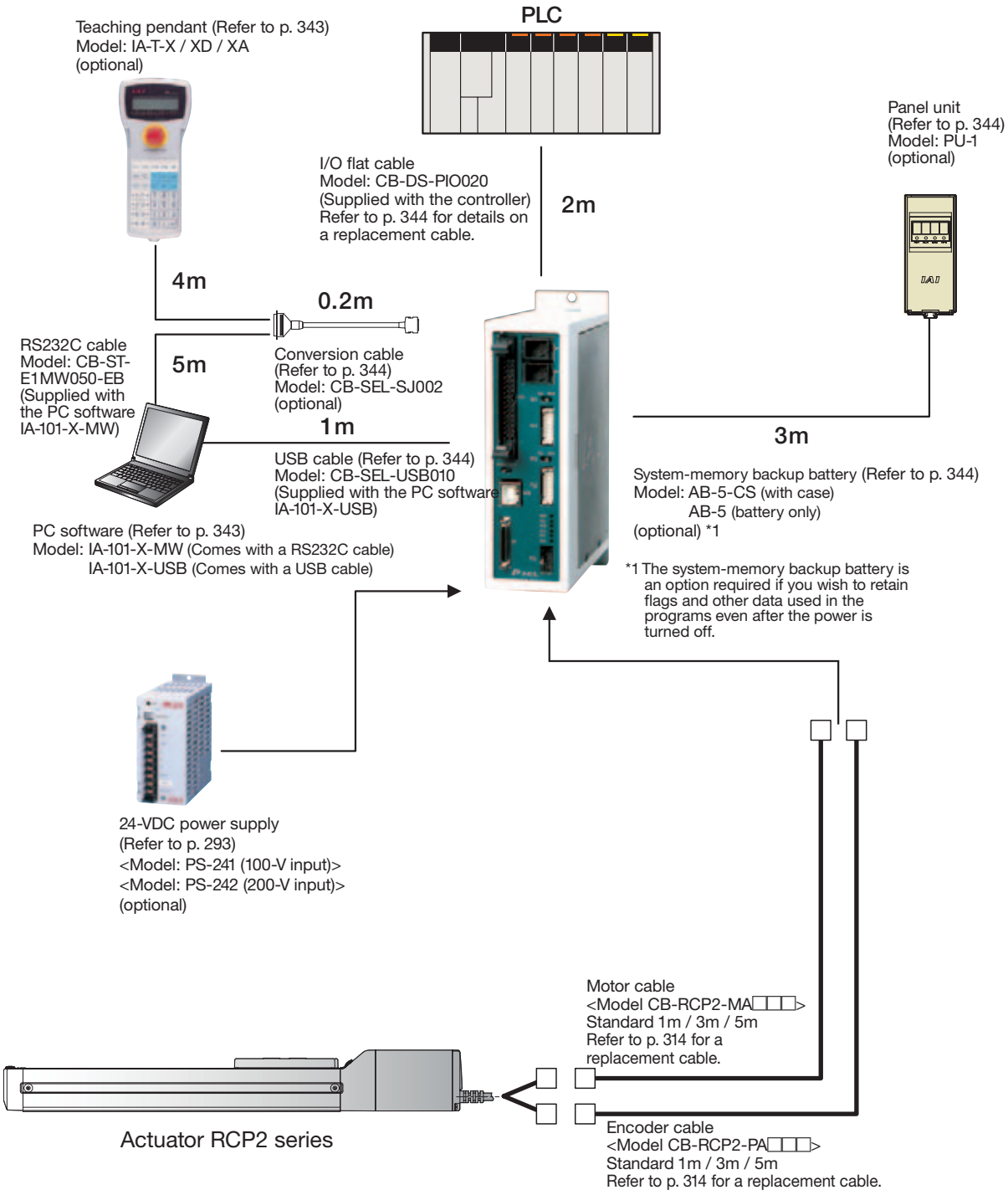
B	Brake

NP	PIO NPN specification (standard)
PN	PIO PNP specification

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

0	DC24V

System Configuration



I/O Specifications

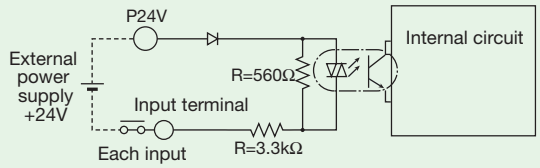
■ Input Part External input specifications

Item	Specification
Input voltage	24VDC ± 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

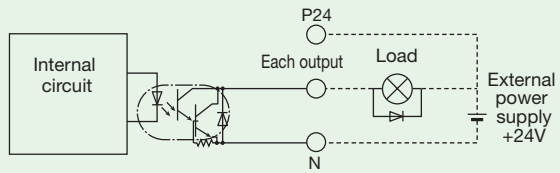
■ Output Part External output specifications

Item	Specification
Load voltage	DC24V
Maximum load current	100mA/point 400mA/8 points
Residual voltage	Max 0.1mA/point
Insulation method	Photocoupler

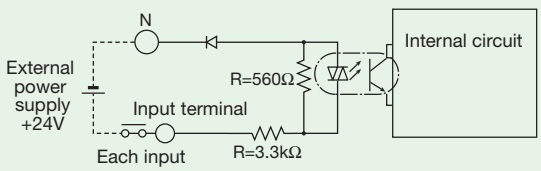
NPN specification



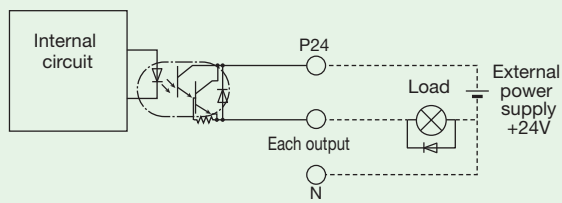
NPN specification



NPN specification



NPN specification



Explanation of I/O Functions

The PSEL 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 provides the following five input patterns each supporting different applications.

■ Controller Functions by Type

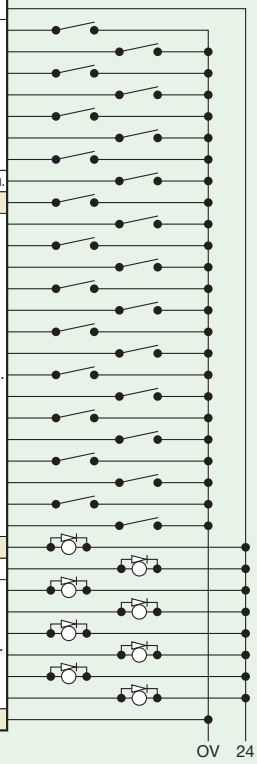
Operation mode		Features
Program mode		Various operations including linear/arc interpolation operation, path operation ideal for coating processes, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode	A basic operation mode in which a position number is specified and then a start signal is input to start operation. Push-motion operation and 2-axis linear interpolation operation are also supported.
	Product-type switchover 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	Category	Port number	Program Mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Program No. 1 selection	These signals are used to select the program to be started. (BCD input using ports 016 to 022)
2A		017	Program No. 2 selection	
2B		018	Program No. 4 selection	
3A		019	Program No. 8 selection	
3B		020	Program No. 10 selection	
4A		021	Program No. 20 selection	
4B		022	Program No. 40 selection	
5A		023	CPU reset	This signal is used to reset the system to create the same condition after power reconnection.
5B		000	Start	This signal is used to start the program selected by port Nos. 016 to 022.
6A		001	General-purpose input	These signals are used with a program command to wait for external input.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	General-purpose output	These signals can be turned ON/OFF freely using program commands.
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		0-V input	Connect 0V.

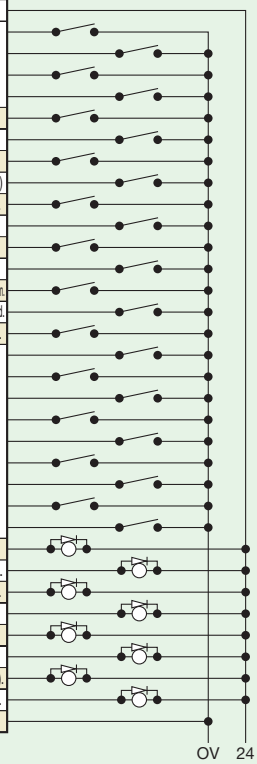
Wiring diagram



Positioner, Standard Mode

Pin number	Category	Port number	Positioner, Standard Mode	Function
1A	P24		24-V 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 either as BCD or binary codes.
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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This signal is used to perform home return.
6B		002	Servo ON	This signal is used to switch the servo on/off.
7A		003	Push	This signal is used to perform push-motion operation.
7B		004	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move 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 either as BCD or binary codes.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	Push motion complete	This signal is output upon completion of push-motion operation.
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

Wiring diagram

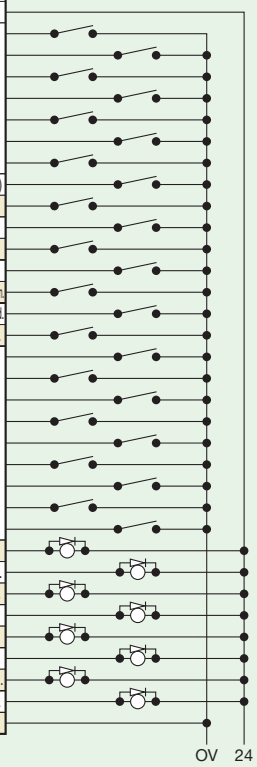


Explanation of I/O Functions

Positioner, Product-Type Switchover Mode

Pin number	Category	Port number	Positioner, Product-Type Switchover Mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position/product type input 10	Port Nos. 007 to 022 are used to specify a target position number and a product type number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
2A		017	Position/product type input 12	
2B		018	Position/product type input 12	
3A		019	Position/product type input 13	
3B		020	Position/product type input 14	
4A		021	Position/product type input 15	
4B		022	Position/product type input 16	
5A		023	Error reset	This signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This signal is used to perform home return.
6B		002	Servo ON	This signal is used to switch the servo on/off.
7A		003	Push	This signal is used to perform push-motion operation.
7B		004	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move via linear interpolation.
9A		007	Position/product type input 1	Port Nos. 007 to 022 are used to specify a target position number and a product type number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
9B		008	Position/product type input 2	
10A		009	Position/product type input 3	
10B		010	Position/product type input 4	
11A		011	Position/product type input 5	
11B		012	Position/product type input 6	
12A		013	Position/product type input 7	
12B		014	Position/product type input 8	
13A		015	Position/product type input 9	
13B	Output	300	Alarm	This signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	Push motion complete	This signal is output upon completion of push-motion operation.
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

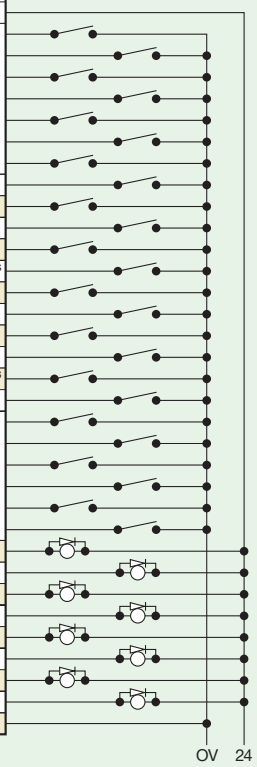
Wiring diagram



Positioner, 2-axis Independent Mode

Pin number	Category	Port number	Positioner, Product-Type Switchover Mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position input 7	Port Nos. 010 to 022 are used to specify a target position number. Position numbers for axis 1 and those for axis 2 are assigned by parameter settings.
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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start 1	This signal is used to cause axis 1 to start moving to the selected position.
6A		001	Home return 1	This signal is used to move axis 1 to the home.
6B		002	Servo ON 1	This signal is used to switch on/off the servo for axis 1.
7A		003	Pause 1	When this signal is turned OFF while axis 1 is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
7B		004	Cancellation 1	This signal is used to cancel the movement of axis 1.
8A		005	Start 2	This signal is used to cause axis 2 to start moving to the selected position.
8B		006	Home return 2	This signal is used to move axis 2 to the home.
9A		007	Servo ON 2	This signal is used to switch on/off the servo for axis 2.
9B		008	Pause 2	When this signal is turned OFF while axis 2 is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
10A		009	Cancellation 2	This signal is used to cancel the movement of axis 2.
10B		010	Position input 1	Port Nos. 010 to 022 are used to specify a target position number. Position numbers for axis 1 and those for axis 2 parameter settings.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete 1	This signal is output upon completion of movement of axis 1 to the specified position.
15A		303	Home return complete 1	This signal is output upon completion of home return of axis 1.
15B		304	Servo ON output 1	This signal is output while the servo for axis 1 is on.
16A		305	Position complete 2	This signal is output upon completion of movement of axis 2 to the specified position.
16B		306	Home return complete 2	This signal is output upon completion of home return of axis 2.
17A		307	Servo ON output 2	This signal is output while the servo for axis 2 is on.
17B	N		0-V input	Connect 0V.

Wiring diagram

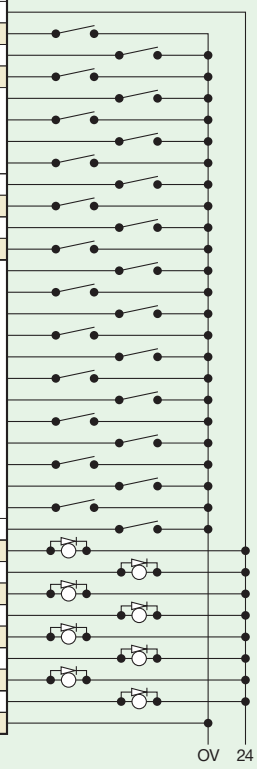


Explanation of I/O Functions

Positioner, Teach Mode

Pin number	Category	Port number	Positioner, Product-Type Switchover Mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Axis 1 JOG-	While this signal is input, axis 1 moves in the negative direction.
2A		017	Axis 2 JOG+	While this signal is input, axis 2 moves in the positive direction.
2B		018	Axis 2 JOG-	While this signal is input, axis 2 moves in the negative direction.
3A		019	Inching specification (0.01mm)	These signals are used to specify an inching travel distance. (The travel distance is the sum of values specified by port Nos. 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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Servo ON	This signal is used to switch the servo on/off.
6B		002	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
7A		003	Position input 1	Port Nos. 003 to 013 are used to specify a target position number and a position number under which to input the current position. When the teaching mode specification signal at port No. 014 is ON, the current value will be written under the specified position number upon turning ON of the start signal at port No. 000.
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+	While this signal is input, axis 1 moves in the positive direction.
13B	Output	300	Alarm	This signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	—	—
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

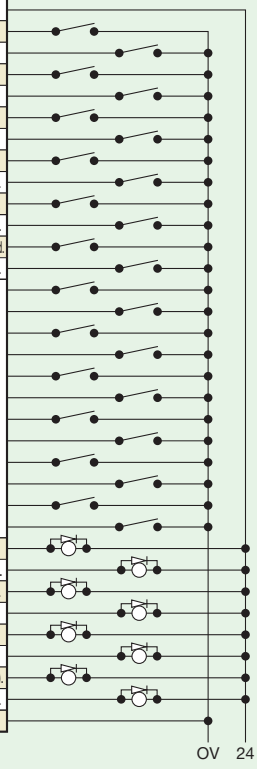
Wiring diagram



Positioner, DS-S-C1 Interchangeable Mode

Pin number	Category	Port number	Positioner, Standard Mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position No. 1000	(Same as port Nos. 004 to 015)
2A		017	—	—
2B		018	—	—
3A		019	—	—
3B		020	—	—
4A		021	—	—
4B		022	—	—
5A		023	CPU reset	This signal is used to reset the system to create the same condition after power reconnection.
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Hold (pause)	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume the remaining operation.
6B		002	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
7A		003	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move via linear interpolation.
7B		004	Position No. 1	Port Nos. 004 to 016 are used to specify a target position number. Numbers can be specified as 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 signal is output upon an alarm. (Contact A)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	—	—
15B		304	—	—
16A		305	—	—
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

Wiring diagram



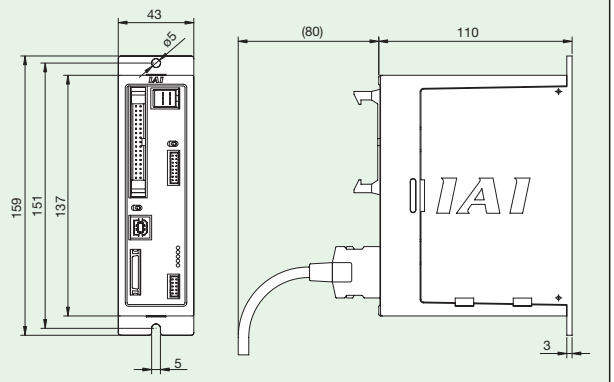
Specification Table

	Item	Specification
Basic specifications	Connectable actuators	RCP2 series actuator (Note 1)
	Input power supply	DC24V ±10%
	Power-supply capacity	5.5A max. 5.5A
	Dielectric strength voltage	500VDC, 10MΩ or above
	Breakdown resistance	500VAC, 1 minute
	Rush current	30A max.
	Vibration resistance	XYZ directions 10~57Hz One-side amplitude 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s2 (continuous), 9.8m/s2 (intermittent)
Control specifications	Number of controlled axes	1 axis/2 axes
	Maximum total output of connected axes	–
	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.
	Operation method	Program operation / Positioner operation (switchable)
Program	Programming language	Super SEL language
	Number of programs	64 programs
	Number of program steps	2,000 steps
	Number of multi-tasking programs	8 programs
	Number of positioning points	1,500 points
	Data storage 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 points	24 input points / 8 output points (NPN or PNP selectable)
	I/O power supply	Externally supplied 24VDC ± 10%
	PIO cable	CB-DS-PIO (supplied with the controller)
	Serial communication function	RS232C (D-sub, half-pitch connector) / USB connector
	Field network	(To be supported in the future)
	Motor cable	CB-RCP2-MA (20m max.)
	Encoder cable	MoCB-RCP2-PA (20m max.)
General specifications	Protective functions	Motor overcurrent, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, battery error, etc.
	Ambient operating temperature, humidity	0~40°C, 10~95% (non-condensing)
	Operating ambience	Free from corrosive gases. In particular, there shall be no significant powder dust.
	Protection class	IP20
	Weight	Approx. 450g
	External dimensions	43mm W ×159mm H ×110mm D

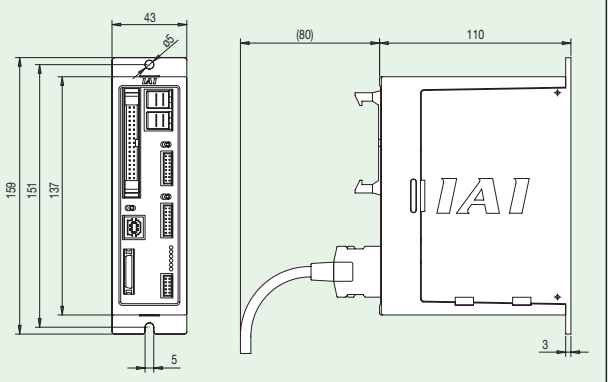
(Note 1) The high-thrust type (RA10C), high-speed type (HS8C/HS8R) and waterproof type (RCP2W-SA16) cannot be operated.

