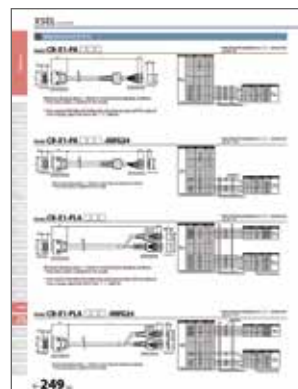
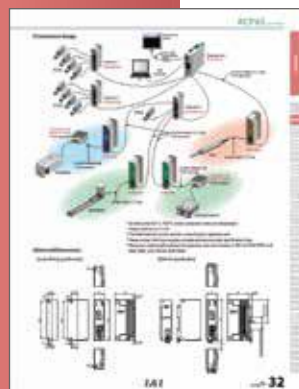
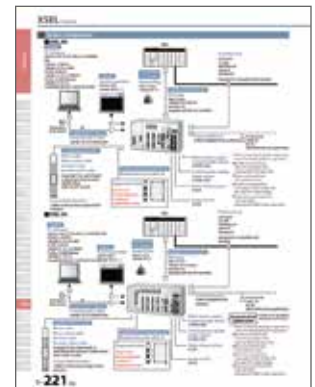


CONTROLLER

2019



controller

Controller

EC
RCP6S
RCON

MCON
PCON

ACON/DCON

SCON

MSCON

PSEL
ASEL
SSEL
MSEL
XSEL

PSA-24
TB-02
TB-03

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03



RCON



MCON-C/LC



PCON



ACON



DCON



SCON-CB/LC



SCON-CAL



MSCON



PSEL



ASEL



SSEL



MSEL



XSEL



PSA-24



TB-02



TB-03

	Controller overview	7-7
	Positioner Type	7-9
	Program type	7-11
	Built-in PLC Type	7-13
	Network	7-15
	Safety Category Compliant Types	7-19
EC	EC	7-21
RCP6S	RCP6S/RCM-P6□C	7-27
RCON	RCON-GW/GWG RCON-PC/PCF/AC/DC	7-41
MCON	MCON-C/CG/LC/LCG	7-71
PCON	PCON-CB/CGB/CFB/CGFB/CYB/PLB/POB	7-93
ACON/DCON	ACON-CB/CGB/CYB/PLB/POB DCON-CB/CGB/CYB/PLB/POB	7-119
SCON	SCON-CB/CGB/LC/CAL/CGAL	7-143
MSCON	MSCON-C	7-197
PSEL	PSEL-CS	7-209
ASEL	ASEL-CS	7-219
SSEL	SSEL-CS	7-229
MSEL	MSEL-PC/PG/PCX/PGX/PCF/PGF	7-243
XSEL	XSEL-RA/SA/P/PCT/Q/QCT	7-257
XSEL (For SCARA)	XSEL-RAX/RAXD/SAX/SAXD/PX/QX	7-275
PSA-24	PSA-24/24L	7-297
TB-02	TB-02	7-301
TB-03	TB-03	7-305

MEMO

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Controller Overview

The controller model can be selected from an ultra-simple type, which is operable with the same controller as a solenoid valve, to a high functionality type that enables program control. A variety of models are available according to the customer's usage.

Controller types can be categorized according to the 3 groups below based on their operations.

Controller	
EC	
RCP6S	
RCON	
MCON -C/LC	
PCON -CB/CFB	
PCON	
ACON-CB DCON-CB	
ACON DCON	
SCON -CB	
SCON-CB (Servo press)	
SCON -LC	
SCON -CAL	
MSCON	
PSEL	
ASEL	
SSEL	
MSEL	
XSEL	
XSEL (SCARA)	
PSA-24	
TB-02	
TB-03	

Positioner Type

- Operable with a registered stop position as a positional data, and specifying of the position number using an external I/O signal.
- Pulse train input type is available as well which is operable freely based on the customer's control.

Program Type

- Standalone operation available without master devices such as a PLC.
- Interpolated motion for 2 - 8 axes is possible; available for coating and palletizing.

Built-in PLC function Type

- Equipped with a PLC function, and operable standalone without master devices.
- Use of this controller type in each process can reduce overloading to the main PLC thanks to its decentralized control.

Single-axis controller



Position controller
24VDC/AC100V/AC200V type

PCON / ACON / DCON / SCON

Multi-axis controller



Position controller
24VDC type

MCON



Position controller
24VDC type

RCON



Position controller
AC100V/AC200V type

MSCON

See P7-9

Multi-axis controller



Program controller
24VDC type

PSEL / ASEL



Program controller
AC100V/AC200V type

MSEL / SSEL / XSEL

See P7-11

Single-axis controller



Position controller with
PLC function

SCON-LC

Multi-axis controller



Position controller with
PLC function

MCON-LC

See P7-13

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

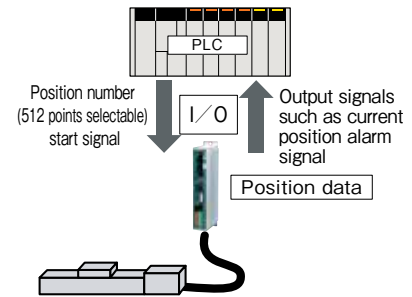
TB-03

Positioner Type

The positioner type stores positions to which the actuator is moved by specifying a target position number. Integration with existing devices is easy because existing air cylinder control signals can be used.

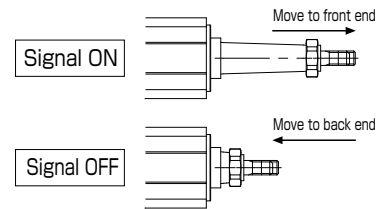
1 No programming needed

The positioner type controller operates by selecting the target position number externally using I/O after teaching the position data. Therefore, no operation programming is needed, allowing for immediate operation directly after mounting the equipment.



2 Operation using the same signal as solenoid valve possible (PCON/ACON/DCON/SCON controllers)

Same as single solenoid valve, traveling between front/back ends is possible only by the single ON/OFF.



3 Reasonable price

A reasonable price range is offered for the pulse motor type controllers which maintain the effective functionality of a servo motor.



4 Wide range of variations with full of functions

A wide range of variations offers the optimum type that best suits the usage, from a 2-point positioning band type that operates using the same signal as air cylinder's, to a 512-point positioning band type and a space-saving type that can connect up to 8 axes in one controller.

In addition, the actuator can provides its best performance thanks to the smart tuning and maintenance functions.

PCON/ACON/DCON/SCON/RCON/MCON/MSCON Controllers

- Positioning is possible for up to 512 points (Except for RCON, MCON and MSCON).
- Compatible with pulse train input control (Except for RCON, MCON and MSCON).
- PCON-CB, RCON and MCON provide 1.5 times of max. speed and 2 times of payload compared to conventional models when combined with RCP6, RCP5 and RCP4.
- ACON, SCON and MSCON provide max. 2G of acceleration/deceleration thanks to the off-board tuning function.
- MCON can accommodate max. 8 axes of actuators inside the compact cabinet.
- RCON is a unit connection system and can operate up to 16 axes of actuators.
- Setting of an absolute specification by PCON, ACON, SCON, MCON, RCON or MSCON, thereby requiring no home return.
 Battery-less absolute type, absolute type using a battery and incremental type actuators can be used in a same way as an absolute type.
 Simple absolute type is available (battery needed).
- The absolute type varies depending on the controller type. Please refer to the relevant controller page.



- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Program Type

The program type controller executes programs that are loaded to it.

The programs loaded to the controller are used to perform various tasks such as operating the actuator and communicating with external equipment. Ideal for small systems whether a PLC is not required which leads to cost savings.

1 High-level control available using simple language

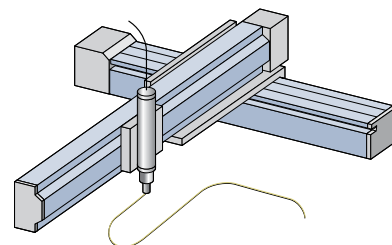
A program is generated for the program type controller using the simple and easy Super SEL Language to execute operation of the actuator and communication between peripheral equipment. Expert knowledge is not needed to use the Super SEL Language, so it's easy to create programs even for beginners.

No.	B	E	N	Cnd	Cand	Operand 1	Operand 2
1					HOME	100	
2					HOME	11	
3					VEL	200	
4					WTON	1	
5					MOVL	1	
6					BTON	301	
7					WTON	2	
8					BTOF	301	
9					MOVL	2	
10					BTON	302	
...							

2 Interpolation possible up to 8 axes

Simultaneous movement of the actuators is possible for up to 2 axes for the PSEL/ASEL/SSEL controllers, up to 4 axes for the MSEL controller, and up to 8 axes for the XSEL controller.

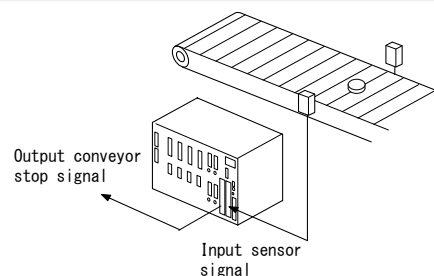
Depending on the program, interpolation is available to easily perform dispensing.



3 Controlling external equipment is possible

Multi-purpose I/O signals are available for the controller which makes communication with peripheral equipment possible.

Therefore, receiving signals from sensors and such through the controller or outputting signals from the controller to lamps or moving equipment, etc. to operate them is possible.



4 No homing needed for absolute type

Homing is not needed for the following combinations of the actuator and controller.

ASEL/SSEL/XSEL

* Battery-less absolute type actuator + controller (battery-less abso).

* Absolute type actuator + controller (Abso spec)

PSEL

* Incremental type actuator + Simple abso unit + controller (simple abso spec)

MSEL

* Incremental type actuator + battery box + controller (simple abso spec)

* Battery-less absolute type actuator + controller (battery-less abso spec)

PSEL/ASEL/SSEL Controller

- Program controller with reasonable price and compact body.
- Interpolation of up to 2 axes is possible which is applicable for dispensing jobs.
- By selecting the positioner mode, it can be used in the same manner as the position controller.
- Communication via PC USB port and direct USB cable is possible with integrated USB port.
- Can store up to 1500 points for PSEL/ASEL and 2000 points for SSEL.
- Absolute type available for ASEL/SSEL controllers can be set up as a battery-less type which requires no battery, or as an absolute type that uses a battery. The PSEL controller can be used as an absolute type when a simple absolute unit is connected.
- Controller power supply is 24VDC for PSEL/ASEL, and single-phase AC100V/200V for SSEL.



See P7-209



See P7-219



See P7-229

MSEL Controller

- Actuator with built-in pulse motor can control up to 4 axes.
- Actuator with built-in battery-less absolute is compatible with RCP6, RCP5, RCP4 and IXP series.
- Positioning points is up to 30,000 points.
- I/O (input/output) signals can be expanded up to 32 points.



See P7-243

XSEL Controller

- High-function controller with up to 8 axes that can be simultaneously controlled.
- Precise dispensing jobs are possible through high velocity uniformity and tracking accuracy.
- Absolute type available for selection.
- 55,000 points can be stored for positioning.
- Expansion I/O is available up to a maximum of 384 points.
- It is equipped with a dedicated function to operate ROBO cylinders using an XSEL controller program via MECHATROLINK connected to a maximum of 32 axes with PCON/ACON/DCON/SCON and MCON (*).
(*) Available for position controllers with MECHATROLINK-III only.



See P7-257

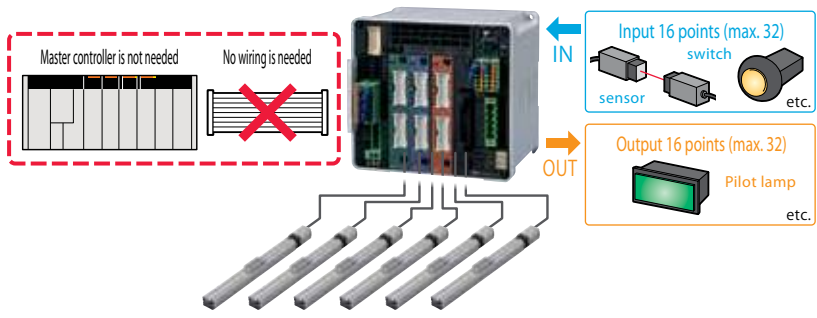
Built-in PLC Type

Applicable models: MCON-LC / SCON-LC

The built-in I/O control function enables:

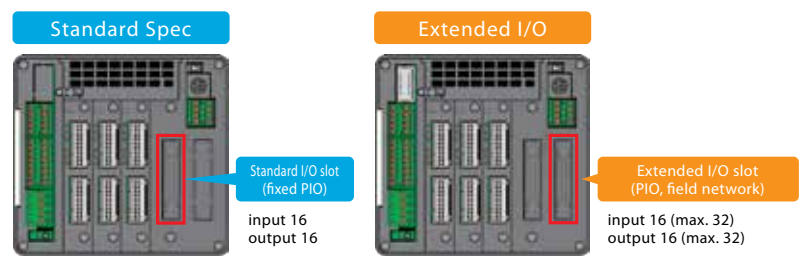
1 Operation without master controller

In the past when operating the ROBO cylinder using a PLC, it used many I/O points. A PLC with many I/O points was needed, but it is no longer necessary.



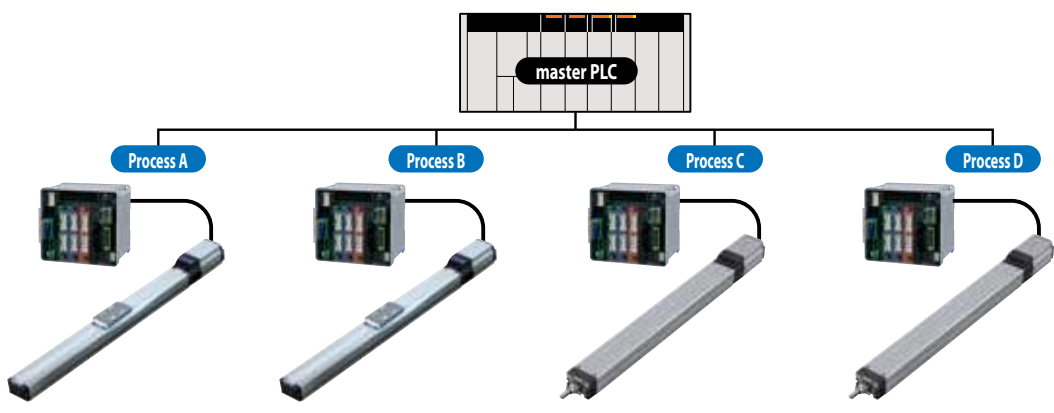
2 The standard controller controls 16 points for input and another 16 for output.

With an extended slots, a total of 32 points for input and 32 for output are available.



3 No master controller is needed, allowing space-saving.

4 A high functionality PLC is not needed when a decentralized control is made using PLC built-in controllers in each process. Workload to the main PLC can be reduced. A big scale modification on the main PLC ladder is not necessary even when units are added.



A ladder program is necessary to use MCON-LC/SCON-LC.

A dedicated software "LC-LADDER" is used to create and edit a ladder program.

- Controller
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Features of the ladder software

LC-LADDER

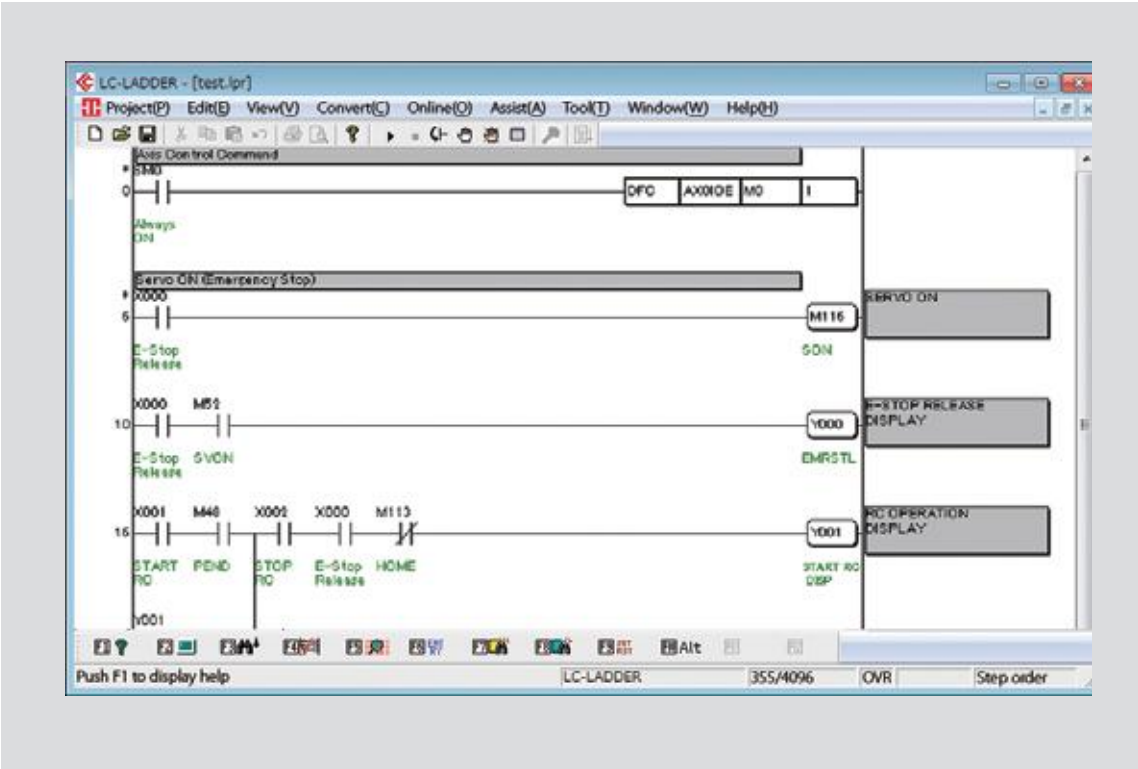
The LC-LADDER is a ladder support software that allows for easy programming, monitoring and debugging. It can be used for switching I/O signals ON/OFF, operation of actuators connected to the controller, monitoring, simulations and debugging.

1 Programming

Programming is possible using 27 basic instructions (contact instructions, output instructions, etc.) and 53 application instructions (data comparison, arithmetic operations, logic operations, etc.).

3 Debugging function

Programs can be validated by executing them with specified conditions.



2 Monitoring

When the program is executed, the conditions of each signals can be monitored.

4 Simulation

A test run can be performed on a PC without executing the program on the controller.

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Network Compatibility

Compatible with the majority of main field networks widely used over the world.
It is also highly compatible with FA devices such as PLCs and touch panels.

1 Compatible with main field networks

Direct connection is possible with main field networks such as DeviceNet or CC-Link, etc.

A position controller is available for an operation defined by movement specified with position number and direct coordinate value using the network.

(When defining coordinate values directly, there is no restriction for the number of positioning points.)



Compatible network and functions

As of December 2018

Controller series	Ellipsis	position controller									program controller							PLC built-in			
		PCON -CB	ACON -CB	SCON -CB	SCON -CAL	SCON-CB (servo press specification)	DCON -CB	MCON -C	MSCON	RCON	PSEL	ASEL	SSEL	TTA	MSEL	XSEL -P/Q	XSEL -RA/SA	MCON -LC	SCON -LC		
Field network type	DeviceNet	DV	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	CompoNet	CN	●	●	●	●	●	●	●	●	—	—	—	—	—	—	—	●	●		
	EtherCAT	EC	●	●	●	●	●	●	●	●	—	—	—	●	●	—	●	●	●		
	EtherCAT Motion	ECM	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—		
	EtherNet/IP	EP	●	●	●	●	●	●	●	●	●	●	●	●	●	(*3)	(*3)	(*3)	(*4)	●	●
	CC-Link	CC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CC-Link IE Field CIE	CIE	●	●	●	—	●	●	●	—	●	—	—	—	—	—	—	—	—	—	—
	SSCNET III/H	SSN	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—
	MECHATRO LINK I/II (*1)	ML	●	●	●	●	●	●	—	—	—	—	—	—	—	—	—	—	—	—	—
	MECHATRO LINK III (*1)	ML3	●	●	●	—	—	●	●	—	—	—	—	—	—	—	—	—	—	—	—
	PROFIBUS-DP	PR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PROFINET IO	PRT	●	●	●	●	●	●	●	—	●	—	—	—	—	—	—	—	—	—	—
IA net	IA	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	—	—	—	—	
Number of positioning points (*2)		768					256			128	1500		20000	30000		20000	55000	256	768		
Operating method	Position No. Movement by specifying positions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Direct number Movement by specifying direct values	●	●	●	●	—	●	●	●	●	—	—	—	—	—	—	—	—	—	—	
Reference page for controllers		P7-95	P7-121	P7-145	P7-185	P7-161	P7-121	P7-73	P7-199	P7-41	P7-211	P7-221	P7-231	P4-541	P7-211	P7- 5	P7-259	P7-73	P7-145		

(*1) MECHATROLINK I/II is treated as an intelligent I/O, and supports only non-synchronous communication. MECHATROLINK III is compatible with the standard ServoProfile.

(*2) When it is operated by movement by specifying direct values, the number of positioning points is unlimited.

(*3) Able to cope with EtherNet (TCP/IP: message communication) when switching the parameters for EtherNet/IP.

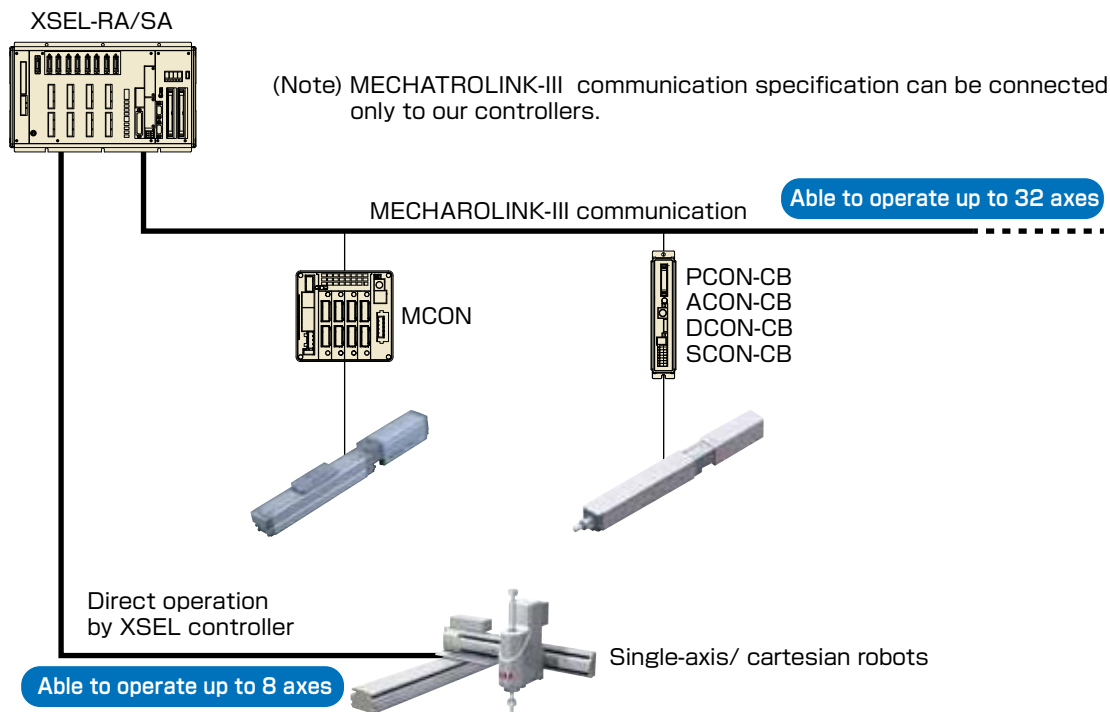
(*4) It corresponds to Ethernet (TCP/IP: message communication) only for standard Ethernet.

2 XSEL-RA/SA Controller can operate up to 40 axes of the ROBO cylinders.

The expanded motion control function of the XSEL-RA/SA controller can use a program of the XSEL controller to operate up to 32 axes of the ROBO cylinders via MECHATROLINK-III.

By adding 8 axes of the XSEL controller, up to 40 axes can easily be controlled by just one controller.

In addition, compared to a ROBO cylinder operation by PIO control, wiring work can significantly be reduced.



Specifications

	MECHATROLINK-III communication method
Compatible controller	XSEL-RA/SA type
Connectable controller	PCON/ACON/DCON SCON/MCON *All for MECAHTROLINK-III specification
Max. connectable ROBO cylinder axes	32
Communication speed	100Mbps
Communication cable length	Total cable length 100 meters or less

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Network

3 Vision system

The XSEL controller can directly be connected to major vision systems to easily take in coordinate values and operate.

(1) Able to directly connect with major vision systems

It is possible to easily use sophisticated vision systems of specialized suppliers such as Omron, Cognex and Keyence.

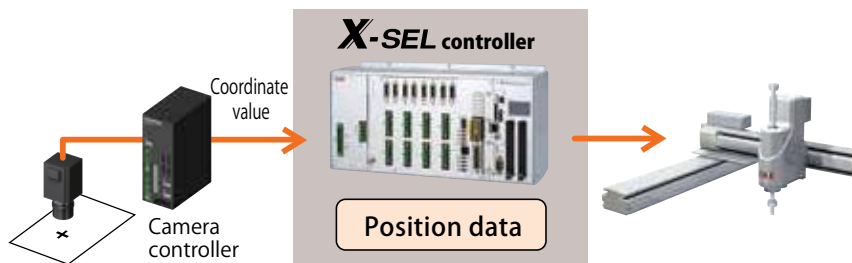


Manufacturer	Applicable model	Communication method
OMRON	FH series	RS232C
COGNEX	In-Sight5000 series In-Sight EZ series	Ethernet
Keyence	CV-5000 series XG-7000 series XG-8000 series	RS232C Ethernet

* Please contact us for connection with vision systems other than listed above.

(2) No communication programs needed

Coordinate values from the camera are stored as position data in the robot controller by dedicated instruction. Communication programs are not necessary.

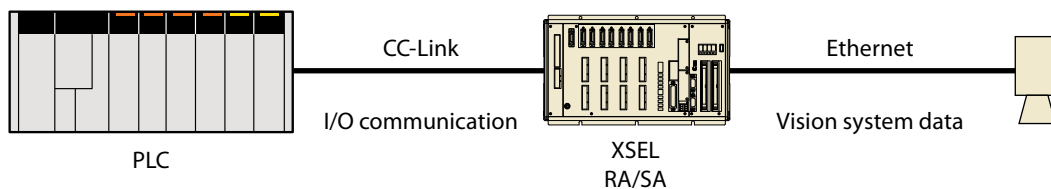


(3) While communicating with a vision system via Ethernet, communication with another network is possible.

The XSEL-RA/SA type can communicate via DeviceNet, CC-Link or PROFIBUS-DP, while communicating via either EtherNet/IP or EtherCAT.

It can be used for communication with a vision system via Ethernet, and with peripheral devices via CC-Link using I/Os.

* XSEL-P/Q type can select one of the networks shown above.



Tips on selection of a network

Please confirm the following notes when selecting network specifications.

<MECHATROLINK>

- MECHATROLINK I/II is treated as an intelligent I/O, and supports only non-synchronous communication commands.
- MECHATROLINK III is compatible with the standard servo profile.
- When controlling rotary actuators using MECHATROLINK III, indexing operations are not possible.
Please make sure to read the "Caution on rotary selection" on P1-489.

<SSCNET III/H>

- A homing operation is always necessary after switching the power supply on.
- When controlling rotary actuators, indexing operations are not possible.
Please make sure to read the "Caution on rotary selection" on P1-489.

EC

RCP6S

RCON

MCON
-C/LCPCON
-CB/CFB

PCON

ACON-CB
DCON-CBACON
DCONSCON
-CBSCON-CB
(Servo press)SCON
-LCSCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Safety Category Compliant Types

<Compliance of controllers with the Safety category>

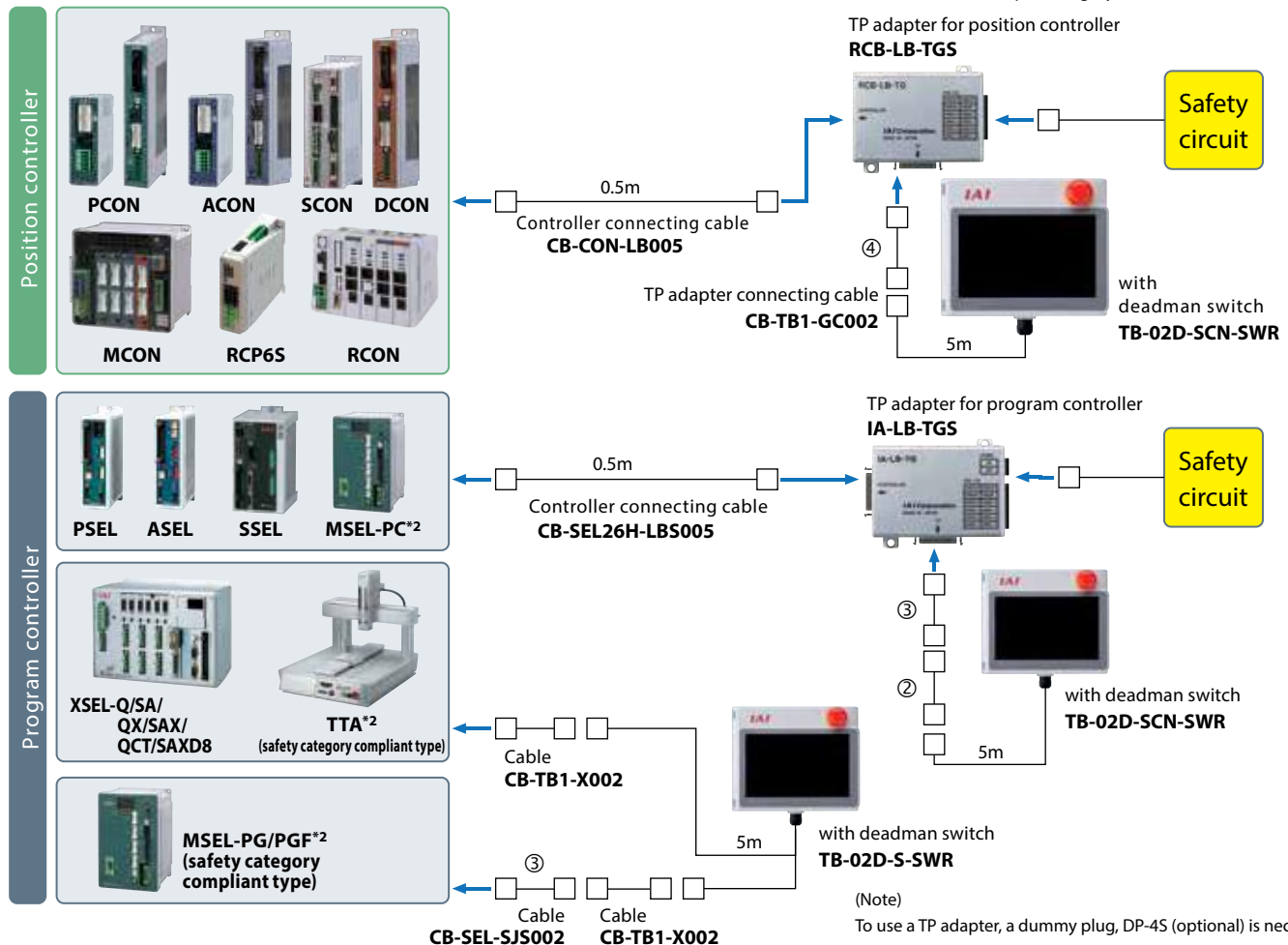
When building a system in compliance with the safety category (ISO 13849-1), use a touch panel teaching pendant (TB-02D) and a TP adapter (RCB-LB-TGS, IA-LB-TGS).

By changing the wiring of the system I/O connector, the safety category of up to B~4 (partially B~3) can be achieved.

Controller type	Safety category	ISO standard
RCP6S	B~4	ISO13849-1
RCON-GWG	B~4	
MCON-C/CG/LC/LCG	B~4	
PCON-CB/CGB/CFB/CGFB	B~4	
ACON-CB/CGB	B~4	
DCON-CB/CGB	B~4	
SCON-CB/CGB/CAL/CGAL/LC/LCG	B~4	
PSEL-CS	B~4	
ASEL-CS	B~4	
SSEL-CS	B~4	
MSEL-PC/PG/PGF	B~3	
XSEL-Q/SA/QX/SAX/QCT/SAXD8	B~4	
TTA	B~3	

■ The following chart shows the safety category compliance. Compliant with Safety Category of up to B~4 *1*2.

*1 Compliant with Category 4 when the dummy plug is attached.
 *2 MSEL and TTA are up to category 3.

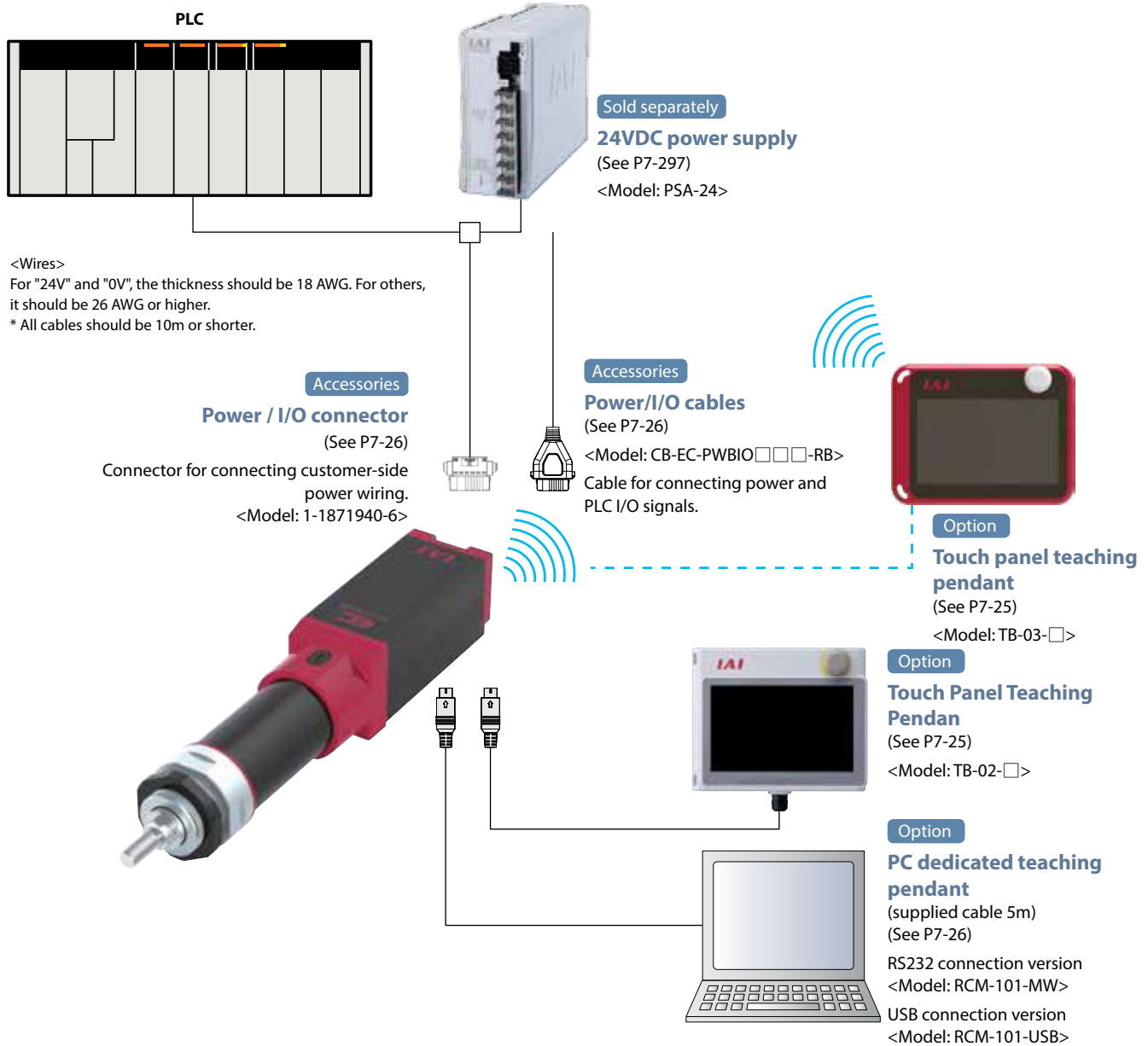


EC with Built-in Controller

Elecyliner (built-in controller type) Controller



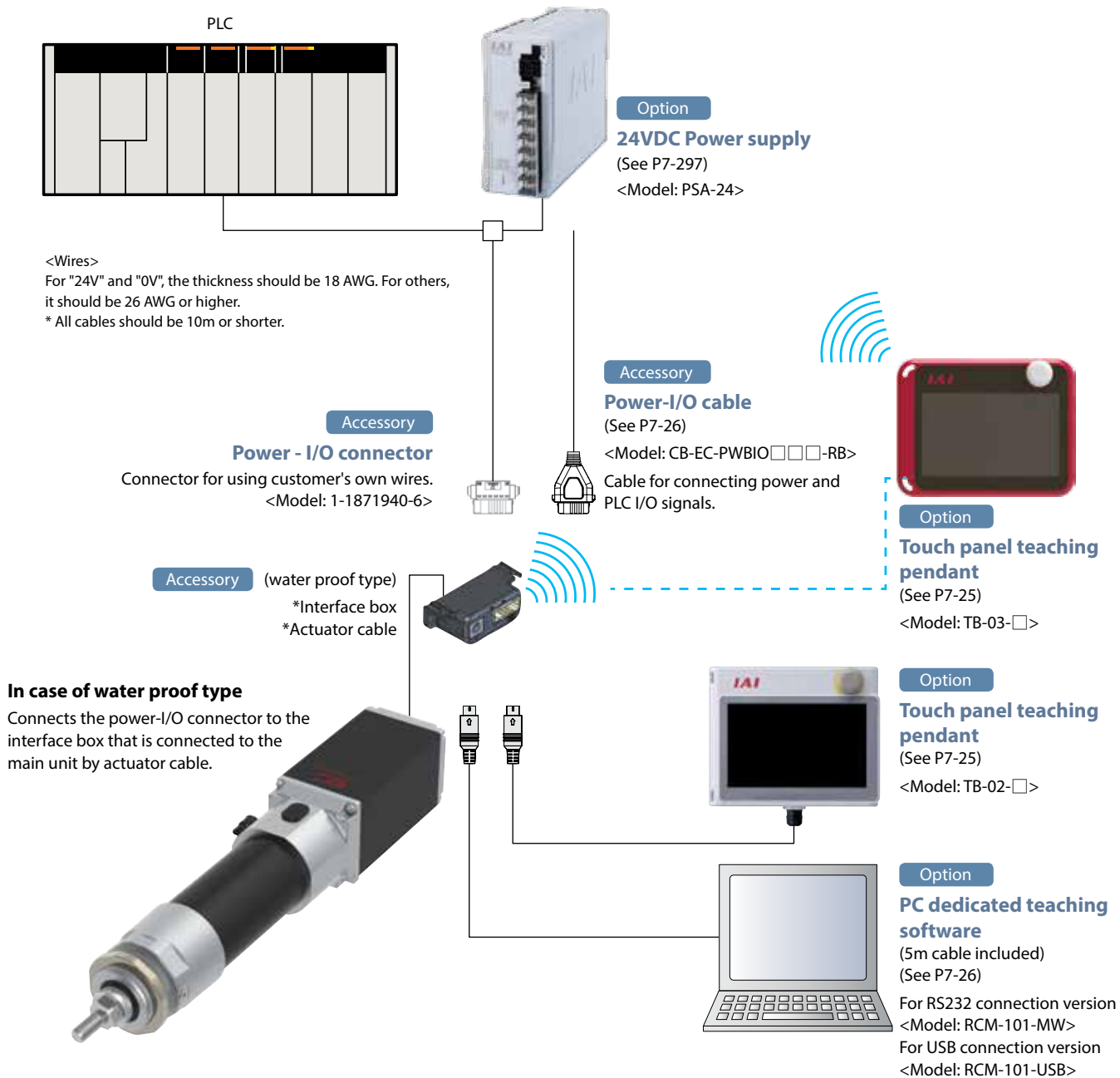
System configuration



List of accessories

Product category	Accessories
Without EC Power / I/O cable (When the cable length of "0" is selected at the actuator model.)	Power / I/O connector (1-1871940-6)
With EC power / I/O cable (When the cable length of "1" to "10" is selected at the actuator model.)	Power / I/O cable (CB-EC-PWBIO□□□-RB)

System Configuration



List of Accessories

Product classification	Accessories
Without EC power-I/O cable (When the cable length of "0" is selected at the actuator model.)	Power-I/O connector (1-1871940-6)
Without EC power-I/O cable (When the cable length of "1" to "10" is selected at the actuator model.)	Power- I/O cable (CB-EC-PWBIO□□□-RB)
	Interface box (water proof type)
	Actuator cable (water proof type)

Controller

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

Controller basic specifications

Specification item		Specification content	
Number of controlled axes		1 axis	
Power supply voltage		24VDC ±10%	
Power capacity	Standard Water proof High rigidity	With energy-saving setting disabled: Rated 3.5A, max. 4.2A With energy-saving setting enabled: Rated 2.2A (For S3/RR3, only with energy-saving setting enabled: Max. 2.2A.)	
	Mini type	Max. 2.0A (only energy-saving setting enabled)	
Brake release power supply		24VDC ±10%, 200mA (only for external brake release)	
Generated heat		8W (at 100% duty)	
Inrush current	Standard Water proof type High rigidity	8.3A (with rush current limiting circuit)	
	Mini type	10A	
Momentary power failure resistance		max 500µs	
Motor size		<input type="checkbox"/> 28, <input type="checkbox"/> 35, <input type="checkbox"/> 42, <input type="checkbox"/> 56	
Motor rated current		1.2A	
Motor control system		Weak field-magnet vector control	
Supported encoders		Incremental (800pulse/rev), battery-less absolute encoder (800pulse/rev)	
SIO		RS485 1ch (Modbus protocol compliant)	
PIO	Input specification	Number of input	3 points (forward, backward, alarm clear)
		Input voltage	24VDC ±10%
		Input current	5mA per circuit
		Leakage current	Max 1mA/1 point
		Isolation method	Non-isolated
	Output specification	No. of output	3 points (forward complete, backward complete, alarm)
		Output voltage	24VDC ±10%
		Output current	50mA/point
		Residual voltage	2V or less
		Isolation method	Non-isolated
Data setting and input methods		PC dedicated teaching software, Touch panel teaching pendant	
Data retention memory		Position and parameters are saved in non-volatile memory. (No limit to rewrite)	
LED display	Controller status display	Servo ON (green light ON) / Alarm (red light ON) / Initializing when power comes ON (orange light ON) / Minor failure alarm (green/red alternately blinking) / Operation from teaching: Stop from teaching (red light ON) / Servo OFF (light OFF)	
	Wireless status display	Initializing wireless hardware, without wireless connection, or connecting from TP board (light OFF) / Connecting through wireless (green blinking) / Wireless hardware error (red blinking) / Initializing when power comes ON (orange light ON)	
Predictive maintenance/ Preventative maintenance		When the number of movements or operation distance has exceeded the set value and when the LED (right side) blinks alternately green and red at overload warning * Only when configured in advance	
Ambient operating temperature		0 to 40°C	
Ambient operating humidity		85% RH or less (no condensation or freezing)	
Operating ambience		Avoid corrosive gas and excessive dust	
Insulation resistance		DC500V 10MΩ	
Electric shock protection mechanism		Class 1 basic insulation	
Cooling method		Natural air cooling	

I/O Specifications (Input/output)

I/O		Input section		Output section	
Specification	Input voltage	24VDC±10%		Load voltage	24VDC±10%
	Input current	5mA/circuit		Max. load current	50mA/point
	ON/OFF Voltage	ON voltage Min. DC18V OFF voltage Max. DC6V		Residual voltage	2V or less
	Leak current	Max. 1mA/point		Leak current	Max. 0.1mA/point
Isolation method		Not isolated from the external circuit		Not isolated from the external circuit	
I/O logic	NPN				
	PNP				

I/O Signal Table

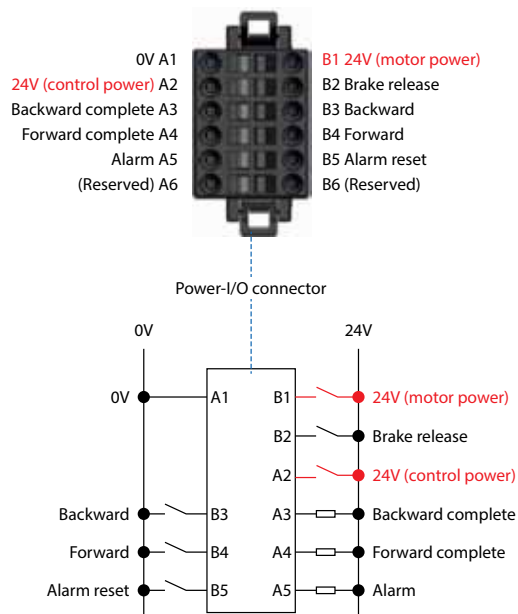
Power / I/O connector pin assignment			
Pin No.	Connector nameplate name	Signal abbreviation	Function overview
B3	Backward	ST0	Backward command
B4	Forward	ST1	Forward command
B5	Alarm reset	RES	Alarm reset
A3	Backward complete	LS0/PE0	Backward complete/push complete
A4	Forward complete	LS1/PE1	Forward complete/push complete
A5	Alarm	*ALM	Alarm detection (b-contact)
B2	Brake release	BKRLS	Forced brake release (when the actuator has a brake)
B1	24V	24V	24V input
A1	0V	0V	0V input

TMD2 Specification Wiring Diagram

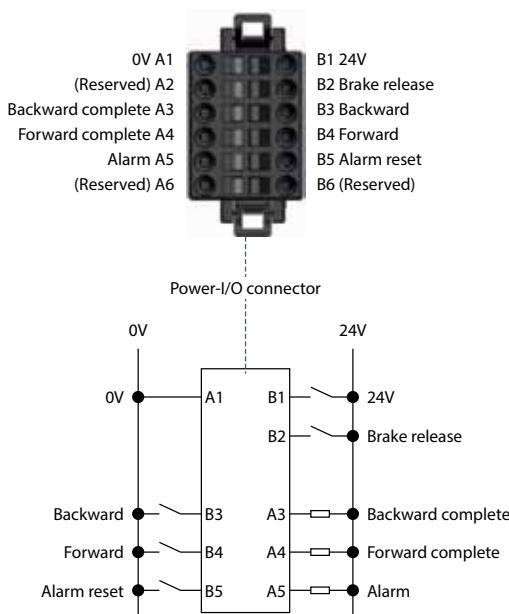
Wiring example for the NPN specification

■ TMD2 specification (option)

In the TMD2 specification, the driving power and control power are separated.



■ Standard specification



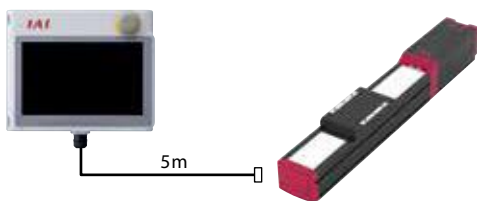
Option

Touch Panel Teaching Pendant

Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

Model **TB-02-** Please contact IAI for the current supported versions.

Configuration Wired connection



■ Specifications

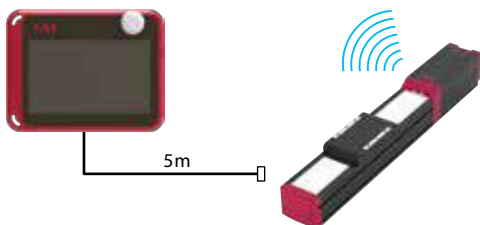
Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

Wireless touch panel teaching pendant Teaching device that supports wireless connection.

Features A data setter that supports wireless connection. Inputs of start/end points and AVD as well as axis operations can be performed wirelessly.

Model **TB-03-** Please contact IAI for the current supported versions.

Configuration Wireless or wired connection



■ Specifications

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Environmental resistance	IPX0
Mass	670g (TB-03 unit only)
Charging method	Wired connection with dedicated adapter / controller
Wireless connection	Bluetooth4.2 class2

PC dedicated teaching software (Windows only)

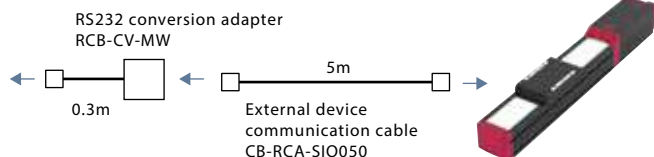
Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to shortened start-up time.

for Windows 7/8/10

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

Please contact IAI for the current supported versions.

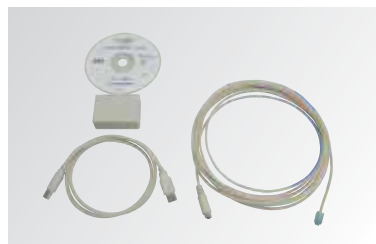
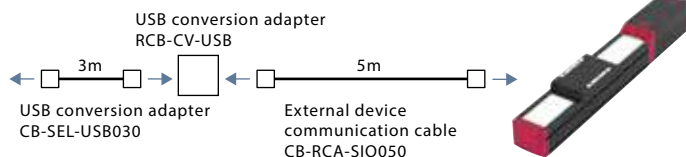
Configuration



Model **RCM-101-USB** (with an external device communication cable + USB conversion unit)

Please contact IAI for the current supported versions.

Configuration



Maintenance Parts

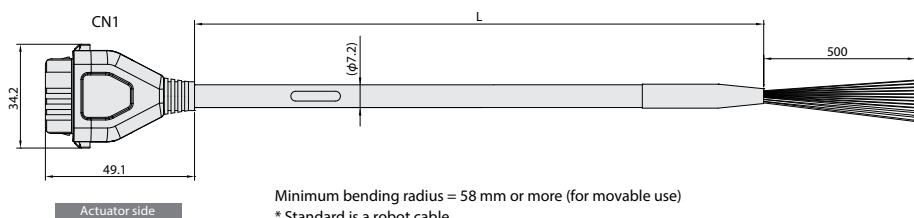
When placing an order for a replacement cable, please refer to the model below.

Table of compatible cables

Product model	Power / I/O cable
EC	CB-EC-PWBIO□□□-RB

Model CB-EC-PWBIO□□□-RB

* Please indicate the cable length (L) in □□□, e.g.) 030 = 3m



Minimum bending radius = 58 mm or more (for movable use)
* Standard is a robot cable.

Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V	B1
Light blue (AWG22)	(Reserved)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	(Reserved)	B6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
White (AWG26)	(Reserved)	A6
Brown (AWG26)	BKRLS	B2

RCP6S with Built-in Controller

Built-in controller for RCS6S



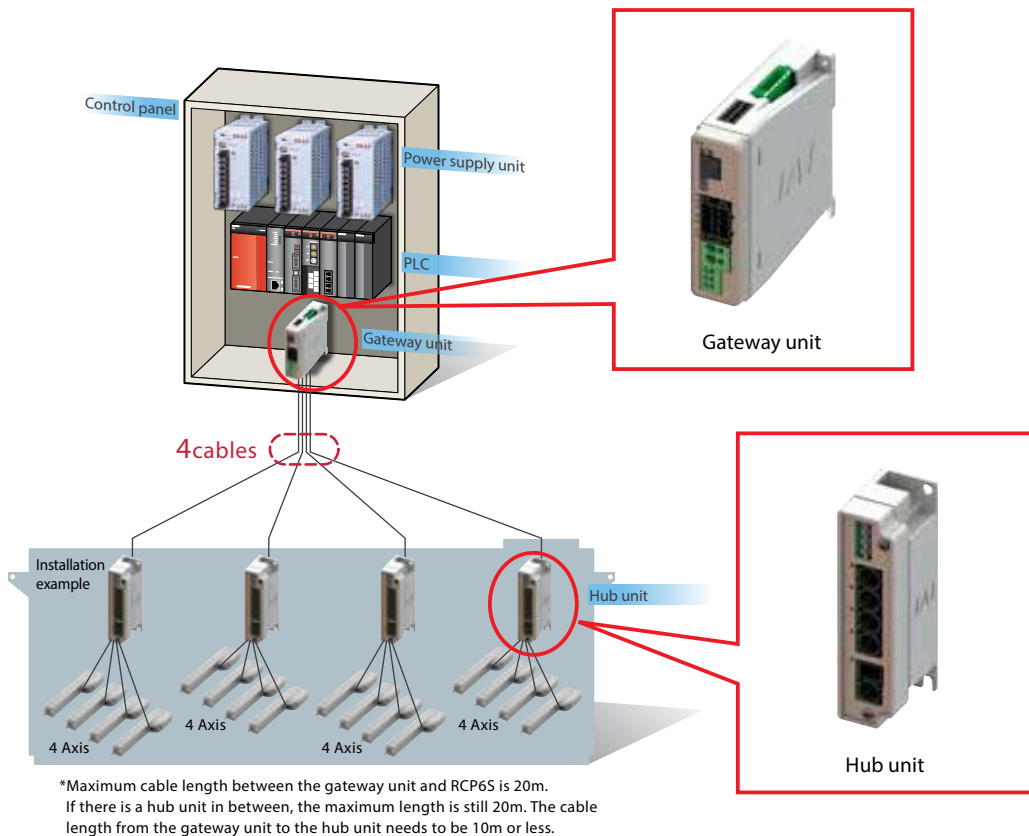
Features

By using the gateway unit, a maximum of 16 axes* of RCP6S (relayed through a hub unit) can be operated via a field network with less wiring.

Hub unit allows us to keep the cable connected to the actuator of each axis short, and motor power supply and control signal lines can be connected as one cable between the hub unit and the RCP6S.

*The number of connectable axes will vary depending on the type of field network and its mode. Please refer to P7-29 for details.

Control Panel for the RCP6S Built-in Controller Actuator



*Maximum cable length between the gateway unit and RCP6S is 20m.
If there is a hub unit in between, the maximum length is still 20m. The cable length from the gateway unit to the hub unit needs to be 10m or less.

RCP 6S peripheral equipment

Gateway unit is required in order to operate RCP6S.

- Gateway unit: This unit is used in order to connect RCP6S to the field network. → See P7-29
- Hub unit: This unit can expand the number of axes connected to the gateway unit. → See P7-33
- PLC connection unit: This unit is used to connect RCP6S directly to the PLC using serial communication. → See P7-34
- Controller for RCP6S Gateway: Controllers for connection of actuators other than RCP6S to an RCP6S gateway within the system. → See P7-35

Basic Controller Specification List

Specification		Specification Description	
Number of controlled axes		1 axis	
Power supply voltage		24VDC±10%	
Load current (including control-side current consumption)	Motor type	28P, 35P, 42P, 56P	Rating 3.5 A · 4.5 A maximum (when high output is enabled) / 2.0 A maximum (when high output is disabled)
		56SP, 60P	Maximum 6.0 A
Electromagnetic brake power (for actuator with brake)		24VDC±10% 0.15A (Note) For releasing brake, 0.7A for 0.2 sec is required.	
Heat output		5W (Motor type 28P, 35P, 42P, 56P) 19.2W (Motor type 56SP, 60P)	
Inrush current (Note 1)	Motor type	28P, 35P, 42P, 56P	8.3A (With inrush current protection circuitry)
		56SP, 60P	10A (With inrush current protection circuitry)
Motor control method		Weak field vector control	
Compatible encoders		Resolution of Battery-less absolute encoder: 8192 pulse / rev	
Serial communication interface (SIO port)		RS485: 1CH (Modbus protocol RTU/ASCII compliant) Speed: 9.6~230.4Kbps 1CH (Modbus protocol RTU)	
Interface		Field bus connection: DeviceNet, CC-Link, PROFIBUS-DP, EtherCAT, EtherNet/IP, PROFINET-IO. (Note) Additional gateway unit connection is required.	
Data setting, input method		PC dedicated teaching software, Touch panel teaching pendant	
Data retention memory		Position data and parameters are saved in non-volatile memory. (No limit to rewrite)	
LED display		SV (green) / ALM (red): Servo ON / Alarm triggered and emergency stop	
Insulation resistance		Not less than 10MΩ at 500VDC	
Electric shock protection mechanism		Class I basic insulation	
Cooling method		Natural air cooling	

Note1: Inrush current will flow for approximately 5msec after the power is turned on (at 40°C). Inrush current value differs depending on the impedance on the power supply line.

<The Calculation of Number of Connectable Axes and Power Capacity>

To calculate the number of axes that are connectable to one gateway unit and the current amperage of 24VDC, figure out (1) to (4) below and follow (5).

(1) The Calculation of Number of Connectable Axes, and Motor Current Consumption

Condition 1: Sum of motor current consumption connectable to one hub unit: 12.8A or less

Condition 2: Number of controlled axes connectable to corresponding 1 unit: 4 axes or less

* By adjusting the number of connected axes or motor type, select the connected axes so each hub unit satisfies the formulas below.

- Sum of motor current consumption for hub unit = Motor current consumption of 1st axis + Motor current consumption of 2nd axis (if connected)
+ Motor current consumption of 3rd axis (if connected)
+ Motor current consumption of 4th axis (if connected) ≤ 12.8A ①

- Sum of motor current consumption = Motor current consumption of hub unit 1st unit
+ Motor current consumption of 2nd hub unit (if connected)
+ Motor current consumption of 3rd hub unit (if connected)
+ Motor current consumption of 4th hub unit (if connected) ②

(2) Control Power Current Consumption: $0.3A \times \text{Number of actuator} + 0.6A \text{ (gateway unit)} + 0.3A \times \text{Number of hub unit} \dots\dots ③$

(3) Inrush Current: 8.3A (RCP6S Motor type 28P, 35P, 42P, 56P,RCM-P6PC) 10A (RCP6S Motor type 56SP, 60P,RCM-P6AC,RCM-P6DC) ④

(4) Current Consumption of Brake Release(RCP6,RCP6S) : Number of actuators with brake $\times 0.7A \dots\dots ⑤$

* When servo is on, it should be 0.5sec or less, after that retaining of released status should be 0.1A / axis. When using control power and motor power in common, calculate by the number of actuators $\times 0.1A$.

(5) Selection of power supply:

Normally, consider a margin of about 20% for the load current of ② + ③ + ⑤ above, select a power supply rated at about 1.2 times.

However, since the current of ④ flows in a short time, consider this and select the "peak load compatible" specification or the power supply with sufficient margin.

The current of ④ can be prevented from occurring at the same time by changing emergency stop release (motor power ON) and changing the timing to turn servo ON (see Note 2).

If you do not make a margin, the voltage may drop momentarily. In particular, please be careful with the power supply with remote sensing.

Note 2: The timing to turn the servo on can be tuned in Parameter No. 165 [Latency after Shutdown Release].

(Note) When using separate power supply for the control power supply and the motor power supply, short the OV side.

Option

Gateway Unit (RCM-P6GW)

Features:

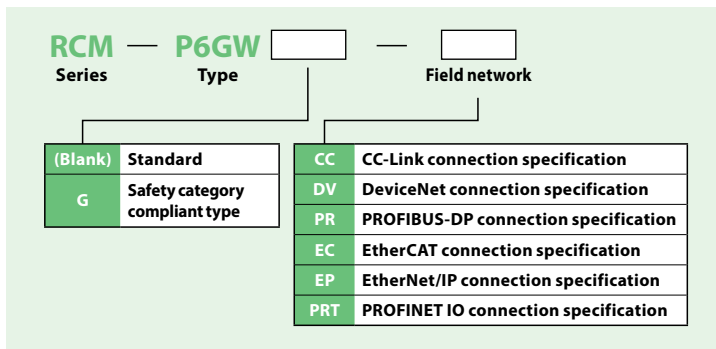
This unit is used in order to connect RCP6S to the field network.

Details:

- Compatible with many field networks. (Applicable networks: CC-Link, DeviceNet, PROFIBUS-DP, EtherCAT, EtherNet/IP, PROFINET-IO)
- Motor power and control power for all of the connected axes can be supplied through the gateway unit.
- Monitoring during AUTO is possible.
- A mini-USB connection comes standard.
- Each channel has MPO/MPI for drive source cutoff.
- Brake can be forcibly released by supplying power to the brake release input terminal for each channel. (In the case that the actuator is directly connected)
- When RCP6S is directly connected to the gateway unit, the communication time is 10msec. When RCP6S is connected to the gateway unit through the hub unit, the communication time is 40msec. The communication time does not become longer even if the connected axes increase.



Model Configuration

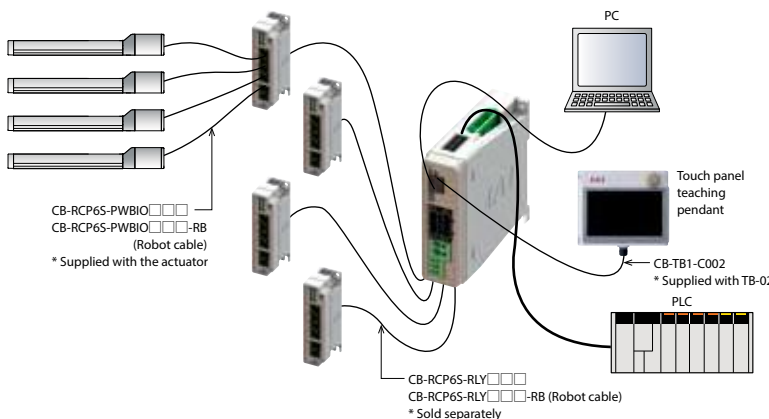


Standard price

Models
CC-Link specification
DeviceNet specification
PROFIBUS-DP specification
EtherCAT specification
EtherNet/IP specification
PROFINET IO specification
Safety category CC-Link specification
Safety category DeviceNet specification
Safety category PROFIBUS-DP specification
Safety category EtherCAT specification
Safety category EtherNet/IP specification
Safety category PROFINET IO specification

* Dummy plug DP-5 is supplied with the safety category specification.

Connection Image



Up to 16 axes (*1) of RCP6S can be connected per gateway unit with hub units. (*2) Because both the motor power and control power for all the axes connected to the gateway unit can be supplied together, the required wiring for RCP6S can be connected as one cable between the hub and RCP6S. Also RCP6S can be directly connected to the gateway unit.

(*1) The number of connectable axes varies depending on the type of the field network. Please see "Number of connectable axes" table for details.

(*2) Hub unit: See P7-33.

The Number of Connectable Axes:

Maximum connectable axes are as shown below

	Direct value mode	Simple direct value mode	Positioner 1	Positioner 2	Positioner 3	Positioner 5
CC-Link	16	16	16	16	16	16
DeviceNet	8	16	16	16	16	16
PROFIBUS-DP	8	16	16	16	16	16
EtherCAT	8	16	16	16	16	16
EtherNet/IP	8	16	16	16	16	16
PROFINET IO	8	16	16	16	16	16

Field Network Control Operation Mode

These control modes are available to choose from when using the RCP6S via field network. Data required for operation (target position, speed, acceleration, push current value, etc.) are written by a PLC or other host controller into the specified addresses.

Operation mode	Description	Overview
Positioner 1/ Simple direct numerical value mode (Simple direct mode)	Positioner 1 mode can store up to 768 points of position data, and can move to the stored position. Both modes allow monitoring the current position numerically with 0.01mm increments. The simple direct numerical value mode can modify any of the stored target positions by numerical value. Both modes allow monitoring the current position numerically with 0.01mm increments.	
Direct numerical control mode (Direct indication/ Full mode)	This mode allows designating the target position, speed, acceleration/deceleration, and motor current percentage for pushing numerically. Also, it is capable of monitoring the current position, current speed, and the motor current command value with 0.01mm increments.	
Positioner 2 mode	Positioner 2 mode can store up to 768 points of position data, and can move to the stored position. This mode does not allow monitoring of the current position. This is a mode that has less in/out data transfer volume than the Positioner 1 mode.	
Positioner 3 mode	Positioner 3 mode can store up to 256 points of position data, and can move to the stored position. This mode does not allow monitoring of the current position. This is a mode that has less in/out data transfer volume than the Positioner 2 mode, and operates with a minimum number of signals.	
Positioner 5 mode	Positioner 5 mode can store up to 16 points of position data, and can move to the stored position. This is a mode that has less position table than the Positioner 2 mode, and allows monitoring the current position numerically with 0.01mm increments.	

Controller

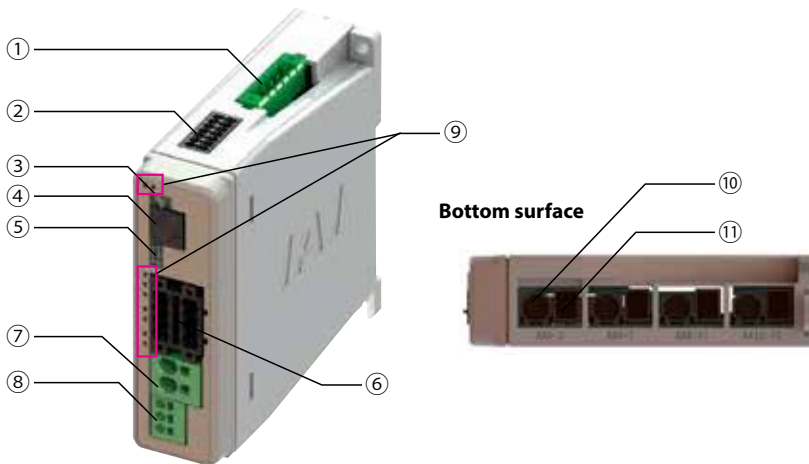
- EC
- RCP6S**
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

List of Functions by Operation Mode

	Simple direct value mode	Positioner 1 mode	Direct numerical control mode (Direct indication/Full mode)	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Number of positioning points	768	768	Unlimited	768	256	16
Home return operation	○	○	○	○	○	○
Positioning operation	○	△	○	△	△	△
Speed, acceleration/deceleration settings	△	△	○	△	△	△
Different acceleration and deceleration settings	△	△	×	△	△	△
Pitch Feed (Incremental)	△	△	○	△	×	△
Push-motion operation	△	△	○	△	△	△
Speed changes while moving	△	△	○	△	△	△
Pausing	○	○	○	○	○	○
Zone signal output	△	△	△	△	△	△
Position zone signal output	△	△	×	△	×	×
Current position reading (Resolution)	○ (0.01mm)	○ (0.01mm)	○ (0.01mm)	×	×	○ (0.01mm)

*○ indicates that direct setting is possible, △ indicates position data or parameter input is required, x indicates the operation is not supported.

Names and Functions of Each Part

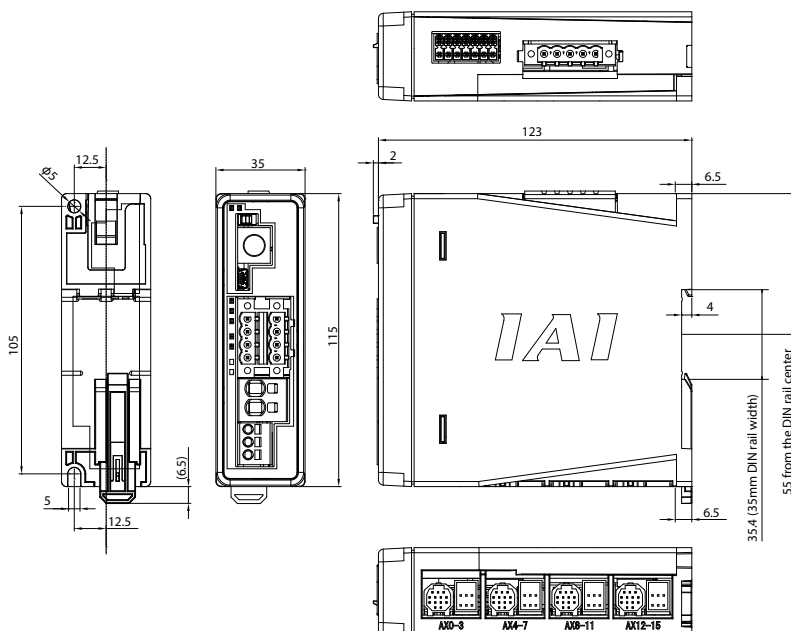


- ① Field network connector
The connector used to connect to the field network.
- ② System I/O connector
The connector for emergency stop input, external AUTO/MANU switchover input, and brake release input in case of directly connecting RCP6S to a gateway unit.
- ③ Operation mode setting switch
For switching the operation mode between automatic (AUTO) and manual (MANU).
- ④ SIO connector
Connector for connecting the touch panel teaching pendant and PC dedicated teaching software.
- ⑤ USB connector
Connector for connecting the PC dedicated teaching software.
- ⑥ Drive power cut-off connector
The connector used to connect an external drive power cut-off relay to the 24VDC power supply from the motor power connector.
- ⑦ Motor power supply connector
For 24VDC motor power supply for a gateway unit.
- ⑧ Control power supply connector
The connector for the gateway unit 24VDC control power supply and the frame ground (FG).
- ⑨ Status display LED

Code	LED	Display color and operating status
LED1	SYS	System status Ready (Green), Alarm (Red)
LED2	AUTO	Operation mode (AUTO/MANU) status Automatic operation mode (Green)
LED3	EMG	Emergency stop (EMG) status Emergency stop (EMG) (Red)
LED4	T. ERR	Bus communication error in the controller T.ERR (Orange)
LED5	C. ERR	Field bus network communication error C.ERR (Orange)

- ⑩ Axis control connector
The connector used to supply power and control signals (24VDC control power, 24VDC motor power, communication line, brake release signal, emergency stop status, etc.) from the gateway unit to the hub unit or RCP6S.
- ⑪ Axis power supply connector
The connector used to supply 24VDC motor power via gateway unit to either a RCP6S or a hub unit.

External Dimensions



Gateway Unit Basic Specifications

Specification	Description
Number of controlled axes	16 axes max. (4 axes with a single gateway unit)*1
Power supply voltage	24VDC±10%
Control power capacity	0.6A (0.3A with a single gateway unit + field bus module 0.3A)
Motor power capacity	51.2A max. from connected axes
Cooling method	Natural air cooling
Emergency stop input	B contact input
Enable input	None
T.P. enable input	Yes
Enable operation	Servo OFF
Backup memory	FRAM (256kbit), No. of overwrites: Unlimited
Calendar function	Yes (retains data for 10 days after power off)
Gateway board LED display	SYS LED × 1 (RUN/ALM), EMG LED × 1, MODE LED × 1 (AUTO/MANU), T.ERR LED × 1, C.ERR LED × 1 Field bus module status LED × 2
Tool connection	T/P connector: RS485 1ch (Modbus protocol compliant) USB connector: USB 1ch
Electromagnetic braking forced release mechanism	System I/O connector: External brake release signal input (24VDC) * Only used when an RCP6S unit is directly connected to the gateway unit. Disabled when a hub is connected.
Electric shock protection mechanism	Class 1, basic insulation
Insulation withstanding voltage	500VDC 10MΩ
Weight	250g
External dimensions	35W × 115H × 123D
Overseas Accreditations	CE, cUL (Both Acquired)

*1 See P. 7-29

Option

Hub Unit (RCM-P6HUB)

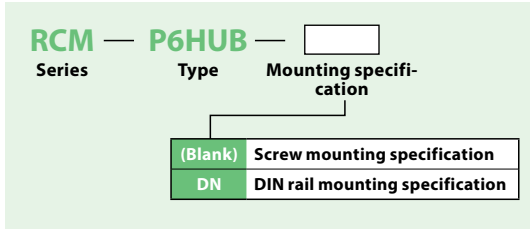
The hub unit cannot be used alone.
It must be used with a gateway unit.

Features:

The connection between gateway unit - hub unit and hub unit - RCP6S can be established using serial communication.
By using a gateway unit with hub units, up to 16 axes can be controlled.

* The number of connectable axes will vary depending on the type of field networks and its mode.
Please refer to P7-29 for details and confirm the "Number of connectable axes".

Model Configuration

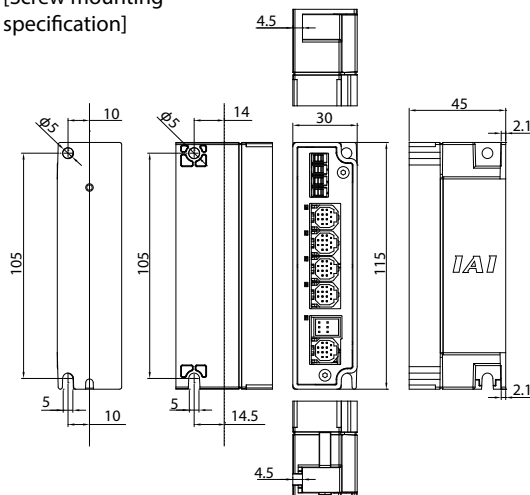


Specification

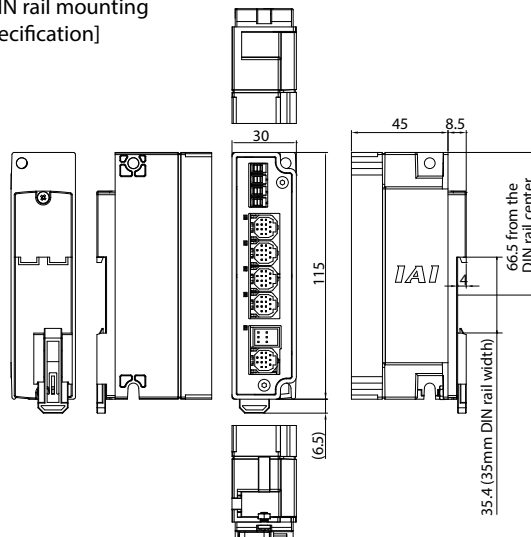
Specification	Description
Number of controlled axes	4 axes max.
Power supply voltage	24VDC±10%
Control power capacity	0.3A (single hub unit)
Motor power capacity	12.8A max. from connected axes
Emergency stop input	None
Enable input	None
LED display	SYS LED × 1 (RUN/ALM) AXIS LED × 4 (RUN/ALM)
Electromagnetic braking forced release mechanism	External brake release switch × 4
Electric shock protection mechanism	Class 1, basic insulation
Insulation withstanding voltage	500VDC 10MΩ
Contamination	Contamination 2
Weight	80g
External dimensions	35W × 115H × 45D
Overseas Accreditations	CE, cUL (Both Acquired)

External Dimensions

[Screw mounting specification]



[DIN rail mounting specification]



Option

PLC Connection Unit (RCB-P6PLC)

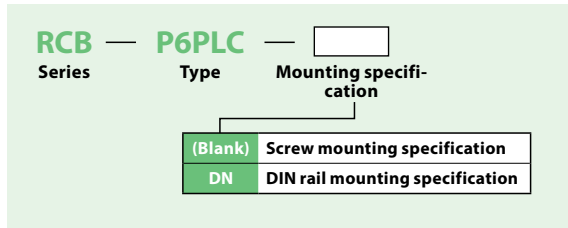
Features:

This is a terminal block used to connect the RCP6S and the PLC using serial communication.

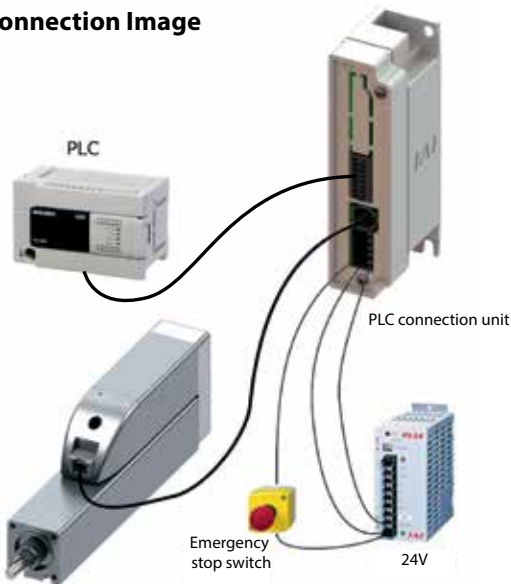
The RCP6S and the PLC connection unit can be easily connected with a cable.

* It cannot be connected to the gateway unit, hub unit or RCP6S gateway controller.

Model Configuration



Connection Image

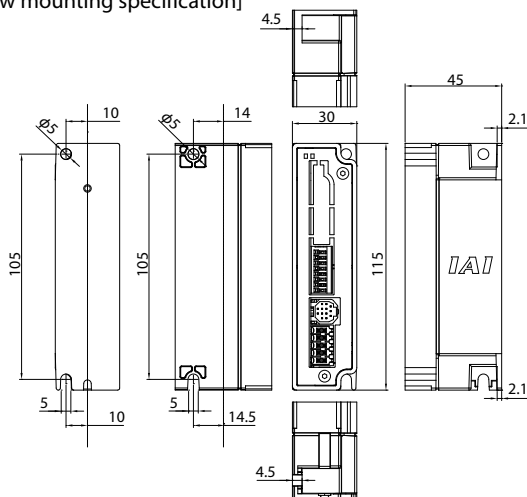


Specification

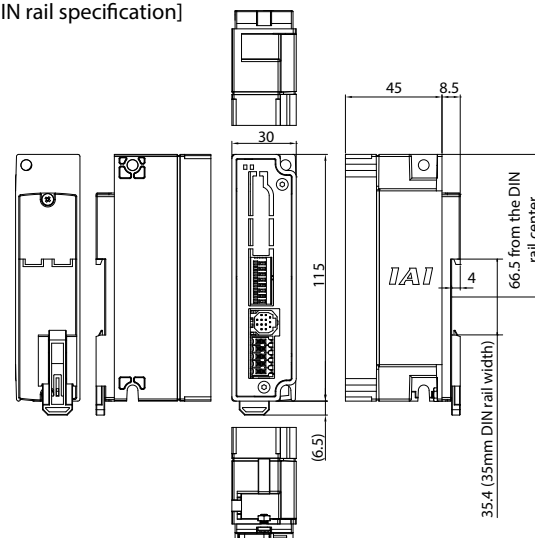
Specification	Description
Number of controlled axes	1-axis
Power supply voltage	24VDC ± 10%
Control power capacity	0A for single PLC connection unit 0.3A for connected PLC units + RCP6S built-in driver • For brake types, 0.7A for 0.2 sec is required for releasing brake
Motor power capacity	Depending on RCP6S built-in driver
Emergency stop input	B contact input
Enable input	None
LED display	None
Electromagnetic braking forced release mechanism	External brake release signal input (24VDC)
Electric shock protection mechanism	Class 1, basic insulation
Insulation withstanding voltage	500VDC 10MΩ
Contamination	Contamination 2
Weight	65g
External dimensions	35W × 115H × 45D
Overseas Accreditations	CE, cUL (Both Acquired)

External Dimensions

[Screw mounting specification]



[DIN rail specification]



Option

RCP6S Gateway Controller <RCM-P6□C>

Features:

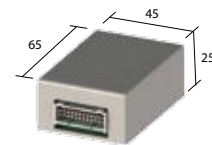
Actuators other than RCP6S can be driven by connecting to the RCP6S gateway unit and hub unit.

Details:

- RCP2~6, RCA, RCA2, RCD actuators can be connected.
 - * Some products may not be supported
- RCP2~4, RCA, and RCA2 connections require a converter unit.
- The same control as an RCP6S built-in controller is possible. (Refer to P7-30 for details about control operation modes.)
- The actuator and controller information during operation can be displayed on a PC screen as a wave form through the use of PC dedicated software. (Current position, current speed, servo motor, etc)



RCM-P6PC RCM-P6DC RCM-P6AC



RCM-CV-APCS (Converter unit)

Model Configuration

RCM Series	Type	Motor Type	Encoder Type	Options	I/O Type	I/O Cable Length	Input Power	Mounting Specifications
P6PC	Stepper motor			HA LA	SE	0	0 24VDC	Blank DN
P6AC	Servo motor							
P6DC	Brush-less DC motor type							

Stepper motor	Servo motor	Brush-less DC motor type
20P 20□	2 2W	3D 3W
20SP 20□	5 5W	
28P 28□	5S 5W	
28SP 28□	10 10W	
35P 35□	20 20W	
42P 42□	20S 20W	
42SP 42□	30 30W	
56P 56□		

Options	I/O Type	I/O Cable Length	Input Power	Mounting Specifications
HA High acceleration/ deceleration specifications *1 LA Energy saving compatible *1	SE SIO specifications	0 No cable	0 24VDC	Blank Screw mounting specification DN DIN rail mounting specification

Encoder Type
WAI Battery-less Absolute/Incremental I Incremental specification *2

*1: RCA series dedicated

*2: For DC brush-less motors only.
*RCA/RCAW series encoder types cannot be connected to "A: Absolute" types.

Notes

In principle, the same type of motor as the type of motor of the actuator to be connected should be entered, however, there are some models where the motor type of some controllers and actuators do not match. Be sure to check the corresponding models listed below during selection.

<20SP/28SP/42SP/5S/20S Target Actuators>

- Motor Type [20SP]...RCP3-RA2AC RCP3-RA2BC
- Motor Type [28SP]...RCP2-RA3C
- Motor Type [42SP]...RCP4-RA5C
- Motor Type [5S]...RCA2-SA2A□, RCA2-RA2A□,
- Motor Type [20S]...RCA2-SA4□, RCA-RA3□, RCA2-TA5□, RCA-RG□3□, RCAW-RA3□

* Please contact IAI if you require a simple absolute encoder specification type.
* DC brush-less motors do not support simple absolute encoders.

Controller

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

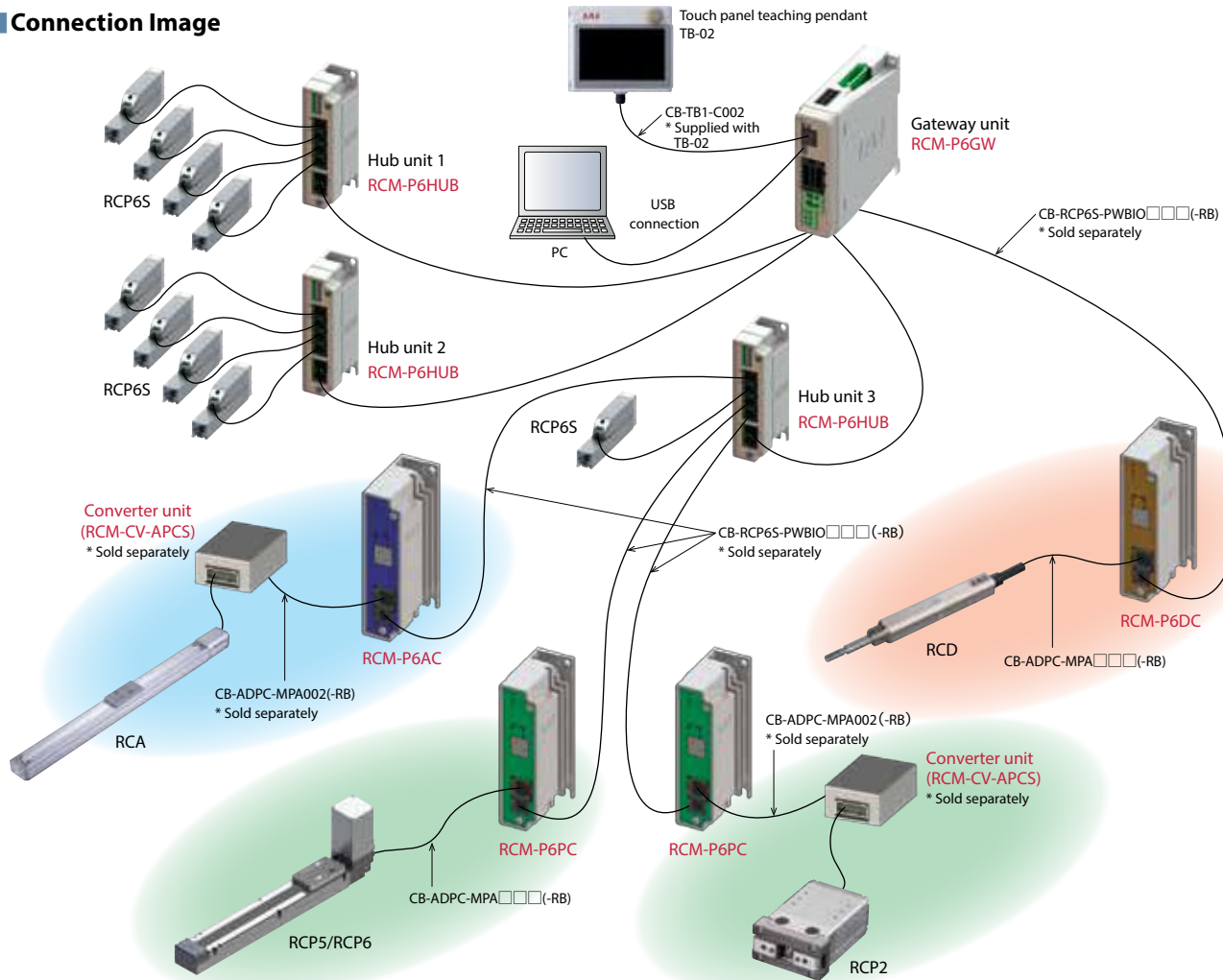
XSEL (SCARA)

PSA-24

TB-02

TB-03

Connection Image



* As with some RCP 5 / RCP 6, some conversion units are unnecessary. Please confirm on P7-38.

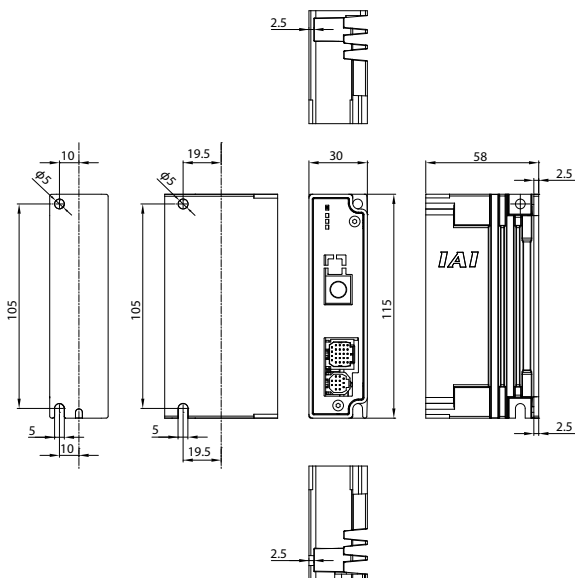
* The field network can be used by connecting to a gateway unit.

* Please contact IAI if you require a simple absolute encoder specification type.

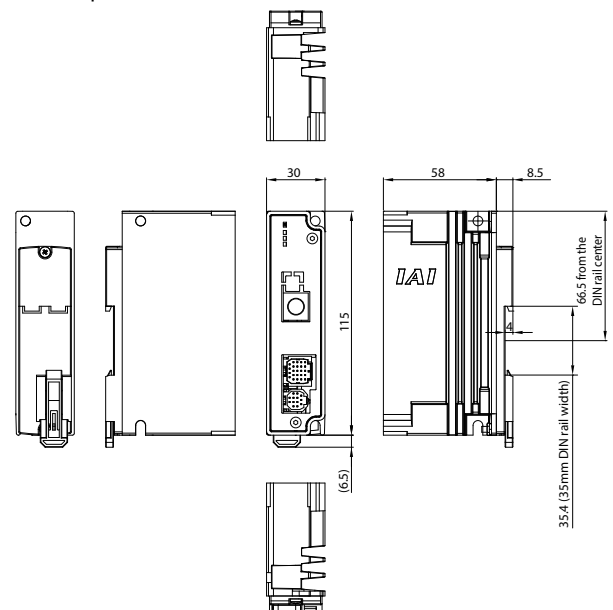
* Maximum cable length between the gateway unit and actuator is 20m for RCM-P6PC and RCM-P6AC, and 10m for RCM-P6DC.

External Dimensions

[Screw fixing specification]



[DIN rail specification]



Option

Specification

Specified Items	Specification Content				
Model number	RCM-P6PC	RCM-P6AC		RCM-P6DC	
Number of controlled axes	1-axis				
Controller power	24VDC ± 10%				
Control power capacity	0.3A • For RCP6 types with brakes only, 0.7A for 0.2 sec is required for releasing brake		0.3A		
Motor power capacity	20P, 28P	High power setting Disabled: Maximum 1.0 A	10W, 20W	Rated 1.3 A / maximum 4.4 A (Maximum 2.5 A at power saving)	Rated 0.7 A Maximum 1.5 A
	35P, 42P, 56P	High power setting Disabled: Maximum 1.7 A	20W, (20S)	Rated 1.7 A / maximum 5.1 A (Maximum 3.4 A at power saving)	
		High power setting Enabled: Rated 3.2 A/ Maximum 4.2 A	30W	Rated 1.3 A / maximum 4.0 A (Maximum 2.2 A at power saving)	
Inrush current	8.3A		10A		
Emergency stop input	B contact input				
Enable input	None				
T.P. enable input	Yes				
Enable operation	Servo OFF				
Backup memory	FRAM (256kbit), No. of overwrites: Unlimited				
Calendar function	None (unless connected to a GW unit)				
Cooling method	Natural air cooling				
Supported encoders	<ul style="list-style-type: none"> High-resolution battery-less absolute encoder: 8192 pulses/rev Battery-less absolute encoder: 800 pulses/rev Incremental encoder: 800 pulses/rev 		<ul style="list-style-type: none"> Battery-less absolute encoder: 16,384 pulses/rev Other than for incremental specification RCA, RCA2-***N: 800 pulses/rev, RCA2-***N, RCA2-***NA: 1,048 pulses/rev 		<ul style="list-style-type: none"> Incremental encoder: 480 pulses/rev
LED display	SV/ALM LED×1				
Electromagnetic forced brake release mechanism	Brake release input (inside I/F connector)				
Electric shock protection mechanism	Class 1 basic insulation				
Insulation withstanding voltage	500VDC 10MΩ				
Contamination	Contamination 2				
Weight	Screw mounting specification: 200g, DIN rail mounting specification: 215g				
External dimensions	Screw mounting specification: 30W x 115H x 58D, DIN rail mounting specification: 30W x 115H x 66.5D				
Overseas accreditations	CE, cUL (Both Acquired)				

Compatible Actuator List

RCM-P6PC Compatible Actuators

Slider Type	
Model	Conversion unit
RCP6-SA4C	—
RCP6-SA6C	—
RCP6-SA7C	—
RCP6-SA4R	—
RCP6-SA6R	—
RCP6-SA7R	—
RCP6-WSA10C	—
RCP6-WSA12C	—
RCP6-WSA14C	—
RCP6-WSA10R	—
RCP6-WSA12R	—
RCP6-WSA14R	—
RCP5-BA4	—
RCP5-BA4U	—
RCP5-BA6	—
RCP5-BA6U	—
RCP5-BA7	—
RCP5-BA7U	—
RCP4-SA3C	—
RCP4-SA5C	—
RCP4-SA3R	—
RCP4-SA5R	—
RCP3-SA2AC	—
RCP3-SA2BC	—
RCP3-SA3C	—
RCP3-SA4C	—
RCP3-SA5C	—
RCP3-SA6C	—
RCP3-SA2AR	—
RCP3-SA2BR	—
RCP3-SA3R	—
RCP3-SA4R	—
RCP3-SA5R	—
RCP3-SA6R	—

Rod Type	
Model	Conversion unit
RCP6-RA4C	—
RCP6-RA6C	—
RCP6-RA7C	—
RCP6-RA4R	—
RCP6-RA6R	—
RCP6-RA7R	—
RCP6-RAA4C	—
RCP6-RAA6C	—
RCP6-RAA7C	—
RCP6-RAA4R	—
RCP6-RAA6R	—
RCP6-RAA7R	—
RCP6-WRA10C	—
RCP6-WRA12C	—
RCP6-WRA14C	—
RCP6-WRA10R	—
RCP6-WRA12R	—
RCP6-WRA14R	—
RCP4-RA3C	—
RCP4-RA5C	—
RCP4-RA3R	—
RCP4-RA5R	—
RCP3-RA2AC	—
RCP3-RA2BC	—
RCP3-RA2AR	—
RCP3-RA2BR	—
RCP2-SRA4R	—
RCP2-SRG54R	—
RCP2-SRGD4R	—

Table Type	
Model	Conversion unit
RCP6-TA4C	—
RCP6-TA6C	—
RCP6-TA7C	—
RCP6-TA4R	—
RCP6-TA6R	—
RCP6-TA7R	—
RCP3-TA3C	—
RCP3-TA4C	—
RCP3-TA5C	—
RCP3-TA6C	—
RCP3-TA7C	—
RCP3-TA3R	—
RCP3-TA4R	—
RCP3-TA5R	—
RCP3-TA6R	—
RCP3-TA7R	—

Gripper Type/Rotary Type	
Model	Conversion unit
RCP6-GRST6C	—
RCP6-GRST7C	—
RCP6-GRST6R	—
RCP6-GRST7R	—
RCP6-GRT7A	—
RCP6-GRT7B	—
RCP4-GRSML	—
RCP4-GRSLL	—
RCP4-GRSVL	—
RCP4-GRLM	—
RCP4-GRLW	—
RCP2-GRSS	○
RCP2-GRLS	○
RCP2-GRS	○
RCP2-GRM	○
RCP2-GRHM	○
RCP2-GRHB	○
RCP2-GR3LS	○
RCP2-GR3LM	○
RCP2-GR3SS	○
RCP2-GR3SM	○
RCP6-RTFML	—
RCP2-RTBS	○
RCP2-RTBSL	○
RCP2-RTCS	○
RCP2-RTCSL	○
RCP2-RTB	○
RCP2-RTBL	○
RCP2-RTC	○
RCP2-RTCL	○
RCP2-RTBB	○
RCP2-RTBBL	○
RCP2-RTCB	○
RCP2-RTCBL	○

Cleanroom	
Model	Conversion unit
RCP6CR-SA4C	—
RCP6CR-SA6C	—
RCP6CR-SA7C	—
RCP6CR-WSA10C	—
RCP6CR-WSA12C	—
RCP6CR-WSA14C	—
RCP4CR-SA3C	—
RCP4CR-SA5C	—
RCP2CR-GRSS	—
RCP2CR-GRLS	—
RCP2CR-GRS	—
RCP2CR-GRM	—
RCP2CR-GR3SS	—
RCP2CR-GR3SM	—
RCP2CR-RTBS	—
RCP2CR-RTBSL	—
RCP2CR-RTCS	—
RCP2CR-RTCSL	—
RCP2CR-RTB	—
RCP2CR-RTBL	—
RCP2CR-RTC	—
RCP2CR-RTCL	—
RCP2CR-RTBB	—
RCP2CR-RTBBL	—
RCP2CR-RTCB	—
RCP2CR-RTCBL	—

Dust/Splash-Proof	
Model	Conversion unit
RCP6W-RA4C	—
RCP6W-RA6C	—
RCP6W-RA7C	—
RCP6W-RA4R	—
RCP6W-RA6R	—
RCP6W-RA7R	—
RCP6W-RAA4C	—
RCP6W-RAA6C	—
RCP6W-RAA7C	—
RCP6W-RAA4R	—
RCP6W-RAA6R	—
RCP6W-RAA7R	—
RCP6W-WRA10C	—
RCP6W-WRA12C	—
RCP6W-WRA14C	—
RCP6W-WRA10R	—
RCP6W-WRA12R	—
RCP6W-WRA14R	—
RCP4W-SA5C	—
RCP4W-SA6C	—
RCP4W-SA7C	—
RCP2W-GRSS	—
RCP2W-GRLS	—
RCP2W-GRS	—
RCP2W-GRM	—
RCP2W-GR3SS	—
RCP2W-GR3SM	—
RCP2W-RTBS	—
RCP2W-RTBSL	—
RCP2W-RTCS	—
RCP2W-RTCSL	—
RCP2W-RTB	—
RCP2W-RTBL	—
RCP2W-RTC	—
RCP2W-RTCL	—
RCP2W-RTBB	—
RCP2W-RTBBL	—
RCP2W-RTCB	—
RCP2W-RTCBL	—

Models with specific functions	
Model	Conversion unit
RCP6-RTCKSPE/SPI	—
RCP6-RTCKSRE/SRI	—
RCP6-RTCKMPE/MPI	—
RCP6-RTCKMRE/MRI	—
RCP4-ST68E	—
RCP4-ST615E	—
RCP4-ST4525E	—

- When using the actuator with "○" displayed, the conversion unit (RCM - CV - APCS) is required.
- Please contact IAI if you require a simple absolute encoder specification type.
- The connecting cable for the RCP4/RCP4CR/RCP4W series are CB-ADPCMPA□□□ (-RB) + CB-CAN-AJ002.
(The cable CB-CAN-AJ002 is not necessary for the gripper (GR□□), ST4525E and SA3/RA3.)
- The connecting cable for the RCP3 series is CB-RCAPC-MPA□□□ (-RB).

RCM-P6AC Compatible Actuators

Slider Type	
Model	Conversion unit
RCA-SA4C	○
RCA-SA5C	○
RCA-SA6C	○
RCA-SA4R	○
RCA-SA5R	○
RCA-SA6R	○

Rod Type	
Model	Conversion unit
RCA2-RN3NA	—
RCA2-RN4NA	—
RCA2-RP3NA	—
RCA2-RP4NA	—
RCA2-GS3NA	—
RCA2-GS4NA	—
RCA2-GD3NA	—
RCA2-GD4NA	—
RCA2-SD3NA	—
RCA2-SD4NA	—
RCA-RA3C	○
RCA-RA4C	○
RCA-RA3R	○
RCA-RA4R	○

Table Type	
Model	Conversion unit
RCA2-TCA3NA	—
RCA2-TCA4NA	—
RCA2-TWA3NA	—
RCA2-TWA4NA	—
RCA2-TFA3NA	—
RCA2-TFA4NA	—

Cleanroom	
Model	Conversion unit
RCACR-SA4C	○
RCACR-SA5C	○
RCACR-SA6C	○
RCA2CR-RN3NB	—
RCA2CR-RN4NB	—
RCA2CR-RP3NB	—
RCA2CR-RP4NB	—
RCA2CR-GS3NB	—
RCA2CR-GS4NB	—
RCA2CR-GD3NB	—
RCA2CR-GD4NB	—
RCA2CR-SD3NB	—
RCA2CR-SD4NB	—
RCA2CR-RN5NB	—

Dust/Splash-Proof	
Model	Conversion unit
RCA2W-RN3NB	—
RCA2W-RN4NB	—
RCA2W-RP3NB	—
RCA2W-RP4NB	—
RCA2W-GS3NB	—
RCA2W-GS4NB	—
RCA2W-GD3NB	—
RCA2W-GD4NB	—
RCA2W-SD3NB	—
RCA2W-SD4NB	—
RCA2W-RN5NB	—

- When using the actuator with "○" displayed, the conversion unit (RCM - CV - APCS) is required.
- The connecting cable for the RCP2/RCP2CR/RCP2W series is CB-RCAPC-MPA□□□ (-RB).
- Please contact IAI if you require a simple absolute encoder specification type.
- Encoder types of RCA / RCAW series are not compatible with "A: Absolute".

RCM-P6DC Compatible Actuators

Rod Type	
Model	Conversion unit
RCD-RA1DA	—

Gripper Type/Rotary Type	
Model	Conversion unit
RCD-GRSNA	—

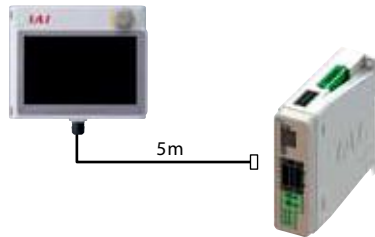
Option

Touch panel teaching pendant

Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring.

Model TB-02-□

Configuration



Specification

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~85% RH (Non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

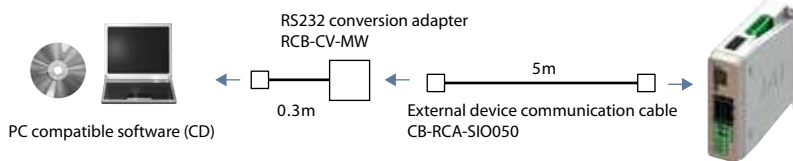
Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

supported Window versions: 7/8/10

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

Configuration

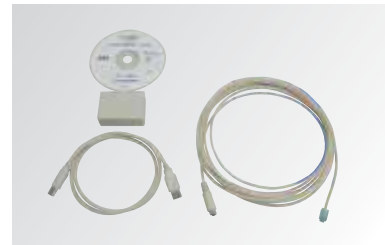
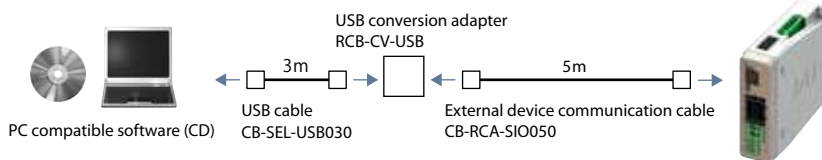
Please contact IAI for the current supported versions.



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

Configuration

Please contact IAI for the current supported versions.



Maintenance parts

When placing an order for a replacement cable, please refer to the model below.

* The total length of the cable is limited. See the cautions on P7-27 and P7-36.

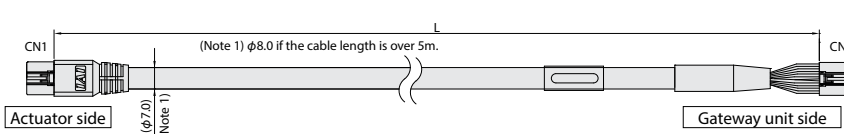
Table of compatible cables

Connection destination		Gateway unit	Hub unit	PLC connection unit
RCP6S RCP6SCR RCP6SW	Standard cable		CB-RCP6S-PWBIO □□□	
	Robot cable		CB-RCP6S-PWBIO □□□ -RB	
	<Extension> Standard cable		CB-RCP6S-PWBIO □□□ -JY1	
	<Extension> Robot cable		CB-RCP6S-PWBIO □□□ -JY1-RB	
Connection destination		Hub unit		
Gateway unit	Standard cable		CB-RCP6S-RLY □□□	
	Robot cable		CB-RCP6S-RLY □□□ -RB	
	<Extension> Standard cable		CB-RCP6S-RLY □□□ -JY1	
	<Extension> Robot cable		CB-RCP6S-RLY □□□ -JY1-RB	
Connection destination		Conversion unit	Actuator connected to RCM-P 6 □ C	
RCM-P6□C	Standard cable		CB-ADPC-MPA □□□	
	Robot cable		CB-ADPC-MPA □□□ -RB	

* When the connected actuator is RCP3/RCA2/RCA2CR/RCAW series, the cable is CB-RCAPC-MPA□□□.

Maintenance parts

Model **CB-RCP6S-PWBIO** / **CB-RCP6S-PWBIO** -RB * Please indicate the cable length (L) in , maximum 20m, e.g.) 080 = 8m

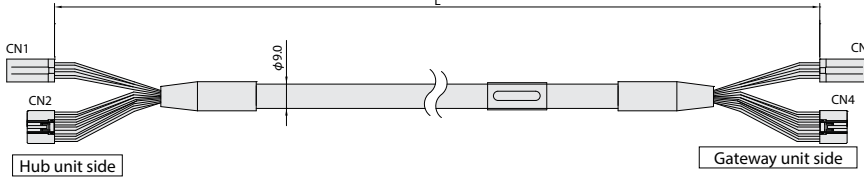


Minimum bending R 5 m or less r = 56 mm or more (for movable use)
 Longer than 5 m r = 64 mm or more (for movable use)

* The robot cable is a cable of the flex-resistant specification. Use a robot cable to pass through the cable bear.

CN1 DF62C-135-2-2C(HIROSE ELECTRIC CO. LTD)			CN2 DF62C-135-2-2C(HIROSE ELECTRIC CO. LTD)		
Color	Signal	Pin No.	Pin No.	Signal	Color
Gray(AWG22/19)	CP	1	1	CP	Gray(AWG22/19)
Blue(AWG22/19)	MP	8	8	MP	Blue(AWG22/19)
Orange(AWG22/19)	MP	9	9	MP	Orange(AWG22/19)
Green(AWG22/19)	GND	10	10	GND	Green(AWG22/19)
Brown(AWG22/19)	GND	11	11	GND	Brown(AWG22/19)
Orange(AWG26)	AM SD+	6	6	AM SD+	Orange(AWG26)
Light blue(AWG26)	AM SD-	2	2	AM SD-	Light blue(AWG26)
Red(AWG26)	CT SD+	7	7	CT SD+	Red(AWG26)
Gray(AWG26)	CT SD-	3	3	CT SD-	Gray(AWG26)
Green(AWG26)	BK	4	4	BK	Green(AWG26)
Brown(AWG26)	EMGS	5	5	EMGS	Brown(AWG26)
Black(AWG26)	NC	13	13	NC	Black(AWG26)
Black(AWG26)	FG	12	12	FG	Black(AWG26)

Model **CB-RCP6S-RLY** / **CB-RCP6S-RLY** -RB * Please indicate the cable length (L) in , maximum 20m, e.g.) 030 = 3m



Minimum bending R r = 72 mm or more (for movable use)

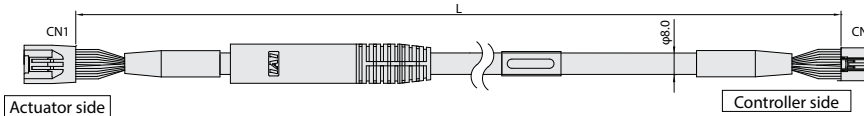
* The robot cable is a cable of the flex-resistant specification. Use a robot cable to pass through the cable bear.

* If you need anything other than the above cable length, please contact us separately.

CN1 J11DF-06V-KX(J.S.T.MFG.CO.LTD)			CN3 J11DF-06-KX(J.S.T.MFG.CO.LTD)		
Color	Signal	Pin No.	Pin No.	Signal	Color
Brown(AWG18)	MP	B1	B1	MP	Brown(AWG18)
Gray(AWG18)	MP	B2	B2	MP	Gray(AWG18)
Red(AWG18)	MP	B3	B3	MP	Red(AWG18)
Blue(AWG18)	GND	A1	A1	GND	Blue(AWG18)
Orange(AWG18)	GND	A2	A2	GND	Orange(AWG18)
Green(AWG18)	GND	A3	A3	GND	Green(AWG18)

CN2 DF62C-135-2-2C(HIROSE ELECTRIC CO. LTD)			CN4 DF62C-135-2-2C(HIROSE ELECTRIC CO. LTD)		
Color	Signal	Pin No.	Pin No.	Signal	Color
Blue(AWG22)	CP	1	1	CP	Blue(AWG22)
NC	NC	8	8	NC	NC
NC	NC	9	9	NC	NC
Orange(AWG22)	GND	10	10	GND	Orange(AWG22)
Green(AWG22)	GND	11	11	GND	Green(AWG22)
Brown(AWG26)	AM SD+	6	6	AM SD+	Brown(AWG26)
Green(AWG26)	AM SD-	2	2	AM SD-	Green(AWG26)
Red(AWG26)	CT SD+	7	7	CT SD+	Red(AWG26)
Gray(AWG26)	CT SD-	3	3	CT SD-	Gray(AWG26)
Light blue(AWG26)	NC	4	4	NC	Light blue(AWG26)
Orange(AWG26)	EMGS	5	5	EMGS	Orange(AWG26)
Black(AWG26)	NC	13	13	NC	Black(AWG26)
Black(AWG26)	FG	12	12	FG	Black(AWG26)

Model **CB-RCP6S-PWBIO** -JY1 / **CB-RCP6S-PWBIO** -JY1-RB * Please indicate the cable length (L) in , maximum 20m, e.g.) 030 = 3m



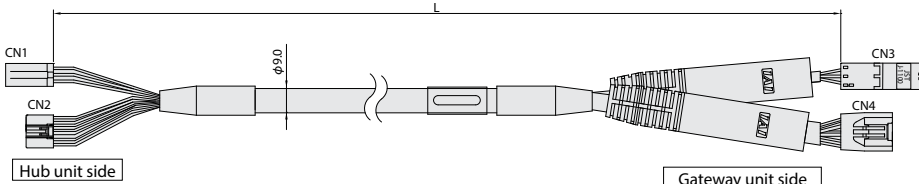
Minimum bending R r = 64 mm or more (for movable use)

* The robot cable is a cable of the flex-resistant specification. Use a robot cable to pass through the cable bear.

* If you need anything other than the above cable length, please contact us separately.

CN1 DF62B-135P-2-2C(HIROSE ELECTRIC CO. LTD)			CN2 DF62C-135-2-2C(HIROSE ELECTRIC CO. LTD)		
Color	Signal	Pin No.	Pin No.	Signal	Color
Gray(AWG18)	CP	1	1	CP	Gray(AWG18)
Blue(AWG18)	MP	8	8	MP	Blue(AWG18)
Orange(AWG18)	MP	9	9	MP	Orange(AWG18)
Green(AWG18)	GND	10	10	GND	Green(AWG18)
Brown(AWG18)	GND	11	11	GND	Brown(AWG18)
Orange(AWG26)	AM SD+	6	6	AM SD+	Orange(AWG26)
Light blue(AWG26)	AM SD-	2	2	AM SD-	Light blue(AWG26)
Red(AWG26)	CT SD+	7	7	CT SD+	Red(AWG26)
Gray(AWG26)	CT SD-	3	3	CT SD-	Gray(AWG26)
Green(AWG26)	BK	4	4	BK	Green(AWG26)
Brown(AWG26)	EMGS	5	5	EMGS	Brown(AWG26)
Black(AWG26)	NC	13	13	NC	Black(AWG26)
Black(AWG26)	FG	12	12	FG	Black(AWG26)

Model **CB-RCP6S-RLY** -JY1 / **CB-RCP6S-RLY** -JY1-RB * Please indicate the cable length (L) in , maximum 20m, e.g.) 030 = 3m



Minimum bending R r = 72 mm or more (for movable use)

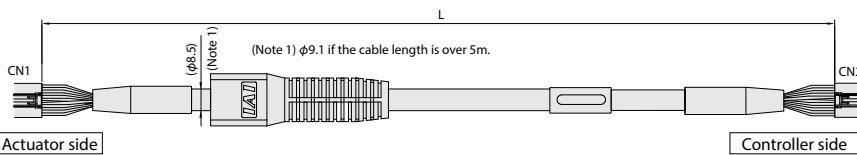
* The robot cable is a cable of the flex-resistant specification. Use a robot cable to pass through the cable bear.

* If you need anything other than the above cable length, please contact us separately.

CN1 J11DF-06V-KX(J.S.T.MFG.CO.LTD)			CN3 J11DFM-06-KX(J.S.T.MFG.CO.LTD)		
Color	Signal	Pin No.	Pin No.	Signal	Color
Brown(AWG18)	MP	B1	B1	MP	Brown(AWG18)
Gray(AWG18)	MP	B2	B2	MP	Gray(AWG18)
Red(AWG18)	MP	B3	B3	MP	Red(AWG18)
Blue(AWG18)	GND	A1	A1	GND	Blue(AWG18)
Orange(AWG18)	GND	A2	A2	GND	Orange(AWG18)
Green(AWG18)	GND	A3	A3	GND	Green(AWG18)

CN2 DF62C-135-2-2C(HIROSE ELECTRIC CO. LTD)			CN4 DF62B-135P-2-2C(HIROSE ELECTRIC CO. LTD)		
Color	Signal	Pin No.	Pin No.	Signal	Color
Blue(AWG22)	CP	1	1	CP	Blue(AWG22)
NC	NC	8	8	NC	NC
NC	NC	9	9	NC	NC
Orange(AWG22)	GND	10	10	GND	Orange(AWG22)
Green(AWG22)	GND	11	11	GND	Green(AWG22)
Brown(AWG26)	AM SD+	6	6	AM SD+	Brown(AWG26)
Green(AWG26)	AM SD-	2	2	AM SD-	Green(AWG26)
Red(AWG26)	CT SD+	7	7	CT SD+	Red(AWG26)
Gray(AWG26)	CT SD-	3	3	CT SD-	Gray(AWG26)
Light blue(AWG26)	NC	4	4	NC	Light blue(AWG26)
Orange(AWG26)	EMGS	5	5	EMGS	Orange(AWG26)
Black(AWG26)	NC	13	13	NC	Black(AWG26)
Black(AWG26)	FG	12	12	FG	Black(AWG26)

Model **CB-ADPC-MPA** / **CB-ADPC-MPA** -RB * Please indicate the cable length (L) in , maximum 20m, e.g.) 030 = 3m



Minimum bending R 5 m or less r = 68 mm or more (for movable use)
 R greater than 5 m r = 73 mm or more (for movable use)

* The robot cable is a cable of the flex-resistant specification. Use a robot cable to pass through the cable bear.

* If you need anything other than the above cable length, please contact us separately.

CN1 DF62C-245-2-2C(HIROSE ELECTRIC CO. LTD)				CN2 DF62C-245-2-2C(HIROSE ELECTRIC CO. LTD)					
Color	Signal	Pin No.	Pin No.	Signal	Color	Pin No.	Pin No.		
Blue(AWG22/19)	U	U	ΦA	3	3	ΦA	U	U	Blue(AWG22/19)
Orange(AWG22/19)	V	V	ΦB	5	5	VMM	V	V	Orange(AWG22/19)
Brown(AWG22/19)	—	—	ΦB	10	10	ΦB	—	—	Brown(AWG22/19)
Gray(AWG22/19)	—	—	VMM	9	9	VMM	—	—	Gray(AWG22/19)
Green(AWG22/19)	W	W	Φ A	4	4	Φ A	W	W	Green(AWG22/19)
Red(AWG22/19)	—	—	Φ B	15	15	Φ B	—	—	Red(AWG22/19)
Black(AWG26)	B	B	A-	6	6	A-	B	B	Black(AWG26)
Yellow(AWG26)	BK	LS-	14	14	LS-	BK	—	—	Yellow(AWG26)
Blue(AWG26)	A+	A+	ΦmB5	12	12	ΦmB5	A+	A+	Blue(AWG26)
Orange(AWG26)	A-	A-	ΦmB5	17	17	ΦmB5	A-	A-	Orange(AWG26)
Green(AWG26)	B+	B+	A+	1	1	A+	B+	B+	Green(AWG26)
Brown(AWG26)	B-	B-	A-	6	6	A-	B-	B-	Brown(AWG26)
Gray(AWG26)	H5	IN	LSmB5	B+	11	LSmB5	H5	IN	Gray(AWG26)
Red(AWG26)	H5	IN	LSmB5	B-	16	LSmB5	H5	IN	Red(AWG26)
Blue(AWG26)	—	—	LS+	BK+	20	LS+	BK+	20	Blue(AWG26)
Orange(AWG26)	—	—	LS-	BK-	2	LS-	BK-	2	Orange(AWG26)
Gray(AWG26)	VCC	VCC	GND	21	21	VCC	VCC	VCC	Gray(AWG26)
Red(AWG26)	GND	GND	GND	7	7	GND	GND	GND	Red(AWG26)
Brown(AWG26)	—	—	VPS	VPS	18	VPS	VPS	VPS	Brown(AWG26)
Green(AWG26)	H5	IN	LS	GND	13	LS	GND	LS	Green(AWG26)
Black(AWG26)	—	—	—	—	19	—	—	—	Black(AWG26)
Pink(AWG26)	BAT+	CF	VCC	22	22	CF	VCC	BAT+	Pink(AWG26)
Black(AWG26)	—	—	—	—	23	—	—	—	Black(AWG26)
Black(AWG26)	FG	FG	FG	24	24	FG	FG	FG	Black(AWG26)

RCON



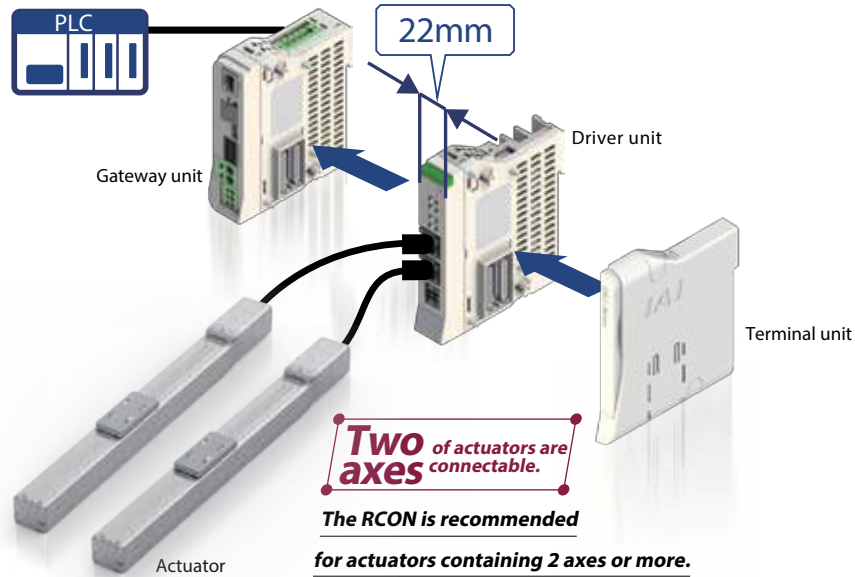
Unit-linkage type position controller



Features

1 The RCON is recommended for actuators containing 2 axes or more.

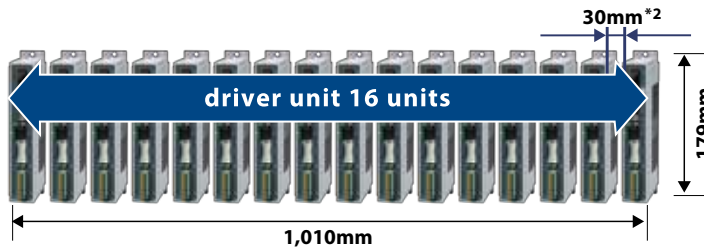
A single Rcon driver unit of 22mm wide can accommodate actuators up to 2 axes, offering an ideal space-saving for the controller.



2 Space saving of the controller up to 85%*1 is possible. *1 Compared with IAI products.

Compared with the type that connects one driver unit and 1-axis actuator, the space for the controller can be reduced up to 85%.

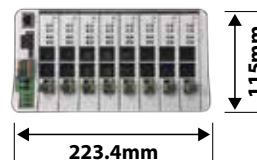
PCON-CB X 16 units



*2 The minimum distance required for the natural heat radiation for the controller.

RCON X 16 axes connectable specification

Space-saving 85%



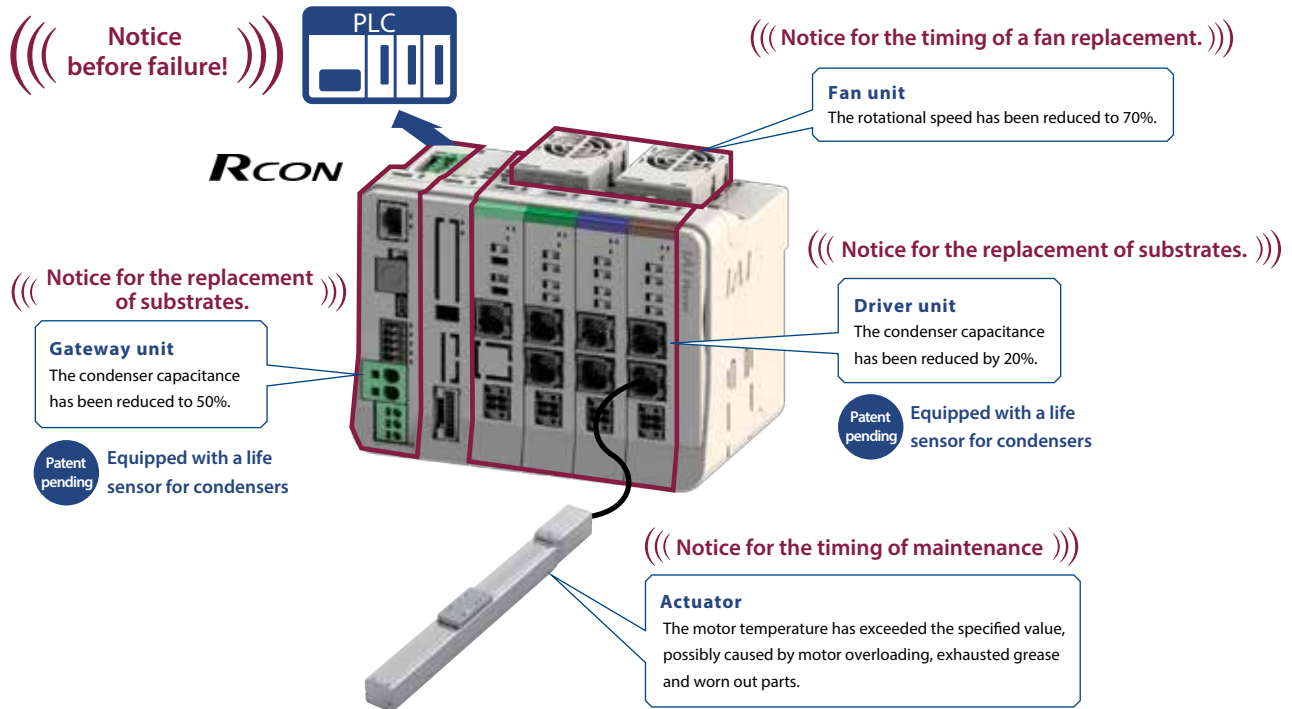
3 No.1 compatibility in the industry. Compatible with 7 field networks.

Compatible with wide selection of field networks.



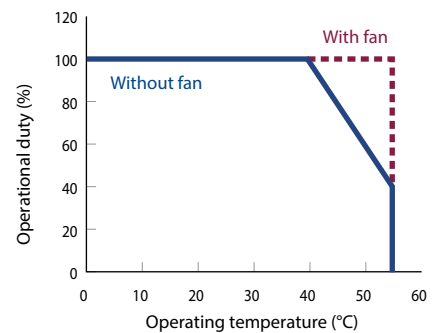
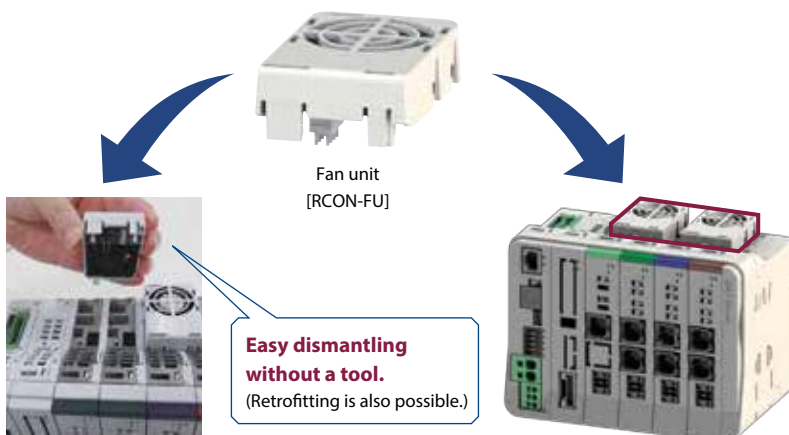
4 Preventive & Predictive Maintenance Function

The RCON is equipped with a preventive maintenance function for capacitors, and a predictive maintenance function for fan units and actuators.



5 Operational at the controller operating temperature of 0 to 55°C.

When an optional fan unit is installed, the controller can be operable at 0 to 55°C without lowering the actuator operating duty.
(A fan unit is needed for every 2 driver units.)

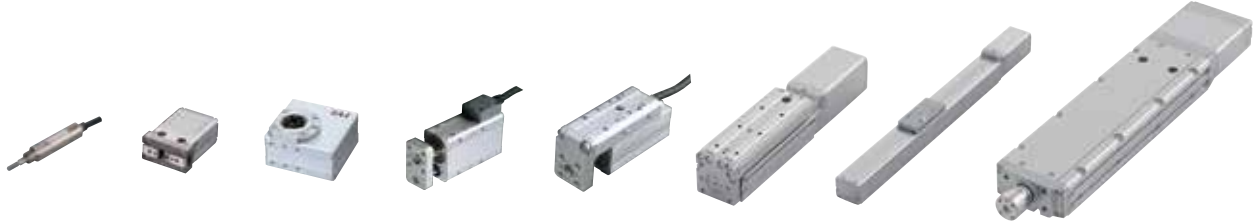


- EC
- RCP6S
- RCON**
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

6 No.1 in the industry for the number of connectable actuators Connectable with 332 IAI actuator models.*

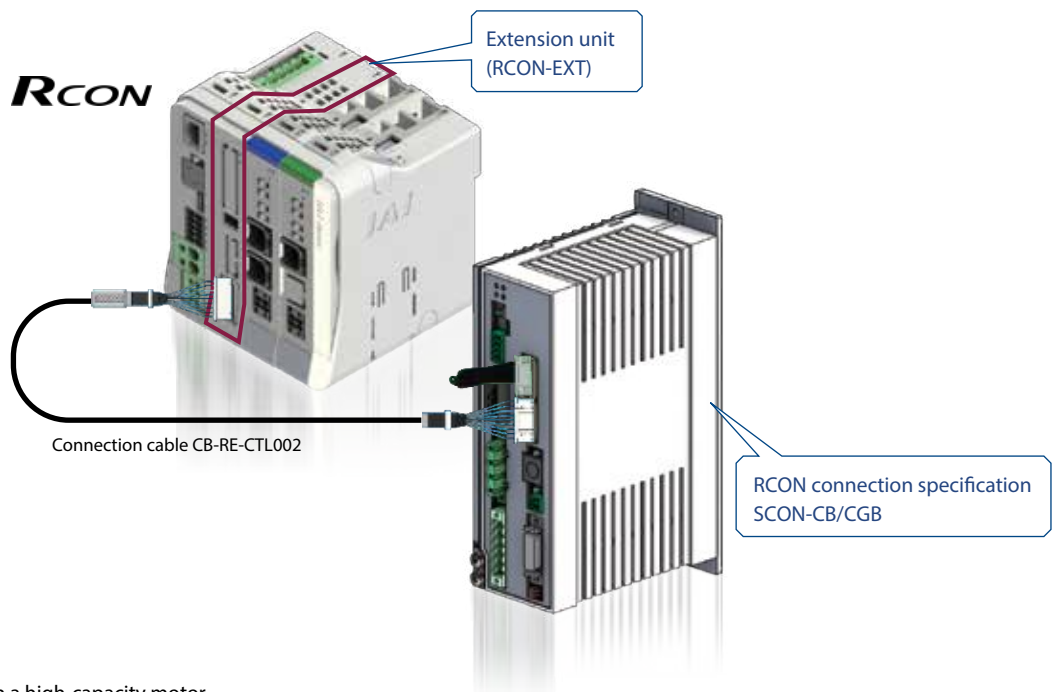
For RCP2/3/4/5/6, RCA/2, RCD, RCL series

Compatible with actuators that have not only battery-less absolute encoders but also actuators equipped with simple absolute encoders and incremental encoders.

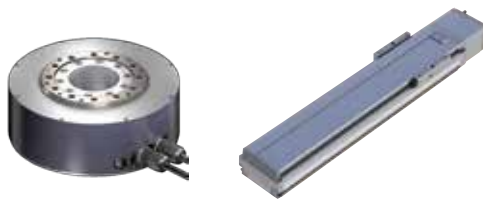


For RCS2/3/4, IS(D) B, SSPA, LSA, NS, DDA series

When selecting an optional RCON connection specification (-RC) of the SCON, an actuator equipped with a high-capacity motor can be operated by connecting to the RCON extension unit (RCON-EXT).



■ Actuator equipped with a high-capacity motor.

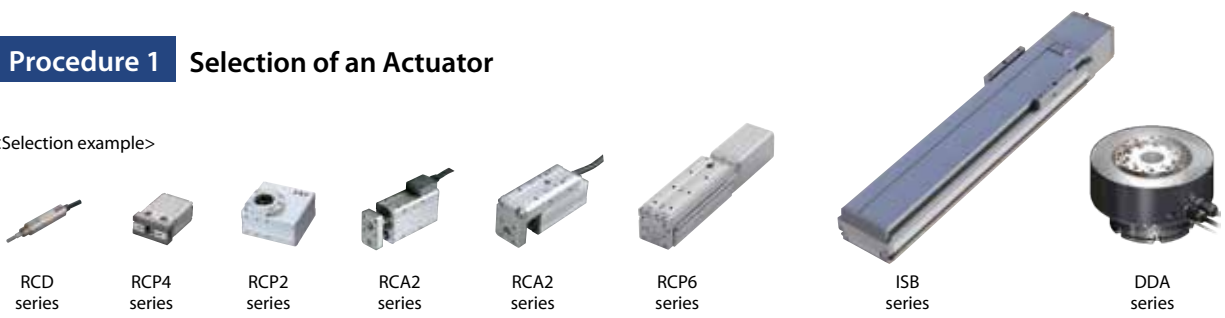


* IAI's General Catalog product series / types and models.
 Except for the servo press actuator models, LSA-W21H, EC series, SCARA robots, TTA, ZR units and wrist units.
 * As of December 2018.

Selection Procedure

Procedure 1 Selection of an Actuator

<Selection example>



Classify the actuator series into 2 categories according to the table below.

Controller	Actuator
<p>RCON</p>	<p>RCP2/3/4/5/6, RCA/2, RCD, RCL series</p> <p><Selection example></p>
<p>SCON-CB</p>	<p>RCS2/3/4, IS(D)B, SSPA, LSA, NS, DDA series</p> <p><Selection example></p>

* Please note that servo press actuator models, LSA-W21H, EC series, SCARA robots, TTA, ZR units and wrist units cannot be connected.

Procedure 2 Selection of a Gateway Unit

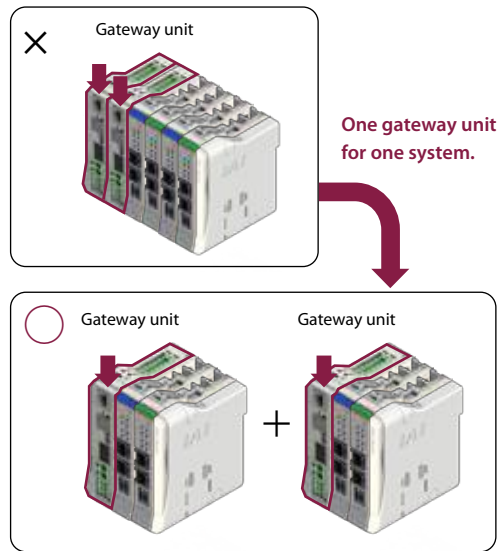
Select a gateway unit model according to the network type.

Network type	Gateway unit model
DeviceNet	RCON-GW/GWG-DV
CC-Link	RCON-GW/GWG-CC
CC-Link IE Field	RCON-GW/GWG-CIE
PROFIBUS	RCON-GW/GWG-PR
EtherCAT	RCON-GW/GWG-EC
EtherNet/IP	RCON-GW/GWG-EP
PROFINET	RCON-GW/GWG-PRT

<Selection example>
Select 1

Caution

Only one gateway unit can be connected to one system. If more than 2 units are used, divide it into 2.












* GW --- Gateway unit of standard specification
 GWG --- Gateway unit of safety category compliant type

The number of connectable actuator axes is 16 for one gateway unit.

- EC
- RCP6S
- RCON**
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Procedure 3 Selection of a Driver Unit

Select a suitable driver unit model and the required number according to the actuator series and motor type to be connected to the RCON.

Actuator		RCON driver unit			<Example of selection>	
Series	Motor type	External view	Number of connectable actuator axes	Model	Classification	Number of necessary units
RCP2 RCP3 RCP4 RCP5 RCP6	20P, 28P 35P, 42P 56P	Stepper motor 	2-axis specification	RCON-PC-2	 	1 unit
			1-axis specification	RCON-PC-1		1 unit
	High-thrust motor 56SP, 60P 86P	1-axis specification	RCON-PCF-1		—	
RCA RCA2 RCL	2 5 10 20, 20S 30	AC servo motor 	2-axis specification	RCON-AC-2	 	1 unit
			1-axis specification	RCON-AC-1		—
RCD	3D	DC brushless motor 	2-axis specification	RCON-DC-2		—
			1-axis specification	RCON-DC-1		1 unit

Select! 2

Select! 2

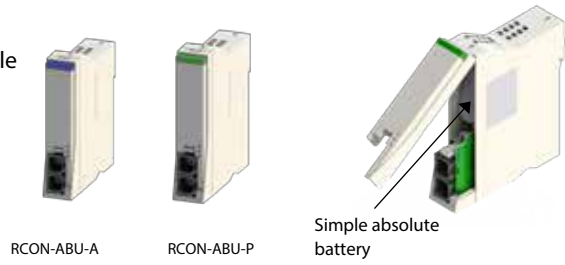
Select! 2

Select! 2

Procedure 4 Selection of a Simple Absolute Unit

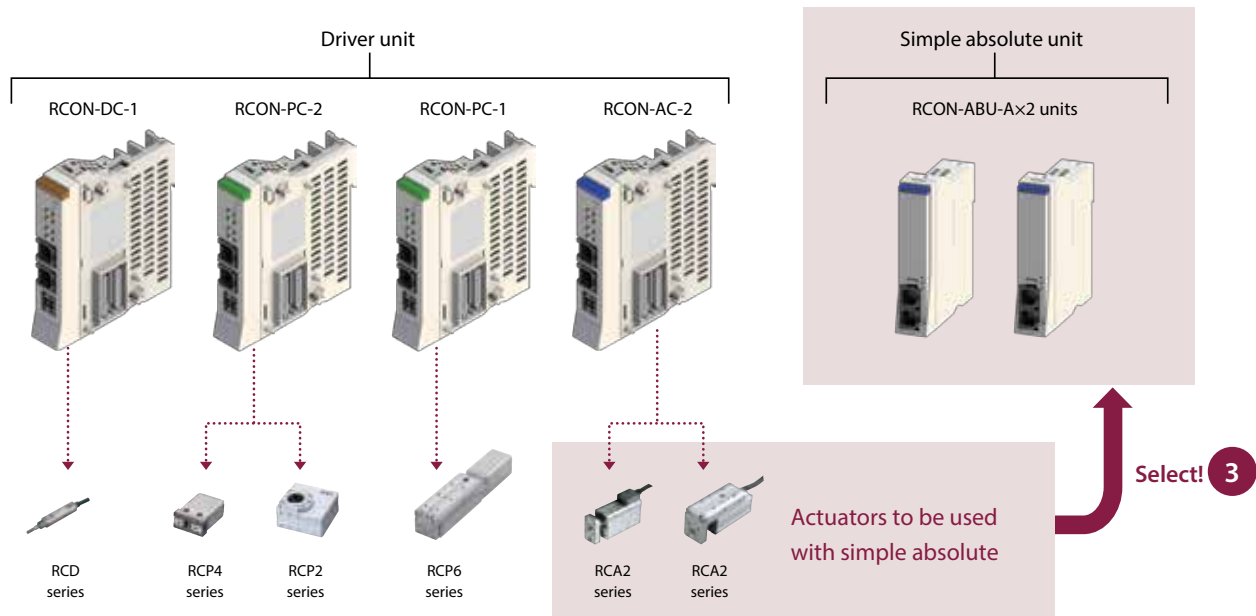
When there are actuators of simple absolute specification, select the simple absolute units (RCON-ABU-A/P) in the same number as the actuator axes.

* Connect to the RCON controller using the cable (CB-ADPC-MPA005).
The cable is supplied with the sample absolute unit.
(Note) The operating ambient temperature of the simple absolute unit is 0 to 40°C.



<Example of selection>

This example shows a selection of 2 axes of RCA2 series actuators as simple absolute specification.




Procedure 5 Selection of an Extension Unit

When there is an actuator to be connected to the SCON-CB, select (1) to (3) as shown below.

(1) Extension unit (Model: RCON-EXT)

<Selection example>

An extension unit is definitely needed when connecting the SCON-CB and RCON.




× 1 unit ← **Select! 4**

(2) RCON connection specification SCON-CB

<Selection example>

I/O type
Model: SCON- * - * - * - RC - *

Necessary to purchase in the same number* as actuator axes connected to SCON.



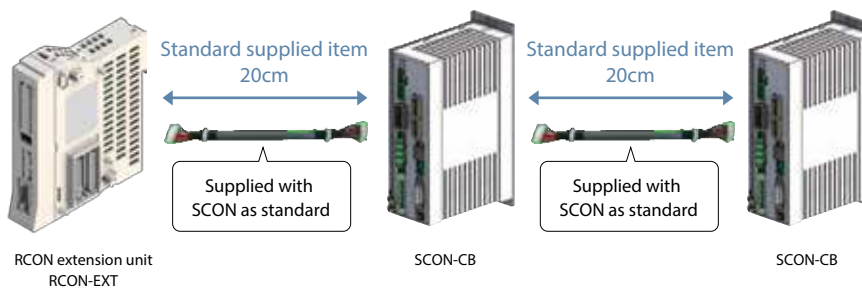
Specify RCON connection specification

× 2 units ← **Select! 5**

(* Max. 16-axes)


(3) Connection cable between extension unit and SCON-CB.

A cable (CB-ER-CTL002) is supplied with the cable SCON-CB for connection with RCON.



Necessary to purchase only when the length of 20 cm is too short.

Model: CB-RE-CTL□□□□
See 7-72



× Required number

- EC
- RCP6S
- RCON**
- MCON-C/LC
- PCON-CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON-CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Procedure 6 Calculation of Control Power (CP) of each unit

Confirm that the total control power capacity of the units selected so far is 9.0A or smaller.

Gateway unit



Control power capacity (CP)
9.0A or smaller

Confirmation method

Add up values according to the "Table of motor power capacities" shown below.

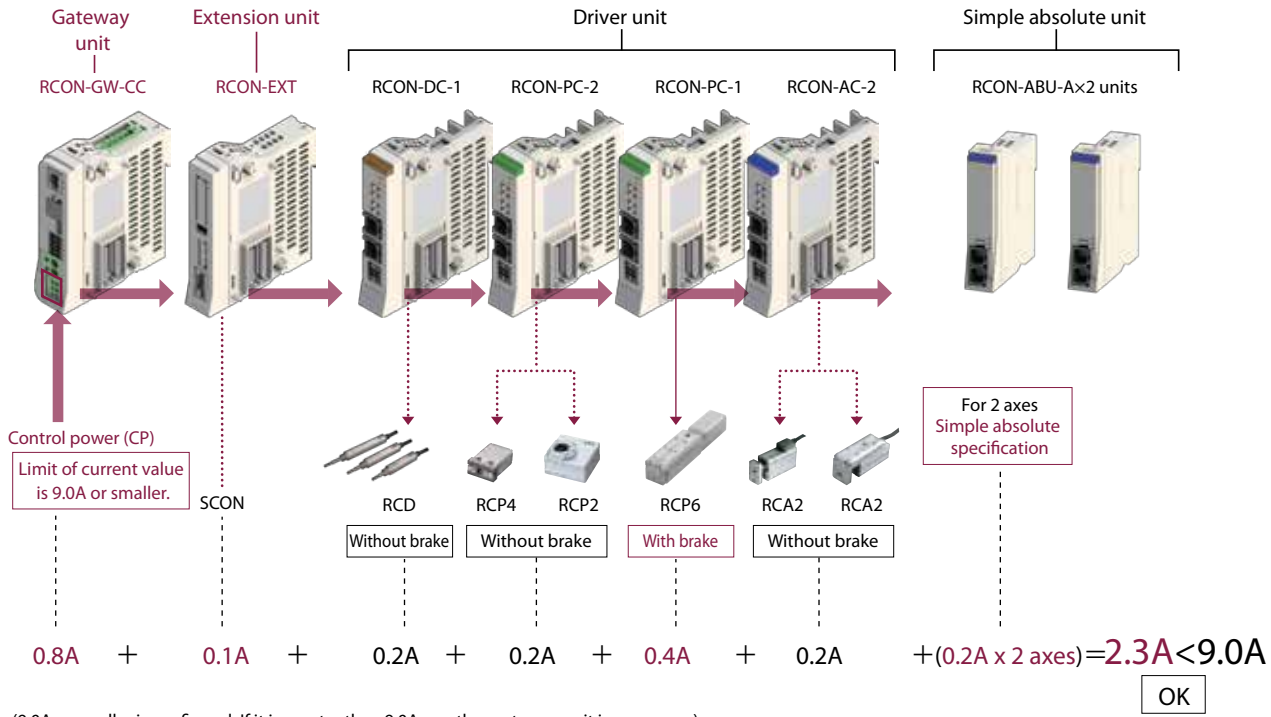
List of control power capacities

Item	Specification		
Power voltage	24VDC±10%		
Control power capacity (CP) (Per driver unit)	Gateway unit (including terminal unit)	0.8A	
	Driver unit (common in all types)	without Brake	0.2A
		with Brake (1-axis)	0.4A
		with Brake (2 axes)	0.6A
	Extension unit	0.1A	
	Simple absolute unit (common in all types)	0.2A	

<Selection example>

× 1 unit
× 3 units
× 1 unit
× 1 unit
× 1 axes

<Selection example>

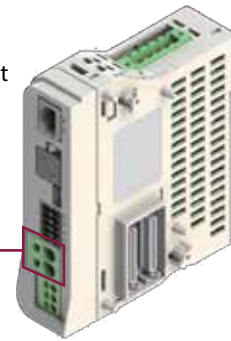


(9.0A or smaller is confirmed. If it is greater than 9.0A, another gateway unit is necessary.)

Procedure 7 Calculation of Motor Power Capacity (MP) of each unit motor

Confirm that the total motor power capacity of the driver units selected so far is 37.5A or smaller.

Gateway unit



Motor power (MP)
37.5A or smaller

Confirmation method

Add up values according to the "Table of motor power capacities" shown below. Use the maximum current if shown in the table, otherwise use the rated current for calculation.

List of motor power capacity

Item	Actuator/driver unit			Rated current	Max. current		<Selection example>	
	series	motor type			Energy-saving enabled			
Motor Power capacity (MP) (per actuator)	Stepper motor RCON-PC	RCP2	20P/20SP/28P	Without Power CON	0.8A	—	—	×1 axis
		RCP3	28P*		1.9A	—	—	
		RCP4	28P/35P/42P/ 42SP/56P	Without Power CON	1.9A	—	—	
		RCP5 RCP6		With Power CON	2.3A	—	3.9A	
	Stepper motor RCON-PCF	RCP2 RCP4 RCP5 RCP6	56SP/60P/ 86P	Without Power CON	5.7A	—	—	
	AC servo motor RCON-AC	RCA RCA2	5W	Standard/ High acceleration/deceleration/ Energy saving	1.0A	—	3.3A	×2 axes
			10W		1.3A	2.5A	4.4A	
			20W		1.3A	2.5A	4.4A	
			20W(20S)		1.7A	3.4A	5.1A	
		RCL	30W	1.3A	2.2A	4.0A		
2W			Standard/ High-acceleration/deceleration	0.8A	—	4.6A		
5W				1.0A	—	6.4A		
10W				1.3A	—	6.4A		
DC brushless motor RCON-DC	RCD	3W	Standard	0.7A	—	1.5A	×1 axis	

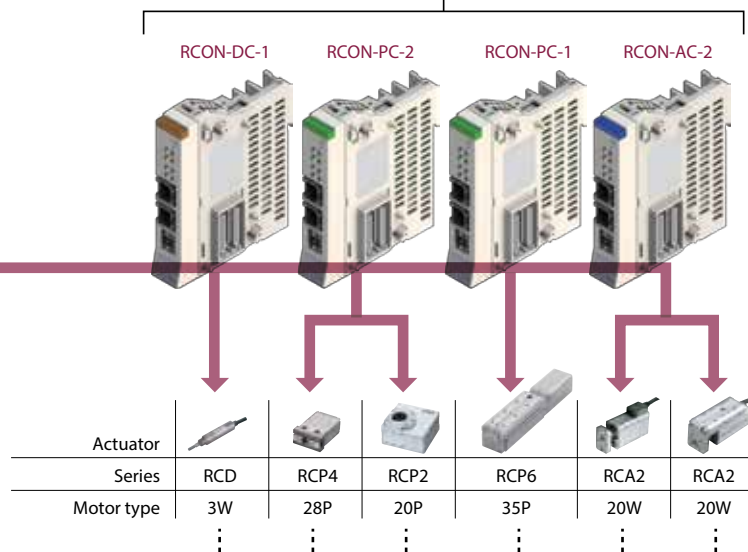
* for RCP2-RA3 and RCP2-RGD3

<Selection example>
Gateway unit



Motor power (MP)
Current limit
37.5A or smaller

Driver unit



$$1.5A + 3.9A + 0.8A + 3.9A + 4.4A + 4.4A = 18.9A < 37.5A$$

(37.5A or smaller is confirmed. If it is greater than 37.5A, another gateway unit is necessary.)

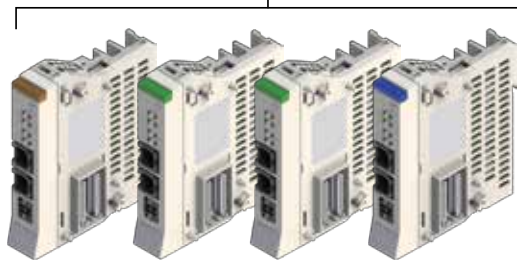
OK

Procedure 8 Selection of a Fan Unit

When the controller operating environment could exceed 40°C, it is necessary to install a fan unit. (up to 55°C)
 The number of fan units is one half of the total number of the driver units.
 If the number of the driver units is an odd number, add 1 to the total odd number for the calculation purpose.
 When placing an order, specify the gateway unit model.

<Selection example>

Driver unit 4 units/2=2 units



Fan unit [RCON-FU]



← Select! **6**

Even when a fan unit is installed, the ambient operating environment for the simple absolute unit is 0 to 40°C.

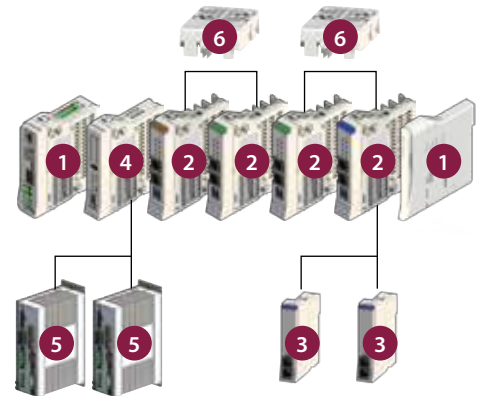
Procedure 9 Unit Model to Order

Please specify each unit model number for ordering.

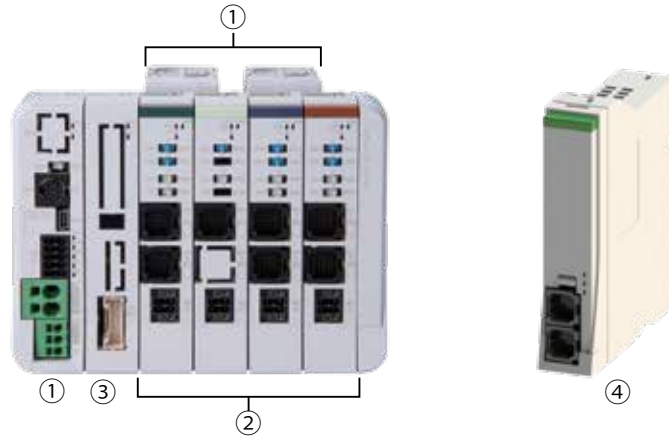
<Selection example>

RCON

- Gateway unit (with 2 fan units) [RCON-GW-CC-FU2] **1** **6**
- Extension unit [RCON-EXT] **4**
- Driver unit [RCON-DC-1] **2**
- Driver unit [RCON-PC-2] **2**
- Driver unit [RCON-PC-1] **2**
- Driver unit [RCON-AC-2] **2**
- Simple Absolute unit [RCON-ABU-A] x 2 units **3**
- RCON connection specification SCON [SCON-*.***-RC] x 2 units **5**



Model Specification Items



① Gateway unit

RCON - [] - [] - []

Series Type I/O Option

GW	Standard type	DV	DeviceNet connection specification	FU <input type="checkbox"/>	Fan unit installed (<input type="checkbox"/> :specify the number of units, 1 to 8)
GWG	Safety category compliant type	CC	CC-Link connection specification	TRN	Without terminal unit
		CIE	CC-Link IE Field connection specification	* A terminal unit is definitely necessary for operation.	
		PR	PROFIBUS-DP connection specification		
		EC	EtherCAT connection specification		
		EP	EtherNet/IP connection specification		
		PRT	PROFINET IO connection specification		

② Driver Unit

RCON - [] - []

Series Type Number of axes

PC	Stepper motor	1	1-axis specification
PCF	High-thrust stepper motor	2	2-axis specification
AC	AC servo motor		
DC	DC brushless motor		

Type: PC 1.2A motor 1 axis 2 axes	20P	20 <input type="checkbox"/> stepper motor
	20SP	20 <input type="checkbox"/> stepper motor (for RA2AC/RA2BC)
	28P	28 <input type="checkbox"/> stepper motor
	35P	35 <input type="checkbox"/> stepper motor
	42P	42 <input type="checkbox"/> stepper motor
	42SP	42 <input type="checkbox"/> stepper motor (for RCP4-RA5C)
Type: PCF 4A motor 1 axis	56P	56 <input type="checkbox"/> stepper motor
	56SP	56 <input type="checkbox"/> High-thrust stepper motor
	60P	60 <input type="checkbox"/> High-thrust stepper motor
	86P	86 <input type="checkbox"/> High-thrust stepper motor

* Type: Only one axis is selectable for PCF

Type: AC 2-30W motor 1 axis 2 axes	2	2W servo motor
	5	5W servo motor
	10	10W servo motor
	20	20W servo motor
	20S	20W servo motor (for RCA2-SA4/RCA-RA3)
	30	30W servo motor

Type: DC 3D motor 1 axis 2 axes	3D	2.5W DC brushless motor
--	----	-------------------------

③ Extension Unit

RCON - EXT

Series Extension

④ Simple Absolute Unit

RCON - ABU - []

Series Absolute unit Type

P	Stepper motor
A	AC servo motor

⑤ SCON Controller (for connecting RCON)

SCON - [] - [] - [] - [] - RC - 0 - []

Type Motor Encoder Option I/O I/O cable length Power voltage

Please refer to SCON (P7-143) for model selection items.

System Configuration

Controller

Option

PC dedicated teaching software
(See P7-65)
<Model: IA-OS>
<Model: RCM-101-MW/USB>



for IA-OS: USB cable
for RCM-101:
Supplied with the PC dedicat-
ed teaching software

Option

Touch panel teaching pendant
(See P7-65)
<Model: TB-03> <Model: TB-02>



Supplied with GWG Specification
Dummy plug
(See P7-66)
<Model: DP-5>



Field network

DeviceNet, CC-Link,
CC-Link IE Field, EtherCAT,
EtherNet/IP,
PROFIBUS-DP, PROFINET IO

Supplied with gateway
unit
System I/O connector
(See P7-66)
<Model: DFMC 15.5-ST-3.5>



Option

Fan unit
(See P7-66)
<Model: RCON-FU>

Supplied with Simple Absolu-
te Unit
Connection cable
(See P7-68)
<Model: CB-ADPC-MPA005>



Option

24V Power supply
(See P7-66)
<Model: PSA-24(L)>



Supplied with SCON-CB
(RC specification)
Connection cable
(See P7-70)
<Model: CB-RE-CTL002>



Supplied with Driver unit
Drive power shutoff connector
(See P7-66)
<Model: DFMC1.5/2-STF-3.5>



Option

Simple absolute unit
(See P7-60)
<Model: RCON-ABU-P
(for stepper motor)>
<Model: RCON-ABU-A
(for AC servo motor)>

RCON connection
specification
SCON controller
[IO: RC]
(See General Catalog)

Supplied with extension unit
Terminal connector
(See P7-66)
<Model: RCON-EXT-TR>



Motor-Encoder Cable *

Connectable actuators

RCS2/3/4 series
DDA series
LSA series
IS(D)B series
SSPA series

Please refer to P7-60 for the actuators that are not connectable.

PCP2/3/4/5/6 series

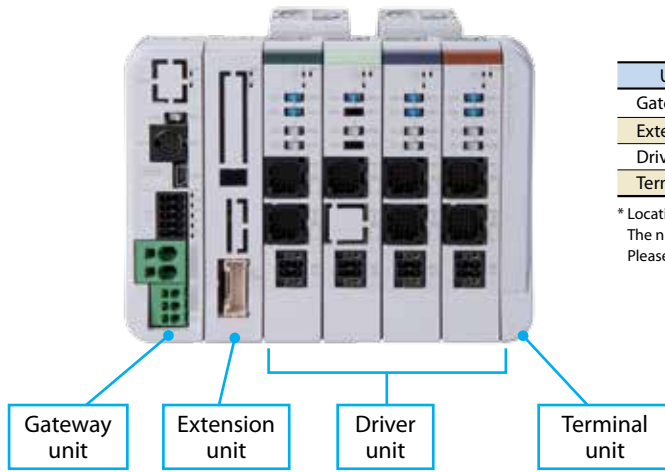
RCA/2 series

RCD series

* The motor - encoder cable is supplied with the actuator.
The motor - encoder cable varies depending on the connected actuator.
When ordering maintenance cables, please refer to P7-67.

Unit Configuration

The RCON has a unit-linkage construction. Please link the units according to the conditions described below.



Unit name	Number of connected units	Location
Gateway unit	1	Left end
Extension unit	1	Right side, next to gateway unit
Driver unit	Max. 16 axes*	Left side, next to terminal unit
Terminal unit	1	Right end

* Locations are exchangeable within the driver unit.
 The number of maximum connectable axes varies depending on the operation mode.
 Please refer to the "Number of maximum connectable axes" on P7-61 for details.

Unit name and List of single unit model numbers

Product name		Model number	Reference page
Gateway unit (GWG: Safety category type)	DeviceNet connection specification	RCON-GW/GWG-DV	P7-55
	CC-Link connection specification	RCON-GW/GWG-CC	P7-55
	CC-Link IE Field connection specification	RCON-GW/GWG-CIE	P7-56
	PROFIBUS-DP connection specification	RCON-GW/GWG-PR	P7-56
	EtherCAT connection specification	RCON-GW/GWG-EC	P7-57
	EtherNet /IP connection specification	RCON-GW/GWG-EP	P7-57
	PROFINET IO connection specification	RCON-GW/GWG-PRT	P7-58
Extension unit	SCON-CB connection	RCON-EXT	P7-60
	Terminal connector (for SCON-CB)	RCON-EXT-TR	P7-66
Driver unit	Stepper motor, 1-axis specification	RCON-PC-1	P7-59
	Stepper motor, 2-axis specification	RCON-PC-2	
	High-thrust stepper motor, 1-axis specification	RCON-PCF-1	
	AC servo motor, 1-axis specification	RCON-AC-1	
	AC servo motor, 2-axis specification	RCON-AC-2	
	DC brush-less motor, 1-axis specification	RCON-DC-1	
Terminal unit	DC brush-less motor, 2-axis specification	RCON-DC-2	P7-60
	Supplied with gateway unit	RCON-GW-TR	
Simple absolute unit (1-axis specification)	For RCON-PC	RCON-ABU-P	P7-60
	For RCON-AC	RCON-ABU-A	
Fan unit	One unit for 2 driver units	RCON-FU	P7-66

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Basic Specifications

Item	Specification			
Power voltage	24VDC±10%			
Power current	Varies depending on the system configuration. (See P7-54)			
Number of controlled axes	1-16 axes * Refer to the "Number of the maximum connectable axes" on P7-61 for the maximum axes.			
Encoder resolution [pulse/r]	Stepper motor	Incremental	800	
		Battery-less absolute	RCP4/RCP5	800
			RCP6	8192
	AC servo motor	Incremental	RCA	800
		Battery-less absolute		16384
		Incremental	RCA2-***N/NA	1048
	DC brush-less motor	Incremental	RCA2-***N/NAN以外	800
			RCD-RA1R/GRSN	400
RCD-RA1DA/GRSNA	480			
Compatible field network	DeviceNet, CC-Link, CC-Link IE Field, PROFIBUS-DP, EtherCAT, EtherNet/IP, PROFINET IO			
Configured units	Gateway unit, Driver unit, Extension unit, Simple absolute unit (See P7-55)			
SIO Interface	Teaching port	Communication method	RS485	
		Communication speed	9.6/19.2/38.4/57.6/115.2/230.4kbps	
	USB port	Communication method	USB	
		Communication speed	12Mbps	
Emergency stop/Enable operation	The whole system reacts to the STOP signal of the gateway unit. Equipped with a connector that can shut off power supply of each axis by individual driver unit.			
Data storage device	Storing the position data and parameters in the involatile memory (no limit on the number of writing)			
Calendar function	Data retention function: approx. 10 days, Energizing time: approx. 100 hours			
Safety category compliance	B (The safety category compliance specification conforms with up to Class 4 by using an external circuit.)			
Protection function	Over current, Abnormal temperature, Encoder disconnection, Overload			
Preventive & predictive maintenance function	Low capacity of electrolytic condenser, Low fan rotational speed			
Operating ambient temperature	0-55°C * 0-40°C for simple absolute unit			
Operating ambient humidity	85%RH or less. No condensing			
Operating ambient atmosphere	No corrosive gases, no significant dust			
Vibration resistance	Vibration frequency 10 to 57Hz/amplitude: 0.075mm, Vibration frequency 57 to 150Hz/acceleration 9.8m/S ² XYZ directions each Sweepage time: 10 minutes Number of sweepages: 10 times			
Shock resistance	Drop height 800mm, 1 corner, 3 edges, 6 surfaces			
Electric shock protection mechanism	Class III			
Degree of protection	IP20			
Dielectric strength voltage	DC500V, 10MΩ			
Calorific value (per unit)	RCN-PC	Power CON: No	5.0W	
		Power CON: Yes	8.0W	
	RCN-PCF	Power CON: No	19.2W	
	RCN-AC	Standard/High-acceleration-deceleration/Energy-saving	4.5W	
	RCN-DC	Standard	3.0W	
Cooling method	Natural cooling, (optional) Forced cooling by fan unit			
Linkage between units	Unit-linkage method			
Installation method	Mounted on DIN rail (35mm)			
Standard	CE marking, UL certificate, RoHS			

Power supply capacity

Please make a selection after confirming that as a result of the calculation of the control power and motor power for each unit based on the connection configuration, the calculated current does not exceed the current limit.

Item	Current limit value
Control power	9.0A or smaller
Motor power	37.5A or smaller

Power supply capacity by unit

Item	Specification								
Power voltage	24VDC±10%								
Control power capacity (per unit)	Gateway unit (including terminal unit)				0.8A				
	Driver unit (common in all types)	Brake: No				0.2A			
		Brake: Yes (1 axis)				0.4A			
		Brake: Yes (2 axes)				0.6A			
	Extension unit				0.1A				
Simple absolute unit (common in all types)				0.2A					
Motor power capacity (per one axis of actuator)	Actuator/driver unit				Rated current	Max. current			
		Series	Motor type			Energy-saving enabled			
	Stepper motor /RCON-PC	RCP2	20P/20SP/28P	without Power CON		0.8A	—	—	
		RCP3	28P*						1.9A
		RCP4 RCP5 RCP6	28P/35P/42P/ 42SP/56P		without Power CON		1.9A	—	—
					with Power CON		2.3A	—	3.9A
	Stepper motor /RCON-PCF	RCP2 RCP4 RCP5 RCP6	56SP/60P/86P	without Power CON		5.7A	—	—	
	AC servo motor /RCON-AC	RCA RCA2	5W	Standard/ High acceleration-deceleration		1.0A	—	3.3A	
			10W	Standard/ High acceleration-deceleration/ Energy-saving		1.3A	2.5A	4.4A	
			20W			1.3A	2.5A	4.4A	
			20W (20S)			1.7A	3.4A	5.1A	
			30W	1.3A	2.2A	4.0A			
		RCL	2W 5W 10W		Standard/ High acceleration-deceleration		0.8A	—	4.6A
							1.0A	—	6.4A
							1.3A	—	6.4A
DC brush-less motor /RCON-DC		RCD	3W	Standard		0.7A	—	1.5A	

* Compatible models: RCP2-RA3 and RCP2-RGD3

System Configuration

Controller

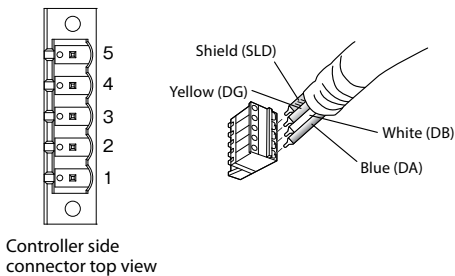
Gateway Unit

- Features Unit to be connected to field networks.
(GWG specification is a safety category compliant type.)

Gateway unit DeviceNet connection specification



Network connector



Specifications

Model RCON-GW/GWG-DV

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	154g
External dimensions	W30mm x H115mm x D95mm

Connector		Connector (make)	Remarks
System I/O	Cable side	DFMC1.5/5-ST-3.5	Supplied standard item
Network	Cable side	MSTB2.5/5-STF-5.08 AUM (Phoenix Contact)	Supplied standard item
	Controller side	MSTBA2.5/5-GF-5.08 AU (Phoenix Contact)	

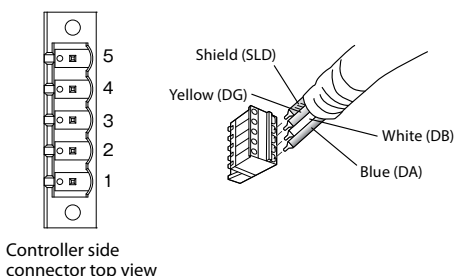
Network connection cable

Pin NO.	Signal name (color)	Description	Adoptable wire diameter
1	V- (black)	Power cable - side	DeviceNet dedicated cable
2	CAN L (blue)	Communication data Low side	
3	—	Drain (shield)	
4	CAN H (white)	Communication data High side	
5	V+ (red)	Power cable + side	

Gateway Unit CC-Link connection specification



Network connector



Specifications

Model RCON-GW/GWG-CC

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	154g
External dimensions	W30mm x H115mm x D95mm

Connector		Connector (make)	Remarks
System I/O	Cable side	DFMC1.5/5-ST-3.5	Supplied standard item
Network	Cable side	MSTB2.5/5-STF-5.08 AU (Phoenix Contact) With terminal resistor 10Ω/130Ω	Supplied standard item
	Controller side	MSTB2.5/5-GF-5.08 AU (Phoenix Contact)	

Network connection cable

Pin NO.	Signal name (color)	Description	Adoptable wire diameter
1	DA (blue)	Communication line A	CC-Link dedicated cable
2	DB (white)	Communication line B	
3	DG (yellow)	Digital ground	
4	SLD	Connect shield of shield cable (Connect the 5 pin FG and the control power connector 1 pin FG internally.)	
5	FG	Frame ground (Connect the 4 pin SLD and the control power connector 1 pin FG internally.)	

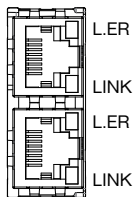
System Configuration

Controller

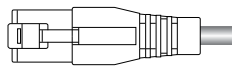
Gateway Unit CC-Link IE Field connection specification



Network connector



Controller side connector top view



Specifications

Model RCON-GW/GWG-CIE

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	165g
External dimensions	W30mm x H115mm x D95mm

Connector	Connector (make)	Remarks
System I/O	Cable side DFMC1.5/5-ST-3.5	Supplied standard item
Network	Cable side Ethernet ANSI/TIA/EIA-568-B Category 5e or higher with shield 8P8C modular plug (RJ45)	Customer's supply
	Controller side Ethernet ANSI/TIA/EIA-568-B Category 5e or higher with shield 8P8C modular plug (RJ45)	

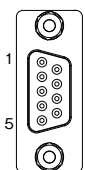
Network connection cable

Pin NO.	Signal name (color)	Description	Adoptable wire diameter
1	TP0 +	Data 0 +	Use an Ethernet cable of Category 5e or higher, straight STP cable.
2	TP0 -	Data 0 -	
3	TP1 +	Data 1 +	
4	TP2 +	Data 2 +	
5	TP2 -	Data 2 -	
6	TP1 -	Data 1 -	
7	TP3 +	Data 3 +	
8	TP3 -	Data 3 -	

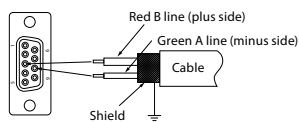
Gateway Unit PROFIBUS-DP connection specification



Network connector



Controller side connector top view



Specifications

Model RCON-GW/GWG-PR

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	158g
External dimensions	W30mm x H115mm x D95mm

Connector	Connector (make)	Remarks
System I/O	Cable side DFMC1.5/5-ST-3.5	Supplied standard item
Network	Cable side 9pin D-sub connector (male)	Customer's supply
	Controller side 9pin D-sub connector (female)	

Network connection cable

Pin NO.	Signal name (color)	Description	Adoptable wire diameter
1	NC	Not connected	PROFIBUS-DP dedicated cable (type A: EN5017)
2	NC	Not connected	
3	B-Line	Communication line B (RS485)	
4	RTS	Transmission request	
5	GND	Signal GND (isolated)	
6	+5V	+5V output (isolated)	
7	NC	Not connected	
8	A-Line	Communication line A (RS485)	
9	NC	Not connected	

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

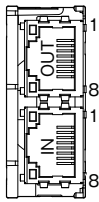
System Configuration

Controller

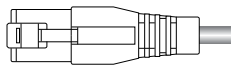
Gateway Unit EtherCAT Connection Specification



Network connector



Controller side connector top view



Specifications

Model RCON-GW/GWG-EC

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	152g
External dimensions	W30mm x H115mm x D95mm

Connector	Connector (make)	Remarks
System I/O	Cable side DFMC1.5/5-ST-3.5	Supplied standard item
Network	Cable side Ethernet ANSI/TIA/EIA-568-B Category 5 or higher 8P8C modular plug with shield (RJ45)	Customer's supply
	Controller side Ethernet ANSI/TIA/EIA-568-B Category 5 or higher 8P8C modular plug with shield (RJ45)	

Network connection cable

Pin NO.	Signal name (color)	Description	Adoptable wire diameter
1	TD +	Transmission data +	Use an Ethernet cable of Category 5 or higher, straight STP cable
2	TD -	Transmission data -	
3	RD +	Receiving data +	
4	-	Not used	
5	-	Not used	
6	RD -	Receiving data -	
7	-	Not used	
8	-	Not used	

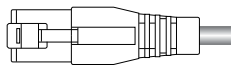
Gateway Unit EtherNet/IP Connection Specification



Network connector



Controller side connector top view



Specifications

Model RCON-GW/GWG-EP

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	156g
External dimensions	W30mm x H115mm x D95mm

Connector	Connector (make)	Remarks
System I/O	Cable side DFMC1.5/5-ST-3.5	Supplied standard item
Network	Cable side Ethernet ANSI/TIA/EIA-568-B Category 5 or higher 8P8C modular plug with shield (RJ45)	Customer's supply
	Controller side Ethernet ANSI/TIA/EIA-568-B Category 5 or higher 8P8C modular plug with shield (RJ45)	

Network connection cable

Pin NO.	Signal name (color)	Description	Adoptable wire diameter
1	TD +	Transmission data +	Use an Ethernet cable of Category 5 or higher, straight STP cable.
2	TD -	Transmission data -	
3	RD +	Receiving data +	
4	-	Not used	
5	-	Not used	
6	RD -	Receiving data -	
7	-	Not used	
8	-	Not used	

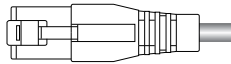
Gateway Unit PROFINET IO connection specification



Network connector



Controller side connector top view



Specifications

Model RCON-GW/GWG-PRT

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	158g
External dimensions	W30mm x H115mm x D95mm

Connector		Connector (make)	Remarks
System I/O	Cable side	DFMC1.5/5-ST-3.5	Supplied standard item
Network	Cable side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher 8P8C modular plug with shield (RJ45)	Customer's supply
	Controller side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher 8P8C modular plug with shield (RJ45)	

Network connection cable

Pin NO.	Signal name (color)	Description	Adoptable wire diameter
1	TD +	Transmission data +	Use an Ethernet cable of Category 5 or higher, straight STP cable.
2	TD -	Transmission data -	
3	RD +	Receiving data +	
4	-	Not used	
5	-	Not used	
6	RD -	Receiving data -	
7	-	Not used	
8	-	Not used	

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

System Configuration

Controller

Driver Unit

- **Features** Controller unit to control actuators.
One unit can be connected up to 2 axes.

Driver Unit for connecting RCP series

Driver unit for connecting stepper motors.
All the RCP series actuators can be connected.



Model	Type	Compatible motor capacity
RCON-PC-1	1 axis connection	1.2A (□ 20/28/35/42/56)
RCON-PC-2	2 axes connection	
RCON-PCF-1	1 axis connection * for high-thrust	4A (□ 56/60/86)

Specifaions

Power supply	24VDC±10%
Control power	(without brake) 0.2A (with brake, 1-axis) 0.4A (with brake, 2-axis) 0.6A
Operating ambient temperature/humidity	(without fan) 0-40°C (with fan) 0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	(1 axis) 175g (2 axes) 180g
External dimensions	W22.6mm x H115mm x D95mm
Accessories	Drive power cutoff connector (DFMC1.5/2-STF-3.5)

Driver Unit for connecting RCA series

Driver unit for connecting AC servo motors.
All the RCA series actuators can be connected.



Model	Type	Compatible motor capacity
RCON-AC-1	1 axis connection	2W - 30W
RCON-AC-2	2 axes connection	

Specifaions

Power supply	24VDC±10%
Control power	(without brake) 0.2A (with brake, 1-axis) 0.4A (with brake, 2-axis) 0.6A
Operating ambient temperature/humidity	(without fan) 0-40°C (with fan) 0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	(1 axis) 175g (2 axes) 180g
External dimensions	W22.6mm x H115mm x D95mm
Accessories	Drive power cutoff connector (DFMC1.5/2-STF-3.5)

Driver Unit for connecting RCD series

Driver unit for connecting DC brush-less motors.
All the RCD series actuators can be connected.



Model	Type	Compatible motor capacity
RCON-DC-1	1 axis connection	3W
RCON-DC-2	2 axes connection	

Specifaions

Power supply	24VDC±10%
Control power	(without brake) 0.2A (with brake, 1-axis) 0.4A (with brake, 2-axis) 0.6A
Operating ambient temperature/humidity	(without fan) 0-40°C (with fan) 0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	(1 axis) 175g (2 axes) 180g
External dimensions	W22.6mm x H115mm x D95mm
Accessories	Drive power cutoff connector (DFMC1.5/2-STF-3.5)

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

Other Units

Extension Unit

Possible to operate actuators with 200V motors by means of connecting SCON-CB/CGB.



Model
RCON-EXT

Specifications

Power supply	24VDC±10%
Control power	0.1A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	96g
External dimensions	W22.6mm × H115mm × D95mm
Accessory	Terminal connector

Actuators that cannot be connected

Servo press type, ISA-W21, SCARA robots, TTA, ZR unit, Wrist units

Terminal Unit

An end point of serial communication of RCON and a terminal resistor of the input/output signals.
(It comes with the gateway unit as a standard supplied item.)



Model
RCON-GW-TR

Price is for a single unit.
The price is included in the gateway unit ordered, unless an option "TRN" is selected.

Specifications

Power supply	24VDC±10%
Control power	0.8A
Operating ambient temperature/humidity	0-55°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	48g
External dimensions	W12.6mm × H115mm × D95mm

Simple Absolute Unit

This unit is connected when an incremental actuator is used as an absolute specification.



Model	Type	Compatible motor capacity
RCON-ABU-P	for RCP series	Stepper motor
RCON-ABU-A	for RCA series	AC servo motor

Specifications

Power supply	24VDC±10%
Control power	0.2A
Absolute battery model	AB-7
Battery voltage	3.6V
Charging time	Approx. 72 hours
Operating ambient temperature/humidity	0-40°C, 85%RH or less, non-condensing
Operating atmosphere	No corrosive gases, no significant dust
Degree of protection	IP20
Weight	271g (including 173g of absolute battery)
External dimensions	W22.6mm×H115mm×D95mm
Accessory	Cable (CB-ADPC-MPA005)

- EC
- RCP6S
- RCON
- MCON-C/LC
- PCON-CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON-CB
- (Servo press)
- SCON-LC
- SCON-CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Field network operation mode

In the field network control operation mode, an operation is performed by one of the following control modes. The operation is performed by writing the necessary data (target position, speed, acceleration, push current value, etc.) from the host PLC device into the predetermined address.

Operation mode	Description	Overview
Direct numerical control mode	The target position, speed, acceleration/deceleration and push current limit values can be specified. In addition to the current position in 0.01mm units, the current speed and current command value can be monitored.	
Simple direct numerical value mode	Target positions can be specified directly in numeric values. The current position can be monitored in 0.01mm units.	
Positioner 1 mode	The position data can be registered up to 128 points and pauses can be made at the registered positions. The current position can be monitored in 0.01mm units.	
Positioner 2 mode	The position data can be registered up to 128 points and pauses can be made at the registered positions. The current position can not be monitored. This mode contains subset data that has been eliminated transmit/receive data from the positioner 1 mode.	
Positioner 3 mode	The position data can be registered up to 128 points and pauses can be made at the registered positions. The current position can not be monitored. This mode contains subset data that has been eliminated transmit/receive data from the positioner 2 mode, and controls using the minimum signals required for motions.	
Positioner 5 mode	The position data can be registered up to 16 points and pauses can be made at the registered positions. The current position can not be monitored. This mode contains a subset data that has been eliminated transmit/receive data and position table from the positioner 2 mode, and the current positions can be monitored in 0.1mm units.	

Number of Maximum Connectable Axes

Operation mode	Direct numerical control mode	Simple direct numerical mode	Positioner 1 mode	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Field network						
DeviceNet	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes
CC-Link	16 axes	16 axes	16 axes	16 axes	16 axes	16 axes
CC-Link IE Field	16 axes	16 axes	16 axes	16 axes	16 axes	16 axes
PROFIBUS-DP	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes
EtherCAT	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes
EtherNet/IP	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes
PROFINET IO	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes

List of Functions by Operation Mode

	Direct numerical control mode	Simple direct numerical mode	Positioner 1 mode	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Number of positioning points	No limit	128 points	128 points	128 points	128 points	16 points
Home return operation	○	○	○	○	○	○
Positioning operation	○	○	△	△	△	△
Setting of velocity and acceleration/ deceleration	○	△	△	△	△	△
Different setting of acceleration and deceleration	×	△	△	△	△	△
Pitch feeding (incremental)	○	△	△	△	×	△
JOG operation	△	△	△	△	×	△
Writing position data	×	×	○	○	×	×
Push-motion operation	○	△	△	△	△	△
Speed change while travelling	○	△	△	△	△	△
Pause	○	○	○	○	○	○
Zone signal output	△ (2 points)	△ (2 points)	△ (2 points)	△ (2 points)	△ (1 point)	△ (2 points)
Position zone signal output	×	△	△	△	×	×
Overload alarm output	○	○	○	○	×	○
Damping control (Note 1)	×	△	△	△	△	△
Read current value (Note 2) (Resolution)	○ (0.01mm)	○ (0.01mm)	○ (0.01mm)	×	×	○(Note 3) (0.01mm)

*○: Direct setting possible, △: Position data or parameter input is needed, ×: Operation not possible.

(Note 1) Function limited to AC servo motor specification.

(Note 2) When a SCON controller is used to control a DDA motor, the resolution is 0.001 degrees (0.01 degrees in positioner 5 mode).

(Note 3) The maximum output value in the positioner 5 mode is 3,276.7mm (327.67 degrees for DDA motor).

When controlling the actuator in an operation range exceeding the maximum value, please use another operation mode.

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

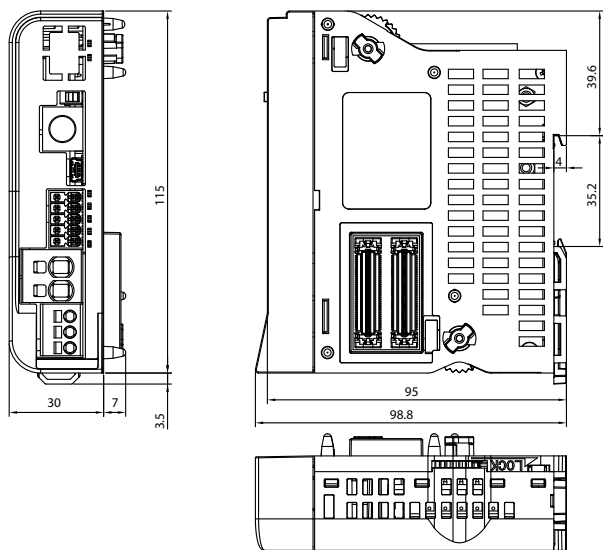
PSA-24

TB-02

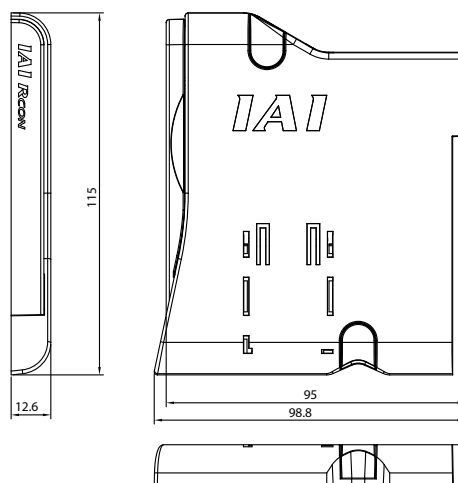
TB-03

External Dimensions

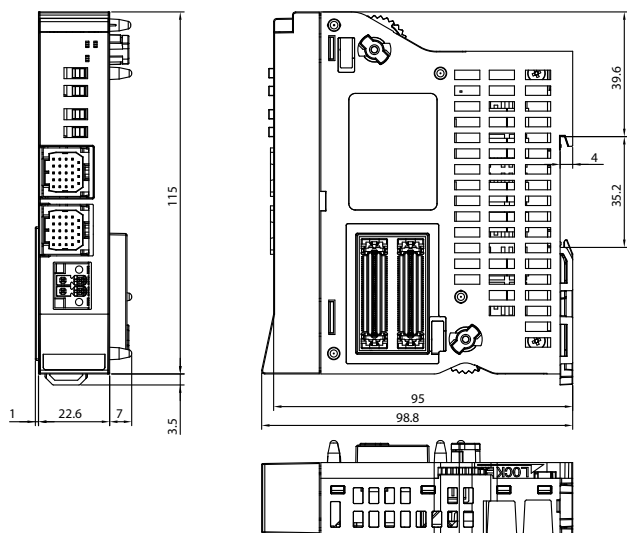
Gateway unit



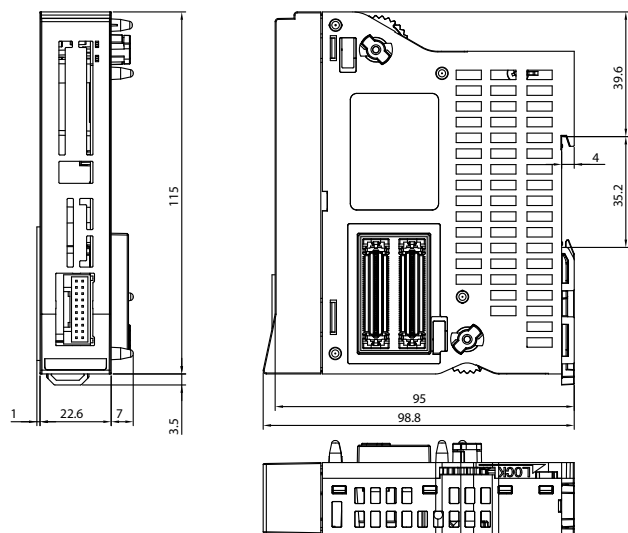
Terminal unit



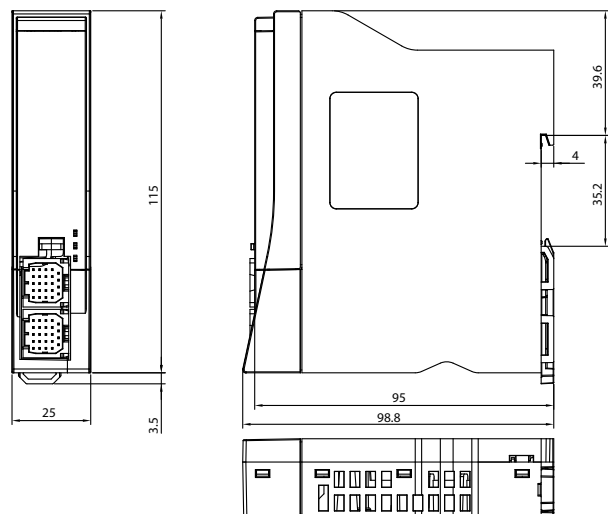
Driver unit



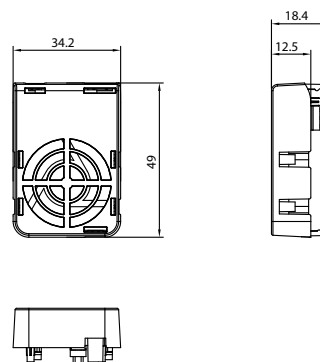
Extension unit



Simple absolute unit



Fan unit



Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

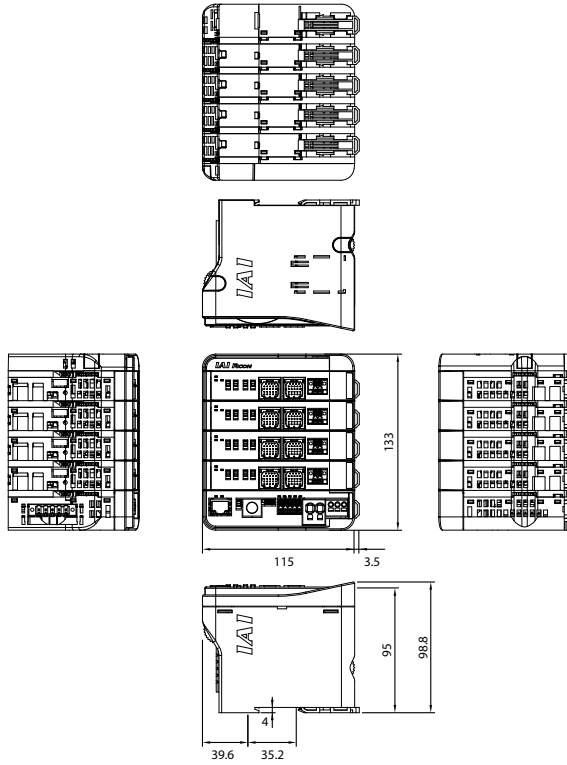
PSA-24

TB-02

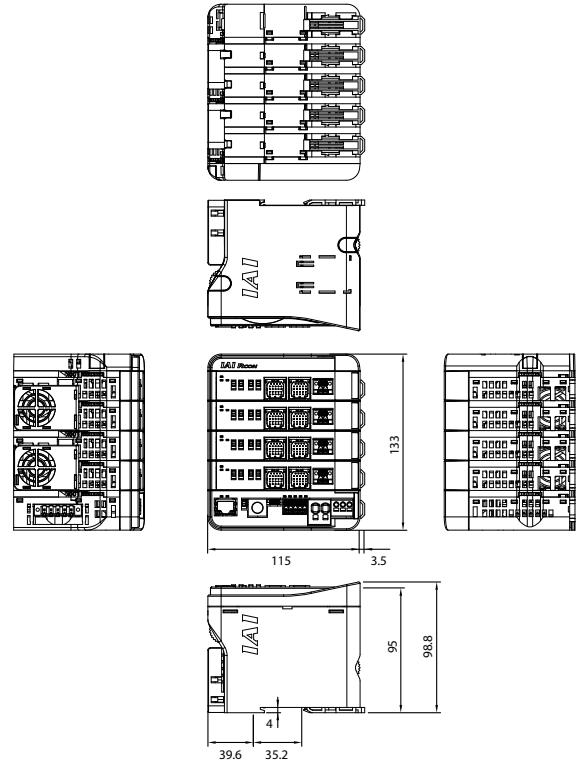
TB-03

Examples of Combined Units

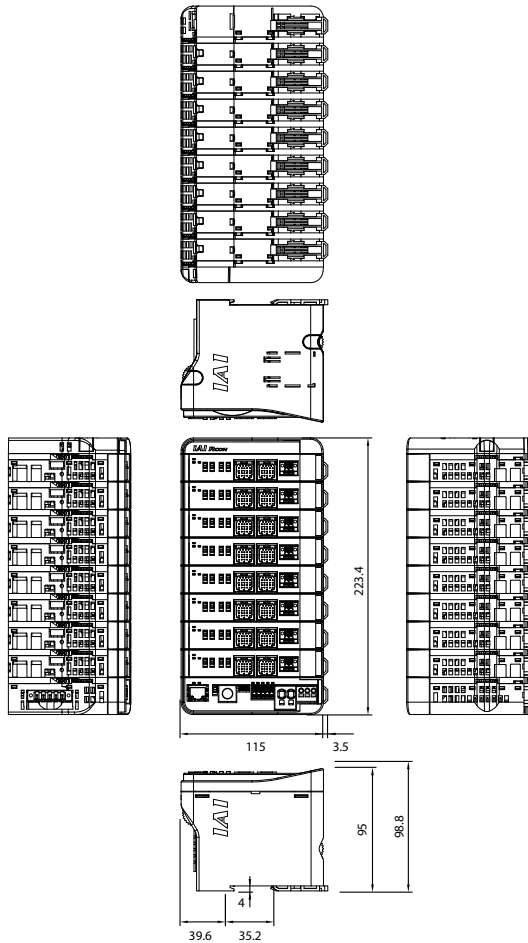
Four Driver units without fan



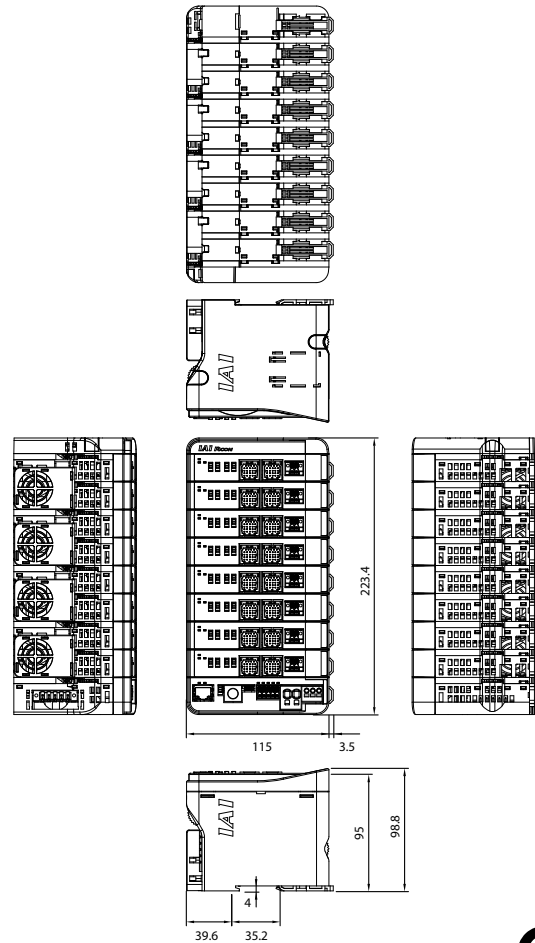
Four Driver units with fan



Eight driver units without fan



Eight driver units with fan



Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

Option

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

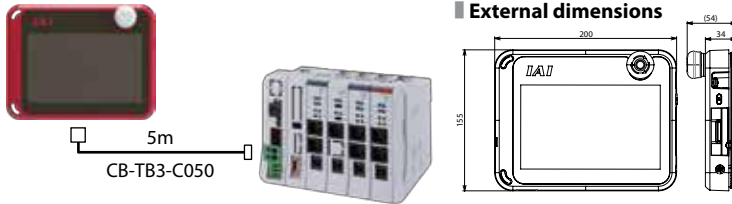
TB-03

Touch Panel Teaching Pendant

Features Teaching device with functions such as position input, trial run and monitoring.

Model **TB-03**-□ Please visit IAI website for compatible versions.

Configuration



Specification

Rated voltage	24VDC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operational temperature	0 to 40°C
Ambient operational humidity	20 to 85% RH (non-condensing)
Protection class	IPX0
Weight	670g (in case of TB-03 main unit only)
Charging method	Dedicated AC adapter / Wired connection with controller
Wireless connection	Bluetooth 4.2 Class 2

Model **TB-02(D)**-□ Please visit IAI website for compatible versions.

Configuration



Specification

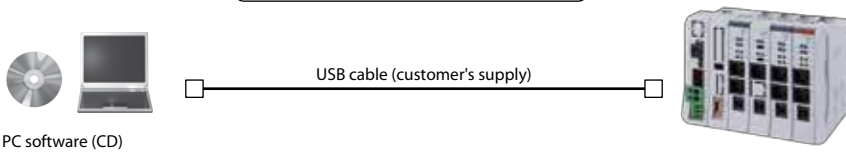
Rated voltage	24VDC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operational temperature	0 to 40°C
Ambient operational humidity	20 to 85% RH (non-condensing)
Protection class	IP20
Weight	470g (in case of TB-02 main unit only)

PC dedicated Teaching Software (Windows only)

Features Startup supporting software for position input, trial run and monitoring, etc. Reduces the startup time by substantial supporting functions necessary for adjustments.

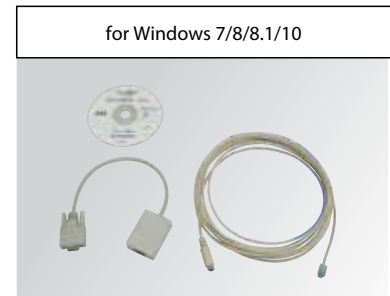
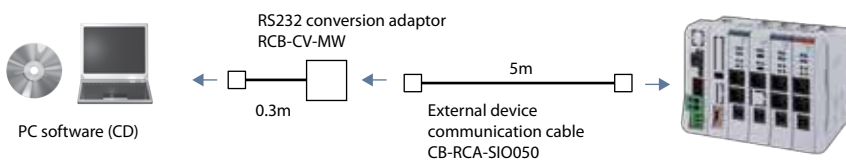
Model **IA-OS**

Configuration Please visit IAI website for compatible versions.



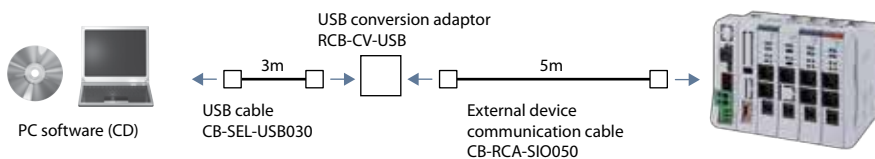
Model **RCM-101-MW** (with external device communication cable + RS232 conversion unit)

Configuration Please visit IAI website for compatible versions.