External Dimensions

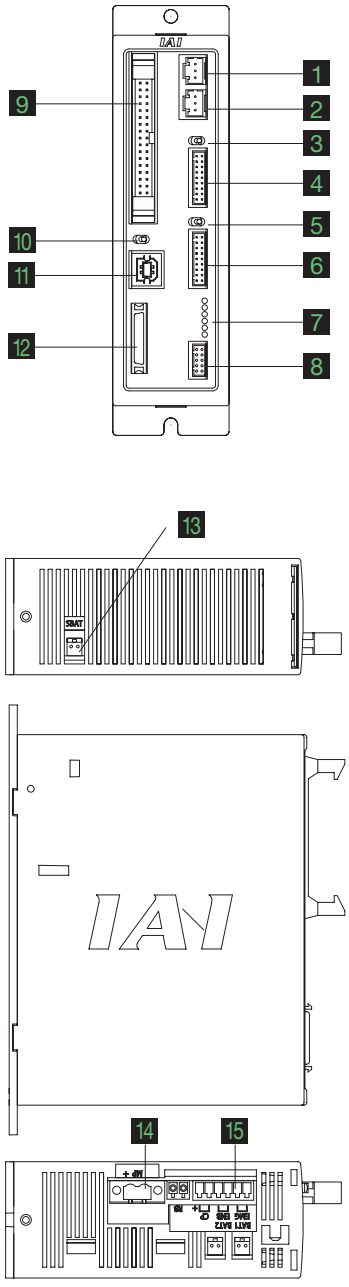
PSEL 1-axis controller



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 motor cable of the axis 2 actuator.

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 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.
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 I/O connector
A connector for interface I/Os.

A 34-pin flat connector is used for the DIO (24 IN/8 OUT) 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 (TP) 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

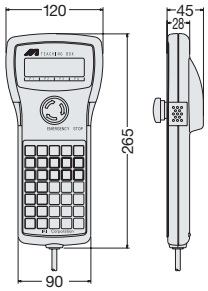
Teaching pendant

Features A teaching device providing program/position input function, test operation function, monitoring function, and more.

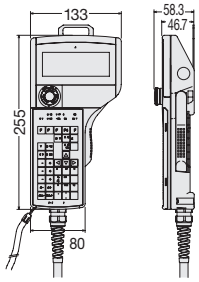
Model

Model	Description	
IA—T—X—J	Standard type with connector conversion cable	—
IA—T—X	Standard type	—
IA—T—XD—J	Deadman switch type with connector conversion cable	—
IA—T—XD	Deadman switch type	—
IA—T—XA—J	ANSI type with connector conversion cable	—
IA—T—XA	ANSI type	—

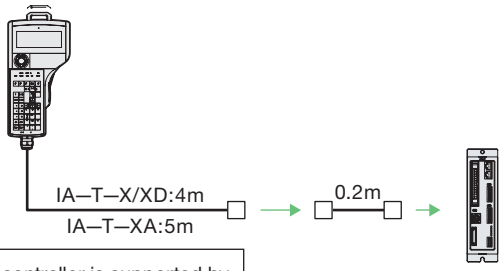
IA—T—X/XD



IA—T—XA



Configuration



Conversion cable: CB—SEL—SJ002

Note

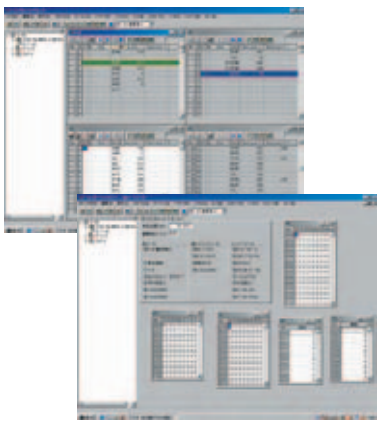
The PSEL controller is supported by version 1.40 or later (or 1.30 or later with the ANSI type).

Specifications

Item	IA—T—X/XD	IA—T—XA
Ambient operating temperature, humidity	Temperature 0~40°C, Humidity 85% RH or below	
Operating ambience	Free from corrosive gases. In particular, there shall be no significant powder dust.	Protective structure conforming to IP54
Weight	Approx. 650g	Approx. 600g (excluding cable)
Cable length	4m	5m
Display	LCD with 20 characters x 4 lines	LCD with 32 characters x 8 lines

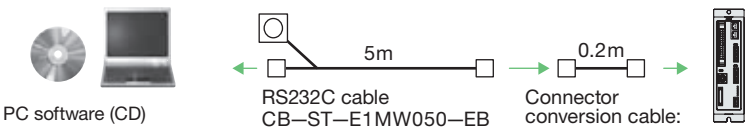
PC Software (Windows Only)

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**
(with RS232C Cable + Connector Conversion Cable)

Configuration

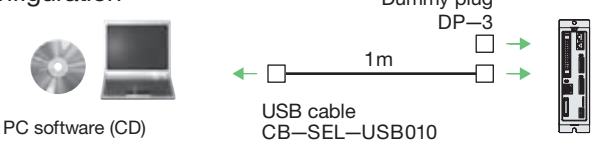


Note

The PSEL controller is supported by version 7.0.0.0 or later.

Model **IA—101—X—USB** (with USB Cable)

Configuration

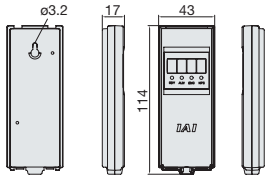


Options

Panel Unit

Features A display for checking controller error codes and active program numbers.

Model **PU—1** (Cable Length 3m)



System-Memory Backup Battery

Features If your programs use global flags, etc., you need this battery to retain data even after the power is turned off.

Model **AB—5—CS** (with Case)
AB—5 (Battery Only)

Dummy plug

Features When connecting your PSEL controller to a PC using a USB cable, install this plug on the teaching port to cut off the enable circuit. (This plug comes with the PC software IA-101-X-USB.)

Model **DP—3**

USB Cable

Features Use this cable to connect your controller with USB port to a PC. If your controller has no USB port (XSEL), connect a RS232C cable to a USB cable via a USB conversion adapter and connect the USB cable to the USB port on the PC. (Refer to the PC software IA-101-X-USBMW.)

Model **CB—SEL—USB010** (Cable Length 1m)

Connector Conversion Cable

Features This conversion cable is used to connect a D-sub, 25-pin connector for teaching pendant or PC software to the teaching connector (half-pitch) on the PSEL controller.

Model **CB—SEL—SJ002** (Cable Length 0.2m)

Spare Parts

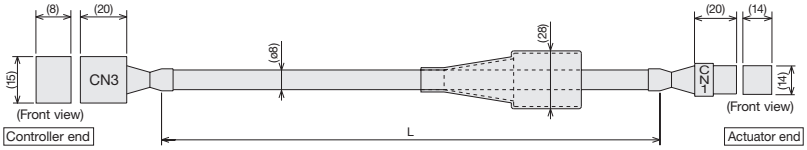
Should you require spare parts after the purchase of your product for replacing the original cables, etc., refer to the model names specified below.

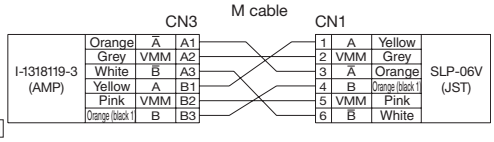
Motor Cable

Model **CB-RCP2-MA□□□**

* The standard motor cable is a robot cable.

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



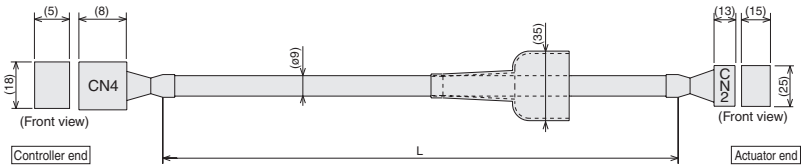


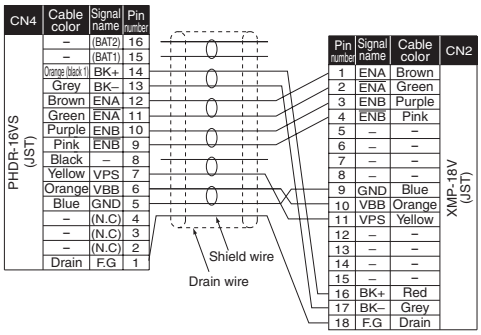
Encoder Cable / Encoder Robot Cable

Model **CB-RCP2-PA□□□/CB-RCP2-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 20 m can be specified. Example) 080 = 8 m

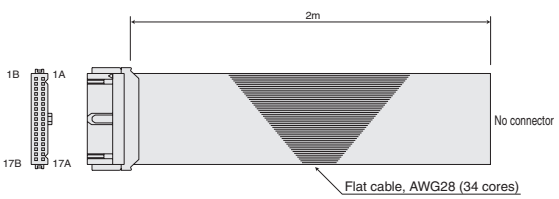




I/O Flat Cable

Model **CB-DS-PIO□□□**

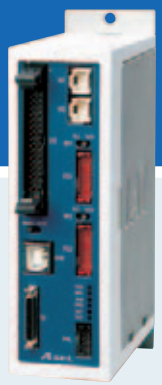
* □□□ indicates the cable length (L). Lengths up to 10 m can be specified. Example) 080 = 8 m



No.	Color	Wire	No.	Color	Wire
1A	Brown 1	Flat cable (pressure-welded)	9B	Grey 2	Flat cable (pressure-welded)
1B	Red 1		10A	White 2	
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	Grey 1		13A	Green 3	
5A	White 1		13B	Blue 3	
5B	Black 1		14A	Purple 3	
6A	Brown 2		14B	Grey 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

Position controller for RCA series
Program controller



Type List

Program controller capable of operating RCA series actuator. Various control functions are combined into a single unit.

Type	C	
Name	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 position points	1500	

Model

* With a 1-axis specification, the section denoted by (Axis 2) need not be specified.

ASEL – C – [Number of connected axes] [Motor type] [Encoder type] [Option] ([Motor type] [Encoder type] [Option]) – [I/O type] [I/O cable length] – 0

Series | Type | Number of connected axes | (1-axis) Motor type | (1-axis) Encoder type | (1-axis) Option | (Axes 2) Motor type | (Axes 2) Encoder type | (Axes 2) Option | I/O type | I/O cable length | Power-supply voltage

C	Standard type

1	1-axis specification
2	2-axes specification

I	Incremental
A	Absolute

20S	20-W motor (RA3 only)
20	20-W motor (other than RA3)
30	30-W motor

B	Brake
H	Home sensor type

I	Incremental
A	Absolute

20S	20-W motor (RA3 only)
20	20-W motor (other than RA3)
30	30-W motor

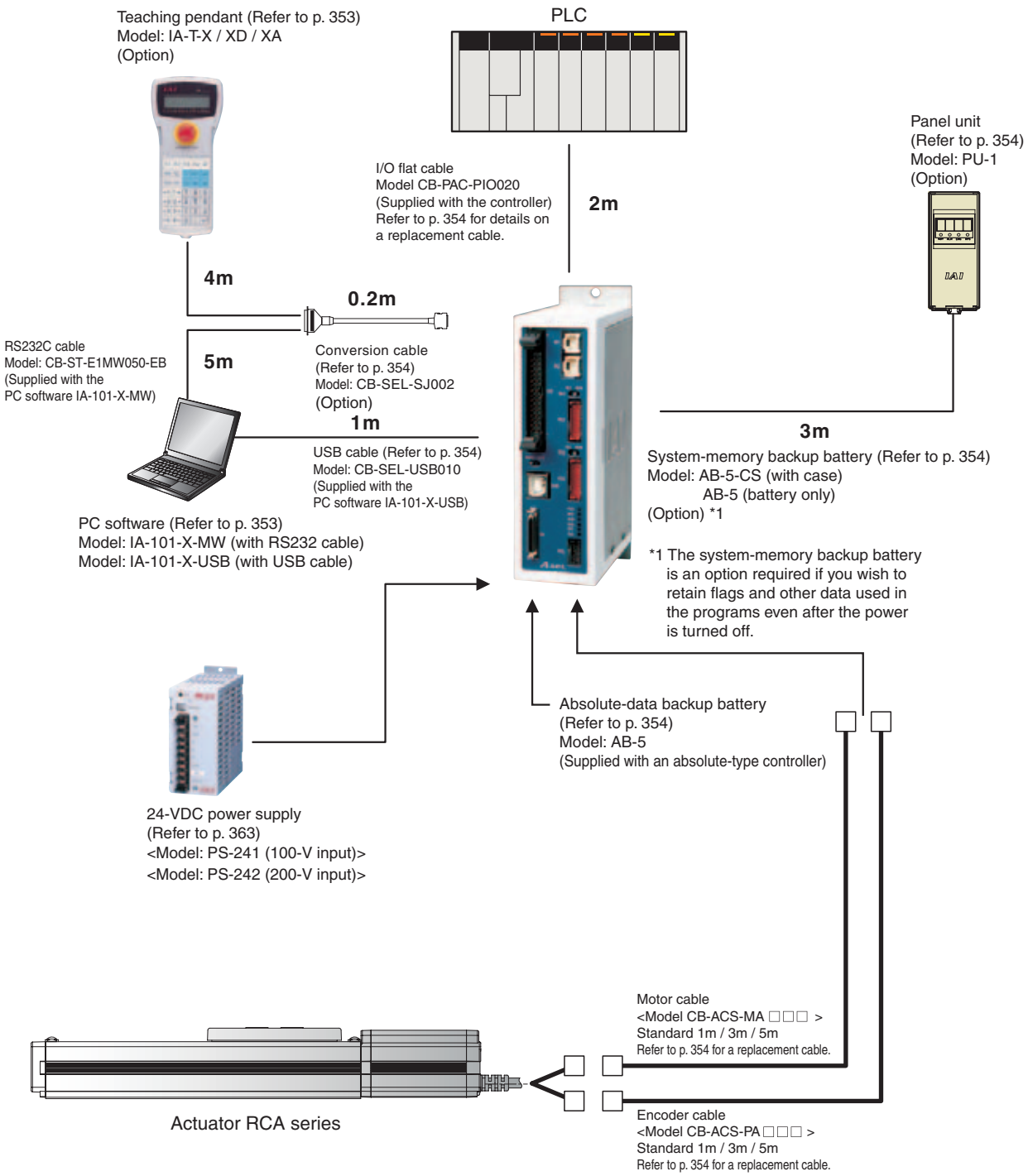
B	Brake
H	Home sensor type

NP	PIO NPN specification (standard)
PN	PIO PNP specification

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

0	DC24V

System Configuration



I/O Specifications

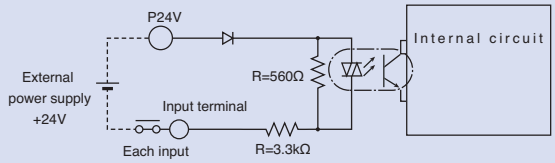
■Input Part External input specifications

Item	Specification
Input voltage	DC24V ± 10%
Input current	7mA/1circuit
ON/OFF voltage	ON voltage (Min.) NPN:DC16V/PNP:DC8V OFF voltage (Max.) NPN:DC5V/PNP:DC19V
Insulation method	Photocoupler

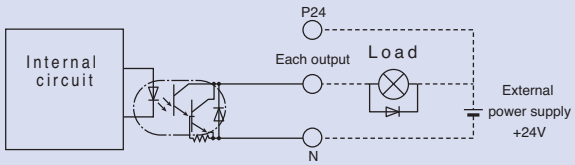
■ Output Part External output specifications.