Model **RCM-101-USB** (With external device communication cable + USB conversion adaptor + USB cable)

Configuration Please visit IAI website for compatible versions.



24V Power Supply

Overview Power supply unit that has the same height as the RCON's and that can be installed easily.
It can also monitor the status of power supply by connecting the RCON.

Model PSA-24 (without fan)

Model PSA-24L (with fan)



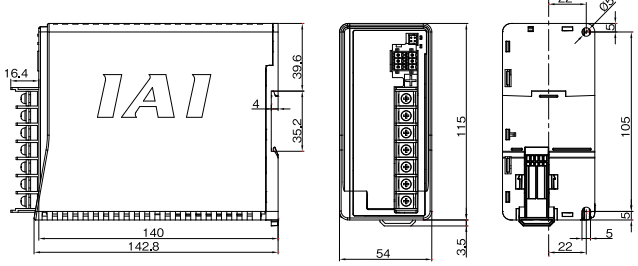
Specification Table

Model	Specification	
	AC100V input	AC200V input
Input power voltage range	AC100V - AC230V±10%	
Input power current	3.9A or smaller	1.9A or smaller
Power supply capacity RCON-PC-2	without fan: 250VA	without fan: 280VA
	with fan: 390VA	with fan: 380VA
Rush current *1	without fan: 17A (typ) with fan: 27.4A (typ)	without fan: 34A (typ) with fan: 54.8A (typ)
Caloric value	28.6W	20.4W
Output voltage range *2	24V±10%	
Continuous rated output	Without fan: 8.5A (204W), with fan: 13.8A (330W)	
Peak output	17A (408W)	
Efficiency	86% or higher	90% or higher
Parallel linkage *3	Max. 5 units	

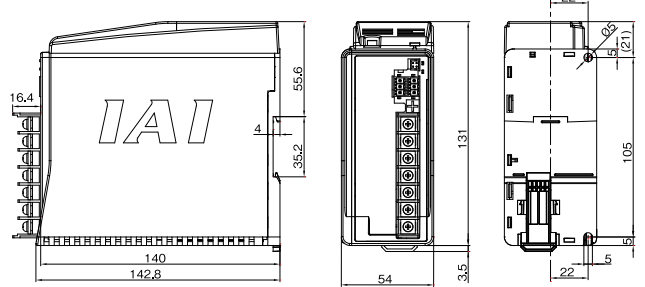
*1 The pulse duration of the rush current is 5ms or smaller.
*2 To enable parallel operations, this power supply unit can change output voltage according to load. For this reason, this power supply unit is dedicated to IAI controllers.
*3 Parallel connections under the following conditions are not possible.
* Parallel connections of PSA-24 (without fan specification) and PSA-24L (with fan specification).
* Parallel connections with the power supply units other than this unit.
* Parallel connection with PS-24.

External dimensions

PSA-24



PSA-24L



Maintenance Parts

Fan Unit

Overview Option to forced-cool the driver unit. One fan unit is necessary for 2 driver units.

Model RCON-FU



Dummy Plug

Overview Necessary for safety category compliant specification (GWG).

Model DP-5



System I/O Connector

Overview Connector for emergency stop input and external input to change operation mode, etc.

Model DFMC1.5/5-ST-3.5



Drive Power Cutoff Connector

Overview Connector for input of the drive power cutoff

Model DFMC1.5/2-STF-3.5



Terminal Connector

Overview Necessary as a terminal resistor when connecting SCON.

Model RCON-EXT-TR



Replacement Battery

Overview Replacement battery for simple absolute unit.

Model AB-7



- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
DCON-CB
- ACON
DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Maintenance Parts (Cables)

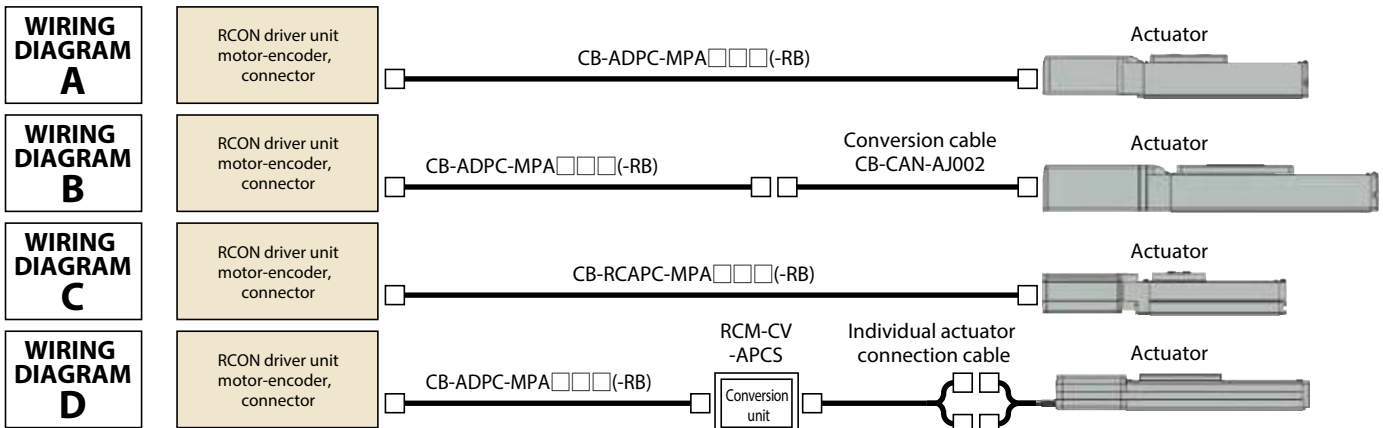
When ordering maintenance cables after the purchase of the product, please refer to the following model numbers.

Table of Cables

No.	Actuator		Applicable controller model number	RCON connecting cable (Note 2) (-RB: Robot cable) [Connecting cable for actuators]	Conversion unit	Wiring diagram
	Series	Applicable type				
①	RCP6 RCP6CR RCP6W	Other than high-thrust type (Note 1)	P5	CB-ADPC-MPA□□□(-RB)	—	A
②	RCP5 RCP5CR RCP5W	High-thrust type (Note 1)	P6	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (Conversion cable)	—	B
③		Gripper (GR*), ST4525E, SA3/RA3	P5	CB-ADPC-MPA□□□(-RB)	—	A
④	RCP4 RCP4CR RCP4W	High-thrust type (Note 1)	P6	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (Conversion cable)	—	B
⑤		Other than (3) and (4)	P5	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (Conversion cable)	—	B
⑥	RCP3		P5	CB-RCAPC-MPA□□□(-RB)	—	C
⑦		RCP2 Rotary small type of RCP2 (Standard type) RCP2-RTBS/RTBSL/RTCS/RTCSL	P5	CB-ADPC-MPA□□□(-RB) [CB-RPSEP-MPA□□□]	Necessary	D
⑧		RCP2CR (Clean type), RCP2W (dust & splash proof type) Rotary (RT*) of the above types GRS/GRM/GR3SS/GR3SM of the above types	P5	CB-ADPC-MPA□□□(-RB)	—	A
⑨	RCP2 RCP2CR RCP2W	All types (standard/clean/dust- & splash-proof) of GRSS/GRLS/GRST/GRHM/GRHB. Overall length short type (only RCP2) RCP2-SRA4R/SRGS4R/SRGD4R	P5	CB-RCAPC-MPA□□□(-RB)	—	C
⑩		High-thrust type (Note 1)	P6	CB-ADPC-MPA□□□(-RB) [CB-CFA-MPA□□□-RB]	Necessary	D
⑪		Other than (7) - (10)	P5	CB-ADPC-MPA□□□(-RB) [CB-PSEP-MPA□□□]	Necessary	D
⑫	RCA2/RCA2CR/RCA2W, RCL		A6	CB-RCAPC-MPA□□□(-RB)	—	C
⑬	RCA2/RCA2CR/RCA2W (CNS option)		A6	CB-ADPC-MPA□□□(-RB)	—	A
⑭	RCA RCACR RCAW	Overall length short type (RCA only) RCA-SRA4R/SRGS4R/SRGD4R	A6	CB-RCAPC-MPA□□□(-RB)	—	C
⑮		Other than (14)	A6	CB-ADPC-MPA□□□(-RB) [CB-ASEP2-MPA□□□]	Necessary	D
⑯	RCD	RCD-RA1DA, RCD-GRSNA	D6	CB-ADPC-MPA□□□(-RB)	—	A

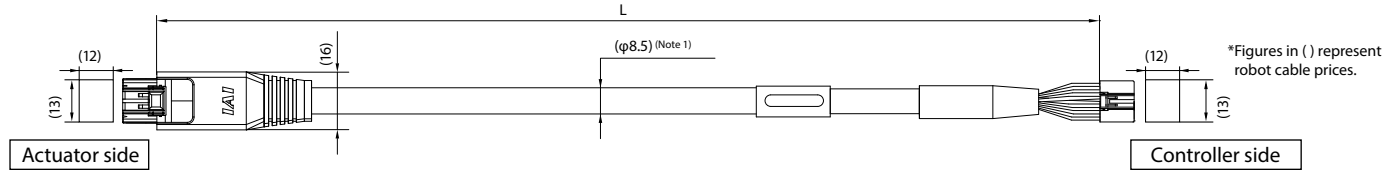
Note 1: Actuators using high-thrust stepper motors (565P, 60P and 86P).

Note 2: The length between each driver unit and the actuator is up to 20m, with or without a conversion unit.
However, the maximum length between the D driver unit and the RCD actuator is up to 10m.



Model **CB-ADPC-MPA** / **CB-ADPC-MPA** -**RB**

*Specify the cable length (L) in □□□, Maximum 20m. Ex) 030=3m.



Minimum bending radius R 5m or less, r=68mm or more (Dynamic bending condition)
 More than 5m, r=73mm or more (Dynamic bending condition)

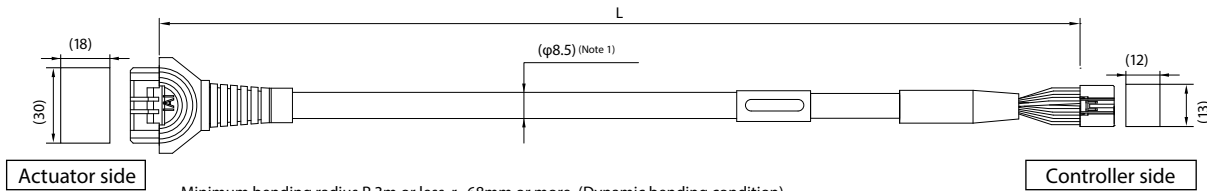
* The robot cable is for flex-resistance. Please use a robot cable when a cable bear is installed inside.

(Note 1) When the cable length is 5m or longer, its diameter is φ9.1.

DF62DL-245-2.2C (Hirose)					DF62DL-245-2.2C (Hirose)				
Color	Signal name			Pin No.	Pin No.	Signal name			Color
	DC	AC	PC			PC	AC	DC	
Blue(AWG22/19)	U	U	φA	3	3	φA	U	U	Blue(AWG22/19)
Orange(AWG22/19)	V	V	VMM	5	5	VMM	V	V	Orange(AWG22/19)
Brown(AWG22/19)	-	-	φB	10	10	φB	-	-	Brown(AWG22/19)
Grey(AWG22/19)	-	-	VMM	9	9	VMM	-	-	Grey(AWG22/19)
Green(AWG22/19)	W	W	φ_A	4	4	φ_A	W	W	Green(AWG22/19)
Red(AWG22/19)	-	-	φ_B	15	15	φ_B	-	-	Red(AWG22/19)
Light blue(AWG26)	A+	A+	SA[mABS]	12	12	SA[mABS]	A+	A+	Light blue(AWG26)
Orange(AWG26)	A-	A-	SB[mABS]	17	17	SB[mABS]	A-	A-	Orange(AWG26)
Green(AWG26)	B+	B+	A+	1	1	A+	B+	B+	Green(AWG26)
Brown(AWG26)	B-	B-	A-	6	6	A-	B-	B-	Brown(AWG26)
Grey(AWG26)	HS1_IN	Z+/SA[mABS]	B+	11	11	B+	Z+/SA[mABS]	HS1_IN	Grey(AWG26)
Red(AWG26)	HS2_IN	Z-/SB[mABS]	B-	16	16	B-	Z-/SB[mABS]	HS2_IN	Red(AWG26)
Black(AWG26)	-	VPS/BAT-	VPS	18	18	VPS	VPS/BAT-	-	Black(AWG26)
Yellow(AWG26)	-	BK+	LS+	8	8	LS+	BK+	-	Yellow(AWG26)
Light blue(AWG26)	-	LS+	BK+	20	20	BK+	LS+	-	Light blue(AWG26)
Orange(AWG26)	-	LS-	BK-	2	2	BK-	LS-	-	Orange(AWG26)
Grey(AWG26)	VCC	VCC	VCC	21	21	VCC	VCC	VCC	Grey(AWG26)
Red(AWG26)	GND	GND	GND	7	7	GND	GND	GND	Red(AWG26)
Brown(AWG26)	-	BK-	LS-	14	14	LS-	BK-	-	Brown(AWG26)
Green(AWG26)	HS3_IN	LS_GND	LS_GND	13	13	LS_GND	LS_GND	HS3_IN	Green(AWG26)
-	-	-	-	19	19	-	-	-	-
Pink(AWG26)	-	BAT+	CF_VCC	22	22	CF_VCC	BAT+	-	Pink(AWG26)
-	-	-	-	23	23	-	-	-	-
Black(AWG26)	FG	FG	FG	24	24	FG	FG	FG	Black(AWG26)

Model **CB-RCAPC-MPA** / **CB-RCAPC-MPA** -**RB**

*Specify the cable length (L) in □□□, Maximum 20m. Ex) 030=3m.



Minimum bending radius R 3m or less, r=68mm or more (Dynamic bending condition)
 More than 3m, r=73mm or more (Dynamic bending condition)

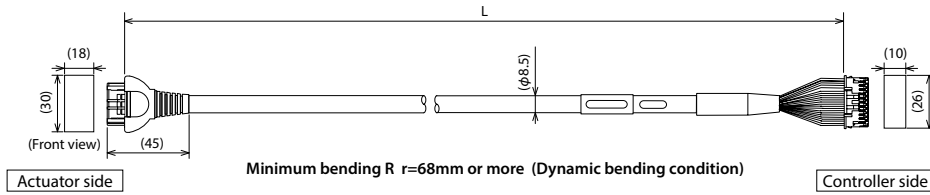
* The robot cable is for flex-resistance. Please use a robot cable when a cable bear is installed inside.

(Note 1) When the cable length is 3m or longer, its diameter is φ9.1.

1-1827863-1(AMP)					DF62DL-245-2.2C (Hirose)				
Color	Signal name			Pin No.	Pin No.	Signal name			Color
	DC	AC	PC			PC	AC	DC	
Blue(AWG22/19)	U	U	φA	A1	3	φA	U	U	Blue(AWG22/19)
Orange(AWG22/19)	V	V	VMM	B1	5	VMM	V	V	Orange(AWG22/19)
Brown(AWG22/19)	-	-	φB	B2	10	φB	-	-	Brown(AWG22/19)
Grey(AWG22/19)	-	-	VMM	A3	9	VMM	-	-	Grey(AWG22/19)
Green(AWG22/19)	W	W	φ_A	A2	4	φ_A	W	W	Green(AWG22/19)
Red(AWG22/19)	-	-	φ_B	B3	15	φ_B	-	-	Red(AWG22/19)
Light blue(AWG26)	A+	A+	SA[mABS]	A6	12	SA[mABS]	A+	A+	Light blue(AWG26)
Orange(AWG26)	A-	A-	SB[mABS]	B6	17	SB[mABS]	A-	A-	Orange(AWG26)
Green(AWG26)	B+	B+	A+	A7	1	A+	B+	B+	Green(AWG26)
Brown(AWG26)	B-	B-	A-	B7	6	A-	B-	B-	Brown(AWG26)
Grey(AWG26)	HS1_IN	Z+/SA[mABS]	B+	A8	11	B+	Z+/SA[mABS]	HS1_IN	Grey(AWG26)
Red(AWG26)	HS2_IN	Z-/SB[mABS]	B-	B8	16	B-	Z-/SB[mABS]	HS2_IN	Red(AWG26)
Black(AWG26)	-	VPS/BAT-	VPS	B9	18	VPS	VPS/BAT-	-	Black(AWG26)
Yellow(AWG26)	-	BK+	LS+	A4	8	LS+	BK+	-	Yellow(AWG26)
Light blue(AWG26)	-	LS+	BK+	A5	20	BK+	LS+	-	Light blue(AWG26)
Orange(AWG26)	-	LS-	BK-	B5	2	BK-	LS-	-	Orange(AWG26)
Grey(AWG26)	VCC	VCC	VCC	A10	21	VCC	VCC	VCC	Grey(AWG26)
Red(AWG26)	GND	GND	GND	B10	7	GND	GND	GND	Red(AWG26)
Brown(AWG26)	-	BK-	LS-	B4	14	LS-	BK-	-	Brown(AWG26)
Green(AWG26)	HS3_IN	LS_GND	LS_GND	A9	13	LS_GND	LS_GND	HS3_IN	Green(AWG26)
-	-	-	-	A11	19	-	-	-	-
-	-	-	-	-	22	CF_VCC	BAT+	-	Grey(AWG26)
-	-	-	-	-	23	-	-	-	-
Black(AWG26)	FG	FG	FG	B11	24	FG	FG	FG	Black(AWG26)

- Controller
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Model CB-RPSEP-MPA * Robot cable is the standard.



Actuator side
D-1100D 1-1827863-1
(AMP)

Terminal No.	Signal name
A1	Black (ΦA)
B1	White (VMM)
A2	Brown (Φ/A)
B2	Green (ΦB)
A3	Yellow (VMM)
B3	Red (Φ/B)
A6	Orange (LS+)
B6	Grey (LS-)
A7	Red (A+)
B7	Green (A-)
A8	Black (B+)
B8	Brown (B-)
A4	NC
B4	NC
A5	Black (id tape) [BK-]
B5	Brown (id tape) [BK-]
A9	Green (id tape) [GNDLS]
B9	Red (id tape) [VPS]
A10	White (id tape) [VCC]
B10	Yellow (id tape) [GND]
A11	NC
B11	Shield (FG) [FG]
	NC
	NC

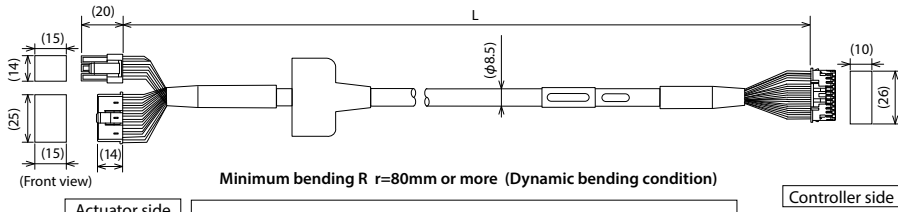
Controller side
PADP-24V-1-S
(JST)

Terminal No.	Signal name
1	Black (ΦA)
2	White (VMM)
3	Brown (Φ/A)
4	Green (ΦB)
5	Yellow (VMM)
6	Red (Φ/B)
7	Orange (LS+)
8	Grey (LS-)
9	Red (A+)
13	Green (A-)
14	Black (B+)
15	Brown (B-)
16	NC
9	Black (id tape) [BK-]
10	Brown (id tape) [BK-]
20	Green (id tape) [GNDLS]
18	Red (id tape) [VPS]
17	White (id tape) [VCC]
19	Yellow (id tape) [GND]
21	NC
24	Shield (FG) [FG]
22	NC
23	NC

*Specify the cable length (L) in
Maximum 20m. Ex) 080=8m.

Model CB-CFA-MPA /CB-CFA-MPA -RB * Robot cable is the standard.

(Note 1) When the cable length is 3m or longer, non-robot cable diameter is Φ9.1 and robot cable diameter is Φ10.



Actuator side
SLP-06V(JST)
XMP-18V(JST)

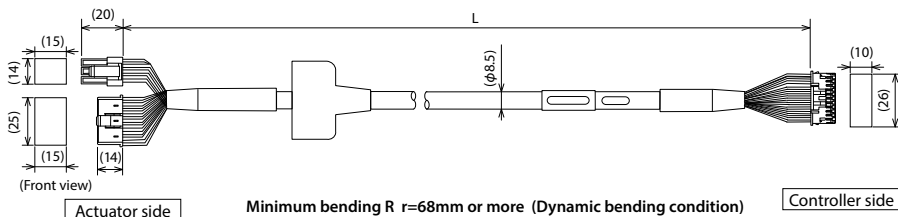
Pin No.	Signal name
1	φA
2	VMM
4	φB
5	VMM
3	φ/A
6	φ/B
5	NC
6	NC
13	LS+
14	LS-
1	A+
2	A-
3	B+
4	B-
16	BK+
17	BK-
12	VCC
9	GND
11	VPS
10	NC
18	FG
15	NC
7	NC
8	NC

Controller side
PADP-24V-1-S
(JST)

Pin No.	Signal name
1	φA
2	VMM
3	φB
4	VMM
5	φ/A
6	φ/B
11	NC
12	NC
7	LS+
8	LS-
13	A+
14	A-
15	B+
16	B-
9	BK+
10	BK-
21	VCC
19	GND
18	VPS
20	NC
24	FG
17	NC
22	NC
23	NC

*Specify the cable length (L) in
Maximum 20m. Ex) 080=8m.

Model CB-PSEP-MPA * Robot cable is the standard.



Actuator side
SLP-06V(JST)
XMP-18V(JST)

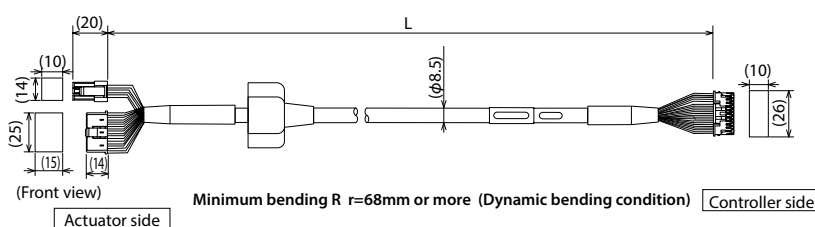
Terminal No.	Signal name
1	Black (ΦA)
2	White (VMM)
4	Red (ΦB)
5	Green (VMM)
3	Brown (Φ/A)
6	Yellow (Φ/B)
16	Orange (BK+)
17	Grey (BK-)
6	NC
6	NC
13	Black (LS+)
14	Brown (LS-)
1	White (A+)
2	Yellow (A-)
4	Red (B+)
3	Green (B-)
10	White (id tape) [VCC]
11	Yellow (id tape) [VPS]
9	Red (id tape) [GND]
12	Green (id tape) [spare]
15	NC
7	NC
8	NC
18	Shield (FG)

Controller side
PADP-24V-1-S
(JST)

Terminal No.	Signal name
1	Black (ΦA)
2	White (VMM)
3	Red (ΦB)
4	Green (VMM)
5	Brown (Φ/A)
6	Yellow (Φ/B)
9	Orange (BK+)
10	Grey (BK-)
11	NC
12	NC
7	Black (LS+)
8	Brown (LS-)
13	White (A+)
14	Yellow (A-)
15	Red (B+)
16	Green (B-)
17	White (id tape) [VCC]
18	Yellow (id tape) [VPS]
19	Red (id tape) [GND]
20	Green (id tape) [spare]
21	NC
22	NC
23	NC
24	Shield (FG)

*Specify the cable length (L) in
Maximum 20m. Ex) 080=8m.

Model CB-ASEP2-MPA * Robot cable is the standard.



Actuator side
SLP-06V(JST)
XMP-18V(JST)

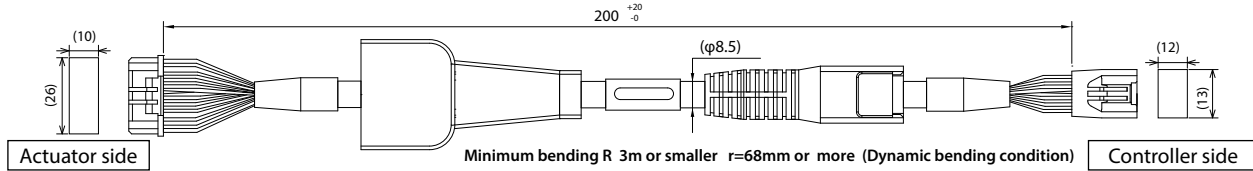
Terminal No.	Signal name
1	Red (U)
2	Yellow (V)
	NC
	NC
3	Black (W)
	NC
18	Orange (BK+)
17	Grey (BK-)
7	Black (LS+)
16	Brown (LS-)
1	White (A+)
2	Yellow (A-)
3	Red (B+)
4	Green (B-)
10	Black (id tape) [Z+]
11	Brown (id tape) [Z-]
14	White (id tape) [VCC]
15	Yellow (id tape) [GND]
13	Red (id tape) [VPS/BAT-]
6	Green (id tape) [spare]
12	White (BAT+)
5	NC
8	NC
9	Shield (FG)

Controller side
PADP-24V-1-S
(JST)

Terminal No.	Signal name
1	Red (U)
2	Yellow (V)
3	NC
4	NC
5	Black (W)
6	NC
7	Orange (BK+)
8	Grey (BK-)
9	Black (LS+)
10	Brown (LS-)
11	White (A+)
12	Yellow (A-)
13	Red (B+)
14	Green (B-)
15	Black (id tape) [Z+]
16	Brown (id tape) [Z-]
17	White (id tape) [VCC]
19	Yellow (id tape) [GND]
18	Red (id tape) [VPS/BAT-]
20	Green (id tape) [spare]
21	White (BAT+)
22	NC
23	NC
24	Shield (FG)

*Specify the cable length (L) in
Maximum 20m. Ex) 080=8m.

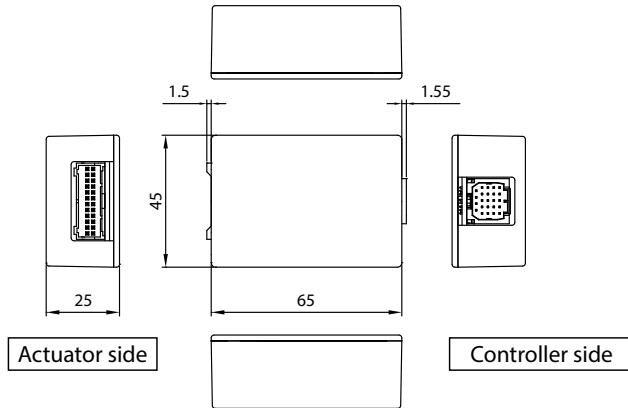
Model **CB-CAN-AJ002**



Wiring diagram

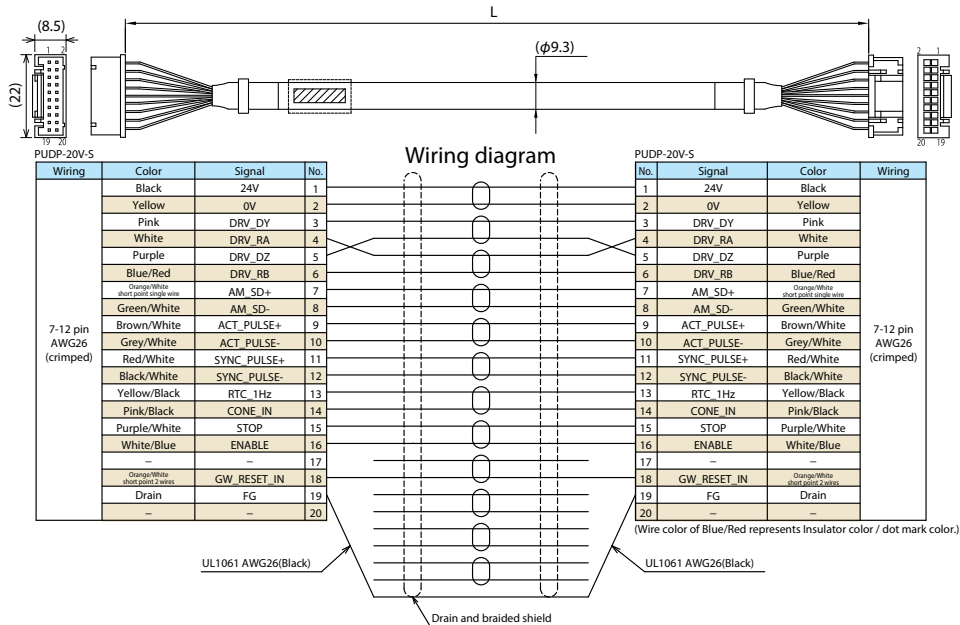
1-1827863-1 (AMP)					DF62B-24EP-2.2C (Hirose)				
Pin No.	PC	AC	DC	Color	Pin No.	PC	AC	DC	Color
A1	ΦA	U	U	Blue(AWG22)	3	ΦA	U	U	Blue(AWG22)
B1	VMM	V	V	Orange(AWG22)	5	VMM	V	V	Orange(AWG22)
B2	ΦB	-	-	Brown(AWG22)	10	ΦB	-	-	Brown(AWG22)
A3	VMM	-	-	Grey(AWG22)	9	VMM	-	-	Grey(AWG22)
A2	Φ_A	W	W	Green(AWG22)	4	Φ_A	W	W	Green(AWG22)
B3	Φ_B	-	-	Red(AWG22)	15	Φ_B	-	-	Red(AWG22)
A6	S _A (mABS)	A+	A+	Light blue(AWG26)	12	S _A (mABS)	A+	A+	Light blue(AWG26)
B6	S _B (mABS)	A-	A-	Orange(AWG26)	17	S _B (mABS)	A-	A-	Orange(AWG26)
A7	A+	B+	B+	Green(AWG26)	1	A+	B+	B+	Green(AWG26)
B7	A-	B-	B-	Brown(AWG26)	6	A-	B-	B-	Brown(AWG26)
A8	B+	Z+(S _m ABS)	HS1_IN	Grey(AWG26)	11	B+	Z+(S _m ABS)	HS1_IN	Grey(AWG26)
B8	B-	Z-(S _m ABS)	HS2_IN	Red(AWG26)	16	B-	Z-(S _m ABS)	HS2_IN	Red(AWG26)
B9	VPS	VPS/BAT-	-	Black(AWG26)	18	VPS	VPS/BAT-	-	Black(AWG26)
A4	LS+	BK+	-	Yellow(AWG26)	8	LS+	BK+	-	Yellow(AWG26)
A5	BK+	LS+	-	Light blue(AWG26)	20	BK+	LS+	-	Light blue(AWG26)
B5	BK-	LS-	-	Orange(AWG26)	2	BK-	LS-	-	Orange(AWG26)
A10	VCC	VCC	VCC	Grey(AWG26)	21	VCC	VCC	VCC	Grey(AWG26)
B10	GND	GND	GND	Red(AWG26)	7	GND	GND	GND	Red(AWG26)
B4	LS-	BK-	-	Brown(AWG26)	14	LS-	BK-	-	Brown(AWG26)
A9	LS_GND	LS_GND	HS3_IN	Green(AWG26)	13	LS_GND	LS_GND	HS3_IN	Green(AWG26)
A11	-	-	-	-	19	-	-	-	-
B11	FG	FG	FG	Black(AWG26)	22	CF_VCC	BAT+	-	Grey(AWG26)
					23	-	-	-	-
					24	FG	FG	FG	Black(AWG26)

Model **RCM-CV-APCS**



Model **CB-RE-CTL**

*Specify the cable length (L) in . Maximum 10m. Ex) 080=8m.



MCON-C/CG

Position Controller
CON series 8-axis Type



MCON-LC/LCG

Position controller
CON series
PLC function mounted type



(*1) CC-Link IE Field, SSCNET and EtherCAT Motion connection specification are not compliant with CE Marking.

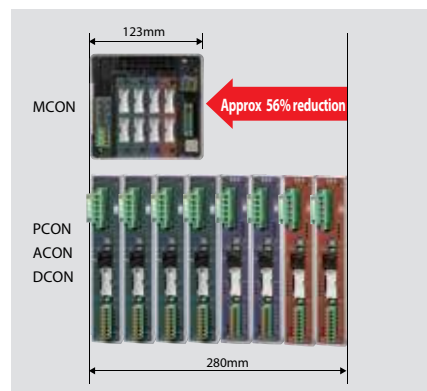
Features

Common to MCON-C / CG, MCON-LC / LCG

1 Saves space and reduces cost

It saves space in the control panel and significantly reduces the total cost by combining 8 controllers into one.

* Mcon-C/CG



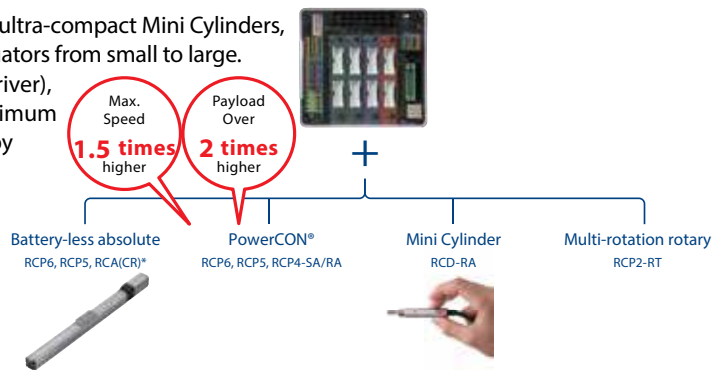
2 Accommodates a wide range of actuators

It corresponds to actuators with battery-less absolute encoders, ultra-compact Mini Cylinders, multi-rotation rotaries and the like, expanding the operable actuators from small to large.

In addition, it is equipped with the PowerCON® (high-output driver), and achieves the maximum speed of 1.5 times higher and maximum payload of over 2 times higher than the conventional models by using in combination with the RCP5/RCP4.

Allows the installation of 7 types of driver boards

- ① Battery-less absolute/incremental driver boards for stepper motor
- ② Simple absolute driver board for stepper motor
- ③ Battery-less absolute/incremental driver boards for PowerCON
- ④ Simple absolute driver board for PowerCON
- ⑤ Battery-less absolute/incremental driver boards for AC servo motor
- ⑥ Simple absolute driver board for AC servo motor
- ⑦ Incremental driver board for brush-less DC motor



* Some models are excluded.
For more information, please refer to the catalog.

3 Many useful functions

Function of servo monitoring in the AUTO mode.

- The AUTO mode status monitoring and servo monitoring can now be performed using multi-axis controllers.
In addition, the monitoring can start from the moment that the condition of a selected signal changed. (Trigger function)

The calendar function

- With the addition of the clock function, the alarm history is displayed with the time of occurrence, making it easier for the alarm to be analyzed.

Smart tuning function

- The optimum acceleration and deceleration are set according to the payload to be conveyed.

Off-board tuning function (for AC servo motor)

- The optimum gain is set according to the payload.

Vibration control function (for AC servo motor)

- It reduces the shaking (vibration) of the workpiece attached to the slider.

Acceleration/deceleration mode specification

- The acceleration and deceleration patterns can be specified from the trapezoid pattern, first-order delay filter and S-shaped motion.

Axis name display function

- The axis name can be displayed in the PC dedicated software and touch panel teaching pendant.

* Some functions are not available depending on the network. Please refer to the instruction manual.

MCON-LC/LCG

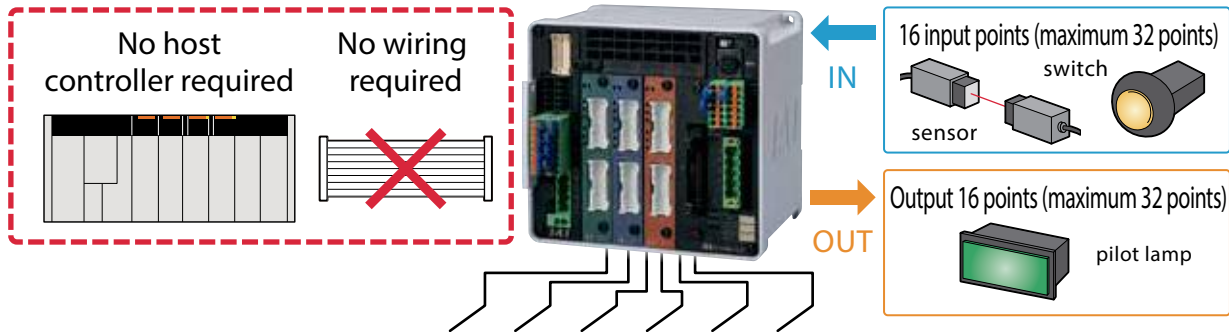
4 New PLC function

The ladder program enables the operation of the actuator and the on/off control of the I/O (input/output) signal.

If it is a small device, it is possible to control the device only by MCON-LC/LCG.

The load of the main PLC can be reduced by performing the dispersion control using MCON-LC/LCG for each process. It is also easy to simplify the program and respond to problems.

* For details of ladder program, please refer to the following.



LC-LADDER

● Features of ladder software

Since MCON-LC/LCG can be controlled by a ladder program, it can be used easily for those who have been using a PLC control. The "dedicated instruction" to move actuators is available in the ladder program, allowing easier operations.

The dedicated editing software "LC-LADDER" can be used to create, monitor and debug ladder programs in a simple operation.

1 Program creation

Programs can be created using 27 types of basic instructions (contact instructions, output instructions, etc.) and 53 types of application instructions (data comparison, arithmetic effect, logical operation, etc.).

3 Debug function

The program operation is confirmed by executing the program with the condition specified.



2 Monitor

The state of program execution can be confirmed by each function.

4 Simulation

Without executing the programs actually on the controller, programs can be tested for confirmation on the PC (test run).

- EC
- RCP6S
- RCON
- MCON-C/LC**
- PCON-CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON-CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Model

Controller

Details of slot 0

(1st axis: Top connector) (2nd axis: Bottom connector)

MCON - [] - [] - [] - [] - [] - [] - [] - [] - []

Series: C (Standard), CG (Safety category compliant type)

Type: 1-8 axis specifications

Motor Type: Stepper motor (20P, 20SP, 28P, 28SP, 35P, 42P, 42SP, 56P, N *1), Servo motor (2, 5, 5S, 10, 20, 20S, 30, A, N *1), brush-less DC motor (3D, D, N *1)

Encoder Type: HA (Hi-accel./decel. supported), LA (Energy saver), T (High-output specification)

Option: WAI (Battery-less absolute/incremental (*1)), SA (Simple absolute (*1)), I (Incremental (*2))

* HA/LA are for RCA only while T is for RCP6/RCP5/RCP4.
* High output specification (T) can not be selected for RCP4 - GR series and RCP4 - ST series.

(*1) Stepper motor/AC servo motor types only.
(*2) Brush-less DC motor type only.

Stepper motor	Servo motor	brush-less DC motor
20P 20□	2 2W	3D 3W
20SP 20□	5 5W	D Unused motor axis
28P 28□	5S 5W	N *1 No connected axis
28SP 28□	10 10W	
35P 35□	20 20W	
42P 42□	20S 20W	
42SP 42□	30 30W	
56P 56□	A Unused motor axis	
P Unused motor axis	N *1 No connected axis	
N *1 No connected axis		

Note: Basically, the motor type has the same symbol as the motor type of the actuator to be connected, however, there is a model that the motor kind of some controllers and the actuator do not match. The applicable models are listed below, so please be careful when selecting.
<28SP, 5S, 20S Applicable actuator->
● Motor type "28SP" ... RCP2 - RA3C
● Motor type "5S" ... R CA2-RA2A□, RCA2-SA2A□
● Motor type "20S" ... RCA2-SA4□, RCA2-TA5□, RCA-RA3□, RCA-RG□3□, RCAW-RA3□

(*1) See P7-74.

Details of slot 1~3

(Details of the 3rd~8th axes)

I/O Type: DV, CC, CIE, PR, CN, EC, ECM, EP, PRT, SSN, ML3

I/O Cable Length: 0 (No cable), 24VDC

Power Supply: 24VDC

Simple Absolute Option: ABB, ABBN, (Blank)

(Note 1) Please be sure to check P7-18 for the caution when selecting.

Details of slot 0

(1st axis: Top connector) (2nd axis: Bottom connector)

MCON - [] - [] - [] - [] - [] - [] - [] - [] - []

Series: LC (Type with PLC function), LCG (Safety category compliant type with PLC function)

Type: 1-6 axis specifications

Motor Type: Stepper motor (20P, 20SP, 28P, 28SP, 35P, 42P, 42SP, 56P, N *1), Servo motor (2, 5, 5S, 10, 20, 20S, 30, A, N *1), brush-less DC motor (3D, D, N *1)

Encoder Type: HA (Hi-accel./decel. supported), LA (Energy saver), T (High-output specification)

Option: WAI (Battery-less absolute/incremental (*1)), SA (Simple absolute (*1)), I (Incremental (*2))

* HA/LA are for RCA only while T is for RCP6/RCP5/RCP4.
* High output specification (T) can not be selected for RCP4 - GR series and RCP4 - ST series.

(*1) Stepper motor/AC servo motor types only.
(*2) Brush-less DC motor type only.

Stepper motor	Servo motor	brush-less DC motor
20P 20□	2 2W	3D 3W
20SP 20□	5 5W	D Unused motor axis
28P 28□	5S 5W	N *1 No connected axis
28SP 28□	10 10W	
35P 35□	20 20W	
42P 42□	20S 20W	
42SP 42□	30 30W	
56P 56□	A Unused motor axis	
P Unused motor axis	N *1 No connected axis	
N *1 No connected axis		

Note: Basically, the motor type has the same symbol as the motor type of the actuator to be connected, however, there is a model that the motor kind of some controllers and the actuator do not match. The applicable models are listed below, so please be careful when selecting.
<28SP, 5S, 20S Applicable actuator->
● Motor type "28SP" ... RCP2 - RA3C
● Motor type "5S" ... R CA2-RA2A□, RCA2-SA2A□
● Motor type "20S" ... RCA2-SA4□, RCA2-TA5□, RCA-RA3□, RCA-RG□3□, RCAW-RA3□

(*1) See P7-74.

Details of slot 1~2

(Details of the 3rd~6th axes)

I/O Type: NP (PIO specification (NPN type))

I/O Cable Length: 0 (No cable), 2 (2m (Standard)), 3 (3m), 5 (5m)

Power Supply: 24VDC

Simple Absolute Option: ABB, ABBN, (Blank)

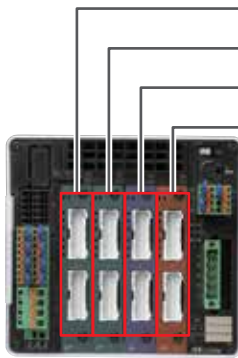
Extended I/O Type: NP, DV, CC, PR, CN, EC, EP, PRT, (Blank)

* RCD series does not support the simple absolute specification.

Details of Slots

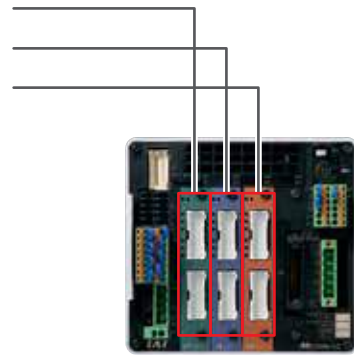
(1) MCON-C/CG has 4 slots.

MCON-LC/LCG has 3 slots.



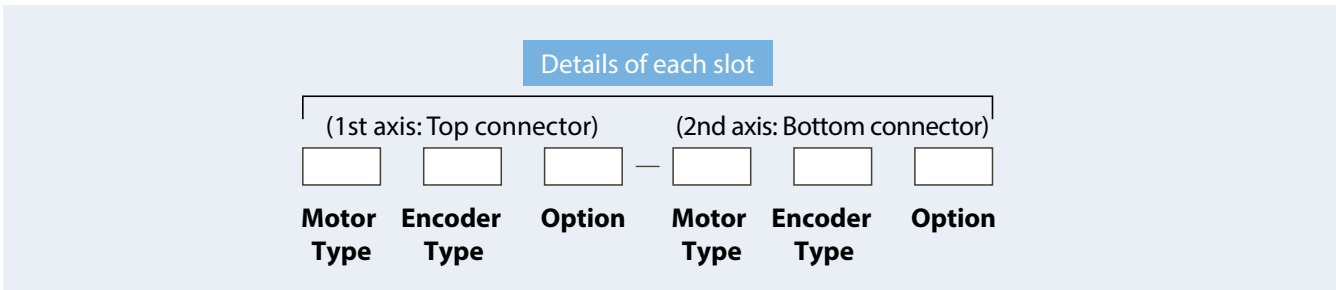
MCON-C/CG
(Up to 4 slots)

- Slot 0 (Top connector: AX0/Bottom connector: AX1)
- Slot 1 (Top connector: AX2/Bottom connector: AX3)
- Slot 2 (Top connector: AX4/Bottom connector: AX5)
- Slot 3 (Top connector: AX6/Bottom connector: AX7)



MCON-LC/LCG
(Up to 3 slots)

(2) How to fill out the model name for each slot



① Slot 1 has a single board, and it is not possible to connect different motor types (Stepper/AC servo/DC Brush-less) or different encoder types (WAI/SA/I) to the same board.

② Depending on the actuator type, 2 axes or only one axis can be connected to Slot 1.

Number of axes that can be connected to 1 slot	Actuator type
Axis 1	RCP6(High power setting Enabled), RCP5(High power setting Enabled), RCP4(High power setting Enabled)
Axis 2	RCP6(High power setting disabled), RCP5(High power setting disabled), RCP4(High power setting disabled) RCP3, RCP2, RCA2, RCA, RCD, RCL

③ If only 1 axis is connected to 1 slot, the model name of the second axis/bottom connector will be "N".

④ When using RCP5/RCP4 with high-output setting enabled, please enter "T" in the option column.

Entry examples for each slot

E.g. 1 When connecting 3 axes of RCP5-SA4C-WA-35P (High-output setting enabled)

Slot 0	Slot 1	Slot 2
35P	WAIT-N	-35P
35PWAIT-N-35PWAIT-N-35PWAIT-N		

E.g. 2 When connecting 2 axes of RCA-SA5C-I-20 or 1 axis of RCD-RA1DA-I-3









Slot 0	Slot 1
20WAI	-20WAI
-3DI-N	

Please refer to the next page for the combination examples of each axis.

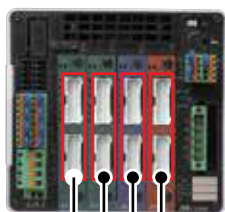
MCON Driver Board Combination Examples

Controller

The table below shows driver board combination examples of MCON.

External view of connecting axes	Model Names of the Connected Actuators	Number of axes
 <p>RCP6-SA6C RCP6-RA4C</p>	<p>1st axis: RCP6-SA6C-WA-42P PowerCON/Battery-less abs.</p> <p>2nd axis: RCP6-RA4C-WA-35P PowerCON/Battery-less abs.</p>	2
 <p>RCP5-SA6C RCP5-RA4C RCA-SA6C</p>	<p>1st axis: RCP5-SA6C-WA-42P Stepper motor/Battery-less abs.</p> <p>2nd axis: RCP5-RA4C-WA-35P Stepper motor/Battery-less abs.</p> <p>3rd axis: RCA-SA6C-WA-30 AC servo/Battery-less abs.</p>	3
 <p>RCP5-SA4C RCP5-RA4C</p>	<p>1st axis: RCP5-SA4C-WA-35P PowerCON/Battery-less abs.</p> <p>2nd axis: RCP5-SA4C-WA-35P PowerCON/Battery-less abs.</p> <p>3rd axis: RCP5-RA4C-WA-35P PowerCON/Battery-less abs.</p> <p>4th axis: RCP5-RA4C-WA-35P PowerCON/Battery-less abs.</p>	4
 <p>RCP5-SA6 RCA5-RA4NA RCD-RA1DA</p>	<p>1st axis: RCP5-SA4C-WA-35P PowerCON/Battery-less abs.</p> <p>2nd axis: RCP5-SA4C-WA-35P Stepper motor/Battery-less abs.</p> <p>3rd axis: RCA2-TCA4NA-I-20 AC servo/Simple absolute</p> <p>4th axis: RCD-RA1DA-I-3D Brush-less DC motor/Incremental</p>	4
 <p>RCP5-SA6 RCP5-RA4C RCA2-TCA4NA RCD-RA1DA</p>	<p>1st axis: RCP5-SA6C-WA-42P PowerCON/Battery-less abs.</p> <p>2nd axis: RCP5-RA4C-WA-35P Stepper motor/Battery-less abs.</p> <p>3rd axis: RCP5-RA4C-WA-35P Stepper motor/Battery-less abs.</p> <p>4th axis: RCA2-TCA4NA-I-20 AC servo/Simple absolute</p> <p>5th axis: RCD-RA1DA-I-3D Brush-less DC motor/Incremental</p>	5
 <p>RCP5-RA4C RCA2-TCA4NA RCD-RA1DA</p>	<p>1st axis/2nd axis: RCP5-RA4C-WA-35P Stepper motor/Battery-less abs.</p> <p>3rd axis/4th axis: RCA2-TCA4NA-I-20 AC servo/Incremental</p> <p>5th axis/6th axis: RCD-RA1DA-I-3D Brush-less DC motor/Incremental</p>	6
 <p>RCP5-RA4C</p>	<p>1~7th axis: RCP5-RA4C-WA-35P Stepper motor/Battery-less abs.</p>	7
 <p>RCP5-RA4C RCA2-TCA4NA RCD-RA1DA</p>	<p>1st axis/2nd axis: RCP5-RA4C-WA-35P Stepper motor/Battery-less abs.</p> <p>3rd axis/4th axis: RCA2-TCA4NA-I-20 AC servo/Simple absolute</p> <p>5~8th axis: RCD-RA1DA-I-3D Brush-less DC motor/Incremental</p>	8

*The powerCON means that the high output setting is effective.

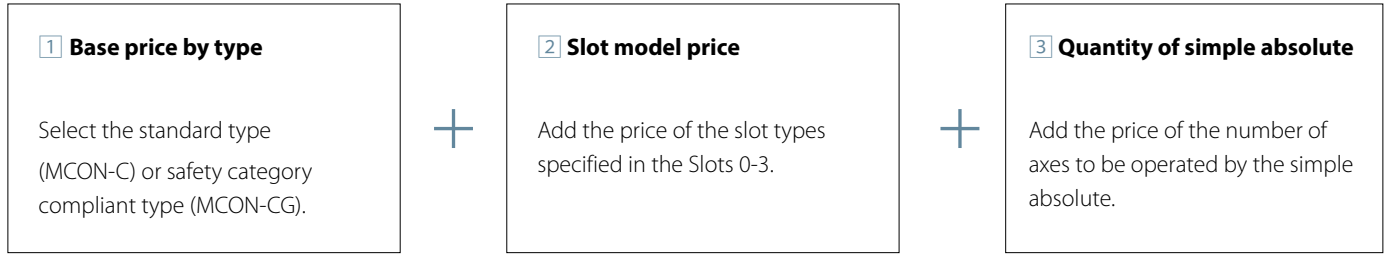


Note: MCON-LC can be used for Slot 0 to Slot 2.
RCD series does not support the simple absolute specification.

	Slot 0	Slot 1	Slot 2	Slot 3	Model
	AX0 PowerCON 42□ Battery-less abs.	AX2 PowerCON 35□ Battery-less abs.	AX4	AX6	<p>MCON-C-2-42PWAIT-N-35PWAIT-N-DV-0-0</p>
	AX1 N	AX3 N	AX5	AX7	
	AX0 Stepper motor 42□ Battery-less abs.	AX2 AC servo motor 30W Battery-less abs.	AX4	AX6	
	AX1 Stepper motor 35□ Battery-less abs.	N	AX5	AX7	
	AX0 PowerCON 35□ Battery-less abs.	AX2 PowerCON 35□ Battery-less abs.	AX4 PowerCON 35□ Battery-less abs.	AX6 PowerCON 35□ Battery-less abs.	<p>MCON-C-4-35PWAIT-N-35PWAIT-N-35PWAIT-N-35PWAIT-N-DV-0-0</p>
	AX1 N	AX3 N	AX5 N	AX7 N	
	AX0 PowerCON 35□ Battery-less abs.	AX2 Stepper motor 35□ Battery-less abs.	AX4 AC servo motor 20W Simple absolute	AX6 Brush-less DC motor Incremental	
	AX1 N	AX3 N	AX5 N	AX7 N	<p>MCON-C-4-35PWAIT-N-35PWAIT-N-20SA-N-3DI-N-DV-0-0-ABB</p>
	AX0 PowerCON 42□ Battery-less abs.	AX2 Stepper motor 35□ Battery-less abs.	AX4 AC servo motor 20W Simple absolute	AX6 Brush-less DC motor Incremental	
	AX1 N	AX3 Stepper motor 35□ Battery-less abs.	AX5 N	AX7 N	
	AX0 Stepper motor 35□ Battery-less abs.	AX2 AC servo motor 20W Incremental	AX4 Brush-less DC motor Incremental	AX6	<p>MCON-C-5-42PWAIT-N-35PWAI-35PWAI-20SA-N-3DI-N-DV-0-0-ABB</p>
	AX1 Stepper motor 35□ Battery-less abs.	AX3 AC servo motor 20W Incremental	AX5 Brush-less DC motor Incremental	AX7	
	AX0 Stepper motor 35□ Battery-less abs.	AX2 AC servo motor 20W Incremental	AX4 Brush-less DC motor Incremental	AX6	
	AX0 Stepper motor 35□ Battery-less abs.	AX2 Stepper motor 35□ Battery-less abs.	AX4 Stepper motor 35□ Battery-less abs.	AX6	<p>MCON-C-6-35PWAI-35PWAI-20WAI-20WAI-3DI-3DI-DV-0-0</p>
	AX1 Stepper motor 35□ Battery-less abs.	AX3 Stepper motor 35□ Battery-less abs.	AX5 Stepper motor 35□ Battery-less abs.	AX7	
	AX0 Stepper motor 35□ Battery-less abs.	AX2 Stepper motor 35□ Battery-less abs.	AX4 Stepper motor 35□ Battery-less abs.	AX6	
	AX0 Stepper motor 35□ Battery-less abs.	AX2 AC servo motor 20W Simple absolute	AX4 Brush-less DC motor Incremental	AX6 Brush-less DC motor Incremental	<p>MCON-C-7-35PWAI-35PWAI-35PWAI-35PWAI-35PWAI-35PWAI-35PWAI-N-DV-0-0</p>
	AX1 Stepper motor 35□ Battery-less abs.	AX3 Stepper motor 35□ Battery-less abs.	AX5 Stepper motor 35□ Battery-less abs.	AX7 N	
	AX0 Stepper motor 35□ Battery-less abs.	AX2 AC servo motor 20W Simple absolute	AX4 Brush-less DC motor Incremental	AX6 Brush-less DC motor Incremental	
	AX1 Stepper motor 35□ Battery-less abs.	AX3 AC servo motor 20W Simple absolute	AX5 Brush-less DC motor Incremental	AX7 Brush-less DC motor Incremental	<p>MCON-C-8-35PWAI-35PWAI-20SA-20SA-3DI-3DI-3DI-3DI-DV-0-0-ABB</p>

- Controller
- EC
- RCP6S
- RCON
- MCON-C/LC
- PCON-CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON-CB
- (Servo press)
- SCON-LC
- SCON-CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Calculate the standard price of the MCON controller based on 1 base price by type as specified below, by adding 2 slot model price, 3 quantity of simple absolute, 4 quantity of batteries for simple absolute, and 5 I/O type.



1	
Base price by type	
Description	Model
Standard	MCON-C
Safety category compliant type	MCON-CG
Type with PLC function	MCON-LC
Safety category compliant type with PLC function	MCON-LCG

+

2			
Slot model price (Add the total amount of slots to be used)			
Details of slot			Model
Stepper motor	1-axis specification	Battery-less absolute/Incremental (High-output enabled)	<input type="checkbox"/> PWAIT-N
		Simple absolute (High-output enabled)	<input type="checkbox"/> PSAT-N
		Battery-less absolute/Incremental (High output disabled)	<input type="checkbox"/> PWAI-N
		Simple absolute (High output disabled)	<input type="checkbox"/> PSA-N
	2-axis specification	Simple absolute (High output disabled) + Simple absolute (High output disabled)	<input type="checkbox"/> PSA- <input type="checkbox"/> PSA
		Battery-less abs./Incremental (High output disabled) + Battery-less abs./Incremental (High output disabled)	<input type="checkbox"/> PWAI- <input type="checkbox"/> PWAI
AC servo motor	1-axis specification	Battery-less absolute/Incremental	<input type="checkbox"/> WAI-N
		Simple absolute	<input type="checkbox"/> SA-N
	2-axis specification	Battery-less absolute/Incremental + Battery-less absolute/Incremental	<input type="checkbox"/> WAI- <input type="checkbox"/> WAI
		Simple absolute + Simple absolute	<input type="checkbox"/> SA- <input type="checkbox"/> SA
Brush-less DC motor	1-axis specification	Incremental	3DI-N
	2-axis specification	Incremental + Incremental	3DI-3DI

+

3
Quantity of simple absolute
Number of axes
Axis 1
Axis 2
Axis 3
Axis 4
Axis 5
Axis 6
Axis 7
Axis 8

* indicates the motor size.

4 Quantity of batteries for simple absolute

Add the total battery price of simple absolute (model: ABB) for applicable axes.

5 I/O type

Select the I/O type of the controller. (The type with a PLC function is limited to "NP")

6 Extended I / O type

Select the extended I / O type of controller. (It is unnecessary in case of standard type controller)

+

+

+

+

+

+

=

4
Quantity of batteries for simple absolute
Number of axes
Axis 1
Axis 2
Axis 3
Axis 4
Axis 5
Axis 6
Axis 7
Axis 8

5	
I/O type (Standard type is not NP, PLC function type can be selected only NP.)	
specification	model number
PIO specification (NPN specification)	NP
DeviceNet connection specification	DV
CC-Link connection specification	CC
CC-Link IE Field connection specification	CIE
PROFIBUS-DP connection specification	PR
CompoNet connection specification	CN
EtherCAT connection specification	EC
EtherCAT Motion specification	ECM
EtherNet/IP connection specification	EP
PROFINET IO connection specification	PRT
SSCENT connection specification	SSN
MeCHATRO LINK III connection specification	ML3

6	
Extended I / O type (Select only with PLC function type)	
specification	model number
PIO specification (NPN specification)	NP
DeviceNet connection specification	DV
CC-Link connection specification	CC
PROFIBUS-DP connection specification	PR
CompoNet connection specification	CN
EtherCAT connection specification	EC
EtherNet/IP connection specification	EP
PROFINET IO connection specification	PRT

Price
Standard price by specification

* No need to add 3 and 4 for the battery-less absolute type.

- EC
- RCP6S
- RCON
- MCON-C/LC**
- PCON-CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON-CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

System Configuration

Controller

Option

PC dedicated teaching software

(See P7-90)

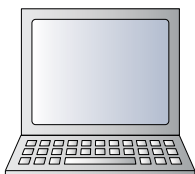
RS232 connection version

<Model Number RCM-101-MW>

USB connection version

<Model Number RCM-101-USB>

* MCON is supported by Ver.10.00.00.00 or later.



Option

Touch panel teaching pendant

(See P7-90)

<Model Number TB-02-□>



Included with MCON-CG

Dummy plug

(See P7-90)

<Model Number DP-5>



* If a teaching tool is not used for the CG type, put a dummy plug to the SIO connector.

Fieldbus

DeviceNet, CC-Link, CC-Link IE, PROFIBUS-DP, CompoNet, EtherCAT, EtherCAT Motion, EtherNet/IP, PROFINET IO, SSCNET, MECHATROLINK III

* In order to connect to the fieldbus, communication setting of the controller is necessary. Please set with gateway parameter setting tool included with PC dedicated software or TB-02. If you do not have it, please purchase PC dedicated software. (See P7-90)

* Fieldbus connection cable should be prepared by customer.

Supplied with PC compatible software

The cable is supplied with the absolute battery box.

0.5m

Option

Absolute battery box

(See P7-90)

<Model Number MSEP-ABB>

Replacement battery

(See P7-90)

<Model Number AB-7>

* If the simple absolute specification is selected for a controller model, an absolute battery box will be included. (See P7-89 for dimensions)



MCON-C/CG

Option

24VDC power supply

(See P7-297)

<Model: PSA-24>



Integrated motor-encoder cable

(See P7-91)

<Model: CB-CAN-MPA □□□>

Integrated motor-encoder robot cable

(See P7-91)

<Model: CB-CAN-MPA □□□-RB>

Integrated motor-encoder cable

(See P7-91)

<Model: CB-CA-MPA □□□>

Integrated motor-encoder robot cable

(See P7-91)

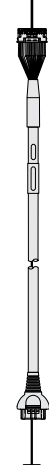
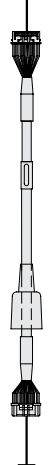
<Model: CB-CA-MPA □□□-RB>

Integrated motor-encoder robot cable

(See P7-92)

<Model: CB-APSEP-MPA □□□>

* Only robot cable is available for this model.



RCP6/RCP5/RCP4/
RCD/RCP2CR/RCP2W
RCA2/RCA2CR/RCA2W Series



RCP4 Series



RCP3/RCA2/RCL Series

(*) RCP4 is compatible with SA3/RA3/GR□□□.
RCP2CR and RCP2W are compatible with GR□□□/RT□□□.
RCA2, RCA2CR and RCA2W are available when selecting CNS(option).

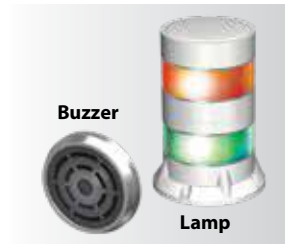
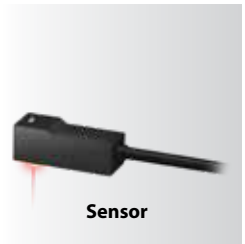
EC
RCP6S
RCON
MCON-C/LC
PCON-CB/CFB
PCON
ACON-CB
DCON-CB
ACON DCON
SCON-CB
SCON-CB (Servo press)
SCON-LC
SCON-CAL
MSCON
PSEL
ASEL
SSEL
MSEL
XSEL
XSEL (SCARA)
PSA-24
TB-02
TB-03

Option
PC dedicated teaching software
 (See P7-90)

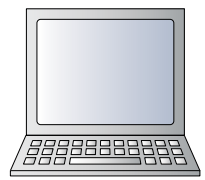
RS232 connection version
 <Model Number RCM-101-MW>
 USB connection version
 <Model Number RCM-101-USB>

Option
Touch panel teaching pendant (See P7-90)
 <Model Number TB-02-□>

* Setting of MCON-LC is necessary for the gateway parameter setting tool included with PC dedicated software or TB-02. If you do not have it, please purchase PC dedicated software.



Download
LC-LADDER
 (See P7-72)



* In case of LCG type, please insert a dummy plug if you do not connect the teaching tool to the SIO connector.

Included with MCON-LCG
Dummy plug
 (See P7-90)
 <Model Number DP-5>

PIO flat cable
 (See P7-92)
 <Model: CB-PAC-PIO□□□>

Included with controller of PIO specification
 * The controller can choose either PIO specification or Fieldbus specification.

Fieldbus
 DeviceNet, CC-Link, CC-Link IE, PROFIBUS-DP, CompoNet, EtherCAT, EtherCAT Motion, EtherNet/IP, PROFINET IO



Option
Absolute battery box
 (See P7-90)
 <Model Number MSEP-ABB>
Replacement battery
 (See P7-90)
 <Model Number AB-7>

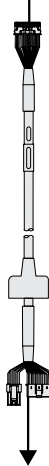
The cable is supplied with the absolute battery box.
 0.5m

* If the simple absolute specification is selected for a controller model, an absolute battery box will be included. (See P7-89 for dimensions)

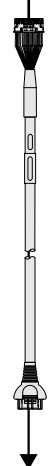


MCON-LC/LCG

Option
24VDC power supply
 (See P7-297)
 <Model: PSA-24>



Integrated motor-encoder robot cable
 (See P7-92)
 <Model: CB-PSEP-MPA□□□>
 * Only robot cable is available for this model.
 (See P7-92)
 <Model: CB-APSEP-MPA□□□>
 * Only robot cable is available for this model.



Integrated motor-encoder robot cable
 (See P7-92)
 <Model: CB-RPSEP-MPA□□□>
 * Only robot cable is available for this model.



Integrated motor-encoder robot cable
 (See P7-92)
 <Model: CB-ASEP2-MPA□□□>
 * Only robot cable is available for this model.
 (See P7-92)
 <Model: CB-APSEP-MPA□□□>
 * Only robot cable is available for this model.



Control method by controller type

Type	Control method	Number of controlled axes		PIO control operation mode	Fieldbus control operation mode
		When using high power driver	When using standard driver		
MCON-C/CG	Positioner function	4	8	—	○
MCON-LC/LCG	PLC function (Sequence control) + Positioner function	3	6	—	(*)

(*) When operating MCON-LC / LCG via fieldbus, it is necessary to transfer data and ladder program for axis movement.

Control method

Since MCON-C / CG does not have a sequence function in the controller, it operates by receiving a command such as a moving position from the upper PLC. MCON-LC / LCG can activate the ladder program inside the controller, communicate with the outside using I / O, and move axes (positioner operation).

Fieldbus control operation mode

MCON-C/CG Case

The fieldbus control operation mode of the MCON-C/CG can be performed using a control mode selected from the table below. (*1)
To perform operations, the required data (target position, speed, acceleration, push current, etc.) is written on the specified address from the connected upper PLC.

Operation mode	Description	Overview
Positioner 1/ Simple direct numerical value mode (Simple direct mode)	Positioner 1 mode can store up to 256 points of position data and can move to the stored position. Both modes allow monitoring the current position numerically with 0.01mm increments. The simple direct numerical value mode can modify any of the stored target positions by numerical value. Both modes allow monitoring the current position numerically with 0.01mm increments.	
Direct numerical control mode	This mode allows designating the target position, speed, acceleration/deceleration, and motor current percentage for pushing numerically. It also allows monitoring the current position, current speed, and the motor current command value with 0.01mm increments.	
Positioner 2 mode	Positioner 2 mode can store up to 256 points of position data and can move to the stored position. This mode does not allow monitoring of the current position. This is a mode that has less in/out data transfer volume than the Positioner 1 mode.	
Positioner 3 mode	Positioner 3 mode can store up to 256 points of position data and can move to the stored position. This mode does not allow monitoring of the current position. This is a mode that has less in/out data transfer volume than the Positioner 2 mode and operates with a minimum number of signals.	
Positioner 5 mode	Positioner 5 mode can store up to 16 points of position data and can move to the stored position. This is a mode that has less in/out data transfer volume than the Positioner 2 mode and allows monitoring the current position numerically with 0.1mm increments.	
Remote I/O mode	It is an operation mode in which bit ON / OFF is controlled similar to PIO (24 V input / output). Five kinds of control are possible. (See page 7-84) * Switch by PIO pattern (parameter of driver board).	

* Only the positioner 3 mode and remote I/O mode can be selected for the CompoNet.

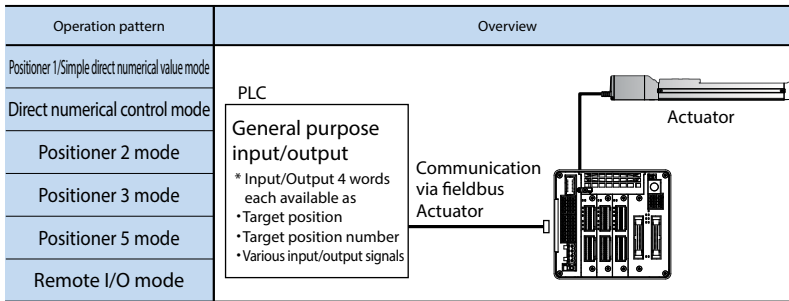
*1 Except for MECHATROLINK III and SSCNET.

In case of MCON-LC/LCG

When operating MCON-LC / LCG via fieldbus, general-purpose input / output communication can be performed via fieldbus.

If necessary, it is also possible to communicate the data necessary for the axis movement in the ladder program and to operate the axis.

* Ladder program is required to perform axis movement with MCON - LC / LCG.



• PLC ⇔ MCON-LC/LCG (n is the leading area of PLC output to MCON-LC/LCG)

Operation pattern	MCON-LC input area			MCON-LC output area			
	n	n+1	n+2	n+3	n+4	n+5	n+6
Simple direct numerical value mode	General purpose input			General purpose output			
Positioner 1 mode							
Direct numerical control mode							
Positioner 2 mode							
Positioner 3 mode							
Positioner 5 mode							

* The allocation of MCON-LC/LCG internal memory changes depending on the operation pattern.

List of Functions by Operation Mode

	Simple direct value mode	Positioner 1 mode	Direct numerical control mode	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Number of positioning points	256	256	Unlimited	256	256	16
Home return operation	○	○	○	○	○	○
Positioning operation	○	△	○	△	△	△
Speed, acceleration/deceleration settings	△	△	○	△	△	△
Different acceleration and deceleration settings	△	△	×	△	△	△
Pitch feed (Incremental)	△	△	○	△	×	△
Push-motion operation	△	△	○	△	△	△
Speed changes while moving	△	△	○	△	△	△
Pausing	○	○	○	○	○	○
Zone signal output	△	△	△	△	△	△
Position zone signal output	△	△	×	△	×	×
Vibration control (Note 1)	△	△	×	△	△	△
Current position reading (Resolution)	○ (0.01mm)	○ (0.01mm)	○ (0.01mm)	×	×	○ (0.1mm)

* ○: Direct setting is possible, △: Position data or parameter input is required, x: The operation is not supported.

(Note 1) This function is limited to the AC servo motor specification.

Functions of ROBO Cylinder	Remote I/O mode				
	Positioning mode	Teaching mode	256-point mode	Solenoid valve mode 1	Solenoid valve mode 2
Number of positioning points	64	64	256	7	3
Home return operation	○	○	○	○	×
Positioning operation	○	○	○	○	○
Speed, acceleration/deceleration settings	○	○	○	○	○
Different acceleration and deceleration settings	○	○	○	○	○
Pitch feed (Incremental)	○	○	○	○	×
Push-motion operation	○	○	○	○	×
Speed changes while moving	○	○	○	○	○
Pausing	○	○	○	○	○ (Note 3)
Zone signal output	○	○ (Note 4)	○ (Note 4)	○	○
Position zone signal output	○ (Note 4)	○ (Note 4)	○ (Note 4)	○ (Note 4)	○ (Note 4)
Vibration control (Note 1)	○	○	○	○	○
Current position reading	×	×	×	×	×

* ○: Direct setting is possible, △: Position data or parameter input is required, x: The operation is not supported.

(Note 1) This function is limited to the AC servo motor specification.

(Note 2) It returns to home position with the first movement command.

(Note 3) It is possible when the movement command type of the parameter No.27 is set to 0.

(Note 4) Select either the zone signal output or position zone signal output with parameter No.149.

I/O Signal Function Details

The following table shows functions assigned to the controller I/O.
 Set to the remote I/O mode and select the PIO patterns from 0-5.
 The controller can be operated by turning each port number ON/OFF via the network.

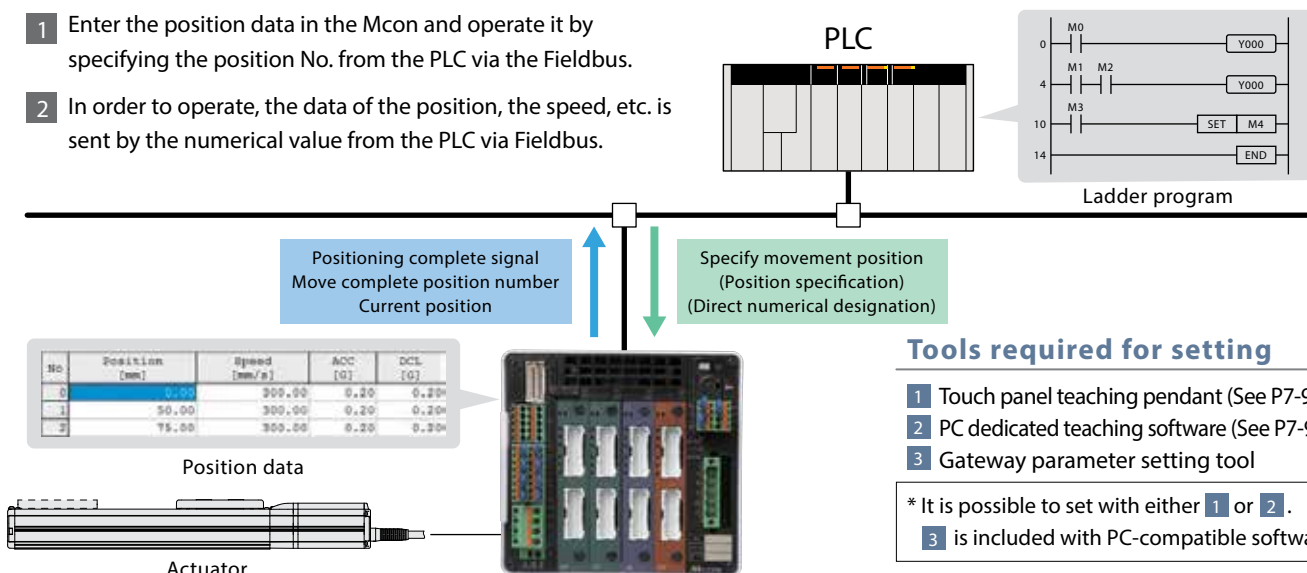
		Setting of the parameter No.25 of MCON									
		Positioning mode		Teaching mode		256-point mode		Solenoid valve mode 1		Solenoid valve mode 2	
		0		1		2		4		5	
Category	Port number	Code	Signal name	Code	Signal name	Code	Signal name	Code	Signal name	Code	Signal name
PLC OUTPUT ↓ MCON INPUT	0	PC1	Command position number	PC1	Command position number	PC1	Command position number	ST0	Start position 0	ST0	Start position 0
	1	PC2		PC2		PC2		ST1	Start position 1	ST1	Start position 1
	2	PC4		PC4		PC4		ST2	Start position 2	ST2	Start position 2
	3	PC8		PC8		PC8		ST3	Start position 3	–	Cannot be used
	4	PC16		PC16		PC16		ST4	Start position 4	–	
	5	PC32		PC32		PC32		ST5	Start position 5	–	
	6	–	MODE	Teaching mode command	PC64	ST6	Start position 6	–			
	7	–	Cannot be used	JISL	Jog/Inching switching	PC128	–	Cannot be used	–		
	8	–	Cannot be used	JOG+	+Jog	–	Cannot be used	–	Cannot be used	–	
	9	BKRL	Forced brake release	JOG–	–Jog	BKRL	Forced brake release	BKRL	Forced brake release	BKRL	Forced brake release
	10	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	Cannot be used
	11	HOME	Home return	HOME	Home return	HOME	Home return	HOME	Home return	–	
	12	*STP	Pausing	*STP	Pausing	*STP	Pausing	*STP	Pausing	–	
	13	CSTR	Positioning start	CSTR/ PWRT	Positioning start/ Position data capture command	CSTR	Positioning start	–	Cannot be used	–	
	14	RES	Reset	RES	Reset	RES	Reset	RES	Reset	RES	Reset
15	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	
MCON OUTPUT ↓ PLC INPUT	0	PM1	Completed position number	PM1	Completed position number	PM1	Completed position number	PE0	Position complete 0	LS0	Backward end movement command 0
	1	PM2		PM2		PM2		PE1	Position complete 1	LS1	Backward end movement command 1
	2	PM4		PM4		PM4		PE2	Position complete 2	LS2	Backward end movement command 2
	3	PM8		PM8		PM8		PE3	Position complete 3	–	Cannot be used
	4	PM16		PM16		PM16		PE4	Position complete 4	–	
	5	PM32		PM32		PM32		PE5	Position complete 5	–	
	6	MOVE	Moving signal	MOVE	Moving signal	PM64	–	PE6	Position complete 6	–	
	7	ZONE1	Zone 1	MODES	Teaching mode signal	PM128	–	ZONE1	Zone 1	ZONE1	Zone 1
	8	PZONE/ ZONE2 (Note 1)	Position zone/ Zone 2	PZONE/ ZONE1	Position zone/ Zone 1	PZONE/ ZONE1	Position zone/ Zone 1	PZONE/ ZONE2	Position zone/ Zone 2	PZONE/ ZONE2	Position zone/ Zone 2
	9	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	Cannot be used
	10	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete
	11	PEND	Positioning complete signal	PEND/ WEND	Positioning complete signal/ Position data capture completed	PEND	Positioning complete signal	PEND	Positioning complete signal	–	Cannot be used
	12	SV	Operation ready	SV	Operation ready	SV	Operation ready	SV	Operation ready	SV	Operation ready
	13	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop
	14	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm
15	LOAD/ TRQS/ *ALML	Torque detection (Note 2)/Minor failure output	*ALML	Minor failure output	LOAD/ TRQS/ *ALML	Torque detection (Note 2)/Minor failure output	LOAD/ TRQS/ *ALML	Torque detection (Note 2)/Minor failure output	*ALML	Minor failure output	

(Note 1) Can be switched by Parameter No. 149 "Zone output switching".
 (Note 2) When the driver for stepper motor is selected, it can be switched by the Parameter No. 156 "Torque detection/Minor failure output".
 Minor failure output is used for the AC servo motor driver / DC brushless motor driver.
 * In the table above, the # symbol accompanying each code indicates a negative logic signal.
 * PIO pattern 3 is not available.

MCON-C / CG operation method

In case of Fieldbus specification

- 1 Enter the position data in the Mcon and operate it by specifying the position No. from the PLC via the Fieldbus.
- 2 In order to operate, the data of the position, the speed, etc. is sent by the numerical value from the PLC via Fieldbus.



Tools required for setting

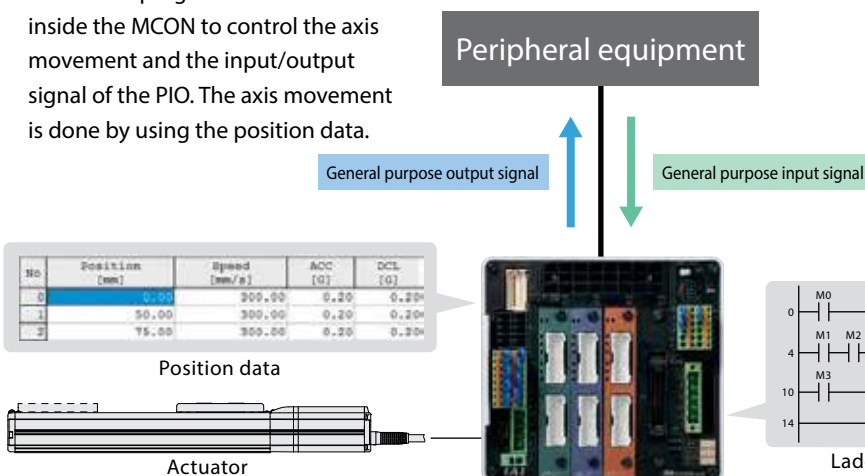
- 1 Touch panel teaching pendant (See P7-90)
- 2 PC dedicated teaching software (See P7-90)
- 3 Gateway parameter setting tool

* It is possible to set with either 1 or 2.
3 is included with PC-compatible software.

MCON-LC / LCG operation method

In case of PIO specification

The ladder program is executed inside the MCON to control the axis movement and the input/output signal of the PIO. The axis movement is done by using the position data.



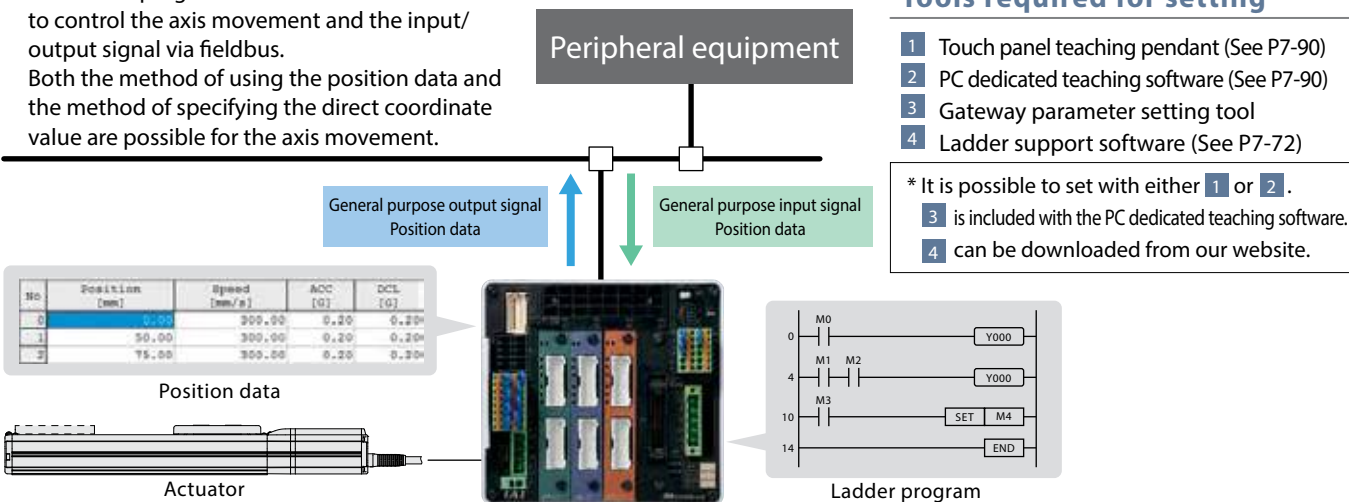
Tools required for setting

- 1 Touch panel teaching pendant (See P7-90)
- 2 PC dedicated teaching software (See P7-90)
- 3 Gateway parameter setting tool
- 4 Ladder support software (See P7-72)

* It is possible to set with either 1 or 2.
3 is included with the PC dedicated teaching software.
4 can be downloaded from our website.

In case of Fieldbus specification

The ladder program is executed inside the MCON to control the axis movement and the input/output signal via fieldbus. Both the method of using the position data and the method of specifying the direct coordinate value are possible for the axis movement.



Tools required for setting

- 1 Touch panel teaching pendant (See P7-90)
- 2 PC dedicated teaching software (See P7-90)
- 3 Gateway parameter setting tool
- 4 Ladder support software (See P7-72)

* It is possible to set with either 1 or 2.
3 is included with the PC dedicated teaching software.
4 can be downloaded from our website.

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

1 Memory types and Number of points

The memory of the table on the right can be used.

Program capacity	12k Steps	
	Number of memory points	Input (X)
Output (Y)		16 points/32 points
Internal relay (M)		3.072 points
Special Relays (SM)		128 points
Data Register (D)		64 words
Special registers (SD)		32 words
Timer (T), Counter (C)		32 points each
Index Register (IX)		33 points
Label (L)		128 points
Retaining Relays (LM)		

2 Basic instructions

27 kinds of basic instructions such as contact instruction and output instruction can be used.

Classification	Instruction		Symbol	Processing	Number of steps
Contact instruction	LD	S		a contact	2
	LDN	S		b contact	2
	OR	S		a contact	2
	ORN	S		b contact	2
	AND	S		a contact	2
	ANDN	S		b contact	2
	LDP	S		Rising trigger	2
	LDNP	S		Falling Trigger	2
	ORP	S		Rising trigger	2
	ORNP	S		Falling Trigger	2
	ANDP	S		Rising trigger	2
	ANDNP	S		Falling Trigger	2
	Combination instruction	OR-BLK		-	OR block processing
AND-BLK			-	AND block processing	1
M-PUSH			-	Memory storage	1
M-READ			-	Memory read	1
M-POP			-	Memory read	1
Output instructions	OUT	D		Coil output	2
	OUT	T set value		Timer output	3
	OUT	C set value		Counter output	3
	SET	D		OM Set	2
	RST	D		OM Reset	2
	PLS	D		Pulse output	2
	PLSN	D		Pulse off output	2
	SFT	D		Bit shift	2
	End instruction	END			End of program
ENDS				End of main routine	1

3 Application instruction

53 kinds of application instructions such as data comparison, arithmetic operation etc. can be used.

Classification	Instruction				Symbol	Processing	Number of steps
Data comparison	S1 = S2				[]	Conductive if S1=S2	3
	S1 > S2				[]	Conductive if S1>S2	3
	S1 >= S2				[]	Conductive if S1>=S2	3
	S1 < S2				[]	Conductive if S1<S2	3
	S1 <= S2				[]	Conductive if S1<=S2	3
	S1 <> S2				[]	Conductive if S1≠ S2	3
Arithmetic operation	+	S	D		[]	Store S + D (BIN) in D	3
	+	S1	S2	D	[]	Store S1 + S2 (BIN) in D	4
	-	S	D		[]	Store D - S (BIN) in D	3
	-	S1	S2	D	[]	Store S1 - S2 (BIN) in D	4
	*	S1	S2	D	[]	Store S1 × S2 (BIN) in D	4
	/	S1	S2	D	[]	Store S1 ÷ S2 (BIN) in D	4
	B+	S	D		[]	Store S + D (BCD) in D	3
	B+	S1	S2	D	[]	Store S1 + S2 (BCD) in D	4
	B-	S	D		[]	Store D - S (BCD) in D	3
	B-	S1	S2	D	[]	Store S1 - S2 (BCD) in D	4
	B*	S1	S2	D	[]	Store S1 × S2 (BCD) in D	4
	B/	S1	S2	D	[]	Store S1 ÷ S2 (BCD) in D	4
	INC	D			[]	Increment	2
	DEC	D			[]	Decrement	2
BCD-BIN conversion	BCD	S	D		[]	BCD conversion	3
	BIN	S	D		[]	BIN conversion	3
Transfer	MOV	S	D		[]	Transfer S to D	3
	MOVN	S	D		[]	S is inverted bit by bit and transferred to D	3
	MCPY	S	D	n	[]	Transfer n points from S to D from S	4
	MSET	S	D	n	[]	Transfer S from D to n points	4
	XCHG	D1	D2		[]	Bit data exchange between D1 and D2	3
Branch	JE	S			[]	When the condition is satisfied, jump to L	2
	JMP	S			[]	Jump unconditionally to L	2
	CALL	S			[]	Execute specified subroutine with L	2
	RET				[]	Return from subroutine	1
Logical operation	LAND	S	D		[]	Store the logical product of S and D in D	3
	LAND	S1	S2	D	[]	Store the logical product of S1 and S2 in D	4
	LOR	S	D		[]	Store the logical sum of S and D in D	3
	LOR	S1	S2	D	[]	Store the logical sum of S1 and S2 in D	4
	LXOR	S	D		[]	Store exclusive OR of S and D in D	3
	LXOR	S1	S2	D	[]	Store exclusive OR of S1 and S2 in D	4
	LXNR	S	D		[]	Store negative exclusive OR of S and D in D	3
	LXNR	S1	S2	D	[]	Store negative exclusive OR of S1 and S2 in D	4
	NEG	D			[]	Sign inversion	2
Rotation	ROR	D	n		[]	D is rotated n bits to the right without containing the carry flag	3
	RCR	D	n		[]	D is rotated n bits to the right including the carry flag	3
	ROL	D	n		[]	D is rotated n bits to the left without including the carry flag	3
	RCL	D	n		[]	D is rotated to the left by n bits including the carry flag	3
Shift	SHR	D	n		[]	Shift D right by n bits	3
	SHL	D	n		[]	Shift D left by n bits	3
	BSHR	D	n		[]	Shift n bits from D to right by 1 bit	3
	BSHL	D	n		[]	Shift n bits from D to left by 1 bit	3
	WSHR	D	n		[]	Shift n points from D to right by 1 point	3
	WSHL	D	n		[]	Shift n points from D to left by 1 point	3
	Data processing	SUM	S	D		[]	Store the ON bit number of 16-bit data of S in D
DECO		S	D	n	[]	Decode lower n bits of S and store from D to 2 ⁿ bits	4
ENCO		S	D	n	[]	Encode 2 ⁿ bits from S and store in D	4
BSET		D	n		[]	Set the nth bit of D	3
BRST		D	n		[]	Reset nth bit of D	3
DDV		S	D	n	[]	Store the lower n digits of S from D to the lower 4 bits of n points	4
DCV		S	D	n	[]	Store low order 4 bit data for n points from S to D	4
FIFO		FIFW	S	D		[]	Write to FIFO table
	FIFR	D1	D2		[]	Read from FIFO table	3
Loop	FOR	S			[]	Execute between FOR and NEXT n times	2
	NEXT				[]		1
	BREAK				[]	Execute the next step of NEXT	1
Carry Flag	STC				[]	Set carry flag contact	1
	CLC				[]	Reset carry flag contact	1
DFC instruction	DFC	fcn	S1	S2	[]	Call DFC instructions	4

Controller

EC

RCP6S

RCON

MCON-C/LC

PCON-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON-CB

SCON-CB
(Servo press)

SCON-LC

SCON-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

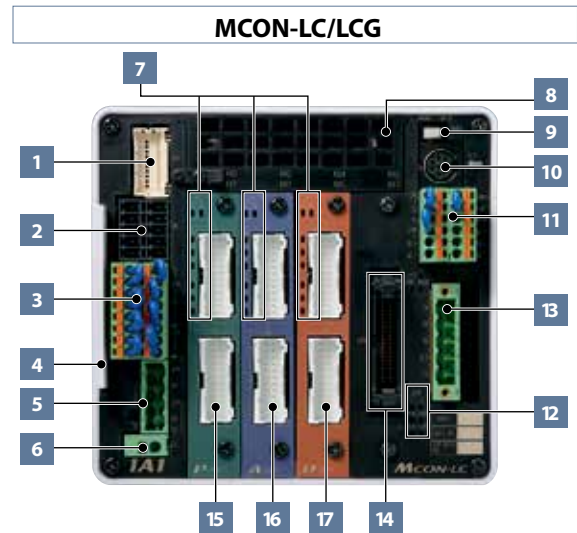
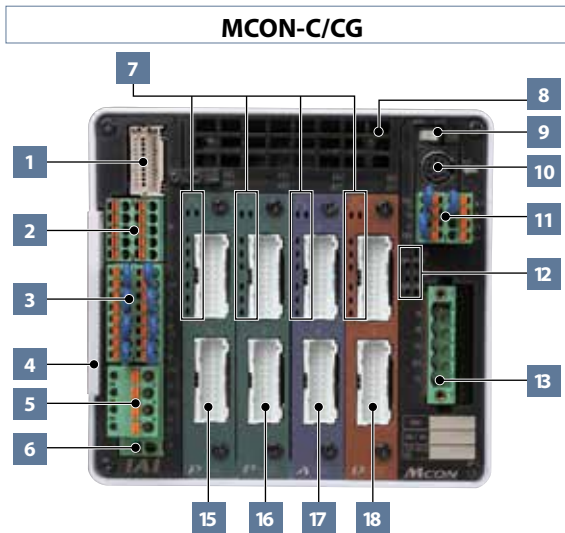
XSEL
(SCARA)

PSA-24

TB-02

TB-03

Name of each part of MCON controller



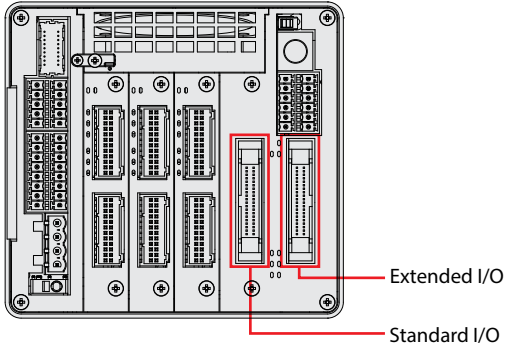
Descriptions of Each Component

- 1 Connector for the absolute data backup battery**
 This connects the absolute data backup battery box should the controller be the simple absolute type.
- 2 Connector for the external brake input**
 This signal input connector is used to release the actuator brake externally.
- 3 Motor power cut-off and emergency stop input connector**
 In/out terminals for external relay for motor power cut-off and connectors for emergency stop input, for each driver slot (2 axes).
- 4 Information card for configuration of the connecting axes**
 The information card contains information regarding the configuration of the controller axes which is removable to examine the contents.
- 5 +24V power supply input connector**
 This is the main power supply connector for the controller: The motor power can be shut-off while the control power remains turned ON at the time of an emergency stop. This is because the power supply terminals for the motor and the controller are separate.
- 6 FG terminal block**
 It is a terminal block for frame ground.
- 7 Status LEDs for drivers**
 The driver status and absolute status are displayed per slot (2 axes).
- 8 Fan unit**
 A fan unit that can be easily replaced. (Replacement fan unit Model: MSEP-FU)
- 9 AUTO/MANU switch**
 A switch for the automatic / manual operation.
- 10 SIO connector**
 A connector for connecting the touch panel teaching pendant and PC dedicated software cable.
- 11 System I/O connector**
 The connector for remote AUTO/MANU switch input and emergency stop input for the entire controller with functions including an external regeneration-resistance expansion terminal and an external SIO terminal.
- 12 Status LEDs for fieldbus**
 Status display LEDs for controller and fieldbus.
- 13 Fieldbus connector / Extended I / O**
 MCON-C / CG is equipped with various fieldbus connectors. MCON-LC / LCG can optionally install expansion I / O.
- 14 Standard I / O (MCON-LC / LCG only)**
 The MCON-LC/LCG is equipped with a 40-pin PIO connector as standard.
- 15 ~ 18 Motor-encoder connectors for actuator connections**
 Connect motor-encoder cables for actuators.

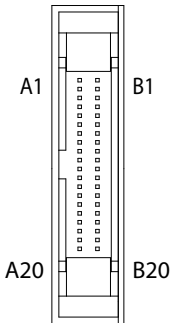
Input / output (PIO) signal

In a ladder program, MCON-LC/LCG can use general-purpose I/O of 16 input and 16 output points as standard. With an extended I/O, 32 input and 32 output points can be used.