Item	Specification
Load voltage	DC24V
Max. load current	1mA/point 400mA/8point total
Leak current	Max. 0.1mA/1point
Insulation method	Photocoupler

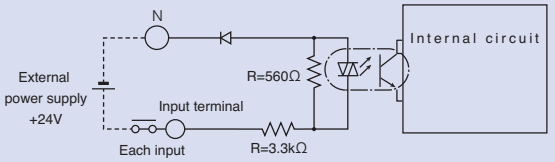
NPN specification



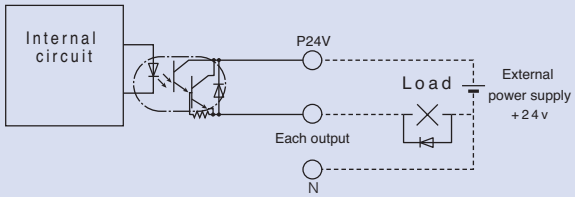
NPN specification



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 provides the following five input patterns each supporting different applications.

■ Controller Functions by Type

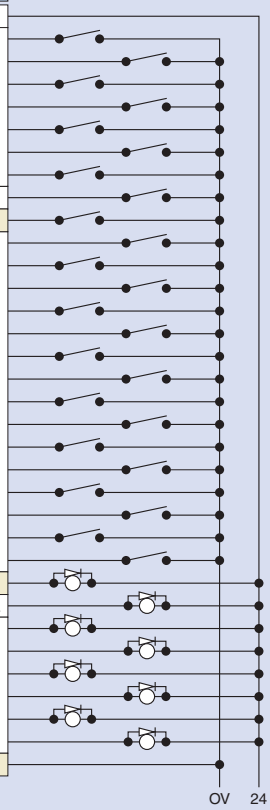
Operation mode		Features
Program mode		Various operations including linear/arc interpolation operation, path operation ideal for coating processes, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode	A basic operation mode in which a position number is specified and then a start signal is input to start operation. Push-motion operation and 2-axis linear interpolation operation are also supported.
	Product-type switchover 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 ASEL controller without having to change the host programs. * This mode does not ensure actuator compatibility.

Explanation of I/O Functions

Program mode

Pin number	Category	Port number	Program mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Program No. 1 selection	These signals are used to select the program to be started. (BCD input using ports 016 to 022)
2A		017	Program No. 2 selection	
2B		018	Program No. 4 selection	
3A		019	Program No. 8 selection	
3B		020	Program No. 10 selection	
4A		021	Program No. 20 selection	
4B		022	Program No. 40 selection	
5A		023	CPU reset	This signal is used to reset the system to create the same condition after power reconnection.
5B		000	Start	This signal is used to start the program selected by port Nos. 016 to 022.
6A		001	General-purpose input	These signals are used with a program command to wait for external input.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	General-purpose output	These signals can be turned ON/OFF freely using program commands.
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		0-V input	Connect 0V.

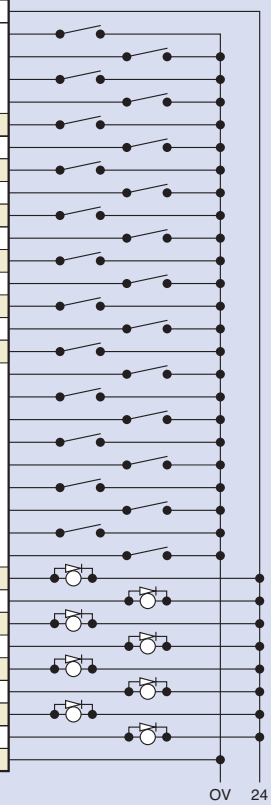
Wiring diagram



Positioner, Standard Mode

Pin number	Category	Port number	Positioner, standard mode	Function
1A	P24		24-V 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 either as BCD or binary codes.
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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This signal is used to perform home return.
6B		002	Servo ON	This signal is used to switch the servo on/off.
7A		003	Push	This signal is used to perform push-motion operation.
7B		004	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move 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 either as BCD or binary codes.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	Push motion complete	This signal is output upon completion of push-motion operation.
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

Wiring diagram

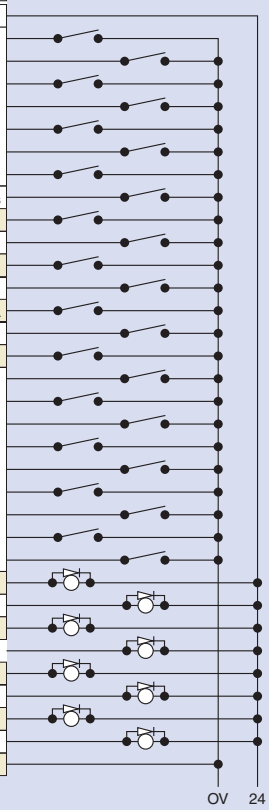


Explanation of I/O Functions

Positioner, Product-Type Switchover Mode

Pin number	Category	Port number	Positioner, product-type switchover mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position/product type input 10	Port Nos. 007 to 022 are used to specify a target position number and a product type number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
2A		017	Position/product type input 11	
2B		018	Position/product type input 12	
3A		019	Position/product type input 13	
3B		020	Position/product type input 14	
4A		021	Position/product type input 15	
4B		022	Position/product type input 16	
5A		023	Error reset	This signal is used to reset minor errors. (The power must be reconnected to reset serious errors
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This signal is used to perform home return.
6B		002	Servo ON	This signal is used to switch the servo on/off.
7A		003	Push	This signal is used to perform push-motion operation.
7B		004	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move via linear interpolation.
9A		007	Position/product type input 1	Port Nos. 007 to 022 are used to specify a target position number and a product type number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
9B		008	Position/product type input 2	
10A		009	Position/product type input 3	
10B		010	Position/product type input 4	
11A		011	Position/product type input 5	
11B		012	Position/product type input 6	
12A		013	Position/product type input 7	
12B		014	Position/product type input 8	
13A		015	Position/product type input 9	
13B	Output	300	Alarm	This signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	Push motion complete	This signal is output upon completion of push-motion operation.
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

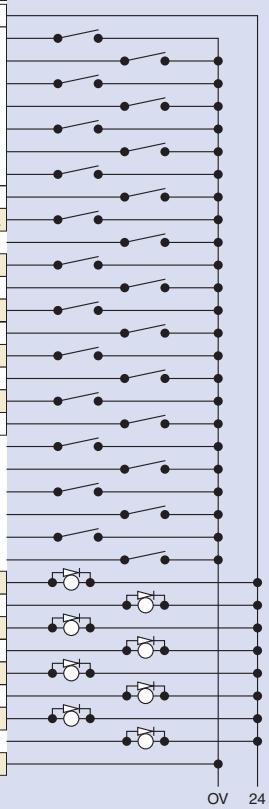
Wiring diagram



Positioner, 2-axis Independent Mode

Pin number	Category	Port number	Positioner	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position input 10	Port Nos. 010 to 022 are used to specify a target position number. Position numbers for axis 1 and those for axis 2 are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start 1	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return 1	This signal is used to move axis 1 to the home.
6B		002	Servo ON 1	This signal is used to switch on/off the servo for axis 1.
7A		003	Pause 1	When this signal is turned OFF while axis 1 is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
7B		004	Cancellation 1	This signal is used to cancel the movement of axis 1.
8A		005	Start 2	This signal is used to cause axis 2 to start moving to the selected position.
8B		006	Home return 2	This signal is used to move axis 2 to the home.
9A		007	Servo ON 2	This signal is used to switch on/off the servo for axis 2.
9B		008	Pause 2	When this signal is turned OFF while axis 2 is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
10A		009	Cancellation 2	This signal is used to cancel the movement of axis 2.
10B		010	Position input 1	Port Nos. 010 to 022 are used to specify a target position number. Position numbers for axis 1 and those for axis 2 are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete 1	This signal is output upon completion of movement of axis 1 to the specified position.
15A		303	Home return complete 1	This signal is output upon completion of home return of axis 1.
15B		304	Servo ON output 1	This signal is output while the servo for axis 1 is on.
16A		305	Position complete 2	This signal is output upon completion of movement of axis 2 to the specified position.
16B		306	Home return complete 2	This signal is output upon completion of home return of axis 2.
17A		307	Servo ON output 2	This signal is output while the servo for axis 2 is on.
17B	N		0-V input	Connect 0V.

Wiring diagram

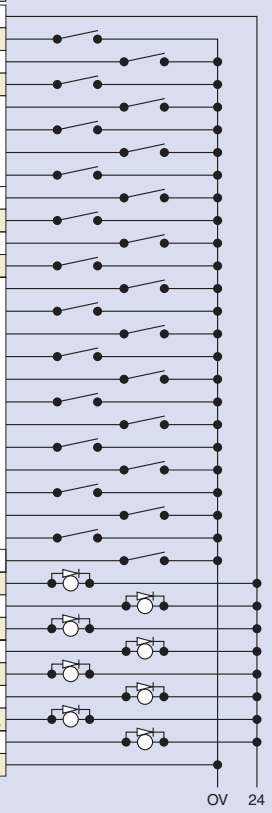


Explanation of I/O Functions

Positioner, Teaching Mode

Pin number	Category	Port number	Positioner	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Axis 1 JOG-	While this signal is input, axis 1 moves in the negative direction.
2A		017	Axis 2 JOG+	While this signal is input, axis 2 moves in the positive direction.
2B		018	Axis 2 JOG-	While this signal is input, axis 2 moves in the negative direction.
3A		019	Inching specification (0.01mm)	These signals are used to specify an inching travel distance. (The travel distance is the sum of values specified by port Nos. 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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Servo ON	This signal is used to switch the servo on/off.
6B		002	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
7A		003	Position input 1	Port Nos. 003 to 013 are used to specify a target position number and a position number under which to input the current position. When the teaching mode specification signal at port No. 014 is ON, the current value will be written under the specified position number upon turning ON of the start signal at port No. 000.
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+	While this signal is input, axis 1 moves in the positive direction.
13B	Output	300	Alarm	This signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	-	-
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

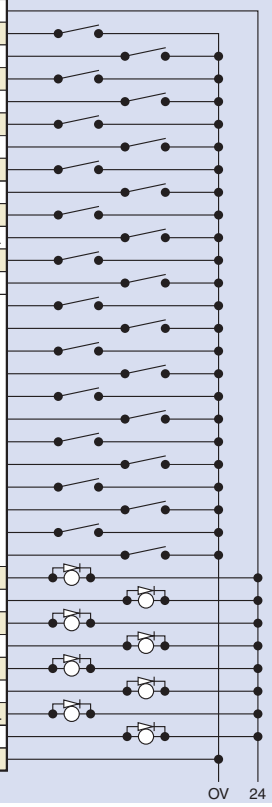
Wiring diagram



Positioner, DS-S-C1 Compatible Mode

Pin number	Category	Port number	Positioner	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position No.1000	(Same as port Nos. 004 to 015)
2A		017	–	–
2B		018	–	–
3A		019	–	–
3B		020	–	–
4A		021	–	–
4B		022	–	–
5A		023	CPU reset	This signal is used to reset the system to create the same condition after power reconnection.
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.T
6A		001	Hold (pause)	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
6B		002	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
7A		003	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move via linear interpolation.
7B		004	Position No.1	Port Nos. 004 to 016 are used to specify a target position number. Numbers can be specified either as BCD or binary codes.
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 signal is output upon an alarm. (Contact A)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	–	–
15B		304	–	–
16A		305	–	–
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

Wiring diagram

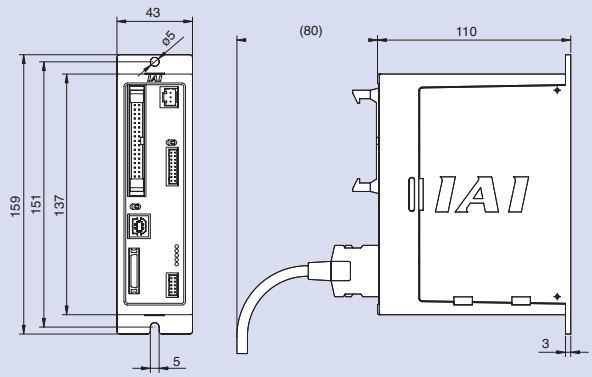


Specification Table

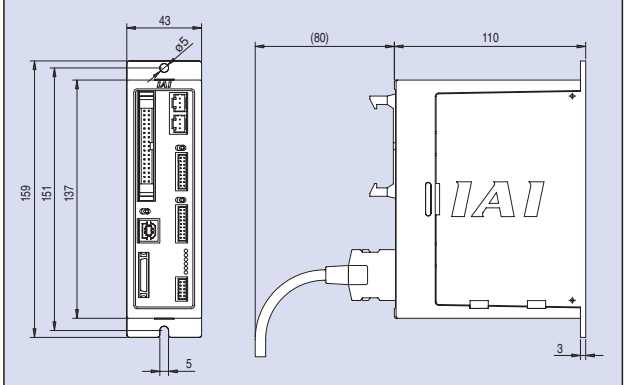
	Item	Specification
Basic specifications	Connectable actuators	RCA series actuator
	Input power supply	DC24V ±10%
	Power-supply capacity	Control power: 1.2A max. Motor power: Rating 1.7A / Peak 5A (per axis)
	Dielectric strength voltage	500VDC, 10MΩ or above
	Breakdown resistance	500VAC, 1 minute
	Rush current	30A max.
	Vibration resistance	XYZ directions One-side amplitude 0.035 mm (continuous), 0.075 ç 4.9m/s2 (continuous), 0.8m/s2 (continuous)
Control specifications	Number of controlled axes	1 axis/2 axes
	Maximum total output of connected axes	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.
	Operation method	Program operation / Positioner operation (switchable)
Program	Programming language	Super SEL language
	Number of programs	64 programs
	Number of program steps	2,000 steps
	Number of multi-tasking programs	8 programs
	Number of positioning points	1,500 points
	Data storage 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 points	24 input points / 8 output points (NPN or PNP selectable)
	I/O power supply	Externally supplied 24VDC ± 10%
	PIO cable	CB-DS-PIO□□□(supplied with the controller)
	Serial communication function	RS232C (D-sub, half-pitch connector) / USB connector
	Field network	(To be supported in the future)
	Motor cable	CB-ACS-MA□□□(20m max.)
	Encoder cable	CB-ACS-PA□□□(20m max.)
General specifications	Protective functions	Motor overcurrent, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, battery error, etc.
	Ambient operating temperature, humidity	0~40ºC 10~95% (non-condensing)
	Operating ambience	Free from corrosive gases. In particular, there shall be no significant powder dust.
	Protection class	IP20
	Weight	Approx. 450g
	External dimensions	43mm (W) ×159mm (H) ×110mm (D)

External Dimensions

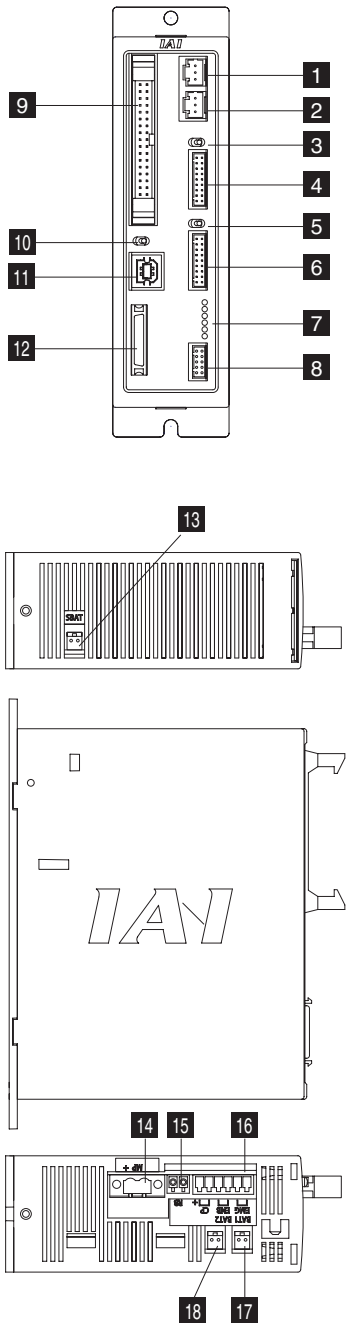
ASEL 1-axis controller



ASEL 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 motor cable of the axis 2 actuator.

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 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.
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 I/O connector

A connector for interface I/Os.

A 34-pin flat connector is used for the DIO (24 IN/8 OUT) 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 (TP) 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 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 6-pin, 2-piece connector by Phoenix Contact.

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.

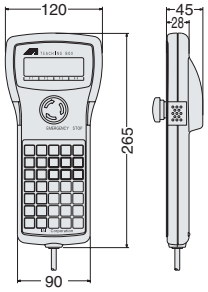
Options

Teaching pendant

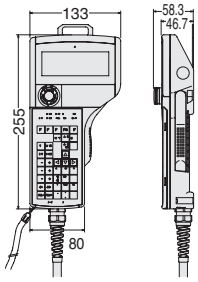
Features

A teaching device providing program/position input function, test operation function, monitoring function, and more.

IA-T-X/XD



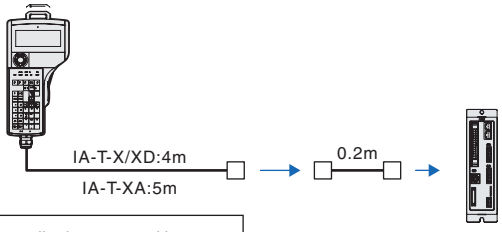
IA-T-XA



Model

Model	Description
IA-T-X-J	Standard type with connector conversion cable
IA-T-X	Standard type
IA-T-XD-J	Deadman switch type with connector conversion cable
IA-T-XD	Deadman switch type
IA-T-XA-J	ANSI type with connector conversion cable
IA-T-XA	ANSI type

Configuration



Conversion cable:CB-SEL-SJ002

NOTE

The PSEL controller is supported by version 1.40 or later (or 1.30 or later with the ANSI type).

Specifications

Item	IA-T-X/XD	IA-T-XA
Ambient operating temperature, humidity	Temperature 0~40°C, Humidity 85% RH or below	
Operating ambience	Free from corrosive gases. In particular, there shall be no significant powder dust.	Protective structure conforming to IP54
Weight	Approx. 650g	Approx. 600g (excluding cable)
Cable length	4m	5m
Display	LCD with 20 characters x 4 lines	LCD with 32 characters x 8 lines

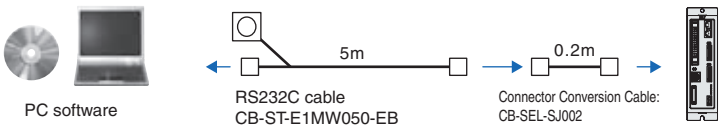
PC Software (Windows Only)

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 (with RS232C Cable + Connector Conversion Cable)**

Configuration

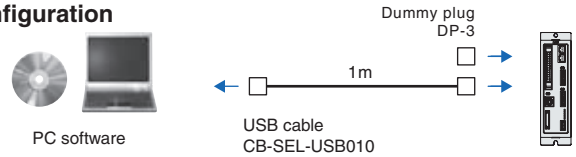


NOTE

The PSEL controller is supported by version 7.0.0.0 or later.

Model **IA-101-X-USB (with USB Cable)**

Configuration

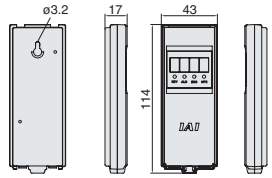


Options

Panel Unit

Features A display for checking controller error codes and active program numbers.

Model **PU-1**(Cable Length 3m)



Absolute-Data Backup Battery

Features This battery backs up absolute data when an absolute-type actuator is operated. Same as the system-memory backup battery.

Model **AB-5**

System-Memory Backup Battery

Features If your programs use global flags, etc., you need this battery to retain data even after the power is turned off.

Model **AB-5-CS (with Case)**
AB-5 (Battery Only)

Dummy plug

Features When connecting your SSEL controller to a PC using a USB cable, install this plug on the teaching port to cut off the enable circuit. (This plug comes with the PC software IA-101-X-USB.)

Model **DP-3**

USB cable

Features Use this cable to connect your controller with USB port to a PC.
If your controller has no USB port (XSEL), connect a RS232C cable to a USB cable via a USB conversion adapter and connect the USB cable to the USB port on the PC.
(Refer to the PC software IA-101-X-USBMW.)

Model **CB-SEL-USB010** (Cable Length 1m)

Connector conversion cable

Features This conversion cable is used to connect a D-sub, 25-pin connector for teaching pendant or PC software to the teaching connector (half-pitch) on the ASEL controller.

Model **CB-SEL-SJ002** (Cable Length 0.2m)

Spare Parts

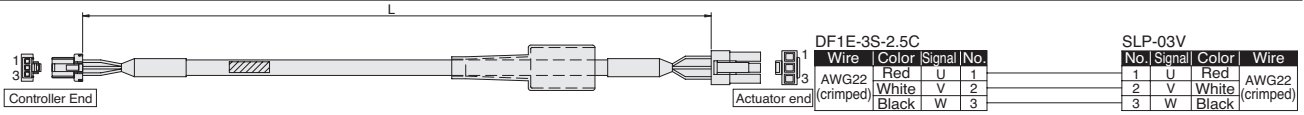
Should you require spare parts after the purchase of your product for replacing the original cables, etc., refer to the model names specified below.

Motor Cable

Model CB-ACS-MA□□□

* The standard motor cable is a robot cable.

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



DF1E-3S-2.5C

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

SLP-03V

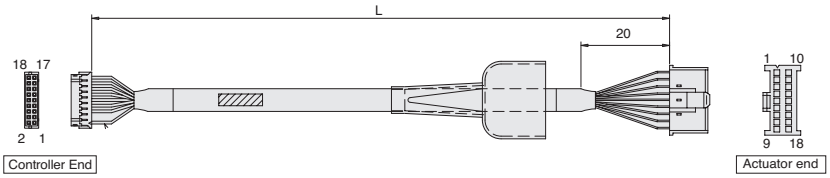
No.	Signal	Color	Wire
1	U	Red	AWG22 (crimped)
2	V	White	
3	W	Black	

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 20 m can be specified.
Example) 080 = 8 m



PHDR-18VR

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

XMP-18V

No.	Signal ABZ	Signal Serial	Color	Wire
1	A+	-	White/blue	AWG26 (crimped)
2	A-	-	White/yellow	
3	B+	-	White/red	
4	B-	-	White/black	
5	-	-	-	
6	-	-	-	
7	LS+	LS+	White/purple	
8	-	-	-	
9	FG	FG	Drain	
10	Z+	SD+	Orange	
11	Z-	SD-	Green	
12	-	BAT+	Purple	
13	VPS	BAT-	Gray	
14	VCC	VCC	Red	
15	GND	GND	Black	
16	LS-	LS-	White/gray	
17	BK-	BK-	Blue	
18	BK+	BK+	Yellow	

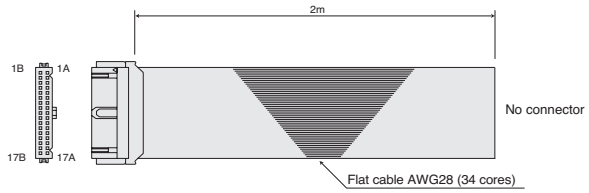
("White/blue" and other designations under "Wire color" indicate the band color/insulator color.)

Drain wire and braided shield wire

I/O Flat Cable

Model CB-DS-PIO□□□

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



No.	Color	Wire	No.	Color	Wire
1A	Brown1	Flat cable pressure -welded	9B	Gray2	Flat cable pressure -welded
1B	Red1		10A	White2	
2A	Orange1		10B	Black2	
2B	Yellow1		11A	Brown-3	
3A	Green1		11B	Red3	
3B	Blue1		12A	Orange3	
4A	Purple1		12B	Yellow3	
4B	Gray1		13A	Green3	
5A	White1		13B	Blue3	
5B	Black1		14A	Purple3	
6A	Brown-2		14B	Gray3	
6B	Red2		15A	White3	
7A	Orange2		15B	Black3	
7B	Yellow2		16A	Brown-4	
8A	Green2		16B	Red4	
8B	Blue2		17A	Orange4	
9A	Purple2		17B	Yellow4	

SSEL

RCS2 series
Program controller

Type List

Program controller capable of operating RCS2 series actuator. Various control functions are combined into a single unit.

Type	C	
Name	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 position points	1,500 positions	

Model

* With a 1-axis specification, the section denoted by (Axis 2) need not be specified.

SSEL – C – ☐ – ☐ – ☐ – ☐ – (– ☐ – ☐ – ☐) – ☐ – ☐ – ☐

Series / Type / Number of connected axes / Motor type / (1-axis) Encoder type / Option / Motor type / (Axes 2 to 6) Encoder type / Option / I/O type / I/O cable length / Power-supply voltage

C: Standard type

Number of connected axes:
- 1: 1-axis specification
- 2: 2-axes specification

Motor type:

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

(1-axis) Encoder type:
- I: Incremental
- A: Absolute

Option:
- B: Brake
- C: Creep sensor
- L: Home sensor/LS type
- M: Master axis specification

Motor type: same as Motor type above

(Axes 2 to 6) Encoder type:
- I: Incremental
- A: Absolute

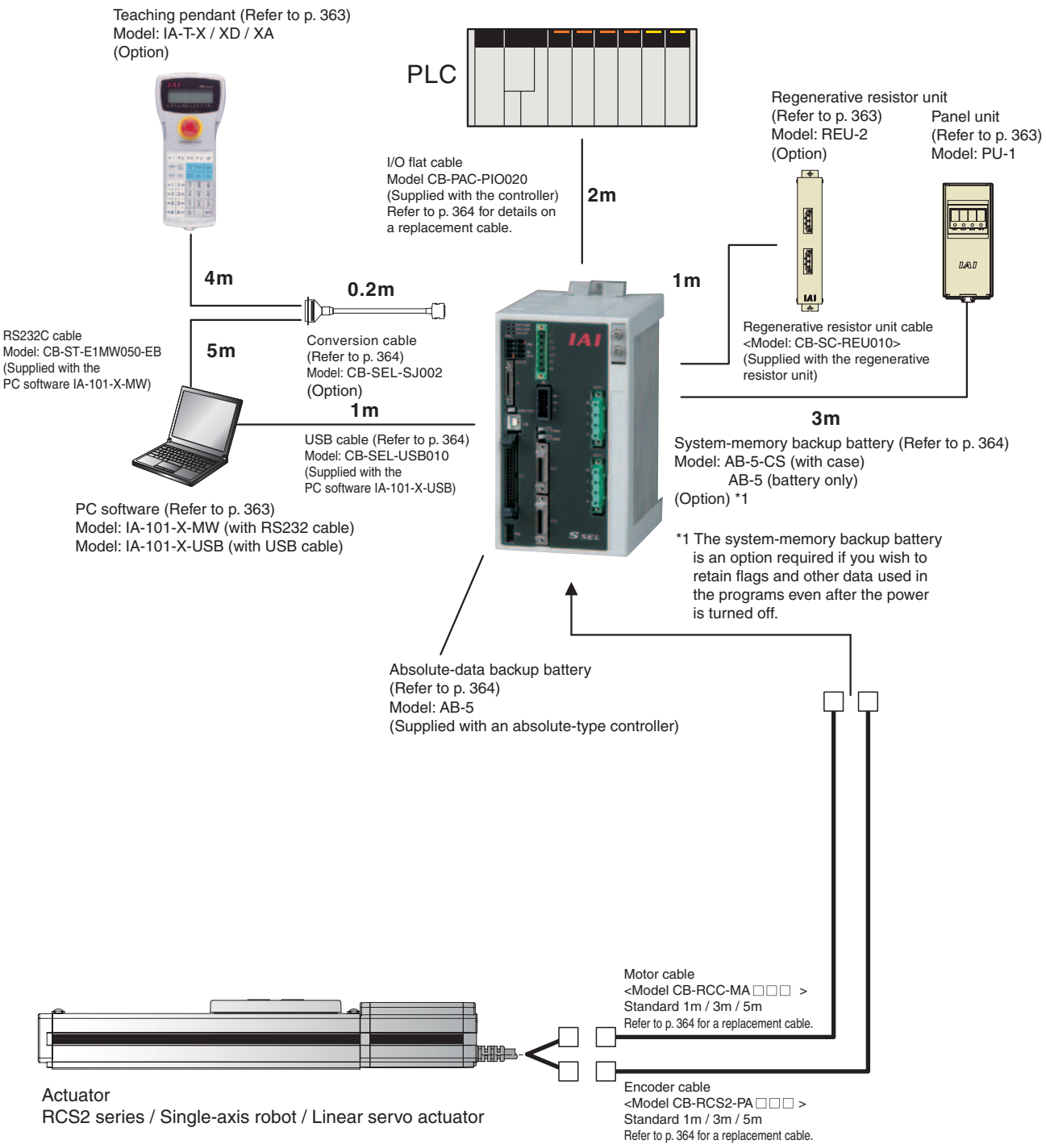
Option:
- B: Brake
- C: Creep sensor
- L: Home sensor/LS type
- S: Slave axis specification

I/O type:
- NP: PIO NPN specification (standard)
- PN: PIO PNP specification

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

Power-supply voltage:
- 1: Single-phase 100VAC
- 2: Single-phase 200VAC

System Configuration



I/O Specifications

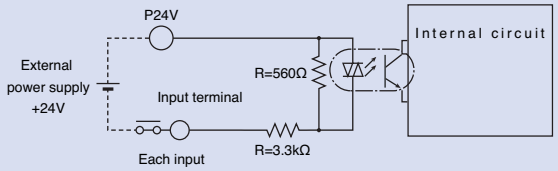
■ Input Part External input specifications

Item	Specification
Input voltage	DC24V 10%
Input current	7mA/1circuit
ON/OFF voltage	ON voltage (Min.) NPN:DC16V/PNP:DC8V OFF voltage (Max.) NPN:DC5V/PNP:DC19V
Insulation method	Photocoupler

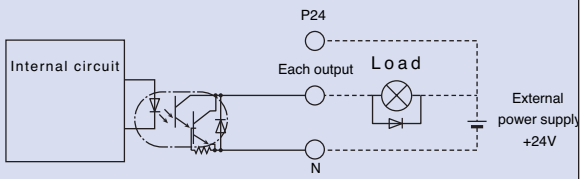
■ Output Part External output specifications.

Item	Specification
Load voltage	DC24V
Max. load current	1mA/point 400mA/8point total
Leak current	Max. 0.1mA/1point
Insulation method	Photocoupler

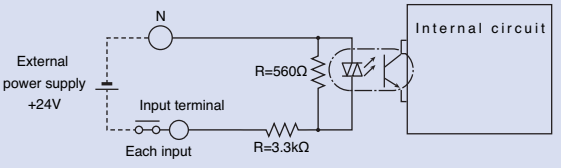
NPN specification



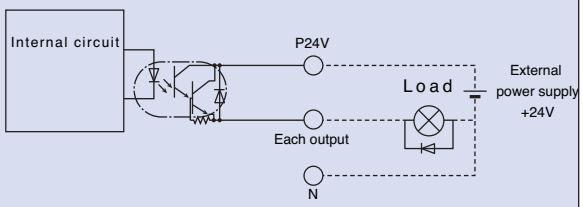
NPN specification



PNP specification



PNP specification



Explanation of I/O Functions

The SSEL 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 provides the following five input patterns each supporting different applications.

■ Controller Functions by Type

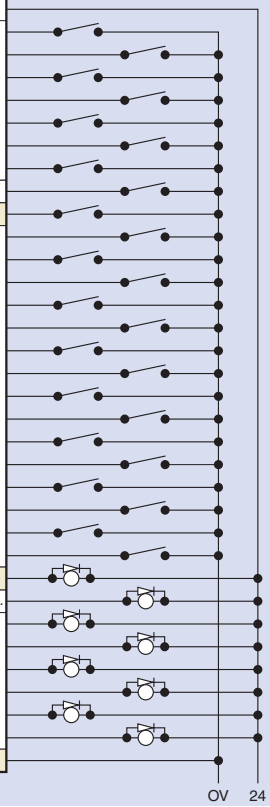
Operation mode		Features
Program mode		Various operations including linear/arc interpolation operation, path operation ideal for coating processes, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode	A basic operation mode in which a position number is specified and then a start signal is input to start operation. Push-motion operation and 2-axis linear interpolation operation are also supported.
	Product-type switchover 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	Category	Port number	Program mode	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Program No. 1 selection	These signals are used to select the program to be started. (BCD input using ports 016 to 022)
2A		017	Program No. 2 selection	
2B		018	Program No. 4 selection	
3A		019	Program No. 8 selection	
3B		020	Program No. 10 selection	
4A		021	Program No. 20 selection	
4B		022	Program No. 40 selection	
5A		023	CPU reset	This signal is used to reset the system to create the same condition after power reconnection.
5B		000	Start	This signal is used to start the program selected by port Nos. 016 to 022.
6A		001	General-purpose input	These signals are used with a program command to wait for external input.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	General-purpose output	These signals can be turned ON/OFF freely using program commands.
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		0-V input	Connect 0V.