MCON-LC / LCG (extended I / O specification)



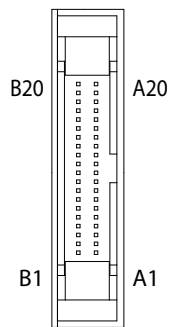
PIO wiring diagram of MCON-LC / LCG



Standard I/O

Pin number	Classification	Destination memory	Pin number	Classification	Destination memory
A1	—	+24V	A11	Input	X006
A2		External input	A12		X007
A3		unused	A13		X008
A4		unused	A14		X009
A5	Input	X000	A15		X00A
A6		X001	A16		X00B
A7		X002	A17		X00C
A8		X003	A18		X00D
A9		X004	A19		X00E
A10		X005	A20		X00F

Pin number	Classification	Destination memory	Pin number	Classification	Destination memory
B1	Output	Y000	B11	Output	Y00A
B2		Y001	B12		Y00B
B3		Y002	B13		Y00C
B4		Y003	B14		Y00D
B5		Y004	B15		Y00E
B6		Y005	B16		Y00F
B7		Y006	B17		unused
B8		Y007	B18		unused
B9		Y008	B19		0V
B10	Y009	B20	External input		



Extended I/O

Pin number	Classification	Destination memory	Pin number	Classification	Destination memory
A1	—	+24V	A11	Input	X016
A2		External input	A12		X017
A3		unused	A13		X018
A4		unused	A14		X019
A5	Input	X010	A15		X01A
A6		X011	A16		X01B
A7		X012	A17		X01C
A8		X013	A18		X01D
A9		X014	A19		X01E
A10		X015	A20		X01F

Pin number	Classification	Destination memory	Pin number	Classification	Destination memory
B1	Output	Y010	B11	Output	Y01A
B2		Y011	B12		Y01B
B3		Y012	B13		Y01C
B4		Y013	B14		Y01D
B5		Y014	B15		Y01E
B6		Y015	B16		Y01F
B7		Y016	B17		unused
B8		Y017	B18		unused
B9		Y018	B19		0V
B10	Y019	B20	External input		

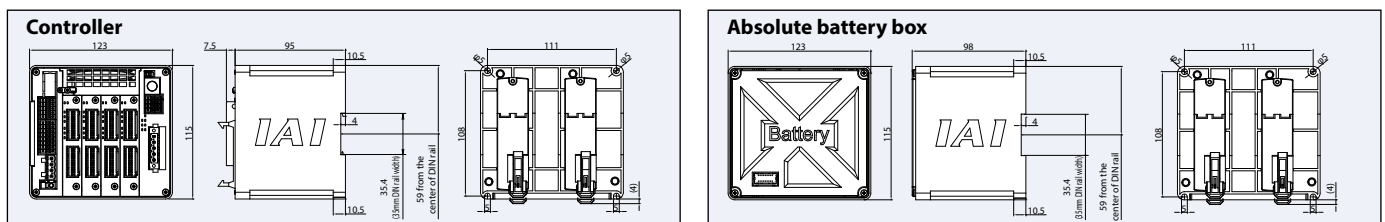
- Controller
- EC
- RCP6S
- RCON
- MCON-C/LC
- PCON-CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON-CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

General specifications

Specification	Description																																																														
Number of controlled axes	MAX. 8 axes (MCON-C/CG) / MAX 6axes (MCON-LC/LCG)																																																														
Controller/Motor input power supply voltage	24VDC ±10%																																																														
Brake release power consumption current	0.15A×Number of axes																																																														
Control power consumption current	1.0A																																																														
Control power inrush current (Note 1)	MAX 5A 30ms or less																																																														
Motor consumption current	<table border="1"> <thead> <tr> <th colspan="2">Actuator type</th> <th>Rating</th> <th colspan="2">Maximum</th> </tr> <tr> <th colspan="2"></th> <th></th> <th>Energy saver</th> <th>Standard/Hi-accel./decel.</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Stepper motor (Note 2)</td> <td>RCP2</td> <td>20P~28P</td> <td></td> <td>2.0A</td> </tr> <tr> <td>RCP3</td> <td>28SP~56P</td> <td></td> <td>2.0A</td> </tr> <tr> <td>RCP4 RCP5 RCP6</td> <td rowspan="2">28P~56P</td> <td>High-output disabled</td> <td>2.0A</td> </tr> <tr> <td>High-output enabled (Note 3)</td> <td>4.2A</td> </tr> <tr> <td rowspan="7">AC servo motor (Note 2)</td> <td colspan="2">2W</td> <td>0.8A</td> <td>4.6A</td> </tr> <tr> <td colspan="2">5W(RCA2)</td> <td>1.0A</td> <td>3.3A</td> </tr> <tr> <td colspan="2">5W(RCL)</td> <td>1.0A</td> <td>6.4A</td> </tr> <tr> <td colspan="2">10W(RCL)</td> <td>1.3A</td> <td>6.4A</td> </tr> <tr> <td colspan="2">10W(RCA/RCA2)</td> <td>1.3A</td> <td>2.5A</td> <td>4.4A</td> </tr> <tr> <td colspan="2">20W</td> <td>1.3A</td> <td>2.5A</td> <td>4.4A</td> </tr> <tr> <td colspan="2">20W(20S type)</td> <td>1.7A</td> <td>3.4A</td> <td>5.1A</td> </tr> <tr> <td>Brush-less DC motor</td> <td>3W</td> <td>0.7A</td> <td></td> <td>1.5A</td> </tr> </tbody> </table>	Actuator type		Rating	Maximum					Energy saver	Standard/Hi-accel./decel.	Stepper motor (Note 2)	RCP2	20P~28P		2.0A	RCP3	28SP~56P		2.0A	RCP4 RCP5 RCP6	28P~56P	High-output disabled	2.0A	High-output enabled (Note 3)	4.2A	AC servo motor (Note 2)	2W		0.8A	4.6A	5W(RCA2)		1.0A	3.3A	5W(RCL)		1.0A	6.4A	10W(RCL)		1.3A	6.4A	10W(RCA/RCA2)		1.3A	2.5A	4.4A	20W		1.3A	2.5A	4.4A	20W(20S type)		1.7A	3.4A	5.1A	Brush-less DC motor	3W	0.7A		1.5A
	Actuator type		Rating	Maximum																																																											
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Brush-less DC motor	3W	0.7A		1.5A																																																											
Motor power inrush current (Note 1)	Slot numbers × 10A max., 5ms or less																																																														
Motor-encoder cable length	Max. 20 m (*) For simplified absolute specifications or when connecting with RCD, the maximum is 10 m.																																																														
Serial communication (SIO port: teaching only)	RS485: 1ch (Modbus protocol) Speed: 9.6~230.4kbps																																																														
External interface	DeviceNet, CC-Link, CC-Link IE, PROFIBUS-DP, CompoNet, EtherCAT, EtherCAT Motion, EtherNet/IP, PROFINET IO, SSCNET, MECHATROLINK III																																																														
Data setting, input method	PC dedicated teaching software, touch panel teaching pendant, Gateway parameter setting tool																																																														
Data retention memory	Position data and parameters are saved in non-volatile memory. (No limit to rewrite)																																																														
Number of positioning points	256 points (Unlimited for simple numerical control and direct numerical control) (*) The number of positioning points vary depending on the motion mode selection set by the parameter.																																																														
LED display (installed on the front panel)	Status LED for driver: 8 LEDs (for each driver board) Status LED for fieldbus: 7 LEDs																																																														
Electromagnetic brake forced release	Enable to force-release by transmitting a deactivation signal to each axis (24VDC input).																																																														
Protection function (Note 4)	Overcurrent protection (each slot has its own solid-state motor cut-off circuit built-in)																																																														
Electric shock protection mechanism	Class 1, basic insulation																																																														
Insulation resistance	DC500V 10MΩ																																																														
Weight	620/ 690g when the simple absolute spec. is selected /Additional 1,950g																																																														
Cooling method	Forced air cooling																																																														
External dimensions	123W×115H×95D																																																														
Ambient operating temp. & humidity	0~40°C, 85% RH or less (Non-condensing)																																																														
Vibration resistance	Frequency: 10~57Hz/Amplitude: 0.075mm, Frequency: 57~150Hz/Acceleration: 9.8m/s ² XYZ directions, Sweepage time: 10 minutes, Number of Sweepage time:10 times																																																														
Impact resistance	Drop height: 800mm 1 corner, 3 edges, 6 faces																																																														
Degree of protection	IP20																																																														
PLC function (* MCON - LC / LCG)	Dedicated ladder (program capacity 12 K steps)																																																														

(Note 1) Please note that the inrush current value varies depending on the impedance of the power line.
 (Note 2) The current will be highest in the exciting phase detection performed in the first servo ON process after the power is turned on.
 (Stepper motor: 100ms (normal)/AC servo motor: approx. 1~2 seconds (normal), up to 10 seconds)
 (Note 3) The driver board of high-output configuration specification can be used to control one axis per slot.
 (Note 4) The AC servo motor will function if the load current reaches equal to or greater than 1.4 times the maximum value.

External Dimensions



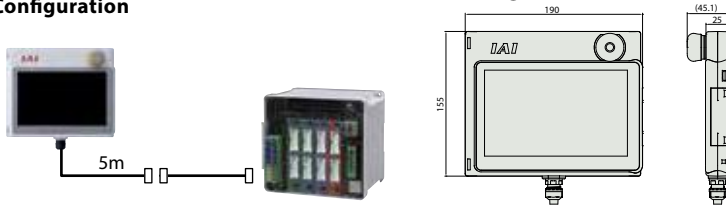
Options

Touch panel teaching pendant

Features A teaching device equipped with functions such as position teaching, trial operation and monitoring.

Model TB-02-□

Configuration



Specifications

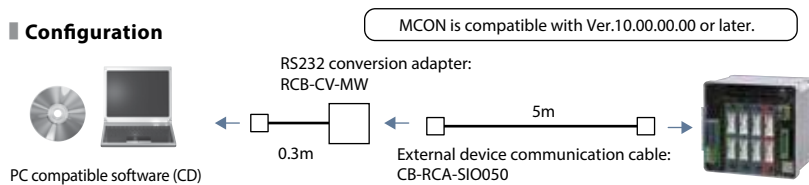
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~85% RH (Non-condensing)
Environmental resistance	IP20
Weight	470g (TB-01 unit only)

PC dedicated teaching software (Windows only) *The PC dedicated software is required for the MCON.

Features The start-up support software which comes equipped with functions such as position teaching, trial operation and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

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

Configuration

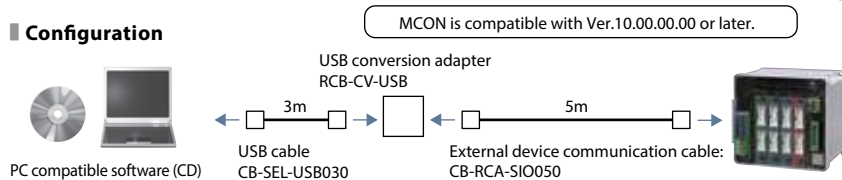


Supported Windows version 7/8/10



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

Configuration

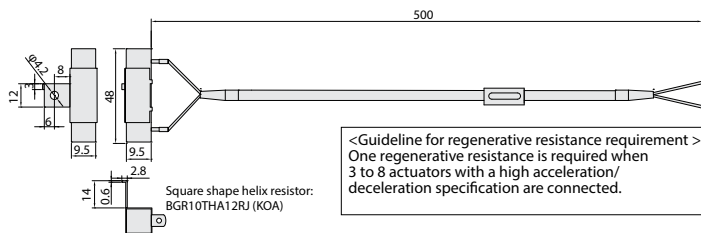


External regenerative resistance

Overview As the motor reduces its speed, the resistor will convert dissipated regenerative current into heat. Since the MCON controller has a built-in regenerative resistance, this can be used for normal operations. However, an external resistor can be installed should the capacity of the internal resistor be insufficient.

Model RER-1

External Dimensions



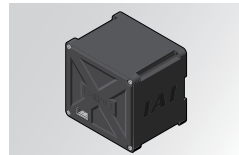
Absolute battery box

Overview If the simple absolute specification (model: ABB) is selected, the absolute battery box is included with the controller (with absolute battery). However, if the battery box is ordered as a separate unit, it does not include the battery but just the box itself. If the battery is needed, please purchase it separately. (Model: AB-7).

Model MSEP-ABB (battery sold separately)

External Dimensions See P7-89

* Cable that connects the absolute battery box and MCON (Cable Model: CB-MSEP-AB005) comes with the absolute battery box.



Dummy plug

Overview It is required for the safety category compliant type (CG).

Model DP-5



Driver board

Overview The driver board can be supplemented or exchanged in the MCON controller. When just the actuator operated needs to be modified, this can be done by simply replacing the driver board instead of the entire controller. (The parameters will need to be adjusted when the driver board is replaced)

Model/Standard price

Motor type	High output type	Encoder type	Number of axes	Model
Stepper motor	High output setting enabled	Battery-less absolute/ Incremental	1	MCON-PPD1-W
		Simple absolute	1	MCON-PPD1-A
	Highoutput Setting disabled	Battery-less absolute/ Incremental	1	MCON-PD1-W
		Simple absolute	1	MCON-PD1-A
AC servo motor	—	Battery-less absolute/ Incremental	2	MCON-PD2-W
			2	MCON-PD2-A
	—	Simple absolute	1	MCON-AD1-W
			2	MCON-AD1-A
Brush-less DC motor	—	Incremental	1	MCON-AD2-W
			2	MCON-AD2-A
—	—	—	1	MCON-DD1- I
			2	MCON-DD2- I

* For SSCNET - MECHATROLINK III specification, it is MCON - M □□□ (□) - □. (Example) For a stepper motor, High output setting enabled and Battery-less absolute for 1 axis:

Replacement battery

Overview Replacement battery used with the absolute battery box.

Model AB-7



Replacement fan unit

Model MSEP-FU

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

Maintenance parts

When placing an order for a replacement cable, please refer to the model below. (* Refer to P1-253 for the actuator to be connected.)

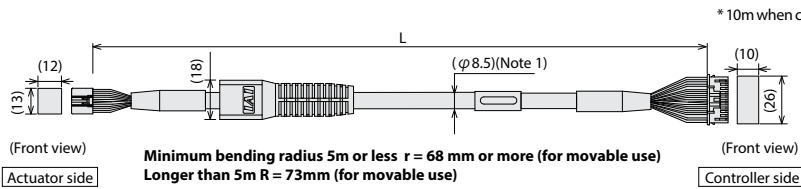
Table of compatible cables

Product model		Motor-encoder integrated cable	Motor-encoder integrated robot cable
①	RCP6/RCP5 RCP6CR/RCP6W/RCP5CR/RCP5W	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
②	RCP4 RCP4CR	SA3/RA3 /GR/ST	
③	RCP4 RCP4CR RCP4W (Models other than ②)	CB-CA-MPA □□□	CB-CA-MPA □□□ -RB
④	RCP3		
⑤	RCP2 RCP2CR RCP2W	GRSS/GRLS/GRST/GRHM/GRHB/ SRA4R/SRG54R/SRGD4R	CB-APSEP-MPA □□□
⑥		RTBS/RTBSL RTCS/RTCSL	CB-RPSEP-MPA □□□
⑦		GRS/GRM GR3SS/GR3SM	
⑧	RCP2	RTBS/RTBSL RTCS/RTCSL/RTB/RTBL/RTC/RTCL/ RTBB/RTBBL/RTCB/RTCBL	CB-CAN-MPA □□□ -RB
⑨	RCP2/RCP2CR/RCP2W (models other than ⑤ ~ ⑧)		CB-PSEP-MPA □□□
⑩	RCA2/RCA2CR/RCA2W		CB-APSEP-MPA □□□
⑪	RCA2/RCA2CR/RCAW (when CNS is selected)		CB-CAN-MPA □□□ -RB
⑫	RCA RCA2CR RCAW	SRA4R SRG54R SRGD4R	CB-APSEP-MPA □□□
⑬		Models other than ⑫	CB-ASEP2-MPA □□□
⑭		RA1DA	
⑮	RCD	GRSNA	CB-CAN-MPA □□□ -RB
⑯		RCL	CB-APSEP-MPA □□□

* If the controller of the RCD-RA1DA model uses "D3", the cable model is CB-CA-MPA□□/CB-CA-MPA□□□-RB.

Product model	PIO Flat Cable
⑰ MCON-LC/LCG	CB-PAC-PIO □□□

Model **CB-CAN-MPA** □ □ □ / **CB-CAN-MPA** □ □ □ -RB * Please indicate the cable length (L) in □□□, maximum 20m. E.g.) 080 = 8m



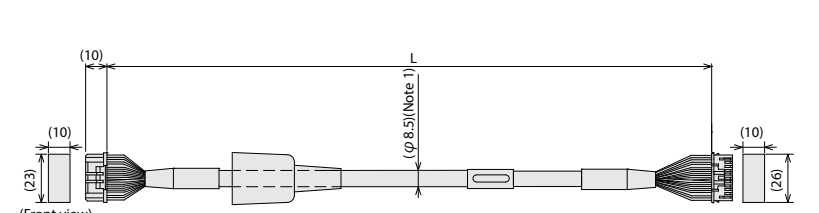
Minimum bending radius 5m or less $r = 68$ mm or more (for movable use)
Longer than 5m $R = 73$ mm (for movable use)

* The robot cable is a cable of the flex-resistant specification.
Use a robot cable to pass through the cable bear.

(Note 1) When the cable length is 5 m or more, both non-robot cable and robot cable will be $\phi 9.1$.

Pin No.	Signal name	Pin No.	Signal name	
			RCP Series	RCD Series
3	$\phi A/U$	1	ϕA	U
5	VMM/V	2	VMM	V
10	$\phi A/W$	3	ϕB	—
9	$\phi B/-$	4	VMM	—
4	VMM/-	5	ϕA	W
15	$\phi B/+$	6	ϕB	—
8	LS+/BK+	7	LS+	—
14	LS-/BK-	8	LS-	—
12	-/A+	11	SA(mABS)	A+
17	-/A-	12	SB(mABS)	A-
1	A+/B+	13	A+	B+
6	A-/B-	14	A-	B-
11	B+/Z+	15	B+	HS1 IN
16	B-/Z-	16	B-	HS2 IN
20	BK+/LS+	9	BK+	—
2	BK-/LS-	10	BK-	—
21	LS_GND	17	VCC	VCC
7	VPS	19	GND	GND
18	VCC	18	VPS	—
13	GND	20	LS_GND	HS3 IN
19	—	22	—	—
22	BAT+	21	-(CFvcc)	—
23	—	23	—	—
24	FG	24	FG	FG

Model **CB-CA-MPA** □ □ □ / **CB-CA-MPA** □ □ □ -RB * Please indicate the cable length (L) in □□□, maximum 20m. E.g.) 080 = 8m



Minimum bending R 5 m or less $r = 68$ mm or more (for movable use)
Longer than 5 m $r = 73$ mm or more (for movable use)

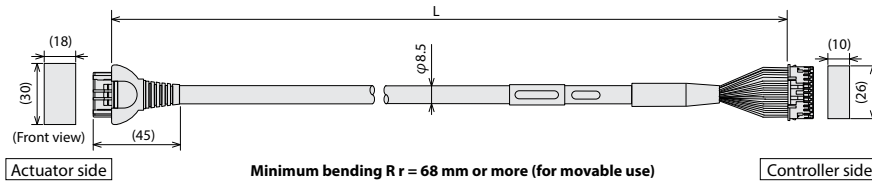
* The robot cable is a cable of the flex-resistant specification.
Use a robot cable to pass through the cable bear.

(Note 1) When the cable length is 5 m or more, both non-robot cable and robot cable will be $\phi 10$.

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

Model **CB-APSEP-MPA** □ □ □

* Please indicate the cable length (L) in □□□, maximum 20m E.g.) 080 = 8m

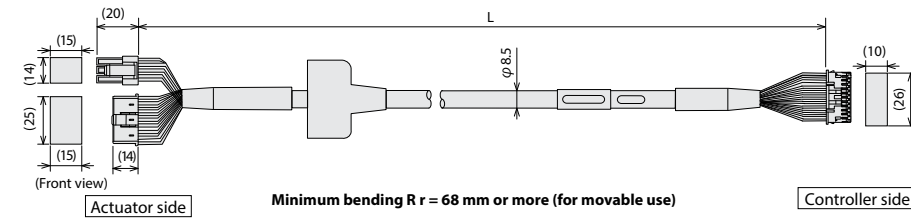


Actuator side 1-1827863-1 (AMP)			Controller side PDP-24V-1-S (JST)		
Pin No.	Signal name	Color	Pin No.	Signal name	Color
A1	φA	Black	1	φA	Black
B1	VMM	White	2	VMM	White
A2	φA	Brown	5	φA	Brown
B2	φB	Green	3	φB	Green
A3	VMM	Yellow	4	VMM	Yellow
B3	φB	Red	6	φB	Red
A4	LS+	Orange	7	LS+	Orange
B4	LS-	Grey	8	LS-	Grey
A6	---	White	11	---	White
B6	---	Yellow	12	---	Yellow
A7	A+	Red	13	A+	Red
B7	A-	Green	14	A-	Green
A8	B+	Black	15	B+	Black
B8	B-	Brown	16	B-	Brown
A5	BK+	Black (td tape)	9	BK+	Black (td tape)
B5	BK-	Brown (td tape)	10	BK-	Brown (td tape)
A9	GND+	Green (td tape)	20	GND+	Green (td tape)
B9	VPS	Red (td tape)	18	VPS	Red (td tape)
A10	VCC	White (td tape)	17	VCC	White (td tape)
B10	GND	Yellow (td tape)	19	GND	Yellow (td tape)
A11	NC	---	21	NC	---
B11	Shield, FG	---	24	Shield, FG	---
			22	---	---
			23	---	---

Model **CB-PSEP-MPA** □ □ □

* Only robot cable is available for this model.

* Please indicate the cable length (L) in □□□, maximum 20m E.g.) 080 = 8m

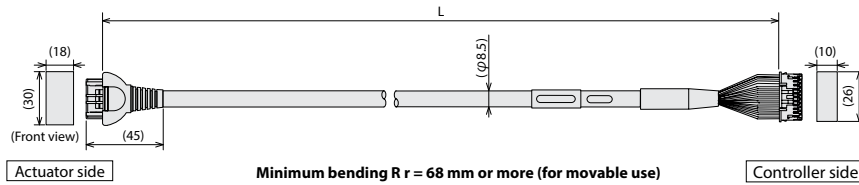


Actuator side Terminal number	Signal name	Controller side Terminal number
1	[φA]	1
2	[VMM]	2
4	[φB]	3
5	[VMM]	4
3	[φA]	5
6	[φB]	6
16	[BK+]	9
17	[BK-]	10
5	NC	11
6	NC	12
13	[LS+]	7
14	[LS-]	8
1	[A+]	13
2	[A-]	14
3	[B+]	15
4	[B-]	16
10	[VPS]	17
11	[VPS]	18
9	[GND]	19
12	(reserve)	20
15	NC	21
10	NC	22
8	NC	23
18	Shield [FG]	24

Model **CB-RPSEP-MPA** □ □ □

* Only robot cable is available for this model.

* Please indicate the cable length (L) in □□□, maximum 20m E.g.) 080 = 8m

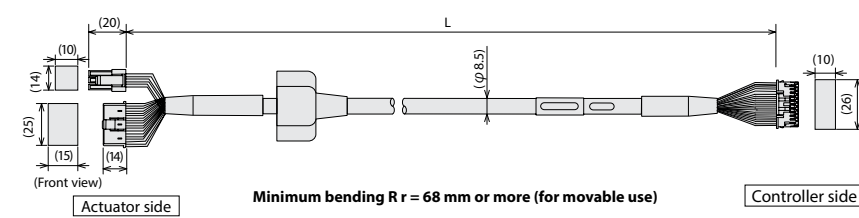


Actuator side Terminal number	Signal name	Controller side Terminal number
A1	[φA]	1
B1	[VMM]	2
A2	[φA]	5
B2	[φB]	3
A3	[VMM]	4
B3	[φB]	6
A6	[LS+]	7
B6	[LS-]	8
A7	[A+]	13
B7	[A-]	14
A8	[B+]	15
B8	[B-]	16
A4	NC	---
B4	NC	---
A5	[BK+]	9
B5	[BK-]	10
A9	[GNDLS]	20
B9	[VPS]	18
A10	[VCC]	17
B10	[GND]	19
A11	NC	21
B11	Shield [FG]	24
	NC	22
	NC	23

Model **CB-ASEP2-MPA** □ □ □

* Only robot cable is available for this model.

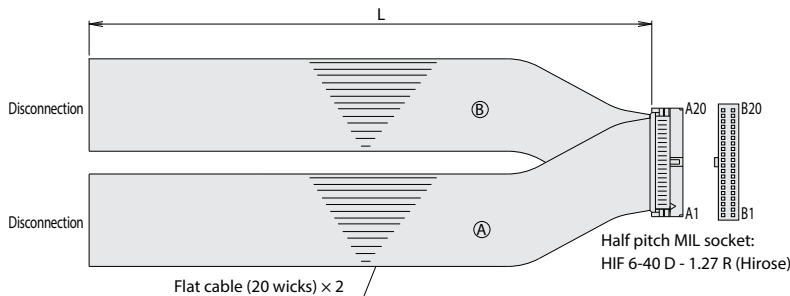
* Please indicate the cable length (L) in □□□, maximum 20m E.g.) 080 = 8m



Actuator side Terminal number	Signal name	Controller side Terminal number
1	[U]	1
2	[V]	2
	NC	3
	NC	4
3	[W]	5
	NC	6
18	[BK+]	7
17	[BK-]	8
7	[LS+]	9
16	[LS-]	10
1	[A+]	11
2	[A-]	12
3	[B+]	13
4	[B-]	14
10	[Z+]	15
11	[Z-]	16
14	[VCC]	17
13	[VPS]	18
15	[GND]	19
6	(reserve)	20
5	NC	21
8	NC	22
12	NC	23
9	Shield [FG]	24

Model **CB-PAC-PIO** □ □ □

* Please indicate the cable length (L) in □□□, maximum 20m E.g.) 080 = 8m



HIF6-40D-1.27R				HIF6-40D-1.27R			
No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
A1	24V	Brown-1		B1	OUT0	Brown-3	
A2	24V	Red-1		B2	OUT1	Red-3	
A3	---	Orange-1		B3	OUT2	Orange-3	
A4	---	Yellow-1		B4	OUT3	Yellow-3	
A5	IN0	Green-1		B5	OUT4	Green-3	
A6	IN1	Blue-1		B6	OUT5	Blue-3	
A7	IN2	Purple-1		B7	OUT6	Purple-3	
A8	IN3	Gray-1		B8	OUT7	Gray-3	
A9	IN4	White-1		B9	OUT8	White-3	
A10	IN5	Black-1		B10	OUT9	Black-3	
A11	IN6	Brown-2		B11	OUT10	Brown-4	
A12	IN7	Red-2		B12	OUT11	Red-4	
A13	IN8	Orange-2		B13	OUT12	Orange-4	
A14	IN9	Yellow-2		B14	OUT13	Yellow-4	
A15	IN10	Green-2		B15	OUT14	Green-4	
A16	IN11	Blue-2		B16	OUT15	Blue-4	
A17	IN12	Purple-2		B17	---	Purple-4	
A18	IN13	Gray-2		B18	---	Gray-4	
A19	IN14	White-2		B19	OV	White-4	
A20	IN15	Black-2		B20	OV	Black-4	

Controller

EC

RCP6S

RCON

MCON-C/LC

PCON-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON-CB

SCON-CB
(Servo press)

SCON-LC

SCON-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

PCON-CB/CFB



The Position Controllers for RCP6/RCP5/RCP4 (PowerCON Type)
Position Controller for RCP3/RCP2



(*1) CC-Link IE Field and MECHATROLINK- I / II connection specification are not compliant with CE Marking.

Features

1 High resolution Battery-less Absolute Encoder type

The RCP6 equipped with a high-resolution battery-less absolute encoder is supported. Since no battery is needed to retain position data, less space is required in the control panel, which in turn leads to lower cost of your equipment. The resolution is increased from 800 pulses /rev to 8,192 pulses/rev.

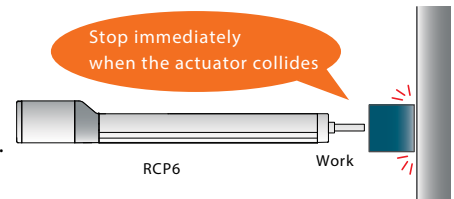


2 PowerCON® Equipped

PowerCON (high-output driver) which can enable the stepper motor to perform at its maximum capacity is now installed. By using PowerCON, the output of the stepper motor is increased by 50%. It contributes to cycle time reduction and productivity improvement.

3 Collision Detection Function Equipped

This function stops the operation immediately when the actuator comes into contact with an object. The actuator stops without crashing, so that damage to the actuator can be minimized.



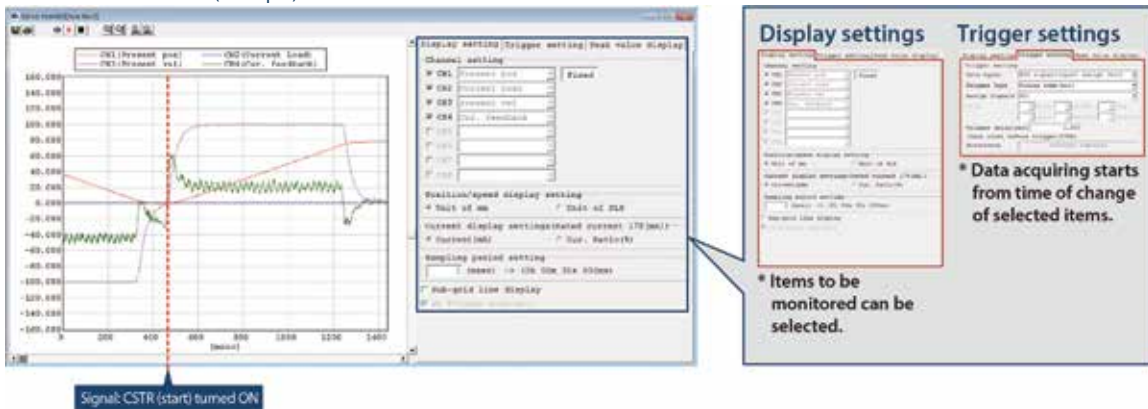
4 Enhanced Monitor Functions

The PC dedicated software can display information about the actuator and controller in operation as waveforms.

*Information that can be displayed: Command current value, current speed/position, and PIO signals (start, positioning completion, alarm, etc.)


Using the trigger function, the end user can specify a particular moment, either a change in PIO signals or a designated moment during the actuator's operation time, to begin displaying the waveforms.

Monitor function screen (example)



- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

List of Models

Model number		PCON-CB•CGB/CFB•CGFB											
External view													
I/O type		Positioner type	Pulse-train type	Field network type									
				DeviceNet	CC-Link	CC-Link IE Field connection specification	PROFIBUS DP	CompoNet	MECHATROLINK I/II*1	MECHATROLINK III*1	EtherCAT	EtherNet/IP	PROFINET IO
I/O type model number		NP/PN	PLN/PLP	DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT
PCON-CB/CGB	Battery-less absolute specification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Simple absolute spec.	With absolute battery	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Without absolute battery	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PCON-CFB/CGFB	Battery-less absolute specification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*1 MECHATROLINK I/II is treated as an Intelligent I/O and supports only asynchronous commands. MECHATROLINK III is compatible with standard servo profiles.

Model Specification Items

PCON — [] — [] — [] — [] — [] — 0 — [] — []

Series **Type** **Motor Type** **Encoder Type** **I/O Type** **I/O Cable Length** **Power Supply Voltage** **Simple Absolute Specification** **Controller Mounting Specification**

CB	Standard							
CGB	Safety category compliant type							
CFB	56SP/60P/86P motor-compliant type	WAI	Battery-less absolute specification					
		SA	Simple absolute spec.			0	24VDC	
CGFB	Safety category compliant 56SP/60P/86P motor-compliant type							

20P	20□	42SP	42□					
20SP	20□	56P	56□					
28P	28□	56SP	56□					
28SP	28□	60P	60□					
35P	35□	86P	86□					
42P	42□							

(E.g.) 20P: 20□ stepper motor supported

Note
In principle, the same type of motor as the type of motor of the actuator to be connected should be entered, but there are some models where the motor type of some controllers and actuators do not match. Be sure to check the corresponding models listed below during selection.
<28SP target actuator>
● Controller motor type [28SP]
RCP2-RA3C

NP	PIO (NPN)
PLN	Pulse train (NPN)
PN	PIO (PNP)
PLP	Pulse train (PNP)
DV	DeviceNet
CC	CC-Link
CIE	CC-Link IE Field connection specification
PR	PROFIBUS-DP
CN	CompoNet
ML	MECHATROLINK-I/II (Note 1)
ML3	MECHATROLINK III (Note 1)
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

Please be sure to check P7-18 for the caution when selecting.

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

* When a field network specification is selected, the I/O cable length is "0".

(Blank)	Battery-less absolute specification
AB	Simple absolute spec. (With absolute battery. No battery unit included)
ABU	Simple absolute spec. (With absolute battery and battery unit)
ABUN	Simple absolute spec. (Without absolute battery and battery unit)

* PCON-CFB/CGFB does not support a simple absolute specification.

(Blank)	Screw mounting specification
DN	DIN rail mounting specification

* The mounting type (screw or DIN rail) of the absolute battery unit and the controller must be the same.

Controller

EC

RCP6S

RCON

MCON-C/LC

PCON-CB/CFB

PCON

ACON-CB

DCON-CB

ACON DCON

SCON-CB

(Servo press)

SCON-CB

(Servo press)

SCON-LC

SCON-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

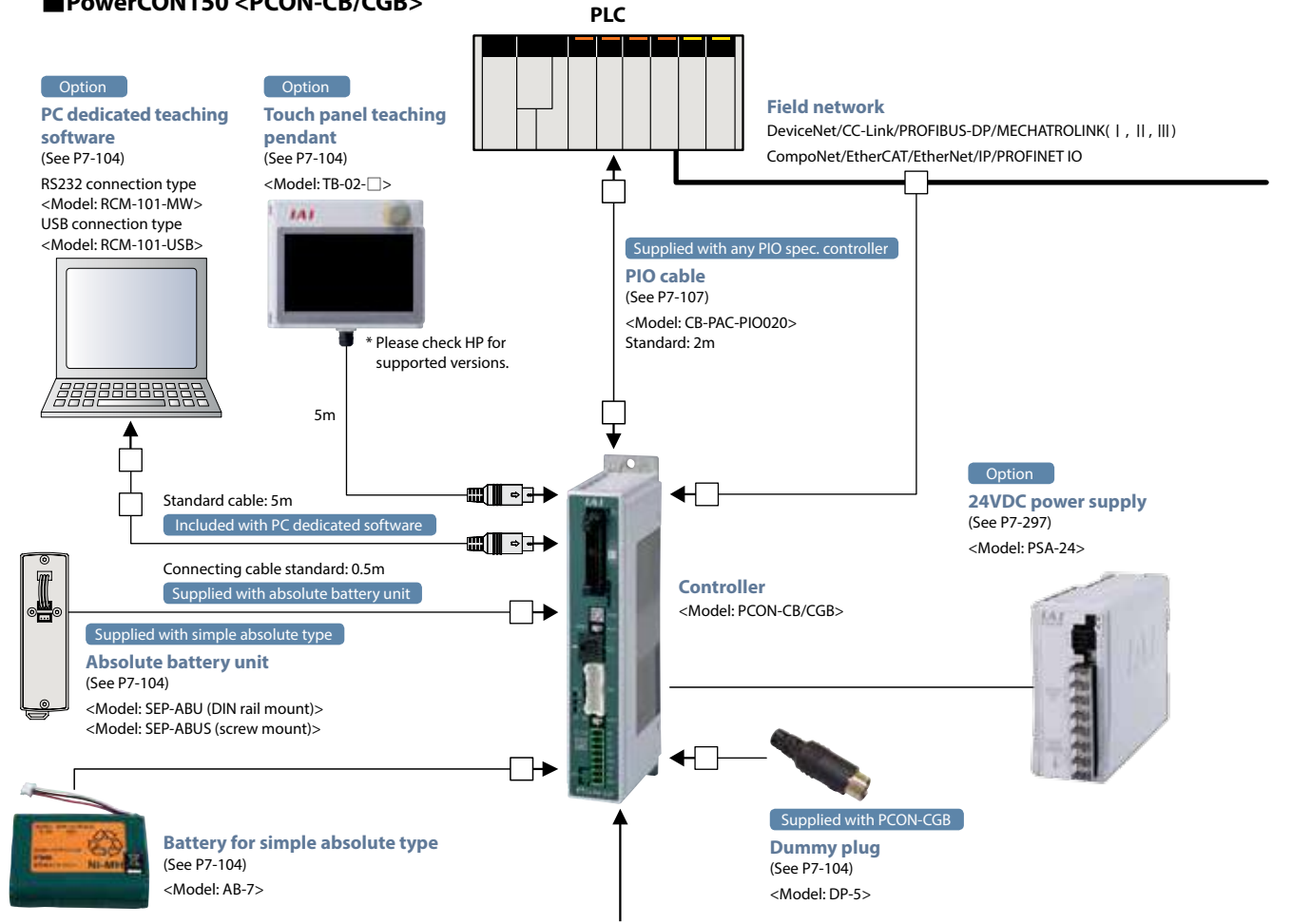
PSA-24

TB-02

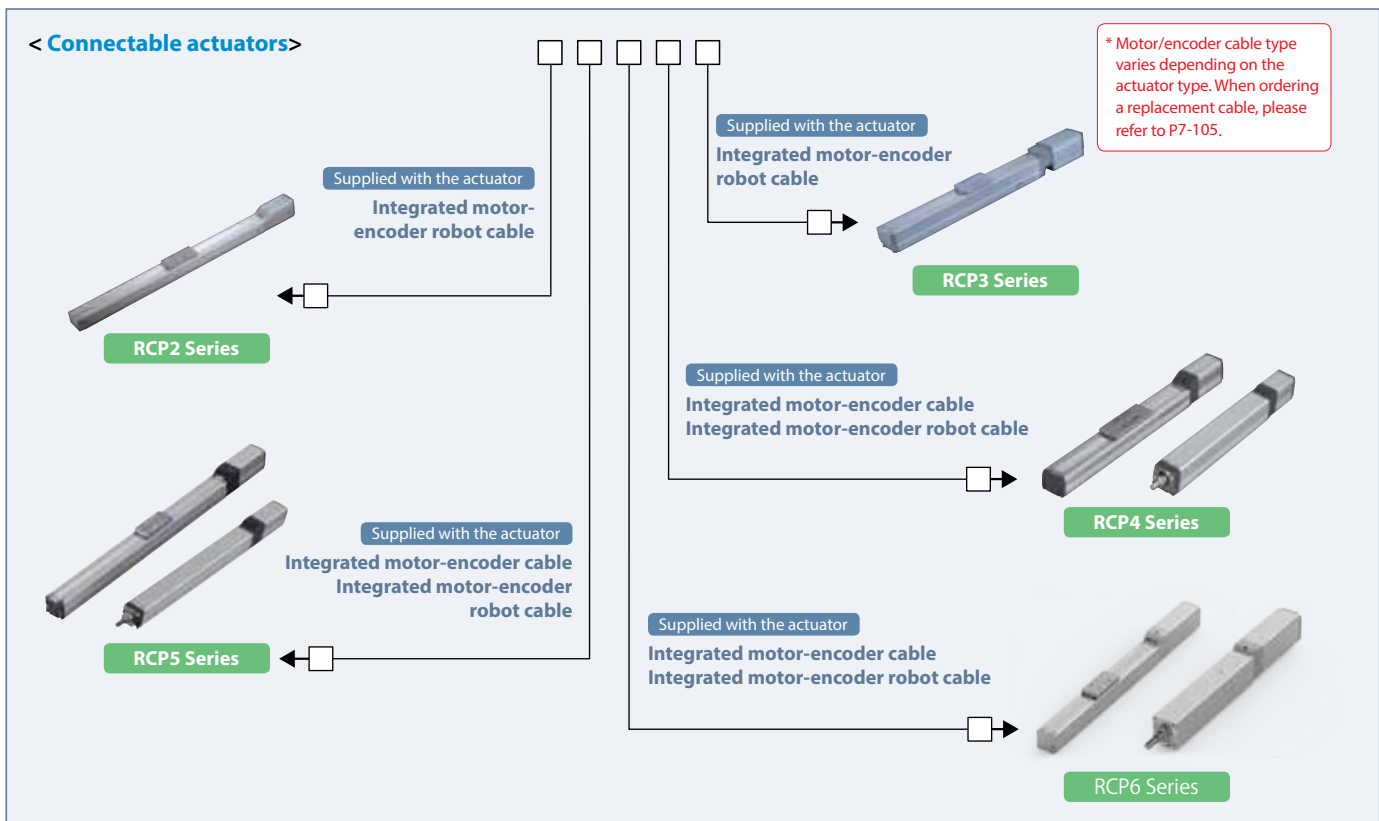
TB-03

System Configuration

PowerCON150 <PCON-CB/CGB>

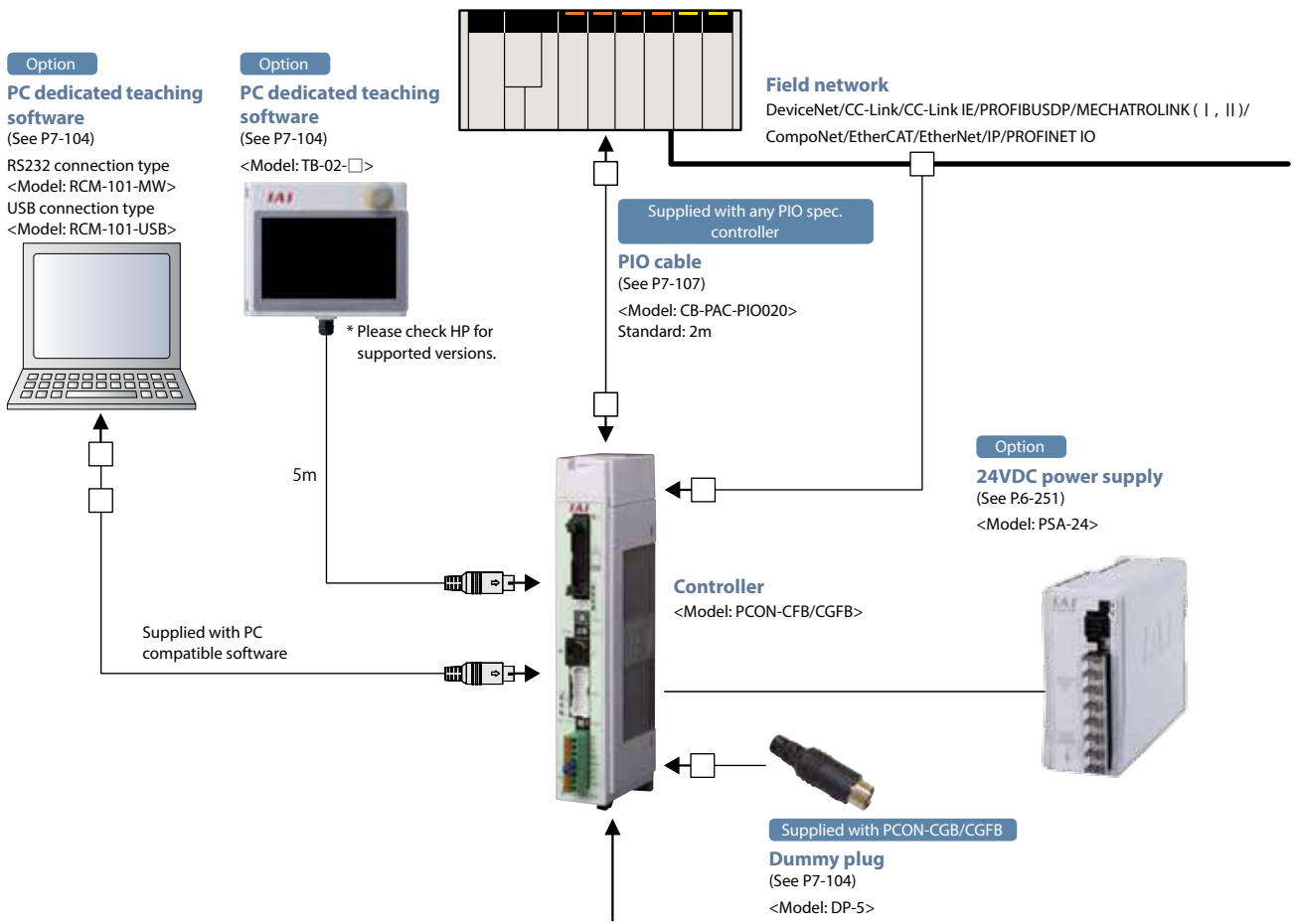


<Connectable actuators>



System Configuration

■ 56SP/60P/86P Motor Compatible <PCON-CFB/CGFB>



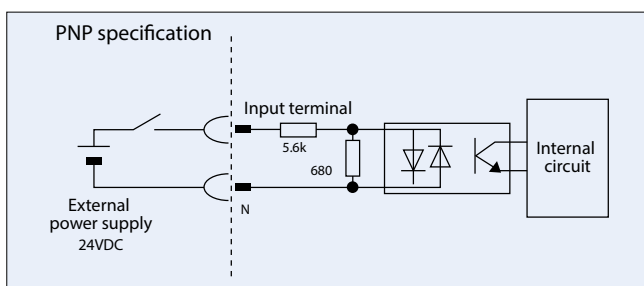
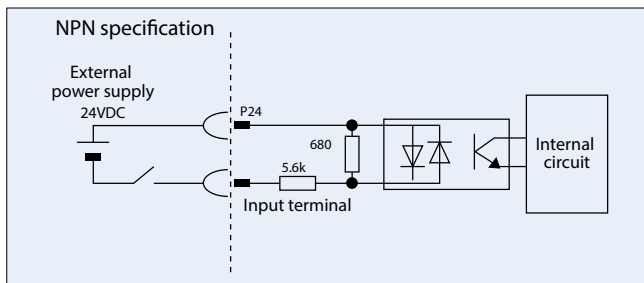
< Connectable actuators >



PIO I/O Interface

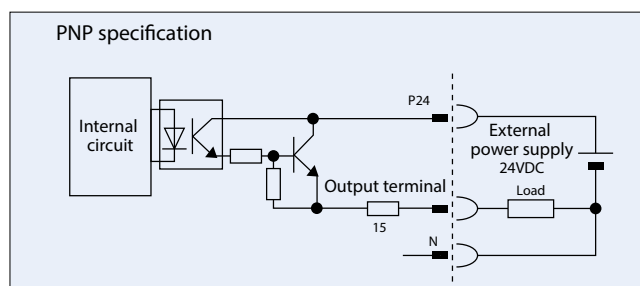
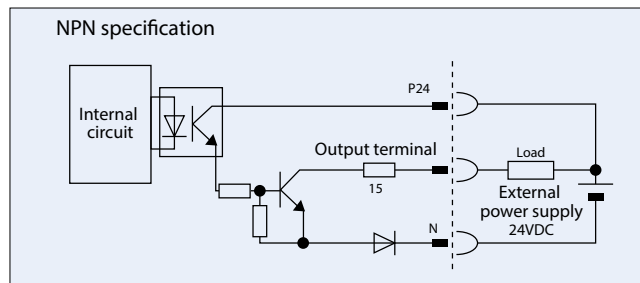
Input part External input specification

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



Output part External output specification

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



Types of PIO Patterns (Control Patterns)

This controller has eight different control methods.

Please select the PIO pattern that best suits your application in Parameter No.25, "PIO Pattern Selection".

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

*1 Zone signal output: Please set the desired zone range in Parameter No.1/2 or 23/24, and it will remain effective once home return is completed.

*2 Position zone signal output: This command function relates to the position number. Set the desired zone range in the position table, and this function will only become enabled when the corresponding position is specified; it will be disabled for all other position commands.

(Note 1) Pulse train control mode is available only the pulse train control type is specified (PCON-CB-PLN and PLP) at the time of purchase.

PIO Patterns and Signal Assignments

The table below lists the signal assignments for the I/O flat cable under different PIO patterns.

Connect an external device (such as a PLC) according to this table.

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

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

(Note 1) In all PIO patterns other than 3, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.

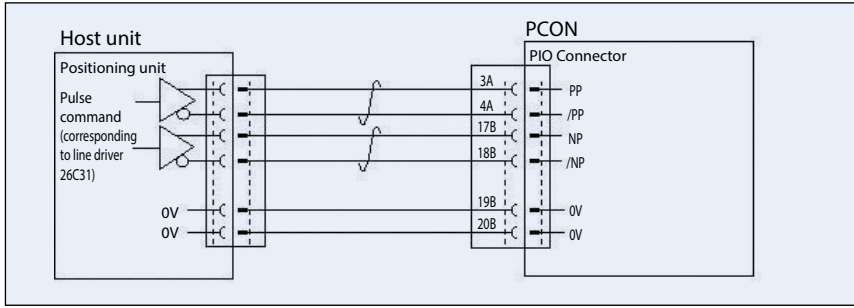
(Note 2) The setting will not become effective until the home return is completed.

Reference) Negative logic signal

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

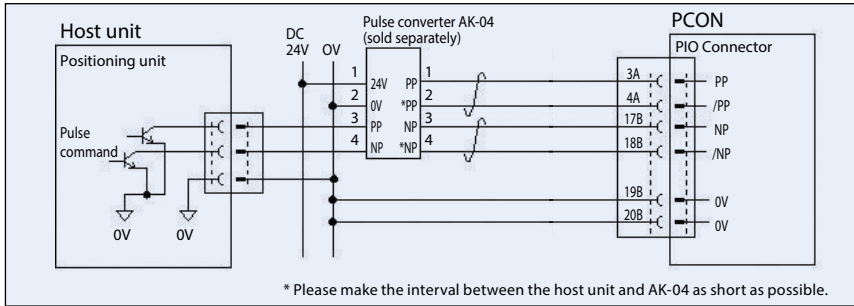
Pulse-train Control Circuit

■ Host Unit = Differential Type



■ Host Unit = Open Collector Type

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



* Please make the interval between the host unit and AK-04 as short as possible.

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

Command Pulse Input Patterns

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

I/O Signals in Pulse-train Control Mode

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

Pin No.	Category	I/O number	Signal abbreviation	Signal name	Parameter No.25, "PIO pattern 6/7"
1A	24V		P24	Power supply	I/O power supply +24V
2A	24V		P24	Power supply	I/O power supply +24V
3A	Pulse input		PP	Differential pulse-train input(+)	Differential pulses are input from the host. Up to 200kpps can be input.
4A			/PP	Differential pulse-train input(-)	
5A	Input	IN0	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
6A		IN1	RES	Reset	Present alarms are reset when this signal is turned ON.
7A		IN2	HOME	Home return	Home return operation is performed when this signal is turned ON.
8A		IN3	TL	Torque limit selection	When this signal is turned ON, the motor torque is limited to the value set by the parameter.
9A		IN4	CSTP	Forced stop	The actuator is forcibly stopped when this signal has remained ON for 16ms or more. The actuator decelerates to a stop at the torque set in the controller and the servo turns OFF.
10A		IN5	DCLR	Deviation counter clear	This signal clears the deviation counter.
11A		IN6	BKRL	Forced brake release	The brake is forcibly released.
12A		IN7	RMOD	Operation mode switching	The operation mode can be switched when the MODE switch on the controller is set to AUTO. (AUTO when this signal is OFF, and to MANU when the signal is ON.)
13A		IN8	RSTR*1	Reference position movement command	When this signal turns on, the actuator moves to the reference position set in parameter No.167. *1: Used only in PIO Pattern 7.
14A		IN9	NC	—	Not used
15A		IN10	NC	—	Not used
16A		IN11	NC	—	Not used
17A		IN12	NC	—	Not used
18A		IN13	NC	—	Not used
19A		IN14	NC	—	Not used
20A	IN15	NC	—	Not used	
1B	Output	OUT0	PWR	System ready	This signal turns ON when the controller becomes ready after the main power supply has been turned on.
2B		OUT1	SV	Servo ON status	This signal turns ON when the servo is ON.
3B		OUT2	INP	Positioning complete	This signal turns ON when the amount of remaining travel pulses in the deviation counter falls within the in-position band.
4B		OUT3	HEND	Home return complete	This signal turns ON upon completion of home return.
5B		OUT4	TLR	Torque limited	This signal turns ON upon reaching the torque limit while the torque is limited.
6B		OUT5	*ALM	Controller alarm status	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.
7B		OUT6	*EMGS	Emergency stop status	This signal turns ON when the emergency stop of the controller is cancelled, and turns OFF when an emergency stop is actuated.
8B		OUT7	RMDS	Operation mode status	The operation mode status is output. This signal turns ON when the controller is in the manual mode.
9B		OUT8	ALM1	Alarm code output signal	An alarm code is output when an alarm generates. For details, refer to the operation manual.
10B		OUT9	ALM2		
11B		OUT10	ALM4		
12B		OUT11	ALM8		
13B		OUT12	*ALML	Minor failure alarm	This signal turns ON when the controller is normal, and turns OFF when a message-level alarm has been generated.
14B		OUT13	REND*1	Reference position movement complete	This signal turns ON when movement to the reference point set in parameter No. 167 is completed. *1: Used only in PIO Pattern 7.
15B		OUT14	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
16B	OUT15	ZONE2	Zone signal 2		
17B	Pulse input		NP	Differential pulse-train input(+)	Differential pulses are input from the host. Up to 200kpps can be input.
18B			/NP	Differential pulse-train input(-)	
19B	0V		N	Power supply	I/O power supply 0V
20B	0V		N	Power supply	I/O power supply 0V

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

Field Network Specification: Explanation of Operation Modes

If the PCON-CB is controlled via a field network, you can select one of the following five modes to operate the actuator. Please note that the data areas required on the PLC side will vary depending on the mode.

Mode Description

Mode	Description
0 Remote I/O mode	Similarly to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1 Position/simple direct value mode	The target position value is directly input, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
2 Half direct value mode	The actuator is operated by directly inputting values for speed, acceleration rate, and push current, as well as the target position.
3 Full direct value mode	The actuator is operated by directly inputting values for the target position, speed, acceleration rate, and push current, etc. In addition, you are able to read the current position, current speed, and the specified current, etc.
4 Remote I/O mode 2	This mode is the same as the remote I/O mode above, with the added functionality of reading current position and the command motor current.

Required Data Size for Each Network

Mode	DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	MECHATROLINK I, II	EtherCAT	EtherNet/IP	PROFINET IO
0 Remote I/O mode	2 bytes	1 station	2 bytes	2 bytes	*	2 bytes	2 bytes	2 bytes
1 Position/simple direct value mode	8 bytes	1 station	8 bytes	8 bytes	*	8 bytes	8 bytes	8 bytes
2 Half direct value mode	16 bytes	2 station	16 bytes	16 bytes	*	16 bytes	16 bytes	16 bytes
3 Full direct value mode	32 bytes	4 station	32 bytes	32 bytes	× (Note 1)	32 bytes	32 bytes	32 bytes
4 Remote I/O mode 2	12 bytes	1 station	12 bytes	12 bytes	*	12 bytes	12 bytes	12 bytes

* No required data size is set for MECHATROLINK I & II.
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2
Number of positioning points	512	768	Unlimited	Unlimited	512
Operation by direct position data input	×	○	○	○	×
Direct speed/acceleration input	×	×	○	○	×
Push-motion operation	○	○	○	○	○
Current position read	×	○	○	○	○
Current speed read	×	×	○	○	×
Operation by position number input	○	○	×	×	○
Completed position number read	○	○	×	×	○

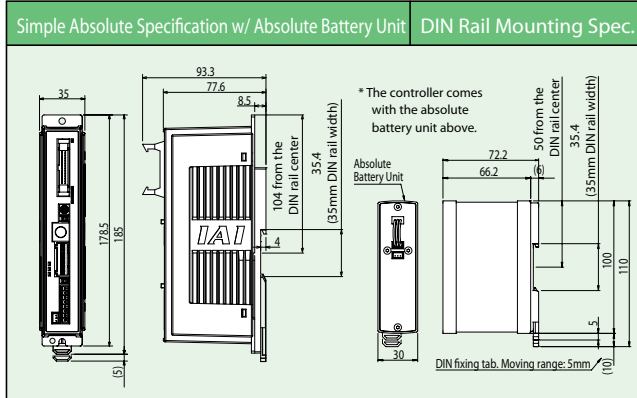
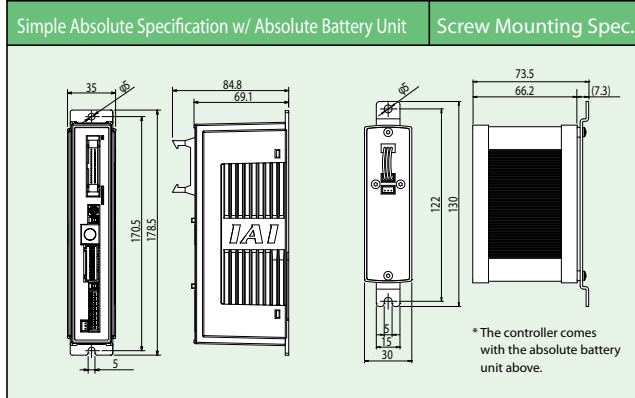
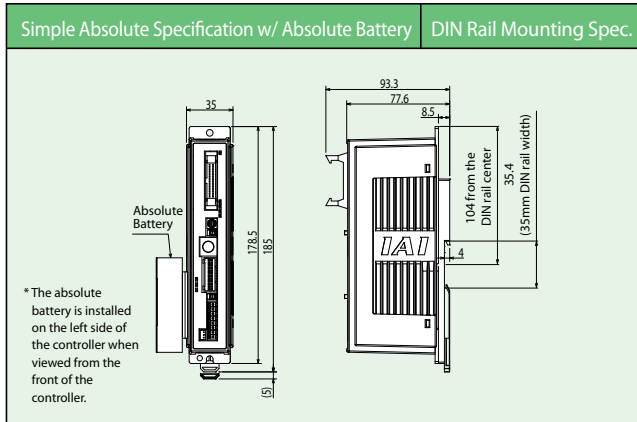
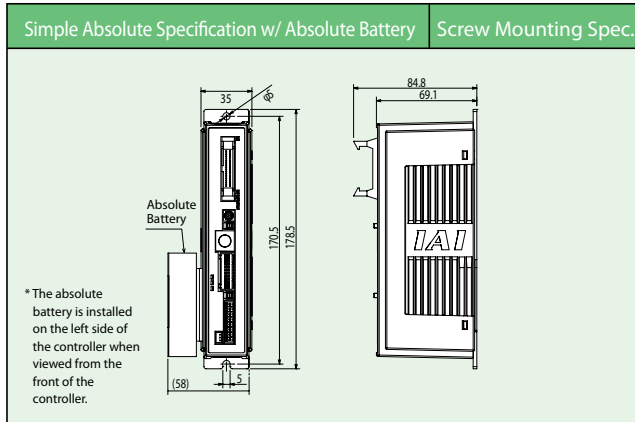
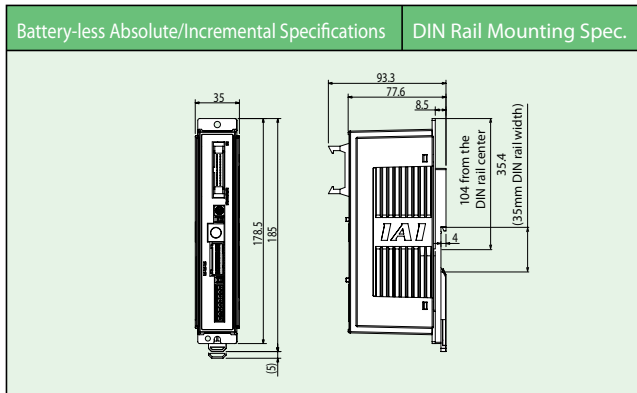
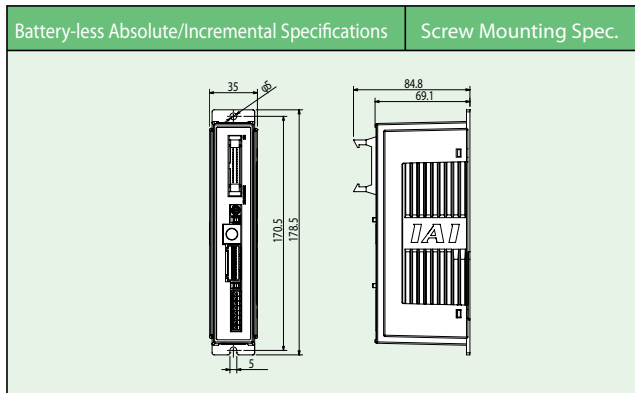
* ○ indicates that the operation is supported, and X indicates that it is not supported.
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

External Dimensions

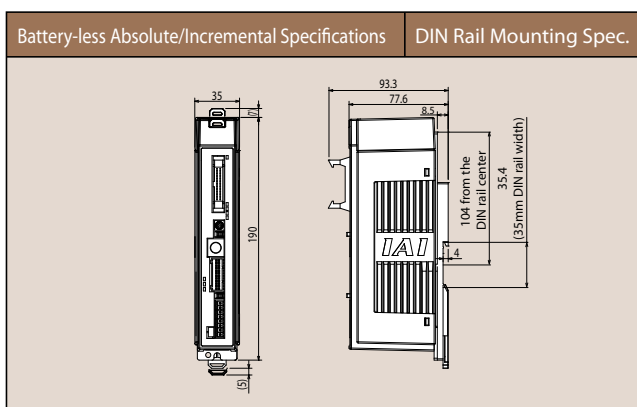
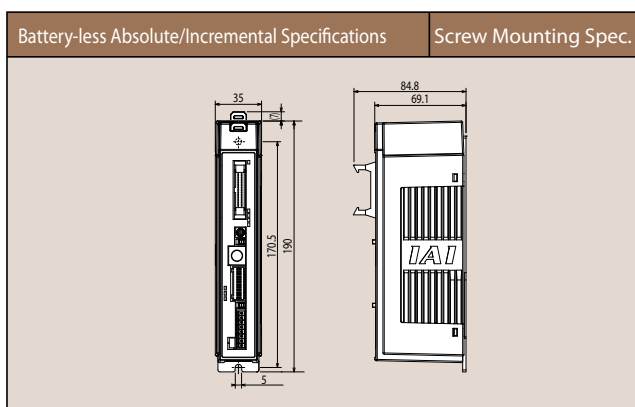
Controller

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB**
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

<PCON-CB · CGB>



<PCON-CFB · CGFB>



Specification List

Item		Details				
		PCON-CB•CGB	PCON-CFB•CGFB			
Number of controlled axes		1 axis				
Power supply voltage		24VDC±10%				
Load current (including control side current consumption) (Note 1)	RCP2 RCP3	Motor type	20P, 28P, 28SP	1A max.		
			35P, 42P, 56P	2.2A max.		
			60P, 86P		6A max.	
	RCP4 RCP5	Motor type	28P, 35P, 42P, 42SP, 56P	High-output setting disabled: 2.2A max.		
			56SP, 60P, 86P	High-output setting enabled: 3.5A rated/4.2A max.		
	RCP6	Motor type	28P, 35P, 42P, 56P	High-output setting disabled: 2.2A max.		
56SP, 60P			High-output setting enabled: 3.5A rated/4.2A max.		6A max.	
Electromagnetic brake power (for actuator with brake)		24VDC ±10% 0.15A (max.)	24VDC ±10% 0.5A (max.)			
Inrush current (Note 2)		8.3A		10A		
Momentary power failure resistance		MAX.500µs				
Compatible encoder		High-resolution battery-less absolute encoder: Resolution 8,192 pulses/rev				
		Battery-less absolute encoder: Resolution 800 pulses/rev				
		Incremental encoder: Resolution 800 pulses/rev				
Actuator cable length		20m max.				
External interface	PIO specification		Dedicated 24VDC signal input/output (NPN/PNP selection) ... Input max. of 16 points, output max. of 16 points, cable length max. of 10m			
	Field network specification		DeviceNet, CC-Link, CC-Link IE, PROFIBUS-DP, CompoNet, MECHATROLINK I / II / III, EtherCAT, EtheNet/IP, PROFINET IO			
Data setting, input method		PC dedicated teaching software, Touch panel teaching pendant				
Data retention memory		Position data and parameters are saved in non-volatile memory. (No limit to rewrite)				
Operation mode		Positioner mode / pulse-train control mode (selectable by parameter setting)				
Number of positioner-mode positions		Up to 512 points for positioner type or up to 768 points for network type *The total number of positioning points varies depending on which PIO pattern is selected.				
Pulse-train interface	Input pulse		Differential type (line-driver type): 200kpps max., cable length up to 10m			
			Open-collector method: Not supported * If the host uses open-collector outputs, use AK-04 (optional, sold separately) to change them to differential outputs.			
	Command pulse magnification (Electronic gear: A/B)		1 / 50 < A / B < 50 / 1 Setting range of A and B (set by parameters): 1~4,096			
Feedback pulse output		None				
Insulation resistance		Not less than 10M at 500VDC				
Electric shock protection mechanism		Class I, basic insulation				
Mass (Note 3)	Battery-less absolute specification / Incremental specification		Screw mounting type: Not more than 250g DIN rail mounting type: Not more than 285g	Screw mounting type: Not more than 270g DIN rail mounting type: Not more than 305g		
	Simple absolute specification (including 190g for battery)		Screw mounting type: Not more than 450g DIN rail mounting type: Not more than 485g			
Cooling method		Natural air cooling		Forced air cooling		
Environment	Ambient operating temperature		0~40°C			
	Ambient operating humidity		Not more than 85% RH (non-condensing)			
	Operating ambience		Free from corrosive gases			
	Degree of protection		IP20			

Note 1) 0.3A higher for the field network specification.
 Note 2) Inrush current flows for approx. 5msec after the power is input (at 40°C). Please note that the inrush current value varies depending on the impedance of the power line.
 Note 3) 30g heavier for the field network specification.

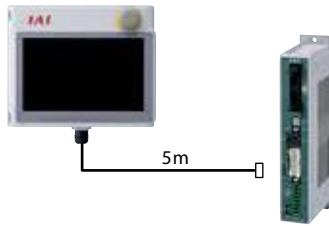
Option

Touch panel teaching pendant

Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

Model TB-02-□

Configuration



Specification

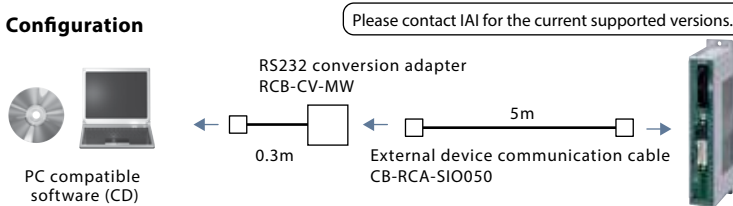
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

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

Configuration

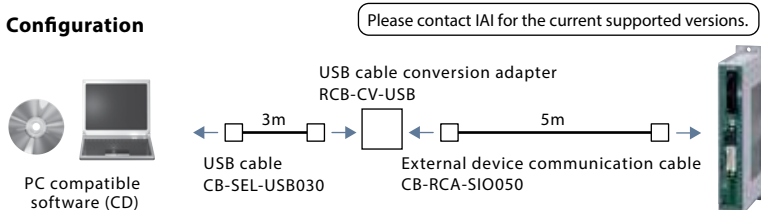


Supported Window versions: 7/8/8.1/10



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

Configuration



Absolute battery unit

Overview A battery unit, supplied as an accessory for the simple absolute specification, which serves to back up the current position of the controller.

Model SEP-ABU (DIN rail mounting specification)

SEP-ABUS (Screw mounting specification)

Specification

Item	Specification
Ambient operating temp. & humidity	0~40°C (around 20°C is desirable), 95% RH or less (non-condensing)
Operating ambience	Free from corrosive gases
Absolute battery	Model: AB-7 (Ni-MH battery/Life: approx. 3 years)
Absolute battery unit connecting cable	Model: CB-APSEP-AB005 (length: 0.5m)
Weight	Standard type: approx.230g/Dust-proof type: approx.260g

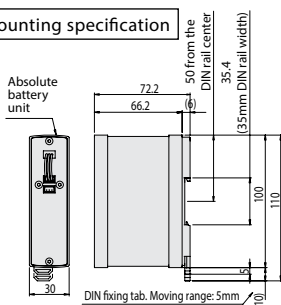
Replacement battery

Overview Replacement battery used with the absolute battery box.

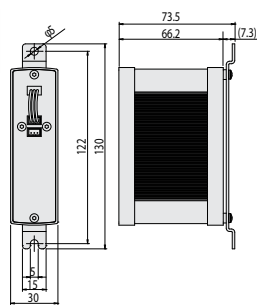
Model AB-7



DIN rail mounting specification



Screw mounting specification



Dummy plug

Overview This plug is required when the safety category specification (PCON-CGB/CGFB) is used.

Model DP-5



EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

Maintenance Parts

When placing an order for the replacement cable, please use the model number shown below.

Table of Applicable Cables

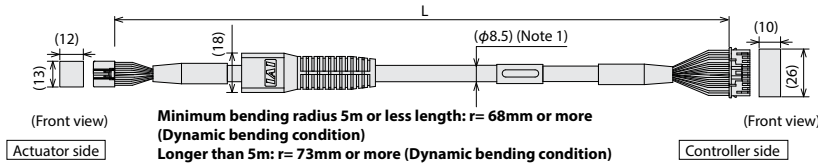
Model Number		Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCP6/RCP6CR/RCP6W/RCP5/RCP5CR/RCP5W (Models other than ③)	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
②	RCP4 SA3/RA3/GR/ST		
③	RCP6/RCP6CR RCP6W/RCP5 RCP5W	SA8/RAA8 RA7 (High-thrust specification)/RA8/RA10 WSA16/WRA16	CB-CFA3-MPA □□□ CB-CFA3-MPA □□□ -RB
④	RCP4/RCP4CR/RCP4W (Models other than ②⑤⑥)	CB-CA-MPA □□□	CB-CA-MPA □□□ -RB
⑤	RCP4	RA6C (High-thrust specification)	
⑥	RCP4W	RA7C (High-thrust specification)	CB-CFA2-MPA □□□ -RB
⑦	RCP3		
⑧	RCP2 RCP2CR RCP2W	GRSS/GRSL/GRST/GRHM/GRHB/SRA4R/ SRGS4R/SRGD4R	CB-APSEP-MPA □□□
⑨	RCP2	RTBS/RTBSL RTCS/RTCSL	CB-RPSEP-MPA □□□
⑩	RCP2CR RCP2W	GRS/GRM GR3SS/GR3SM	CB-CAN-MPA □□□ CB-CAN-MPA □□□ -RB
⑪		RTBS/RTBSL RTCS/RTCSL/RTB/RTBL/RTC/RTCL/RTBB/ RTBBL/RTCB/RTCBL	
⑫	RCP2 RCP2CR RCP2W	RA10/HS8 RA8	CB-CFA-MPA □□□ CB-CFA-MPA □□□ -RB
⑬	RCP2W	SA16C	
⑭	RCP2/RCP2CR/RCP2W (Models other than ⑧ ~ ⑬)		CB-PSEP-MPA □□□

Model Number	PIO Flat Cable
⑮ PCON-CB・CGB/CFB・CGFB	CB-PAC-PIO □□□

Model CB-CAN-MPA□□□/CB-CAN-MPA□□□-RB

* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m

* () is the amount of the robot cable.



* The robot cable is designed for ex-resistance: Please use the robot cable if the cable has to be installed through the cable track.

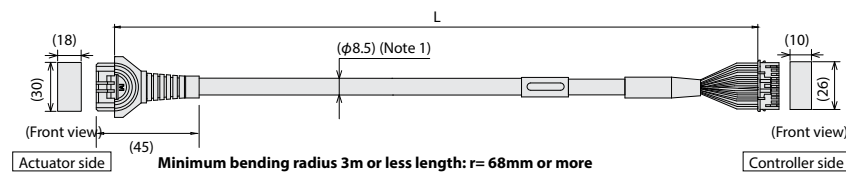
(Note 1) If the cable length is 5m or more, φ9.1 cable diameter applies for both non-robot cables and robot cables.

Pin No	Signal name	Pin No	Signal name
3	φA	1	φA
5	VMM	2	VMM
10	φB	3	φB
9	VMM	4	VMM
4	φA	5	φA
15	φB	6	φB
8	LS+	7	LS+
14	LS-	8	LS-
12	SA(mABS)	11	SA(mABS)
17	SB(mABS)	12	SB(mABS)
1	A+	13	A+
6	A-	14	A-
11	B+	15	B+
16	B-	16	B-
20	BK+	9	BK+
2	BK-	10	BK-
21	VCC	17	VCC
7	GND	19	GND
18	VPS	18	VPS
13	LS_GND	20	LS_GND
19	—	22	—
22	(-CFvcc)	21	(-CFvcc)
23	—	23	—
24	FG	24	FG

Model CB-CFA3-MPA□□□/CB-CFA3-MPA□□□-RB

* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m

* () is the amount of the robot cable.



* The robot cable is designed for ex-resistance: Please use the robot cable if the cable has to be installed through the cable track.

(Note 1) If the cable length is 5m or more, φ9.1 cable diameter applies for both non-robot cables and robot cables.

Pin No	Signal name	Pin No	Signal name
A1	φA	1	φA
B1	VMM	2	VMM
A2	φA	5	φA
B2	φB	3	φB
A3	VMM	4	VMM
B3	φB	6	φB
A4	LS+	7	LS+
B4	LS-	8	LS-
A6	SA(mABS)	11	SA(mABS)
B6	SB(mABS)	12	SB(mABS)
A7	A+	13	A+
B7	A-	14	A-
A8	B+	15	B+
B8	B-	16	B-
A5	BK+	9	BK+
B5	BK-	10	BK-
A9	LS_GND	20	LS_GND
B9	VPS	18	VPS
A10	VCC	21	VCC
B10	GND	19	GND
A11	—	22	—
—	—	23	—
—	—	24	FG

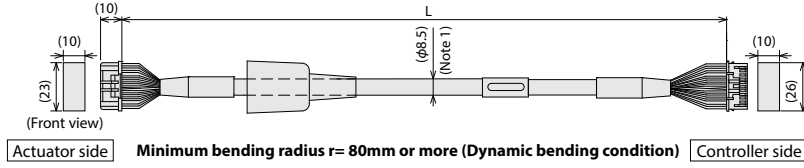
Maintenance Parts

When placing an order for the replacement cable, please use the model number shown below.

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

* () is the amount of the robot cable.

(Note 1) If the cable is 5m or longer, φ9.1 cable diameter applies for a non-robot cable and φ10 for a robot cable.



Minimum bending radius $r=80\text{mm}$ or more (Dynamic bending condition)

* The robot cable is designed for ex-resistance: Please use the robot cable if the cable has to be installed through the cable track.

* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m

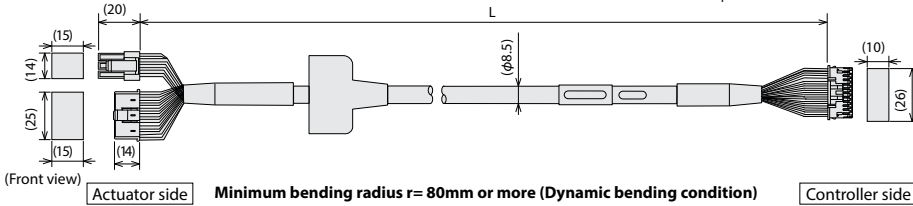
Actuator side 1-1827863-1 (AMP)			Controller side PADP-24V-1-S (J.S.T.MFG.CO.,LTD.)		
Pin No	Signal name	Color	Pin No	Signal name	Color
A1	φA/U	Blue(Black)	1	φA/U	Blue(Black)
B1	VMM/V	Orange(White)	2	VMM/V	Orange(White)
A2	φ A/W	Green(Brown)	5	φ A/W	Green(Brown)
B2	φB/-	Brown(Green)	3	φB/-	Brown(Green)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

* () indicates the color of the robot cable.

Model **CB-CFA-MPA**□□□□/ **CB-CFA-MPA**□□□□-**RB**

* () is the amount of the robot cable.

(Note 1) If the cable is 3m or longer, φ9.1 cable diameter applies for a non-robot cable and φ10 for a robot cable.



Minimum bending radius $r=80\text{mm}$ or more (Dynamic bending condition)

* The robot cable is designed for ex-resistance: Please use the robot cable if the cable has to be installed through the cable track.

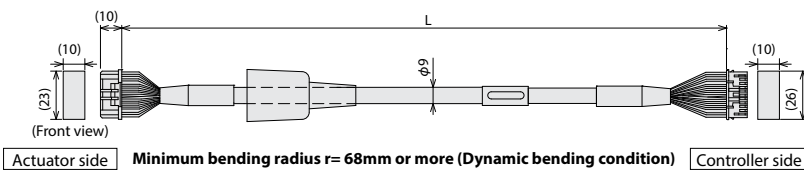
* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m

Actuator side SLP-06V (J.S.T.MFG.CO.,LTD.)			Controller side PADP-24V-1-S (J.S.T.MFG.CO.,LTD.)		
Pin No	Signal name	Color	Pin No	Signal name	Color
1	φA	Blue	1	φA	Blue
4	φB	Green	3	φB	Green
5	VMM	Orange	4	VMM	Orange
3	φ/A	Red	5	φ/A	Red
6	φ/B	Blue	6	φ/B	Blue
5	NC	—	11	NC	—
6	NC	—	12	NC	—
13	LS+	Black	7	LS+	Black
14	LS-	Yellow	8	LS-	Yellow
1	A+	Blue	13	A+	Blue
2	A-	Orange	14	A-	Orange
3	B+	Green	15	B+	Green
4	B-	Brown	16	B-	Brown
16	BK+	Blue	9	BK+	Blue
17	BK-	Orange	10	BK-	Orange
12	VCC	Gray	21	VCC	Gray
9	GND	Red	19	GND	Red
11	VPS	Brown	18	VPS	Brown
10	NC	—	20	NC	—
18	FG	Black	24	FG	Black
A10	VCC	Gray	17	VCC	Gray
7	NC	—	22	NC	—
8	NC	—	23	NC	—

Model **CB-CFA2-MPA**□□□□/ **CB-CFA2-MPA**□□□□-**RB**

* () is the amount of the robot cable.

* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m



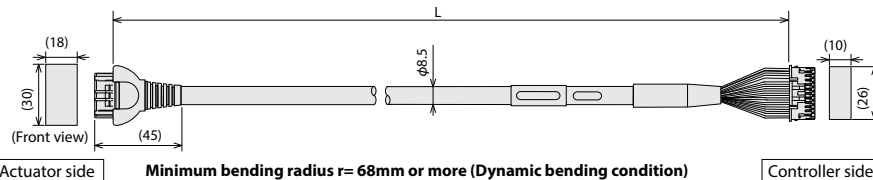
Minimum bending radius $r=68\text{mm}$ or more (Dynamic bending condition)

* The robot cable is designed for ex-resistance: Please use the robot cable if the cable has to be installed through the cable track.

Actuator side 1-1827863-1 (AMP)			Controller side PADP-24V-1-S (J.S.T.MFG.CO.,LTD.)		
Pin No	Signal name	Color	Pin No	Signal name	Color
A1	φA	Blue	1	φA	Blue
B1	VMM	Orange	2	VMM	Orange
B2	φB	Green	3	φB	Green
A3	VMM	Orange	4	VMM	Orange
A4	φ B	Red	6	φ B	Red
B4	LS+	Black	7	LS+	Black
A6	LS-	Yellow	8	LS-	Yellow
A7	A+	Blue	12	—	—
B7	A-	Orange	13	A+	Blue
A8	B+	Green	14	A-	Orange
B8	B-	Brown	15	B+	Green
A5	BK+	Blue	16	B-	Brown
B5	BK-	Orange	9	BK+	Blue
A9	LS_GND	Green	10	BK-	Orange
B9	VPS	Brown	20	LS_GND	Green
A10	VCC	Gray	18	VPS	Brown
B10	GND	Red	21	VCC	Gray
A11	—	—	17	GND	Red
B11	FG	Black	19	GND	Red
			22	—	—
			23	—	—
			24	FG	Black

Model **CB-APSEP-MPA**□□□□ * Robot cable is standard.

* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m



Minimum bending radius $r=68\text{mm}$ or more (Dynamic bending condition)

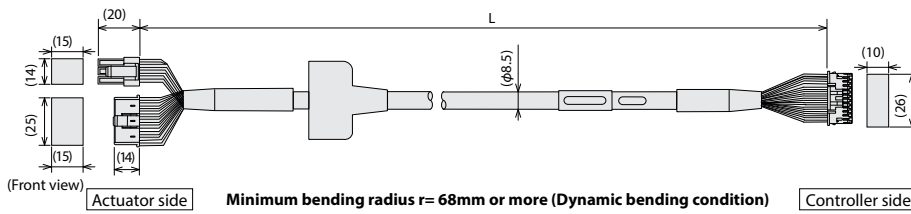
Actuator side 1-1827863-1 (AMP)			Controller side PADP-24V-1-S (JST)		
Pin No	Signal name	Color	Pin No	Signal name	Color
A1	φA	Black	1	φA	Black
B1	VMM	White	2	VMM	White
A2	φ A	Brown	5	φ A	Brown
B2	φB	Green	3	φB	Green
A3	VMM	Yellow	4	VMM	Yellow
B3	φ B	Red	6	φ B	Red
A4	LS+	Orange	7	LS+	Orange
B4	LS-	Gray	8	LS-	Gray
A6	—	White	11	—	White
B6	—	Yellow	12	—	Yellow
A7	A+	Red	13	A+	Red
B7	A-	Green	14	A-	Green
A8	B+	Black	15	B+	Black
B8	B-	Brown	16	B-	Brown
A5	BK+	Black (id tape)	9	BK+	Black (id tape)
B5	BK-	Brown (id tape)	10	BK-	Brown (id tape)
A9	GND+	Green (id tape)	20	GND+	Green (id tape)
B9	VPS	Red (id tape)	18	VPS	Red (id tape)
A10	VCC	White (id tape)	17	VCC	White (id tape)
B10	GND	Yellow (id tape)	19	GND	Yellow (id tape)
A11	NC	—	21	NC	—
B11	Shield, FG	—	24	Shield, FG	—
			22	—	—
			23	—	—

Maintenance Parts

Controller

Model CB-PSEP-MPA * Robot cable is standard.

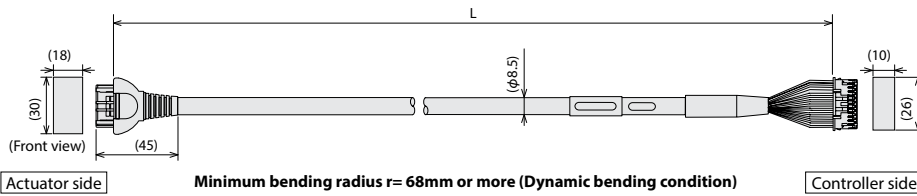
* Please indicate the cable length (L) in , maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m



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

Model CB-RPSEP-MPA * Robot cable is standard.

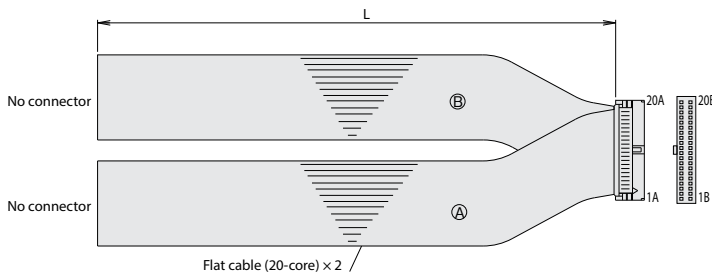
* Please indicate the cable length (L) in , maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m



Actuator side Terminal number		Controller side Terminal number
A1	Black[ΦA]	1
B1	White[VMM]	2
A2	Brown[ΦA]	5
A3	Green[ΦB]	3
B3	Yellow[VMM]	4
A6	Red[ΦB]	6
B6	Orange[LS+]	8
A7	Gray[LS-]	7
B7	Red[A+]	13
A8	Green[A-]	14
B8	Red[B+]	15
A4	Brown[B-]	16
B4	NC	—
A5	Black[Identification tape](BK+)	9
B5	Brown[Identification tape](BK-)	10
A9	Green[Identification tape](GNDLS)	20
B9	Red[Identification tape](VPS)	18
A10	White[Identification tape](VCC)	17
B10	Yellow[Identification tape](GND)	19
A11	NC	21
B11	ShieldFG	24
	NC	22
	NC	23

Model CB-PAC-PIO

* Please indicate the cable length (L) in , maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m



HIF6-40D-1.27R

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

Horizontal dotted lines for writing.

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

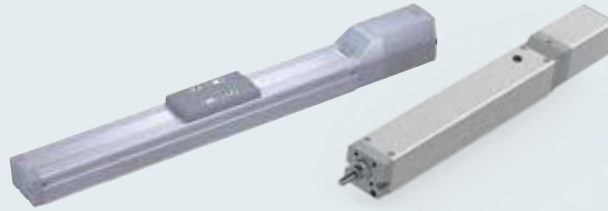
TB-02

TB-03

PCON-CYB/PLB/POB



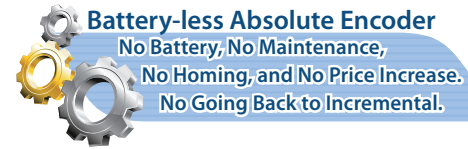
**Position Controller
for RoboCylinder**



Features

1 For products with battery-less absolute encoder

Battery maintenance is not required, since it does not need a battery. Home return is not required during the initial setting, after emergency stop output, or when the device is restarted after failure. Down time can be shortened, and manufacturing costs can be reduced.



2 Power CON® type

All controllers are compatible with the high-output driver "Power CON" that can improve the performance of stepper motor output. It can shorten the cycle time and improve the productivity of the equipment.

3 Equipped with Smart tuning function

Supports the smart tuning function, allowing optimal setting of the speed and acceleration/deceleration values based on the payload. (*) When using the smart tuning function, PC dedicated software or TB-02 (touch panel teaching pendant) is required.

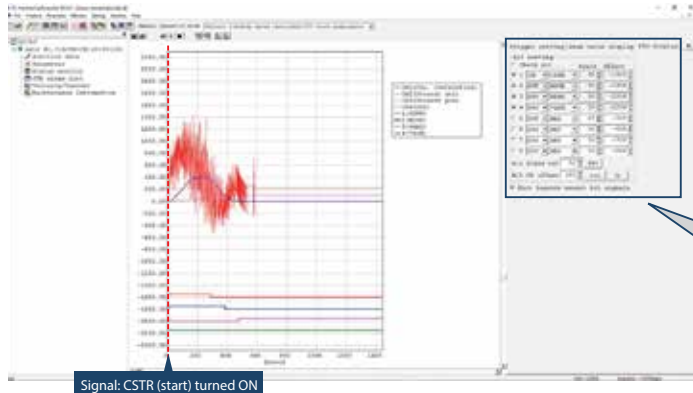
4 Enhanced Monitor Functions

The PC dedicated software can display information about the actuator and controller in operation as waveforms.

*Information that can be displayed: Command current value, current speed/position, and PIO signals (start, positioning completion, alarm, etc.)

Using the trigger function, the end user can specify a particular moment, either a change in PIO signals or a designated moment during the actuator's operation time, to begin displaying the waveforms.

Monitor function screen (example)



Signal: CSTR (start) turned ON

Display settings

Items to be monitored can be selected.

Trigger settings

* Data acquiring starts from time of change of selected items.


5 Low price

It is possible to achieve a low price by limiting it to the function that I often use.

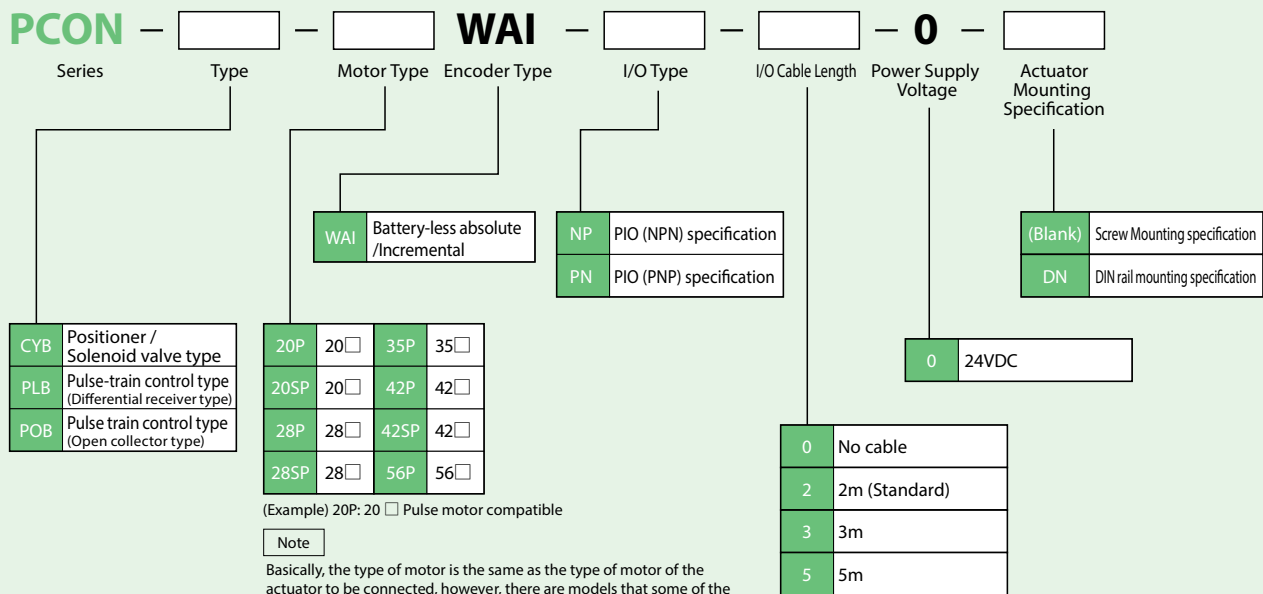
Product model		PowerCon (High output driver)	High resolution battery-less absolute	Simple absolute	Calendar function	Maintenance function	I/O point	Positioning point	Field network
PCON	CYB/PLB/POB	○	○	×	×	○	Non insulated 8IN/8OUT	Standard 16 points Max. 64 points	×
	CB	○	○	○	○	○	Insulated 16IN/16OUT	Standard 64 points Max. 512 points	○

List of Models/Price

Positioner Controller that can operate ROBO cylinder. Lineup for 3 types that can support various control.

Model	CYB	PLB / POB
Type	Positioner/ Solenoid valve type	Pulse-train control type
External view		
Number of positions	64	-

Model number



Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

System configuration

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

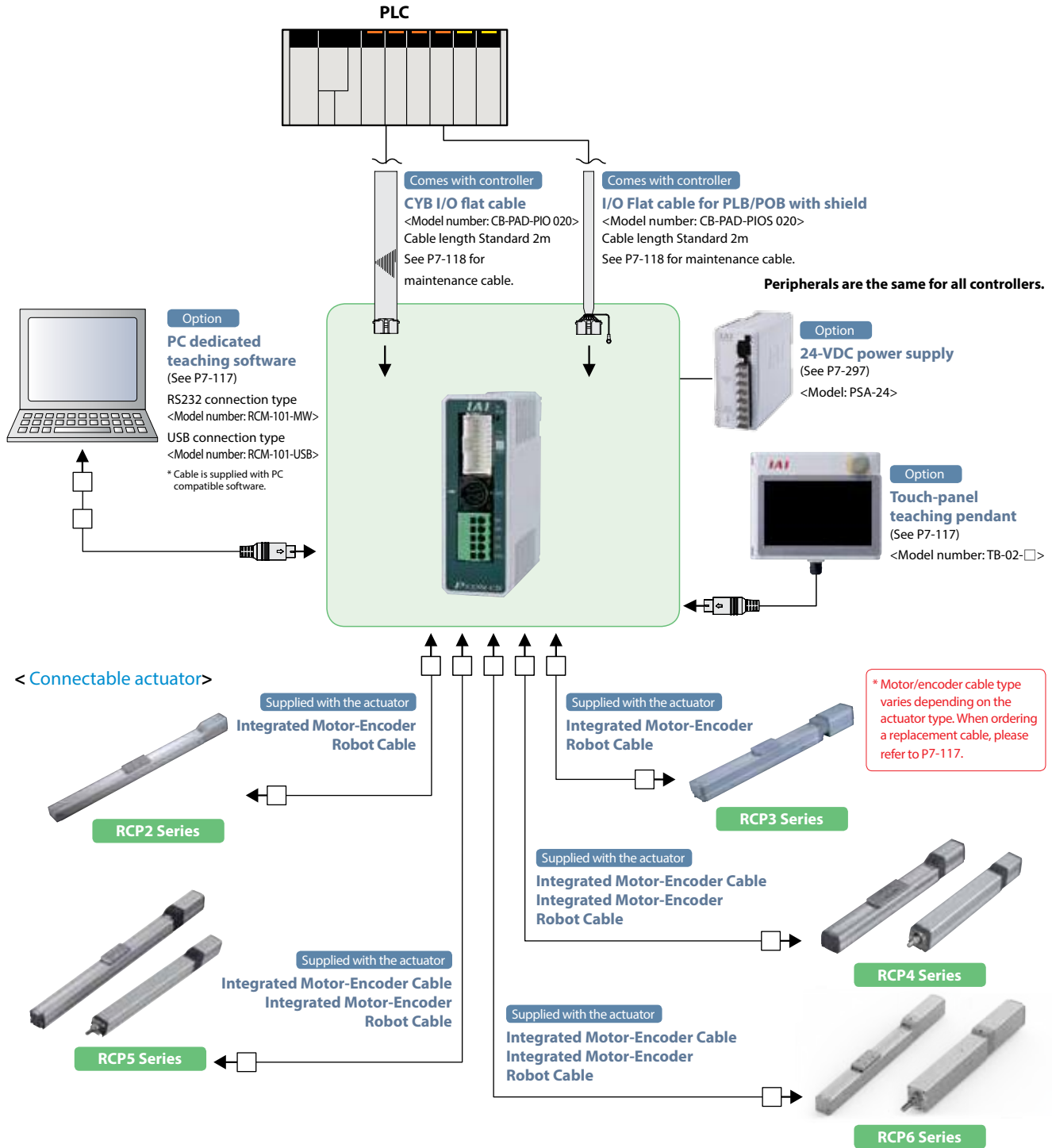
XSEL

(SCARA)

PSA-24

TB-02

TB-03



I/O signals in positioner / solenoid valve type (PCON-CYB)

Pin number	Category	Number of positioning points	Parameter (PIO pattern) selection						Serial communication (Modbus) Refer to operation manual	
			0	1	2	3	4	5		6
			Positioning mode	Solenoid valve mode 1	Solenoid valve mode 2	Single solenoid mode	Double solenoid mode	User Selection mode		Serial communication
			16	7	3	2	2	One of 4,8,16,32,64 points (selection)	768	
		Zone signal	△(Note 2)	×	△(Note 2)	△(Note 2)	△(Note 2)	△(Note 2)		
		Position zone signal	△(Note 2)	×	△(Note 2)	△(Note 2)	△(Note 2)	△(Note 2)		
5	Input	IN0	PC1	ST0	ST0	ST0	ST0	Any signal other than the command position No.,CSTR can be selected in the input.		
6		IN1	PC2	ST1	ST1(JOG+)	-	ST1(-)			
7		IN2	PC4	ST2	ST2(-)	-	ASTR			
8		IN3	PC8	ST3	-	-	-			
9		IN4	HOME	ST4	SON	SON	SON			
10		IN5	*STP	ST5	-	*STP	*STP			
11		IN6	CSTR	ST6	-	-	-			
12		IN7	RES	RES	RES	RES				
13	Output	OUT0	PM1(ALM1)	PE0	LS0	LS0/PE0	LS0/PE0	Any signal other than the completed position No.,PEND can be selected in the output.		
14		OUT1	PM2(ALM2)	PE1	LS1(TRQS)	LS1/PE1	LS1/PE1			
15		OUT2	PM4(ALM4)	PE2	LS2(-)	PSFL	PSFL			
16		OUT3	PM8(ALM8)	PE3	HEND	HEND	HEND			
17		OUT4	HEND	PE4	SV	SV	SV			
18		OUT5	PZONE/ZONE1	PE5	PZONE/ZONE1	PZONE/ZONE1	PZONE/ZONE1			
19		OUT6	PEND	PE6	*ALML	*ALML	*ALML			
20	OUT7	*ALM	*ALM	*ALM	*ALM	*ALM				

(Note 1) In the table above, the asterisk* symbol next to the code indicates a reverse logic signal.
 (Note 2) In all PIO patterns other than 1, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.
 (Note 3) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)
 (Note 4) Pin number 13 and 14 of PIO pattern 3 or 4, can select PE* and LS* by setting Parameter No. 186.

I/O signals functions in positioner / solenoid valve type (PCON-CYB)

Depending on the controller settings, the available signals are different. Please check the available functions by referring to the signal table.

Category	Signal abbreviation	Signal name	Function description
Input	PC1~PC8	Command position No.	Enter the target position number (binary input).
	HOME	Home return	Home return operation is performed when this signal is turned ON.
	*STP	Pause	The actuator decelerates to a stop when this signal is turned OFF. During the stop, the remaining motion is on hold. It restarts when the signal is turned ON.
	CSTR	PTP Strobe (Start signal)	Start moving to the position set in the command position.
	RES	Reset	Current alarms are reset when this signal is turned ON. In addition, it is possible to cancel the remaining travel amount when it is turned ON during the pause state (*STP is OFF).
	ST0~6	Start signal	In the solenoid valve mode, it moves to the position specified when this signal is turned ON. (Start signal is not required.)
	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
Output	ASTR	Continuous cycling operation signal	When this signal is turned ON, continuous cycling between two points is performed. If this signal is turned OFF while moving, it stops after arriving at the current target position.
	PM1~PM8	Completed position No.	It outputs (binary output) the number of the position reached after positioning is complete.
	HEND	Home return complete	This signal turns ON upon completion of home return.
	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
	PZONE	Position zone	This signal turns ON when the current position of the actuator enters desired zone set by the position data when moving to the position. It is possible to select with ZONE 1, PZONE is effective only when moving to the set position.
	PEND	Positioning complete	This signal turns ON when it reaches within the positioning band after moving. It remains ON even if it exceeds the positioning band.
	*ALM	Alarm	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.
	PE0~6	Current position No.	In solenoid valve mode 1, this signal turns ON after movement is complete.
	LS0~2	Limit switch output	This signal turns ON when the current position of the actuator reaches within the positioning band. In home return complete status, this signal is output even before the movement command or in the servo OFF status.
	SV	SV Servo ON	This signal turns ON when the servo is ON.
	*ALML	Minor failure alarm	This signal is ON in normal conditions and turns OFF when a message-level alarm generates. (Operation will continue.)
PSFL	Unloaded push-motion	This signal turns ON when push-motion is unloaded.	
ALM1~ALM8	Alarm code	When an alarm generates equal or higher than the operation release level, this signal outputs the alarm details using a binary code.	

(Note) The above signals marked with (*) are normally ON and turn OFF at operation.

I/O signals in pulse-train control type (PCON-PLB/POB)

Pin number	Category		Parameter (PIO pattern) selected	
			0	1
			Incremental Axis Connection mode	Absolute Axis Connection mode
		Number of positioning points	0	1
		Zone signal	1	1
1	Pulse-train input		/PP	/PP
2			PP	PP
3			/NP	/NP
4			NP	NP
5	Input	IN0	SON	SON
6		IN1	RES	RES
7		IN2	HOME	HOME
8		IN3	TL	TL
9		IN4	CSTP	CSTP
10		IN5	DCLR	DCLR
11		IN6	BKRL	BKRL
12		IN7	-	RSTR
13	Output	OUT0	PWR	PWR
14		OUT1	SV	SV
15		OUT2	INP	INP
16		OUT3	HEND	HEND
17		OUT4	TLR	TLR
18		OUT5	ZONE1	ZONE1
19		OUT6	*ALML	REND
20		OUT7	*ALM	*ALM

(Note) The above signals marked with (*) are normally ON and turn OFF at operation.

I/O signals functions in pulse-train control type (PCON-PLB/POB)

Depending on the controller type and setting, the available signals are different. Please check the available functions by referring to the signal table.

Category	Signal abbreviation	Signal name	Function description
Pulse train input	/PP	Pulse train input (-)	Pulses are input from the host. • Differential (PLB type) ≤ 200kpps • Open collector (POB type) ≤ 60kpps
	PP	Pulse train input (+)	
	/NP	Pulse train input (-)	
	NP	Pulse train input (+)	
Input	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
	RES	Reset	Current alarms are reset when this signal is turned ON.
	HOME	Home return	When the signal is ON, home return operation is performed.
	TL	Torque limit selection	When this signal is turned ON, the motor torque is limited to the value set by the parameter.
	CSTP	Forced stop	The actuator is forcibly stopped when this signal has remained ON for 16 ms or more. The actuator decelerates to a stop at the torque set in the controller and the servo turns OFF.
	DCLR	Deviation counter clear	This signal clears the deviation counter.
	BKRL	Forced brake release	The brake is forcibly released.
	RSTR	Reference position move command	Move to the position set to parameter No. 167 when signal turns ON. (PIO pattern 1 only)
Output	PWR	System ready	This signal turns ON when the controller becomes ready after the main power has been turned on.
	SV	Servo ON status	This signal turns ON when the servo is ON.
	INP	Positioning complete	This signal turns ON when the amount of remaining travel pulses in the deviation counter falls within the in-position band.
	HEND	Home return complete	This signal turns ON upon completion of home return.
	TLR	Torque limited	This signal turns ON upon reaching the torque limit while the torque is limited.
	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
	*ALML	Minor failure alarm	This signal is ON in normal conditions and turns OFF when a message-level alarm generates. (Operation will continue.)
	REND	Reference position move complete	This signal turns ON when moving to the position set to parameter No. 167 is completed. (PIO pattern 1 only)
*ALM	Alarm	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.	

(Note) The above signals marked with (*) are normally ON and turn OFF at operation.

I/O Specification

The three types (CYB, PLB/POB) controllers are distinguished by their I / O specifications. In addition, the positioner mode and solenoid valve mode can change the I / O signal content according to the controller setting, so it is possible to use multiple functions.

Function by controller type

Model	CYB	PLB / POB	Summary
Name	Positioner / Solenoid valve type	Pulse-train control type	
Positioner mode	○	×	It is the basic operation mode that operates by specifying the position number and inputting the start signal.
Solenoid valve mode	○	×	It is possible to move just by turning ON/OFF the position signals. This mode operates with the same controls as the solenoid valves on air cylinders.
Pulse-train mode	×	○	This mode can operate freely with your pulse train control without inputting position data.

PIO Input/output circuit (Other than pulse-train input)

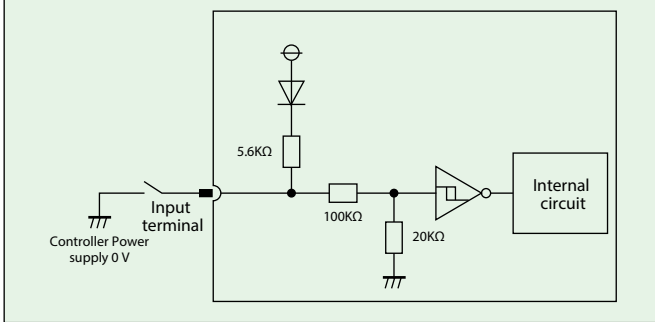
Input Part External Input Specifications

Item	Specification
Input voltage	24VDC ±10%
Input current	5mA, 1 circuit
ON/OFF voltage	ON voltage: 18VDC min. OFF voltage: 6VDC max.
Leakage current	1 mA or less / 1 point
Isolation method	Non-insulated

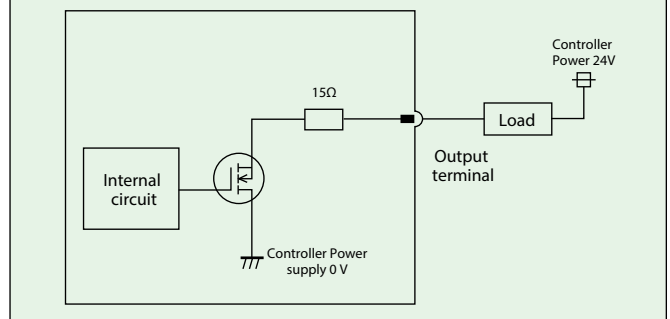
Output Part External Output Specifications

Item	Specification
Load voltage	24VDC ±10%
Maximum load current	5mA, 1 circuit
Residual voltage	2V or less
Isolation method	Non-insulated

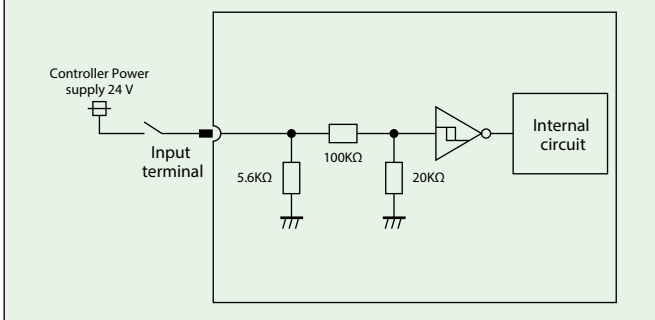
NPN Specification



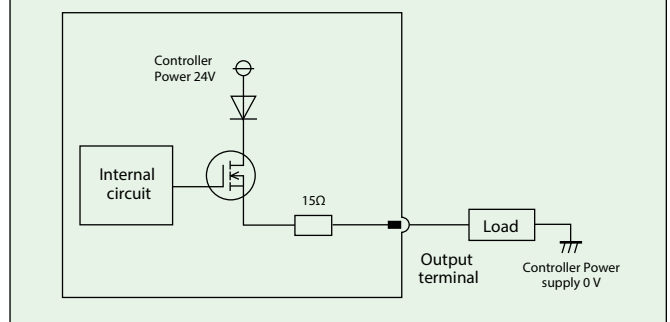
NPN Specification



PNP Specification



PNP Specification



Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

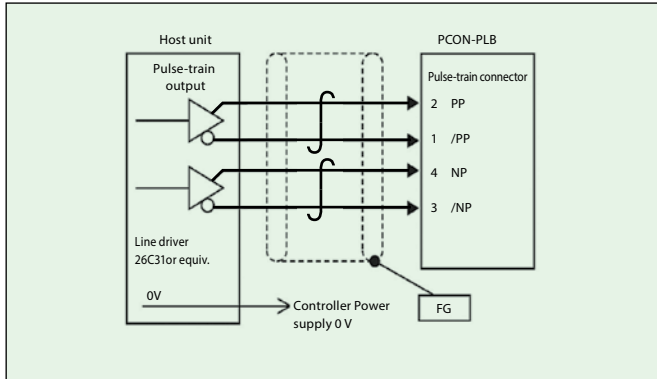
TB-03

Pulse-train input circuit

■ Differential line driver

Maximum number of input pulse : Differential line driver max 200kpps
Isolation method : Non-insulated
Maximum cable length : 10m

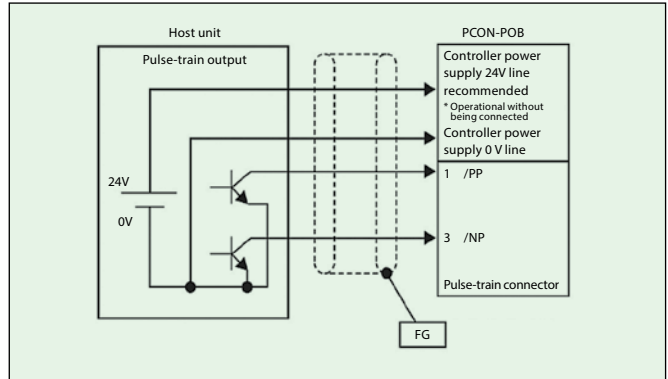
*The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



■ Open collector

Maximum number of input pulse : Open collector max 60kpps
Isolation method : Non-insulated
Maximum cable length : 2m

*The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



Command pulse-train pattern

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

Note) The number of encoder pulses that can be operated with PCON is as follows.

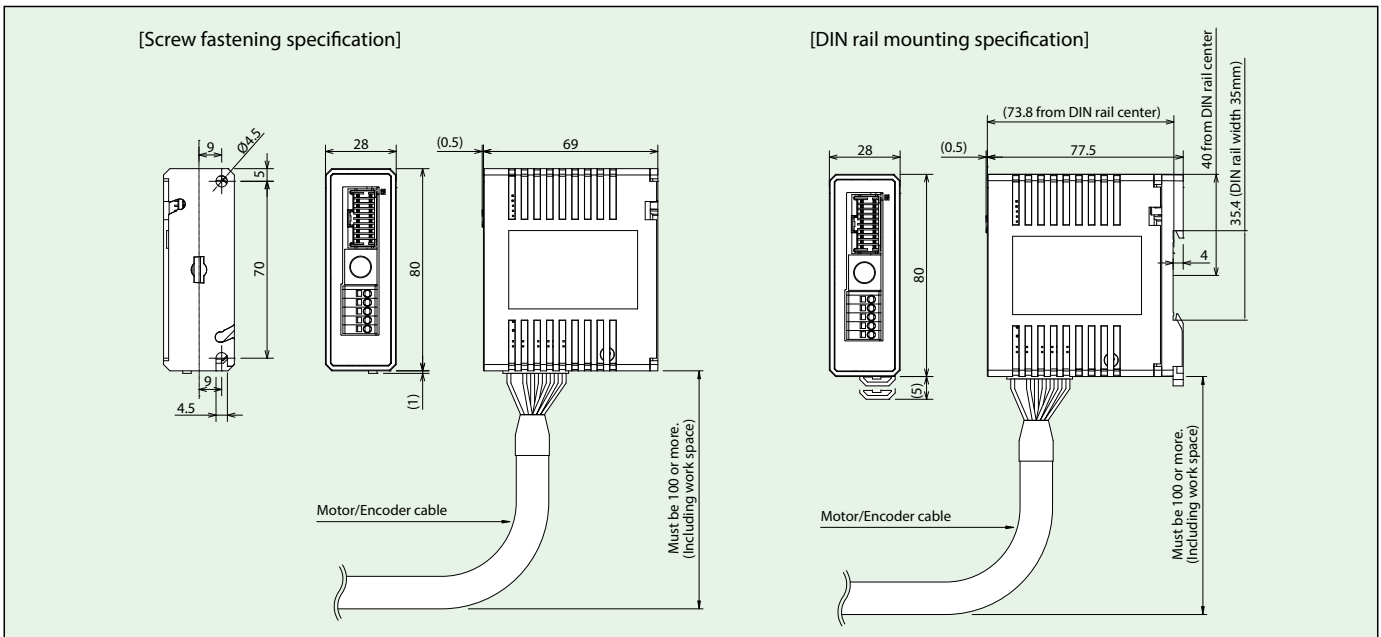
RCP5·RCP4·RCP3·RCP2 ... 800 pulse

RCP6 ... 8192 pulse

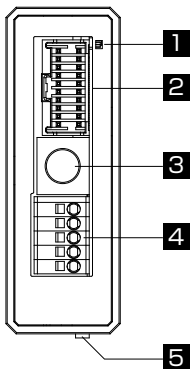
Specification Table

Item	Specification		
Controller type	CYB	PLB	POB
Number of controlled axes	1 axis		
Operation method	Positioner/Solenoid valve type	Pulse-train control type	
Number of positioning points	Up to 64 points	—	
Back up memory	FRAM		
I/O connector (PIO connector)	20 pin connector		
Number of I/Os	8 input points/8 output points	8 input points/8 output points	
I/O power supply	External supply 24VDC±10%		
Serial communication (SIO connector)	RS485 1ch		
Command pulse-train input method	—	Differential line driver	Open collector
Maximum input pulse frequency	—	Max 200kpps	Max 60kpps
Position detection method	Incremental encoder/Battery-less absolute encoder		
Forced electromagnetic brake release	Supply 24VDC 150 mA to the BK terminal in the power connector to release		
Input power	24VDC±10%		
Power supply capacity	2.2A (High-output setting enabled: 3.5A rated / 4.2 max.)		
Insulation voltage	DC500V 10MΩ		
Anti-vibration	XYZ direction 10 ~ 57Hz One side width 0.035 mm (continuous), 0.075 mm (intermittent) 57 to 150 Hz 4.9 m / s ² (continuous), 9.8 m / s ² (intermittent)		
Ambient operating temperature	0 to 40°C		
Ambient operating humidity	85% RH or less (non-condensing)		
Operating ambience	Not exposed to corrosive gases		
Degree of protection	IP20		
Mass	250g (DIN rail mounting specification 285g)		

External Dimensions



Names of each part



1 Controller status display LED

Displays the operation status of the controller.

○: ON ×: OFF ☆: Blinking

LED		Operation status
SV (Green)	ALM (Red)	
×	×	Power supply OFF
×	×	Servo OFF
×	○	Alarm (More than the operational level)
○	×	Motor drive power OFF
○	×	Emergency stop
○	×	Servo ON
☆	×	Automatic servo OFF
○ (Orange)	×	Initializing when the power turns on
×	☆	Detecting collision

2 PIO connector

Connector for input/output signal connection for control.

PLB / POB type for pulse train control is also used as pulse signal input.

3 SIO connector (SIO)

Connector for communication cable connection of teaching tool.

4 Power connector

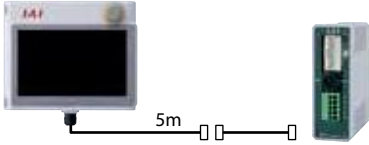
Connector for the main power supplier for the controller, actuator, brake, and emergency stop.

5 Motor encoder connector

Connector for the actuator's motor and encoder cable.

Option

Touch panel teaching box

- Features** Teaching device for positioning input, test operation, and monitoring.
- Model** **TB-02-□**
- Configuration** 

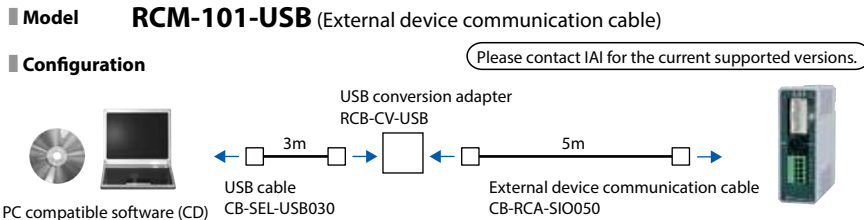
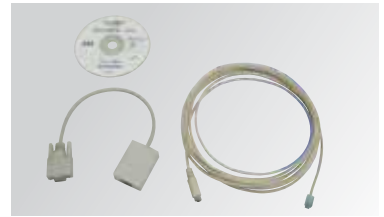
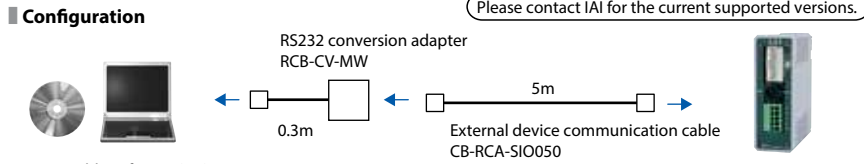
Specification

Rated voltage	24VDC
Power consumption	3.6 W or less (150 mA or less)
Ambient operating temperature	0 ~ 40°C
Ambient operating humidity	20 to 85%RH (Non-condensing)
Degree of protection	IP20
Weight	470g (TB-02 only)

PC dedicated teaching software (Windows only)

- Features** The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.
- Model** **RCM-101-MW** (External device communication cable + RS232)

Supported Windows versions: 7 / 8 / 10



Maintenance parts

When placing an order for the replacement cable, please use the model number shown below.

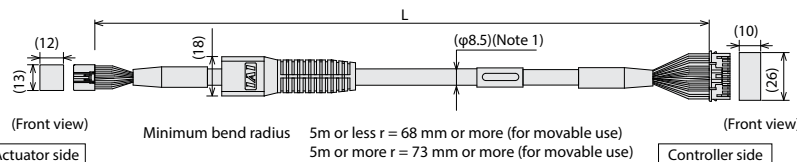
Table of Applicable Cables

Model Number	Integrated Motor-encoder	Cable Integrated Motor-encoder Robot Cable
① RCP6/RCP6CR/RCP6W/RCP5/RCP5CR/RCP5W	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
② RCP4 SA3/RA3/GR/ST		
③ RCP4/RCP4CR/RCP4W (Models other than ②)	CB-CA-MPA □□□	CB-CA-MPA □□□ -RB
④ RCP3	-	CB-APSEP-MPA □□□
⑤ RCP2 GRSS/GRLS/GRST/GRHM/GRHB/SRA4R/SRG54R/SRGD4R		
⑥ RCP2 RTBS/RTBSL RTCS/RTCSL	-	CB-RPSEP-MPA □□□
⑦ RCP2CR RCP2W GRS/GRM GR3SS/GR3SM	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
⑧ RCP2CR RCP2W RTBS/RTBSL RTCS/RTCSL/RTB/RTBL/RTC/RTCL/RTBB/RTBBL/RTCB/RTCBL		
⑨ RCP2 (Models other than ⑤ ~ ⑧)	-	CB-PSEP-MPA □□□

Product model	I/O flat cable for CYB (Without shield)	I/O cable for PLB/POB (With shield)
⑩ PCON-CYB/PLB/POB	CB-PAD-PIO □□□	CB-PAD-PIOS □□□

Model **CB-CAN-MPA□□□/CB-CAN-MPA□□□-RB**

* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



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

(Note 1) If the cable length is 5 m or more, the diameter of both the non-robot cable and robot cable become φ9.1.

Pin No.	Signal name	Pin No.	Signal name
3	φA	1	φA
5	VMM	2	VMM
10	φB	3	φB
9	VMM	4	VMM
4	φA	5	φA
15	φB	6	φB
8	LS+	7	LS+
14	LS-	8	LS-
12	SA ₀ A ₀ BS ₁	11	SA ₀ A ₀ BS ₁
17	SB ₀ A ₀ BS ₁	12	SB ₀ A ₀ BS ₁
1	A+	13	A+
6	A-	14	A-
11	B+	15	B+
16	B-	16	B-
20	BK+	9	BK+
2	BK-	10	BK-
21	VCC	17	VCC
7	GND	19	GND
18	VPS	18	VPS
13	LS_GND	20	LS_GND
19	---	22	---
22	---	21	---
23	---	23	---
24	FG	24	FG

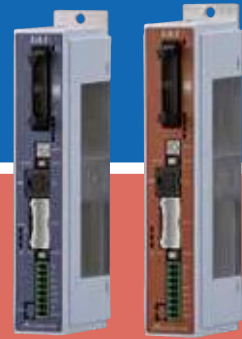
ACON-CB

Position Controller
for RoboCylinder



DCON-CB

Position Controller
for Mini-cylinder



(*1) CC-Link IE Field and MECHATROLINK-I/II connection specification are not compliant with CE Marking.

Features

1 Compatible with Battery-less Absolute Encoder *ACON-CB only

RCA equipped with a battery-less absolute encoder is supported.

Since no battery is needed to retain position data, less space is required in the control panel, which in turn leads to lower both initial and maintenance costs of your equipment.



2 Compatible with Many Major Field Networks

Compatible with DeviceNet, CC-Link, CC-Link IE Field, PROFIBUS-DP, PROFINET IO, CompoNet, MECHATROLINK, EtherCAT and EtherNet/IP.

Field network connection allows for less-wiring, direct numerical commands, position number commands, current position reading, and more.



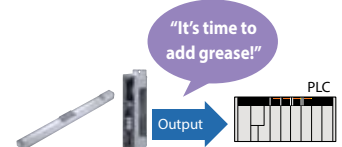
3 Maintenance Timings Can Be Checked Using the Traveled Distance Calculation Function

The total distance traveled by the actuator is calculated and recorded in the controller.

If the preset distance is exceeded, a signal is output from the controller.

This function can be used to check when to add grease or perform the next periodic inspection.

<Maintenance information>



A signal is automatically output to the PLC when the preset maintenance/inspection timing (number of operations or distance traveled) is reached.

4 The Calendar Function Can Retain Alarm Timestamps

The built-in calendar function (clock function) records alarms and other events with timestamps, which helps analyze the causes of troubles should they occur.



5 Equipped with the Offboard Tuning Function *ACON-CB only

Supports Off-board tuning function, allowing optimum setting of the gain based on the transport load.

List of Models

Model number		ACON-CB/CGB · DCON-CB/CGB											
External view													
I/O type		Positioner type	Pulse-train type	Field network type									PRT
				DeviceNet	CC-Link	CC-Link IE Field	PROFIBUS DP	CompoNet	MECHATROLINK I/II	MECHATROLINK III	EtherCAT	EtherNet/IP	
I/O type model number		NP/PN	PLN/PLP	DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT
ACON-CB-CGB	Battery-less absolute specification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Simple absolute spec.	With absolute battery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		With absolute battery unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Without absolute battery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Absolute specification		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DCON-CB-CGB	Incremental specification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Model Specification Items

ACON — [] — [] — [] — [] — [] — [] — [] — [] — [] — []

Series Type Motor Type Encoder Type Option I/O Type I/O Cable Length Power Supply Voltage Simple Absolute Specification Controller Mounting Specification

CB	Standard		WAI	Battery-less absolute/Incremental	HA	Hi-accel./decel. specification	0	24VDC	(Blank)	Battery-less absolute specification Incremental specification Absolute Specification
CGB	Safety category compliant type		A	Absolute	LA	Energy saver specification	2		AB	Simple Absolute Specification (With absolute battery)
		2	NP	PIO (NPN)			3		ABU	Simple Absolute Specification (With absolute battery unit)
		5	PN	PIO (PNP)			5		ABUN	Simple Absolute Specification (Without absolute battery)
		10	PLN	Pulse-train (NPN)					(Blank)	Screw mounting specification
		20	PLP	Pulse-train (PNP)					DN	DIN rail mounting specification
		20S	DV	DeviceNet						
		30	CC	CC-Link						
		30W	CIE	CC-Link IE Field						
			PR	PROFIBUS-DP						
			CN	CompoNet						
			ML	MECHATROLINK I/II (Note 1)						
			ML3	MECHATROLINK III (Note 1)						
			EC	EtherCAT						
			EP	EtherNet/IP						
			PRT	PROFINET IO						

(E.g.) 2: 2W servo motor supported

Note: In principle, the same type of motor as the type of motor of the actuator to be connected should be entered, but there are some models where the motor type of some controllers and actuators do not match. Be sure to check the corresponding models listed below during selection.

<5S/20S target actuator>
 ● Controller Motor type "5S"
 ...RCA2-RA2A□, RCA2-SA2A□
 ● Controller Motor type "20S"
 ...RCA2-S4A□, RCA2-TA5□, RCA-RA3□, RCA-RG□3□, RCAW-RA3□

* If you choose a field network specification, the length of I/O cable will be "0"

(Note 1) Please be sure to check P7-18 for the caution when selecting.

DCON — [] — [] — [] — [] — [] — [] — [] — [] — [] — []

Series Type Motor Type Encoder Type I/O Type I/O Cable Length Power Supply Voltage Controller Mounting Specification

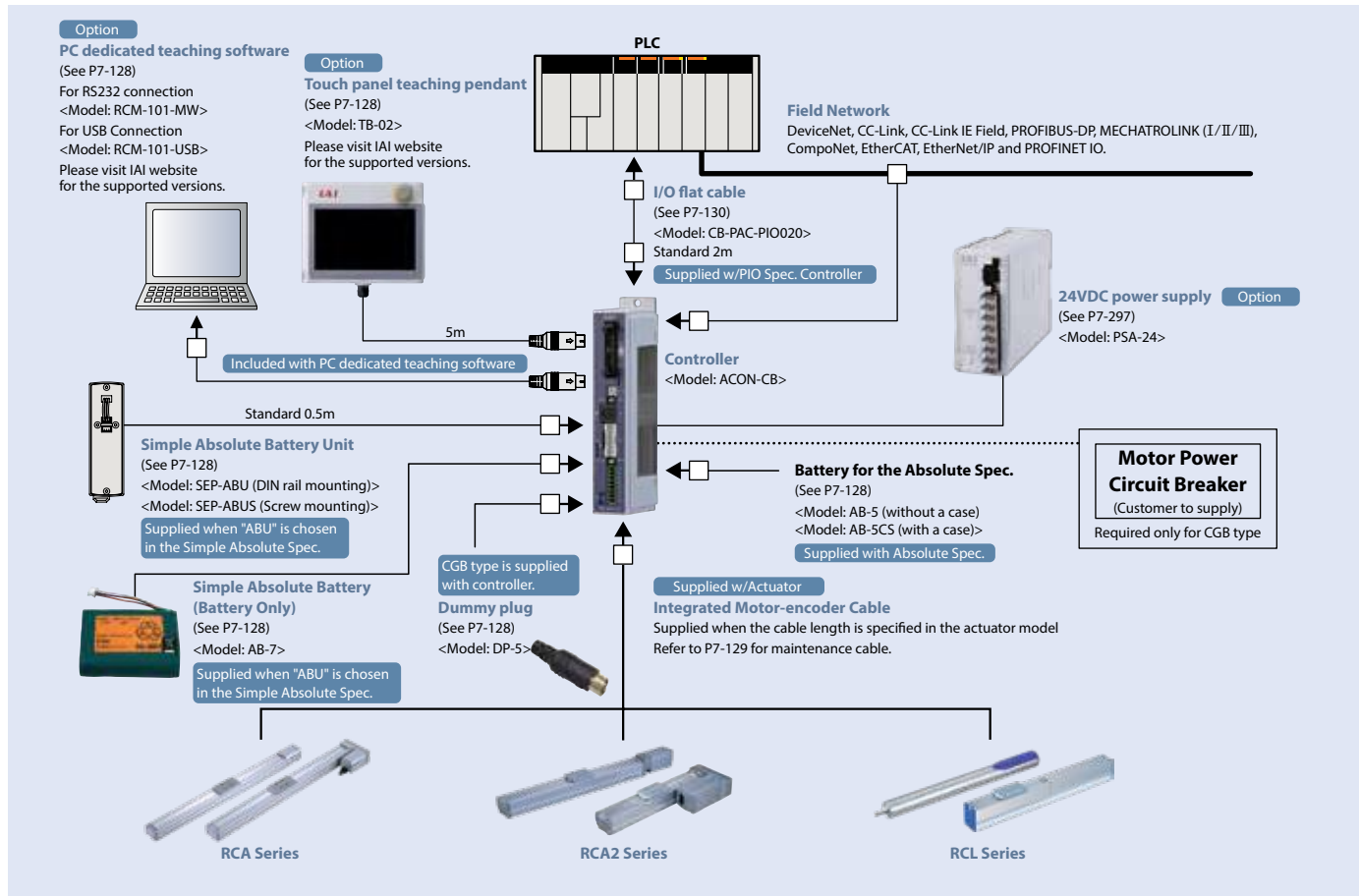
CB	Standard	3	I	Incremental			0	24VDC	(Blank)	Screw mounting specification
CGB	Safety category compliant type		NP	PIO (NPN)			2		DN	DIN rail mounting specification
			PN	PIO (PNP)			3			
			PLN	Pulse-train (NPN)			5			
			PLP	Pulse-train (PNP)						
			DV	DeviceNet						
			CC	CC-Link						
			CIE	CC-Link IE Field						
			PR	PROFIBUS-DP						
			CN	CompoNet						
			ML	MECHATROLINK I/II (Note1)						
			ML3	MECHATROLINK III (Note1)						
			EC	EtherCAT						
			EP	EtherNet/IP						
			PRT	PROFINET IO						

(Note 1) Please be sure to check P7-18 for the caution when selecting.

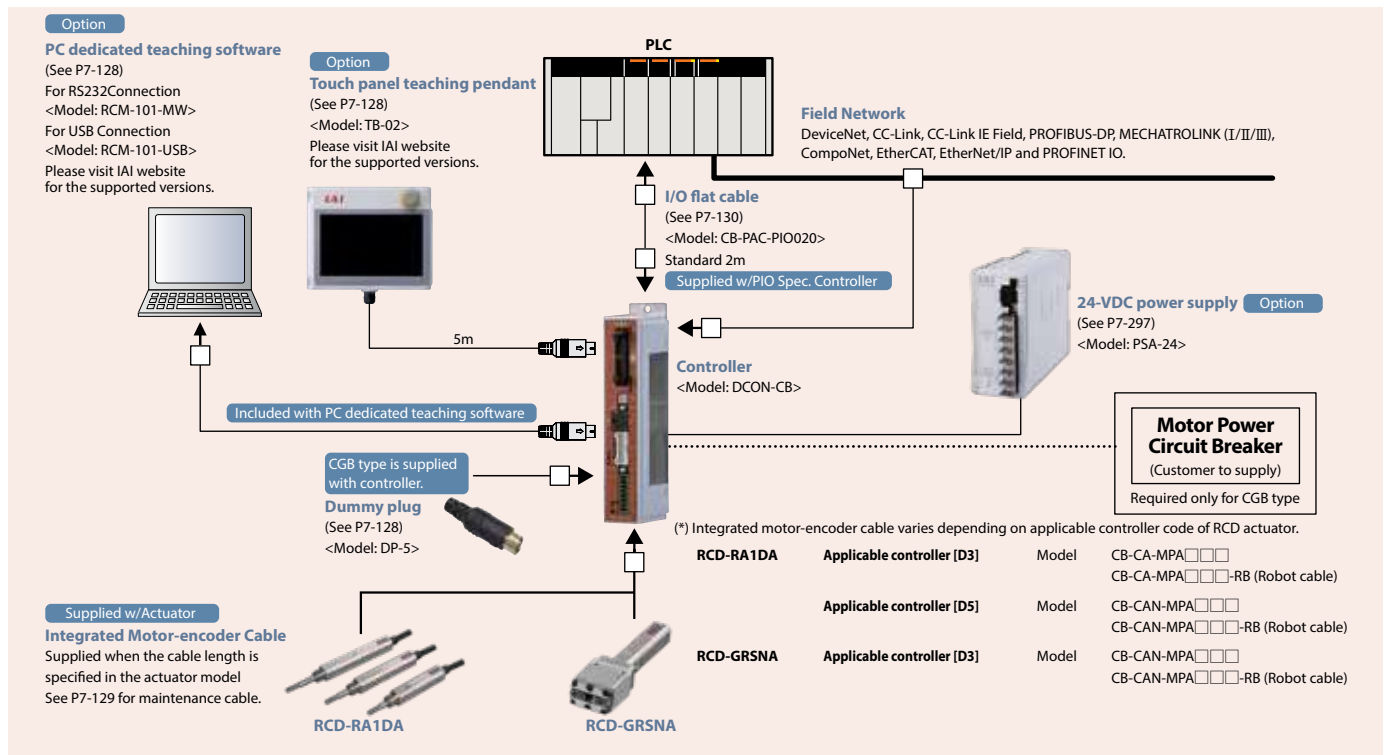
- EC
- RCP6S
- RCON
- MCON-C/LC
- PCON-CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON-CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

System Configuration

<ACON-CB/CGB>



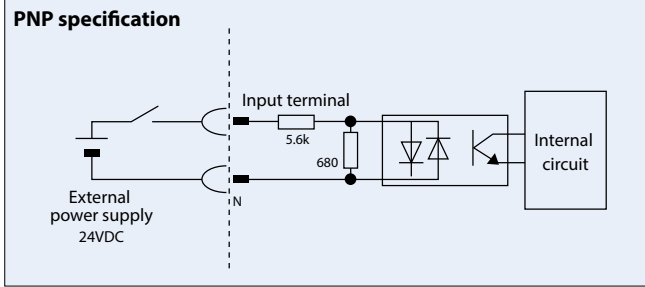
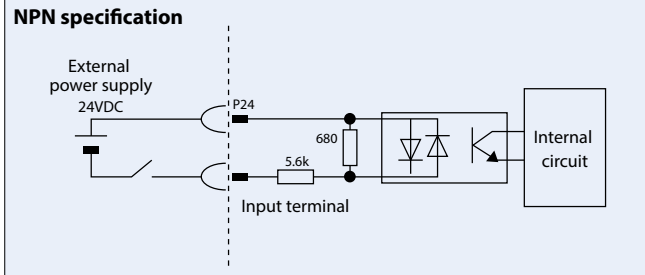
<DCON-CB/CGB>



PIO I/O Interface (Common to ACON-CB / DCON-CB)

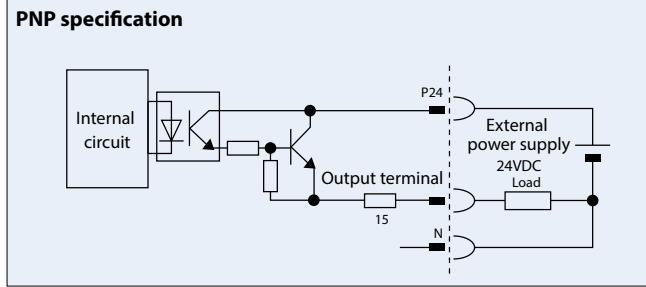
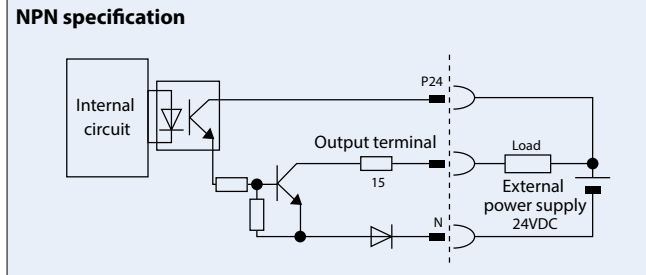
Input part External input specification

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



Output part External output specification

Item	Specification
Load voltage	24VDC
Maximum load current	5mA, 1 circuit
Leak current	2mA max. /point



Types of PIO Patterns (Control Patterns) (Common to ACON-CB / DCON-CB)

This controller has eight different control methods.

Please select the PIO pattern that best suits your application in Parameter No.25, "PIO Pattern Selection".

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

*1 Zone signal output: Please set the desired zone range in Parameter No.1/2 or 23/24, and it will remain effective once home return is completed.

*2 Position zone signal output: This command function relates to the position number. Set the desired zone range in the position table, and this function will only become enabled when the corresponding position is specified; it will be disabled for all other position commands.

(Note 1) Pulse train control mode is available only the pulse train control type is specified (ACON-PLN/PLP,DCON-PLN/PLP) at the time of purchase.

Controller

EC

RCP6S

RCON

MCON

PCON

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

PIO Patterns and Signal Assignments (Common to ACON-CB/DCON-CB)

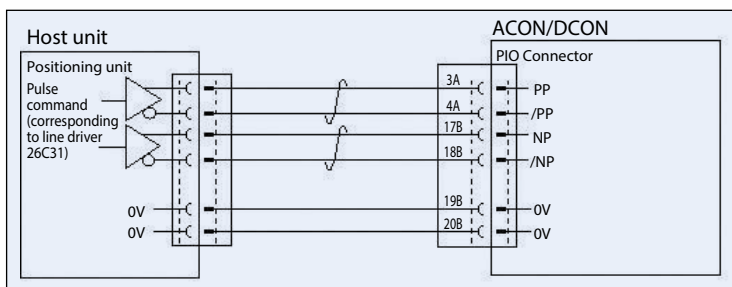
The table below lists the signal assignments for the I/O flat cable under different PIO patterns. Connect an external device (such as a PLC) according to this table.

Pin No.	Category	PIO function	Parameter No.25, "PIO Pattern Selection"					
			0	1	2	3	4	5
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2
	Input	Number of positioning points	64	64	256	512	7	3
		Home return signal	○	○	○	○	○	×
		Jog signal	×	○	×	×	×	×
		Teaching signal (writing of current position)	×	○	×	×	×	×
	Output	Brake release	○	×	○	○	○	○
		Moving signal	○	○	×	×	×	×
		Zone signal	○	△ (Note1)	△ (Note1)	×	○	○
		Position zone signal	○	○	○	×	○	
1A	24V	P24						
2A	24V	P24						
3A	Pulse input	—						
4A		—						
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (Note2)
8A		IN3	PC8	PC8	PC8	PC8	ST3	—
9A		IN4	PC16	PC16	PC16	PC16	ST4	—
10A		IN5	PC32	PC32	PC32	PC32	ST5	—
11A		IN6	—	MODE	PC64	PC64	ST6	—
12A		IN7	—	JISL	PC128	PC128	—	—
13A		IN8	—	JOG+	—	PC256	—	—
14A		IN9	BKRL	JOG-	BKRL	BKRL	BKRL	BKRL
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD
16A		IN11	HOME	HOME	HOME	HOME	HOME	—
17A		IN12	*STP	*STP	*STP	*STP	*STP	—
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—
19A		IN14	RES	RES	RES	RES	RES	RES
20A	IN15	SON	SON	SON	SON	SON	SON	
1B	Output	OUT0	PM1 (ALM1)	PM1 (ALM1)	PM1 (ALM1)	PM1 (ALM1)	PE0	LSO
2B		OUT1	PM2 (ALM2)	PM2 (ALM2)	PM2 (ALM2)	PM2 (ALM2)	PE1	LS1 (TRQS)
3B		OUT2	PM4 (ALM4)	PM4 (ALM4)	PM4 (ALM4)	PM4 (ALM4)	PE2	LS2 (Note2)
4B		OUT3	PM8 (ALM8)	PM8 (ALM8)	PM8 (ALM8)	PM8 (ALM8)	PE3	—
5B		OUT4	PM16	PM16	PM16	PM16	PE4	—
6B		OUT5	PM32	PM32	PM32	PM32	PE5	—
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	—
8B		OUT7	ZONE1	MODE5	PM128	PM128	ZONE1	ZONE1
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—
13B		OUT12	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B	OUT15	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	
17B	Pulse input	—						
18B		—						
19B	0V	N						
20B	0V	N						

(Note) In the table above, asterisk * symbol accompanying each code indicates a negative logic signal. PM1~PM8 are alarm binary code output signals that are used when an alarm generates.
 (Note 1) In all PIO patterns other than 3, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.
 (Note 2) The setting will not become effective until the home return is completed.
 Note 3) Signals dedicated to ACON-CB.
 Reference) Negative logic signal
 Signals denoted by * are negative logic signals. Negative logic input signals are processed when turned OFF. Negative logic output signals normally remain ON while the power is supplied, and turn OFF when the signal is output.

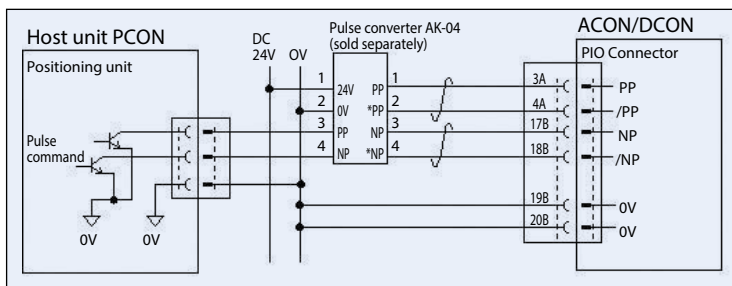
Pulse-train Control Circuit (Common to ACON-CB/DCON-CB)

■ Host Unit = Differential Type



■ Host Unit = Open Collector Type

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

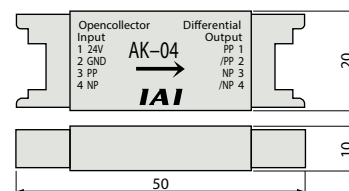


Pulse Converter: AK-04

It converts open-collector command pulses into the differential type. Use this converter if the host controller's output pulse is the open-collector type.

■ Specification

Item	Specification
Input power	24VDC ±10% (max. 50mA)
Input pulse	Open-collector (Collector current: max. 12mA)
Input frequency	200kHz or less
Output pulse	Differential output (max.10mA) (26C31 or equiv.)
Mass	10g or less (excluding cable connectors)
Accessories	37104-3122-000FL (3M) (e-CON connector) x 2 Applic. wire: AWG No. 24~26



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

Command Pulse Input Patterns

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

Controller

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

I/O Signals in Pulse-train Control Mode (Common to ACON-CB/DCON-CB)

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

Parameter No.25, "PIO pattern 6/7"					
Pin No.	Category	I/O number	Signal abbreviation	Signal name	Details
1A	24V		P24	Power supply	I/O power supply +24V
2A	24V		P24	Power supply	I/O power supply +24V
3A	Pulse input		PP	Differential pulse-train input (+)	Differential pulses are input from the host. Up to 200kpps can be input.
4A			/PP	Differential pulse-train input (-)	
5A	Input	IN0	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
6A		IN1	RES	Reset	The alarm is reset when this signal is turned ON.
7A		IN2	HOME	Home return	Home return operation is performed when this signal is turned ON.
8A		IN3	TL	Torque limit selection	When this signal is turned ON, the motor torque is limited to the value set by the parameter.
9A		IN4	CSTP	Forced stop	The actuator is forcibly stopped when this signal has remained ON for 16ms or more. The actuator decelerates to a stop at the torque set in the controller and the servo turns OFF.
10A		IN5	DCLR	Deviation counter clear	This signal clears the deviation counter.
11A		IN6	BKRL	Forced brake release	The brake is forcibly released.
12A		IN7	RMOD	Operation mode switching	The operation mode can be switched when the MODE switch on the controller is set to AUTO. (AUTO when this signal is OFF, and to MANU when the signal is ON.)
13A		IN8	RSTR*1	Reference position movement command	When this signal turns on, the actuator moves to the reference position set in parameter No.167. *1: Used only in PIO Pattern 7.
14A		IN9	NC	—	Not used
15A		IN10	NC	—	Not used
16A		IN11	NC	—	Not used
17A		IN12	NC	—	Not used
18A		IN13	NC	—	Not used
19A		IN14	NC	—	Not used
20A	IN15	NC	—	Not used	
1B	Output	OUT0	PWR	System ready	This signal turns ON when the controller becomes ready after the main power supply has been turned on.
2B		OUT1	SV	Servo ON status	This signal turns ON when the servo is ON.
3B		OUT2	INP	Positioning complete	This signal turns ON when the amount of remaining travel pulses in the deviation counter falls within the in-position band.
4B		OUT3	HEND	Home return complete	This signal turns ON upon completion of home return.
5B		OUT4	TLR	Torque limited	This signal turns ON upon reaching the torque limit while the torque is limited.
6B		OUT5	*ALM	Controller alarm status	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.
7B		OUT6	*EMGS	Emergency stop status	This signal turns ON when the emergency stop of the controller is cancelled, and turns OFF when an emergency stop is actuated.
8B		OUT7	RMDS	Operation mode status	The operation mode status is output. This signal turns ON when the controller is in the manual mode.
9B		OUT8	ALM1	Alarm code output signal	An alarm code is output when an alarm generates. For details, refer to the operation manual.
10B		OUT9	ALM2		
11B		OUT10	ALM4		
12B		OUT11	ALM8		
13B		OUT12	*ALML	Minor failure alarm	This signal turns ON when the controller is normal, and turns OFF when a message-level alarm has been generated.
14B		OUT13	REND*1	Reference position movement complete	This signal turns ON when movement to the reference point set in parameter No. 167 is completed. *1: Used only in PIO Pattern 7.
15B		OUT14	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
16B	OUT15	ZONE2	Zone signal 2		
17B	Pulse input		NP	Differential pulse-train input (+)	Differential pulses are input from the host. Up to 200kpps can be input.
18B			/NP	Differential pulse-train input (-)	
19B	0V		N	Power supply	I/O power supply 0V
20B	0V		N	Power supply	I/O power supply 0V

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

Field Network Specification: Explanation of Operation Modes (Common to ACON-CB/DCON-CB)

If the ACON-CB/DCON-CB is controlled via a field network, you can select one of the following five modes to operate the actuator. Please note that the data areas required on the PLC side will vary depending on the mode.

Mode Description

Mode	Description
0 Remote I/O mode	Similarly to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1 Position/simple direct value mode	The target position value is directly input, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
2 Half direct value mode	The actuator is operated by directly inputting values for speed, acceleration rate and push current, as well as the target position.
3 Full direct value mode	The actuator is operated by directly inputting values for the target position, speed, acceleration rate and push current, etc. In addition, you are able to read the current position, current speed, and the specified current, etc.
4 Remote I/O mode 2	This mode is the same as the remote I/O mode above, with the added functionality of reading current position and the command motor current.

Required Data Size for Each Network

		DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	MECHATROLINK I/II	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 bytes	1 station	2 bytes	2 bytes	*	2 bytes	2 bytes	2 bytes
1	Position/simple direct value mode	8 bytes	1 station	8 bytes	8 bytes	*	8 bytes	8 bytes	8 bytes
2	Half direct value mode	16 bytes	2 stations	16 bytes	16 bytes	*	16 bytes	16 bytes	16 bytes
3	Full direct value mode	32 bytes	4 stations	32 bytes	32 bytes	X (Note 1)	32 bytes	32 bytes	32 bytes
4	Remote I/O mode 2	12 bytes	1 station	12 bytes	12 bytes	*	12 bytes	12 bytes	12 bytes

* No required data size is set for MECHATROLINK I & II.
 (Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

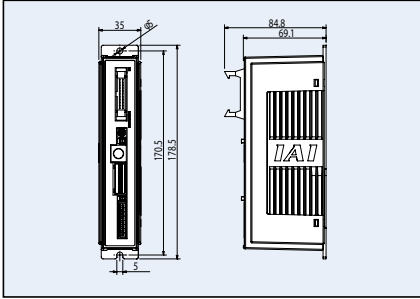
	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2
Number of positioning points	512	768	Unlimited	Unlimited	512
Operation by direct position data input	X	O	O	O	X
Direct speed/acceleration input	X	X	O	O	X
Push-motion operation	O	O	O	O	O
Current position read	X	O	O	O	O
Current speed read	X	X	O	O	X
Operation by position number input	O	O	X	X	O
Completed position number read	O	O	X	X	O

* O indicates that the operation is supported, and X indicates that it is not supported.
 (Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

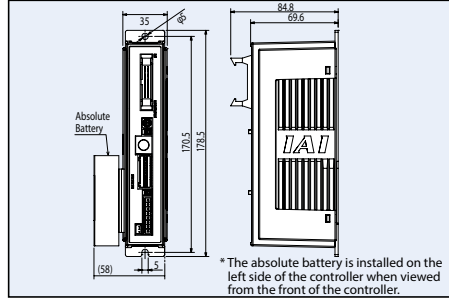
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

External Dimensions (Common to ACON-CB/DCON-CB) * DCON-CB is available only for incremental specification.

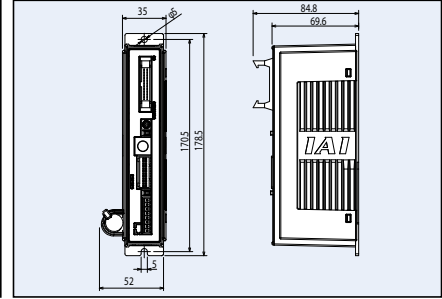
Battery-less Absolute/Incremental Specifications (Screw Mounting Type)



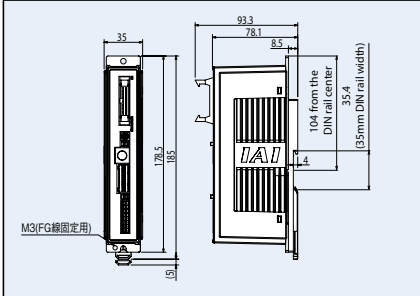
Simple Absolute Specification (Screw Mounting Type)



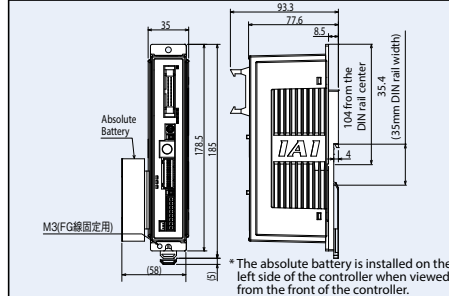
Absolute Specification (Screw Mounting Type)



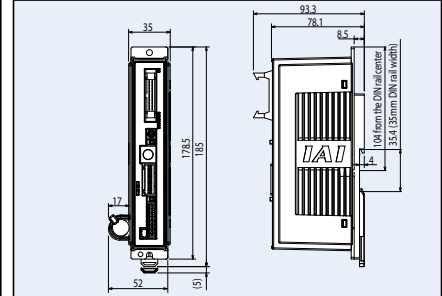
Battery-less Absolute/Incremental Specifications (DIN Rail Mounting)



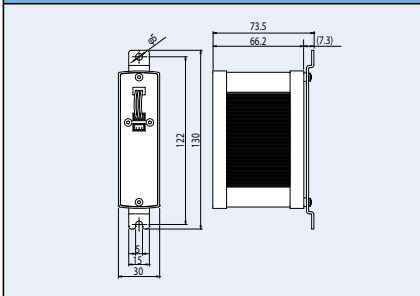
Simple Absolute Specification (DIN Rail Mounting)



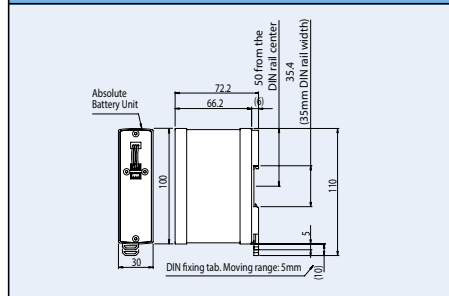
Absolute Specification (DIN Rail Mounting)



Absolute Battery Unit (Screw Mounting Type)



Absolute Battery Unit (DIN Rail Mounting)



Specification List

Item	ACON-CB	DCON-CB
Number of controlled axes	1 axis	
Power supply voltage	24VDC ±10%	
Rush current from power supply	10A (Rush current limiting circuit is provided)	
Cooling method	Natural air cooling	
Off-board tuning	Available (RCA only)	Not available
Backup memory	FRAM (256kbit) Number of rewrite: No limit	
I/O power supply	24VDC ±10%	
Number of I/Os	16IN/16OUT	
Pulse-train specification	Available (differential type only: AK-04 is used for the open-collector type)	
Fieldbus specification	Available	
Serial communication	RS485: 1 channel (conforming to Modbus protocol)	
Ambient operating temperature	0 to 40°C	
Ambient operating humidity	85% RH or less (non-condensing)	
Degree of protection	IP20	
Mass	Battery-less absolute/Incremental spec.: 230g, simple absolute spec.: 240g (incl. battery: 430g) Absolute spec.: 240g (incl. battery: 260g)	Incremental specification: 230g —

Motor Power Capacity

	Motor type	Standard / High-accel/decel		Power-saving		
		Rated [A]	Max. [A]	Rated [A]	Max. [A]	
ACON-CB	RCA/RCA2	5W	1.0	3.3	—	—
		10W	1.3	4.4	1.3	2.5
		20W	1.3	4.4	1.3	2.5
		30W	1.3	4	1.3	2.2
		20W(20S)	1.7	5.1	1.7	3.4
DCON-CB	RCD	2W	0.8	4.6	—	—
		5W	1	6.4	—	—
		10W	1.3	6.4	—	—
		3W	0.7	1.5	—	—

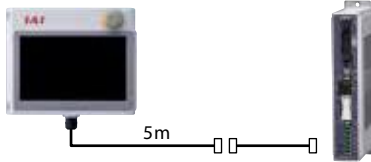
Option (Common to ACON-CB/DCON-CB)

Touch panel teaching pendant

Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

Model TB-02-□

Configuration



Specifications

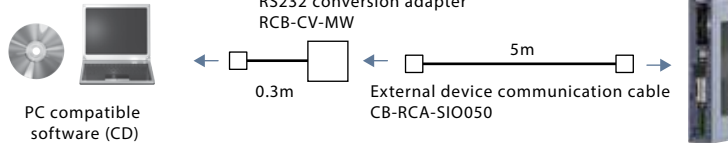
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Degree of protection	IP20
Mass	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

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

Configuration



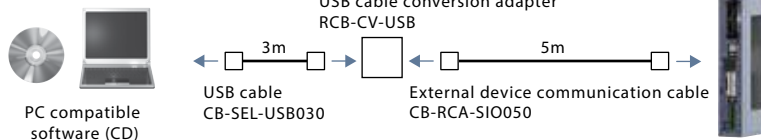
Please contract IAI for the current supported versions.

Supported Windows versions: 7/8/8.1/10



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

Configuration



Please contract IAI for the current supported versions.



Dummy plug

Features This plug is required when the safety category specification (ACON/DCON-CGB) is used.

Model DP-5



Option (for ACON-CB)

Absolute battery unit

Overview A battery unit, supplied as an accessory for the simple absolute specification, which serves to back up the current position of the controller.

Model SEP-ABU (DIN rail mounting specification)
SEP-ABUS (Screw mounting specification)

Specification

Item	Specification
Ambient operating temp. & humidity	0~40°C (around 20°C is desirable), 95% RH or less (non-condensing)
Operating ambience	Free from corrosive gases
Absolute battery	Model: AB-7 (Ni-MH battery/Life: approx. 3 years)
Absolute battery unit connecting cable	Model: CB-APSEP-AB005 (length: 0.5m)
Mass	Battery box: 140 g or less, Battery: 140 g or less

Replacement battery (Simple absolute specification)

Overview Replacement battery used for the simple absolute

Model AB-7



Replacement battery (Absolute specification)

Overview Replacement battery used for the absolute specification.

Model AB-5 (Battery)
AB-5-CS3 (Battery with case)



- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
DCON-CB
- ACON
DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Maintenance Parts

Table of Applicable Cables

ACON-CB

Model Number		Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCA2/RCA2CR/RCA2W	-	CB-APSEP-MPA □□□
②	RCA2/RCA2CR/RCA2W (when selecting CNS)	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
③	RCA RCACR RCAW	SRA4R SRGS4R SRGD4R	CB-APSEP-MPA □□□
④		(Models other than ②)	CB-ASEP2-MPA □□□
②	RCL	-	CB-APSEP-MPA □□□

DCON-CB

Model Number		Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCD	RA1DA	CB-CAN-MPA □□□ -RB
②		GRSNA	

*When the applicable controller of the RCD - RA1DA model uses "D3", the cable model is CB - CA - MPA □□□ / CB - CA - MPA □□□ - RB.

Common to ACON-CB/DCON-CB

Model Number	PIO Flat Cable
⑤ ACON-CB/DCON-CB	CB-PAC-PIO □□□

Controller

EC

RCP6S

RCON

MCON
-C/LCPCON
-CB/CFB

PCON

ACON-CB
DCON-CBACON
DCONSCON
-CBSCON-CB
(Servo press)SCON
-LCSCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

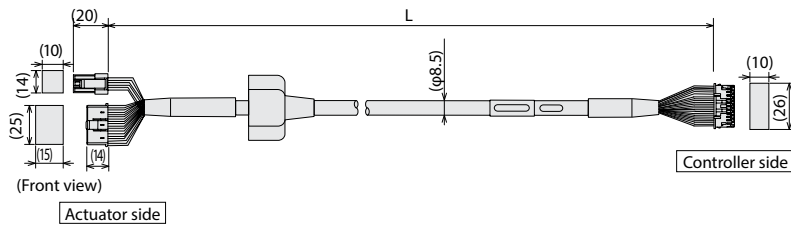
PSA-24

TB-02

TB-03

Model number CB-ASEP2-MPA [] [] [] *The standard is the robot cable.

* Please indicate the cable length (L) in [] [] [], maximum 20m, e.g.) 080 = 8m

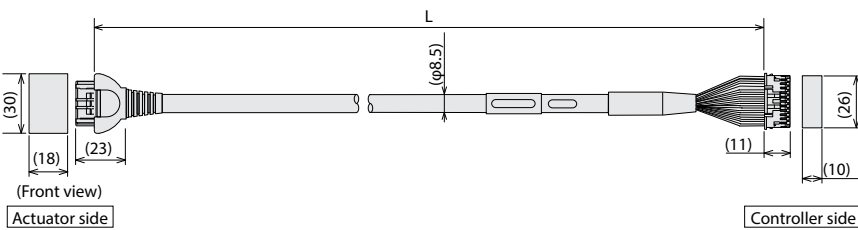


Minimum bending radius R = 68mm or more (Dynamic bending condition)

Actuator side Terminal number		Controller side Terminal number
1	Red(U)	1
2	Yellow(V)	2
	NC	3
3	Black(W)	4
	NC	5
18	Orange(BK+)	7
17	Gray(BK)	8
7	Black(LS+)	9
16	Brown(LS-)	10
1	White(A+)	11
2	Yellow(A-)	12
3	Red(B+)	13
4	Green(B-)	14
10	Black (id tape)(Z+)	15
11	Brown (id tape)(Z-)	16
14	White (id tape)(VCC)	17
15	Yellow (id tape)(GND)	19
13	Red (id tape)(VPS/BAT-)	18
6	Green (id tape)(Spare)	20
12	White(BAT+)	21
5	NC	22
8	NC	23
9	Shield(FG)	24

Model number CB-APSEP-MPA [] [] [] *The standard is the robot cable.

* Please indicate the cable length (L) in [] [] [], maximum 20m, e.g.) 080 = 8m

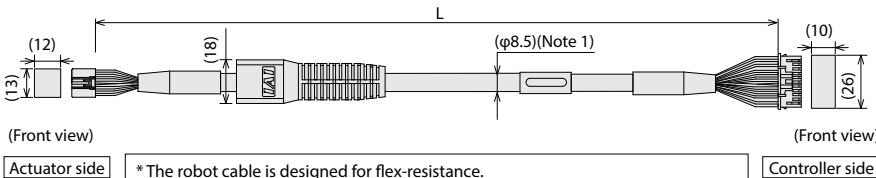


Minimum bending radius R = 68mm or more (Dynamic bending condition)

Actuator side 1-1827863-1 (AMP)			Controller side PADD-24V-1-5 (JST)		
Pin No.	Signal name	Color	Pin No.	Signal name	Color
A1	φA	Black	1	φA	Black
B1	VMM	White	2	VMM	White
A2	φA	Brown	5	φA	Brown
B2	φB	Green	3	φB	Green
A3	VMM	Yellow	4	VMM	Yellow
B3	φB	Red	6	φB	Red
A4	LS+	Orange	7	LS+	Orange
B4	LS-	Grey	8	LS-	Grey
A5	—	White	11	—	White
B5	—	Yellow	12	—	Yellow
A7	A+	Red	13	A+	Red
B7	A-	Green	14	A-	Green
A8	B+	Black	15	B+	Black
B8	B-	Brown	16	B-	Brown
A5	BK+	Black (id tape)	9	BK+	Black (id tape)
B5	BK-	Brown (id tape)	10	BK-	Brown (id tape)
A9	GND+	Green (id tape)	20	GND+	Green (id tape)
B9	VPS	Red (id tape)	18	VPS	Red (id tape)
A10	VCC	White (id tape)	17	VCC	White (id tape)
B10	GND	Yellow (id tape)	19	GND	Yellow (id tape)
A11	NC	—	21	NC	—
B11	Shield, FG	—	24	Shield, FG	—
			22	—	—
			23	—	—

Model number CB-CAN-MPA [] [] [] / CB-CAN-MPA [] [] [] -RB

* Please indicate the cable length (L) in [] [] [], maximum 20m, e.g.) 080 = 8m (For connection with RCD, maximum 10m)



* The robot cable is designed for flex-resistance. Please use the robot cable if the cable has to be installed through the cable track.

Minimum bending radius R = 68mm or more (Dynamic bending condition)

(Note 1) If the cable length is 5m or more, φ9.1 cable diameter applies for both non-robot cables and robot cables.

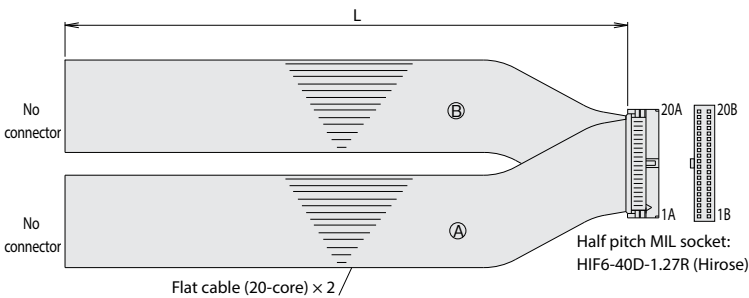
* When the applicable controller of the RCD - RA1DA model uses "D3", the cable model is CB - CA - MPA [] [] [] / CB - CA - MPA [] [] [] - RB.

Pin No.	Signal name	Pin No.	Signal name
3	φA/U	2	U
5	VMM/V	3	V
10	φA/V	4	—
9	φB/-	5	W
4	VMM/-	6	—
15	φB/+	7	—
8	LS+/BK+	8	—
14	LS-/BK-	9	—
12	-/A+	11	A+
17	-/A-	12	A-
1	A+/B+	13	B+
6	A-/B-	14	B-
11	B+/Z+	15	HS1 IN
16	B-/Z-	16	HS2 IN
20	BK+/LS+	9	—
2	BK-/LS-	10	—
21	LS GND	17	VCC
7	VPS	19	GND
18	VCC	18	—
13	GND	20	HS3 IN
19	—	22	—
22	—	21	—
23	—	23	—
24	FG	24	FG

* () indicates color of robot cable.

Model number CB-PAC-PIO [] [] []

* Please indicate the cable length (L) in [] [] [], maximum 10m, e.g.) 080 = 8m



HIF6-40D-1.27R

No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
1A	24V	Brown-1	Flat cable A (pressure-welded)	1B	OUT0	Brown-3	Flat cable B (pressure-welded) AWG28
2A	24V	Red-1		2B	OUT1	Red-3	
3A	Pulse input	Orange-1		3B	OUT2	Orange-3	
4A	IN0	Yellow-1		4B	OUT3	Yellow-3	
5A	IN0	Green-1		5B	OUT4	Green-3	
6A	IN1	Blue-1		6B	OUT5	Blue-3	
7A	IN2	Purple-1		7B	OUT6	Purple-3	
8A	IN3	Gray-1		8B	OUT7	Gray-3	
9A	IN4	White-1		9B	OUT8	White-3	
10A	IN5	Black-1		10B	OUT9	Black-3	
11A	IN6	Brown-2		11B	OUT10	Brown-4	
12A	IN7	Red-2		12B	OUT11	Red-4	
13A	IN8	Orange-2		13B	OUT12	Orange-4	
14A	IN9	Yellow-2		14B	OUT13	Yellow-4	
15A	IN10	Green-2		15B	OUT14	Green-4	
16A	IN11	Blue-2		16B	OUT15	Blue-4	
17A	IN12	Purple-2		17B	Pulse input	Purple-4	
18A	IN13	Gray-2		18B	input	Gray-4	
19A	IN14	White-2		19B	0V	White-4	
20A	IN15	Black-2		20B	0V	Black-4	

ACON-CYB/PLB/POB

DCON-CYB/PLB/POB

Position Controller
for RoboCylinder



Features

1 For products with battery-less absolute encoder (ACON only)

Battery maintenance is not required, since it does not need a battery. Home return is not required during the initial setting, after emergency stop, or when the device is restarted after failure.

Down time can be shortened, and manufacturing costs can be reduced.



Battery-less Absolute Encoder

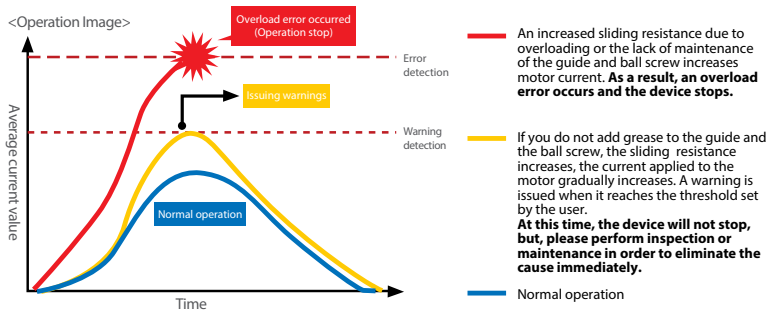
No Battery, No Maintenance,
No Homing, and No Price Increase.
No Going Back to Incremental.

2 Equipped with Smart tuning function (ACON only)

Supports the smart tuning function, allowing optimal setting of the speed and acceleration/deceleration values based on the payload.

3 Predictive maintenance

Warning is issued before an overload error is generated from a change in the average current value.



- The predictive maintenance function can prevent urgent stops of the equipment.
- It effectively reduces labor costs because maintenance personnel can be minimized to the minimum required amount.


4 Low price

It is possible to achieve a low price by limiting it to the function that I often use.

Product model		High resolution battery-less absolute	Simple absolute	Calendar function	Maintenance function	I/O point	Positioning point	Field network
ACON	CYB/PLB/POB	○	×	×	○	Non insulated 8IN/8OUT	Standard 16 points Max. 64 points	×
	CB	○	○	○	○	Insulated 16IN/16OUT	Standard 64 points Max. 512 points	○

List of Models/Price

Position Controller that can operate actuators of the RCA2/RCA/RCL series. Lineup for 3 types that can support various control.

Model	CYB	PLB / POB
Type	Positioner/ Solenoid valve type	Pulse-train control type
External view		
Details	Operable with control similar to air cylinder	Controller for Pulse-train control
Number of positions	64	-

Model number

ACON — [] — [] **WAI** [] — [] — [] — **0** — []

Series Type Motor Type Encoder Type Option I/O Type I/O Cable Length Power Supply Voltage Controller Mounting Specification

CYB	Positioner / Solenoid valve type	2 2W 20 20W	WAI Battery-less absolute/ Incremental	HA Hi-accel./decel. supported LA Energy saver	NP PIO(NPN) specification PN PIO(PNP) specification	0 No cable 2 2m 3 3m 5 5m	0 24VDC	(Blank) Screw mounting specification DN DIN rail mounting specification
PLB	Pulse-train control type (Differential receiver type)	5 5W 20S 20W						
POB	Pulse-train control type (Open collector type)	5S 5W 30 30W 10 10W						

(Example) 2: 2W Servo motor compatible

Note
Basically, the type of motor is the same as that of the actuator to be connected. However, in some models the controller and actuator motor types do not match. The applicable models are listed below, so please note when selecting.
<5S/20S target actuator>
● Controller Motor type "5S" ... RCA2 - RA2A□, RCA2 - SA2A□
● Controller Motor type "20S" ... RCA2 - SA4□, RCA2 - TA5□, RCA - RG□3□, RCAW - RA3□

* The POB type has a maximum cable length of 2m.

DCON — [] — **3** **I** — [] — [] — **0** — []

Series Type Motor Type Encoder Type I/O Type I/O Cable Length Power Supply Voltage Controller Mounting Specification

CYB	Positioner / Solenoid valve type	3 3W	I Incremental	NP PIO(NPN) specification PN PIO(PNP) specification	0 No cable 2 2m 3 3m 5 5m	0 24VDC	(Blank) Screw mounting specification DN DIN rail mounting specification
PLB	Pulse-train control type (Differential receiver type)						
POB	Pulse-train control type (Open collector type)						

* DC Brushless motor compatible

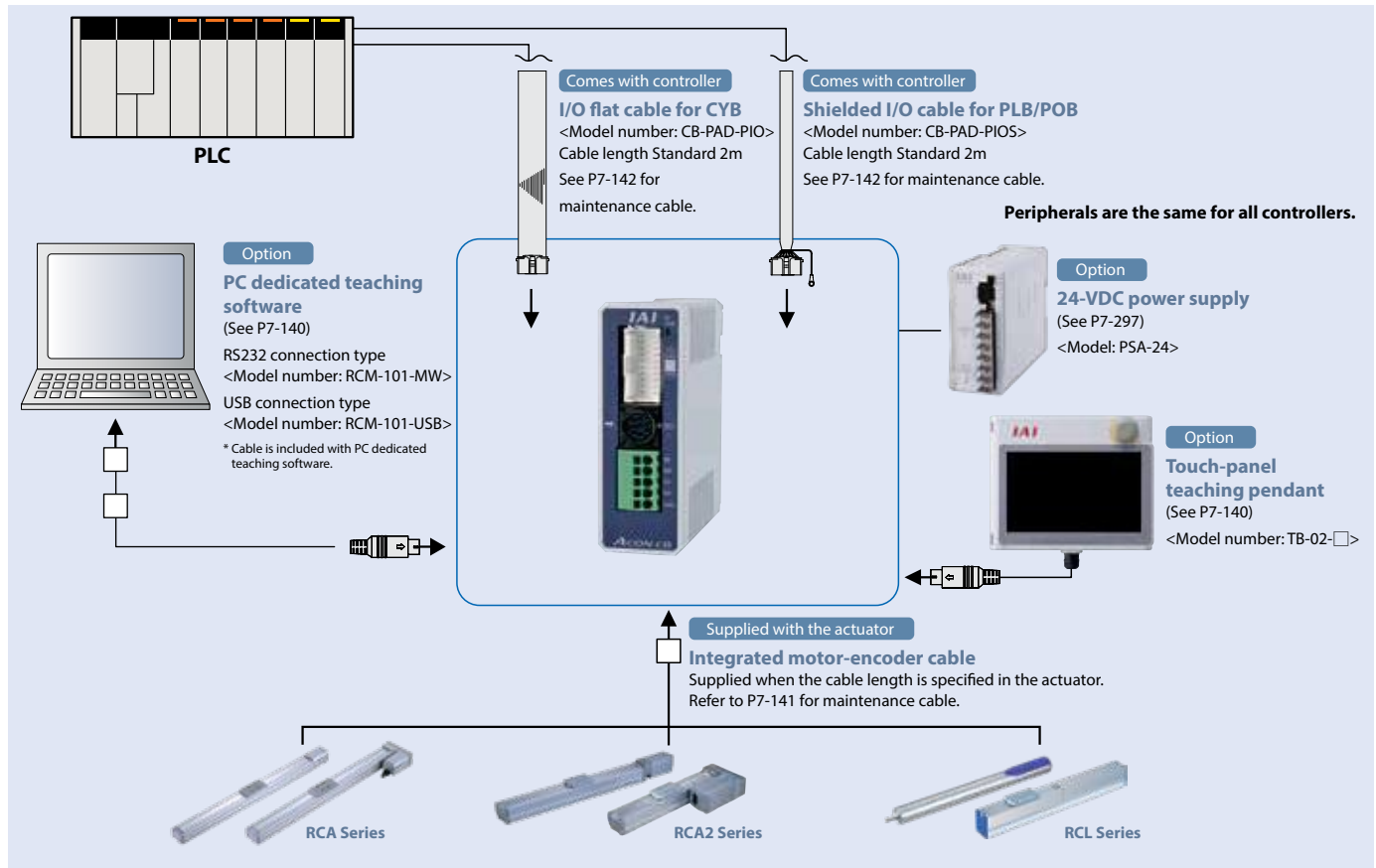
* The POB type has a maximum cable length of 2m.

Controller

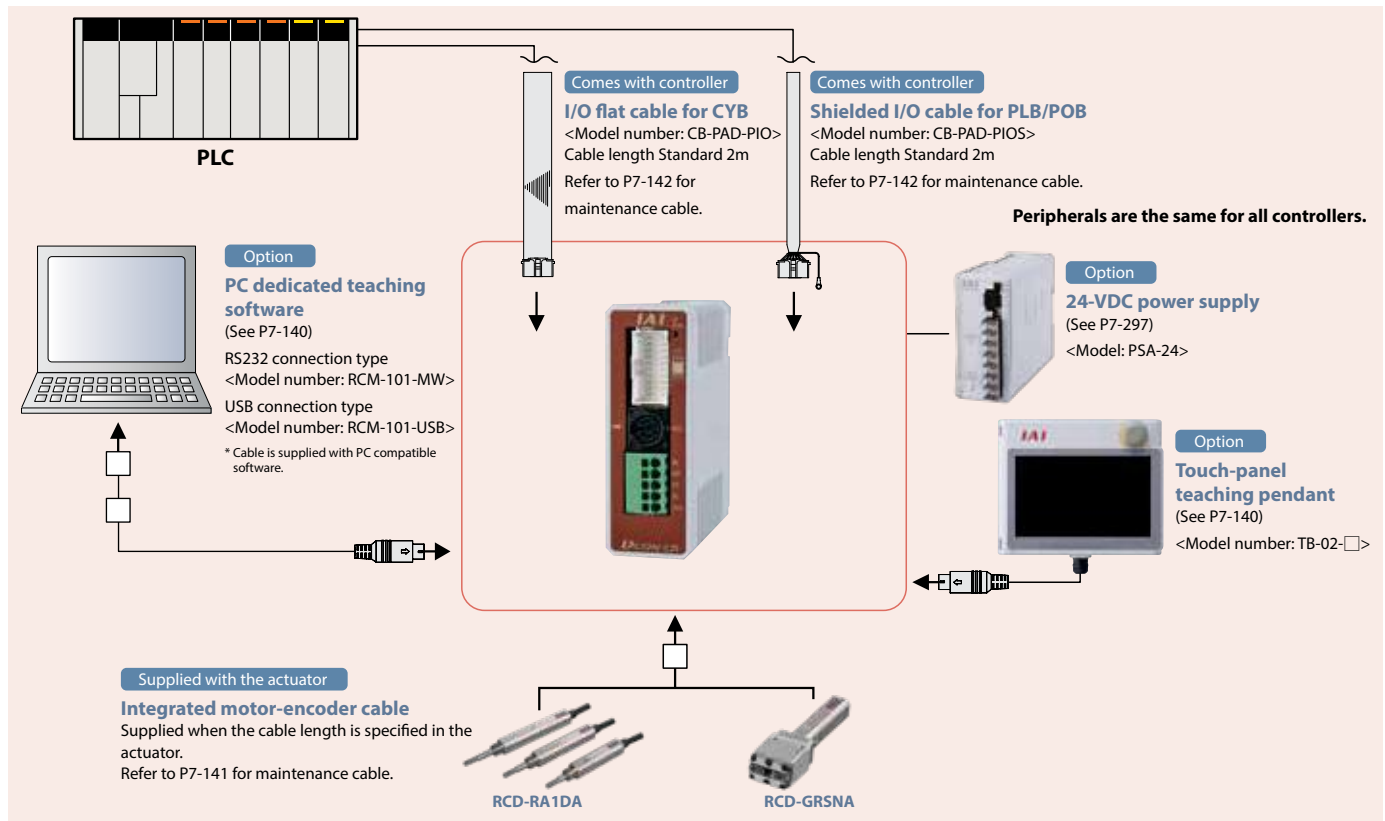
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
DCON-CB
- ACON
DCON**
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

System configuration

<ACON-CYB/PLB/POB>



<DCON-CYB/PLB/POB>



I/O signals in positioner / solenoid valve type (ACON/PCON-CYB)

Pin number	Category	Number of positioning points	Parameter (PIO pattern) selection						Serial communication (Modbus) Refer to operation manual	
			0	1	2	3	4	5		6
			Positioning mode	Solenoid valve mode 1	Solenoid valve mode 2	Single solenoid mode	Double solenoid mode	User Selection mode		Serial communication
			16	7	3	2	2	One of 4, 8, 16, 32, 64 points (Selection)	768	
		Zone signal	△(Note 2)	×	△(Note 2)	△(Note 2)	△(Note 2)	△(Note 2)		
		Position zone signal	△(Note 2)	×	△(Note 2)	△(Note 2)	△(Note 2)	△(Note 2)		
5	Input	IN0	PC1	ST0	ST0	ST0	ST0	Any one of the 8 input signals can be selected except for Command position No. and CSTR.		
6		IN1	PC2	ST1	ST1(JOG+)	-	ST1 (-)			
7		IN2	PC4	ST2	ST2 (-)	-	ASTR			
8		IN3	PC8	ST3	-	-	-			
9		IN4	HOME	ST4	SON	SON	SON			
10		IN5	*STP	ST5	-	*STP	*STP			
11		IN6	CSTR	ST6	-	-	-			
12		IN7	RES	RES	RES	RES	RES			
13	Output	OUT0	PM1(ALM1)	PE0	LS0	LS0/PE0	LS0/PE0	Any one of the 8 output signals can be selected except for Complete position No. and PEND.		
14		OUT1	PM2(ALM2)	PE1	LS1(TRQS)	LS1/PE1	LS1/PE1			
15		OUT2	PM4(ALM4)	PE2	LS2 (-)	PSFL	PSFL			
16		OUT3	PM8(ALM8)	PE3	HEND	HEND	HEND			
17		OUT4	HEND	PE4	SV	SV	SV			
18		OUT5	PZONE/ZONE1	PE5	PZONE/ZONE1	PZONE/ZONE1	PZONE/ZONE1			
19		OUT6	PEND	PE6	*ALML	*ALML	*ALML			
20		OUT7	*ALM	*ALM	*ALM	*ALM	*ALM			

Note 1) In the table above, the asterisk symbol (*) accompanying each code indicates a negative logic signal.
 (Note 2) In all PIO patterns other than 1, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.
 (Note 3) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)
 (Note 4) Pin numbers 13 and 14 of PIO patterns 3 or 4, can select PE * and LS * by by setting Parameter No. 186.

I/O signals functions in positioner / solenoid valve type (ACON-CYB/DCON-CYB)

Depending on the controller settings, the available signals are different. Please check the available functions by referring to the signal table.

Category	Signal abbreviation	Signal name	Function description
Input	PC1~PC8	Command position No.	Enter the target position number (binary input).
	HOME	Home return	Home return operation is performed when this signal is turned ON.
	*STP	Pause	The actuator decelerates to a stop when this signal is turned OFF. During the stop, the remaining motion is on hold. It restarts when the signal is turned ON.
	CSTR	PTP Strobe (Start signal)	Start moving to the position set in the command position.
	RES	Reset	Current alarms are reset when this signal is turned ON. In addition, it is possible to cancel the remaining travel amount when it is turned ON during the pause state (* STP is OFF).
	ST0~6	Start signal	In the solenoid valve mode, it moves to the position specified when this signal is turned ON. (Start signal is not required.)
	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
Output	ASTR	Continuous cycling operation signal	When this signal is turned ON, continuous cycling between two points is performed. If this signal is turned OFF while moving, it stops after arriving at the current target position.
	PM1~PM8	Completed position No.	It outputs (binary output) the number of the position reached after positioning is complete.
	HEND	Home return complete	This signal turns ON upon completion of home return.
	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
	PZONE	Position zone	This signal turns ON when the current position of the actuator enters desired zone set by the position data when moving to the position. Although it is possible to select ZONE 1, PZONE is effective only when moving to the set
	PEND	Positioning complete	This signal turns ON when it reaches within the positioning band after moving. It remains ON even if it exceeds the positioning band.
	*ALM	Alarm	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.
	PE0~6	Current position No.	In the solenoid valve mode, it turns ON after movement to the target position is completed.
	LS0~2	Limit switch output	This signal turns ON when the current position of the actuator reaches within the positioning band. In home return complete status, this signal is output even before the movement command or in the servo OFF status.
	SV	Servo ON	This signal turns ON when the servo is ON.
	*ALML	Minor failure alarm	This signal is ON in normal conditions and turns OFF when a message-level alarm generates. (Operation will continue.)
	PSFL	Unloaded push-motion	This signal turns ON when push-motion is unloaded.
	ALM1~ALM8	Alarm code	When an alarm generates equal or higher than the operation release level, this signal outputs the alarm details using a binary code.

(Note) The above signals marked with (*) are normally ON and turned OFF at operation.

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON -CB (Servo press)
- SCON -LC
- SCON -CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

I/O signals in pulse-train control type (ACON-PLB/POB DCON-PLB/POB)

Pin number	Category	Number of positioning points Zone signal	Parameter(PIO pattern) selected	
			0	1
			Incremental Axis Connection mode	Absolute Axis Connection mode
1	Pulse-train input		/PP	/PP
2			PP	PP
3			/NP	/NP
4			NP	NP
5	Input	IN0	SON	SON
6		IN1	RES	RES
7		IN2	HOME	HOME
8		IN3	TL	TL
9		IN4	CSTP	CSTP
10		IN5	DCLR	DCLR
11		IN6	BKRL	BKRL
12		IN7	-	RSTR
13	Output	OUT0	PWR	PWR
14		OUT1	SV	SV
15		OUT2	INP	INP
16		OUT3	HEND	HEND
17		OUT4	TLR	TLR
18		OUT5	ZONE1	ZONE1
19		OUT6	*ALML	REND
20		OUT7	*ALM	*ALM

(Note) The above signals marked with (*) are normally ON and turn OFF at operation.

I/O signals functions in pulse-train control type (ACON-PLB/POB DCON-PLB/POB)

Depending on the controller type and setting, the available signals are different. Please check the available functions by referring to the signal table.

Category	Signal abbreviation	Signal name	Function description
Pulse-train input	/PP	Pulse-train input (-)	Pulses are input from the host. • Differential (PLB type) ≥ 200kpps • Open collector (POB type) ≥ 60kpps
	PP	Pulse-train input (+)	
	/NP	Pulse-train input (-)	
	NP	Pulse-train input (+)	
Input	SON	Servo ON	The servo is ON while this signal is ON, and OFF while the signal is OFF.
	RES	Reset	Current alarms are reset when this signal is turned ON.
	HOME	Home return	When the signal is ON, home return operation is performed.
	TL	Torque limit selection	When this signal is turned ON, the motor torque is limited to the value set by the parameter.
	CSTP	Forced stop	The actuator is forcibly stopped when this signal has remained ON for 16 ms or more. The actuator decelerates to a stop at the torque set in the controller and the servo turns OFF.
	DCLR	Deviation counter clear	This signal clears the deviation counter.
	BKRL	Forced brake release	The brake is forcibly released.
Output	RSTR	Reference position move command	Move to the position set to parameter No. 167 when signal turns ON. (PIO pattern 1 only)
	PWR	System ready	This signal turns ON when the controller becomes ready after the main power has been turned on.
	SV	Servo ON status	This signal turns ON when the servo is ON.
	INP	Positioning complete	This signal turns ON when the amount of remaining travel pulses in the deviation counter falls within the in-position band.
	HEND	Home return complete	This signal turns ON upon completion of home return.
	TLR	Torque limited	This signal turns ON upon reaching the torque limit while the torque is limited.
	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
	*ALML	Minor failure alarm	This signal is ON in normal conditions and turns OFF when a message-level alarm generates. (Operation will continue.)
	REND	Reference position move complete	This signal turns ON when moving to the position set to parameter No. 167 is completed. (PIO pattern 1 only)
*ALM	Alarm	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.	

(Note) The above signals marked with (*) are normally ON and turned OFF at operation.

I/O Specification

The three types (CYB, PLB/POB) controllers are distinguished by their I/O specifications. In addition, the positioner mode and solenoid valve mode can change the I/O signal content according to the controller setting, so it is possible to use multiple functions.

Function by controller type

Model	CYB	PLB / POB	Features
Name	Positioner / Solenoid valve type	Pulse-train control type	
Positioner mode	○	×	It is the basic operation mode that operates by specifying the position number and inputting the start signal.
Solenoid valve mode	○	×	It is possible to move just by turning ON/OFF the position signals. This mode operates with the same controls as the solenoid valves on air cylinders.
Pulse-train mode	×	○	This mode can operate freely with your pulse-train control without inputting position data.

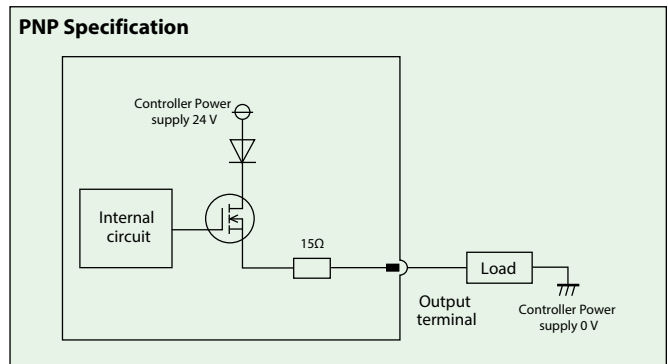
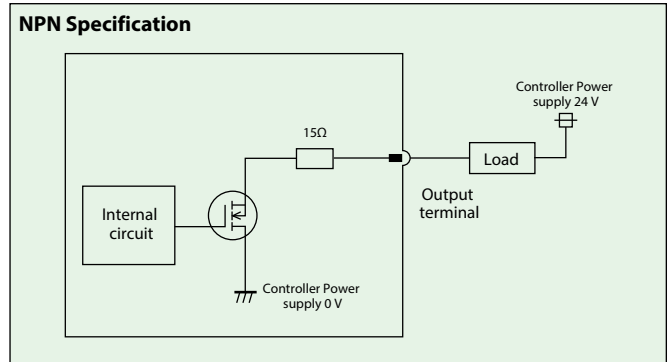
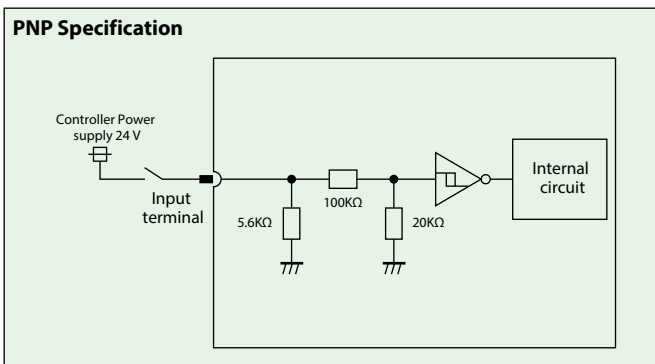
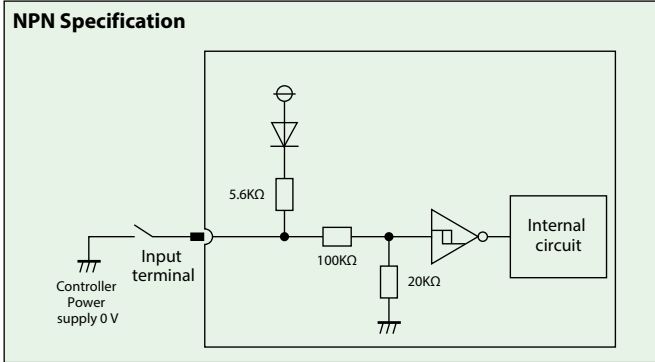
PIO Input/output circuit (Except for pulse-train input)

Input Part External Input Specifications

Item	Specification
Input voltage	24VDC ±10%
Input current	5mA, 1 circuit
ON/OFF voltage	ON voltage: 18 VDC min. OFF voltage: 6 VDC max.
Leakage current	1 mA or less / 1point
Isolation method	Non-insulated

Output Part External Output Specifications

Item	Specification
Load voltage	24VDC ±10%
Maximum load current	50mA, 1 circuit
Residual voltage	2V or less
Isolation method	Non-insulated



Controller

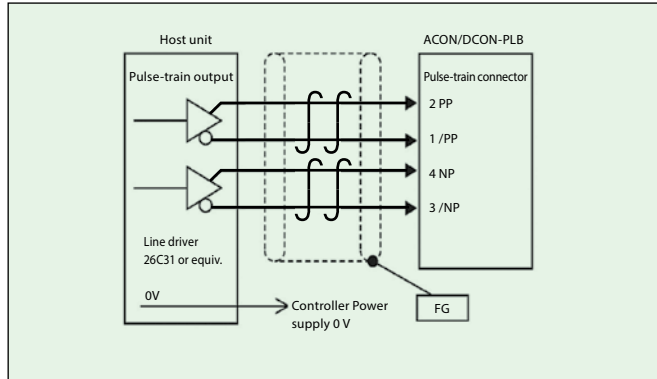
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
DCON-CB
- ACON
DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Pulse-train input circuit

Differential line driver

Maximum number of input pulse : Differential line driver max 200kpps
Isolation method : Non-insulated
Maximum cable length : 10m

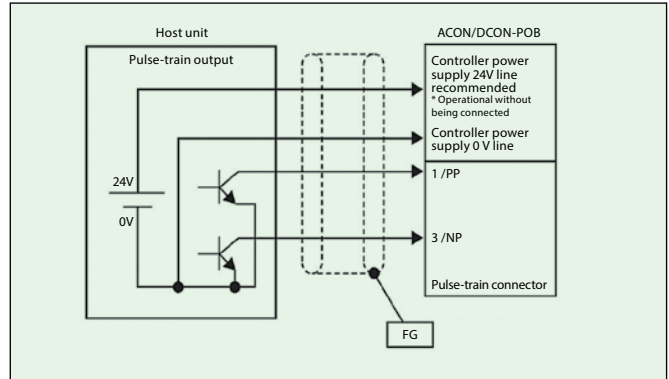
* The power supply of the pulse-train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



Open collector

Maximum number of input pulse : Open collector max 60kpps
Isolation method : Non-insulated
Maximum cable length : 2m

* The power supply of the pulse-train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



Command pulse-train pattern

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

Specification Table

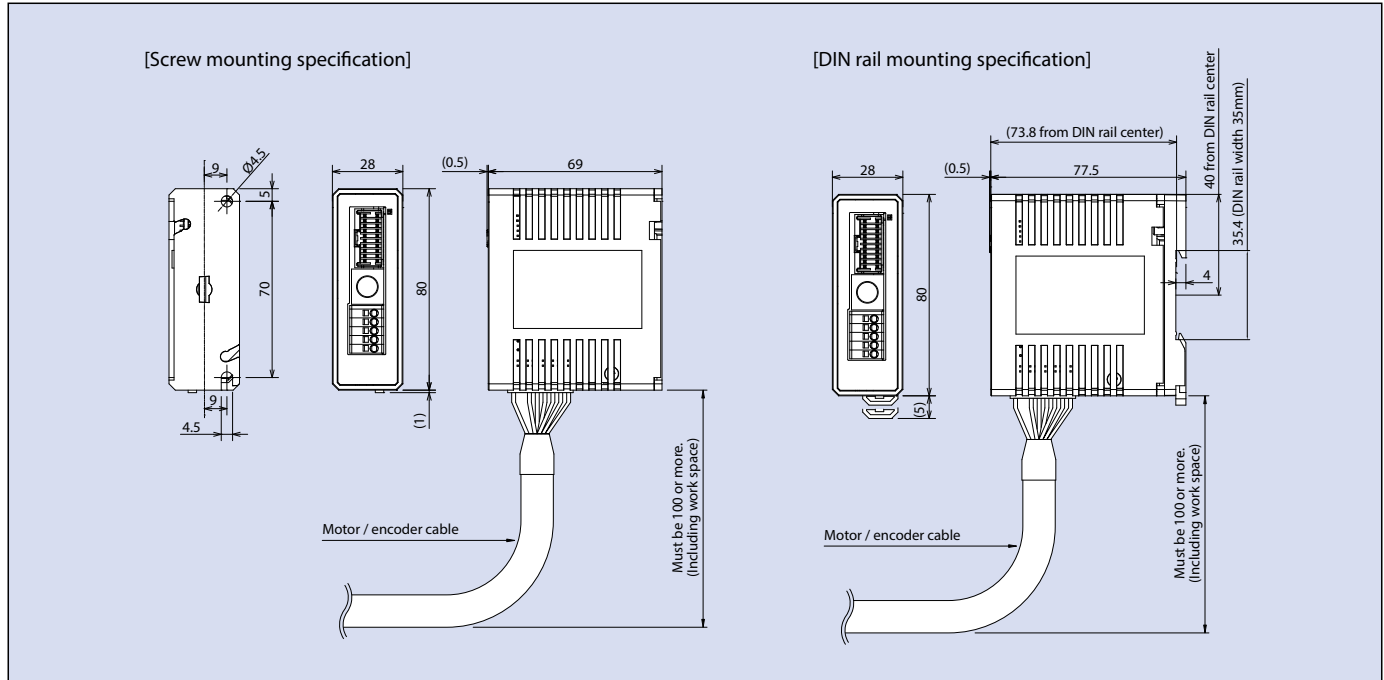
Item	Specification		
	CYB	PLB	POB
Controller type	CYB	PLB	POB
Number of controlled axes	1 axis		
Operation method	Positioner/Solenoid valve type	Pulse-train control type	
Number of positioning points	Up to 64 points	—	
Back up memory	FRAM		
I/O connector (PIO connector)	20 pin connector		
Number of I/Os	8 input points/8 output points	8 input points/8 output points	
I/O power supply	External supply 24VDC±10%		
Serial communication (SIO connector)	RS485 1ch		
Command pulse-train input method	—	Differential line driver	Open collector
Maximum input pulse frequency	—	Max 200kpps	Max 60kpps
Position detection method	Incremental encoder/Battery-less absolute encoder		
Forced electromagnetic brake release	Supply 24 VDC 150 mA to the BK terminal in the power connector to release		
Input power	24VDC ±10%		
Insulation voltage	DC500V 10MΩ		
Anti-vibration	XYZ direction 10 ~ 57 Hz One side width 0.035 mm (continuous), 0.075 mm (intermittent) 57 to 150 Hz 4.9 m / s ² (continuous), 9.8 m / s ² (intermittent)		
Ambient operating temperature	0 to 40°C		
Ambient operating humidity	85% RH or less (non-condensing)		
Operating ambience	Not exposed to corrosive gases		
Degree of protection	IP20		
Mass	230g (DIN rail mounting specification 265g)		

Motor power capacity

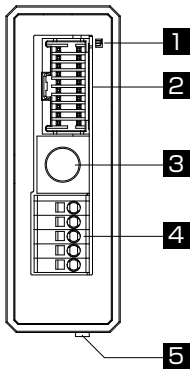
	Motor type	Standard/High-acceleration		Power-saving		
		Rated [A]	Max. [A]	Rated [A]	Max. [A]	
ACON	RCA/RCA2	5W(5S)	1.0	3.3	—	—
		10W	1.3	4.4	1.3	2.5
		20W	1.3	4.4	1.3	2.5
		30W	1.3	4.0	1.3	2.2
		20W(20S)	1.7	5.1	1.7	3.4
	RCL	2W	0.8	4.6	—	—
		5W	1.0	6.4	—	—
		10W	1.3	6.4	—	—
DCON	RCD	3W	0.7	1.5	—	—

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

External Dimensions



Names of each part



1 Controller status display LED

Displays the operation status of the controller.