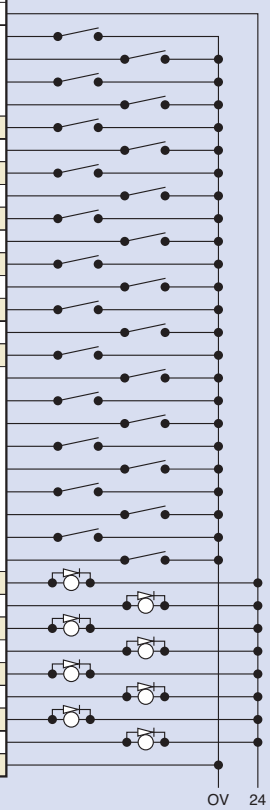
Wiring diagram



Positioner, Standard Mode

Pin number	Category	Port number	Positioner, standard mode	Function
1A	P24		24-V 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 either as BCD or binary codes.
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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This signal is used to perform home return.
6B		002	Servo ON	This signal is used to switch the servo on/off.
7A		003	Push	This signal is used to perform push-motion operation.
7B		004	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move 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 either as BCD or binary codes.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	Push motion complete	This signal is output upon completion of push-motion operation.
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

Wiring diagram

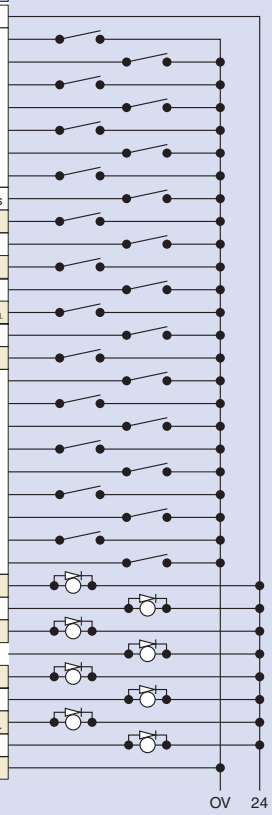


Explanation of I/O Functions

Positioner, Product-Type Switchover Mode

Pin number	Category	Port number	Positioner	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position/product type input 10	Port Nos. 007 to 022 are used to specify a target position number and a product type number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
2A		017	Position/product type input 11	
2B		018	Position/product type input 12	
3A		019	Position/product type input 13	
3B		020	Position/product type input 14	
4A		021	Position/product type input 15	
4B		022	Position/product type input 16	
5A		023	Error reset	This signal is used to reset minor errors. (The power must be reconnected to reset serious errors
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return	This signal is used to perform home return.
6B		002	Servo ON	This signal is used to switch the servo on/off.
7A		003	Push	This signal is used to perform push-motion operation.
7B		004	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
8A		005	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
8B		006	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move via linear interpolation.
9A		007	Position/product type input 1	Port Nos. 007 to 022 are used to specify a target position number and a product type number. Position numbers and product type numbers are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
9B		008	Position/product type input 2	
10A		009	Position/product type input 3	
10B		010	Position/product type input 4	
11A		011	Position/product type input 5	
11B		012	Position/product type input 6	
12A		013	Position/product type input 7	
12B		014	Position/product type input 8	
13A		015	Position/product type input 9	
13B	Output	300	Alarm	This signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	Push motion complete	This signal is output upon completion of push-motion operation.
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

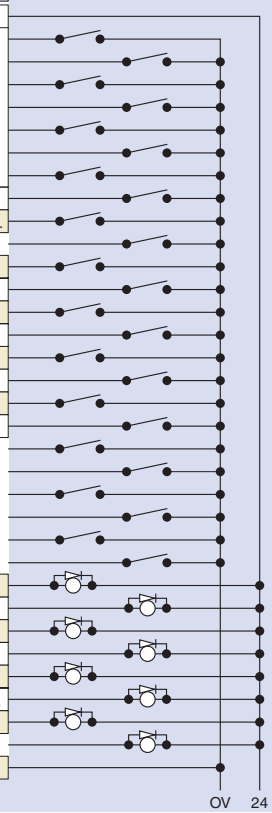
Wiring diagram



Positioner, 2-axis Independent Mode

Pin number	Category	Port number	Positioner	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position input 10	Port Nos. 010 to 022 are used to specify a target position number. Position numbers for axis 1 and those for axis 2 are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start 1	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Home return 1	This signal is used to move axis 1 to the home.
6B		002	Servo ON 1	This signal is used to switch on/off the servo for axis 1.
7A		003	Pause 1	When this signal is turned OFF while axis 1 is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
7B		004	Cancellation 1	This signal is used to cancel the movement of axis 1.
8A		005	Start 2	This signal is used to cause axis 2 to start moving to the selected position.
8B		006	Home return 2	This signal is used to move axis 2 to the home.
9A		007	Servo ON 2	This signal is used to switch on/off the servo for axis 2.
9B		008	Pause 2	When this signal is turned OFF while axis 2 is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
10A		009	Cancellation 2	This signal is used to cancel the movement of axis 2.
10B		010	Position input 1	Port Nos. 010 to 022 are used to specify a target position number. Position numbers for axis 1 and those for axis 2 are assigned by parameter settings. Numbers can be specified either as BCD or binary codes.
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 signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete 1	This signal is output upon completion of movement of axis 1 to the specified position.
15A		303	Home return complete 1	This signal is output upon completion of home return of axis 1.
15B		304	Servo ON output 1	This signal is output while the servo for axis 1 is on.
16A		305	Position complete 2	This signal is output upon completion of movement of axis 2 to the specified position.
16B		306	Home return complete 2	This signal is output upon completion of home return of axis 2.
17A		307	Servo ON output 2	This signal is output while the servo for axis 2 is on.
17B	N		0-V input	Connect 0V.

Wiring diagram

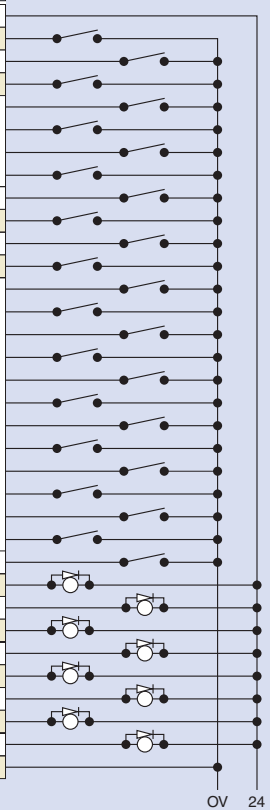


Explanation of I/O Functions

Positioner, Teaching Mode

Pin number	Category	Port number	Positioner	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Axis 1 JOG-	While this signal is input, axis 1 moves in the negative direction.
2A		017	Axis 2 JOG+	While this signal is input, axis 2 moves in the positive direction.
2B		018	Axis 2 JOG-	While this signal is input, axis 2 moves in the negative direction.
3A		019	Inching specification (0.01mm)	These signals are used to specify an inching travel distance. (The travel distance is the sum of values specified by port Nos. 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 signal is used to reset minor errors. (The power must be reconnected to reset serious errors.)
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.
6A		001	Servo ON	This signal is used to switch the servo on/off.
6B		002	Pause	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
7A		003	Position input 1	Port Nos. 003 to 013 are used to specify a target position number and a position number under which to input the current position. When the teaching mode specification signal at port No. 014 is ON, the current value will be written under the specified position number upon turning ON of the start signal at port No. 000.
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+	While this signal is input, axis 1 moves in the positive direction.
13B	Output	300	Alarm	This signal is output upon an alarm. (Contact B)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	Home return complete	This signal is output upon completion of home return.
15B		304	Servo ON output	This signal is output while the servo is on.
16A		305	-	-
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

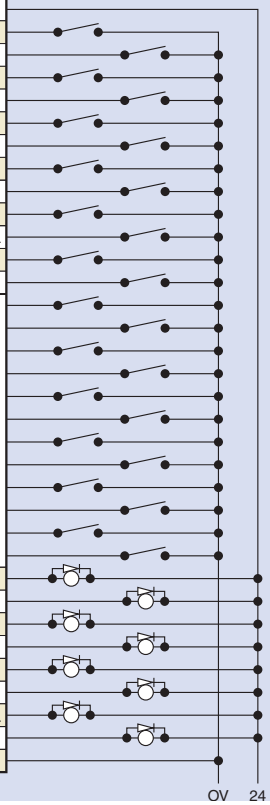
Wiring diagram



Positioner, DS-S-C1 Compatible Mode

Pin number	Category	Port number	Positioner	Function
1A	P24		24-V input	Connect 24V.
1B	Input	016	Position No.1000	(Same as port Nos. 004 to 015)
2A		017	–	–
2B		018	–	–
3A		019	–	–
3B		020	–	–
4A		021	–	–
4B		022	–	–
5A		023	CPU reset	This signal is used to reset the system to create the same condition after power reconnection.
5B		000	Start	This signal is used to cause the actuator to start moving to the selected position.T
6A		001	Hold (pause)	When this signal is turned OFF while the actuator is moving, the actuator will pause. When the signal is turned ON, the actuator will resume and complete the remaining operation.
6B		002	Cancellation	When this signal is turned OFF while the actuator is moving, the actuator will stop and the remaining operation will be cancelled.
7A		003	Interpolation setting	With a 2-axis specification, turning ON this signal causes the actuator to move via linear interpolation.
7B		004	Position No.1	Port Nos. 004 to 016 are used to specify a target position number. Numbers can be specified either as BCD or binary codes.
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 signal is output upon an alarm. (Contact A)
14A		301	Ready	This signal is output once the controller has started properly and entered a ready state.
14B		302	Position complete	This signal is output upon completion of movement to the specified position.
15A		303	–	–
15B		304	–	–
16A		305	–	–
16B		306	System-memory backup battery error	This signal is output when the system-memory backup battery voltage has dropped (to the warning level).
17A		307	Absolute-data backup battery error	This signal is output when the absolute-data backup battery voltage has dropped (to the warning level).
17B	N		0-V input	Connect 0V.

Wiring diagram

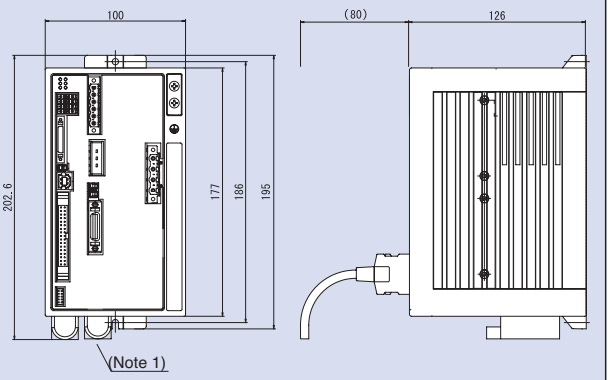


Specification Table

	Item	Specification	
Basic specifications	Connectable actuators	RCS2 series actuator / Single-axis robot / Linear servo actuator	
	Input power supply	Single-phase 100VAC ± 10%	Single-phase 200VAC ± 10%
	Power-supply capacity	1,660VA max. (400W, 2 axes operated)	
	Dielectric strength voltage	500VDC, 10MΩ or above	
	Breakdown resistance	500VAC, 1 minute	
	Rush current	30A max.	
	Vibration resistance	XYZ directions	One-side amplitude 0.035 mm (continuous), 0.075 (intermittent) 4.9m/s2 (continuous), 9.8m/s2 (intermittent)
Control specifications	Number of controlled axes	1 axis/2 axes	
	Maximum total output of connected axes	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.	
	Operation method	Program operation / Positioner operation (switchable)	
Program	Programming language	Super SEL language	
	Number of programs	64 programs	
	Number of program steps	2,000 steps	
	Number of multi-tasking programs	8 programs	
	Number of positioning points	1,500 points	
	Data storage 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 points	24 input points / 8 output points (NPN or PNP selectable)	
	I/O power supply	Externally supplied 24VDC ± 10%	
	PIO cable	CB-DS-PIO□□□(supplied with the controller)	
	Serial communication function	RS232C (D-sub, half-pitch connector) / USB connector	
	Field network	(To be supported in the future)	
	Motor cable	CB-RCC-MA□□□(20m max.)	
	Encoder cable	CB-RCS2-PA□□□(20m max.)	
General specifications	Protective functions	Motor overcurrent, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, battery error, etc.	
	Ambient operating temperature, humidity	0~40ºC 10~95% (non-condensing)	
	Operating ambience	Free from corrosive gases. In particular, there shall be no significant powder dust.	
	Protection class	IP20	
	Weight	1.4kg	
	External dimensions	100mm (W) ×202.6mm (H) ×126mm (D)	

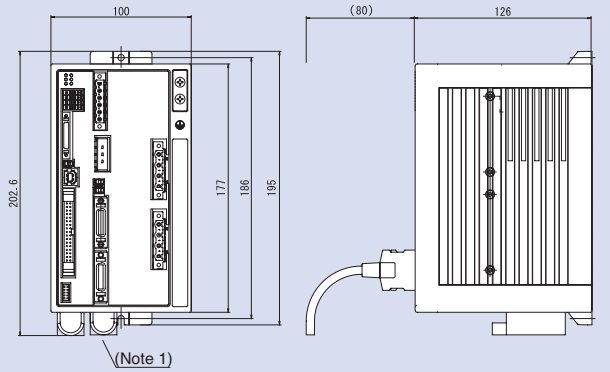
External Dimensions

SSEL 1-axis controller



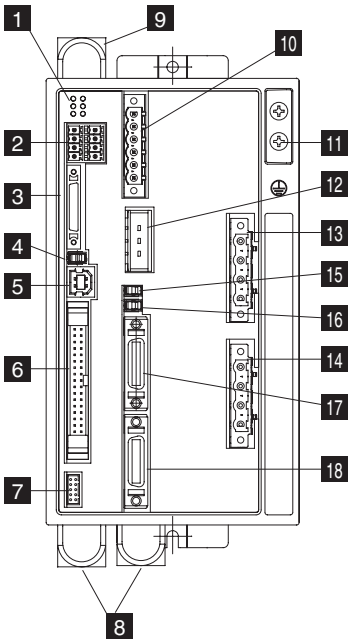
(Note 1) Absolute-data backup battery. This battery is not installed on an incremental-type controller.

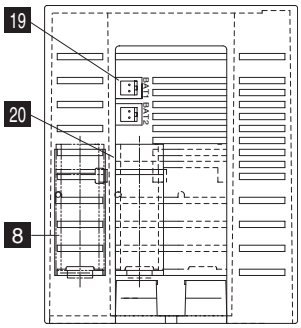
ASEL 2-axis controller

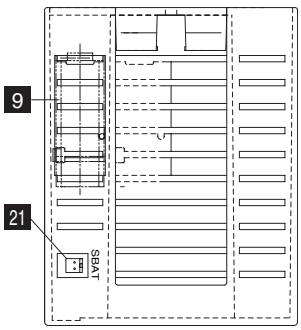


(Note 1) Absolute-data backup battery. This battery is not installed on an incremental-type controller.

Name of Each Part







1 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.

2 System I/O connector

A connector for the emergency stop input, enable input, brake power input, etc.

3 Teaching pendant (TP) 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.

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 I/O connector

A connector for interface I/Os.
A 34-pin flat connector is used for the DIO (24 IN/8 OUT) interface.

The I/O power is also supplied to the controller through this connector (pins 1 and 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 Grounding screw

A screw for protective grounding. 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

Connect the motor cable of the axis 1 actuator.

14 Motor connector for axis 2

Connect the motor 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. 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

Connect the encoder cable of the axis 1 actuator.

18 Encoder connector for axis 2

Connect 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. Secure installation of the battery is the customer's responsibility.

20 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.

21 System-memory backup battery connector

A connector for the system-memory backup battery.

Option

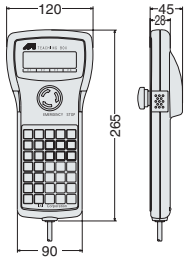
Teaching pendant

Features A teaching device providing program/position input function, test operation function, monitoring function, and more.

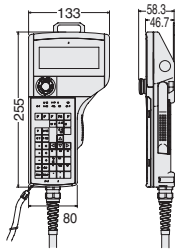
Model

Model	Description
IA-T-X-J	Standard type with connector conversion cable
IA-T-X	Standard type
IA-T-XD-J	Deadman switch type with connector conversion cable
IA-T-XD	Deadman switch type
IA-T-XA-J	ANSI type with connector conversion cable
IA-T-XA	ANSI type

IA-T-X/XD



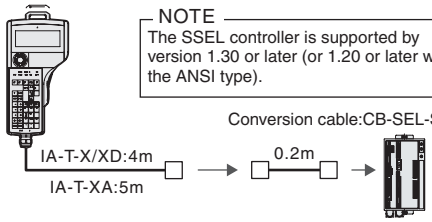
IA-T-XA



Specifications

Item	IA-T-X/XD	IA-T-XA
Ambient operating temperature, humidity	Temperature 0~40°C, Humidity 85% RH or below	
Operating ambience	Free from corrosive gases. In particular, there shall be no significant powder dust.	Protective structure conforming to IP54
Weight	Approx. 650g	Approx. 600g (excluding cable)
Cable length	4m	5m
Display	LCD with 20 characters x 4 lines	LCD with 32 characters x 8 lines

Configuration



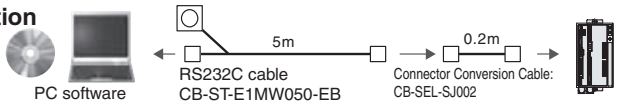
NOTE
The SSEL controller is supported by version 1.30 or later (or 1.20 or later with the ANSI type).

PC Software (Windows Only)

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

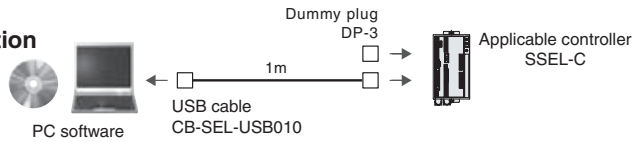
Model **IA-101-X-MW-J (with RS232C Cable + Connector Conversion Cable)**
IA-101-X-MW (with RS232C Cable)

Configuration



Model **IA-101-X-USB (with USB Cable)**

Configuration



NOTE
The SSEL controller is supported by version 6.0.0.0 or later.