○: ON ×: OFF ☆: Blinking

LED		Operation status
SV (Green)	ALM (Red)	
×	×	Power supply OFF
		Servo OFF
		Alarm (Over the operational level)
×	○	Motor drive power OFF
		Emergency stop
○	×	Servo ON
☆	×	Automatic servo OFF
○ (Orange)		Initializing after turning ON.

2 PIO connector

Connector for input/output signal connection for control. PLB/POB types are also used as a pulse signal input.

3 SIO connector (SIO)

Connector for communication cable connection of teaching tool.

4 Power connector

Connector for main power supply (power for controller, actuator and brake forced release) and for the emergency stop signal.

5 Motor encoder connector

Connector for the actuator's motor and encoder cable.

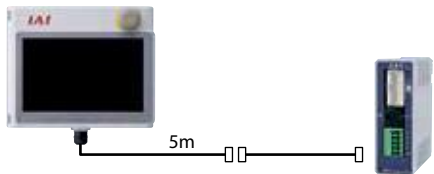
Option

Touch panel teaching pendant

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

Model TB-02-□

Configuration



Specification

Rated voltage	24V DC
Power consumption	3.6 W or less (150 mA or less)
Ambient operating temperature	0 ~ 40°C
Ambient operating humidity	20 to 85%RH (Non-condensing)
Degree of protection	IP20
Mass	470g (TB-02 only)

PC dedicated teaching software (Windows only)

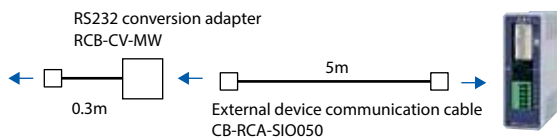
Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

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

Configuration



PC compatible software (CD)



Please contact IAI for the current supported versions.

Supported Windows versions: 7/8/8.1/10

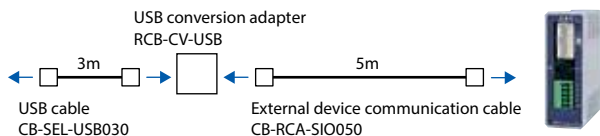


Model RCM-101-USB (External device communication cable+USB conversion adapter+USB cable)

Configuration



PC compatible software (CD)



Please contact IAI for the current supported versions.



Maintenance parts

When placing an order for a replacement cable, please use the model number shown below.

Table of Applicable Cables

ACON

Model Number	Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
① RCA2/RCA2CR/RCA2W	—	CB-APSEP-MPA □□□
② RCA2/RCA2CR/RCA2W (when selecting CNS)	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
③ RCA RCACR RCAW	SRA4R SRGS4R SRGD4R	CB-APSEP-MPA □□□
④ (Models other than ②)	—	CB-ASEP2-MPA □□□
⑤ RCL	—	CB-APSEP-MPA □□□

DCON

Model Number	Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
① RCD	RA1DA	CB-CAN-MPA □□□
② RCD	GRSNA	CB-CAN-MPA □□□ -RB

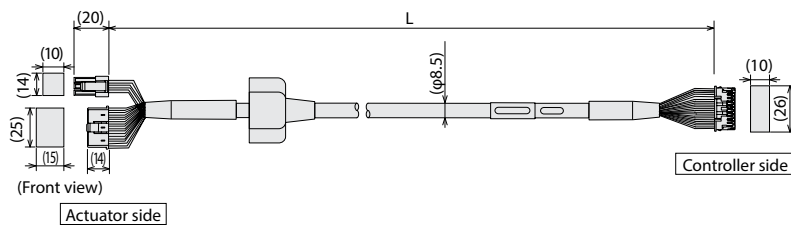
* When the applicable controller of the RCD - RA1DA model uses "D3", the cable model is CB - CA - MPA □□□ / CB - CA - MPA □□□ - RB.

Common to ACON/DCON

Model Number	I/O flat cable for CYB (Without shield)	I/O cable for PLB/POB (With shield)
① ACON/DCON	CB-PAD-PIO □□□	CB-PAD-PIOS □□□

Model CB-ASEP2-MPA □□□ *The standard is the robot cable.

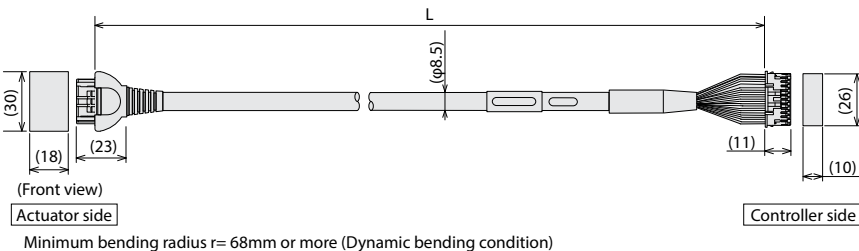
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



Actuator side Terminal number	Signal name	Controller side Terminal number
1	Red(U)	1
2	Yellow(V)	2
3	NC	3
4	NC	4
5	Black(W)	5
6	NC	6
7	Orange(BK+)	7
8	Gray(BK-)	8
9	Black(LS+)	9
10	Brown(LS-)	10
11	White(A+)	11
12	Yellow(A-)	12
13	Red(B+)	13
14	Green(B-)	14
15	Black (id tape)(Z+)	15
16	Brown (id tape)(Z-)	16
17	White (id tape)(VCC)	17
18	Yellow (id tape)(GND)	18
19	Red (id tape)(VPS/BAT+)	19
20	Green (id tape)(Span)	20
21	White(BAT+)	21
22	NC	22
23	NC	23
24	Shield(FG)	24

Model CB-APSEP-MPA □□□ *The standard is the robot cable.

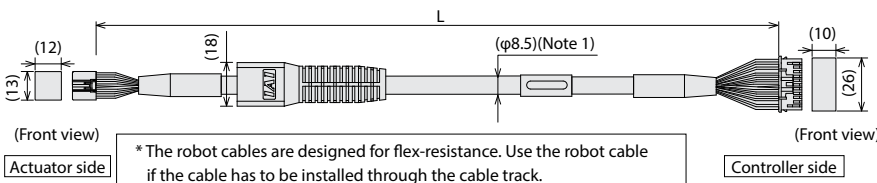
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



Actuator side 1-1827863-1 (AMP) Pin No.	Signal name	Color	Controller side PADP-24V-1-S (JST) Pin No.	Signal name	Color
A1	φA	Black	1	φA	Black
B1	VMM	White	2	VMM	White
A2	φ-A	Brown	3	φ-A	Brown
B2	φB	Green	4	φB	Green
A3	VMM	Yellow	5	VMM	Yellow
B3	φ-B	Red	6	φ-B	Red
A4	LS+	Orange	7	LS+	Orange
B4	LS-	Grey	8	LS-	Grey
A6	---	White	11	---	White
B6	---	Yellow	12	---	Yellow
A7	A+	Red	13	A+	Red
B7	A-	Green	14	A-	Green
A8	B+	Black	15	B+	Black
B8	B-	Brown	16	B-	Brown
A5	BK+	Black (id tape)	9	BK+	Black (id tape)
B5	BK-	Brown (id tape)	10	BK-	Brown (id tape)
A9	GND+	Green (id tape)	20	GND+	Green (id tape)
B9	VPS	Red (id tape)	18	VPS	Red (id tape)
A10	VCC	White (id tape)	17	VCC	White (id tape)
B10	GND	Yellow (id tape)	19	GND	Yellow (id tape)
A11	NC	---	21	NC	---
B11	Shield, FG	---	24	Shield, FG	---
			22		
			23		

Model CB-CAN-MPA □□□/CB-CAN-MPA □□□ -RB

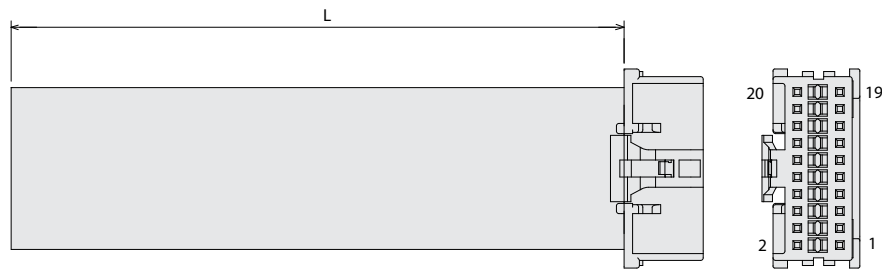
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m (When connecting to RCD, it corresponds to a maximum of 10 m)



Pin No.	Signal name	Pin No.	Signal name
3	φA/U	1	U
5	VMM/V	2	V
10	φ-A/W	3	---
9	φB/-	4	---
4	VMM/-	5	W
15	φ B/-	6	---
8	LS+/BK+	7	---
14	LS-/BK-	8	---
12	-/A+	11	A+
17	-/A-	12	A-
1	A+/B+	13	B+
6	A-/B-	14	B-
11	B+/Z+	15	HS1 IN
16	B-/Z-	16	HS2 IN
20	BK+/LS+	9	---
2	BK-/LS-	10	---
21	LS GND	17	VCC
7	VPS	19	GND
18	VCC	18	---
19	GND	20	HS3 IN
22	---	21	---
23	---	22	---
24	FG	24	FG

Model **CB-PAD-PIO**

* Please indicate the cable length (L) in , maximum 10m, e.g.) 080 = 8m

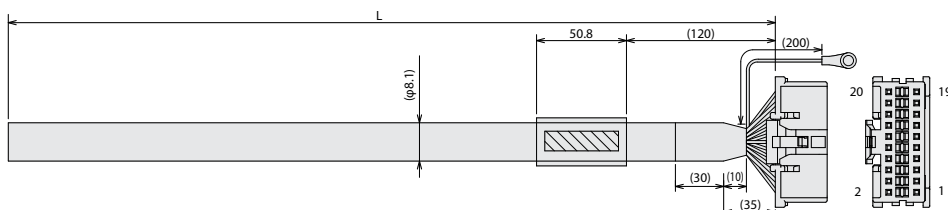


Housing: 51353-2000 (MOLEX)
Contact: 56134-9000 (MOLEX)

No.	Cable color	Wiring	No.	Cable color	Wiring
1	Brown-1	Flat cable AWG28	11	Brown-2	Flat cable AWG28
2	Red-1		12	Red-2	
3	Orange-1		13	Orange-2	
4	Yellow-1		14	Yellow-2	
5	Green-1		15	Green-2	
6	Blue-1		16	Blue-2	
7	Purple-1		17	Purple-2	
8	Gray-1		18	Gray-2	
9	White-1		19	White-2	
10	Black-1		20	Black-2	

Model **CB-PAD-PIOS**

* Please indicate the cable length (L) in , maximum 10m, e.g.) 080 = 8m



Housing: 51353-2000 (MOLEX)
Contact: 56134-9000 (MOLEX)

51353-2000(MOLEX)			
No.	Signal	Color	Wiring
1	/PP	Orange/Red	0.25sq
2	PP	Orange/Black	
3	/NP	Gray/Red	
4	NP	Gray/Black	
5	IN0	White/Red	
6	IN1	White/Black	
7	IN2	Yellow/Red	
8	IN3	Yellow/Black	
9	IN4	Pink/Red	
10	IN5	Pink/Black	
11	IN6	Orange/Red	
12	IN7	Orange/Black	
13	OUT0	Gray/Red	
14	OUT1	Gray/Black	
15	OUT2	White/Red	
16	OUT3	White/Black	
17	OUT4	Yellow/Red	
18	OUT5	Yellow/Black	
19	OUT6	Pink/Red	
20	OUT7	Pink/Black	
0.5-5(JST)			
1	FG	Green	AWG22

* The maximum length for ACON and DCON-POB types is 2m.

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

SCON-CB



Position Controller for Single-axis robot / Cartesian robot / Linear servo / ROBO Cylinder RCS2/RCS3/RCS4



(*1) MECHATROLINK-I/II connection specification is not compliant with CE Marking.
(*2) 3000 and 3300W types are not compliant with UL standard.

Features

1 Compatible with Battery-less Absolute Encoder

The RCS2, RCS3, RCS4, ISB and ISDB equipped with a battery-less absolute encoder are supported. Since no battery is needed to retain position data, less space is required in the control panel, which contributes to saving initial cost and maintenance cost.



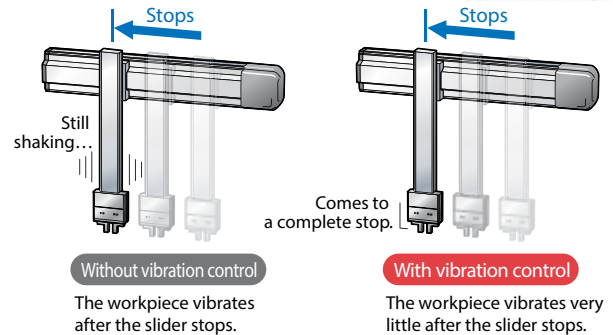
2 Supporting Major Field Networks <Optional Function>

In addition to DeviceNet, CC-Link, CC-Link IE Field and PROFIBUS-DP, direct connections are now possible to MECHATROLINK, CompoNet, EtherCAT, EtherNet/IP and PROFINET IO. The actuator can also be operated by specifying coordinate values directly via a field network.



3 Vibration Control Function <Standard Function>

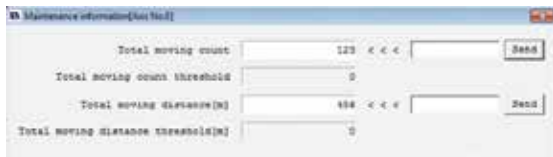
A vibration control function is equipped that suppresses vibration of the work part installed on the slider when the slider stops. This function shortens the time the actuator waits for vibration to settle, and consequently shortens the cycle time.



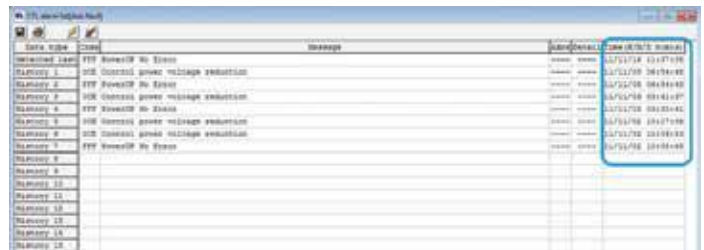
4 Capable of Predictive Maintenance <Standard Function>

- Equipped with a feature to detect motor overload and issue warning. By monitoring the motor temperature, abnormal changes can be detected before a malfunction or failure occurs.
- Fully equipped with a monitoring function. Like an oscilloscope, waveforms of position and speed can be acquired from the moment that the condition of a selected signal is changed. Signal status of positioning complete, alarm and so on can also be acquired.
- With smart tuning and off-board tuning, it is possible to adjust the acceleration/deceleration and gain depending on the payload.
- Maintenance timings can be checked using the function to record the number of travels and the accumulated traveled distance. This function can be used to output a signal when maintenance is required.
- The calendar function can retain alarm timestamps.

<Maintenance information>



<Calendar function>



5 Supports the Safety Function STO/SS1-t <Optional function>

Supports the STO (Safe Torque Off) / SS1-t (Safe Stop 1 - time controlled) function.

The STO / SS1-t function is to shut off the energy supply to the motor by electric circuit in the controller.

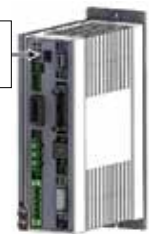
For the SCON-CB, two specification are available; STO and SS1-t specifications. For applications of the vertical axis, SS1-t specification that has a long reaction time can prevent workpiece from dropping due to the time lag of brake operation when the safety torque shut off function is activated.



Specification	Description	Remarks
STO	Reacting to input signals, the energy supply to the motor is shut off after a reaction time (8ms or shorter) by shut-off circuit in the controller.	
SS1-t	Reacting to input signals, brake is applied and the energy supply to the motor is shut off after a reaction time (500ms or shorter) by shut-off circuit in the controller.	This braking operation is not included in the safety function.

The energy supply to the servo motor can be shut off safely by connecting an external safety-related device and the I/O connector for safety function.

I/O connector for safety function (for STO/SS1-t specification only)



In addition, the STO/SS1-t functions are compliant with the following safety standards:

- ISO/EN ISO 13849-1 category 3 PL e
- IEC 61508 SIL3
- IEC/EN61800-5-2
- IEC/EN62061 SIL CL3

(Note) An engineer with expert knowledge in relevant safety standards should read and understand the descriptions stated in the instruction manual before designing a safety system using this function. Beware of potential injuries and failures.

List of Models

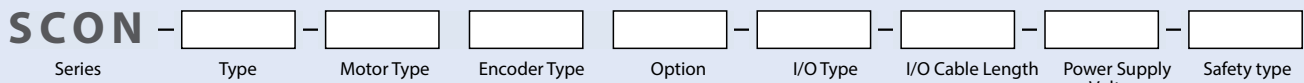
Model		SCON-CB											
External view													
	Standard specification		Field network type (*1)										
I/O type	PIO connection specification (*1)	DeviceNet	CC-Link	CC-Link IE	PROFIBUS	CompoNet	MECHATROLINK	MECHATROLINK	EtherCAT	EtherNet/IP	PROFINET	RCON	
		DeviceNet	CC-Link IE Field	PROFIBUS -DP	CompoNet	MECHATRO LINK-I/ II	MECHATRO LINK- III	EtherCAT	EtherNet/IP	PROFINET IO			
I/O type code	NP/PN	DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT	RC	
Applicable encoder type	Battery-less absolute Incremental Quasi-absolute Index absolute	Absolute Multi-Rotation Absolute	Battery-less absolute/ Incremental/Absolute/Quasi-absolute										
SCON-CB	12~150W	○	○										
	200W	○	○										
	100S/200S/300S	○	○										
	300~400W	○	○	○	○	○	○	○	○	○	○	○	
	600W	○	○										
	750W	○	○										
3000~3300W	○												

(Note) Index absolute type can not be used during pulse-train control and MECHATROLINK III control. (See P1-489)

(*1) Note that communication with PIO and pulse-train cannot be performed in the network type.

(Reference) Refer to P7-173 for the PLC function loaded type.

Model



CB	High-function type
CGB	Safety category compliant type

* For RCS 3-RA15R/20R, only CGB can be chosen.

HA	Hi-accel./decel. specification
----	--------------------------------

* High acceleration / deceleration specification is available to choose only when the high acceleration / deceleration option has been chosen for the actuators.
 <High-acceleration/deceleration compatible actuator>
 RCS2-SA4C/SA5C/SA6C/SA7C/RA4C/RA5C/RGS4C/RGS5C/RGD4C/RGD5C

Not specified	Standard type
STO	STO type
SS	SS1-t type

* Only the standard type is selectable for RCS3-RA15R/20R.

12	12W	200	200W
20	20W	200S	200W
30D	30W	300S	300W
30R	30W	400	400W
60	60W	600	600W
100	100W	750	750W
100S	100W	3000	3000W
150	150W	3300	3300W

(Example) 12: 12 W Servo motor compatible

WAI	Battery-less absolute Incremental
A	Absolute
G	Quasi-absolute*1
AI	Index absolute*2
AM	Multi-Rotation Absolute*2

*1 Quasi-absolute is for LSAS Series only.

*2 DD motor operation mode is added.

1	Single phase 100VAC
2	Single phase 100VAC

* Please check the power supply voltage that can be selected on the page of the actuator.

NP	PIO NPN (standard)
PN	PIO PNP
DV	DeviceNet
CN	CompoNet
CC	CC-Link
CIE	CC-Link IE Field
ML	MECHATROLINK-I/II (Note 1)
ML3	MECHATROLINK-III (Note 1)
PR	PROFIBUS-DP
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO
RC	RCON

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

* If you choose a field network specification, the length of the I/O cable will be 0".

Note

Basically, the type of motor is the same as that of the actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.
 <30D•30R•200S applicable actuator>

● Controller Motor type "30D" 30W actuator other than RS

● Controller Motor type "200S"
 DD-LT18□ DDCR-LT18□
 DDA-LT18C DDACR-LT18C

● Controller Motor type "30R" RS

* For 200S, the housing of the controller will be 400W. Please check the 400w specifications for the price.

(Note 1) Please be sure to check P7-18 for the caution when selecting.

Operation Modes

With this controller, you can select a desired control method from the two modes of positioner mode and pulse-train control mode. In the positioner mode, you can enter position data (target position, speed, acceleration, etc.) in the controller under the desired numbers and then specify each number externally via a I/O (input/output signal) to operate the actuator. Also, in the positioner mode, you can select the desired operation mode from the eight modes using the parameter. In the pulse-train control mode, you can control the travel, speed, acceleration, etc., by sending pulses from an external pulse generator.

Mode	Type	Number of positioning points	Features	
Positioner mode	Positioning mode	PIO Patterns 0	64	Standard factory-set mode. Specify externally a number corresponding to the position you want to move to, to operate the actuator.
	Teaching mode	PIO Patterns 1	64	In this mode, you can move the slider (rod) via an external signal and register stopped position in the position data table.
	256-point mode	PIO Patterns 2	256	In this mode, the number of positioning points available in the positioning mode has been increased to 256 points.
	512-point mode	PIO Patterns 3	512	In this mode, the number of positioning points available in the positioning mode has been increased to 512 points.
	Solenoid valve mode 1	PIO Patterns 4	7	Like the solenoid valve of an air cylinder, the actuator can be moved only by turning signals ON/OFF.
	Solenoid valve mode 2	PIO Patterns 5	3	In this mode, the output signal is set to the same as the air cylinder auto switch in the solenoid valve mode.
	Force mode 1 (Note1)	PIO Patterns 6	32	In this mode, you can move to positions under force control in the positioning mode. (Up to 32 positioning points are available.)
	Force mode 2 (Note1)	PIO Patterns 7	5	In this mode, you can move to positions under force control in the solenoid valve mode. (Up to five positioning points are available.)
Pulse-train control mode	Pulse-train control mode for incremental (Note1)	PIO Patterns 0	—	Position data input to the controller is not necessary, and movement is made according to the sent pulse.
	Pulse-train control mode for absolute (Note1)	PIO Patterns 1	—	

Note 1: 3000W and 3300W cannot be used.

I/O Signal Table * You can select one of nine types of I/O signal assignments.

Pin No	Category	Positioning point	Parameter (PIO Pattern) Selection								
			0	1	2	3	4	5	6 (Note 1)	7 (Note 1)	0/1 (Note 1)
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2	Force mode 1	Force mode 2	Pluse-train mode
1A	24V		64	64	256	512	7	3	32	5	—
2A	24V										P24
3A	—										NC
4A	—										NC
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0	PC1	ST0	SON
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)	PC2	ST1	RES
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (-)	PC4	ST2	HOME
8A		IN3	PC8	PC8	PC8	PC8	ST3	—	PC8	ST3	TL
9A		IN4	PC16	PC16	PC16	PC16	ST4	—	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	—	—	CLBR	CLBR	RSTR (Note 2)
14A		IN9	BKRL	JOG-	BKRL	BKRL	BKRL	BKRL	BKRL	BKRL	—
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	—
16A		IN11	HOME	HOME	HOME	HOME	HOME	—	HOME	HOME	—
17A		IN12	*STP	*STP	*STP	*STP	*STP	—	*STP	*STP	—
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—	CSTR	—	—
19A		IN14	RES	RES	RES	RES	RES	RES	RES	RES	—
20A		IN15	SON	SON	SON	SON	SON	SON	SON	SON	—
1B		Output	OUT0	PM1	PM1	PM1	PM1	PE0	LSO	PM1	PE0
2B	OUT1		PM2	PM2	PM2	PM2	PE1	LS1 (TROQS)	PM2	PE1	SV
3B	OUT2		PM4	PM4	PM4	PM4	PE2	LS2 (-)	PM4	PE2	INP
4B	OUT3		PM8	PM8	PM8	PM8	PE3	—	PM8	PE3	HEND
5B	OUT4		PM16	PM16	PM16	PM16	PE4	—	PM16	PE4	TLR
6B	OUT5		PM32	PM32	PM32	PM32	PE5	—	TRQS	TRQS	*ALM
7B	OUT6		MOVE	MOVE	PM64	PM64	PE6	—	LOAD	LOAD	*EMGS
8B	OUT7		ZONE1	MODES	PM128	PM128	ZONE1	ZONE1	CEND	CEND	RMDS
9B	OUT8		PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	ALM1
10B	OUT9		RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	ALM2
11B	OUT10		HEND	HEND	HEND	HEND	HEND	HEND	HEND	HEND	ALM4
12B	OUT11		PEND	PEND/WEND	PEND	PEND	PEND	—	PEND	PEND	ALM8
13B	OUT12		SV	SV	SV	SV	SV	SV	SV	SV	*OVLW/*ALML
14B	OUT13		*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	REND Note 1
15B	OUT14		*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	ZONE1
16B	OUT15	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM	ZONE2	
17B	—									—	
18B	—									—	
19B	0V					N				N	
20B	0V					N				N	

* In the above table, signals in () represent functions available before the home return.

* In the above table, signals preceded by * are turned OFF while the actuator is operating.

Note 1: 3000 W / 3300 W cannot be used.

Note 2: It is available to use only in Pulse-Train Control Mode PIO Pattern 1.

Field network specification Operation mode Description

If the SCON-CB is controlled via a field network, you can select one of the following nine modes to operate the actuator. Please note that the data areas required on the PLC side will vary depending on the mode.

Mode Description

Mode	Description
0 Remote I/O mode	Similarly to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1 Position/simple direct value mode	The target position value is directly input, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
2 Half direct value mode	The actuator is operated by directly inputting values for speed, acceleration, deceleration and push current as well as the target position.
3 Full direct value mode	The actuator is operated by directly inputting values for the target position, speed, acceleration rate and push current, etc. In addition, you are able to read the current position, current speed, and the specified current, etc.
4 Remote I/O mode 2	This mode is the same as the remote I/O mode above, with the added functionality of reading current position and the command motor current.
5 Position/simple direct value mode 2	Instead of teaching and zone function of the above position / simple direct value mode, it is a mode equipped with force control function.
6 Half direct value mode 2	Instead of reading the command current which is the function of the half direct value mode, load cell data can be read. It also supports force control function.
7 Remote I/O mode 3	This mode added the current position and load cell data reading function to the remote I/O mode.
8 Half direct value mode 3	This mode supports the vibration control function instead of the job function of the above half direct value mode.

Required Data Size for Each Network

Mode	DeviceNet	CompoNet	CC-Link	MECHATROLINK I,II	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0 Remote I/O mode	2 bytes	2 bytes	1 channel	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes
1 Position/simple direct value mode	8 bytes	8 bytes	1 channel	8 bytes	8 bytes	8 bytes	8 bytes	8 bytes
2 Half direct value mode	16 bytes	16 bytes	2 channels	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes
3 Full direct value mode	32 bytes	32 bytes	4 channels	× (Note 1)	32 bytes	32 bytes	32 bytes	32 bytes
4 Remote I/O mode 2	12 bytes	12 bytes	1 channel	12 bytes	12 bytes	12 bytes	12 bytes	12 bytes
5 Position/simple direct value mode 2	8 bytes	8 bytes	1 channel	8 bytes	8 bytes	8 bytes	8 bytes	8 bytes
6 Half direct value mode 2	16 bytes	16 bytes	2 channels	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes
7 Remote I/O mode 3	12 bytes	12 bytes	1 channel	12 bytes	12 bytes	12 bytes	12 bytes	12 bytes
8 Half direct value mode 3	16 bytes	16 bytes	2 channels	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2	Position/simple direct value mode 2	Half direct value mode 2	Remote I/O mode 3	Half direct value mode 3
Number of positioning points	512	768	(No limit)	(No limit)	512	768	(No limit)	512	(No limit)
Operation by direct position data input	×	○	○	○	×	○	○	×	○
Direct speed/acceleration input	×	×	○	○	×	×	○	×	○
Push-motion operation	○	○	○	○	○	○	○	○	○
Current position read	×	○	○	○	○	○	○	○	○
Current speed read	×	×	○	○	×	×	○	×	○
Operation by position number input	○	○	×	×	○	○	×	○	×
Completed position number read	○	○	×	×	○	○	×	○	×
Force control	△(Note 2)	×	×	○	△(Note 2)	○	○	△(Note 2)	×
Damping control	○	○	×	○	○	○	×	○	○
Servo gain switching	○	○	○	○	○	○	×	○	○

* ○ indicates that the operation is supported, and X indicates that it is not supported.

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

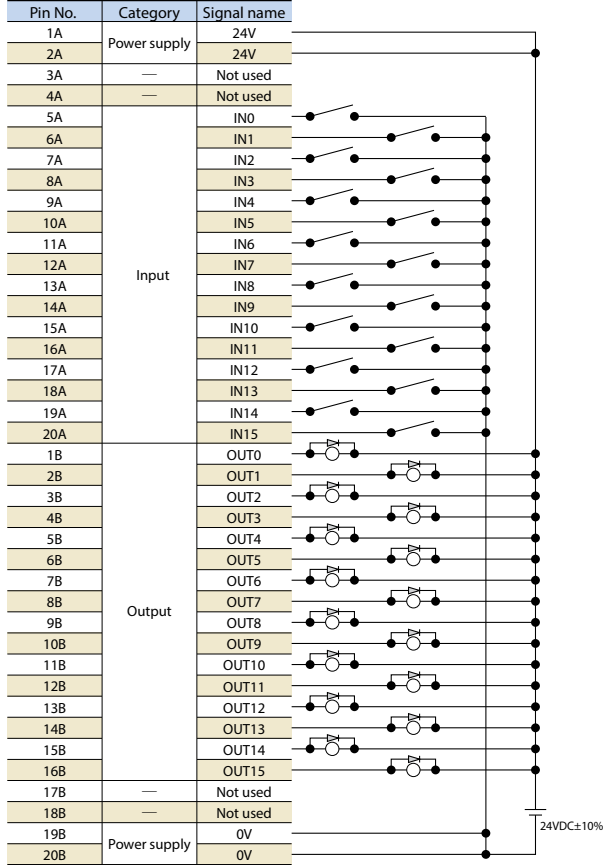
(Note 2): It can be used when the PIO pattern is set to 6 or 7.

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

I/O Wiring Diagrams

Positioning Mode/Teaching Mode/Solenoid Valve Mode

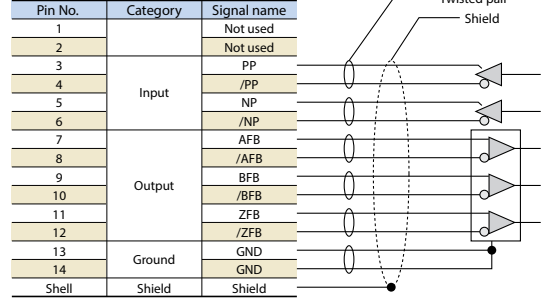
PIO connector (NPN specification)



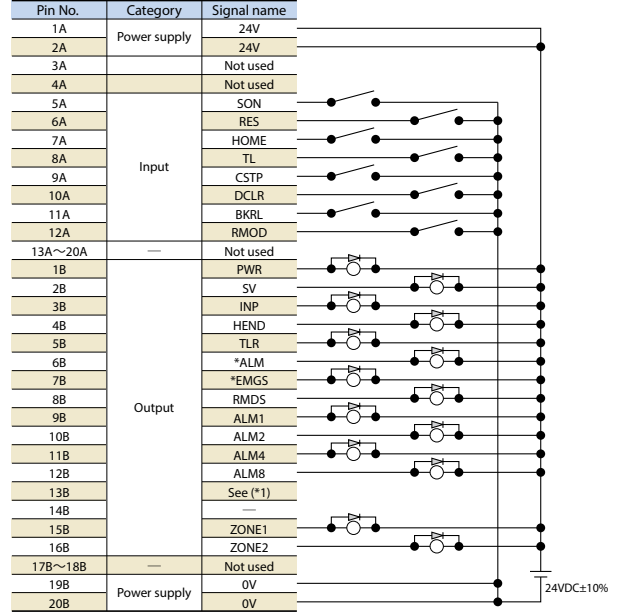
* Connect Pins 1A and 2A to 24V, and Pins 19B and 20B to 0V.

Pulse-train Mode (Differential Output)

Pulse connector



PIO connector (NPN specification)



* Please make sure to connect the Shield of the twisted pair cable, which connects to the Pulse connector, to the Shell. Also keep the cable length to 10m or less.

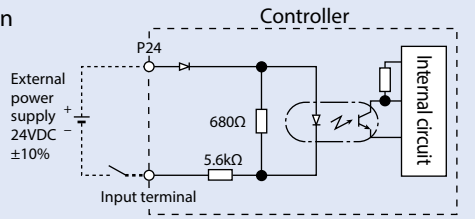
* Connect Pins 1A and 2A to 24V, and Pins 19B and 20B to 0V (*1) —/*ALML/*OVLW/*BALM (switchable with parameters)

PIO Input and Output Interface

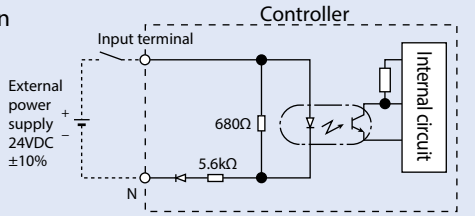
Input Part External Input Specifications

Item	Specification
Input voltage	24VDC ±10%
Input current	4mA/1 circuit
ON/OFF voltage	ON voltage: DC 18V min. OFF voltage: DC 6V max.
Isolation method	Photocoupler

NPN specification



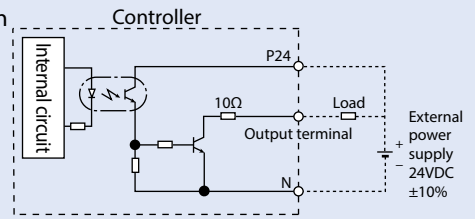
PNP specification



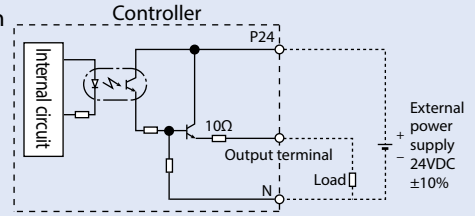
Output Part External Output Specifications

Item	Specification
Load voltage	24VDC
Max. load current	50mA/1 point
Leak current	Max. 0.1mA/1 point
Isolation method	Photocoupler

NPN specification



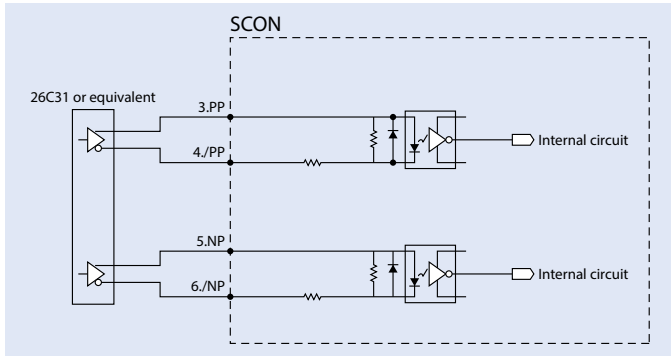
PNP specification



Pulse-train Type I/O Specification (Differential Line Driver Specification)

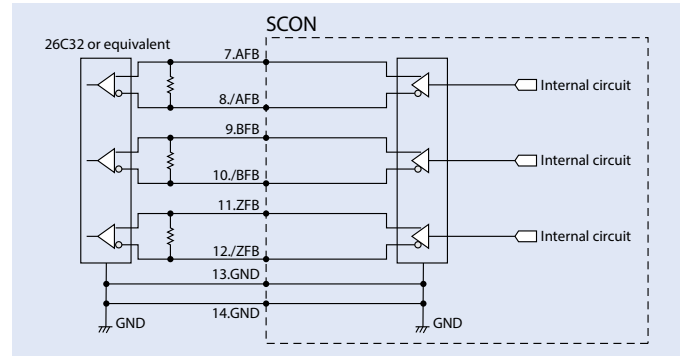
Input Part

Maximum number of input pulses : Line driver interface 2.5Mpps
 Isolation method : Photocoupler isolation



Output Part

Maximum number of output pulses : Line driver interface 2.5Mpps
 Isolation/non-isolation : Non-isolation



Pulse-train Type I/O Specification (Open-collector Specification)

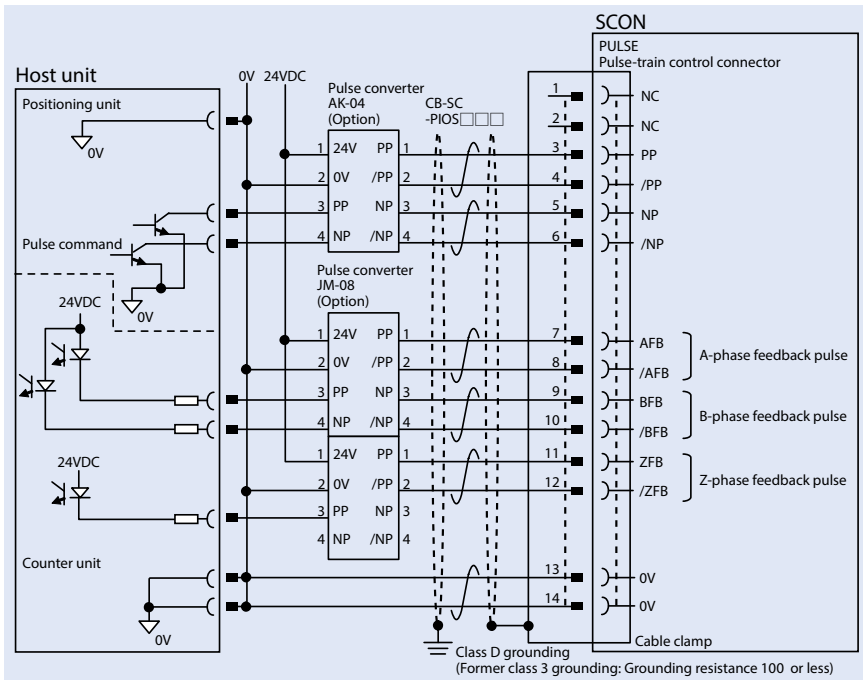
The AK-04 (Option) is needed to input pulses. The JM-08 (Option) is needed to output pulses.

Maximum number of input pulses : 200kpps (AK-04 required)
 Maximum number of output pulses : 500kpps (JM-08 required)

- * The 24VDC power supply connected to the AK-04 must be shared with the PIO interface.
- * Keep the length of the cable connecting the pulse output unit (PLC) and AK-04/JM-08 as short as possible. Also keep the cable between the AK-04/JM-08 and PULSE connector to 2m or less.

Note

Use the same power supply for opencollector input/output to/from the host and for the AK-04, JM-08.



Command Pulse Input Patterns

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

I/O connector for safety function

	Model	Manufacturer
Controller side	2294417-1	Tyco Electronics
Cable side	2013595-1 (*1)	

(*1) Customer's supply. Cable with connector (CB-SC-ST0030) is sold separately.

■ Signals of I/O connector for safety function

Pin No.	Signal name	Name	Description
1	NC	-	Do not connect.
2	NC	-	Do not connect.
3	/SRI1-	Safety request input signal 1	Input for the safety request input signal. ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function.
4	/SRI1+		
5	/SRI2-	Safety request input signal 2	Input the safety request input signal ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function.
6	/SRI2+		
7	EDM-	Output signal for monitoring external device	Output signal to indicate that the safety function is functioning without failure.
8	EDM+		

Specification Table

Item	Specification		
Applicable motor capacity	Less than 400W	400~750W	3000W~3300W
Number of controlled axes	1 axis		
Operation method	Positioner type/pulse-train type		Positioner type
Number of positioning points	512 points (PIO specification), 768 points (Fieldbus specification)		
Backup memory	Non-volatile memory (FRAM)		
I/O connector	40-pin connector		
Number of I/O points	16 input points/16 output points		
I/O power supply	External supply 24VDC ±10%		
Serial communication	RS485 1ch		RS485 2ch
Command pulse-train input method (Note 1)	Differential line driver output supported		-
Maximum input pulse frequency	Differential line driver method: 2.5Mpps max./ Open-collector method (pulse converter used): 200kpps max.		-
Position detection method	Incremental encoder / Absolute encoder / Quasi-absolute serial encoder		Battery-less absolute encoder
Driving power shut-off function	CB: Available (built-in relay) CGB: Unavailable		No internal relay
Forced electromagnetic brake release	Brake release switch ON/OFF		
Input power supply	Single-phase 100~115VAC±10% Single-phase 200~230VAC±10%	Single-phase 200~230VAC±10%	Three-phase 200 ~ 230 VAC±10%
Power-supply capacity (Note 2)	12W/89VA 20W/74VA 30W(other than RS)/94VA 30W(RS)/186VA 60W(other than RCS3-CTZ5C)/186VA 60W(RCS3-CTZ5C)/245VA 100W/282VA 150W/376VA 200W/469VA	100SW(LSA/LSAS-N10)(*)/331VA 200SW(LSA-S10H, LSA/LSAS-N15S)(*)/534VA 200SW(LSA/LSAS-N15H)(*)/821VA 300W(LSA-N19)(*)/710VA 400W(other than RCS3-CT8C)/968VA 400W(RCS3-CT8C)/1278VA 600W/1212VA 750W/1569VA	3000W/5705VA 3300W/6062VA
Vibration resistance	X,Y, and Z directions 10~57Hz single-side width 0.035mm(intermittent), 0.075mm(intermittent) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (intermittent)		X,Y, and Z directions 10~57Hz single-side width 0.035mm(continuous), 0.075mm(intermittent) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (intermittent)
Calendar/ clock function	Retention time	Approx. 10 days	
	Charge time	Approx. 100 hours	
Protective functions	Overcurrent, abnormal temperature, low fan speed monitoring, encoder disconnection, etc.		
Ambient operating temperature	0~40°C		
Ambient operating humidity	85%RH or less (non-condensing)		
Operating atmosphere	Free from corrosive gases		
Protection degree	IP20		
Mass	Approx. 900g (+ 25g for the absolute specification)	Approx. 1.2kg (+ 25g for the absolute specification)	Approx. 2.8kg
External dimensions	58mm(W)×194mm(H)×121mm(D)	72mm(W)×194mm(H)×121mm(D)	92.7mm(W)×300mm(H)×172mm(D)

(Note 1) For the command pulse input method, use the differential line driver method resistant to noise.

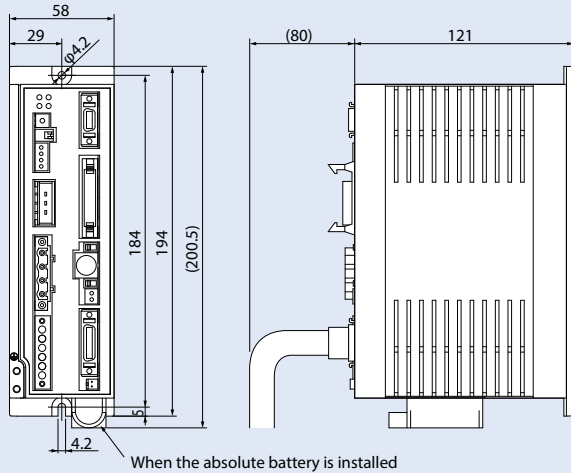
If the open-collector method must be used, use the optional pulse converter (AK-04/JM-08) to convert open-collector pulses to differential pulses.

(Note 2) The external dimensions of the controller to operate actuator models denoted by (*) are those for 400W or more, even when the motor is under 400W.

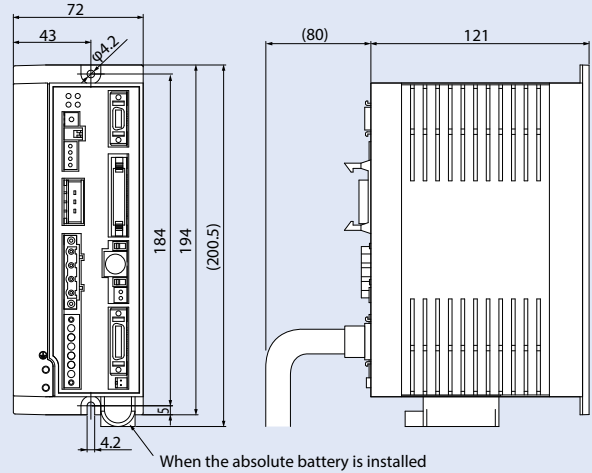
* The number of encoder pulses for the actuators operable with SCON-CB is 3072 pulses for RCS2-SRA7BD/SRGS7BD/SRGD7BD, 1600 pulses for RCS2-□□5N (Incremental), 1048576 pulses for DD-□18P:20bit, 131072 pulses for DD-□18S:17bit, 2400 pulses for NS-S□M□ (Incremental) and 16384 pulses for all other models.

External Dimensions

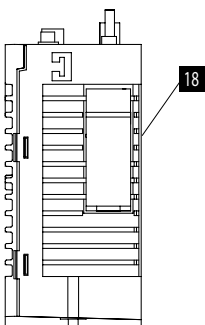
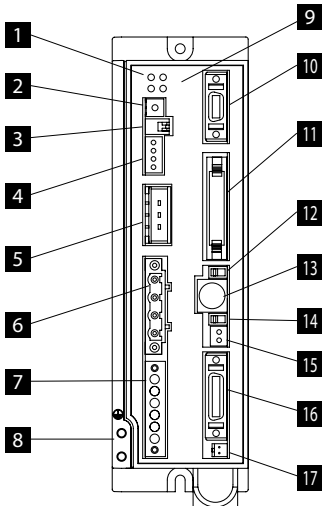
Less than 400W



400~750W



Name of Each Part



1 LED display

It displays the controller status.

Name	Color	Function description
PWR	Green	Turns on when system is ready (after power turned on, CPU in normal function).
SV	Green	Turns on when servo is on
ALM	Orange	Turns on when alarm issued
EMG	Red	Turns on while in emergency stop

2 Rotary switch

The address setting switch for identifying each controller when they are linked.

3 Piano switch

The controller systems switch.

Name	Function description
1	Operation mode changeover switch OFF: Positioner mode ON: Pulse-train control mode * Valid when power is turned on
2	For manufacturer tuning, always off

4 System I/O connector

The connector for the emergency stop switch etc.

5 Regenerative unit connector

The connector for regenerative units which absorb the regenerative current generated when the actuator decelerates and stops.

6 Motor connector

The actuator motor cable connector.

7 Power supply connector

The AC power connector. Divided into controller power input and motor power input.

8 Grounding terminal

The protective grounding screw. Please make sure to secure grounding.

9 I/O connector for safety function

Connector to enable STO/SSI-t function.

10 Connector for pulse-train control

It is a connector used in the operation in Pulse-Train Control Mode. Feedback pulse is valid also in Positioner Mode.

11 PIO connector

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

12 Operation mode selection switch

Name	Function description
MANU	Does not accept PIO commands
AUTO	Accepts PIO commands

* The emergency stop switch on the touch panel teaching pendant becomes effective as soon as it is connected regardless of AUTO or MANU. Turn the power off before disconnecting the touch panel teaching pendant or SIO communication cable.

13 SIO connector

The connector for the teaching pendant or the PC communications cable.

14 Brake release switch

The forced release switch for the electromagnetic brake integrated with an actuator.

* It is necessary that 24VDC power supply for brake drive is connected.

15 Brake power supply connector

The connector for supplying 24VDC power to the brake. (necessary only when brake-equipped actuator is connected).

16 Encoder / Sensor connector

The encoder/sensor cable connector.

17 Absolute battery connector

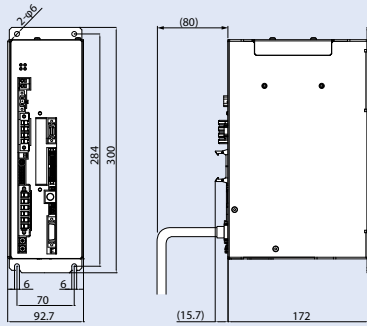
The connector for the absolute data backup battery (necessary only for absolute encoder type).

18 Absolute battery holder

It is a battery holder in order to mount the absolute data backup battery.

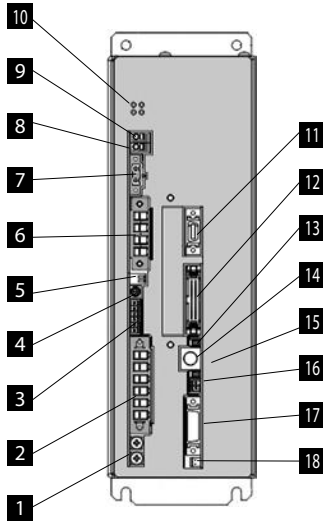
External Dimensions

For 3000W, 3300W



Name of Each Part

[For 3000W·3300W]



1 FG connection terminal

A terminal for connecting the ground line to prevent electric shock and noise. It is connected to the PE power supply connector inside the controller.

2 Power supply connector (PWR)

A connector used to supply driving power and control power to the controller.

3 System I/O connector (SYS I/O)

This connector is used to connect the operation stop switch of the actuator.

4 Axis number setting switch (ADRS)

A switch for setting the axis number when operating multiple axes by serial communication. When using the SIO converter, it is possible to control multiple axes without attaching/detaching the connector of the communication cable from teaching tools such as PCs, etc.

5 Piano switch

Not used.

6 Motor connector (MOT)

A connector for the actuator motor cable.

7 Regenerative resistance unit cable connector (RB)

A connector for the external regenerative resistance unit.

8 Charge status display LED

This displays the charge status inside the controller. Caution: While this LED is lit, do not touch the controller or regenerative resistance unit in order to prevent electric shock.

9 Internal regenerative resistance enable connector

A short-circuit cable is connected at shipping.
Caution: Be sure to use with the short circuit cable attached.
Use without the cable will damage the equipment.

10 LED display (PWR, SV, ALM, EMG)

This shows the operation status of the controller.
○: ON ×: OFF △: Undefined (ON or OFF)

LED				Operating status
PWR(Green)	SV(Green)	ALM(Orange)	EMG(Red)	
×	×	×	×	Control power OFF
○	×	×	×	Controller starts up normally
○	×	×	×	Servo OFF
○	○ Note 1	×	×	Servo ON
○	×	○	△	Alarm
○	×	△	△	Emergency stop
○	△	△	△	Warning

Note 1: Blinks when automatic servo is OFF

11 Multi-function connector (MF I/F)

A connector to output the feedback pulses and analog load data of the load cell, and to use the SIO communication function (SIO2).

12 PIO connector (PIO)

A connector for control input/output signal connection.
(Note) It is not installed for the fieldbus specification.

13 Operation mode setting switch (MANU/AUTO)

An interlocking switch for preventing duplication of movement commands from PIO (PLC) and commands from teaching tools such as PCs, etc.

14 SIO connector (SIO)

A cable connector for a teaching tool such as PC-dedicated teaching software and for communication such as a gateway unit.

15 Brake release switch (BK RLS / NOM)

A switch to be used to release the brake of the actuator with brake forcibly.
Warning: Be sure to set this switch to the NOM side in normal operation. If it is left on the RLS side, the brake will not be applied even if the servo is turned OFF. If it is vertically mounted, the workpiece may fall, risking injury or damage to the workpiece.

16 Brake power supply connector (BK PWR)

A connector for supplying power (24VDC) to release the brake when using an actuator with brake.

17 Encoder connector (PG)

A connector for the actuator encoder cable.

18 Connector for the absolute data backup battery

A battery cable connector used for the absolute specification.

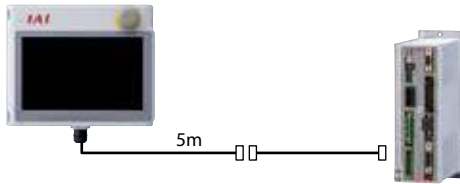
Options

Touch panel teaching pendant

Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

Model TB-02-□

Configuration



Specification

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Degree of protection	IP20
Mass	470g (TB-02 unit only)

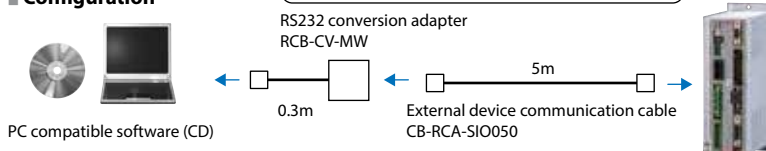
PC dedicated teaching software (Windows only)

Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

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

Configuration

Please contact IAI for the current supported versions.

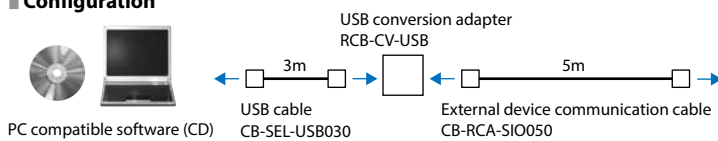


PC compatible software (CD)

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

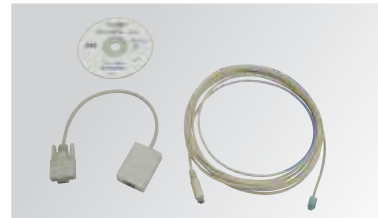
Configuration

Please contact IAI for the current supported versions.



PC compatible software (CD)

Supported Windows: 7/8 / 8.1 / 10



Regenerative Resistance Unit

Features This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the tables below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

<For ~750W>

Model RESU-2 (Standard specification)/ RESUD-2 (DIN rail mounting specification)

Specification

Model number	RESU-2	RESUD-2
Mass	Approximately 0.4kg	
Internal regen. resistance value	235Ω 80W	
Mounting method	Screw mounting	DIN rail mounting
Included cable	CB-SC-REU010	

Necessary Quantity Guideline

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

* Regenerative resistance units more than specified above may be required depending on the operating conditions.

* Guideline for the linear servo actuator is same as above. However, one unit is needed for LSA/LSAS-N105 types.

Necessary Quantity Guideline (RCS2-RA13R)

	Lead 2.5	Lead 1.25
Horizontal	1	0
Vertical	1	1

* The required regenerative resistance may be more than as specified above depending on the operating conditions.

Necessary Amount Guideline (DD)

Series	Type	Required Quantity
DD	LT18□	1
DDA	LH18□	2

<For 3000W·3300W>

Model RESU-35T

Specification

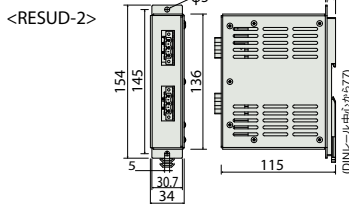
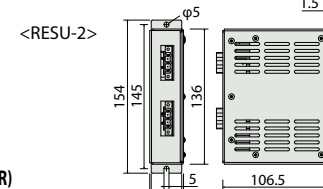
Mass	Approximately 1.8kg
Internal regen. resistance value	30Ω 450W
Mounting method	Screw mounting

* The cable is required to prepare by the customer.

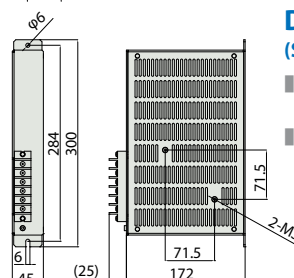
Necessary Amount Guideline

● 3000W, 3300W
Number of connected units
2

External dimensions



<RESU-35T>



* When two regenerative units are required, please use one RESU-2 and one RESU-1 (Please refer to P7-288).

Absolute data backup battery

Features This is an absolute data backup battery for an actuator with absolute specification.

Model Model AB-5(battery only) AB-5-CS(with a case)



Dummy plug (Safety category compliant)

Features This plug is required when the safety category specification (PCON-CGB/CGFB) is used.

Model DP-5



Dummy plug (STO/SS1-t specification)

Features Necessary when STO/SS-1t function is not used.

Model DP-6



EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

Maintenance Parts

When placing an order for a replacement cable, please use the model number shown below.

Table of Applicable Cables

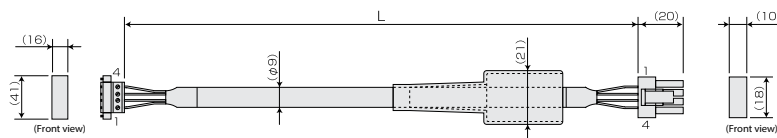
Model Number		Motor Cable	Motor Robot Cable	Encoder Cable	Encoder Robot Cable
①	RCS2(CR/W) RCS3(CR)	Models other than ② - ⑥		CB-RCS2-PA□□□□	CB-X3-PA□□□□
②	RCS2	RT	CB-RCC-MA□□□□	CB-RCS2-PLA□□□□	CB-X2-PLA□□□□
③		RA13R (without load cell, without brake)		CB-RCS2-PLA□□□□	CB-X2-PLA□□□□
④		RA13R (without load cell, with brake)		* Between controller and brake CB-RCS2-PLA□□□□	* Between controller and brake CB-X2-PLA□□□□
⑤		CTZ5C/ CT8C		-	CB-X1-PA□□□□
⑥	RCS3	RA15R RA20R	-	CB-RCS3-MA□□□□-RB	CB-RCS3-PLA□□□□-RB
⑦	RCS4(CR)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	-	CB-X1-PA□□□□
⑧	NS	No LS	-	-	CB-X3-PA□□□□
⑨		With LS	-	CB-X-MA□□□□	CB-X2-PLA□□□□
⑩	LSAS	N	-	-	CB-X1-PA□□□□
⑪	LSA	S/H/L/N	-	-	CB-X3-PA□□□□
⑫		W	-	CB-XMC-MA□□□□	CB-X2-PLA□□□□
⑬	DDA	LT18□	-	CB-X-MA□□□□	CB-X3-PA□□□□
⑭	DDACR DDW	LH18□	-	CB-XMC-MA□□□□	
⑮	DDA	LT18□	-	CB-X-MA□□□□	* Between the brake box and the actuator, CB-DDB-BK□□□□
⑯	DDACR (with brake)	LH18□	-	CB-XMC-MA□□□□	
⑰	IS(P)WA	S/M/L	-	CB-XEU-MA□□□□	CB-X1-PA□□□□-WC
⑱	Models other than ① - ⑰	-	CB-X-MA□□□□	-	CB-X1-PA□□□□ (In case of 20 m or shorter) * CB-X1-PA□□□□-AWG24 (in case of 21 m or longer) CB-X1-PLA□□□□
⑲	Models with LS other than ① - ⑰	-		-	(In case of 20 m or shorter) * CB-X1-PLA□□□□-AWG24 (in case of 21 m or longer)

* Model that is not battery-less absolute specification will be CB-X1-PA□□□□ / CB-X1-PLA□□□□ even when it is 20 m or more.

Model Number	PIO flat cable	Pulse-train control cable	I/O cable for safety function
--------------	----------------	---------------------------	-------------------------------

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

* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



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

Controller side

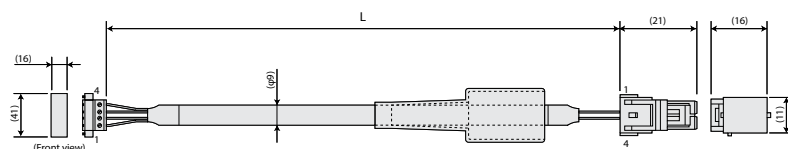
Actuator side

Minimum bending radius $r=51\text{mm}$ or more (Dynamic bending condition)

* Please use the robot cable if the cable has to be installed through the cable track.

Model Number CB-XMC-MA□□□□

* Please indicate the cable length (L) in □□□□, e.g.) 080 = 8m maximum SCON/SSEL:20m, XSEL:30m



Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
1.25sq	Green	PE	1	1	U	Red	1.25sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Controller side

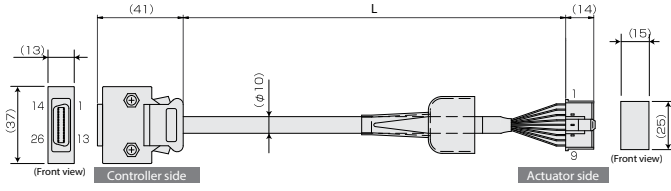
Actuator side

Minimum bending radius $r=55\text{mm}$ or more (Dynamic bending condition)

* The robot cable is used as standard.

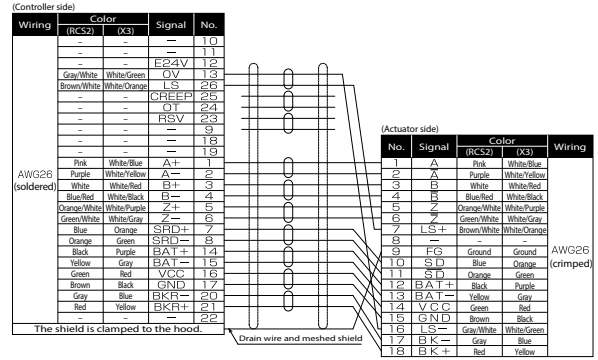
Maintenance Parts

Model Number **CB-RCS2-PA** [] [] [] (For RCS2/RCS3) / **CB-X3-PA** [] [] [] (For NS/RCS2/RCS3) * Please indicate the cable length (L) in [] [] [], maximum 30m, e.g.) 080 = 8m



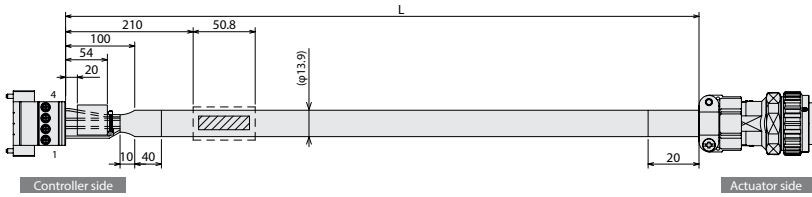
Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)

* Please use the robot cable if the cable has to be installed through the cable track.

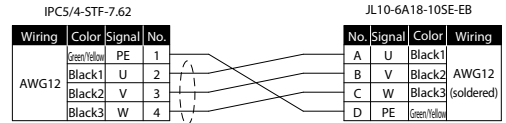


Model Number **CB-RCS3-MA** [] [] [] -RB

* Please indicate the cable length (L) in [] [] [], maximum 30m, e.g.) 080 = 8m



Minimum bending radius $r = 83.4\text{mm}$ or more (Dynamic bending condition)

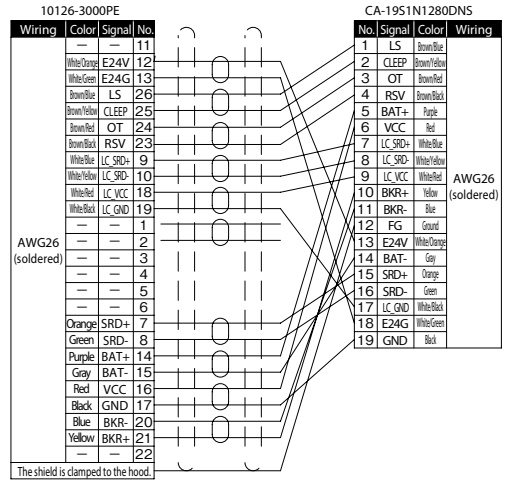


Model Number **CB-RCS3-PLA** [] [] [] -RB

* Please indicate the cable length (L) in [] [] [], maximum 30m, e.g.) 080 = 8m

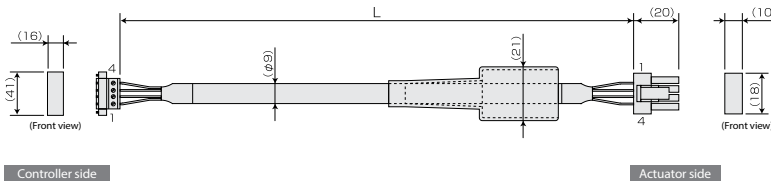


Minimum bending radius $r = 50\text{mm}$ or more (Dynamic bending condition)



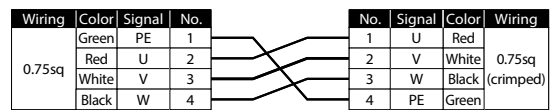
Model Number **CB-X-MA** [] [] []

* Please indicate the cable length (L) in [] [] [], maximum 30m, e.g.) 080 = 8m



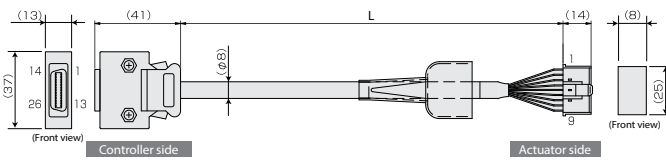
Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)

* The robot cable is used as standard.



When replacing a cable after purchasing the product, please refer to the list of models below.

Model Number CB-X1-PA



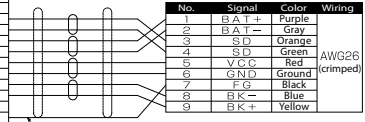
Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)

* The robot cable is used as standard.

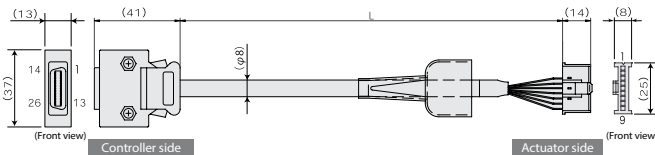
** For ISB, ISDB, ISDBCR and NSA (encoder coder is the battery-less absolute type), select CB-X1-PA -AWG24 when the cable is 21m long or more.

* Please indicate the cable length (L) in , maximum 20m, e.g.) 080 = 8m

Wiring	Color	Signal	No.
-	-	-	10
-	-	-	11
-	-	E24V	12
-	-	OV	13
-	-	LS	26
-	-	CREEP	25
-	-	OT	24
-	-	RSV	23
-	-	-	18
-	-	-	19
-	-	A+	1
-	-	B+	2
-	-	B-	3
-	-	Z+	4
-	-	Z-	5
-	-	Z0	6
Orange	SRD+	SRD+	7
Green	SRD-	SRD-	8
Purple	BAT+	BAT+	14
Gray	BAT-	BAT-	15
Red	VCC	VCC	16
Black	GND	GND	17
Blue	BKR-	BKR-	20
Yellow	BKR+	BKR+	21
-	-	-	22



Model Number CB-X1-PA -AWG24

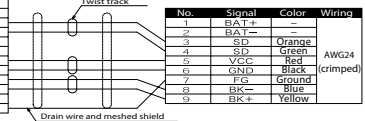


Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)

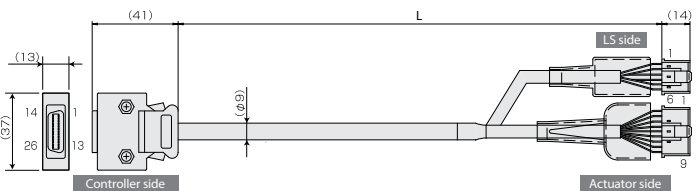
* The robot cable is used as standard.

* Please indicate the cable length (L) in , maximum 30m, e.g.) 210 = 21m

Wiring	Color	Signal	No.
-	-	-	11
-	-	E24V	12
-	-	OV	13
-	-	LS	26
-	-	CREEP	25
-	-	OT	24
-	-	RSV	23
-	-	-	18
-	-	-	19
-	-	A+	1
-	-	B+	2
-	-	B-	3
-	-	Z+	4
-	-	Z-	5
-	-	Z0	6
Orange	SRD+	SRD+	7
Green	SRD-	SRD-	8
Purple	BAT+	BAT+	14
Gray	BAT-	BAT-	15
Red	VCC	VCC	16
Black	GND	GND	17
Blue	BKR-	BKR-	20
Yellow	BKR+	BKR+	21
-	-	-	22



Model Number CB-X1-PLA



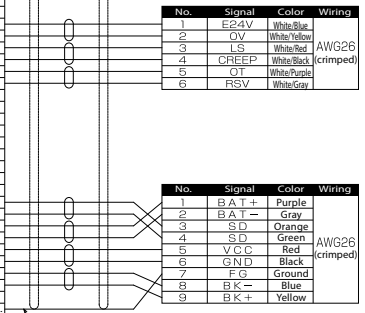
Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)

* The robot cable is used as standard.

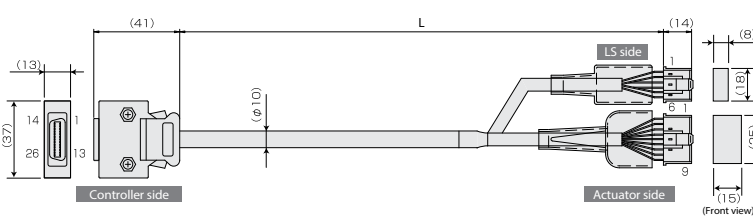
** For ISB, ISDB, ISDBCR and NSA (encoder is the battery-less absolute type), select CB-X1-PA -AWG24 when the cable is 21m long or more.

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m

Wiring	Color	Signal	No.
-	-	-	10
-	-	-	11
White/Blue	E24V	E24V	12
White/Yellow	OV	OV	13
White/Red	LS	LS	26
White/Black	CREEP	CREEP	25
White/Purple	OT	OT	24
White/Gray	RSV	RSV	23
-	-	-	18
-	-	-	19
-	-	A+	1
-	-	B+	2
-	-	B-	3
-	-	Z+	4
-	-	Z-	5
-	-	Z0	6
Orange	SRD+	SRD+	7
Green	SRD-	SRD-	8
Purple	BAT+	BAT+	14
Gray	BAT-	BAT-	15
Red	VCC	VCC	16
Black	GND	GND	17
Blue	BKR-	BKR-	20
Yellow	BKR+	BKR+	21
-	-	-	22



Model Number CB-RCS2-PLA (For RCS2 rotary) / CB-X2-PLA (NS LS Specification / for RCS2 rotary)

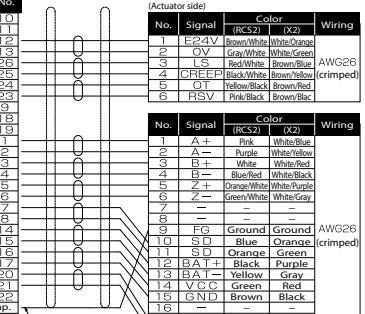


Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)

* Please use the robot cable if the cable has to be installed through the cable track.

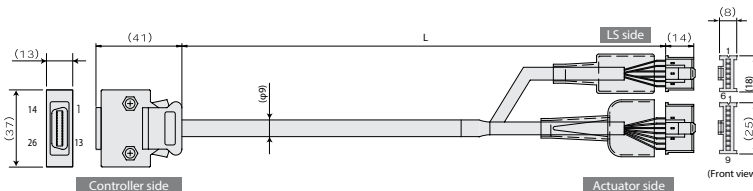
* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m

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



* The above is wiring diagram of the encoder cable. For wiring diagram of encoder robot cable, please check CB-X2-PLA on P7-239.

Model Number CB-X1-PLA -AWG24

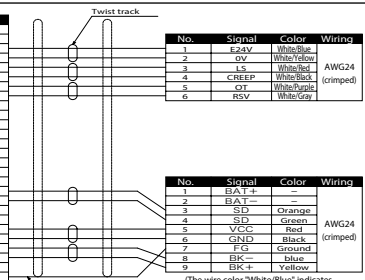


Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)

* The robot cable is used as standard.

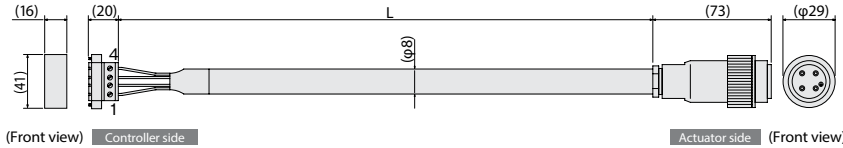
* Please indicate the cable length (L) in , maximum 30m, e.g.) 210 = 21m

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



Model Number CB-XEU-MA

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



Plug
GIC2.5/4-STF-7.62 (Phoenix)

Wiring	Signal	No.
	PE	1
0.75sq	U	2
	V	3
	W	4

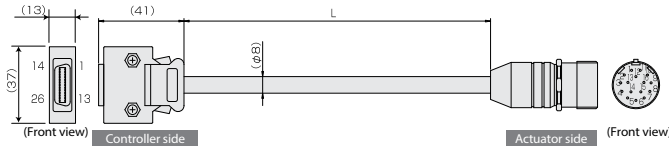
Plug connector
99-4222-00-04(BINDER)

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

Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

Model Number CB-X1-PA -WC

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

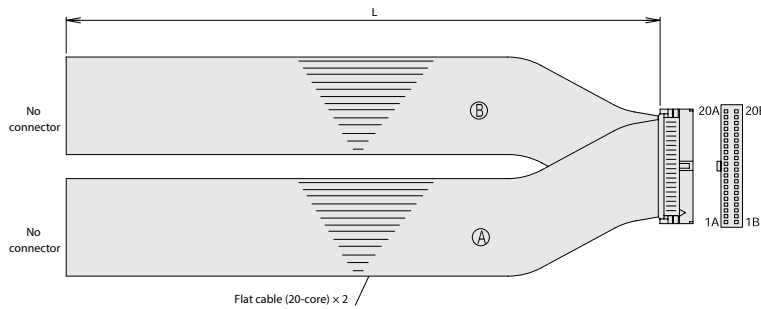
Wiring	Color	Signal	No.
-	-	-	10
-	-	-	11
-	E24V	-	12
-	OV	-	13
-	LS	-	26
-	GREENP	-	25
-	OT	-	24
-	RSV	-	23
-	-	-	9
-	-	-	18
-	-	-	19
-	A+	-	1
-	A-	-	2
-	B+	-	3
-	B-	-	4
-	Z+	-	5
-	Z-	-	6
-	SRD+	-	7
-	SRD-	-	8
Green	SRD+	-	7
Purple	BAT+	-	14
Gray	BAT-	-	15
Red	VCC	-	16
Black	GND	-	17
Blue	BKR-	-	20
Yellow	BKR+	-	21
-	-	-	22

No.	Signal	Color	Wiring
1	SD	Orange	
2	SD	Green	
3	-	-	
4	-	-	
5	-	-	
6	-	-	
7	-	-	
8	-	-	
9	-	-	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT-	Gray	
14	-	-	
15	BK-	Blue	
16	BK+	Yellow	

The shield is connected to cable clamp.
Drain wire and meshed shield
(The wire color "White/Blue" indicates the colors of the band and insulation)
The shield is connected to metal sleeve.

Model Number CB-PAC-PIO

* Please indicate the cable length (L) in , maximum 10m, e.g.) 080 = 8m



HIF6-40D-1.27R

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

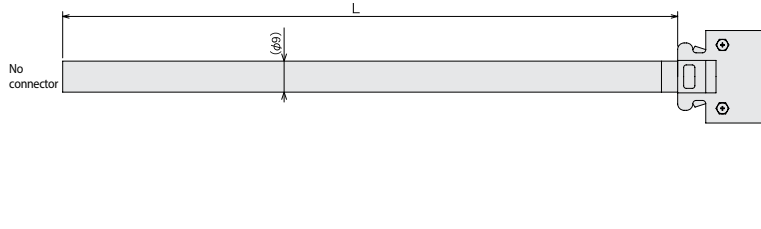
No.	Signal name	Cable Color	Wiring
1B	OUT0	Brown-3	
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Gray-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B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

Flat cable @ (pressure-welded)

Flat cable @ (pressure-welded) AWG28

Model Number CB-SC-PIOS

* Please indicate the cable length (L) in , maximum 10m, e.g.) 080 = 8m

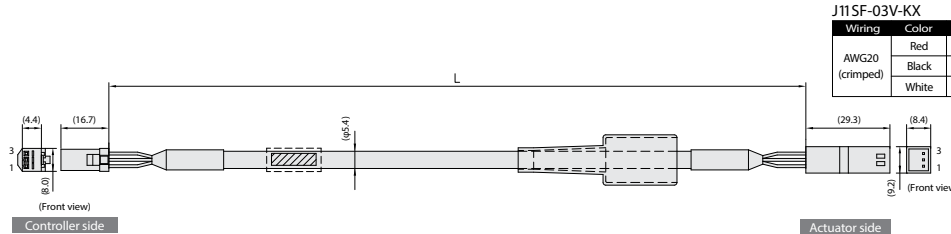


Wiring	Color	Signal	No.
	Black	No use	1
	White/Black	No use	2
	Red	PP	3
	White/Red	PP	4
	Green	NP	5
	White/Green	NP	6
0.2sq (soldered)	Yellow	AFB	7
	White/Yellow	AFB	8
	Brown	BFB	9
	White/Brown	BFB	10
	Blue	ZFB	11
	White/Blue	ZFB	12
	Gray	GND	13
	White/Gray	GND	14

Shield
The shield is connected to cable clamp.

Model Number CB-DDB-BK

* Please indicate the cable length (L) in , maximum 20m, e.g.) 080 = 8m



J11SF-03V-KX

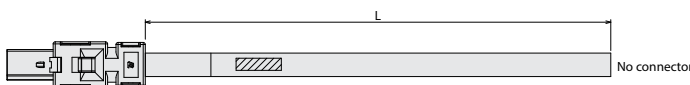
Wiring	Color	Signal	No.
AWG20 (crimped)	Red	+	3
	Black	-	2
	White	FG	1

J11SFM-03V-KX

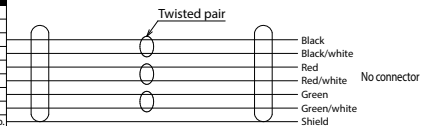
No.	Signal	Color	Wiring
3	+	Red	
2	-	Black	AWG20 (crimped)
1	FG	White	

Model Number CB-SC-STO 030

* Please indicate the cable length (L) in , maximum 20m, e.g.) 080 = 8m



Wiring	Color	Signal	No.
-	-	-	1
-	-	-	2
Black	/SRI-	-	3
Black/White	/SRI+	-	4
Red	/SRI2-	-	5
Red/White	/SRI2+	-	6
Green	EDM-	-	7
Green/White	EDM+	-	8



* Wire color: (ex.) Black/White represents white lines on the black insulator.

SCON-CB <Servo press specification>



Controller dedicated for Servo Press



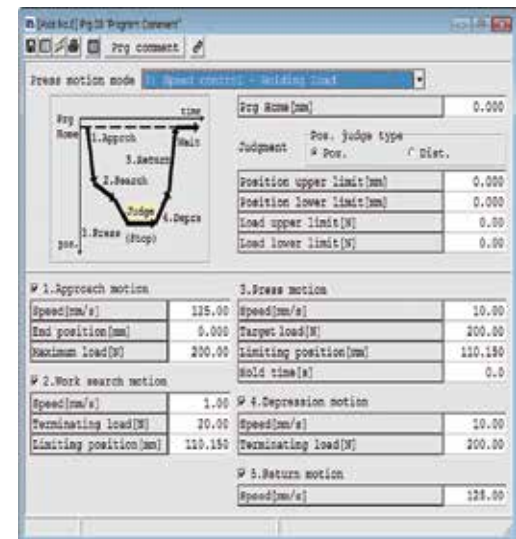
(*1) MECHATROLINK-I/II connection specification is not compliant with CE Marking.
(*2) 3000 and 3300W types are not compliant with UL standard.

Features

1 Equipped Dedicated Press Program

There are 9 types of press-operation modes to choose from

Speed control After completing a press motion, the actuator stops maintaining the position at the time of arrival.	Position stop
	Distance stop
	Load stop
	Incremental load stop
Force control After completing a press motion, the actuator stops maintaining the force at the time of arrival.	Position stop/Position stop ²
	Distance stop
	Load stop
	Incremental load stop



Simple program input

Operations are simple: just enter values on the screen for each motion. Also, because the input increment for position is 0.001mm, it is now possible to input more precise settings. This allows the user to make fine adjustments in the positioning process.

A judgment function has also been added

Setting the judgment range with the press program judges whether or not the position and load fall within the specified range.

2 Assignment of I/O Signals Specialized for the Servo Press Functions

A completely different I/O signal assignment specialized for the servo press to enable all of the functions.

3 Predictive Maintenance Functions

- Equipped with a function to detect motor overload and issue a warning. By estimating changes in the motor temperature from the feedback current, abnormality can be detected before a malfunction or failure occurs.
- Fully equipped with a monitoring function. Like the trigger function of an oscilloscope, waveforms of current position and current speed can be acquired from the moment that the condition of a selected signal is changed. Signal status such as positioning complete and alarm can also be obtained.
- Maintenance timings can be confirmed using the function to record the number of travels and the total traveled distance calculation.
- The calendar function can retain alarm timestamps.

4 Supports the Safety Function STO/SS1-t <Optional function>

Supports the STO (Safe Torque Off) / SS1-t (Safe Stop 1 - time controlled) function. The STO / SS1-t function is to shut off the energy supply to the motor by electric circuit in the controller.

For the SCON-CB, two specifications are available; STO and SS1-t specifications.

For applications of the vertical axis, SS1-t specification that has a long reaction time can prevent workpiece from dropping due to the time lag of brake operation when the safety torque shut off function is activated.



Specifications	Description	Remarks
STO	Reacting to input signals, the energy supply to the motor is shut off after a reaction time (8ms or shorter) by shut-off circuit in the controller.	
SS1-t	Reacting to input signals, brake is applied and the energy supply to the motor is shut off after a reaction time (500ms or shorter) by shut-off circuit in the controller.	This braking operation is not included in the safety function.

The energy supply to the servo motor can be shut off safely by connecting an external safety-related device and the I/O connector for safety function.

I/O connector for safety function (for STO/SS1-t specification only)



In addition, the STO/SS1-t function is compliant with the following safety standards:

- ISO/EN ISO 13849-1 category 3 Pl e
- IEC 61508 SIL3
- IEC/EN61800-5-2
- IEC/EN62061 SIL CL3

(Note) An engineer with expert knowledge in relevant safety standards should read and understand the descriptions stated in the instruction manual before designing a safety system using this function. Beware of potential injuries and failures.

List of Models

Model number		SCON-CB/CGB									
External view											
	I/O type	Standard specification	Network connection specification (option) (*2)								
PIO connection specification (*1)		DeviceNet DeviceNet	CC-Link CC-Link	CC-Link IE Field CC-Link IE Field	PROFIBUS PROFIBUS-DP	CompoNet CompoNet	MECHATROLINK MECHATRO LINK-I/II	EtherCAT EtherCAT	EtherNet/IP EtherNet/IP	PROFINET PROFINET IO	
I/O type model number	NP/PN	DV	CC	CIE	PR	CN	ML	EC	EP	PRT	
Supported encoder type	Battery-less absolute										
SCON-CB	30W	○									
	60W・100W	○									
	200W	○									
	400W	○	○	○	○	○	○	○	○	○	
	750W	○									
	3000W	○									
	3300W	○									

(*1) Pulse-train control is not available.

(*2) Communication with PIO and pulse-train is not available.

(Reference) Refer to P7-173 for the PLC function loaded type.

Model

SCON - [] - [] - [] **F** - [] - [] - [] - []

Series Type Motor Type Encoder Type I/O Type I/O Cable Length Power Supply Voltage Safety type

CB	Standard
CGB	Safety category compliant type

* Only CGB can be selected for RCS3-RA15R/20R.

F	For servo press only (Note 1)
---	-------------------------------

Not specified	Standard type
STO	STO type
SS	SS1-t type

* Only the standard type is selectable for RCS3-RA15R/20R.

30D	30W	400	400W
60	60W	750S	750W
100	100W	3000	3000W
200	200W	3300	3300W

(Example) 60: 60W servo motor compatible

(Note 1) If you do not use the press program, it will be blank. (Excluding 3000 W, 3300 W)

Note

Basically, the type of motor is the same as that of the actuator to be connected. However, in some models the controller and actuator motor types do not match. Be sure to check the corresponding models listed below during selection.

<Actuators for 30D and 750S>

● Controller Motor type "30D"
RCS3-RA4R

● Controller Motor type "750S"
RCS2-RA13R When option LCT is selected

WAI	Battery-less Absolute
-----	-----------------------

1	Single phase 100VDC
2	Single phase 200VDC
3	Three phase 200VDC

* Please check the power supply voltage that can be selected on the page of the actuator.

NP	PIO NPN (standard)
PN	PIO PNP
DV	DeviceNet
CN	CompoNet
CC	CC-Link
CIE	CC-Link IE Field
ML	MECHATROLINK-I/II (Note 1)
PR	PROFIBUS-DP
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

(Note 1) Please be sure to check P7-18 for the caution when selecting.

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

* When a field network specification is selected, the I/O cable length is "0".

Controller

EC

RCP6S

RCN

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

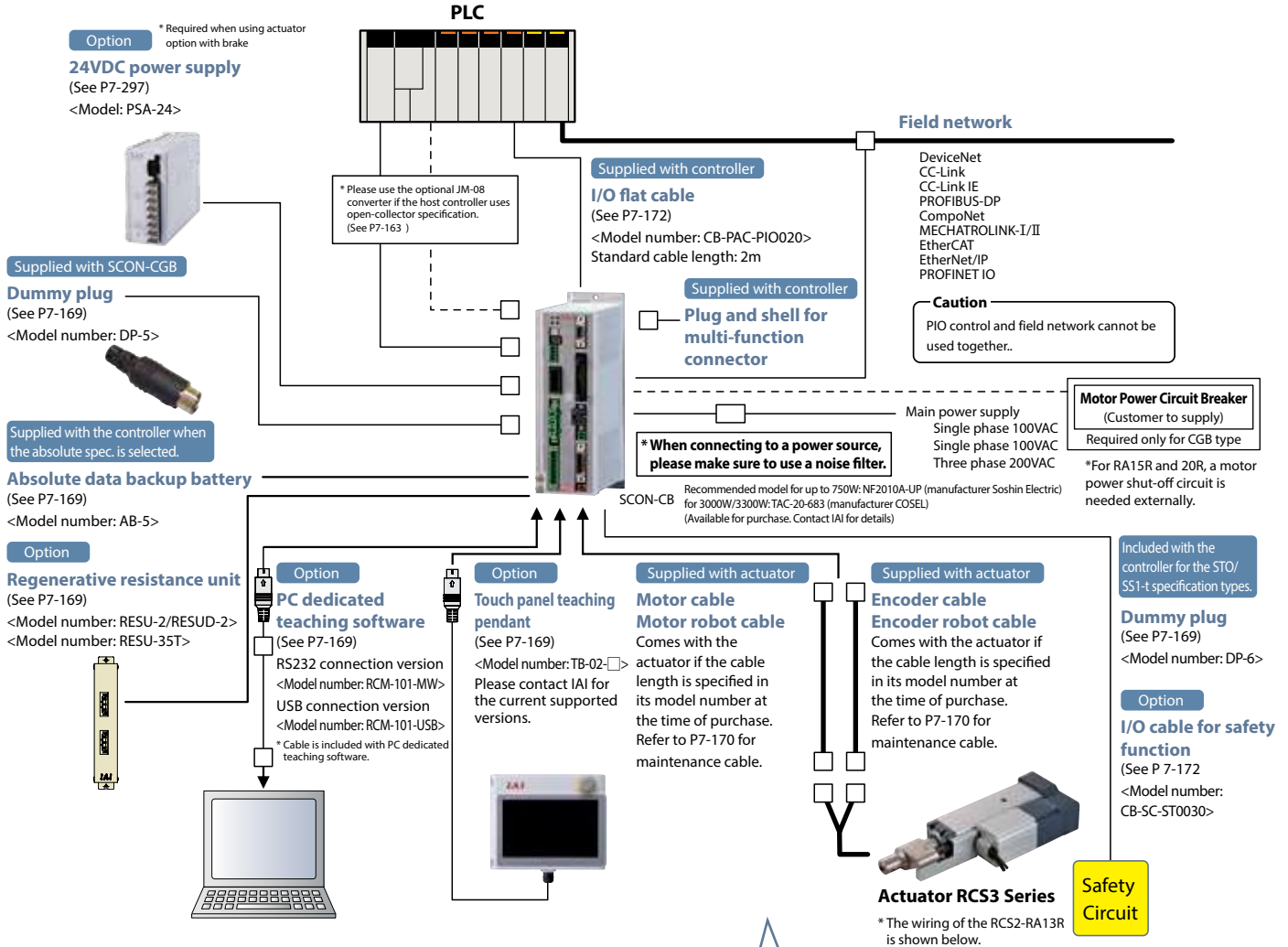
(SCARA)

PSA-24

TB-02

TB-03

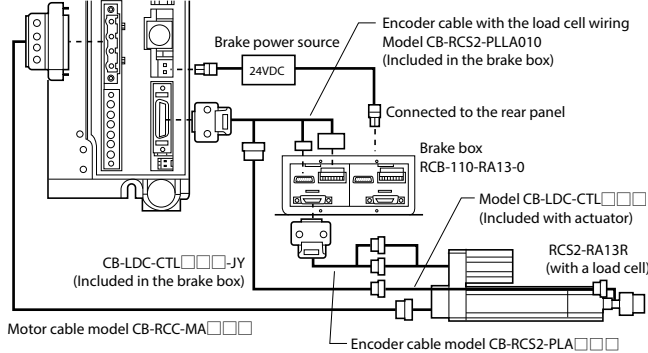
System Configuration



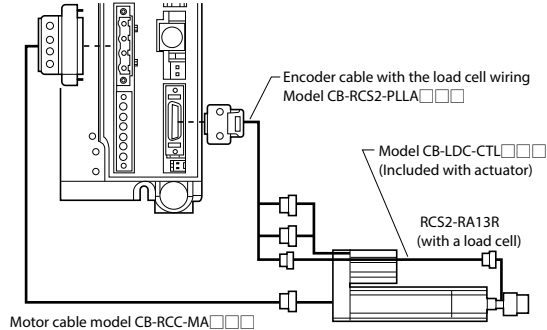
RCS2-RA13R wiring

*"CB-LDC-CT□□□-JY" and "CB-RCS2-PLLA010" should be purchased separately.

With a Brake



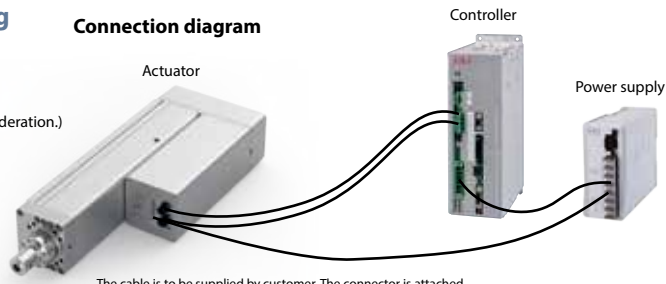
Without a Brake



RCS 3-RA15R/20R (with brake) wiring

The brake circuit of RCS3-RA15R/20R is built into the actuator.
 Enter a DC ± 10% voltage on the actuator.
 (If the input voltage is low, the brake cannot be released.)
 Please supply power with the voltage drop of the wiring in consideration.)
 24VDC Supply is required for both actuators and controllers.

Connection diagram



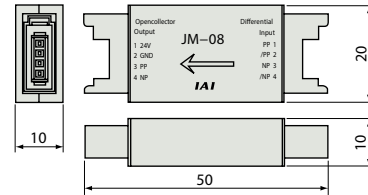
The cable is to be supplied by customer. The connector is attached.
 * Please check the instruction manual for details.

Pulse Converter: JM-08

Converts differential pulses to the open-collector specification (NPN only). Please use this converter if the host controller uses open-collector input.

Specification

Item	Specifications
Input power	24VDC±10% (Max.50mA)
Input pulses	Differential input (Max. 10mA) (RS422 compliant)
Input frequency	500kHz or less
Output pulses	24VDC open collector (collector current Max. 25mA)
Mass	10g or less (not including the cable connectors)
Accessory	37104-3122-000FL (e-CON connector) x 2 by 3M Suitable wire AWG No.24~26



I/O Signals

Pin number	Category	Signal	Symbol	Name
1A	24V		P24	Power supply (+24V) for I/O
2A	24V		P24	Power supply (+24V) for I/O
3A	-		NC	-
4A	-		NC	-
5A	Input	IN0	PC1	Command program No. 1
6A		IN1	PC2	Command program No. 2
7A		IN2	PC4	Command program No. 4
8A		IN3	PC8	Command program No. 8
9A		IN4	PC16	Command program No. 16
10A		IN5	PC32	Command program No. 32
11A		IN6	PSTR	Program start
12A		IN7	PHOM	Move to program home position
13A		IN8	ENMV	Enable axis to move
14A		IN9	FPST	Forcibly stop program from running
15A		IN10	CLBR	Load cell calibration command
16A		IN11	BKRL	Forced release of brake
17A		IN12	RMOD	Operation mode switching
18A		IN13	HOME	Home return
19A		IN14	RES	Alarm reset
20A	IN15	SON	Servo ON command	
1B	Output	OUT0	PCMP	Program normally completed
2B		OUT1	PRUN	Program running
3B		OUT2	PORG	Program home position
4B		OUT3	APRC	Approaching
5B		OUT4	SERC	Searching
6B		OUT5	PRSS	Pressing
7B		OUT6	PSTP	Stop pressing
8B		OUT7	MPHM	Moving to program home position
9B		OUT8	JDOK	Overall judgment OK
10B		OUT9	JDNG	Overall judgment NG
11B		OUT10	CEND	Load cell calibration completed
12B		OUT11	RMDS	Operation mode status
13B		OUT12	HEND	Home return completed
14B		OUT13	SV	Servo ON status
15B		OUT14	*ALM	Alarm (Negative logic)
16B	OUT15	*ALML	Minor failure alarm (Negative logic)	
17B	-		-	-
18B	-		-	-
19B	0V		N	Power supply (0V) for I/O
20B	0V		N	Power supply (0V) for I/O

Field network specification Operation mode Description

If the PCON-CB is controlled via a field network, you can select one of the following two modes to operate the actuator. Please note that the data areas required on the PLC side will vary depending on the mode.

Mode Description

Mode	Description
0 Remote I/O mode	Similar to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1 Full function mode	In addition to servo press functions such as start of press program and judgement result reading, it supports all functions such as direct numerical movement and current load data reading.

Required Data Size for Each Network

Mode	DeviceNet	CompoNet	CC-Link	MECHATROLINK-I/II	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0 Remote I/O mode	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes
1 Full function mode	32 bytes	32 bytes	32 bytes	× (Note 1)	32 bytes	32 bytes	32 bytes	32 bytes

(Note 1) Please note that the MECHATROLINK specification does not support the full function mode.

List of Functions by Operation Mode

	Remote I/O mode	Full function mode (Note 1)
Operation by position data input	×	○
Direct speed/acceleration input	×	○
Current position reading	×	○
Current speed reading	×	○
Operation by program No. input	○	○
Judgment result reading	○	○
Current load data read	×	○
Overload level monitor	×	○
Servo gain switching	○ (*1)	○ (*1)

(*1) One servo gain can be registered in one press program.