Regenerative Resistor Unit

Features This unit converts to heat the regenerative current produced when the motor decelerates. Use the table shown to the right to check the total wattage of actuators operated by the controller, and purchase one or more regenerative resistor units if required.

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

Specifications

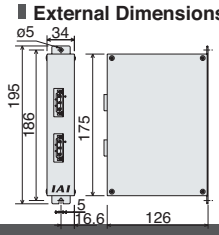
Weight	0.9kg
Built-in regenerative resistor	220Ω 80W
Unit-controller connection cable (supplied)	CB-SC-REU010 (SSEL)

Guide for Determining Necessary Number of Units

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

* More regenerative resistor units than the numbers specified above may be required depending on the operating conditions.

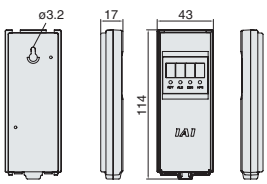
External Dimensions



Panel Unit

Features A display for checking controller error codes and active program numbers.

Model **PU-1(Cable Length 3m)**



Absolute-Data Backup Battery

Features This battery backs up absolute data when an absolute-type actuator is operated. Same as the system-memory backup battery.

Model **AB-5**

System-Memory Backup Battery

Features If your programs use global flags, etc., you need this battery to retain data even after the power is turned off.

Model **AB-5-CS (with Case)**
AB-5 (Battery Only)

Options

Dummy plug

Features When connecting your SSEL controller to a PC using a USB cable, install this plug on the teaching port to cut off the enable circuit. (This plug comes with the PC software IA-101-X-USB.)

Model **DP-3**

USB cable

Features Use this cable to connect your controller with USB port to a PC.
If your controller has no USB port (XSEL), connect a RS232C cable to a USB cable via a USB conversion adapter and connect the USB cable to the USB port on the PC.
(Refer to the PC software IA-101-X-USBMW.)

Model **CB-SEL-USB010** (Cable Length 1m)

Connector conversion cable

Features This conversion cable is used to connect a D-sub, 25-pin connector for teaching pendant or PC software to the teaching connector (half-pitch) on the ASEL controller.

Model **CB-SEL-SJ002** (Cable Length 0.2m)

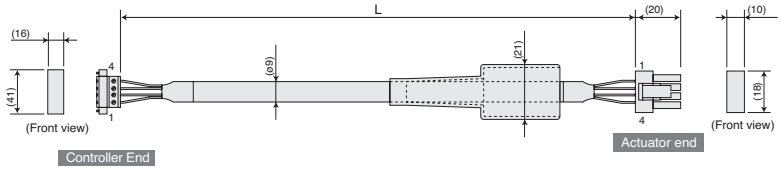
Spare Parts

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). Lengths up to 30 m can be specified.
Example) 080 = 8 m



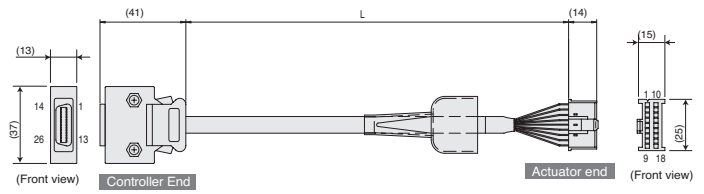
Wire	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

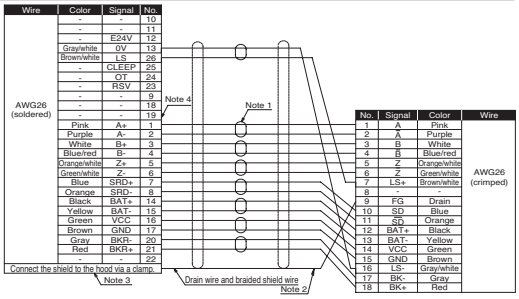
No.	Signal	Color	Wire
1	U	Red	0.75sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Encoder Cable/ Encoder Robot Cable

Model CB-RCS2-PA□□□ / CB-X2-PA□□□

* □□□ indicates the cable length (L). Lengths up to 30 m can be specified.
Example) 080 = 8 m





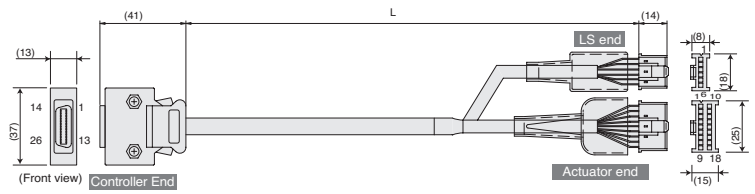
Wire	Color	Signal	No.
AWG26 (soldered)	-	-	10
	-	-	11
	-	E24V	12
	Gray/white	0V	13
	Brown/white	LS	26
	-	CLEEP	25
	-	OT	24
	-	RSV	23
	-	-	9
	-	-	18
	-	-	19
	Pink	A+	1
	Purple	A-	2
	White	B+	3
	Blue/red	B-	4
	Orange/white	Z+	5
	Green/white	Z-	6
	Blue	SRD+	7
	Orange	SRD-	8
	Black	BAT+	14
	Yellow	BAT-	15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

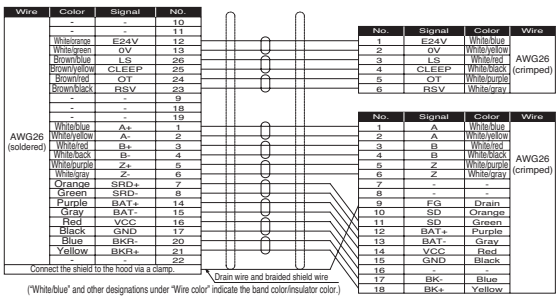
No.	Signal	Color	Wire
1	A	Pink	AWG26 (crimped)
2	A	Purple	
3	B	White	
4	B	Blue/red	
5	Z	Orange/white	
6	Z	Green/white	
7	LS+	Brown/white	
8	-	-	
9	FG	Drain	
10	SD	Blue	
11	SD	Orange	
12	BAT+	Black	
13	BAT-	Yellow	
14	VCC	Green	
15	GND	Brown	
16	LS-	Gray/white	
17	BK-	Gray	
18	BK+	Red	

Encoder Cable/ Encoder Robot Cable for RCS2-RT6/RT6R/RT7R

Model CB-RCS2-PLA□□□ / CB-X2-PLA□□□

* □□□ indicates the cable length (L). Lengths up to 30 m can be specified.
Example) 080 = 8 m





Wire	Color	Signal	No.
AWG26 (soldered)	-	-	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

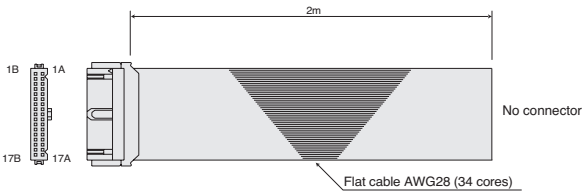
No.	Signal	Color	Wire
1	E24V	White/blue	AWG26 (crimped)
2	0V	White/yellow	
3	LS	White/red	
4	CLEEP	White/black	
5	OT	White/purple	
6	RSV	White/gray	

No.	Signal	Color	Wire
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 (SSEL Types)

Model CB-DS-PIO□□□

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



No.	Color	Wire	No.	Color	Wire
1A	Brown1	Flat cable pressure -welded	9B	Gray2	Flat cable pressure -welded
1B	Red1		10A	White2	
2A	Orange1		10B	Black2	
2B	Yellow1		11A	Brown-3	
3A	Green1		11B	Red3	
3B	Blue1		12A	Orange3	
4A	Purple1		12B	Yellow3	
4B	Gray1		13A	Green3	
5A	White1		13B	Blue3	
5B	Black1		14A	Purple3	
6A	Brown-2		14B	Gray3	
6B	Red2		15A	White3	
7A	Orange2		15B	Black3	
7B	Yellow2		16A	Brown-4	
8A	Green2		16B	Red4	
8B	Blue2		17A	Orange4	
9A	Purple2		17B	Yellow4	

X-SEL

RCS2 Series
Program controller

Type List

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

Type	J	K	P	Q
Name	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 2,400 W	Large-capacity type conforming to safety category 4
Maximum number of controlled axes	4 axes		6 axes	
Number of position points	3,000 positions		4,000 positions	
Total connectable wattage	800W	1600W	2400W	
Power supply	Single-phase 100VAC / Single-phase 200VAC		Three-phase 200VAC	
Safety category	B		B	Conforming to safety category 4
Safety standard	–	–	CE	CE, ANSI

Model

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

* Specification of the section denoted by (Axes 2 to 6) varies depending on the number of axes used.

XSEL - [ ] - [ ] - [ ] [ ] [ ] - ([ ] [ ] [ ]) - [ ] - [ ] [ ] [ ] - [ ] - [ ]

Series | Type | Number of connected axes | Motor type | (1-axis) Encoder type | Option | (Axes 2 to 6) Motor type | Encoder type | Option | (Slot 1) Standard I/O | (Slot 2) (Slot 3) (Slot 4) Expansion I/O | I/O cable length | Power-supply voltage

J	Compact type
K	General-purpose type
P	Large-capacity type
Q	Large-capacity type (meeting safety category)

1	1-axis specification	4	4-axes specification
2	2-axes specification	5	5-axes specification
3	3-axes specification	6	6-axes specification

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

B	Brake
C	Creep sensor
L	Home sensor/LS type
M	Master axis specification
S	Slave axis specification

I	Incremental
A	Absolute

20	20-W servo motor
30D	RCS2 30-W servo motor
30R	RS 30-W servo motor
60	60-W servo motor
100	100-W servo motor
150	150-W servo motor

I	Incremental
A	Absolute

B	Brake
C	Creep sensor
L	Home sensor/LS type
M	Master axis specification
S	Slave axis specification

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
SA	Expansion SIO A type
SB	Expansion SIO B type
SC	Expansion SIO C type

1	Single-phase 100VAC
2	Single-phase 200VAC
3	Three-phase 200VAC

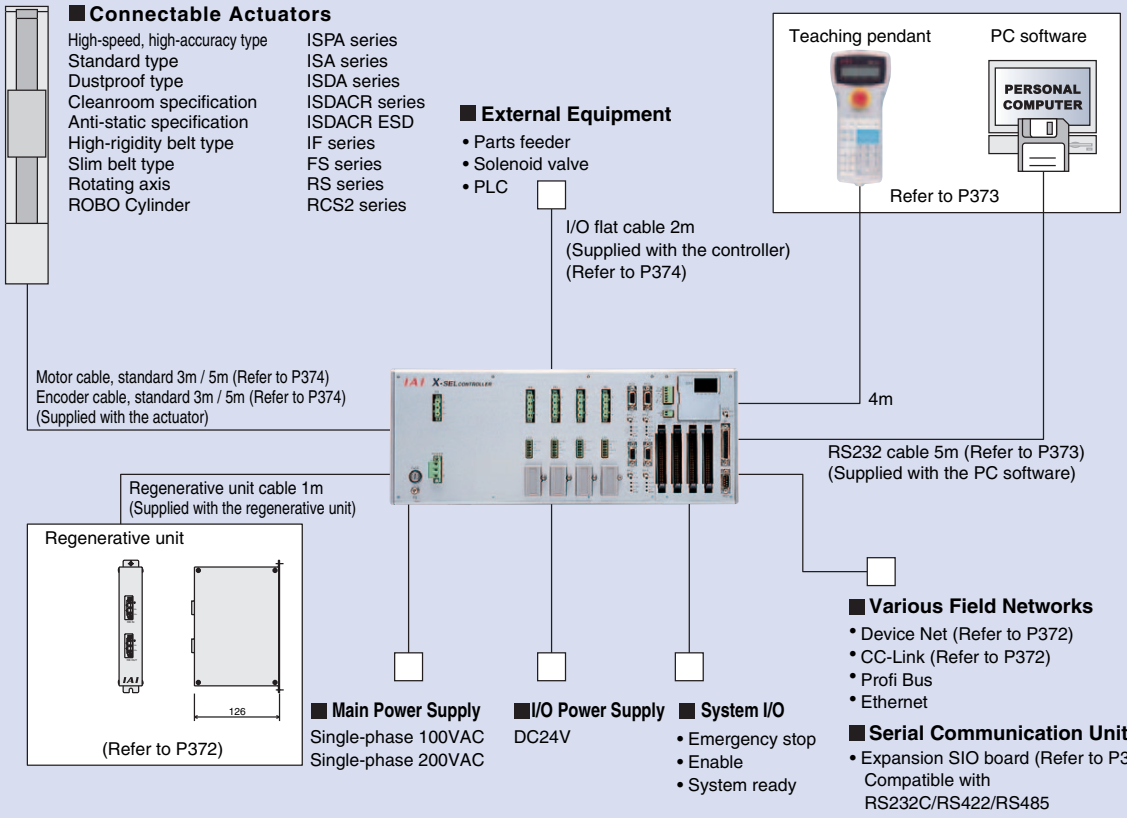
* The XSEL-J/K types supports both single-phase 100 VAC and single-phase 200 VAC, so you can select whichever power-supply voltage is appropriate. However, the XSEL-P/Q types only support three-phase 200 VAC.

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

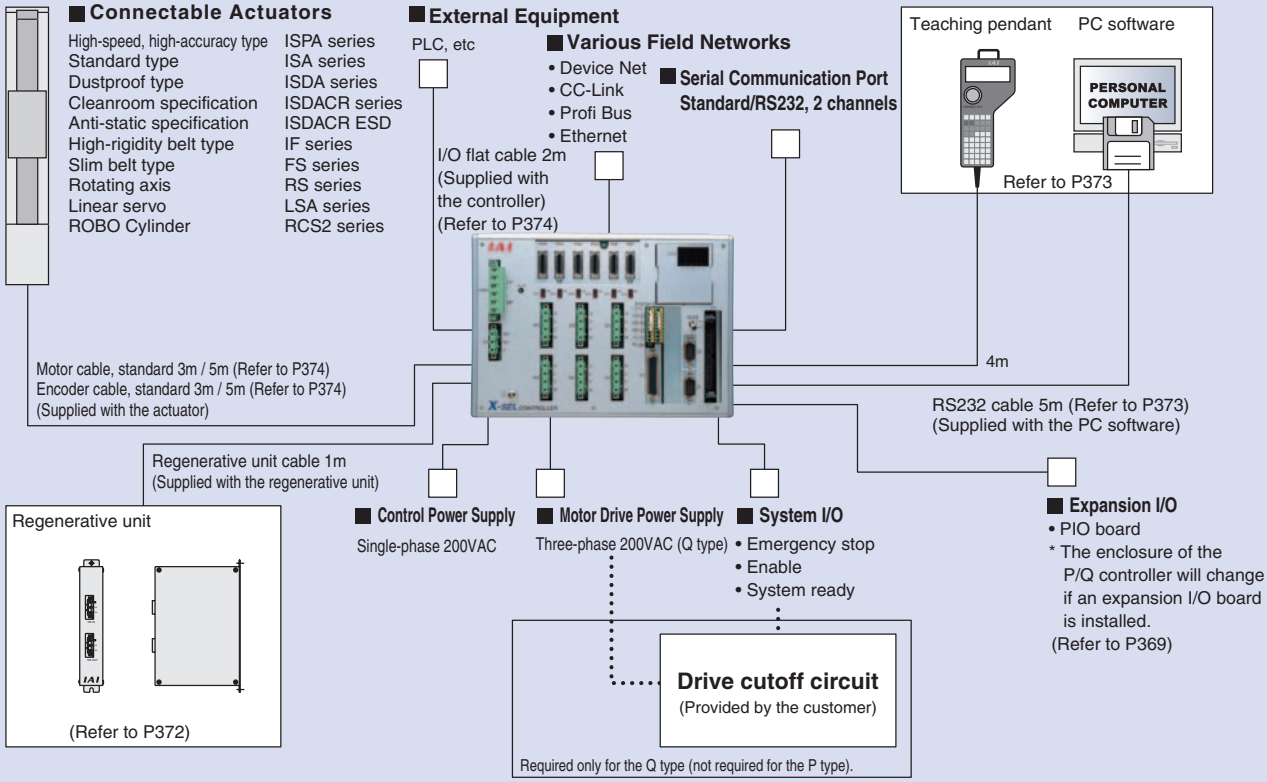
* When selecting standard I/O, expansion I/O by DV, CC, PR, or ET, please select 0 for the I/O cable length.

System Configuration

J (Compact) / K (General-Purpose) / KE (CE) Types



P (Large-Capacity) / Q (Large-Capacity Global) Types

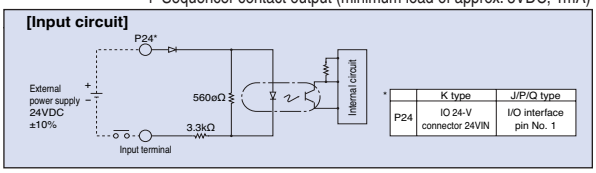


I/O Wiring Diagram

Input Part External input specifications (NPN specifications)

Item	Specification
Input voltage	24VDC ±10%
Input current	7mA / 1 circuit
ON/OF voltage	ON voltage…Min DC16.0V OFF voltage…Max DC5.0V
Insulation method	Photocoupler insulation
Externally connected equipment	1 No-voltage contacts (minimum load of approx. 5VDC, 1mA) 2 Photoelectric/proximity sensor (NPN type) 3 Sequencer transistor output (open collector type) 4 Sequencer contact output (minimum load of approx. 5VDC, 1mA)

[Input circuit]

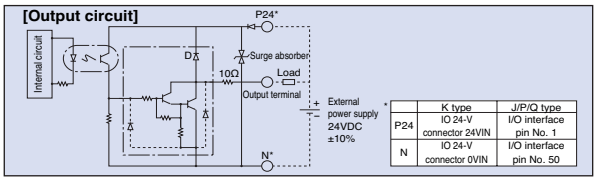


*	K type	J/P/Q type
P24	IO 24-V connector 24VIN	I/O interface pin No. 1

Output Part External output specifications (NPN specifications)

Item	Specification	
Load voltage	24VDC	TD62084 (or equivalent)
Maximum load current	100mA / 1 circuit 400mA Peak (full current)	
Leak current	Max 0.1mA / 1point	
Insulation method	Photocoupler insulation	
Externally connected equipment	1 Miniature relay 2 Sequencer input unit	

[Output circuit]

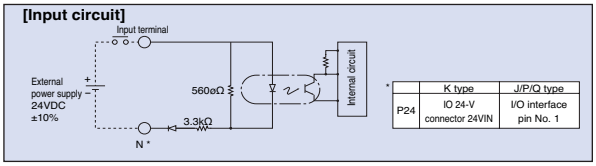


*	K type	J/P/Q type
P24	IO 24-V connector 24VIN	I/O interface pin No. 1
N	IO 24-V connector 0VIN	I/O interface pin No. 50

Input Part External input specifications (PNP specifications)

Item	Specification
Input voltage	24VDC ±10%
Input current	7mA / 1 circuit
ON/OF voltage	ON voltage…Min DC8V OFF voltage…Max DC19V
Insulation method	Photocoupler insulation
Externally connected equipment	1 No-voltage contacts (minimum load of approx. 5VDC, 1mA) 2 Photoelectric/proximity sensor (PNP type) 3 Sequencer transistor output (open collector type) 4 Sequencer contact output (minimum load of approx. 5VDC, 1mA)

[Input circuit]



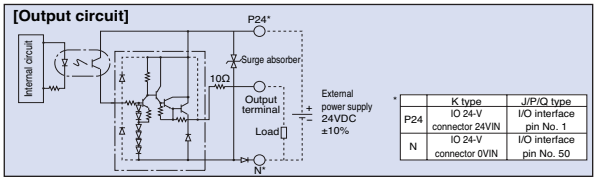
*	K type	J/P/Q type
P24	IO 24-V connector 24VIN	I/O interface pin No. 1

Output Part External output specifications (PNP specifications)

Item	Specification	
Load voltage	24VDC	TD62784 (or equivalent)
Maximum load current	100mA / 1 circuit 400mA/8 ports (Note)	
Leak current	Max 0.1mA / 1point	
Insulation method	Photocoupler insulation	
Externally connected equipment	1 Miniature relay 2 Sequencer input unit	

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

[Output circuit]



*	K type	J/P/Q type
P24	IO 24-V connector 24VIN	I/O interface pin No. 1
N	IO 24-V connector 0VIN	I/O interface pin No. 50

I/O Signal Table

Standard I/O Signal Table (N1 or P1 Selected)

Pin number	Category	Port number	Standard setting
1		—	(J/P/Q types: Connected to 24V / K type: NC)
2		000	Program start
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 types: Connected to 0V / K type: NC)

Expansion I/O Signal Table (N1 or P1 Selected)

Pin number	Category	Standard setting
1		(J/P/Q types: Connected to 24V / 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 types: Connected to 0V / K type: NC)

Expansion I/O Signal Table (N2 or P2 Selected)

Pin number	Category	Standard setting
1		(J/P/Q types: Connected to 24V / 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 types: Connected to 0V / K type: NC)

Specification Table

J (Compact) / K (General-Purpose) Types

Item	Description						
Controller series, type	J (compact) type				K (general-purpose) type / KE (CE) type		
Connectable actuators	RCS2 / ISA / ISPA / ISP / ISDA / ISDACR / ISPDACR / IF / FS / RS						
Motor output (W)	20 / 30 / 60 / 100 / 150 / 200 / 300 / 400 / 600 / 750						
Number of controlled axes	1 axis	2 axes	3 axes	4 axes	1 axis	2 axes	3 axes	4 axes
Maximum output of connected axes (W)	Max800(at power-supply voltage of 200V) Max400(at power-supply voltage of 100V)				Max 800	Max1600(at power-supply voltage of 200V) Max800(at power-supply voltage of 100V)	
Input power supply	100-V specification: Single-phase 100~115VAC 200-V specification: Single-phase 200~230VAC						
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 (wire-saving type) Absolute encoder with rotation data backup (wire-saving type)						
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.						
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 positioning points	3,000 positions						
Data storage device	Flash ROM + SRAM battery backup						
Data input method	Teaching pendant or PC software						
Standard inputs/outputs	32 points (total of dedicated inputs + general-purpose inputs) / 16 points (total of dedicated outputs + general-purpose outputs)						
Expansion inputs/outputs	None		48 points per unit (1 unit can be added)		48 points per unit (Up to 3 units can be added)		
Serial communication function	RS232 port (D-sub, 25-pin) – Standard accessory				Standard RS232 port + Expansion SIO board (optional)		
Other inputs/outputs	System I/Os (emergency stop input, enable input, system ready output)						
Protective functions	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 0~40°C, humidity 30~85% (non-condensing)						
Operating ambience	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						

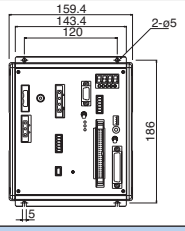
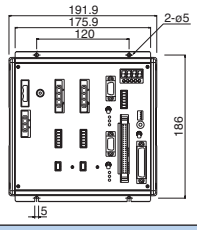
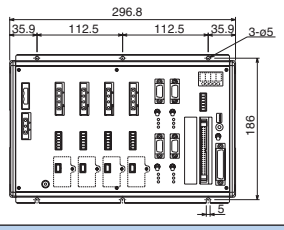
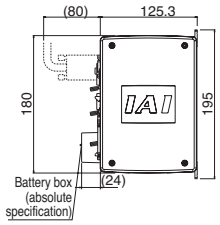
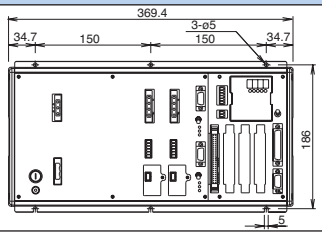
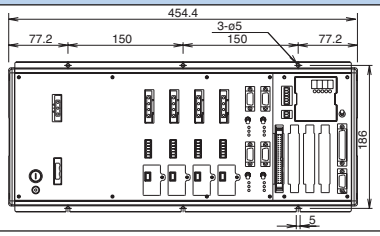
P (Large-Capacity) / Q (Large-Capacity Meeting Safety Category) Types

Item	Description											
Controller series, type	P (standard) type						Q (global) type					
Connectable actuators	RCS2 / ISA / ISPA / ISP / ISDA / ISDACR / ISPDACR / IF / FS / RS / LSA											
Motor output (W)	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 output of connected axes (W)	Max2400W											
Control power input	AC200 / 230 Single-phase -15%, +10%						AC200 / 230 Single-phase -15%, +10%					
Motor power input	AC200 / 230 Three-phase -10%, +10%						AC200 / 230 Three-phase -10%, +10%					
Power-supply frequency	50 / 60Hz											
Dielectric strength voltage	10MΩ or more (between the power-supply terminal and I/O terminals, and between all external terminals and case, at 500VDC)											
Breakdown voltage	1,500VAC (1 minute)						1,500VAC (1 minute)					
Power-supply capacity	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 (wire-saving type) Absolute encoder with rotation data backup (wire-saving type)											
Safety circuit configuration	Redundancy not supported						Redundancy supported					
Drive-source cutoff method	Internal cutoff relay						External safety circuit					
Enable input	Contact-B input (powered internally)						Contact-B input (powered externally, redundant)					
Speed setting	From 1mm/s. The maximum limit varies depending on the actuator.											
Acceleration/deceleration setting	From 0.01G. The maximum limit varies depending on the 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 positioning points	4,000 steps (total)											
Data storage device	Flash ROM + SRAM battery backup											
Data input method	Teaching pendant or PC software											
Standard inputs/outputs	PIO board with 48 input/output points (NPN/PNP) or PIO board with 96 input/output points (NPN/PNP) – 1 board can be installed											
Expansion inputs/outputs	PIO board with 48 input/output points (NPN/PNP) or PIO board with 96 input/output points (NPN/PNP) – Up to 3 boards can be installed											
Serial communication function	Teaching port (D-sub, 25-pin) + 2-channel RS232C port (D-sub, 9-pin x 2) – Standard accessory											
Protective functions	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	0~40°C, 10~95% (non-condensing). Free from corrosive gases. In particular, there shall be no significant powder dust.											
Weight	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.

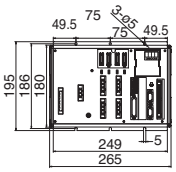
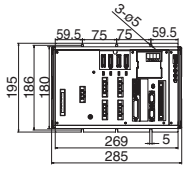
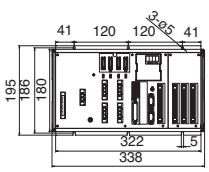
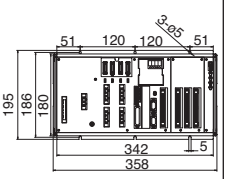
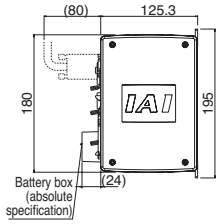
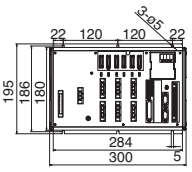
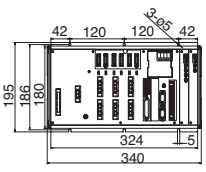
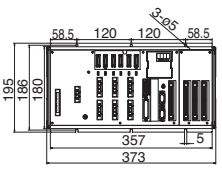
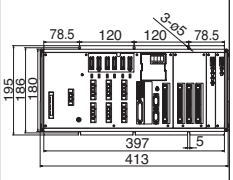
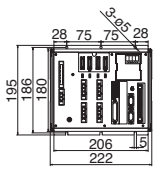
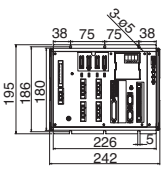
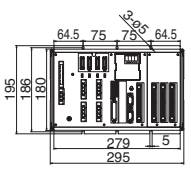
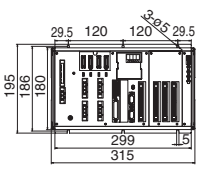
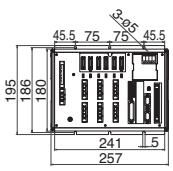
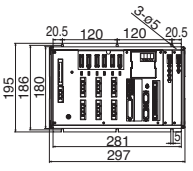
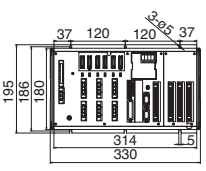
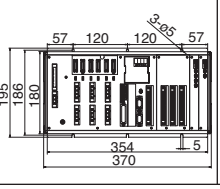
External Dimensions

J (Compact) / K (General-Purpose) Types

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

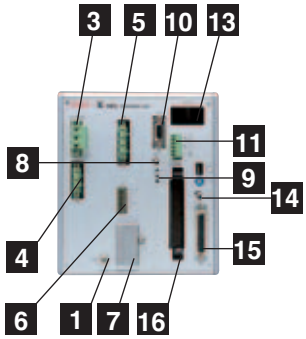
P (Large-Capacity Standard) / Q (Large-Capacity Global) Types

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 four possible shapes are shown below. Check the dimensions of the controller type and number of axes you desire.

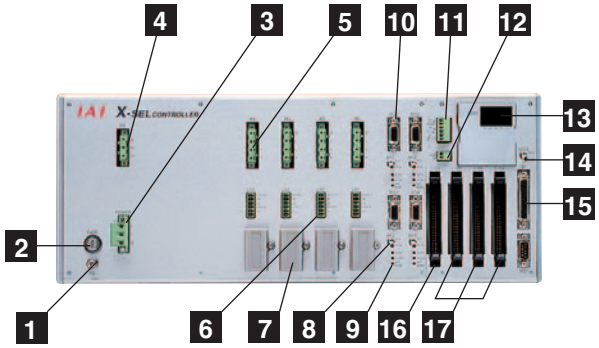
		Basic shape (incremental specification)	With brake/absolute unit	With I/O expansion base	With brake/absolute unit + I/O expansion base	Side view
Controller specifications	Encoder	Incremental	Absolute	Incremental	Absolute	
	Brake	Without	With	Without	With	
	I/O	Standard only	Standard only	Standard + Expansion	Standard + Expansion	
P (Large-Capacity)	1 to 4-axis specification					
	5 to 6-axis specification					
Q (Large-Capacity Meeting Safety Category)	1 to 4-axis specification					
	5 to 6-axis specification					

Name of Each Part

J Type (Compact)



K Type (General-Purpose)



1 FG connection terminal

A terminal for connecting to the FG terminal on the enclosure. The PE at the AC input part is connected to the enclosure inside the controller.

2 Fuse holder (K type only)

A half-cut fuse holder provided for overcurrent protection of the AC input part.

3 Main power input connector

A connector for 100/200-VAC single-phase input.
(The cable comes with a matching plug. Refer to the facing page.)

4 Regenerative resistor unit connector

A connector for the regenerative resistor unit (optional/REU-1) that must be connected when the built-in regenerative resistor alone does not offer sufficient capacity in high-acceleration/high-load operation, 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

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

8 Brake release switch (brake specification only)

An alternate switch with lock 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 LEDs

These LEDs are used to monitor the operating status of the driver CPU that controls the motor drive.
The following three LEDs are available.

Name	Color	Meaning when the LED is lit
ALM	Orange	The driver has detected an error.
SVON	Green	The servo is on and the motor is driven.
BATT ALM	Orange	The absolute-data backup battery voltage is low.

10 Encoder cable connector

A 15-pin, D-sub connector for the actuator's encoder cable.

11 System I/O connector

A connector for three input/output points including two inputs used to control controller operation, and one system status output. (The cable comes with a matching plug. Refer to the facing page.)

Name		
EMG	Emergency stop input	ON: The controller is ready. OFF: An emergency stop is actuated.
ENB	Safety gate input	ON: The controller is ready. OFF: The servo is off.
RDY	System ready relay output	This signal outputs the status of this controller. Cascade connection is supported. Shorted: Ready. Open: Not ready.

12 I/O 24-V power-supply connector (K type only)

If DIs and DOs are installed in the I/O boards (16 and 17), this connector is used to externally supply the I/O power for the insulated part.

13 Panel window

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

14 Mode switch

This alternate switch with lock is used to specify the running mode of the controller. 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

A D-sub, 25-pin connector for connecting a teaching pendant or PC to input program positions.

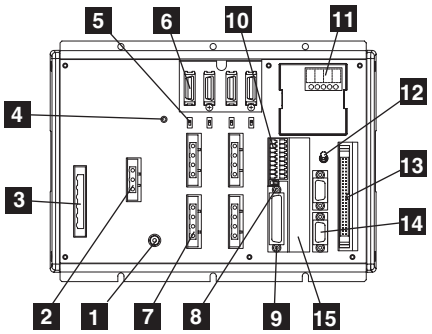
16 Standard I/O slot (slot 1)

The controller comes standard with a PIO board offering 32 input points and 16 output points.

17 Expansion I/O slots (slot 2, slot 3, slot 4)

Install an expansion I/O board in each of these slots. (Optional)

P type (Standard, 4 axes)



1 FG connection terminal

A terminal for connecting to the FG terminal on the enclosure.
The PE at the AC input part is 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

A three-phase 200-VAC input connector. It consists of six terminals including motor power-supply, control power-supply and PE terminals.
The controller only comes standard with a terminal block.

Note Do not touch the connector while the power is supplied, as it may cause electric shock.

4 Control power-supply monitor LED

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

5 Enable/disable switch for absolute-data backup battery

This switch is used to enable or disable encoder backup using the absolute-data backup battery. Encoder backup has been disabled prior to the 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 sensors are optional.

7 Motor connector

A connector for driving the motor in the actuator.

8 Teaching-pendant type selector switch

This switch is used to select the type of the teaching pendant to be connected to the teaching connector (9). Specifically, you can switch between IAI's standard teaching pendant and the ANSI teaching pendant. Operate the switch on the front face of the board in accordance with the teaching pendant used.

9 Teaching connector

This teaching interface is used to connect IAI's teaching pendant or a PC (PC software) to operate/set the system, etc.