(Note 1) Please note that Mechatrolink does not support full function mode.

I/O connector for safety function

	Model	Manufacturer
Controller side	2294417-1	Tyco Electronics (TE Connectivity)
Cable side	2013595-1 (*1)	

(*1) Customer's supply. Cable with connector (CB-SC-ST0030) is sold separately.

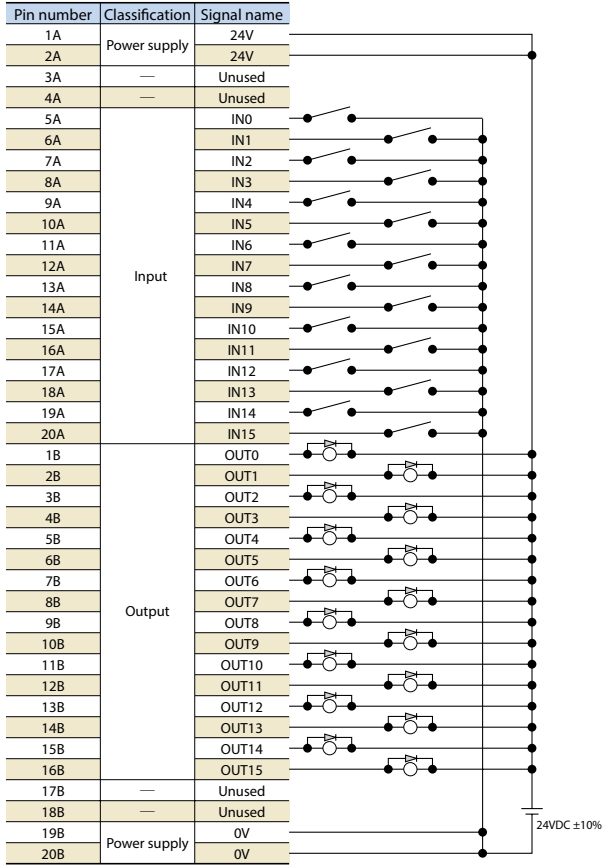
Signals of I/O connector for safety function

Pin No.	Signal name	Name	Description
1	NC	–	Do not connect.
2	NC	–	Do not connect.
3	/SRI1-	Safety request input signal 1	Input the safety request input signal 1 ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function
4	/SRI1+		
5	/SRI2-	Safety request input signal 2	Input the safety request input signal ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function
6	/SRI2+		
7	EDM-	Output signal for monitoring external device	Output signal to monitor that the safety function is functioning without failure.
8	EDM+		

- EC
- RCP6S
- RCON
- MCON-C/LC
- PCON-CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON-CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

I/O Wiring Diagram

PIO connector (NPN specification)



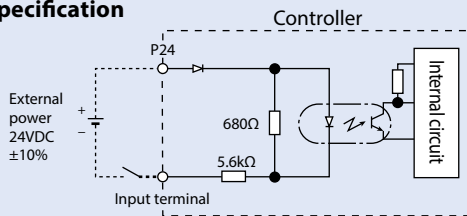
* Connect pin numbers 1A and 2A to 24V, and connect pin numbers 19B and 20B to 0V.

PIO Input/Output Interface

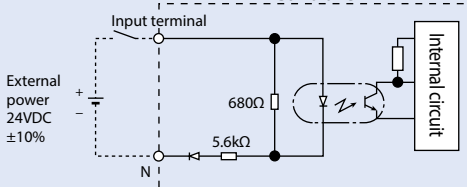
Input part External Input Specification

Item	Specification
Input voltage	24VDC ±10%
Input current	4mA, 1 circuit
ON/OFF voltage	ON voltage, 18.0VDC min. OFF voltage, 6.0VDC max.
Isolation method	Photo-coupler

NPN specification



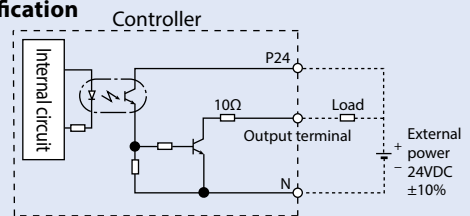
PNP specification



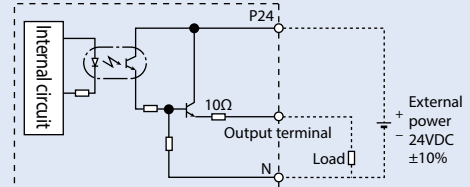
Output part Part External Output Specifications

Item	Specification
Load voltage	24VDC
Maximum load current	50mA, 1 circuit
Leakage current	0.1 mA or less / 1 point
Isolation method	Photo-coupler

NPN specification

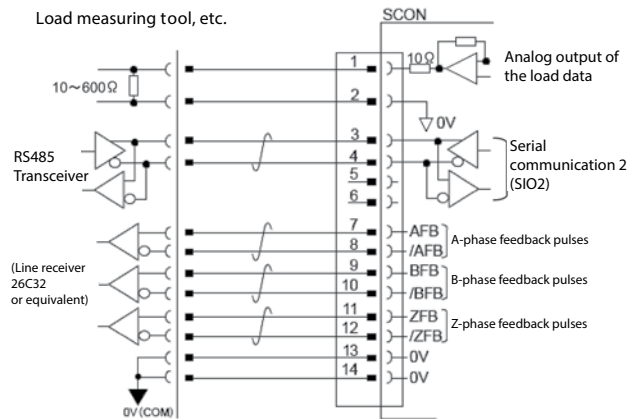


PNP specification

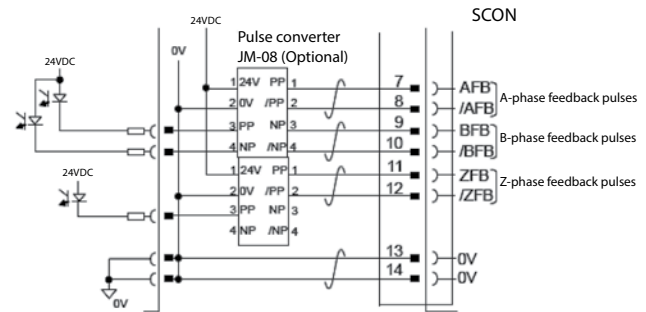


Multi-function Connector (Interface)

① When the host controller inputs feedback pulses with a line receiver.



② A pulse converter (JM - 08: option) is required when the host controller inputs feedback pulses with an open collector.

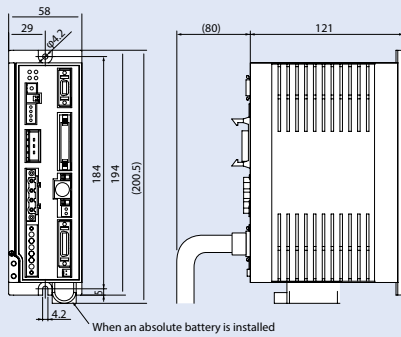


Specifications

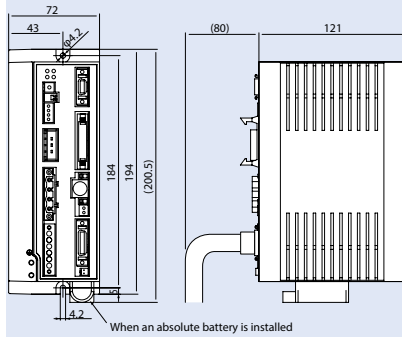
Item	Specifications		
Supported motor capacity	Less than 400W	400W~750W	3000W•3300W
Connected actuator	RCS2/RCS3 series actuator (with load cell)		
Number of controlled axes	1 axis		
Operation method	Press program type		
Backup memory	Non-volatile memory (FRAM)		
I/O connector	40-pin connector		
Number of I/O points	Input 16 points/ output 16 points		
I/O power	External supply 24VDC ±10%		
Brake supply power	External supply 24VDC ±10% (Max1A)	External supply 24VDC ±10% (Max0.1A) *Max 1.5 A must be separately supplied for Actuator.	
Serial communication	RS485 2ch		
Position detection methods	Incremental encoder / Absolute encoder		
Driving power shut-off function	CB: Available (built-in relay) CGB: Unavailable		
Electromagnetic brake forced release	Brake release switch ON/OFF		
Input power	Single phase 100~115VAC ±10% Single phase 200~230VAC ±10%	Single phase 200~230VAC ±10%	Three phase 200~230VAC ±10%
Power supply capacity	30W/94VA 60W/186VA 100W/282VA 200W/469VA	400W/968VA 750W/1569VA	3000W/5705VA 3300W/6062VA
SCONCB/ CGB	External interface	Dedicated 24VDC signal inputs/outputs (NPN/PNP selectable) --- Max. of 16 input/16 output points	
	Fieldbus network specification	DeviceNet, CC-Link, CC-Link IE, PROFIBUS-DP, CompoNet, MECHATROLINK-I/II, EtherCAT, EtherNet/IP, PROFINET IO	
	Data retention memory	Position data and parameters are saved in non-volatile memory. (No limit to rewrite)	
Vibration control	X,Y,and Z directions, 10~57Hz single-side width 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (intermittent)		
Calendar/ clock function	Retention time	Approximately 10 days	
	Charging time	Approximately 100 hours	
Protection functions	Excess current, abnormal temperature, monitoring of fan speed drops, encoder disconnection, etc.		
Internal regenerative resistance value	2000Ω 10W		34Ω 160W
Ambient operating temperature	0~40°C		
Ambient operating humidity	85% or less (non-condensing)		
Ambient operating atmosphere	Free from corrosive gases		
Degree of protection	IP20		
Mass	Approx. 900g (+25g for absolute specification)	Approx. 1.2kg (+25g for absolute specification)	Approx. 2.8kg (+25g for absolute specification)
External dimensions	58mm(W)×194mm(H)×121mm(D)	72mm(W)×194mm(H)×121mm(D)	92.7mm(W)×300mm(H)×172mm(D)

External Dimensions

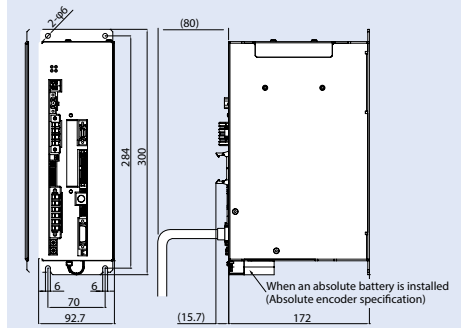
Less than 400W



400W~750W

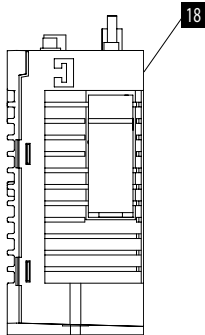
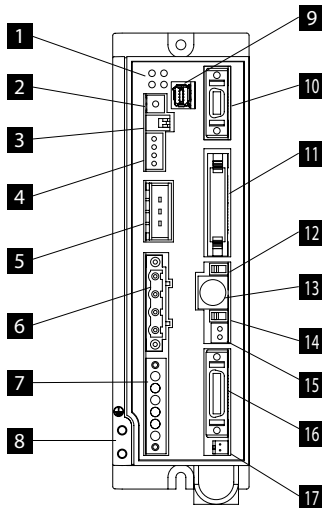


For 3000W, 3300W



Names of each Parts

[For ~750W]



1 LED display(PWR, SV, ALM, EMG)

Indicates the status of the controller.

Name	Color	Description
PWR	Green	Turned ON when the system is ready (after power ON, CPU is functioning normally)
SV	Green	Turned ON when the servo is ON.
ALM	Orange	Turned ON when alarm is being issued.
EMG	Red	Turned ON when the system is in the emergency stop status.

2 Axis number setting switch (ADRS)

Used to set up the controller address after connecting the controller in order to identify every controller connected.

3 Operation mode selector switch

Not used.

4 System I/O connector(SYS I/O)

Connector used to connect switches such as emergency stop switch.

5 Regenerative unit connector

Connector used to connect the resistance unit that absorbs the regenerative current generated when the actuator decelerates to stop.

6 Motor connector(MOT)

Connector used to connect the actuator cable.

7 Power supply connector (PWR)

Connector used to connect the AC power supply. Pins of this connector are divided into two groups, one for power to controller and the other for power to motor.

8 FG connecting terminal

Screw used to connect the protection grounding. Make sure to secure the grounding.

9 I/O connector for safety function

Connector to enable STO/SS1-t function

10 Multi-function connector (MF I/F)

Connector to output feedback pulses and analog load cell data, as well as to use SIO communication function (SIO2).

11 PIO connector

Used to connect communication cable with peripheral equipment such as PLC in parallel communication.

12 Operation mode selection switch (MANU/AUTO)

Name	Description
MANU	Does not accept commands from PIO.
AUTO	Ready to accept commands from PIO.

* The emergency stop switch on the touch panel teaching pendant is enabled when the connection is made, regardless of the states, AUTO or MANU. Turn the power OFF before removing the touch panel teaching pendant and SIO communication cable.

13 SIO connector(SIO)

Used to connect the touch panel teaching pendant or the communication cable with PC.

14 Brake release switch (BK RLS/NOM)

Used to forcibly release the electromagnetic brake installed in the actuator.

* To release the brake, the power supply (24VDC) for driving brake must be connected.

15 Brake power supply connector (BK PWR)

Connector for 24VDC brake power supply. (Use only when the actuator with a brake is connected).

16 Encoder and sensor connector

Connector used to connect encoder and sensor cables.

17 Absolute battery connector

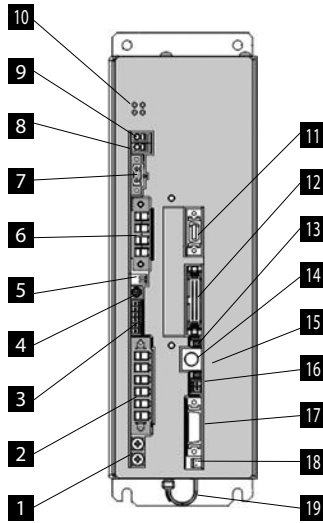
Connector used to connect the absolute data backup battery (necessary only for the absolute encoder specification).

18 Absolute battery holder (attached in case of absolute specification)

Battery holder used to hold the absolute data backup battery.

Names of the Parts

[For 3000W and 3300W]



1 FG connection terminal

A terminal for connecting the ground line to prevent electric shock and noise. It is connected to the PE power supply connector inside the controller.

2 Power supply connector (PWR)

A connector used to connect to the AC power supply.

3 System I/O connector (SYS I/O)

This connector is used to connect the operation stop switch of the actuator.

4 Axis number setting switch (ADRS)

A switch for setting the axis number when operating multiple axes by serial communication. When using the SIO converter, it is possible to control multiple axes without attaching/detaching the connector of the communication cable from teaching tools such as PCs, etc.

5 Piano switch

Not used.

6 Motor connector (MOT)

A connector for the actuator motor cable.

7 Regenerative resistance unit cable connector (RB)

A connector for the external regenerative resistance unit.

8 Charge status display LED

This displays the charge status inside the controller.

Caution: While this LED is lit, do not touch the controller or regenerative resistance unit in order to prevent electric shock.

9 Internal regenerative resistance enable connector

A short-circuit cable is connected at shipping.

Caution: Be sure to use with the short circuit cable attached. Use without the cable will damage the equipment.

10 LED display (PWR, SV, ALM, EMG)

This represents the operation status of the controller.

○: ON ×: OFF △: Undefined (ON or OFF)

LED				Operating status
PWR(Green)	SV(Green)	ALM(Orange)	EMG(Red)	
×	×	×	×	Control power OFF
○	×	×	×	Controller starts up normally
○	×	×	×	Servo OFF
○	○ Note 1	×	×	Servo ON
○	×	○	△	Alarm
○	×	△	○	Emergency stop
○	△	△	△	Warning

Note1: Blinks when automatic servo is OFF.

11 Multi-function connector (MF I/F)

A connector to output feedback pulses and analog load cell data, as well as to use SIO communication function (SIO2).

12 PIO connector (PIO)

A connector for control input/output signal connection. (Note) It is not installed for the fieldbus specification.

13 Operation mode setting switch (MANU/AUTO)

An interlocking switch for preventing duplication of movement commands from PIO (PLC) and commands from teaching tools such as PCs, etc.

14 SIO connector (SIO)

Used to connect teaching tools such as the PC dedicated teaching software and communication cables such as the gateway unit.

15 Brake release switch (BK RLS /NOM)

A switch to forcibly release the electromagnetic brake installed in the actuator.

Warning: Be sure to set this switch to the NOM side in normal operation. If it is left on the RLS side, the brake will not be applied even if the servo is turned OFF. If the actuator is vertically mounted, the workpiece may fall, risking injury or damage to the workpiece.

16 Brake power supply connector (BK PWR)

A connector for supplying power (24VDC) to release the brake when using an actuator with brake.

17 Encoder connector (PG)

A connector for the actuator encoder cable.

18 Absolute battery connector

A battery cable connector used for the absolute specification.

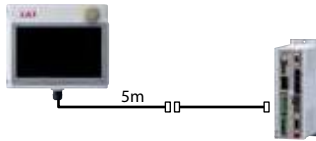
19 Absobattery Holder (comes with absolute specifications)

Battery holder used to hold the absolute data backup battery.

Options

Touch panel teaching pendant

- Features** Teaching tool that has functions for position inputs, test runs and monitoring.
- Model** **TB-02**-□
- Configuration**



Specification

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0-40°C
Ambient operating relative humidity	20-85%RH (no-condensing)
Degree of protection	IP20
Mass	470g (TB-02 main unit only)

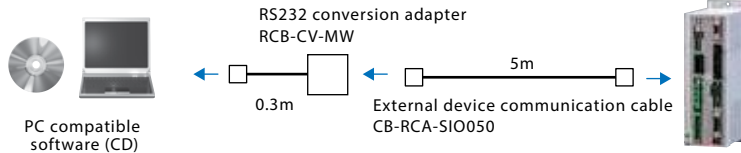
Supported Windows: 7/8/8.1/10

PC dedicated teaching software (Windows only)

- Features** Start-up support software that allows you to input positions, perform test operations, monitor functions, etc. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

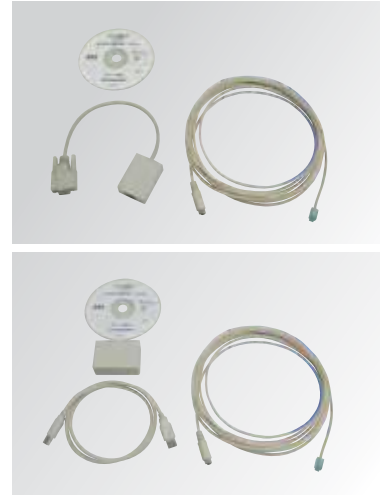
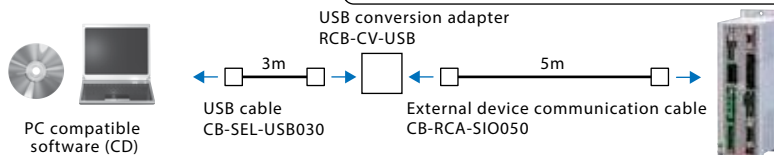
- Model** **RCM-101-MW** (with an external device communication cable + RS232 conversion unit)

- Configuration** Please contact IAI for the current supported versions.



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

- Configuration** Please contact IAI for the current supported versions.



Regenerative Resistance Unit

- Features** This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the tables below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

* When two regenerative units are required, please use one RESU-2 and one RESU-1 (Please refer to P7-288).

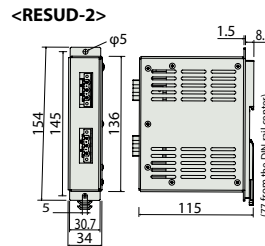
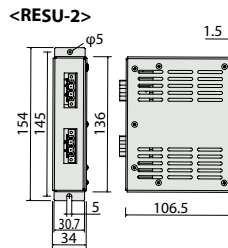
<For ~750W>

- Model** **RESU-2** (Standard specification)/**RESUD-2** (DIN-installed specification)

Specification

Model number	RESU-2	RESUD-2
Mass	Approximately 0.4kg	
Internal regen. resistance value	235Ω 80W	
Mounting method	Screw mounting DIN rail mounting	
Included cable	CB-SC-REU010	

External dimensions



Necessary Quantity Guideline

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

Necessary Quantity Guideline (RCS2-RA13R)

	Lead 2.5	Lead 1.25
Horizontal	1	0
Vertical	1	1

* Regenerative resistance units more than specified above may be required depending on the operating conditions.

* Regenerative resistance units more than specified above may be required depending on the operating conditions.

Absolute Data Backup Battery

- Features** This is an absolute data backup battery for an actuator with absolute specification.

- Model** **AB-5 (Battery only)**
AB-5-CS (With a case)
AB-5-CS3 (With a case)

* For 3000W・3300W



Dummy plug (Safety category specification)

- Features** Necessary when safety category specification (SCON-CGB) is used.

- Model** **DP-5**



Dummy plug (STO/SS1-t specification)

- Features** Necessary when STO/SS1-t function is not used.

- Model** **DP-6**



<For 3000W and 3300W>

- Model** **RESU-35T**

Specification

Mass	Approx. 1.8kg
Internal regen. resistance value	30Ω 450W
Mounting method	Screw mounting

Note The cable is required to prepare by the customer.

Necessary Quantity Guideline

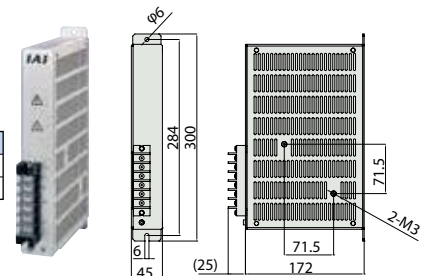
For 3000W

Cycle time	Number of connected units
12sec or more	No need
6~12sec	1
3.5~6sec	2
3.5sec or less	(Note)

For 3300W

Cycle time	Number of connected units
2.5sec or more	No need
Less than 2.5sec	1

* The required number varies depending on operating conditions. (Note) Please inquire when a cycle time of 3.5 sec or less is assumed.



Maintenance Parts

When placing an order for a replacement cable, please use the model number shown below.

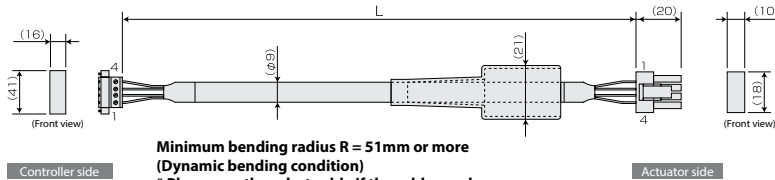
Table of Applicable Cables

Model Number	Motor Cable	Motor Robot Cable	Encoder cable	Encoder robot cable	
RCS3	RA4R	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PLDA□□□□	CB-RCS2-PLDA□□□□-RB
	RA6R				
	RA7R				
	RA8R				
	RA10R				
	RA15R				
RA20R	-	CB-RCS3-MA□□□□-RB	-	CB-RCS3-PLA□□□□-RB	
RCS2	RA13R (With brake / load cell specification)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PLA□□□□ * Between controller and brake CB-RCS2-PLLA □□□□ * Between the load cell and controller: CB-LDC-CTL□□□□-JY	CB-X2-PLA□□□□ * Between controller and brake CB-RCS2-PLLA□□□□-RB
	RA13R (No brake / Load cell specification)			CB-RCS2-PLLA□□□□	CB-RCS2-PLLA□□□□-RB

Model Number	PIO flat cable	I/O cable for safety function
SCON-CB	CB-PAC-PIO□□□□	CB-SC-STO030

Model CB-RCC-MA□□□□/CB-RCC-MA□□□□-RB

* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m

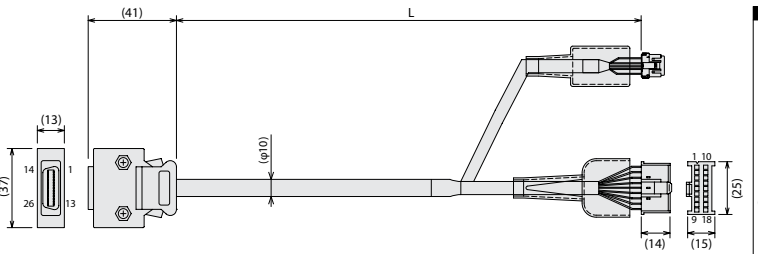


Minimum bending radius R = 51mm or more
(Dynamic bending condition)
* Please use the robot cable if the cable needs to be installed through the cable track.

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

Model CB-RCS2-PLDA□□□□/CB-RCS2-PLDA□□□□-RB

* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



Minimum bending radius R = 52mm or more (Dynamic bending condition)
* Please use the robot cable if the cable needs to be installed through the cable track.

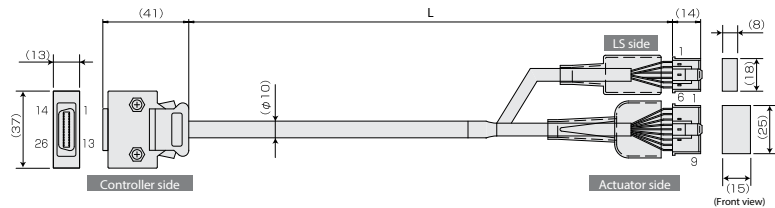
Wiring	Signal	No.	No.	Signal	Wiring
-	-	-	1	SGA	AWG26 (Crimped)
E24V	12	2	2	SGB	
0V	13	3	3	B	
LS	26	4	4	VCA	
CREEP	25	5	5	FG	
OT	24	-	-	-	AWG26 (Crimped)
RSV	23	1	1	A	
LC SRD+	9	2	2	B	
LC SRD-	10	3	3	Z	
LC VCC	18	4	4	Z	
LC GND	19	5	5	Z	
A+	1	6	6	Z	
A-	2	7	7	-	
B+	3	8	8	-	
B-	4	9	9	FG	
Z+	5	10	10	SD	
Z-	6	11	11	SD	
SRD+	7	12	12	BAT+	
SRD-	8	13	13	BAT-	
BAT+	14	14	14	VCC	
BAT-	15	15	15	GND	
VCC	16	16	16	BK-	
GND	17	17	17	BK+	
BKR-	20	18	18	-	
BKR+	21	-	-	-	
-	22	-	-	-	

The shield is clamped to the hood.

Drain wire and meshed shield

Model CB-RCS2-PLA□□□□/CB-X2-PLA□□□□

* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



Minimum bending radius R = 58mm or more (Dynamic bending condition)
* Please use the robot cable if the cable needs to be installed through the cable track.

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

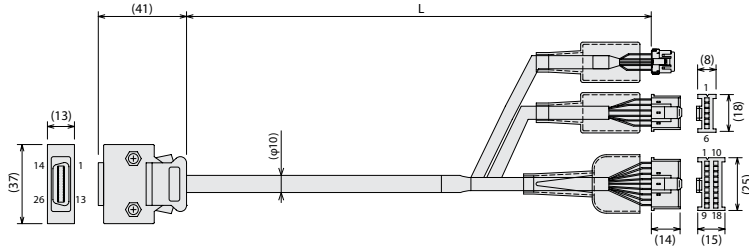
The shield is clamped to the hood.

Drain wire and meshed shield
(Line / white / blue indicates band color / insulator color)

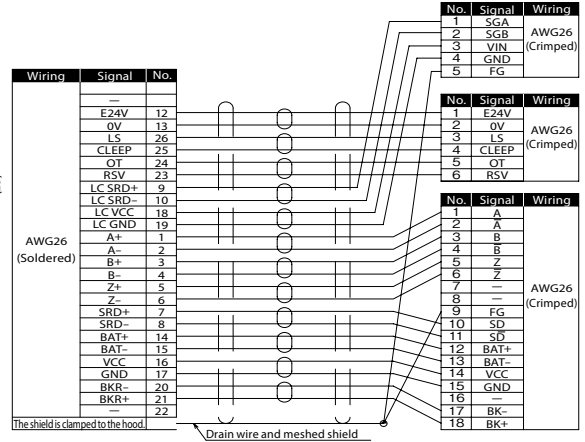
* The above is wiring diagram of the encoder cable. For wiring diagram of encoder robot cable, please check CB-X2-PLA □□□□ placement on page 7-239.

Model CB-RCS2-PLLA□□□ / CB-RCS2-PLLA□□□-RB

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

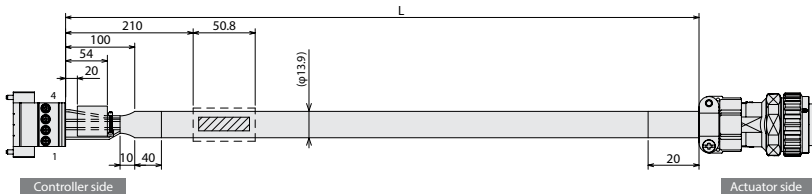


Minimum bending radius R = 52mm or more (Dynamic bending condition)
* Please use the robot cable if the cable needs to be installed through the cable track.

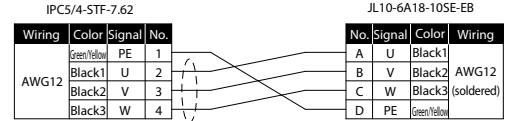


Model CB-RCS3-MA□□□-RB

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

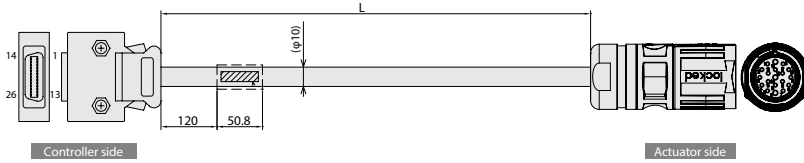


Minimum bending radius R = 83.4mm or more (Dynamic bending condition)

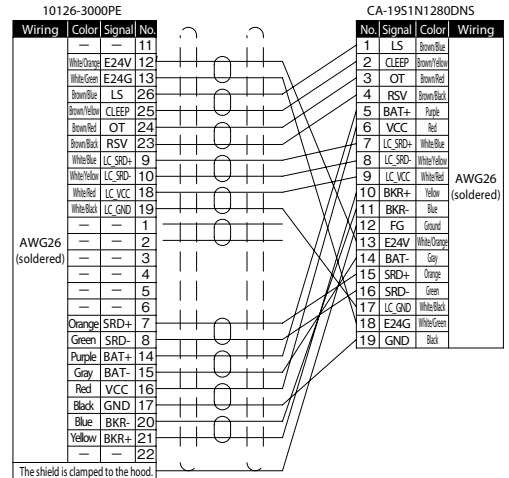


Model CB-RCS3-PLA□□□-RB

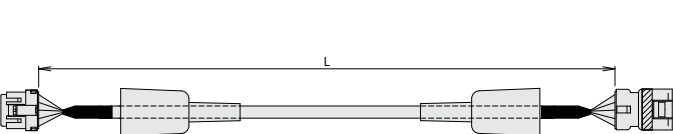
* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m



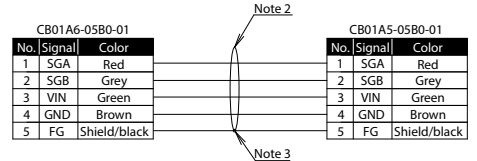
Minimum bending radius R = 50mm or more (Dynamic bending condition)



Model CB-LDC-CTL□□□-JY

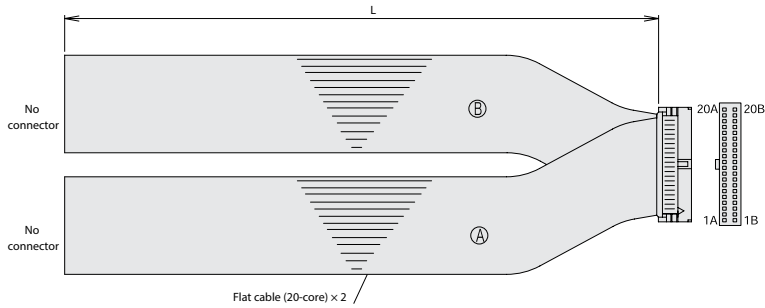


Minimum bending radius r=28mm or more (Dynamic bending condition)



Model CB-PAC-PIO

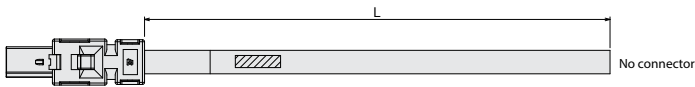
* Please indicate the cable length (L) in , maximum 10m, e.g.) 080 = 8m



HIF6-40D-1.27R

No.	Signal name	Cable Color	Wiring	No.	Signal name	Cable Color	Wiring
1A	24V	Brown-1	Flat cable ② (pressure-welded)	1B	OUT0	Brown-3	Flat cable ② (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	Gray-1		8B	OUT7	Gray-3	
9A	IN4	White-1		9B	OUT8	White-3	
10A	IN5	Black-1		10B	OUT9	Black-3	
11A	IN6	Brown-2		11B	OUT10	Brown-4	
12A	IN7	Red-2		12B	OUT11	Red-4	
13A	IN8	Orange-2		13B	OUT12	Orange-4	
14A	IN9	Yellow-2		14B	OUT13	Yellow-4	
15A	IN10	Green-2		15B	OUT14	Green-4	
16A	IN11	Blue-2		16B	OUT15	Blue-4	
17A	IN12	Purple-2		17B	—	Purple-4	
18A	IN13	Gray-2		18B	—	Gray-4	
19A	IN14	White-2		19B	0V	White-4	
20A	IN15	Black-2		20B	0V	Black-4	

Model CB-SC-STO 030



Wiring	Color	Signal	No.
—	—	—	1
—	—	—	2
Black	/ SRI1-	3	3
Black/White	/ SRI1+	4	4
Red	/ SRI2-	5	5
Red/White	/ SRI2+	6	6
Green	EDM-	7	7
Green/White	EDM+	8	8

Shield is connected to the cable clamp.

* Wire color: (ex.) Black/white represents white lines on the black insulator.

Controller

EC

RCP6S

RCON

MCON

PCON

PCON

ACON-CB

DCON-CB

ACON

SCON

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

SCON-LC

Position Controller for Single-axis Robot / Cartesian Robot / Linear Servo / ROBO Cylinder RCS2/RCS3 PLC function mounted type



(*1) MECHATROLINK-I/II connection specification is not compliant with CE Marking.
(*2) 3000 and 3300W types are not compliant with UL standard.

Features

With PLC Function

It is capable of operating actuators and ON/OFF controls of I/O (input and output) signals by ladder program. Small-scale devices can be controlled by SCON-LC/LCG only. For large-scale devices, load on the main PLC can be reduced by performing distributed control using SCON-LC/LCG for each procedure. In addition, it allows for easier programming and troubleshooting.



Ladder Software

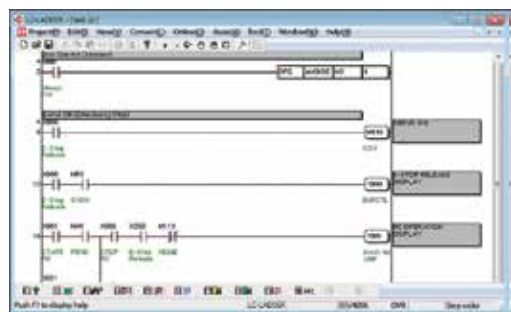


● Features of ladder software

As SCON-LC/LCG can be controlled by a ladder program, it can be easily used by those who had been using PLC. In addition, the editing software "LC-LADDER" can be used to easily create, monitor and debug a ladder program.

1 Program creation

Programs can be created using 27 types of basic commands (contact command, output command, etc.) and 53 types of application commands (data comparison, arithmetic and logical operations, etc.).



2 Monitor

Running states of the program can be checked by built-in functions.

3 Debug function

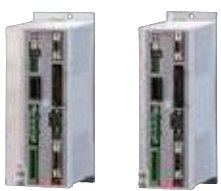
Run the program with specified conditions and check the operations of the program.

4 Simulation

You can check (simulate) the program on a PC without operating it on the controller.

SCON-LC/LCG

List of Models/Price

Model number		SCON-LC/LCG									
External view											
I/O type		Standard specification		Field network type *1							
		PIO connection specification		DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	MECHATROLINK I,II *2	EtherCAT	EtherNet/IP	PROFINET IO
I/O type code		NP/PN	DV	CC	PR	CN	ML	EC	EP	PRT	
Applicable encoder type		Battery-less abs. Incremental Quasi abs.	Absolute	Battery-less absolute/ Incremental/Absolute/Quasi-absolute							
SCON-LC/LCG Motor type	12~150W	<input type="checkbox"/>	<input type="checkbox"/>								
	200W	<input type="checkbox"/>	<input type="checkbox"/>								
	100S/200S/300S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	300~400W	<input type="checkbox"/>	<input type="checkbox"/>								
	600W	<input type="checkbox"/>	<input type="checkbox"/>								
	750W	<input type="checkbox"/>	<input type="checkbox"/>								

*1 It cannot be used with the PIO. *2 It is treated as an Intelligent I/O, and supports asynchronous communication command. (Note) Pulse-train control is not available.

Model

SCON - [] - [] - [] - [] - [] - [] - []

Series Type Motor Type Encoder Type Option I/O Type I/O Cable Length Power Supply Voltage

LC	PLC equipped type						
LCG	Safety category PLC equipped type						

HA	Hi-accel./decel. specification						
----	--------------------------------	--	--	--	--	--	--

* High acceleration / deceleration specification is available to choose only when the high acceleration / deceleration option has been chosen for the actuator.
<High-acceleration/deceleration compatible actuators>
RCS2-SA4C/SA5C/SA6C/SA7C/RA4C/RA5C/RGS4C/RGS5C/RGD4C/RGD5C

1	Single phase 100VAC
2	Single phase 200VAC

* Please check the power supply voltage that can be selected on the page of the actuator.

12	12W	200	200W
20	20W	200S	200W
30D	30W	300S	300W
30R	30W	400	400W
60	60W	600	600W
100	100W	750	750W
100S	100W		
150	150W		

(Example) 12: 12W Servo motor compatible

WAI	Battery-less absolute incremental
A	Absolute
G	Quasi-absolute*1
AI	Index absolute type *2
AM	Multi-Rotation Absolute type *2

*1 Quasi-absolute is for LSAS Series only.
*2 DD motor operation mode is added.

NP	PIO NPN (Standard)
PN	PIO PNP
DV	DeviceNet
CN	CompoNet
CC	CC-Link
ML	MECHATROLINK-I/II
PR	PROFIBUS-DP
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

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

* If you choose a field network specification, the length of the I/O cable will be 0".

Note

Basically, the type of motor is the same as that of the actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.


<Actuators for 30D, 30R and 200S>

- Controller Motor type "30D" ... 30W actuator other than RS
 - Controller Motor type "30R" RS
 - Controller motor type [200S] DD-LT18□ DDCR-LT18□ DDA-LT8C DDACR-LT8C
- * For 200S, the controller casing will be 400W. Check the 400W specification for the price.

SCON-LC/LCG (For servo press only)

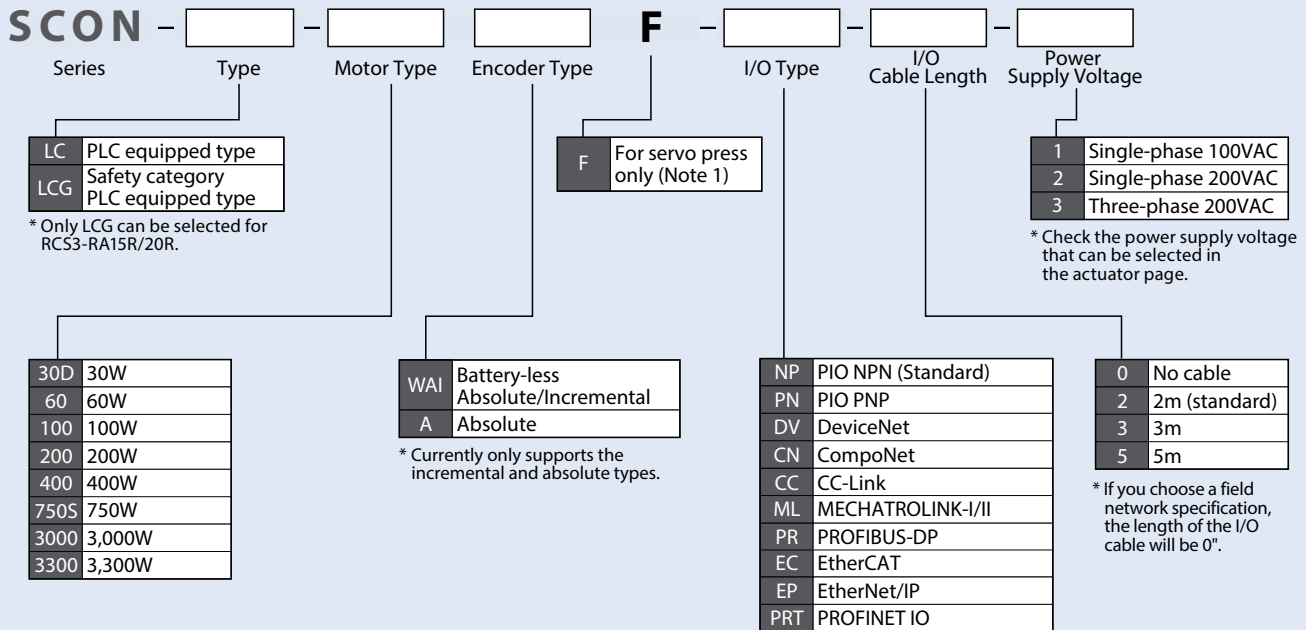
This page shows models only.
Please refer to P7-159 ~ for features and detailed specifications of the servo press controller.

List of Models

SCON-LC/LCG										
Model number										
External view										
I/O type	Standard specification		Network connection specification (option) *1							
	PIO connection specification		DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	MECHATROLINK I/II *2	EtherCAT	EtherNet/IP	PROFINET IO
I/O type code	NP/PN		DV	CC	PR	CN	ML	EC	EP	PRT
Applicable encoder type	Incremental	Absolute	Incremental/Absolute							
Motor type	30W, 60W, 100W	<input type="radio"/>	<input type="radio"/>							
	200W	<input type="radio"/>	<input type="radio"/>							
	400W	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	750W	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	3,000W	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	3,300W	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*1 It cannot be used with the PIO. *2 It is treated as an Intelligent I/O, and supports asynchronous communication command.
(Note) Pulse-train control is not available.

Model



(Note 1) It is left blank if the press program is not used.

Note

Basically, the type of motor is the same as that of the actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.

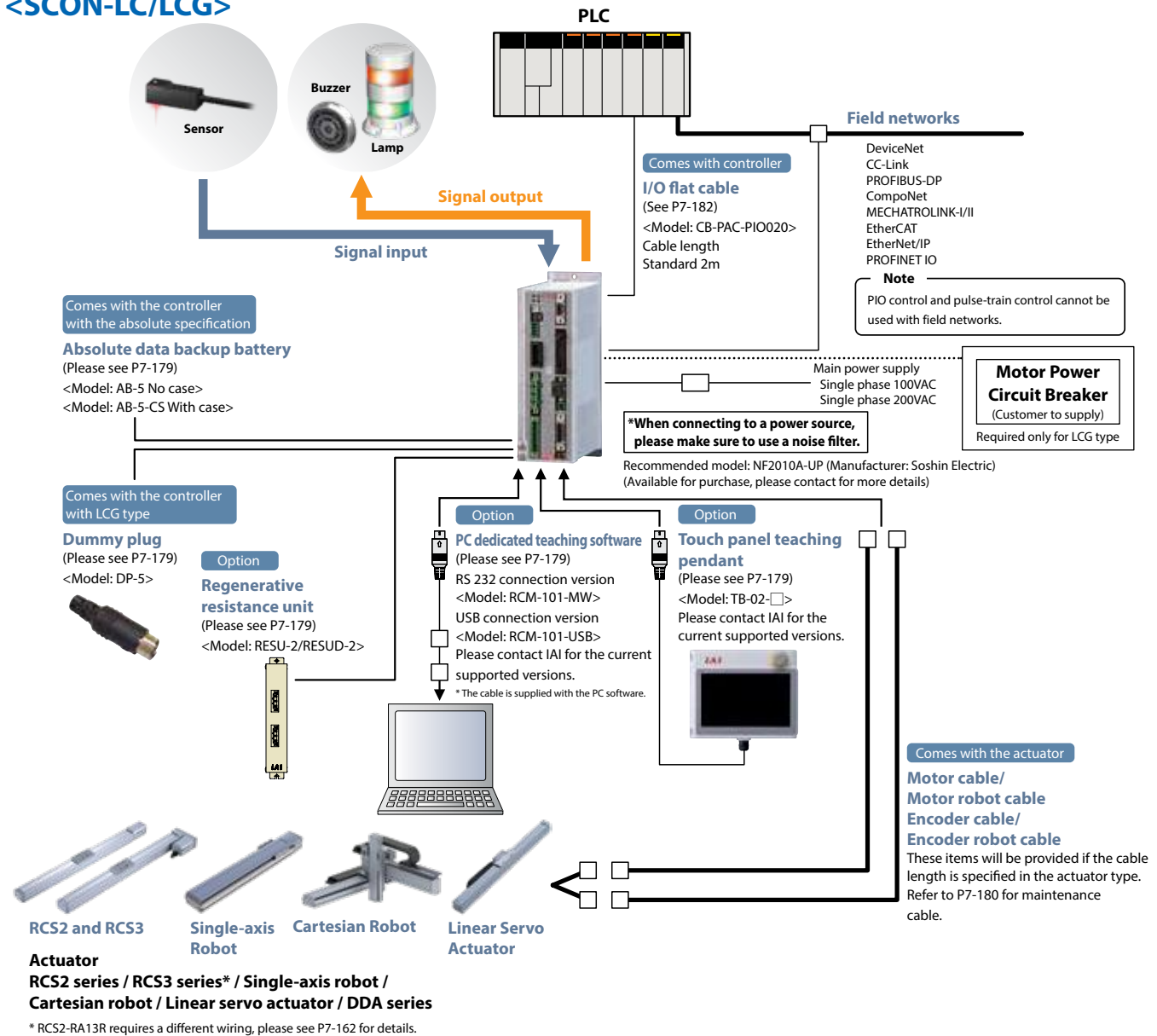
<applicable actuators for 30D and 750S>

● Controller Motor type "30D"
RCS3-RA4R

● Controller motor type "750S"
RCS2-RA13R When selecting the LCT option

System configuration

<SCON-LC/LCG>



Operation Pattern (allocation) of Field Network

Each bit of the field network communication uses general-purpose input and output. If necessary, use a ladder program to connect it to an internal relay with each I/O pattern allocated.

* Set the operation pattern to the parameter No.84 fieldbus operation mode.

Set value of parameter No.84	Operation pattern	CC link				Excluding CC link											
		Input area		Output area		Input area		Output area									
		RWr0	RWr1	RWr2	RWr3	RWw0	RWw1	RWw2	RWw3	Input 0	Input 1	Input 2	Input 3	Output 0	Output 1	Output 2	Output 3
0	Remote I/O mode																
1	Position/simple direct value mode																
2	Half direct value mode																
3	Full direct value mode																
4	Remote I/O mode 2					General-purpose input				General-purpose input				General-purpose output			
5	Position/simple direct value mode 2																
6	Half direct value mode 2																
7	Remote I/O mode 3																
8	Half direct value mode 3																

* Please refer to P7-159 ~ for specifications of the servo press controller.

Specification Table

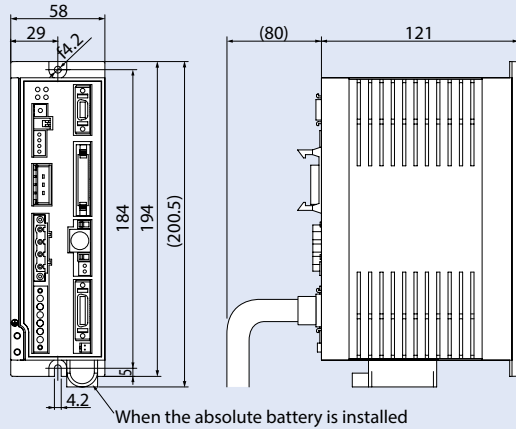
Item		SCON-LC/LCG		
Applicable motor capacity		Less than 400W	400W~750W	
Number of controlled axes		1 axis		
Operation method		Positioner type		
Number of positioning points		512 points (PIO specification), 768 points (Field network specification)		
Backup memory		Non-volatile memory (FRAM)		
Power supply voltage		Single-phase 100~115VAC Single-phase 200~230VAC (Power supply fluctuations: within ±10%)	Single-phase 200~230VAC (Power supply fluctuations: within ±10%)	
PIO power supply		24VDC ±10%		
Electromagnetic brake power (For actuator with brake)		24VDC ±10%, 1A (MAX) (Supplied from the outside)		
Electromagnetic brake forced release		Brake release switch ON/OFF		
Power-supply capacity (Note 1)		12W/89VA 20W/74VA 30W (other than RS)/94VA 30W (RS)/186VA 60W (other than RCS3-CTZ5C)/186VA 60W (For CS3-CTZ5C)/245VA 100W/282VA 150W/376VA 200W/469VA	100SW (For LSA/LSAS-N10) ^(*) /331VA 200SW (For LSA-S10H, LSA/LSAS-N15S) ^(*) /534VA 200SW (For LSA/LSAS-N15H) ^(*) /821VA 300SW (For LSA-N19) ^(*) /710VA 400W (other than RCS3-CT8C)/968VA 400W (For RCS3-CT8C)/1278VA 600W/1212VA 750W/1569VA 750SW/1569VA	
Vibration resistance		X,Y,and Z directions, 10~57Hz single-side width 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (intermittent)		
Motor control method		Sine wave PWM vector current control		
Compatible encoder		Incremental serial encoder Absolute serial encoder Battery-less absolute encoder ABZ (UVW) parallel encoder Quasi absolute encoder		
Driving power shut-off function		LC: Available (built-in relay) LCG: Unavailable		
Serial communication interface		RS485: 1CH .. Modbus protocol RTU/ASCII compliant, Speed: 9.6~230.4Kbps Can be controlled by serial communication Total cable length: 100m or less		
External interface	PIO specification	24VDC general-purpose signal input/output (NPN/PNP selection) ... Input max. of 16 points, output max. of 16 points		
	Field network specification	DeviceNet, CC-Link, PROFIBUS-DP, CompoNet, MECHATROLINK-I/II, EtherCAT, EtherNet/IP, PROFINET IO		
	Multifunction connector	Serial communication interface 2	For display connection RS485: 1CH .. Modbus protocol RTU/ASCII compliant, Speed: 9.6~230.4Kbps	
		Feedback pulse	Differential type (line-driver type): MAX. 2.5Mpps Open collector method: MAX 500Kpps (JM-08 option)	
Data setting, input method		PC dedicated teaching software, Touch panel teaching pendant		
Number of Programmable steps		4K		
Data retention memory		Position data and parameters are saved in non-volatile memory. (No limit to rewrite)		
Calendar/clock function	Retention time	Approx. 10 days		
	Charge time	Approx. 100 hours		
Protective functions		Overcurrent, abnormal temperature, low fan speed monitoring, encoder disconnection, etc.		
Ambient operating temperature		0~40°C		
Ambient operating humidity		85%RH or less (non-condensing)		
Operating atmosphere		Free from corrosive gases		
Degree of protection		IP20		
Mass		Approx. 900g (+ 25g for the absolute specification)	Approx. 1.2kg (+ 25g for the absolute specification)	
External dimensions		58mm (W) × 194mm (H) × 121mm (D)	72mm (W) × 194mm (H) × 121mm (D)	

(Note 1) The external dimensions of the controller to operate actuator models denoted by (*) are those for 400W or more, even when the motor capacity is under 400W.

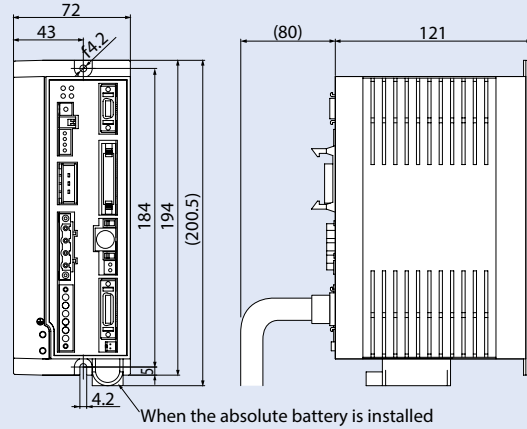
* Please refer to P7-159 ~ for specifications of the servo press controller.

External Dimensions

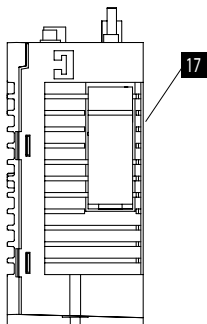
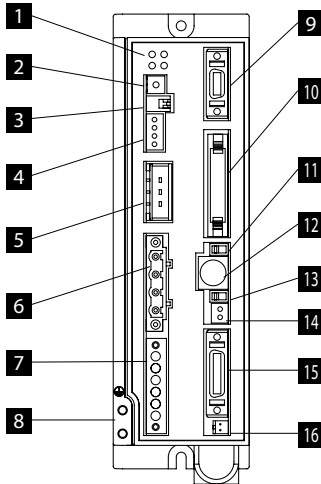
Less than 400W



400W~750W



Name of Each Part



1 Status display LED

It displays the controller status.

Name	Color	Function description
PWR	Green	Turns on when system is ready (after power ON and CPU is functioning normally).
SV	Green	Turn on when servo is on
ALM	Orange	Turns on when alarm issued
EMG	Red	Turns on while in emergency stop

2 Axis number setting switch

A switch for setting the axis number when operating multiple axes by serial communication.

3 Operation mode switch

Switch for the positioner mode and the pulse-train control mode. Pulse-train control mode cannot be selected for this product.

Type	Description
1	Used by the manufacturer for adjustment. Always keep this switch OFF.
2	

4 System I/O connector

The connector for the emergency stop switch etc.

5 Regenerative unit connector

The connector for regenerative units which absorb the regenerative current generated when the actuator decelerates and stops.

6 Motor connector

The actuator motor cable connector.

7 Power supply connector

The AC power connector. Divided into controller power input and motor power input.

8 Grounding terminal

The protective grounding screw. Please make sure to secure grounding.

9 Multi-function connector

Connector for using the feedback pulse output and SIO communication function (SIO2).

10 PIO connector

Cable connector for performing parallel communication with peripheral devices such as PLC. It is not to be installed for the field network specification.

11 Operation mode selection switch

Name	Description
MANU	Does not accept ladder commands
AUTO	Accepts ladder commands

* The emergency stop switch on the touch panel teaching pendant becomes effective as soon as it is connected, regardless of AUTO or MANU.

Also, turn the power off before disconnecting the touch panel teaching pendant or SIO communication cable.

12 SIO connector

The connector for the touch panel teaching pendant or the PC communication cable.

13 Brake release switch

The forced release switch for the electromagnetic brake integrated with an actuator.

* It is necessary that 24V DC power supply for brake drive is connected.

14 Brake power supply connector

The connector for supplying 24VDC power to the brake (necessary only when brake-equipped actuator is connected).

15 Encoder / Sensor connector

The encoder/sensor cable connector.

16 Absolute battery connector

The connector for the absolute data backup battery (necessary only for absolute encoder type).

17 Absolute battery holder

A battery holder to mount the absolute data backup battery.

* Please refer to P7-159 ~ for specifications of the servo press controller.

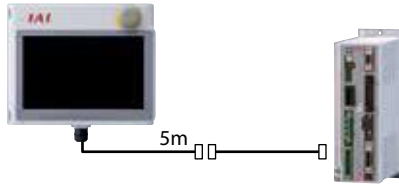
Options

Touch panel teaching pendant

Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

Model **TB-02-**

Configuration



Specification

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Degree of protection	IP20
Mass	470g (TB-02 unit only)

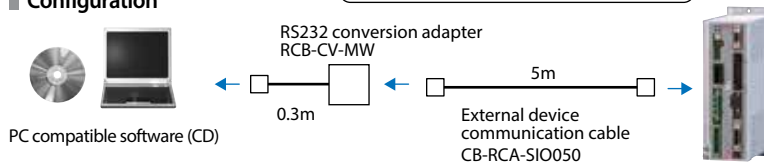
PC dedicated teaching software (Windows only)

Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

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

Configuration

Refer to IAI for the current supported versions.



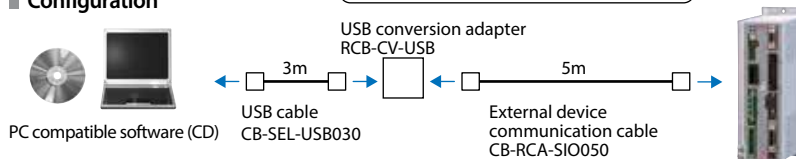
Supported Windows: 7/8/8.1/10



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

Configuration

Refer to IAI for the current supported versions.



Regenerative Resistance Unit

Features This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the tables below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

Model **RESU-2** (Standard specification)/**RESUD-2** (DIN rail mounting specification)

Specification

Model number	RESU-2	RESUD-2
Mass	Approximately 0.4kg	
Internal regen. resistance value	235Ω 80W	
Mounting method	Screw mount	DIN rail mount
Included cable	CB-SC-REU010	

Necessary Quantity Guideline

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

* Regenerative resistance units more than specified above may be required depending on the operating conditions.

* Guideline for the linear servo actuator is same as above. However, one unit is needed for LSA/LSAS-N105 types.

Necessary Quantity Guideline (RCS2-RA13R)

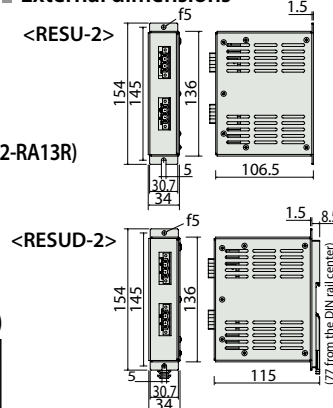
	Lead 2.5	Lead 1.25
Horizontal	1	0
Vertical	1	1

* Regenerative resistance units more than specified above may be required depending on the operating conditions.

Necessary Quantity Guideline (DD)

Series	Type	Required Quantity
DD	T18□/LT18□	1
	H18□/LH18□	2

External dimensions



* When two regenerative units are required, please use one RESU-2 and one RESU-1 (Please refer to P7-288).

Absolute data backup battery

Feature This is an absolute data backup battery for an actuator with absolute specification.

Model **AB-5 (battery only)**
AB-5-CS (with a case)



Dummy plug

Features This is required when the safety category specification (SCON-LCG) is used.

Model **DP-5**



* Please refer to P7-159 ~ for specifications of the servo press controller.

Maintenance Parts

When placing an order for a replacement cable, please use the model number shown below

Table of Applicable Cables

Model Number	Motor Cable	Motor Robot Cable	Encoder Cable	Encoder Robot Cable
① RCS2(CR/W) RCS3(CR)	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
② RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③ RA13R (without load cell / without brake)*2			CB-RCS2-PLA□□□	CB-X2-PLA□□□
④ RA13R (without load cell / with brake)*2			CB-RCS2-PLA□□□	* Between controller and brake CB-X2-PLA□□□
⑤ RCS3 CTZ5C CT8C			—	CB-X1-PA□□□
⑥ RCS3 RA15R RA20R	—	CB-RCS3-MA□□□-RB	CB-RCS3-PLA□□□-RB	
⑦ RCS4(CR)	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	—	CB-X1-PA□□□
⑧ NS No LS	—	CB-X-MA□□□	—	CB-X3-PA□□□
⑨ NS With LS	—		—	CB-X2-PLA□□□
⑩ LSAS N	—		—	CB-X1-PA□□□
⑪ LSA S/H/L/N	—		—	CB-X3-PA□□□
⑫ LSA W	—	CB-XMC-MA□□□	—	CB-X2-PLA□□□
⑬ DDA DDACR DDW	LT18□	—	—	CB-X3-PA□□□
⑭ DDA DDACR DDW	LH18□	—	—	Between the brake box and the actuator, CB-DDB-BK□□□
⑮ DDA DDACR (With brake)	LT18□	—	—	CB-X3-PA□□□
⑯ DDA DDACR (With brake)	LH18□	—	—	CB-X1-PA□□□-WC
⑰ IS(P)WA	S/M/L	—	—	CB-X1-PA□□□ (In case of 20 m or less) *1 CB-X1-PA□□□-AWG24 (In case of 21 m or more) CB-X1-PLA□□□ (In case of 20 m or less) *1 CB-X1-PLA□□□-AWG24 (In case of 21 m or more)
⑱ Models other than ①~⑰ Specification with LS	—	CB-X-MA□□□	—	—

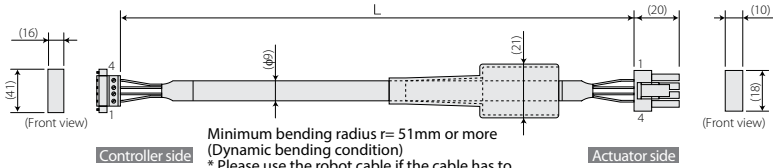
*1 Model that is not battery-less absolute specification will be CB-X1-PA □□□ / CB-X1-PLA □□□ even when it is 21 m or more.

*2 Please refer to P7-170 for the load cell specification cable for RCS2-RA13R.

Model Number	PIO flat cable
⑳ SCON-LC/LCG	CB-PAC-PIO□□□

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

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

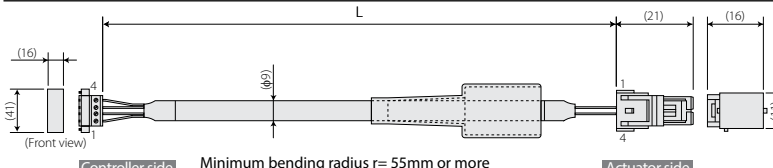


Minimum bending radius r = 51mm or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

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

Model Number **CB-XMC-MA□□□**

* Please indicate the cable length (L) in □□□, e.g.) 080 = 8m SCON/SSEL: 20m, XSEL: 30m

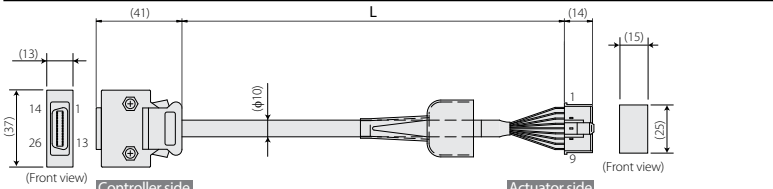


Minimum bending radius r = 55mm or more (Dynamic bending condition)
* The robot cable is used as standard.

Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
1.25sq	Green	PE	1	1	U	Red	1.25sq (Crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Model Number **CB-RCS2-PA□□□ (For RCS2/RCS3)/CB-X3-□□□ (For NS/RCS2/RCS3)**

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m



Minimum bending radius r = 58mm or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

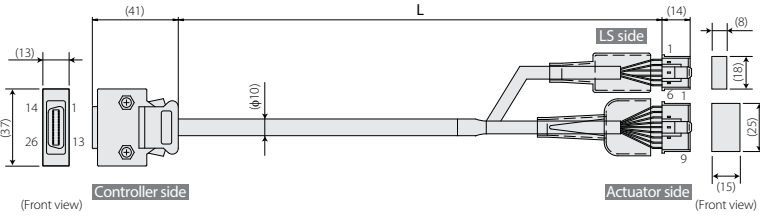
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
—	—	—	10	2	A	White/Blue	AWG26 (Crimped)
—	—	E24V	12	3	B	White/Yellow	
White/Green	OV	13	4	4	B	White/Black	
White/Orange	LS	25	5	5	Z	White/Black	
—	—	CHLEEP	25	6	Z	White/Gray	
—	—	OT	24	7	LS+	White/Orange	
—	—	RSV	23	8	—	—	
—	—	—	9	9	—	—	
—	—	—	19	10	—	—	
White/Blue	A+	—	—	11	—	—	
White/Yellow	A-	—	—	12	—	—	
White/Red	B+	—	—	13	—	—	
White/Black	B-	—	—	14	VCC	Black	
White/Purple	Z+	—	—	5	Z	White/Black	
White/Gray	Z-	—	—	6	Z	White/Gray	
Orange	SFD+	—	—	7	LS+	White/Orange	
Green	SFD-	—	—	8	—	—	
Purple	BAT+	—	—	14	—	—	
Gray	BAT-	—	—	15	—	—	
Red	VCC	—	—	16	—	—	
Black	GND	—	—	17	B A T +	Purple	
Blue	BKR-	—	—	20	B A T -	Gray	
Yellow	BKR+	—	—	21	VCC	Red	
—	—	—	—	22	GND	Black	
Shield is clamp connected to the hood	—	—	—	16	LS-	White/Green	
—	—	—	—	17	BK-	Blue	
—	—	—	—	18	BK+	Yellow	

* Please refer to P7-159 ~ for specifications of the servo press controller.

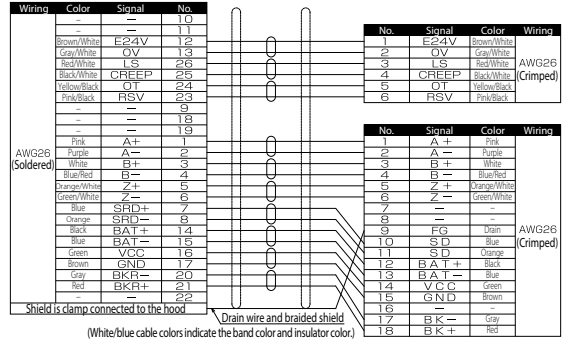
Maintenance Parts

When replacing a cable after purchasing the product, please refer to the list of models below.

Model Number **CB-RCS2-PLA** (For RCS2 rotary) / **CB-X2-PLA** (NS LS specification/for RCS rotary) * Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

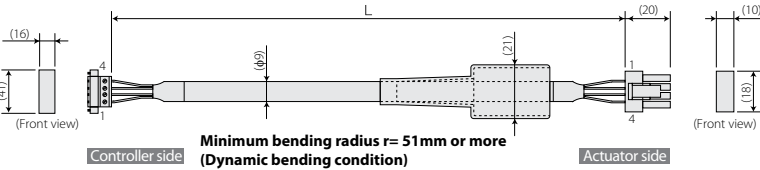


Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

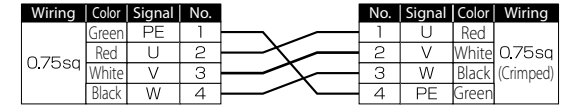


* The above is wiring diagram of the encoder cable. For wiring diagram of encoder robot cable, please check CB - X2 - PLA on P7-239.

Model Number **CB-X-MA**

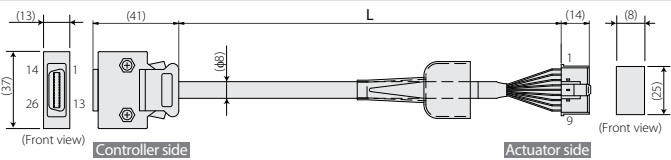


Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

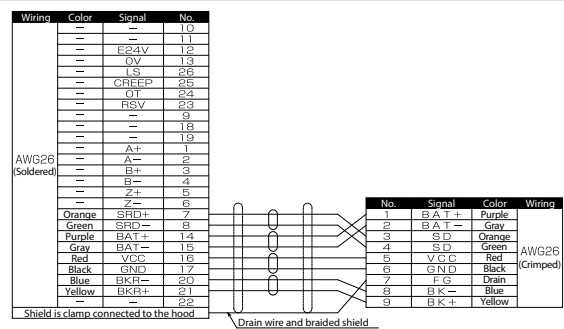


* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

Model Number **CB-X1-PA**

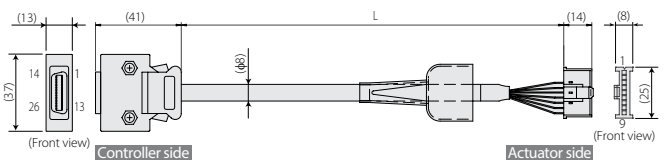


Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.
* For ISB, ISDB, ISDBCR and NSA (the encoder type is battery-less absolute) with the cable length of 21m or longer, please select CB-X1-PA -AWG 24.

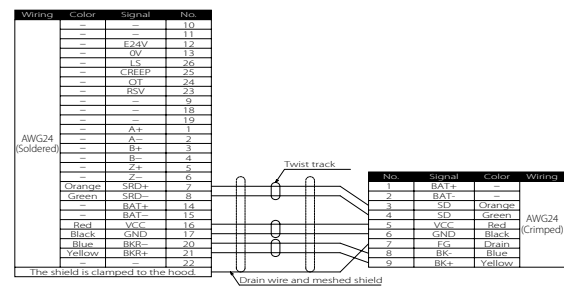


* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

Model Number **CB-X1-PA -AWG24**

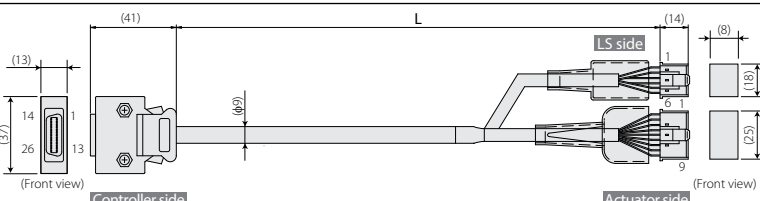


Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

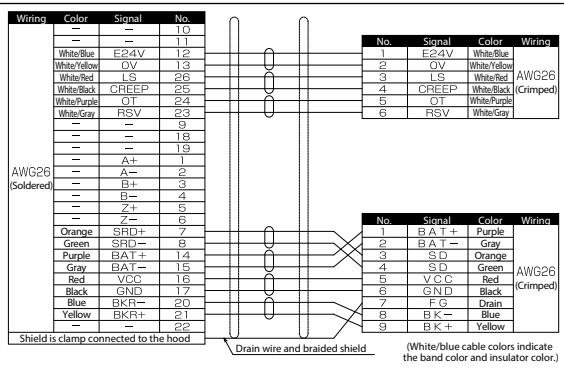


* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 210 = 21m

Model Number **CB-X1-PLA**



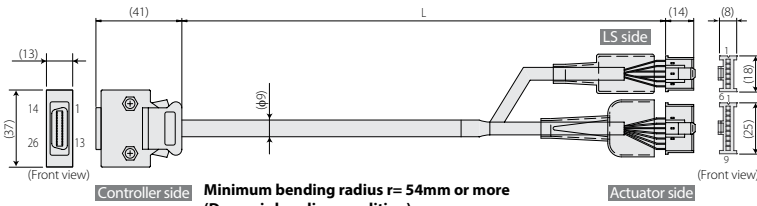
Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.
* For ISB, ISDB, ISDBCR and NSA (the encoder type is battery-less absolute), please select CB-X1-PA -AWG 24 if you want a cable of 21 m or more.



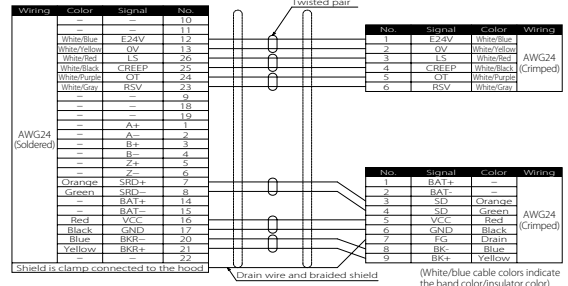
* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

Model Number CB-X1-PLA--AWG24

* Please indicate the cable length (L) in , maximum 30m, e.g.) 210=21m

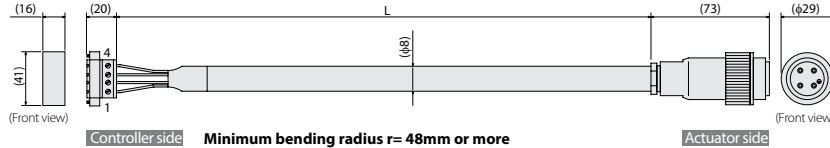


Minimum bending radius $r=54\text{mm}$ or more
(Dynamic bending condition)
* the robot cable is used as standard.

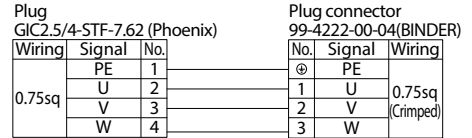


Model Number CB-XEU-MA-

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080=8m

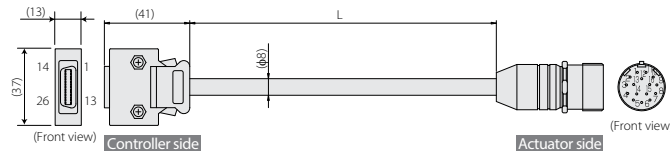


Minimum bending radius $r=48\text{mm}$ or more
(Dynamic bending condition)
* the robot cable is used as standard.

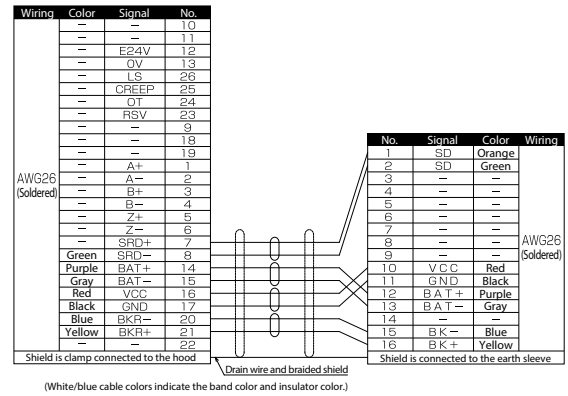


Model Number CB-X1-PA--WC

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080=8m

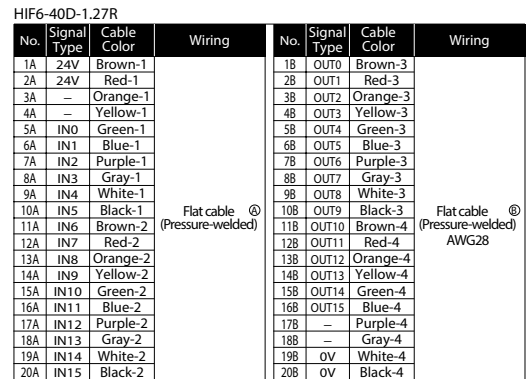
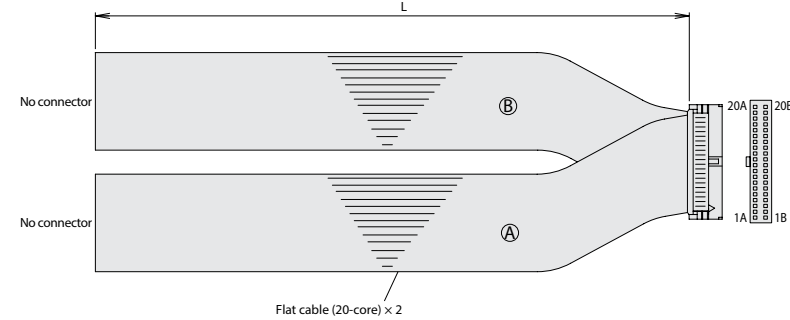


Minimum bending radius $r=44\text{mm}$ or more
(Dynamic bending condition)
* the robot cable is used as standard.



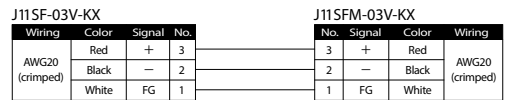
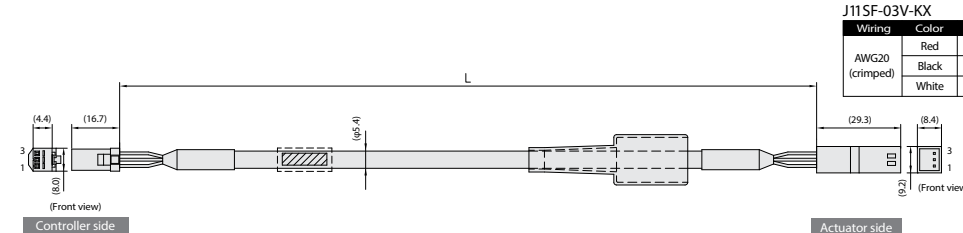
Model Number CB-PAC-PIO-

* Please indicate the cable length (L) in , maximum 10m, e.g.) 080=8m



Model Number CB-DDB-BK-

* Please indicate the cable length (L) in , maximum 20m, e.g.) 080=8m

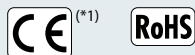


SCON-CAL



Position Controller for Single-axis Robot/Cartesian Robot/ROBO Cylinder

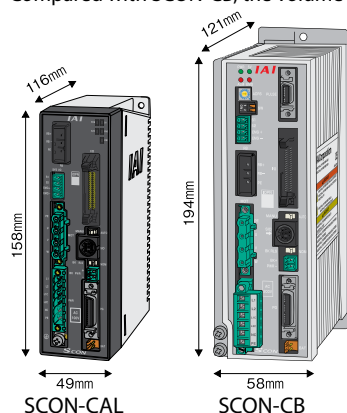
RCS2/RCS3



(*1) MECHATROLINK-I/II connection specification is not compliant with CE Marking.

1 Downsized

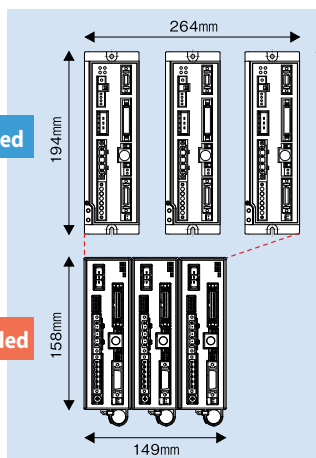
Compared with SCON-CB, the volume has been reduced to 34%. It contributes to the space saving of the control panel.



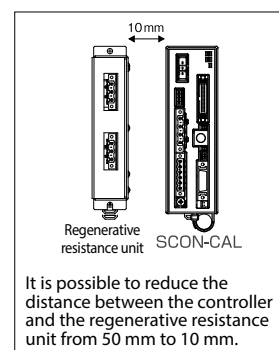
Smaller in volume 34%

Three SCON-CB's installed

Three SCON-CAL's installed



Installation space: Approx. 53% less
Installation width: Approx. 43% less



2 Improved maintainability

- When the absolute battery voltage or fan speed drops, the "WRG (warning)" LED turns on to alert the situation. With this function, you are informed visually when to replace each maintenance part. (The controller can also be set up to output a warning signal.)
- The total number of actuator movements and the accumulated distance travelled are calculated and recorded in the controller, and when the predetermined count or distance is exceeded, a signal is output to an external device. You can use this function to check when the actuator needs re-greasing or periodic inspection. Alarm logs can easily be analyzed.



3 Function comparison with SCON-CB


	SCON-CB	SCON-CAL
① Supported encoders	Incremental Battery-less absolute encoder Absolute ABZ (UVW) parallel encoder	Incremental Battery-less absolute encoder Absolute
② Pulse-train control	○	×
③ Servo monitor function	○	×
④ Offboard tuning	○	△ Unable to analyze with servo monitor
⑤ Vibration control function	○	△ Unable to analyze with servo monitor

(Note) Depending on the actuator, some models can not be connected to SCON - CAL. Please refer to P7-185 for details.

<<Explanation of Functions>>

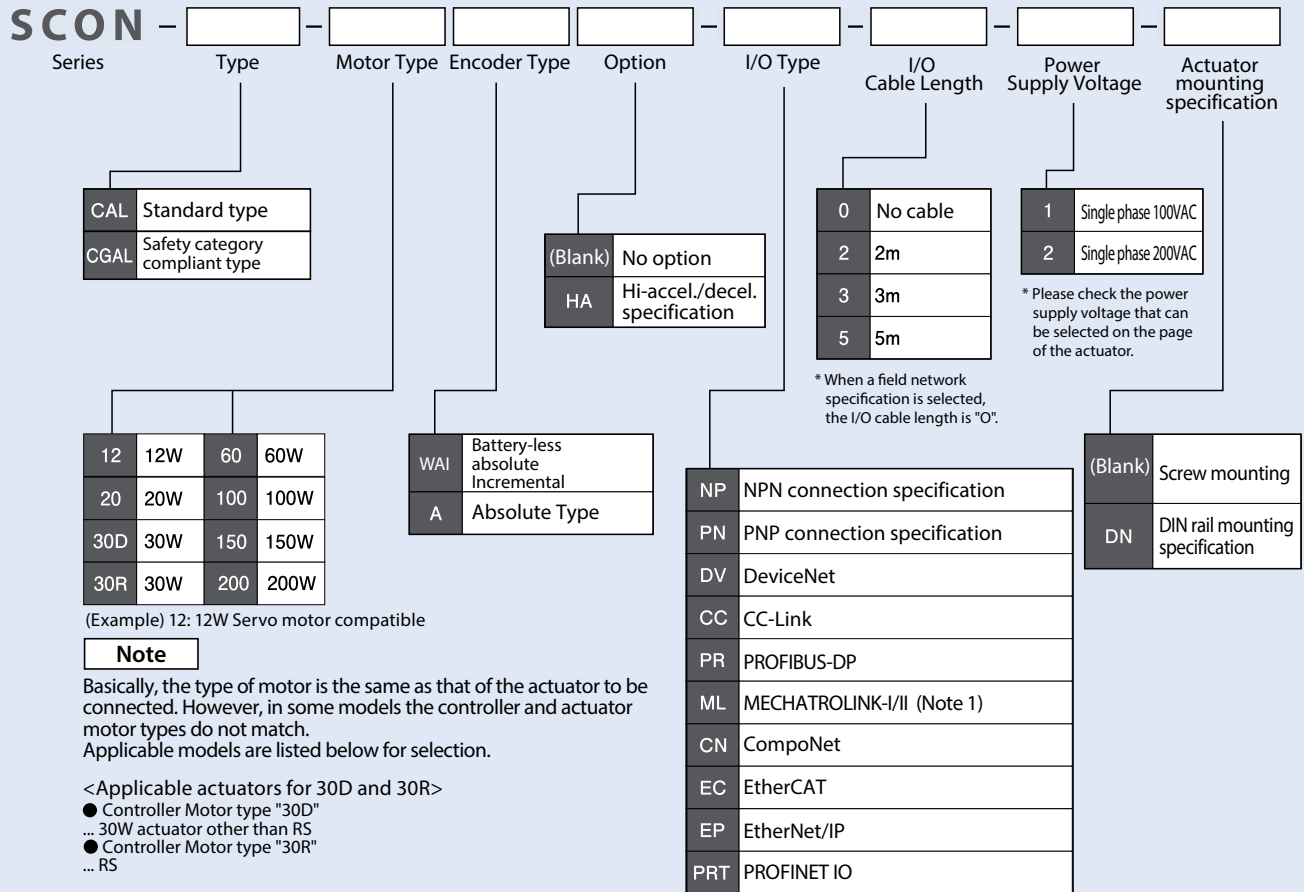
- ③ Servo monitor function: You can check the current speed, position, etc.
- ④ Offboard tuning: An optimal servo gain is calculated according to the payload.
- ⑤ Vibration control function: When the actuator slider moves, oscillation (vibration) of the workpiece attached to the slider is suppressed.

List of Models

Model number	SCON-CAL / CGAL									
External view										
I/O type	Standard specification		Network connection specification (Option)*1							
I/O type specification	PIO connection specification		DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	MECHATROLINK I/II*2	EtherCAT	EtherNet/IP	PROFINET IO
I/O type code	NP/PN		DV	CC	PR	CN	ML	EC	EP	PRT
Applicable encoder type	Battery-less absolute Incremental	Absolute	Battery-less absolute/ Incremental/Absolute							
SCON-CAL/CGAL	○	○	○	○	○	○	○	○	○	○

*1 If a network specification is selected, PIOs are not available.
 * This product does not support pulse-train control.
 * The DIN rail mounting specification will be increased by ¥ 1000.

Model



Note

Basically, the type of motor is the same as that of the actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.

<Applicable actuators for 30D and 30R>

- Controller Motor type "30D"
- ... 30W actuator other than RS
- Controller Motor type "30R"
- ... RS

(Note 1) Please be sure to check P7-<OV> for the caution when selecting.

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

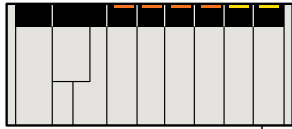
TB-02

TB-03

System configuration

Controller

PLC



Field networks

- DeviceNet
- CC-Link
- PROFIBUS-DP
- CompoNet
- MECHATROLINK-I/II
- EtherCAT
- EtherNet/IP
- PROFINET IO

Controller accessory

I/O flat cable

(See P7-196)
<Model: CB-PAC-PIO020>
Cable length
Standard 2m

Note

PIO control and the field networks cannot be used together.

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

**SCON
-CAL**

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Comes with the controller with the absolute specification

Absolute data backup battery

(See P7-192)
<Model: AB-5 No case>
<Model: AB-5-CS With case>

Option

Regenerative resistance unit

(See P7-193)
<Model: RESU-2>
<Model: RESUD-2>



*** When connecting to a power source, please make sure to use a noise filter.**

Recommended model: NF2010A-UP (Manufacturer: Soshin Electric)
(Available for purchase, please contact for more details)

Main power supply
Single phase 100VAC
Single phase 200VAC

Comes with the SCON-CGAL

Dummy plug

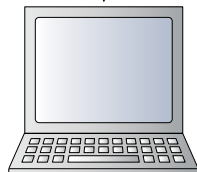
(See P7-192)
<Model: DP-5>



Option

PC dedicated teaching software

(See P7-192)
RS232 connection version
<Model: RCM-101-MW>
USB connection version
<Model: RCM-101-USB>
* Cable is included with the PC dedicated teaching software.



Option

Teaching pendant

(See P7-192)
<Model: TB-02-□>
* Please contact IAI for the current supported versions.



Motor cable

(See P7-194)

Encoder cable

(See P7-194)

Actuator

RCS2 series / RCS3 series / Single-axis robot



(Note) The actuators which cannot be connected to SCON-CAL

- Actuators whose motor wattage is greater than 200W
- Linear actuators • DD Series

Incremental types of the following models:

- NS-S types: RCS2-SRA7BD, SRGD7BD, SRGS7BD
- Mini ROBO Cylinders: RCS2-RN5N, RP5N, GS5N, GD5N, SD5N, TCA5N, TWA5N, TFA5N

Operation Modes

This controller only supports the positioner control mode.

In the positioner mode, you can enter position data (target position, speed, acceleration, etc.) in the controller under the desired numbers and then specify each number externally via a I/O (input/output signal) to operate the actuator. Also, in the positioner mode, you can select the desired operation mode from the six modes using the parameter.

Mode	Number of positioning points	Features
Positioner mode	Positioning mode	64 Standard factory-set mode. Specify externally a number corresponding to the position you want to move to, to operate the actuator.
	Teaching mode	64 In this mode, you can move the slider (rod) via an external signal and register the stopped position in the position data table.
	256-point mode	256 In this mode, the number of positioning points available in the positioning mode has been increased to 256 points.
	512-point mode	512 In this mode, the number of positioning points available in the positioning mode has been increased to 512 points.
	Solenoid valve mode 1	7 Like the solenoid valve of an air cylinder, the actuator can be moved only by turning signals ON/OFF.
	Solenoid valve mode 2	3 In this mode, the output signal is set to the same as the air cylinder auto switch in the solenoid valve mode.

I/O Signal Table * You can select one of six types of I/O signal assignments.

PIN number	Category	Positioning point	Parameter (PIO pattern) selection					
			0	1	2	3	4	5
			Positioning mode 64	Teaching mode 64	256-point mode 256	512-point mode 512	Solenoid valve mode 1 7	Solenoid valve mode 2 3
1A	24V		P24					
2A	24V		P24					
3A	—		NC					
4A	—		NC					
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2(-)
8A		IN3	PC8	PC8	PC8	PC8	ST3	—
9A		IN4	PC16	PC16	PC16	PC16	ST4	—
10A		IN5	PC32	PC32	PC32	PC32	ST5	—
11A		IN6	—	MODE	PC64	PC64	ST6	—
12A		IN7	—	JISL	PC128	PC128	—	—
13A		IN8	—	JOG+	—	PC256	—	—
14A		IN9	BKRL	JOG-	BKRL	BKRL	BKRL	BKRL
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD
16A		IN11	HOME	HOME	HOME	HOME	HOME	—
17A		IN12	*STP	*STP	*STP	*STP	*STP	—
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—
19A		IN14	RES	RES	RES	RES	RES	RES
20A		IN15	SON	SON	SON	SON	SON	SON
1B	Output	OUT0	PM1	PM1	PM1	PM1	PE0	LS0
2B		OUT1	PM2	PM2	PM2	PM2	PE1	LS1 (TRQS)
3B		OUT2	PM4	PM4	PM4	PM4	PE2	LS2(-)
4B		OUT3	PM8	PM8	PM8	PM8	PE3	—
5B		OUT4	PM16	PM16	PM16	PM16	PE4	—
6B		OUT5	PM32	PM32	PM32	PM32	PE5	—
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	—
8B		OUT7	ZONE1	MODES	PM128	PM128	ZONE1	ZONE1
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—
13B		OUT12	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B		OUT15	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM
17B	—		NC					
18B	—		NC					
19B	0V		N					
20B	0V		N					

* In the above table, signals in () represent functions available before the home return.
* In the above table, signals preceded by * are turned OFF while the actuator is operating.

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Field network specification Operation mode Description

If the SCON-CAL is controlled via a field network, you can select one of the following six modes to operate the actuator. Please note that the data areas required on the PLC side will vary depending on the mode.

Mode Description

	Mode	Description
0	Remote I/O mode	Similarly to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1	Position/simple direct value mode	The target position value is directly input, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
2	Half direct value mode	The actuator is operated by directly input values for speed, acceleration, deceleration and push current, as well as the target position.
3	Full direct value mode	The actuator is operated by directly inputting values for the target position, speed, acceleration, deceleration and push current, etc. In addition, you are able to read the current position, current speed, and the specified current, etc.
4	Remote I/O mode 2	This mode is the same as the remote I/O mode above, with the added functionality of reading current position and the command motor current.
8	Half direct value mode 3	This mode corresponds to the damping control function instead of the jog function of the half direct value mode.

Required Data Size for Each Network

	Mode	DeviceNet	CompoNet	CC-Link	MECHATROLINK-I/II	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 bytes	2 bytes	1 channel	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes
1	Position/simple direct value mode	8 bytes	8 bytes	1 channel	8 bytes	8 bytes	8 bytes	8 bytes	8 bytes
2	Half direct value mode	16 bytes	16 bytes	2 channels	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes
3	Full direct value mode	32 bytes	32 bytes	4 channels	× (Note 1)	32 bytes	32 bytes	32 bytes	32 bytes
4	Remote I/O mode 2	12 bytes	12 bytes	1 channel	12 bytes	12 bytes	12 bytes	12 bytes	12 bytes
8	Half direct value mode 3	16 bytes	16 bytes	2 channels	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note1)	Remote I/O mode 2	Half direct value mode 3
Number of positioning points	512	768	No limit	No limit	512	No limit
Operation by direct position data input	×	○	○	○	×	○
Direct speed/acceleration input	×	×	○	○	×	○
Push-motion operation	○	○	○	○	○	○
Current position read	×	○	○	○	○	○
Current speed read	×	×	○	○	×	○
Operation by position number input	○	○	×	×	○	×
Completed position number read	○	○	×	×	○	×
Vibration control	○	○	×	○	○	○
Servo gain switching	○	○	○	○	○	○

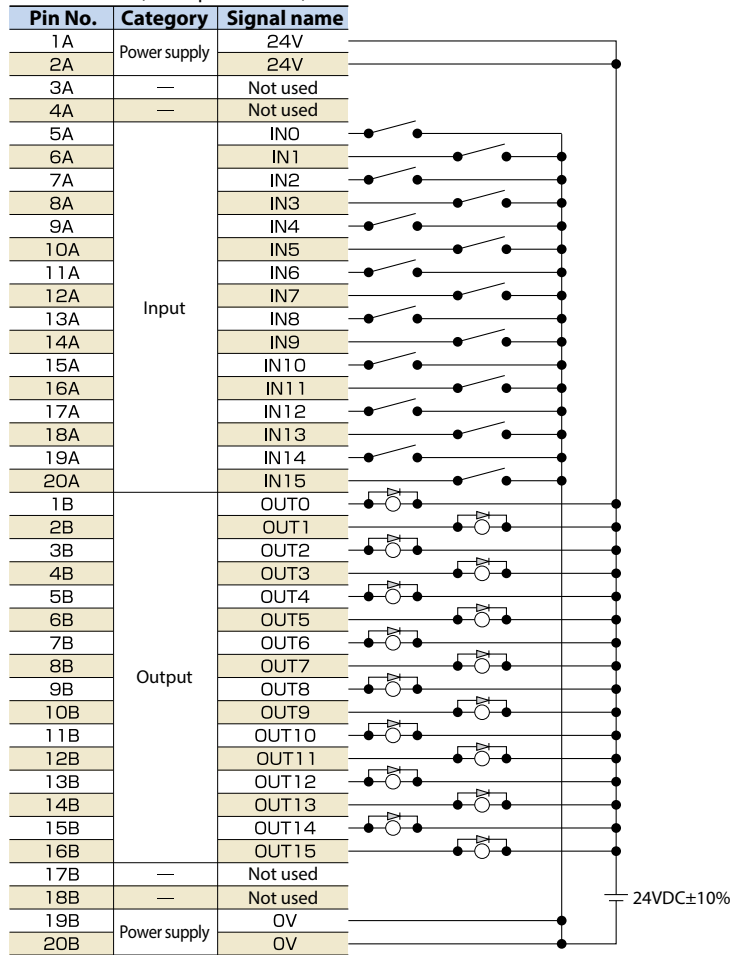
* ○ indicates that the operation is supported, and X indicates that it is not supported.

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

I/O Wiring Diagrams

Positioning Mode/Teaching Mode/Solenoid Valve Mode

PIO connector (NPN specification)



* Connect Pins 1A and 2A to 24 V, and Pins 19B and 20B to 0 V.