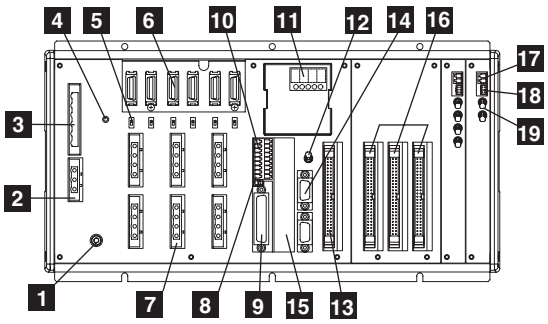
10 System I/O connector

An I/O connector that governs the safety operation functions of the controller. 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.

Q type (Absolute brake unit + Expansion base, 6 axes)



Description of 5 LEDs

Name	Status when the LED is lit
RDY	The CPU is ready (program operation can be performed).
ALM	A CPU alarm (system-shutdown level error) or CPU hardware error is present.
EMG	An emergency stop is actuated or CPU hardware error or power-supply hardware error is present.
PSE	A power-supply hardware error is present.
CLK	A system clock error is present.

12 Mode switch

This alternate switch with lock is used to specify the running mode of the controller. 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.

13 Standard I/O connector

A 50-pin flat connector constituting 32-input/16-output DIOs.

Overview of standard I/O interface specifications

Items	Description
Connector name	I/O
Applicable connector	Flat connector, 50 pins
Power supply	Power is supplied from connector pin Nos. 1 and 50.
Inputs	32 points (including general-purpose and dedicated inputs)
Outputs	16 points (including general-purpose and dedicated outputs)
Connected to	External PLC, sensors, etc.

14 General-purpose RS232C port connector

A port for connecting general-purpose RS232 equipment. (Two channels are available.)

15 Field network board slot

A slot that accepts a fieldbus interface module.

16 Expansion I/O board slots (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 the specified power is not supplied, the actuator brake cannot be released. Always supply 24 VDC for an axis with brake. Use a shield cable as the brake power-supply cable and connect the shield on the 24-V 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

An alternate switch with lock 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.

Option

Regenerative Resistor Unit

Model **REU-1**

Description

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.)

Specifications

Item	Specification
Dimensions	W34mm×H195mm×D126mm
Weight	0.9kg
Built-in regenerative resistor	220Ω 80W
Accessory	Controller cable (model CB-ST-REU010) 1m

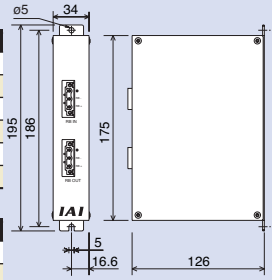
Installation Standard Determined by the total motor capacity of vertical axes connected.

Horizontal application

Motor wattage	P/Q type	J type	K type
~200W	Not required	Not required	Not required
~800W	1 unit	Not required	Not required
~1000W	1 unit	–	Not required
~1500W	2 unit	–	Not required
~2000W	3 unit	–	–
~2400W	4 unit	–	–

Vertical application

Motor wattage	P/Q type	J type	K type
~100W	Not required	Not required	Not required
~200W	1 unit	Not required	Not required
~400W	1 unit	1 unit	Not required
~600W	1 unit	1 unit	1 unit
~800W	1 unit	2 unit	1 unit
~1200W	2 unit	–	2 unit
~1600W	3 unit	–	To be discussed separately
~2000W	4 unit	–	–
~2400W	5 unit	–	–



Absolute-Data Retention Battery (XSEL-J/K/KE/KT/KET)

Model **IA-XAB-BT**

Features A battery that retains the data stored in an absolute-type controller. Replace the battery promptly once the controller generated a battery alarm.

Packaging Sold individually. (One battery is needed for each axis. Specify a quantity corresponding to the number of axes used.)

Absolute-Data Backup Battery

Model **AB-5**

Features A battery that backs up absolute data when an absolute-type actuator is operated.

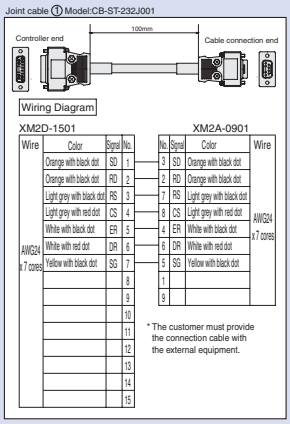
Expansion PIO Board

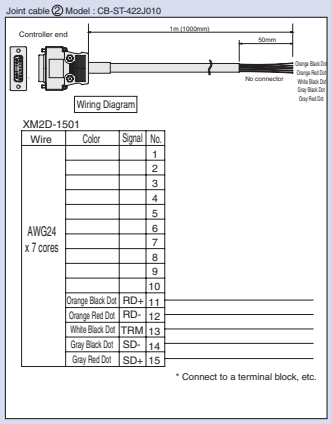
Description An optional board for adding I/O (input/output) points.
With the general-purpose and large-capacity types, up to three expansion PIO boards can be installed in the expansion slots.
(With the compact types, only one expansion PIO board can be installed in the expansion slot provided that the controller is of 3 or 4-axis specification.)

Expansion SIO Board (General-Purpose Type Only)

Model/ Specification
IA-105-X-MW-A (Board + 2 joint cables)
IA-105-X-MW-B (Board + 1 joint cables)
IA-105-X-MW-C (Board + 1 joint cables)

Description A board for serial communication with external equipment. This board has two port channels and implements three communication modes using the supplied joint cable(s).





DeviceNet Connection Board

A board for connecting the XSEL controller to DeviceNet.

Item	Specification			
Number of input/output points	1 board, 256 input points / 256 output points * Only 1 board can be installed.			
Communication standard	Interface module certified under DeviceNet 2.0 (certification to be obtained)			
	Group 2 only server			
	Insulated node operating on network power supply			
Communication specifications	Master slave connection	Bit strobe		
		Polling		
		Cyclic		
Baud rate	500k/250k/125kbps (switched using DIP switches)			
Communication cable length	Baud rate	Maximum network length	Maximum branch length	Total branch length
	500kbps	100m	6m	39m
	250kbps	250m		78m
	125kbps	500m		156m
	Note) When a large-size DeviceNet cable is used.			
Communication power supply	24VDC (supplied from DeviceNet)			
Communication power consumption	60mA min.			
Number of occupied nodes	1 node			
Connector	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.

CC-LINK Connection Board

A board for connecting the XSEL controller to CC-Link.

Item		Specification					
Number of input/output points	Remote device	1 board, 256 input points / 256 output points * Only 1 board can be installed.					
	Remote I/Os	1 board, 16 input points / 16 output points * Up to 3 boards can be installed (in expansion slots).					
Communication standard		CC-Link Version 1.10 (already certified)					
Baud rate		(switched using a rotary switch)					
Communication method		Broadcast polling method					
Synchronization method		Frame synchronization method					
Encoding method		NRZI					
Transmission path type		Bus type (conforming to EIA RS485)					
Transmission format		Conforming to HDLC					
Error control method		CRC($X^{16}+X^{12}+X^5+X1$)					
Number of occupied stations		1 to 3 stations (remote device stations)					
Communication cable length	Baud rate (bps)	10M	5M	2.5M	625k	156k	
	Cable length (m)	100	160	400	900	1200	
Connector (controller end)		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.

Option

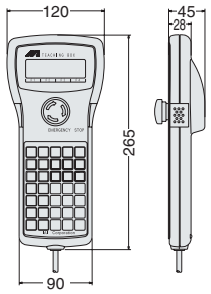
Teaching pendant

Features A teaching device providing program/position input function, test operation function, monitoring function, and more.

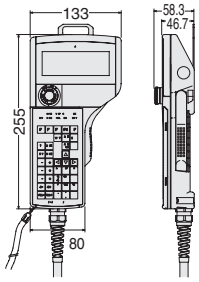
Model

Model	Description
IA-T-X	Standard type
IA-T-XD	Deadman switch type
IA-T-XA	ANSI type

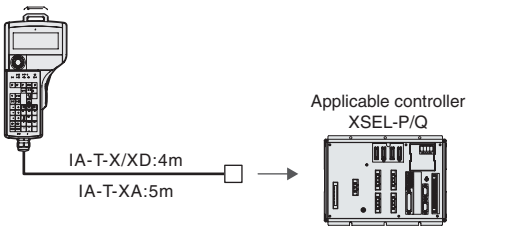
IA-T-X/XD



IA-T-XA



Configuration



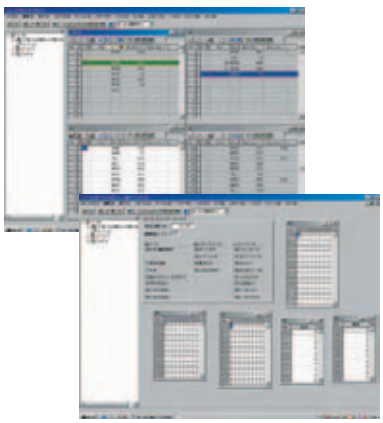
Conversion cable : CB-SEL-SJ002

Specifications

Item	IA-T-X/XD	IA-T-XA
Ambient operating temperature, humidity	Temperature 0~40°C, Humidity 85% RH or below	
Operating ambience	Free from corrosive gases. In particular, there shall be no significant powder dust.	Protective structure conforming to IP54
Weight	Approx. 650g	Approx. 600g (excluding cable)
Cable length	4m	5m
Display	LCD with 20 characters x 4 lines	LCD with 32 characters x 8 lines

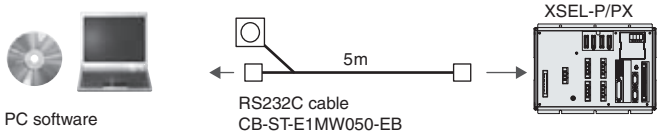
PC Software (Windows Only)

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.



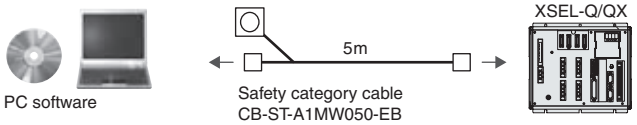
Model IA-101-X-MW(with RS232C Cable)

Configuration



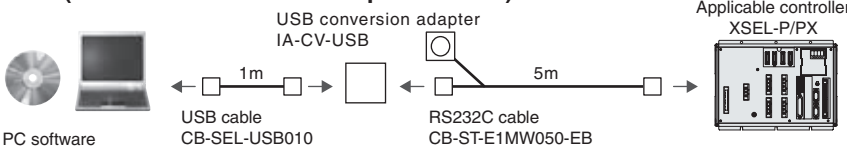
Model IA-101-XA-MW(with Safety Category 4 Cable)

Configuration



Model IA-101-X-USBMW(with USB Conversion Adapter + Cable)

Configuration



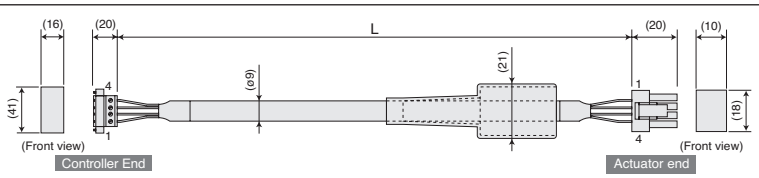
Spare Parts

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). Lengths up to 20 m can be specified.
Example) 080 = 8 m



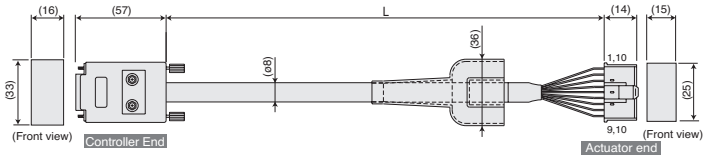
Wire	Signal	No.		No.	Signal	Wire
0.75sq	PE	1		1	U	0.75sq (crimped)
	U	2		2	V	
	V	3		3	W	
	W	4		4	PE	

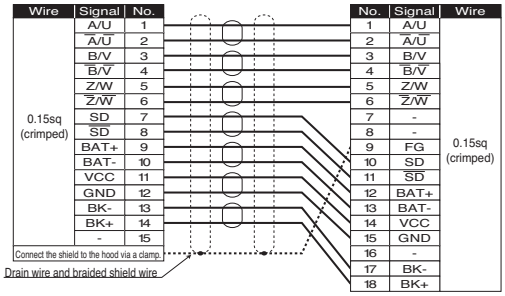
Spare Parts

Encoder Cable/ Encoder Robot Cable (XSEL-J/K Types)

Model CB-RCBC-PA□□□/ CB-RCBC-PA□□□-RB

* □□□ indicates the cable length (L). Lengths up to 15 m can be specified.
Example) 080 = 8 m

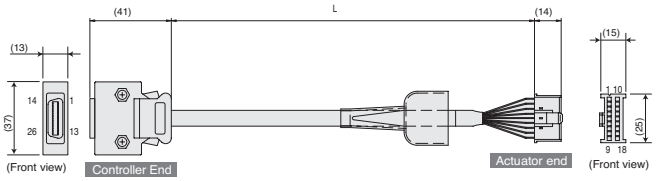


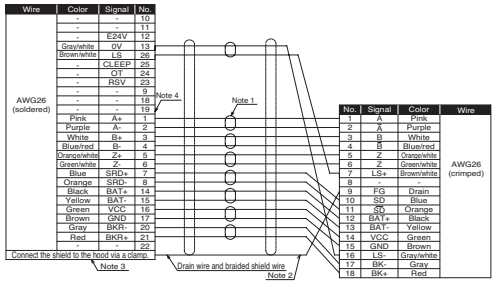


Encoder Cable/ Encoder Robot Cable (XSEL-P/Q Types)

Model CB-RCS2-PA□□□/ CB-X2-PA

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

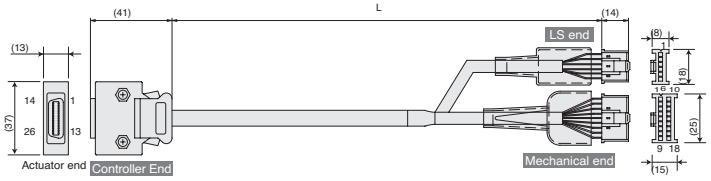


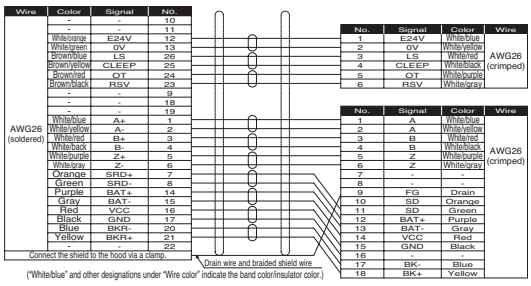


Encoder Cable/ Encoder Robot Cable

Model CB-RCS2-PLA□□□/ CB-X2-PLA

* □□□ indicates the cable length (L). Lengths up to 30 m can be specified.
Example) 080 = 8 m

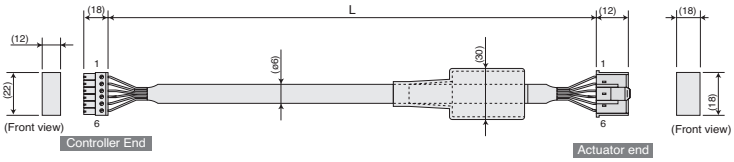




Limit Switch Cable (XSEL-J/K Types)

Model CB-X-LC□□□

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



Wire	Color	Signal	No.
AWG24	Blue	24VOUT	6
	Pink	N	5
	Green	LS	4
	Orange	CREEP	3
	Gray	OT	2
	1B/Blue	RSV	1

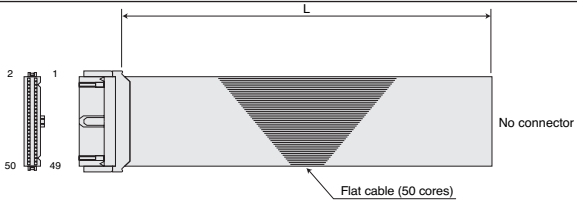
No.	Signal	Color	Wire
1	24VOUT	Blue	AWG24 (crimped)
2	N	Pink	
3	LS	Green	
4	CREEP	Orange	
5	OT	Gray	
6	RSV	1B/Blue	

Note)"1B" indicates one black dot.

I/O Flat Cable (XSEL-J/K/P/Q Types)

Model CB-X-PIO□□□

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



No.	Color	Wire	No.	Color	Wire	No.	Color	Wire
1	Brown1	Flat cable pressure-welded	18	Gray2	Flat cable pressure-welded	35	Green4	Flat cable pressure-welded
2	Red1		19	White2		36	Blue4	
3	Orange1		20	Black2		37	Purple4	
4	Yellow1		21	Brown-3		38	Gray4	
5	Green1		22	Red3		39	White4	
6	Blue1		23	Orange3		40	Black4	
7	Purple1		24	Yellow3		41	Brown-5	
8	Gray1		25	Green3		42	Red5	
9	White1		26	Blue3		43	Orange5	
10	Black1		27	Purple3		44	Yellow5	
11	Brown-2		28	Gray3		45	Green5	
12	Red2		29	White3		46	Blue5	
13	Orange2		30	Black3		47	Purple5	
14	Yellow2		31	Brown-4		48	Gray5	
15	Green2		32	Red4		49	White5	
16	Blue2		33	Orange4		50	Black5	
17	Purple2		34	Yellow4				