I/O Specification

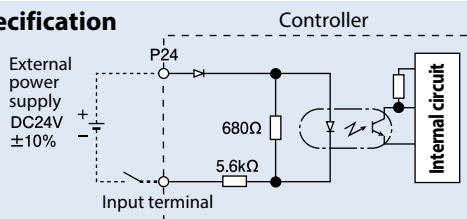
Input Part External Input Specifications

Item	Specification
Input voltage	24VDC±10%
Input current	4mA/1 circuit
ON/OFF voltage	ON voltage: Min.DC 18V min. OFF voltage: Max.DC 6V max.
Isolation method	Photocoupler

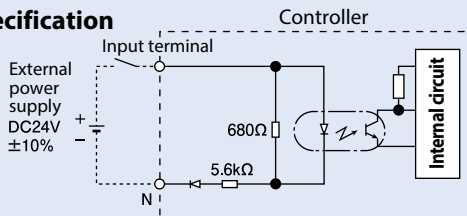
Output Part External Output Specifications

Item	Specification
Load voltage	DC24V
Max. load current	50mA/1 point
Leak current	Max.0.1mA/ 1 point
Isolation method	Photocoupler

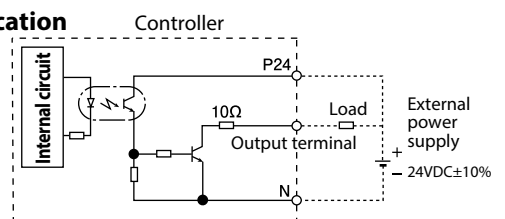
NPN specification



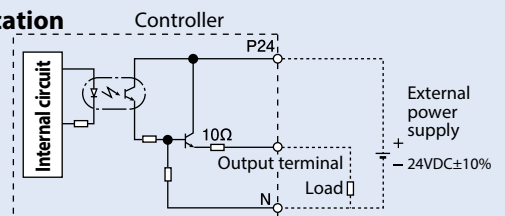
PNP specification



NPN specification



PNP specification

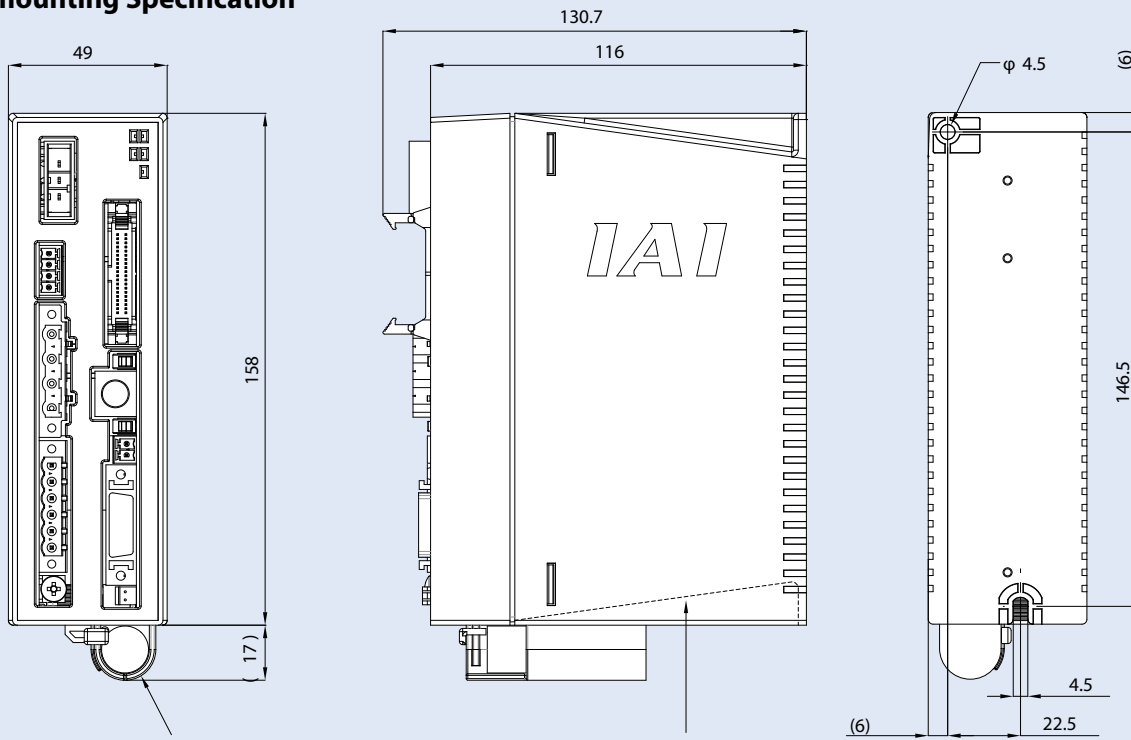


Specification Table

Item		Specification
Applicable motor capacity		Less than 200W
Connected actuator		RCS2/RCS3/RCS4 series actuators/single-axis robot
Number of controlled axes		1 axis
Operation method	Positioner	○
	Direct value	○ (Available only for the Fieldbus specification)
	Pulse train	×
Number of positioning points		512 points (PIO specification), 768 points (Fieldbus specification)
Backup memory		Non-volatile memory (FRAM)
I/O connector		40-pin connector
Number of I/O points		16 input points/16 output points (No fieldbus specification)
I/O power supply		External supply 24VDC ±10%
Serial communication		RS485 1ch
Peripherals communication cable		CB-PAC-PIO□□□
Position detection method		Incremental encoder / Absolute encoder / Battery-less absolute encoder
Driving power shut-off function		Standard type (CAL): Available (Built-in shut-off relay) Safety category compliant type(CGAL): Not available (External shut-off relay)
Forced electromagnetic brake release		Brake release switch ON/OFF
Input power supply		Single-phase 100~115VAC±10% Single-phase 200~230VAC±10%
Power-supply capacity		12W/89VA 20W/74VA 30W (other than RS)/94VA 30W (RS)/186VA 60W/186VA 100W/282VA 150W/376VA 200W/469VA
Vibration resistance		X,Y,and Z directions, 10~57Hz single-side width 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (intermittent)
Calendar/ clock function	Retention time	Approx. 10 days
	Charge time	Approx. 100 hours
Protective functions		Overcurrent, abnormal temperature, low fan speed monitoring, encoder disconnection, etc.
Ambient operating temperature		0~40°C
Ambient operating humidity		85%RH or less (non-condensing)
Operating atmosphere		Free from corrosive gases
Installation	Installation direction	Vertical installation (Exhaust side on top)
	Installation method	Screw mounting or DIN rail mounting
Cooling method		Forced air cooling
Degree of protection		IP20 or equivalent
Mass		Approx. 560g (+ 25g for the absolute specification)
External dimensions		49mm (W) × 158mm (H) × 116mm (D)

External Dimensions

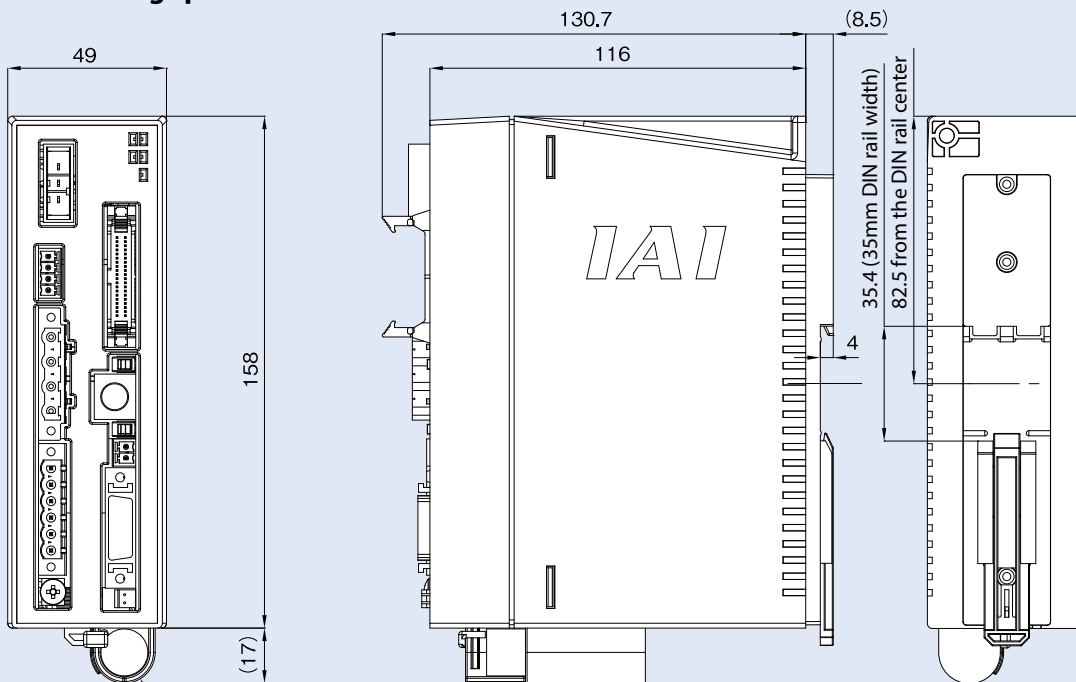
Screw mounting Specification



When the absolute battery is installed (Absolute encoder specification)

The broken line indicates the open access to the screw mount. The controller can be mounted with a screw driver without removing the cover.

DIN rail mounting specification



When the absolute battery is installed (Absolute encoder specification)

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

Name of Each Part

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

**SCON
-CAL**

MSCON

PSEL

ASEL

SSEL

MSEL

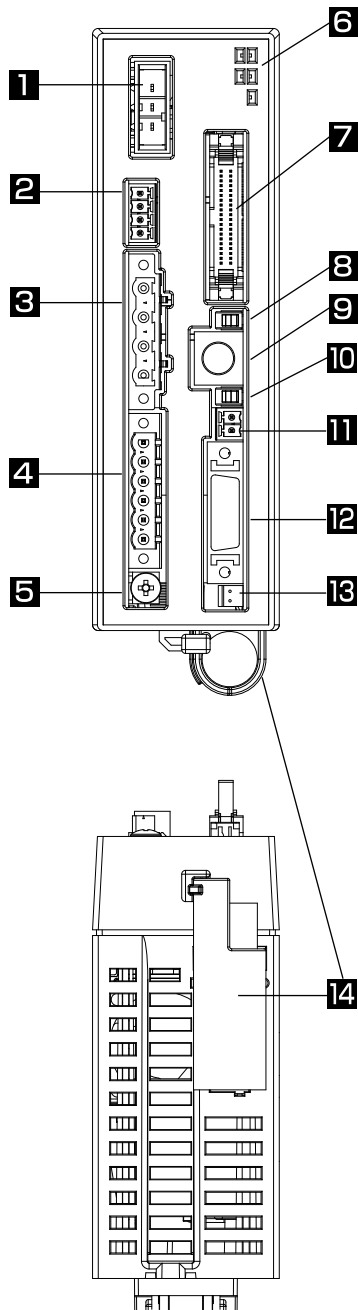
XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03



1 Regenerative unit connector

The connector for regenerative units which absorb the regenerative current generated when the actuator decelerates and stops.

2 System I/O connector

The connector for the emergency stop switch etc.

3 Motor connector

The actuator motor cable connector.

4 Power supply connector

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

5 Grounding terminal

The protective grounding screw. Please make sure to secure grounding.

6 LED display

These LED colors indicate the condition of the controller.

Name	Color	Function description
PWR	Green	Turned ON when the system is ready (after power ON and CPU is functioning normally).
SV	Green	Turned ON when the servo is ON.
ALM	Orange	Turned ON when alarm is being issued.
EMG	Red	Turned ON when the system is in the emergency stop status.
WRG	Orange	Flashes when ABS battery voltage is low or a rotational speed of the fan decreases, etc.

7 PIO connector

Connector for the cable for connecting input/output signals to the peripheral devices such as PLC.

8 Operation mode selection switch

Name	Function description
MANU	Does not accept PIO commands
AUTO	Accepts PIO commands

* For the standard type, the emergency stop switch on the touch panel teaching pendant becomes effective when the line is connected, regardless of whether this switch is set to AUTO or MANU.

9 SIO connector

The connector for the touch panel teaching pendant or the PC communication cable.

10 Break release switch

This is the electromagnetic brake forced release switch, integrated with the actuator.
* It is necessary to connect the 24VDC power for the brake drive.

11 Brake power supply connector

The connector for supplying 24VDC power to the brake (necessary only when brake-equipped actuator is connected).

12 Encoder connector

Connector for the encoder.

13 Absolute battery connector

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

14 Absolute battery holder

Battery holder for installing the absolute data backup battery.

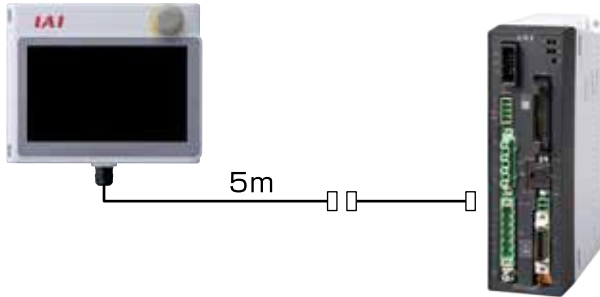
Options

Touch panel teaching pendant

Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

Model **TB-02-**□

Configuration



Specification

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Degree of protection	IP20
Mass	470g (TB-02 unit only)

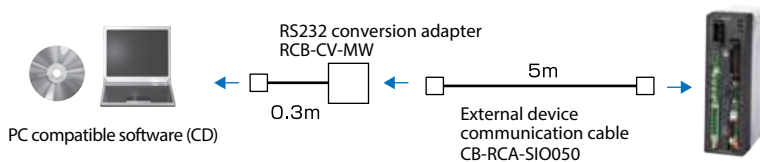
PC dedicated teaching software (Windows only)

Features The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

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

Configuration

The SCON-CAL is supported by **Ver. 9.07.00.00 or later.**



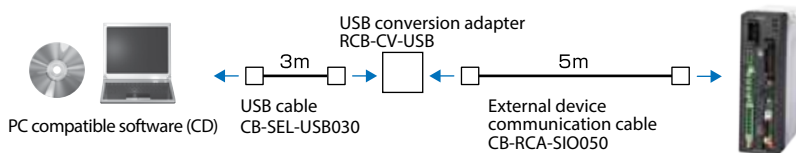
Supported Windows: 7/8/8.1/10



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

Configuration

The SCON-CAL is supported by **Ver. 9.07.00.00 or later.**



Absolute data backup battery

Feature This is an absolute data backup battery for an actuator with absolute specification.

Model **AB-5** (battery only) **AB-5-CS3** (with a case)



Dummy plug

Features This plug is required when the safety category specification (SCON-CGAL) is used.

Model **DP-5**



Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON

-CB

SCON-CB
(Servo press)

SCON

-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Regenerative Resistance Unit

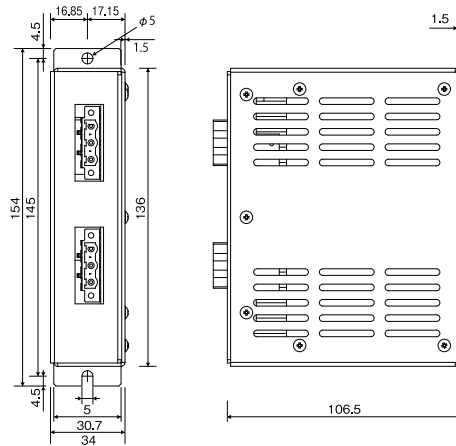
■ **Features** This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the table below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

■ **Model** **RESU-2** (Standard specification)
RESUD-2 (DIN rail mounting specification)

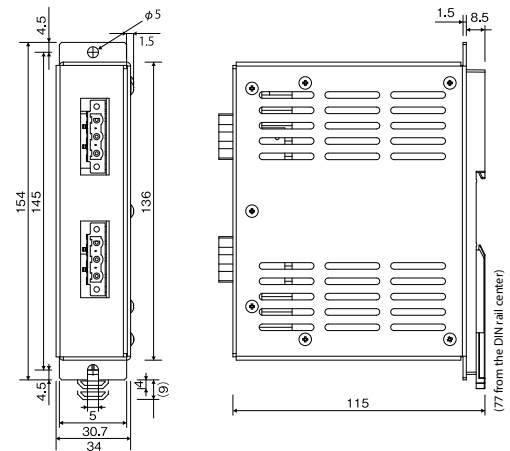
■ Specification

Model number	RESU-2	RESUD-2
Unit mass	Approximately 0.4kg	
Internal regenerative resistance value	235Ω 80W	
Actuator mounting method	Screw mounting	DIN rail mounting
Included cable	CB-SC-REU010	

■ External Dimensions <RESU-2>



■ External Dimensions <RESUD-2>



■ Necessary Quantity Guideline

	Horizontal	Vertical
0		~100W
1		~200W

* Regenerative resistance units more than specified above may be required depending on the operating conditions.
 When more than two regenerative resistance units are necessary, add RESU-1/RESUD-1.

Replacement Fan Unit

■ **Model** **SCON-FU**

Maintenance Parts

When placing an order for a replacement cable, please use the model number shown below. (* Refer to P1-253~ for the actuator to be connected.)

Table of Applicable Cables

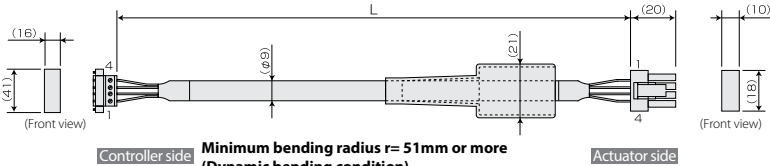
Model	Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
① RCS2(CR/W) RCS3(CR)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PA□□□□	CB-X3-PA□□□□
② RCS2			CB-RCS2-PLA□□□□	CB-X2-PLA□□□□
③ RCS3			—	CB-X1-PA□□□□
④ RCS4(CR)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	—	CB-X1-PA□□□□
⑤ NS	without LS	—	—	CB-X3-PA□□□□
	with LS	—	—	CB-X2-PLA□□□□
⑦ IS(P)WA	—	CB-XEU-MA□□□□	—	CB-X1-PA□□□□-WC
⑧ Models other than ①~⑦	—	CB-X-MA□□□□	—	CB-X1-PA□□□□ (in case of 20m or shorter) *
				CB-X1-PA□□□□-AWG24 (in case of 21m or longer)
⑨ Models other than ① to ⑦ with LS specification	—	—	—	CB-X1-PLA□□□□ (in case of 20m or shorter) *
				CB-X1-PLA□□□□-AWG24 (in case of 21m or longer)

* Model that is not battery-less absolute specification will be CB-X1-PA□□□□ / CB-X1-PLA□□□□ even when it is 20 m or more.

Model Number	PIO flat cable
⑩ SCON-CB	CB-PAC-PIO□□□□

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

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

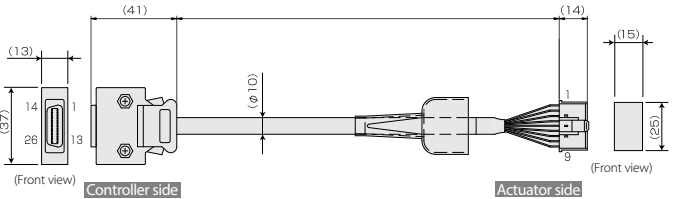


Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
Green	PE	1	1	1	U	Red	0.75sq (Crimped)
Red	U	2	2	2	V	White	
White	V	3	3	3	W	Black	
Black	W	4	4	4	PE	Green	

Minimum bending radius r= 51mm or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

Model Number CB-RCS2-PA□□□□ (For RCS2/RCS3)/CB-X3-PA□□□□ (For NS/RCS2/RCS3)

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

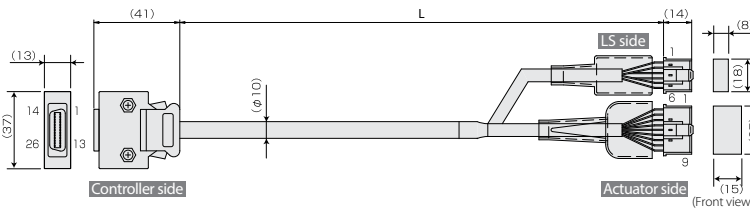


Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
—	—	—	10	1	A	Pink	White/Blue
—	—	—	11	2	A+	Purple	White/Yellow
—	—	—	12	3	B	White	White/Red
—	—	—	13	4	B+	Blue/Red	White/Black
—	—	—	14	5	Z	Orange/White	White/Purple
—	—	—	15	6	Z+	Green/White	White/Gray
—	—	—	16	7	LS+	Brown/White	White/Orange
—	—	—	17	8	FG	Drain	Ground
—	—	—	18	9	SD	Blue	Orange
—	—	—	19	10	SD	Blue	Orange
—	—	—	20	11	SD	Orange	Green
—	—	—	21	12	BAT+	Black	Purple
—	—	—	22	13	BAT+	Yellow	Gray
—	—	—	23	14	VCC	Green	Red
—	—	—	24	15	GND	Brown	Black
—	—	—	25	16	LS+	Green/White	White/Purple
—	—	—	26	17	RSV	Pink/Black	Brown/Red
—	—	—	27	18	BK+	Gray	Blue
—	—	—	28	19	BK+	Red	Yellow

Minimum bending radius r= 58mm or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

Model Number CB-RCS2-PLA□□□□ (For RCS 2 rotary)/CB-X2-PLA□□□□ (Specification with NS LS · For RCS 2 rotary)

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m



Wire	Color	Signal	No.	No.	Signal	Color	Wire
—	—	—	10	1	A	Pink	White/Blue
—	—	—	11	2	A+	Purple	White/Yellow
—	—	—	12	3	B	White	White/Red
—	—	—	13	4	B+	Blue/Red	White/Black
—	—	—	14	5	Z	Orange/White	White/Purple
—	—	—	15	6	Z+	Green/White	White/Gray
—	—	—	16	7	LS+	Brown/White	White/Orange
—	—	—	17	8	FG	Drain	Ground
—	—	—	18	9	SD	Blue	Orange
—	—	—	19	10	SD	Blue	Orange
—	—	—	20	11	SD	Orange	Green
—	—	—	21	12	BAT+	Black	Purple
—	—	—	22	13	BAT+	Yellow	Gray
—	—	—	23	14	VCC	Green	Red
—	—	—	24	15	GND	Brown	Black
—	—	—	25	16	LS+	Green/White	White/Purple
—	—	—	26	17	RSV	Pink/Black	Brown/Red
—	—	—	27	18	BK+	Gray	Blue
—	—	—	28	19	BK+	Red	Yellow

Minimum bending radius r= 58mm or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

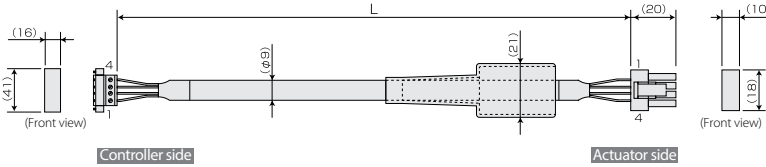
* The above is the wiring diagram of the encoder cable.
For the wiring diagram of the encoder robot cable, please refer to CB-X2-PLA□□□□ on P7-239.

Maintenance Parts

When replacing a cable after purchasing the product, please refer to the list of models below. (* Refer to P1-253~ for the actuator to be connected.)

Model Number **CB-X-MA**

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m

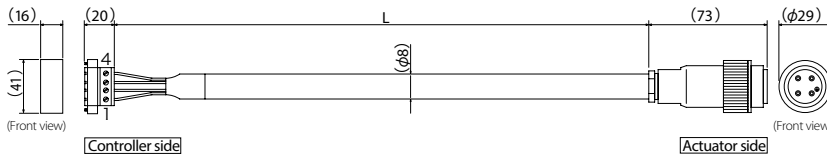


Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
0.75sq	Green	PE	1	1	U	Red	0.75sq (Crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

Model Number **CB-XEU-MA**

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m

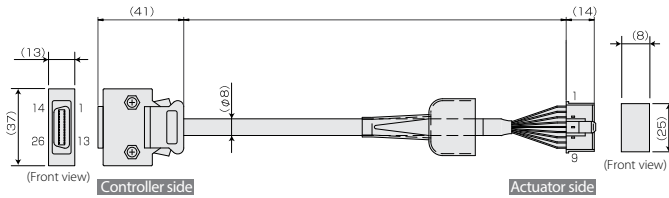


Plug GIC2.5/4-STF-7.62 (Phoenix)				Plug connector 99-4222-00-04 (BINDER)			
Wiring	Signal	No.		No.	Signal	Color	Wiring
0.75sq	PE	1		1	U	Red	0.75sq (Crimped)
	U	2		2	V	White	
	V	3		3	W	Black	
	W	4		3	W	Green	

Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

Model Number **CB-X1-PA**

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
-	-	-	10	1	EA T+	Purple	AWG26 (Crimped)
-	-	-	11	2	BAT-	Grey	
-	-	E24V	12	3	SD	Orange	
-	-	OV	13	4	SD	Green	
-	-	LS	26	5	V.C.C	Red	
-	-	CREEP	26	6	GND	Black	
-	-	OT	24	7	F.G	Drain	
-	-	RSV	23	8	BK+	Blue	
-	-	-	9	9	BK+	Yellow	
-	-	-	18	-	-	-	
-	-	-	19	-	-	-	
-	-	A+	1	-	-	-	
-	-	A-	2	-	-	-	
-	-	B+	3	-	-	-	
-	-	B-	4	-	-	-	
-	-	Z+	5	-	-	-	
-	-	Z-	6	-	-	-	
Orange	SFD+	7	-	-	-	-	
Green	SFD-	8	-	-	-	-	
Purple	BAT+	14	-	-	-	-	
Gray	BAT-	15	-	-	-	-	
Red	V.C.C	16	-	-	-	-	
Black	GND	17	-	-	-	-	
Blue	BKR-	20	-	-	-	-	
Yellow	BKR+	21	-	-	-	-	
-	-	-	22	-	-	-	

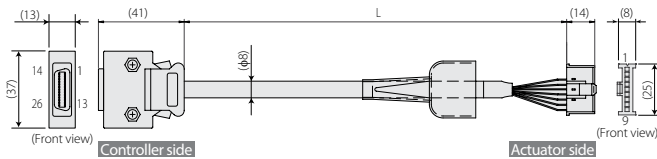
The shield is connected to cable clamp.

Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

* For ISB · ISDB · ISDBCR · NSA (Encoder types are battery-less absolute), please select CB-X1-PA -AWG 24 if you want a cable of 21 m or more.

Model Number **CB-X1-PA** -AWG24

* Please indicate the cable length (L) in , maximum 30m, e.g.) 210 = 21m



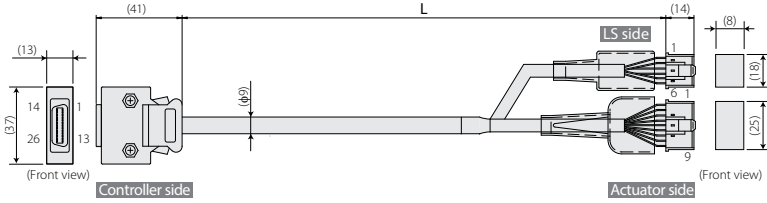
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
-	-	-	10	1	BAT+	-	AWG24 (Crimped)
-	-	E24V	11	2	BAT-	-	
-	-	OV	13	3	SD	Orange	
-	-	LS	26	4	SD	Green	
-	-	CREEP	26	5	V.C.C	Red	
-	-	OT	24	6	GND	Black	
-	-	RSV	23	7	F.G	Drain	
-	-	-	9	8	BK-	Blue	
-	-	-	18	9	BK+	Yellow	
-	-	-	19	-	-	-	
-	-	A+	1	-	-	-	
-	-	A-	2	-	-	-	
-	-	B+	3	-	-	-	
-	-	B-	4	-	-	-	
-	-	Z+	5	-	-	-	
-	-	Z-	6	-	-	-	
Orange	SFD+	7	-	-	-	-	
Green	SFD-	8	-	-	-	-	
-	-	BAT+	14	-	-	-	
-	-	BAT-	15	-	-	-	
Red	V.C.C	16	-	-	-	-	
Black	GND	17	-	-	-	-	
Blue	BKR-	20	-	-	-	-	
Yellow	BKR+	21	-	-	-	-	

The shield is clamped to the hood.

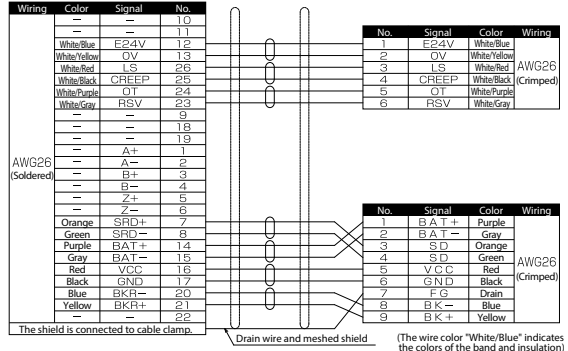
Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

Model Number CB-X1-PLA

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m

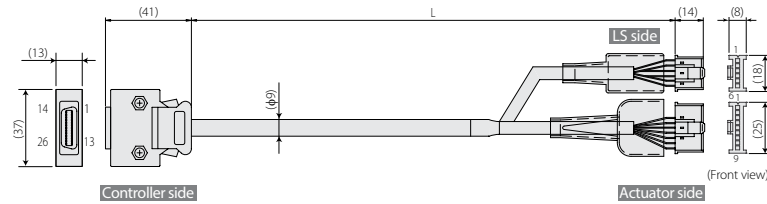


Minimum bending radius $r=54\text{mm}$ or more (Dynamic bending condition)
 * The robot cable is used as standard.
 * For ISB, ISDB and ISDBCR (the encoder type is battery-less absolute), please select CB-X1-PA -AWG24 if you want a cable of 21 m or more.

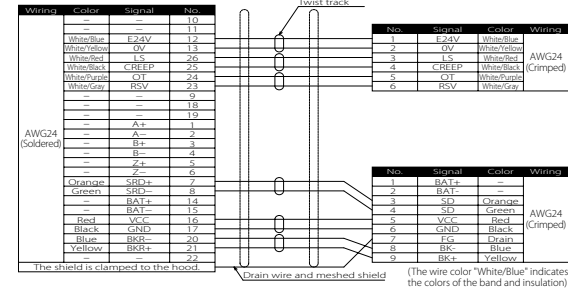


Model Number CB-X1-PLA -AWG24

* Please indicate the cable length (L) in , maximum 30m, e.g.) 210 = 21m

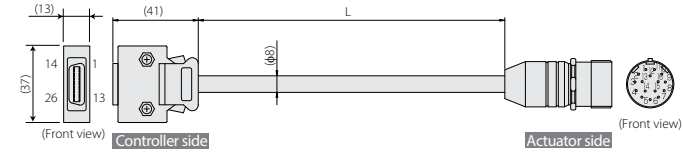


Minimum bending radius $r=54\text{mm}$ or more (Dynamic bending condition)
 * The robot cable is used as standard.

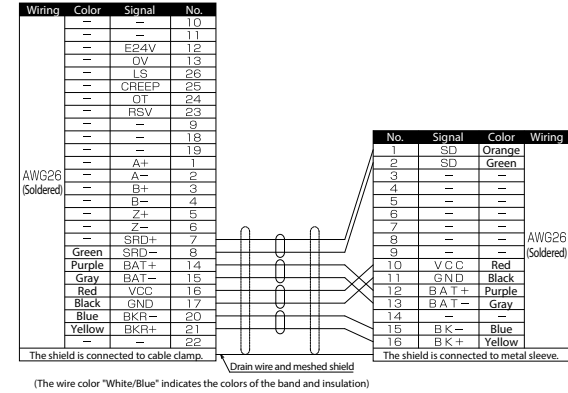


Model Number CB-X1-PA -WC

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m

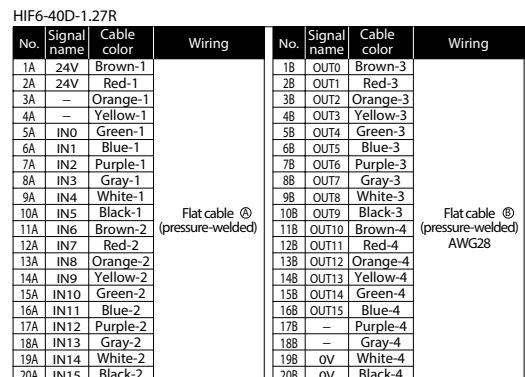
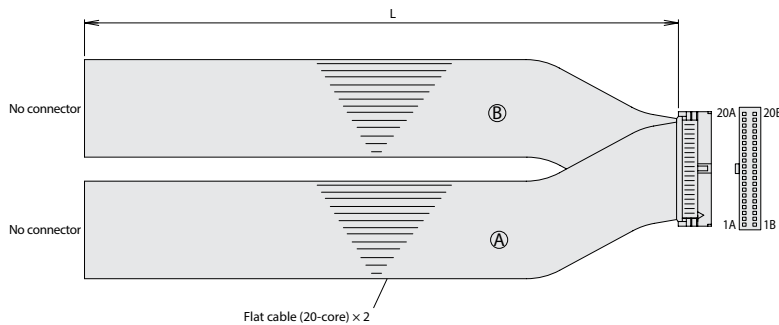


Minimum bending radius $r=44\text{mm}$ or more (Dynamic bending condition)
 * The robot cable is used as standard.



Model Number CB-PAC-PIO

* Please indicate the cable length (L) in , maximum 10m, e.g.) 080 = 8m



MSCON



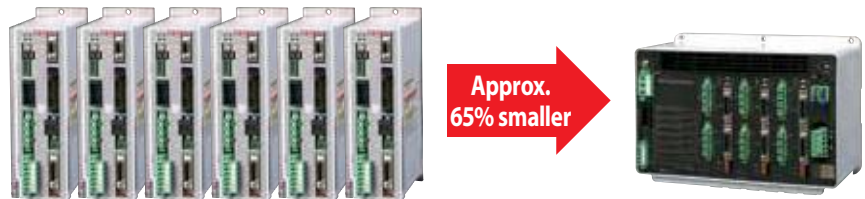
Position Controller for Single-axis Robot / Cartesian Robot / ROBO Cylinder RCS2/RCS3/RCS4 /SCON Series, 6-axis Type



Features

1 Space-saving, low-cost, and easy to use

Six controllers (SCON-CB) are combined into one unit to save the installation space and achieve significant reduction in total cost.



2 Movement by numerical control mode via Field network

Substantially shorter transmission time

MSCON controllers can be connected directly to key field networks such as DeviceNet, CC-Link, PROFIBUS-DP,, CompoNet, EtherCAT(*) and EtherNet/IP.

Features of Network Specification

- 256 positioning points per axis
- Moving the electric actuator after numerically specifying the position to move to, and the speed
- Checking the current position in real time
- Significantly shorter communication time within the controller (approx. one-sixth compared to conventional controllers)

DeviceNet™



CompoNet™



EtherNet/IP™



3 Offboard tuning function to enhance actuator payload capacity

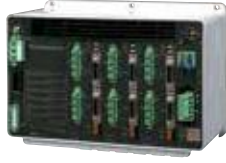






The offboard tuning function increases the acceleration/deceleration speed when the load is small, and decreases the acceleration/deceleration when the load is large, to ensure optimal operation settings according to the load. In addition, this function also adjusts the servo characteristics.

(Please refer to P1-356 for details)

4 Vibration control function for shorter cycle time

The vibration control function has been added to prevent the workpiece from shaking (vibrating) on the electric actuator slider as the slider moves. The wait time for vibration to settle is shorter and the cycle time can also be shortened.

Model List/Standard Price

Model number		MSCON-C						
External view								
I/O type		DeviceNet	CC-Link	PROFIBUS-DP	CompoNet	EtherCAT	EtherNet/IP	
								
I/O type model code		DV	CC	PR	CN	EC	EP	
MSCON	Number of axes	Encoder	Standard price					
MSCON	1 axis	Battery-less absolute / Incremental	○	○	○	○	○	○
		Absolute	○	○	○	○	○	○
	2 axes	Battery-less absolute / Incremental	○	○	○	○	○	○
		Absolute	○	○	○	○	○	○
	3 axes	Battery-less absolute / Incremental	○	○	○	○	○	○
		Absolute	○	○	○	○	○	○
	4 axes	Battery-less absolute / Incremental	○	○	○	○	○	○
		Absolute	○	○	○	○	○	○
	5 axes	Battery-less absolute / Incremental	○	○	○	○	○	○
		Absolute	○	○	○	○	○	○
	6 axes	Battery-less absolute / Incremental	○	○	○	○	○	○
		Absolute	○	○	○	○	○	○

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON

Model

(Specs for 1st axis) (Specs for axis 2 - 6)

MSCON - C - [] - [] - [] - [] - ([] [] []) - [] - 0 - []

Series Type Number of axes Motor Encoder Option I/O type I/O cable length Power/voltage

1	Single-axis model	12	12W	60	60W	HA High acceleration/deceleration type WAI Battery-less absolute/Incremental A Absolute	DV DeviceNet CC CC-Link PR PROFIBUS-DP CN CompoNet EC EtherCAT EP EtherNet/IP	1 100VAC 2 200VAC
2	2-axis model	20	20W	100	100W			
3	3-axis model	30D	30W	150	150W			
4	4-axis model	30R	30W	200	200W			
5	5-axis model							
6	6-axis model							

(Example) 12: 12 W Servo motor compatible * Encoder type can be specified for each axis.

Note
Basically, the type of motor is the same as that of the electric actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.

<Electric actuators for 30D and 30R>
 ● Controller Motor type "30D" ... 30W actuator other than RS
 ● Controller Motor type "30R" ... RS

* Please check the power supply voltage that can be selected on the page of the actuator.
 * The MSCON is available only in network specifications and does not come with I/O cables.

- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

System configuration

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

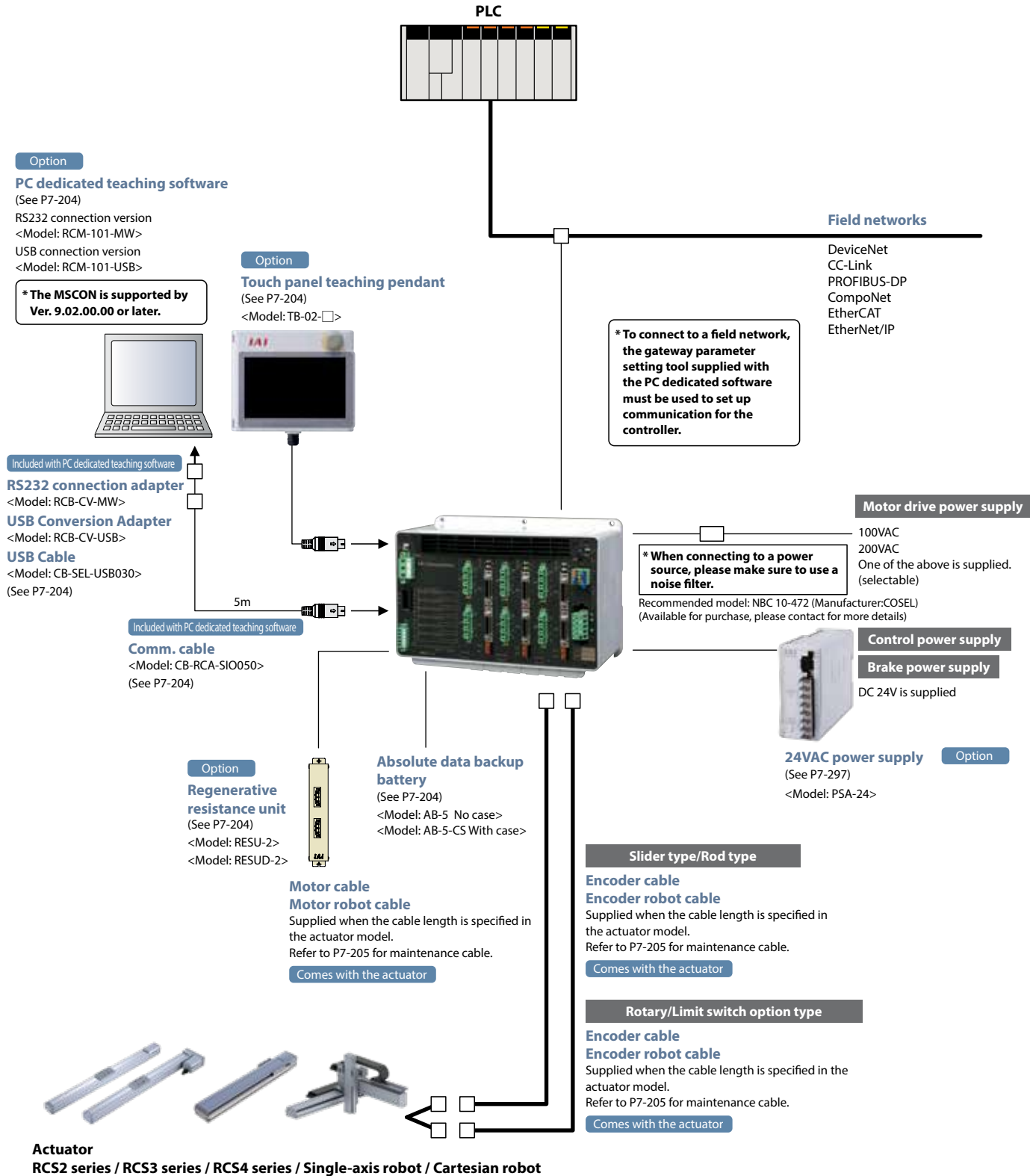
XSEL

(SCARA)

PSA-24

TB-02

TB-03



Notes Please note that the following models are not supported by the MSCON:

- All linear servo actuator models
- RCS2-RN5N/RP5N/G55N/GD5N/SD5N/TCA5N/TWA5N/TFA5N/SRA7BD/SRGS7BD/SRGD7BD, NS-SXM□/SZM□ (All models with incremental specification only)
- DD series
- Electric actuators with more than 200W motor W

Operation Mode

When the MSCON is controlled via a field network, one of the following seven operation modes can be used. The necessary data areas on the PLC side vary depending on the mode, so please refer to the MSCON controller manual or contact IAI before use.

Mode	Description
Simple direct input mode	The target position value is directly input, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
Positioner 1 mode	The target position, speed, acceleration/deceleration, etc., are input to the position data table of the controller and input position numbers are specified to operate the actuator (maximum 256 points). The current position can be read, as well.
Direct numerical control mode	The actuator is operated by specifying the target position, speed, acceleration/deceleration, etc., by directly entering values. The current position, current speed, command current, etc., can also be read.
Direct numerical control mode 2	Same as the direct numerical control mode, except that jog operation is not supported and vibration control is added.
Positioner 2 mode	Same as the positioner 1 mode, except that the target position is not specified and reading of current position not supported, in order to reduce the amount of data to be transmitted/received.
Positioner 3 mode (*2)	Same as the positioner 2 mode, with the amount of data to be transmitted/received reduced further to allow for actuator operation with minimum input/output signals.
Remote I/O mode (*1)(*2)	In this mode, the actuator is operated by controlling the ON/OFF of bits via the network, just like with the PIO specification. The number of positioning points and functions vary with each of the operation patterns (PIO patterns) that can be set by the controller's parameter.

(*1) Please note that if the remote I/O mode is selected, all axes will operate in the remote I/O mode.

(*2) CompoNet can only select Positioner 3 mode and Remote I / O mode.

List of Functions by Operation Mode

	Simple direct input mode	Positioner 1 mode	Direct input mode	Direct input mode 2	Positioner 2 mode	Positioner 3 mode
Number of positioning points	Unlimited	256	Unlimited	Unlimited	256	256
Home return operation	○	○	○	○	○	○
Positioning operation	○	△	○	○	△	△
Speed & acceleration/deceleration setting	△	△	○	○	△	△
Pitch feed (inching)	△	△	○	○	△	△
Push-motion operation	△	△	○	○	△	△
Speed change during movement	△	△	○	○	△	△
Pause	○	○	○	○	○	○
Zone signal output	△	△	△	△	△	△
Vibration control	△	△	×	○	△	△
Reading of current value	○	○	○	○	×	×
Selection of PIO pattern (Note 1)	×	×	×	×	×	×

* ○ indicates that the operation is supported, △ indicates that position data or parameter must be input, and X indicates that the function is not supported.

(Note 1) It can be used when the PIO pattern is set to 8.

	Remote I/O mode				
	Positioning mode	Teaching mode	256-point mode	Solenoid valve mode 1	Solenoid valve mode 2
Number of positioning points	64	64	256	7	3
Home return operation	○	○	○	○	×
Positioning operation	△	△	△	△	△
Speed & acceleration/deceleration setting	△	△	△	△	△
Pitch feed (inching)	△	△	△	△	×
Push-motion operation	△	△	△	△	×
Speed change during movement	△	△	△	△	×
Pause	○	○	○	○	×
Zone signal output	△	△	△	△	△
Vibration control	△	△	△	△	△
Reading of current value	×	×	×	×	×
Selection of PIO patter	○	○	○	○	○

* ○ indicates that direct setting is possible; △ indicates that position data or parameter must be input; and × indicates that the function is not supported.

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

Explanation of I/O Signal Functions

The table below explains the functions assigned to the controller's I/O signals. The controller can be operated by setting the remote I/O mode, selecting one of modes 0 to 5, and then turning each port number ON/OFF via the network.

Classification		Setting of MSCON Parameter No. 25									
		Positioning mode		Teaching mode		256-point mode		Solenoid valve mode 1		Solenoid valve mode 2	
		0		1		2		4		5	
Port No.	Code	Signal name	Code	Signal name	Code	Signal name	Code	Signal name	Code	Signal name	
PLC output ↓ MSCON input	0	PC1	Command position number	PC1	Command position number	PC1	Command position number	ST0	Start position 0	ST0	Start position 0
	1	PC2		PC2		PC2		ST1	Start position 1	ST1	Start position 1
	2	PC4		PC4		PC4		ST2	Start position 2	ST2	Start position 2
	3	PC8		PC8		PC8		ST3	Start position 3	–	Cannot be used
	4	PC16		PC16		PC16		ST4	Start position 4	–	
	5	PC32	PC32	PC32	ST5	Start position 5	–				
	6	–	MODE	Teaching mode command	PC64	ST6	Start position 6	–			
	7	–	JISL	Jog/inch switching	PC128	–	Cannot be used	–			
	8	–	JOG+	+Jog	–	Cannot be used	–	–	–	–	–
	9	BKRL	Forced brake release	JOG–	–Jog	BKRL	Forced brake release	BKRL	Forced brake release	BKRL	Forced brake release
	10	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	–
	11	HOME	Home return	HOME	Home return	HOME	Home return	HOME	Home return	–	Cannot be used
	12	*STP	Pause	*STP	Pause	*STP	Pause	*STP	Pause	–	
	13	CSTR	Positioning start	CSTR/ PWRT	Positioning start/ Position data load command	CSTR	Positioning start	–	Cannot be used	–	
	14	RES	Reset	RES	Reset	RES	Reset	RES	Reset	RES	Reset
15	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	
MSCON output ↓ PLC input	0	PM1	Complete position number	PM1	Complete position number	PM1	Complete position number	PE0	Position complete 0	LS0	Limit switch output 0
	1	PM2		PM2		PM2		PE1	Position complete 1	LS1	Limit switch output 1
	2	PM4		PM4		PM4		PE2	Position complete 2	LS2	Limit switch output 2
	3	PM8		PM8		PM8		PE3	Position complete 3	–	Cannot be used
	4	PM16		PM16		PM16		PE4	Position complete 4	–	
	5	PM32	PM32	PM32	PE5	Position complete 5	–				
	6	MOVE	Moving signal	MOVE	Moving signal	PM64	–	PE6	Position complete 6	–	
	7	ZONE1	Zone 1	MODES	Teaching mode signal	PM128	–	ZONE1	Zone 1	ZONE1	Zone 1
	8	PZONE/ ZONE2	Position zone/ Zone 2	PZONE/ ZONE1	Position zone/ Zone 1	PZONE/ ZONE1	Position zone/ Zone 1	PZONE/ ZONE2	Position zone/ Zone 2	PZONE/ ZONE2	Position zone/ Zone 2
	9	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	Cannot be used	–	Cannot be used
	10	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete
	11	PEND	Positioning complete signal	PEND/ WEND	Positioning complete signal/ Position data load complete	PEND	Positioning complete signal	PEND	Positioning complete signal	–	Cannot be used
	12	SV	Ready	SV	Ready	SV	Ready	SV	Ready	SV	Ready
	13	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop
	14	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm
15	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning	

* In the table above, * accompanying each code indicates a negative logic signal.

List of Basic Specifications

Item	Specification	
Number of controlled axes	1 to 6 axes	
Control power-supply voltage	24VDC ± 10%	
Control power-supply current consumption	2.4 A max.	
Control power-supply rush current (Note 1)	7 A max., 5 msec or less	
Drive (motor) power-supply voltage	Drive power-supply voltage 100VAC	100~115VAC ± 10%
	Drive power-supply voltage 200 VAC	200~230VAC ± 10%
Drive (motor) power-supply rush current (Note 1)	Drive power-supply voltage 100VAC	20 A, 10 A max. within 80 msec (Drive power-supply voltage 100 V 25°C ambience) 45 A, 10 A max. within 80 msec (Drive power-supply voltage 115 V x 10%, 40°C ambience)
	Drive power-supply voltage 200VAC	45 A, 10 A max. within 40 msec (Drive power-supply voltage 200 V 25°C ambience) 95 A, 10 A max. within 40 msec (Drive power-supply voltage 230 V x 10%, 40°C ambience)
Connectable actuator motor capacity	Drive power-supply voltage 100VAC	200 W max. per axis (Total of 6 axes limited to 450 W)
	Drive power-supply voltage 200VAC	200 W max. per axis (Total of 6 axes limited to 900 W)
Electromagnetic brake power-supply voltage (when actuator with brake is connected)	24VDC ± 10%	
Brake power-supply current	1 A max. per axis (0.5 A per axis in steady state)	
Brake power-supply rush current (Note 1)	10 A max., 10 msec or less	
Leak current (Note 2)	3.5 mA (motor power supply) ◎No leak current from the control power supply or brake power supply	
Motor control method	Sine-wave PWM vector current control	
Applicable encoder	Battery-less absolute encoder Incremental serial encoder Absolute serial encoder	
Serial communication (SIO port: Teaching only)	RS485: 1 channel (conforming to Modbus protocol) / Speed: 9.6 to 230.4 kbps	
External interface	DeviceNet, CC-Link, PROFIBUS-DP, CompoNet, EtherNet/IP, EtherCAT	
Data setting/input method	PC dedicated teaching software, Touch panel teaching pendant, Gateway parameter setting tool	
Data retention memory	Saving of position data and parameters to nonvolatile memory (Memory can be rewritten an unlimited number of times)	
Number of positioning points	Max. 256 points (Not limited in the simple direct input mode or direct input mode) Note: The number of positioning points varies depending on the operation mode selected by the parameter.	
LED display (installed on the front panel)	Driver status LED x2 Fieldbus status LED x 2 Gateway status LED x5 Power-supply status LED x 2	
Electromagnetic brake forced release switch (installed on the front panel)	Switched between NOM (standard) and RLS (forced releases)	
Protective function	Overload, overcurrent, overvoltage, etc.	
Electric shock protection mechanism	Class I	
Isolation resistance	500VDC, 10 MΩ or more	
Withstand voltage	1500VAC for 1 minute	
External dimensions	225W×154H×115D	
Weight	Incremental specification (When drivers for 6 axes are installed)	Approx. 1900g
	Absolute specification (When drivers for 6 axes are installed)	Approx. 2000g
Cooling method	Forced air cooling	
Environment	Ambient operating temperature	0 to 40°C
	Ambient operating humidity	85% RH or less (non-condensing)
	Operating ambience	Free from corrosive gases
	Protection degree	IP20

Note 1: Please note that the rush current value varies depending on the impedance of the power supply line.

Note 2: Leak current varies depending on the motor capacity to be connected, cable length, and ambient environment.

To protect against leak current, measure leak current at locations where the earth leakage breaker is installed.

An earth leakage breaker must be selected that serves the specific purpose required, such as fire protection and injury protection.

Use an earth leakage breaker of harmonic wave type (inverter type).

Power Supply Selection

With the MSCON controller, motor driver power (100VAC/200VAC) and control power (24VDC) must be supplied separately. Check the necessary power-supply capacity according to the table below.

RS: Rotational shaft

Motor Drive Power-supply Capacity

Actuator motor Wattage	Motor power supply capacity [VA]	Momentary maximum motor power-supply capacity [VA]	Heat output [W]
12	41	123	1.7
20	50	150	2.0
30D (other than RS)	47	141	2.0
30R (RS)	138	414	4.0
60	146	438	4.8
100	238	714	7.0
150	328	984	8.3
200	421	1263	9.2

Selecting the Circuit Breaker

Select the circuit breaker as follows:

- Three times the rated current will flow through the controller during acceleration/deceleration. (Refer to "Momentary maximum motor power-supply capacity" above).
Select a circuit breaker that will not trip when this current flows. If the selected circuit breaker trips under this current, select another breaker of the next higher rated current. (Confirm on the operation characteristic curve in the manufacturer's catalog to confirm that the circuit breaker will not trip.)
- Select a circuit breaker that will not trip due to rush current. (Check the operation characteristic curve in the manufacturer's catalog to confirm that the circuit breaker will not trip.)
- Select a rated break current that will break the circuit even when a short-circuit current flows.
Rated shutoff current > Short-circuit current = Primary power-supply capacity of circuit breaker / Power-supply voltage

Consider allowance when selecting the rated current of circuit breaker.

$$\text{Total sum of motor power-supply capacities of all actuators connected [VA] / AC input voltage x Safety factor (Rough guide: 1.2 to 1.3)}$$

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Control Power-supply (24VDC) Capacity

Calculate the 24VDC power-supply capacity as follows:

(1) Current consumption of control power supply: Select the applicable control power-supply current shown in the table below.....①

Number of controlled axes (Note 1)	1 axis	2 axes	3 axes	4 axes	5 axes	6 axes
Heat quantity from control power supply [W]	25.5	31.5	38.2	44.2	50.9	56.9
Control power-supply current [A]	1.1	1.3	1.6	1.8	2.1	2.4

(Note 1): Check the maximum number of controlled axes that can be connected to the MSCON. This information is available on the manufacturer's nameplate.
 MSCON-C*-...: * represents the maximum number of axes that can be connected.

(2) Current consumption of brake power supply: 1 A or 0.5 A (Note 2) x Number of actuators with brakes.....②

(Note 2): When the brake is released, up to 1 A of current will flow per actuator for a period of approx. 100 ms.

If this maximum current can be accommodated by the 24VDC power supply used which is capable of handling momentary load fluctuation at the time of peak load, etc., calculate at 0.5 A/unit. If not, calculate at 1 A/unit.

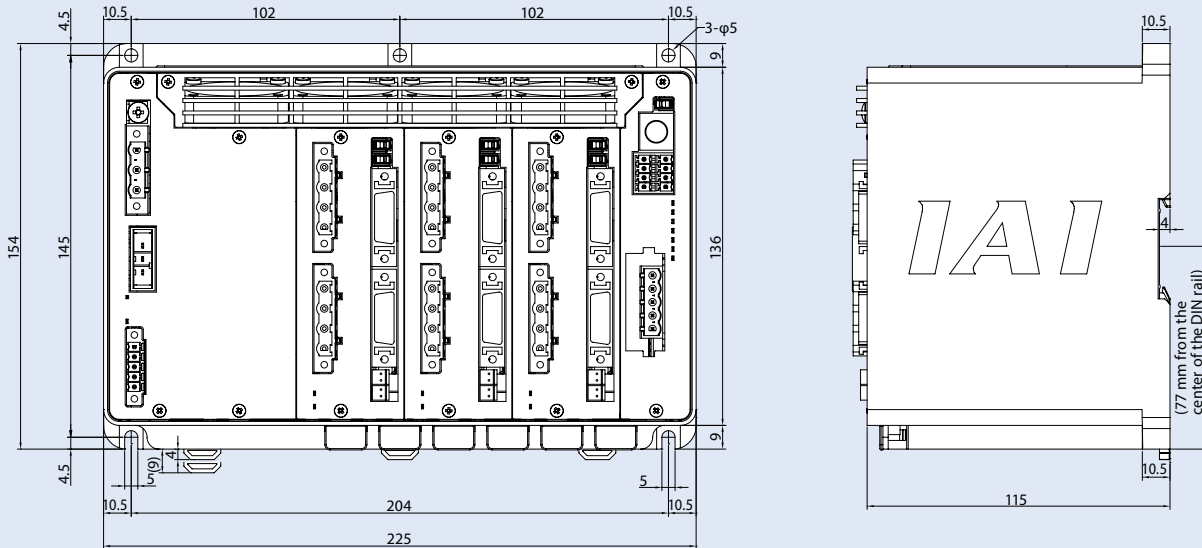
(3) Rush current of control power supply: 7 A.....③

[Selection of power supply]

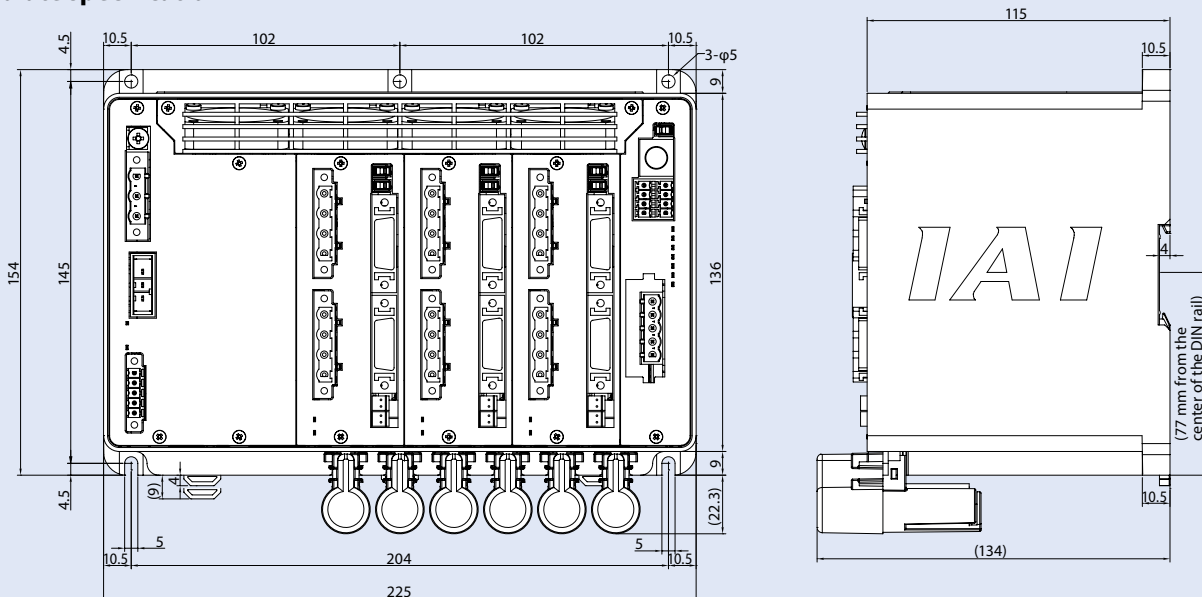
Normally a power supply whose rated current is approx. 1.3 times is selected by considering approx. 30% of allowance on top of the load current of ① + ② above. Since the current of ③ will flow for a short period, select a power supply of the "peak load accommodation" specification or having enough allowance. If the selected power supply has no allowance, voltage may drop momentarily. In particular, pay attention to the power supply with remote sensing function.

External Dimensions

Battery-less absolute specification/Incremental specification



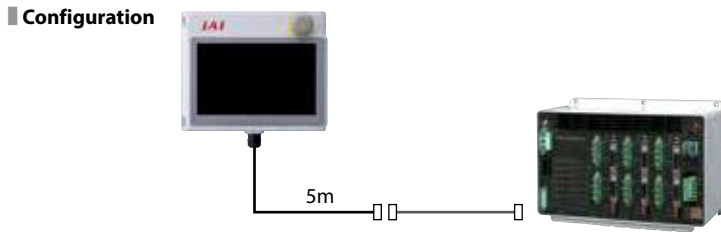
Absolute specification



Options

Touch panel teaching pendant

- Features** A teaching device equipped with functions such as position teaching, trial operation, and monitoring.
- Model** **TB-02-**



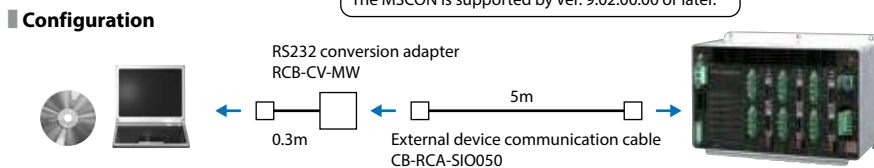
Specification

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~85% RH (Non-condensing)
Degree of protection	IP20
Mass	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

- Features** The start-up support software which comes equipped with functions such as position teaching, trial operation, and monitoring. A complete range of functions needed for making adjustments contributes to a reduced start-up time.

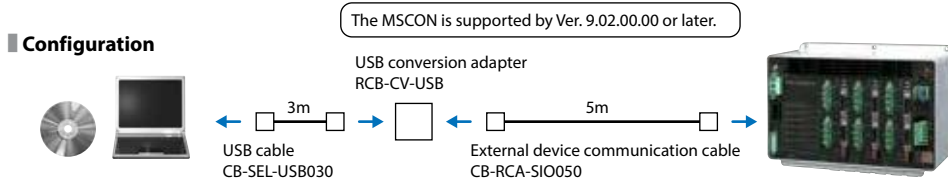
- Model** **RCM-101-MW** (with an external device communication cable + RS232 conversion unit)



Supported Windows versions:
7/8/8.1/10



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



Regenerative Resistance Unit

- Features** This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the tables below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

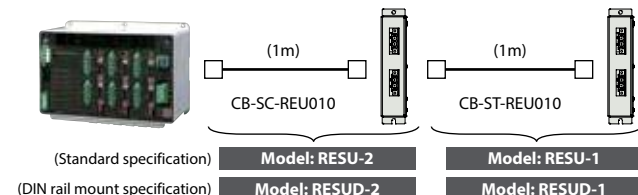
- Model** **RESU-2** (Standard specification)
RESUD-2 (DIN rail mounting specification)
RESU-1 (Standard specification, second or subsequent unit)
RESUD-1 (DIN rail mount specification, second or subsequent unit)

*When two regenerative units are required, please use one RESU-2 and one RESU-1.

Specification

Model	RESU-2	RESUD-2	RESU-1	RESUD-1
Connected to	MSCON controller		RESU-1/RESUD-1	
Included cable	CB-SC-REU010		CB-ST-REU010	
Unit installation method	Screw mount	DIN rail mount	Screw mount	DIN rail mount
Mass	Approx. 0.4kg			
Internal regen. resistance value	220Ω 80W			

* The first regenerative resistance unit connected to the MSCON should be the RESU-2/RESUD-2. The regenerative resistor unit connected to this regenerative resistance unit should be the RESU-1/RESUD-1.



Estimated number of connections

Total W amount of motor 6 axes		Number of regenerative resistance units connected
Actuator horizontal installation	Actuator vertical installation	
~450	~200	0
~900	~600	1
-	~800	2
-	~900	3

Note:
The numbers of units to be connected are reference values based on the following operating conditions:
 [Conditions] Operate the actuator to travel back and forth over 1000 mm at the maximum speed, acceleration/ deceleration of 0.3 G, rated load, and operation duty of 50%.

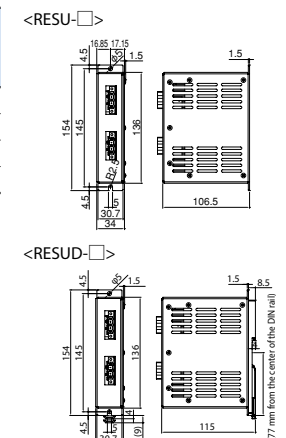
Depending on the operating conditions, an error may generate and regenerative resistance greater than the applicable value shown in the table above may be required. In this case, add a regenerative resistance unit or units. Note that only up to four regenerative resistance units can be connected. If five or more units are connected, a failure may occur.
 When horizontal use and vertical use are mixed, the total required number of each of the horizontal use and the vertical use is the total necessary number.

Absolute data backup battery

- Features** This is an absolute data backup battery for an actuator with absolute specification.
- Model** **AB-5** (battery only) **AB-5-CS2** (with a case)



External dimensional drawing



- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Maintenance Parts

When replacing a cable after purchasing the product, please refer to the list of models below. (* Refer to P1-253 for the actuator to be connected.)

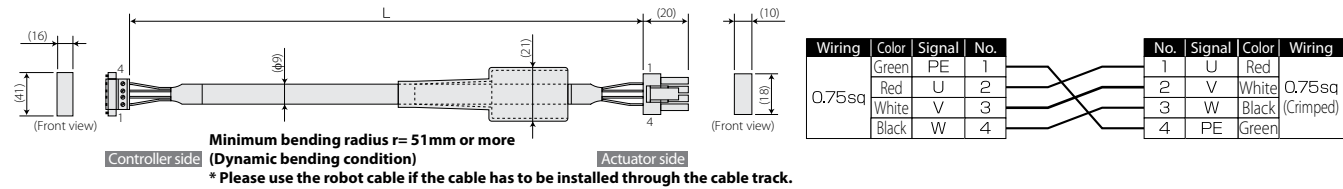
Table of Applicable Cables

Model Number		Motor Cable	Motor Robot Cable	Encoder Cable	Encoder Robot Cable
①	RCS2(CR/W) RCS3(CR)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PA□□□□	CB-X3-PA □□□□
②	RCS2			RT	CB-RCS2-PLA□□□□
③	RCS4(CR)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	-	CB-X1-PA □□□□
④	NS	Without LS	CB-X-MA□□□□	-	CB-X3-PA □□□□
⑤		With LS		-	CB-X2-PLA □□□□
⑥	IS(P)WA	S/M/L	CB-XEU-MA□□□□	-	CB-X1-PA □□□□ -WC
⑦	Models other than ① to ⑥		CB-X-MA□□□□	-	CB-X1-PA □□□□ (In case of 20 m or less)*
⑧	Models other than ① to ⑥ Specification with LS			-	CB-X1-PA □□□□ -AWG24 (In case of 21 m or more)
				-	CB-X1-PLA □□□□ (In case of 20 m or less)*
				-	CB-X1-PLA □□□□ -AWG24 (In case of 21 m or more)

* Model that is not battery-less absolute specification will be CB-X1-PA □□□□ / CB-X1-PLA □□□□ even when it is 20 m or more.

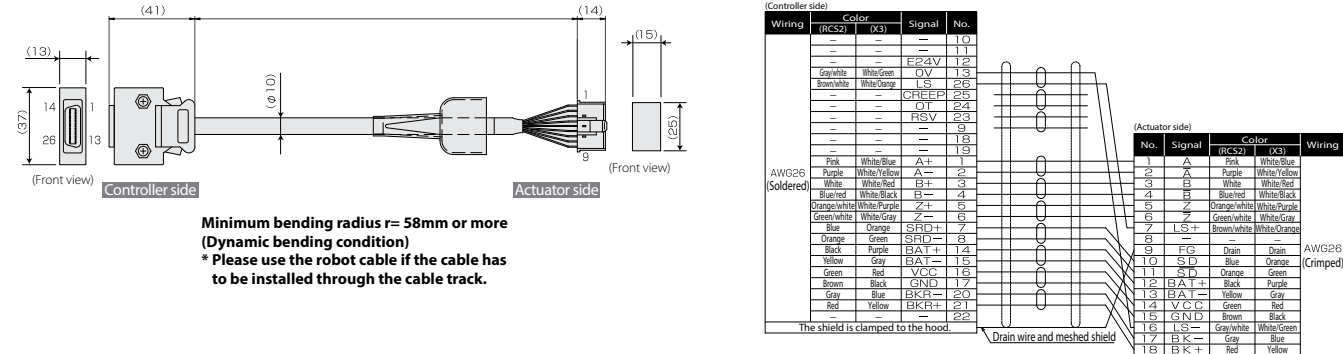
Model Number CB-RCC-MA□□□□/CB-RCC-MA□□□□-RB

* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



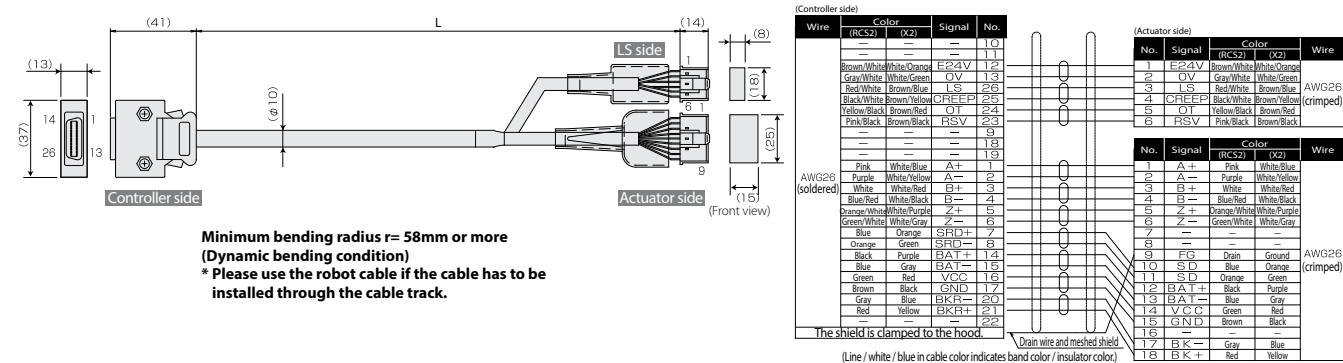
Model Number CB-RCS2-PA□□□□ (For RCS2/RCS3)/CB-X3-PA□□□□ (For NS/RCS2/RCS3)

* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



Model Number CB-RCS2-PLA□□□□ (For RCS 2 rotary)/CB-X2-PLA□□□□ (Specification with NS LS · For RCS 2 rotary)

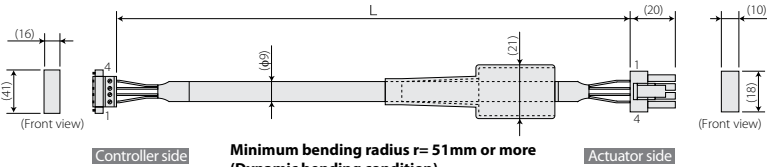
* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



* The above is wiring diagram of the encoder cable. For wiring diagram of encoder robot cable, please check CB-X2-PLA □□□□ on P7-239.

Model Number CB-X-MA

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m

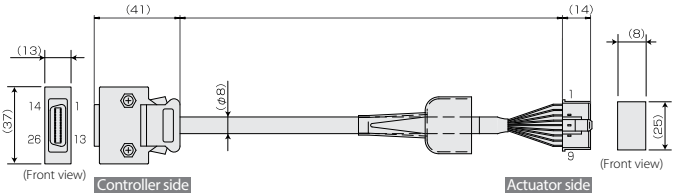


Minimum bending radius $r = 51$ mm or more (Dynamic bending condition)
*The robot cable is used as standard.

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

Model Number CB-X1-PA

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



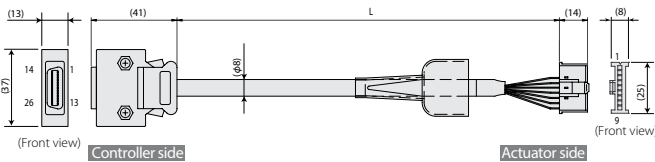
Minimum bending radius $r = 44$ mm or more (Dynamic bending condition)
*The robot cable is used as standard.

* For ISB · ISDB · ISDBCR · NSA (Encoder types are battery-less absolute) with the cable length of 21m or longer, please select CB-X1-PA -AWG 24.

Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
---	---	---	1	1	IG	---	---
---	---	E24V	11	2	BAT+	Gray	---
---	---	OV	13	3	SD	Orange	---
---	---	LS	26	4	SD	Green	---
---	---	CREEP	25	5	VCC	Red	---
---	---	OT	24	6	GND	Black	---
---	---	RSV	23	7	F.G	Drain	---
---	---	---	9	8	B.K+	Blue	---
---	---	---	18	9	B.K+	Blue	---
---	---	---	19	9	B.K+	Blue	---
---	---	A+	2	9	B.K+	Blue	---
---	---	B+	3	9	B.K+	Blue	---
---	---	Z+	5	9	B.K+	Blue	---
---	---	Z-	6	9	B.K+	Blue	---
Orange	SRD+	7	2	1	BAT+	Purple	---
Green	SRD-	8	2	2	BAT-	Gray	---
Purple	BAT+	14	4	3	SD	Orange	---
Gray	BAT-	15	4	4	SD	Green	---
Red	VCC	16	5	5	VCC	Red	---
Black	GND	17	6	6	GND	Black	---
Blue	BKR-	20	7	7	F.G	Drain	---
Yellow	BKR+	21	8	8	B.K+	Blue	---
---	---	---	22	9	B.K+	Blue	---

Model Number CB-X1-PA -AWG24

* Please indicate the cable length (L) in , maximum 30m, e.g.) 210 = 21m

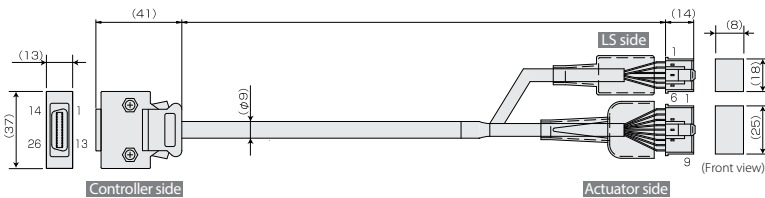


Minimum bending radius $r = 44$ mm or more (Dynamic bending condition).
*The robot cable is used as standard.

Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
---	---	---	10	---	---	---	---
---	---	E24V	11	---	---	---	---
---	---	OV	13	---	---	---	---
---	---	LS	26	---	---	---	---
---	---	CREEP	25	---	---	---	---
---	---	OT	24	---	---	---	---
---	---	RSV	23	---	---	---	---
---	---	---	9	---	---	---	---
---	---	---	18	---	---	---	---
---	---	---	19	---	---	---	---
---	---	A+	2	---	---	---	---
---	---	B+	3	---	---	---	---
---	---	Z+	5	---	---	---	---
---	---	Z-	6	---	---	---	---
Orange	SRD+	7	2	---	---	---	---
Green	SRD-	8	2	---	---	---	---
Purple	BAT+	14	4	---	---	---	---
Gray	BAT-	15	4	---	---	---	---
Red	VCC	16	5	---	---	---	---
Black	GND	17	6	---	---	---	---
Blue	BKR-	20	7	---	---	---	---
Yellow	BKR+	21	8	---	---	---	---
---	---	---	22	---	---	---	---

Model Number CB-X1-PLA

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



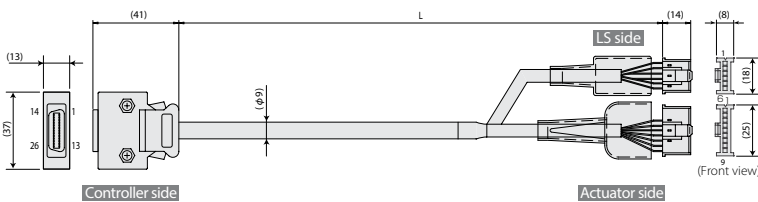
Minimum bending radius $r = 54$ mm or more (Dynamic bending condition)
* The robot cable is used as standard.

* For ISB · ISDB · ISDBCR (Encoder types are battery-less absolute), please select CB-X1-PA -AWG 24 if you want a cable of 21 m or more.

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

Model Number CB-X1-PLA -AWG24

* Please indicate the cable length (L) in , maximum 30m, e.g.) 210 = 21m

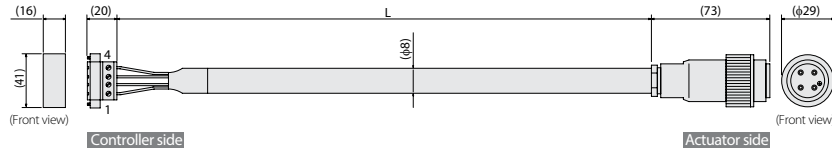


Minimum bending radius $r = 54$ mm or more (Dynamic bending condition).
* Robot cable is the standard.

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

Model Number CB-XEU-MA

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



Plug
GIC2.5/4-STF-7.62 (Phoenix)

Wiring	Signal	No.
0.75sq	PE	1
	U	2
	V	3
	W	4

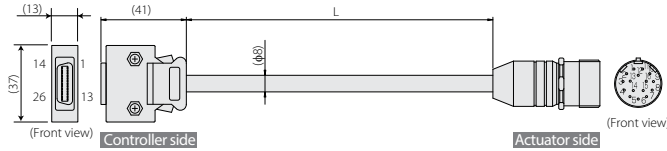
Plug connector
99-4222-00-04(BINDER)

No.	Signal	Wiring
1	PE	0.75sq
2	U	(Crimped)
3	V	
4	W	

Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

Model Number CB-X1-PA -WC

* Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

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

No.	Signal	Color	Wiring
1	SD	Orange	
2	SD	Green	
3	—	—	
4	—	—	
5	—	—	
6	—	—	
7	—	—	
8	—	—	
9	—	—	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT-	Gray	
14	—	—	
15	BK-	Blue	
16	BK+	Yellow	

The shield is clamped to the hood.
Drain wire and meshed shield
Shield is connected to the earth sleeve
(Line / white / blue in cable color indicates band color / insulator color.)

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

PSEL



**Program controller
for RCP3/RCP2**



List of Models

Program controller for operating RCP3/RCP2 Series actuators. Various control functions are combined into a single unit.

Type	CS	
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 operations can be performed.	Up to 1500 positions are supported. Push-motion operation and teaching operation are also possible.
Number of positions	1500	
	1 axis	○
	2 axes	○

Model

* 2nd axis specs not applicable to the single-axis model.

PSEL - CS - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - [] - []

Series Type Number of axes (Specs for 1st axis) (Specs for 2nd axis) I/O type I/O cable length Power/voltage Simple absolute unit High acceleration type model

CS Standard type

1 Single-axis model

2 2-axis model

I Incremental

B Brake

20P	20	35P	35
20SP	20	42P	42
28P	28	56P	56
28SP	28		

(Ex) 20P:20 stepper motor-compatible (Ex) 20P:20 stepper motor-compatible

Note

Basically, the type of motor is the same as that of the electric actuator to be connected. However, in some models the controller and actuator motor types do not match.
Applicable models are listed below for selection.
<Actuators for 28SP>
● Controller motor type "28SP"... RCP2-RA3C.

NP	PIO NPN (standard)
PN	PIO PNP
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP
EP	EtherNet/IP

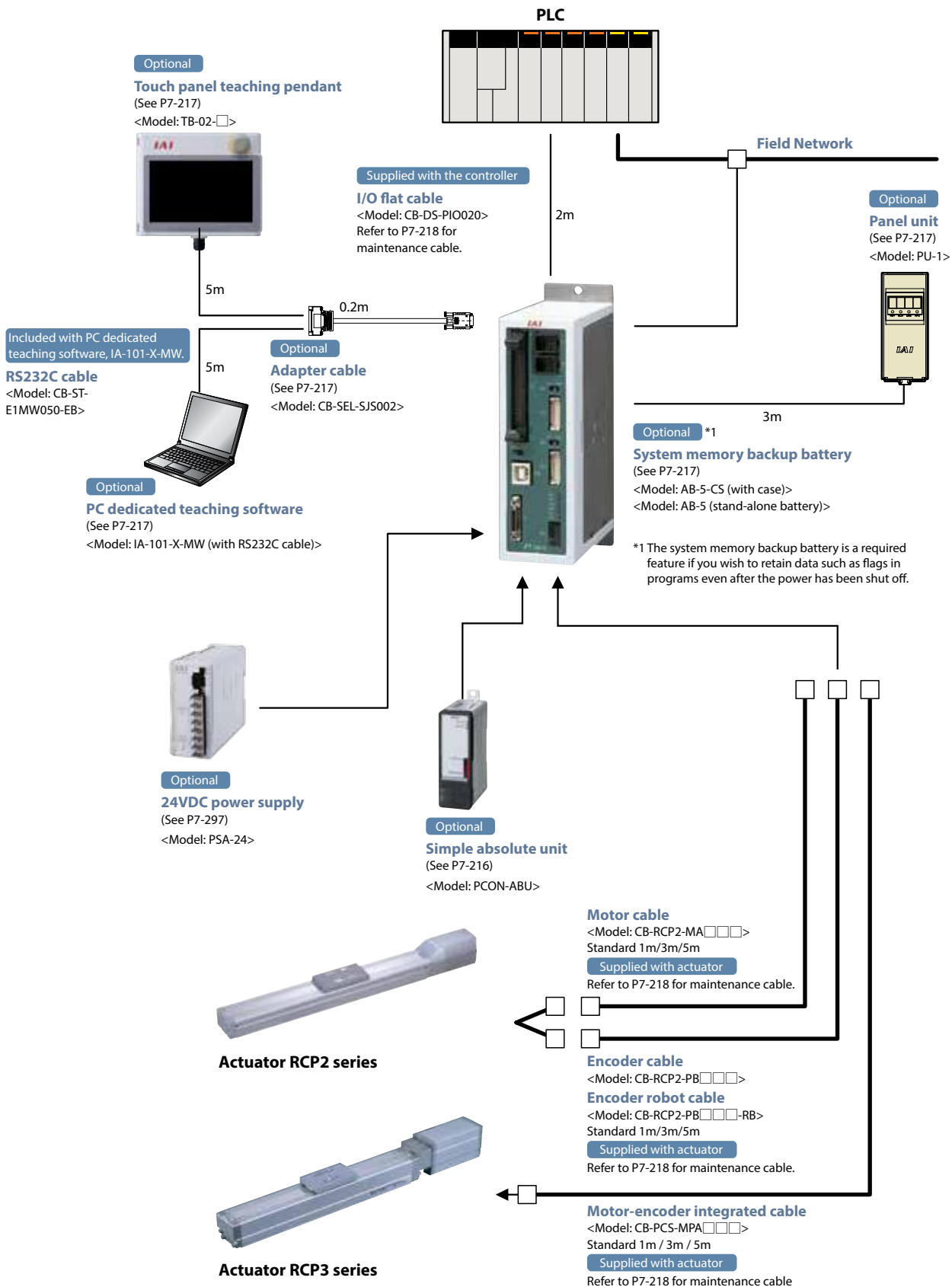
Blank	Not used
ABU	Used

Blank	Standard
H	High acceleration type model

* When selecting a field Network specification, the I/O cable length is "0".

* If connecting to RCP3-SA4C/SA5C/SA6C/RCP2-SA5C/SA6C, specify "H" for high acceleration type model.

System configuration



Controller

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PS_{EL}
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

I/O Specifications

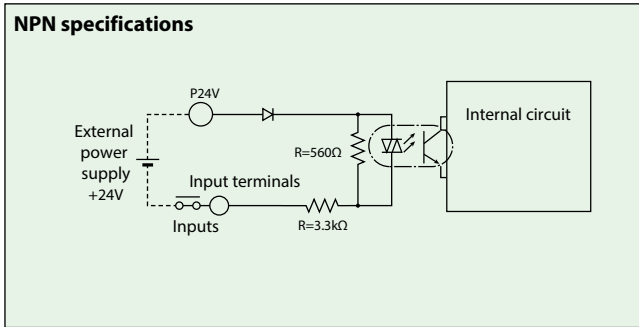
Input section External input specifications

Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / 1 circuit
ON/OFF voltage	ON voltage (min.) NPN: 16VDC / PNP: 8VDC OFF voltage (max.) NPN: 5VDC / PNP: 19VDC
Isolation method	Photocoupler

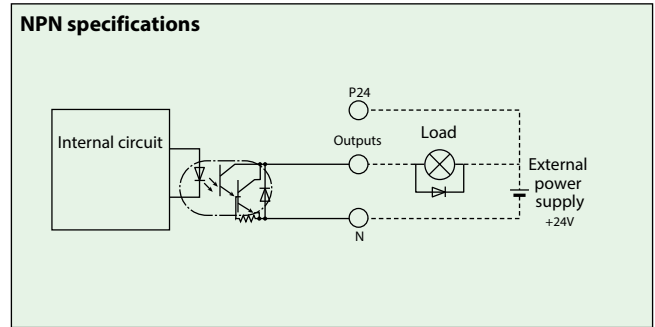
Output section External output specifications

Item	Specifications
Load voltage	24VDC
Max. load current	100mA/1 point, 400mA/8 points in total
Leakage current (max.)	Max. 0.1mA/1 point
Isolation method	Photocoupler

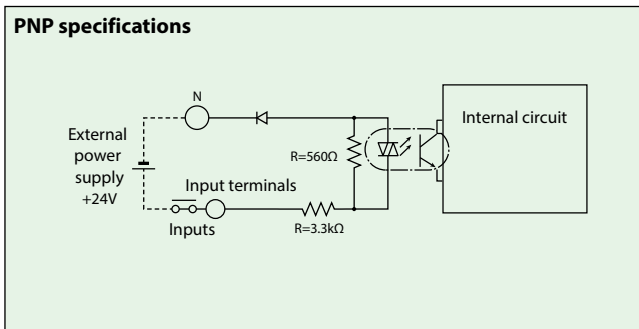
NPN specifications



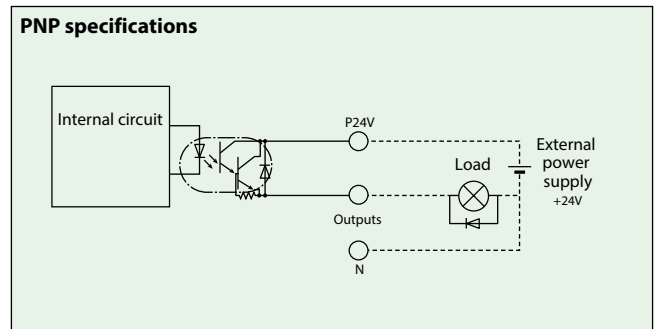
NPN specifications



PNP specifications



PNP specifications



Explanation of I/O Signal Functions

Two modes can be selected for the PSEL controller: "Program Mode," in which the actuator is operated by entering a program, and "Positioner Mode," in which PLC signals are received and the actuator is moved to designated positions.

The Positioner Mode has the five input patterns listed below to enable various applications.

Control Functions by Type

Operation mode	Features
Program mode	Various operations including linear/arc interpolation operations, ideal path operation for dispensing, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode This is the basic mode from which operations can be conducted by designating position numbers and inputting the start signal. Push-motion operations and interpolation operations of 2 axes are also possible.
	Product change mode Multiple workpieces 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 This mode enables the actuator to move by external signals, and the stop positions to be registered as position data.
	DS-S-C1 compatible mode When using a DS-S-C1 controller, you can replace it with a PSEL controller without changing the host program. *This mode does not ensure actuator compatibility.

Explanation of I/O Signal Functions

Program mode

Pin No.	Category	Port No.	Program mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	Select program No.1	Selects the program number to start. (Input as BCD values to ports 016 to 022)	
2A		017	Select program No.2		
2B		018	Select program No.4		
3A		019	Select program No.8		
3B		020	Select program No.10		
4A		021	Select program No.20		
4B		022	Select program No.40		
5A		023	CPU reset	Resets the system to the same state as when the power is turned on.	
5B		000	Start	Starts the program selected by ports 016 to 022.	
6A		001	General-purpose input	Waits for external input via program instructions.	
6B		002	General-purpose input		
7A		003	General-purpose input		
7B		004	General-purpose input		
8A		005	General-purpose input		
8B		006	General-purpose input		
9A	007	General-purpose input			
9B	008	General-purpose input			
10A	009	General-purpose input			
10B	010	General-purpose input			
11A	011	General-purpose input	Turns off when an alarm occurs. (contact B)		
11B	012	General-purpose input			
12A	013	General-purpose input			
12B	014	General-purpose input			
13A	015	General-purpose input			
13B	300	Alarm			
14A	301	Ready		Turns on when the controller starts up normally and is in an operable state.	
14B	302	General-purpose output	These outputs can be turned ON/OFF as desired via program instructions.		
15A	303	General-purpose output			
15B	304	General-purpose output			
16A	305	General-purpose output			
16B	306	General-purpose output			
17A	307	General-purpose output			
17B	N		0V input	Connect 0V.	

Positioner Standard Mode

Pin No.	Category	Port No.	Positioner standard mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	Position input 10	Specifies the position numbers to move to, using port number 007 to 019. The number can be specified either as BCD or binary.	
2A		017	Position input 11		
2B		018	Position input 12		
3A		019	Position input 13		
3B		020	—		
4A		021	—		
4B		022	—		
5A		023	Error reset		Resets minor errors. (Severe errors require a restart.)
5B		000	Start		Starts moving to selected position.
6A		001	Home return	Performs home return.	
6B		002	Servo ON	Switches between servo ON and OFF.	
7A		003	Push motion	Performs a push motion.	
7B		004	Pause	Pauses the motion when turned OFF, and resumes when turned ON.	
8A		005	Cancel	Stops the motion when turned OFF. The remaining motions is canceled.	
8B		006	Interpolation settings	When this signal is turned ON for a 2-axis model, the actuators move by linear interpolation.	
9A	007	Position input 1	Specifies the position numbers to move to, using port number 007 to 019. The number can be specified either as BCD or binary.		
9B	008	Position input 2			
10A	009	Position input 3			
10B	010	Position input 4			
11A	011	Position input 5			
11B	012	Position input 6			
12A	013	Position input 7			
12B	014	Position input 8			
13A	015	Position input 9			
13B	300	Alarm	Turns off when an alarm occurs. (contact B)		
14A	301	Ready	Turns on when the controller starts up normally and is in an operable state.		
14B	302	Positioning complete	Turns on when the movement to the destination is complete.		
15A	303	Home return complete	Turns on when the home return operation is complete.		
15B	304	Servo ON	Turns on when servo is ON.		
16A	305	Push motion complete	Turns on when a push motion is complete.		
16B	306	System battery error	Turns on when the system battery runs low (warning level).		
17A	307	—	—		
17B	N		0V input	Connect 0V.	

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

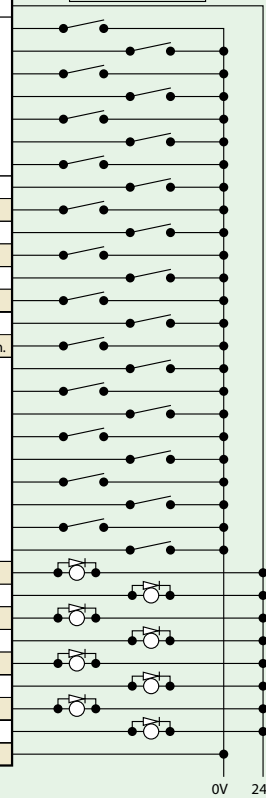
TB-03

Explanation of I/O Signal Functions

Positioner, Product-Type Change Mode

Pin No.	Category	Port No.	Positioner, Product-Type Change Mode	Functions		
1A	P24	016	24V input	Connect 24V.		
1B			Position/Product type input 10	Specifies the position numbers to move to and the product type numbers, using ports 007 to 022. The position and product type numbers are assigned by parameter settings. The number can be specified either as BCD or binary.		
2A			Position/Product type input 11			
2B			Position/Product type input 12			
3A			Position/Product type input 13			
3B			Position/Product type input 14			
4A			Position/Product type input 15			
4B			Position/Product type input 16			
5A			023		Error reset	Resets minor errors. (Severe errors require a restart.)
5B			000		Start	Starts moving to selected position.
6A			001	Home return	Performs a home return.	
6B			002	Servo ON	Switches between Servo ON and OFF.	
7A			003	Push motion	Performs a push motion.	
7B			004	Pause	Pauses the motion when turned OFF, and resumes when turned ON.	
8A			005	Cancel	Stops the motion when turned OFF. The remaining motion is canceled.	
8B			006	Interpolation settings	When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.	
9A			007	Position/Product type input 1	Specifies the position numbers to move to and the product type numbers, using ports 007 to 022. The position and product type numbers are assigned by parameter settings. The number can be specified either as BCD or binary.	
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	Turns off when an alarm occurs. (contact B)		
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.		
14B		302	Positioning complete	Turns on when the movement to the destination is complete.		
15A		303	Home return complete	Turns on when the home return operation is complete.		
15B		304	Servo ON	Turns on when servo is ON.		
16A		305	Push motion complete	Turns on when a push motion is complete.		
16B		306	System battery error	Turns on when the system battery runs low (warning level).		
17A	307	—	—			
17B	N	0V input	0V input	Connect 0V.		

Wiring diagram

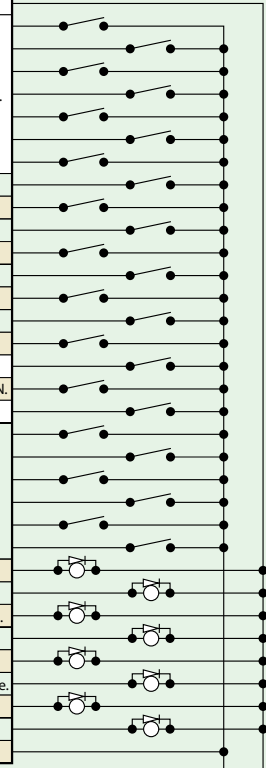


0V 24

Positioner, 2-axis Independent Mode

Pin No.	Category	Port No.	Positioner, 2-axis Independent Mode	Functions	
1A	P24	016	24V input	Connect 24V.	
1B			017	Position input 7	Specifies the position numbers to move to, using ports 010 to 022. The position numbers on the 1st and 2nd axes are assigned by parameter settings. The number can be specified either as BCD or binary.
2A			018	Position input 8	
2B			019	Position input 9	
3A			020	Position input 10	
3B			021	Position input 11	
4A			022	Position input 13	
4B			023	Error reset	Resets minor errors. (Severe errors require a restart.)
5A			000	Start 1	Starts moving to selected position on the 1st axis.
5B			001	Home return 1	Performs home return of the 1st axis.
6A			002	Servo ON 1	Switches between Servo ON and OFF on the 1st axis.
6B			003	Pause 1	Pauses the motion of 1st axis when turned OFF, and resumes when turned ON.
7A			004	Cancel 1	Cancels the movement on the 1st axis.
7B	Input	005	Start 2	Starts moving to selected position on the 2nd axis.	
8A		006	Home return 2	Performs home return of the 2nd axis.	
8B		007	Servo ON 2	Switches between Servo ON and OFF on the 1st axis.	
9A		008	Pause 2	Pauses the motion of the 2nd axis when turned OFF, and resumes when turned ON.	
9B		009	Cancel 2	Cancels the movement on the 2nd axis.	
10A		010	Position input 1	Specifies the position numbers to move to, using ports 010 to 022. The position No. of the 1st and 2nd axes are assigned by parameter settings. The number can be specified either as BCD or binary.	
10B		011	Position input 2		
11A	012	Position input 3			
11B	013	Position input 4			
12A	014	Position input 5			
12B	015	Position input 6			
13A	Output	300	Alarm	Turns off when an alarm occurs. (contact B)	
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.	
14B		302	Positioning complete 1	Turns on when the movement to the specified position on the 1st axis is complete.	
15A		303	Home return complete 1	Turns on when the home return operation of the 1st axis is complete.	
15B		304	Servo ON 1	Turns on when servo of the 1st axis is ON.	
16A		305	Positioning complete 2	Turns on when the movement to the specified position on the 2nd axis is complete.	
16B		306	Home return complete 2	Turns on when the home return operation of the 2nd axis is complete.	
17A	307	Servo ON 2	Turns on when servo of the 2nd axis is ON.		
17B	N	0V input	0V input	Connect 0V.	

Wiring diagram



0V 24

Explanation of I/O Signal Functions

Positioner, Teaching mode

Pin No.	Category	Port No.	Positioner, Teaching Mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	JOG- on 1st axis	While the signal is input, the 1st axis is moved in the - (negative) direction.	
2A		017	JOG+ on 2nd axis	While the signal is input, the 2nd axis is moved in the + (positive) direction.	
2B		018	JOG- on 2nd axis	While the signal is input, the 2nd axis is moved in the - (negative) direction.	
3A		019	Specify inching (0.01mm)	Specifies how much to move during inching. (The travel distance is the total of the specified values of ports 019 to 022.)	
3B		020	Specify inching (0.1mm)		
4A		021	Specify inching (0.5mm)		
4B		022	Specify inching (1mm)		
5A		023	Error reset	Resets minor errors. (Severe errors require a restart.)	
5B		000	Start	Starts moving to selected position.	
6A		001	Servo ON	Switches between Servo ON and OFF.	
6B		002	Pause	Pauses the motion when turned OFF, and resumes when turned ON.	
7A		003	Position input 1	Ports 003 to 013 are used to specify the position number to move, and the position number for inputting the current position. When the teaching mode setting on port 014 is in the ON state, the current value is written to the specified position number.	
7B		004	Position input 2		
8A	005	Position input 3			
8B	006	Position input 4			
9A	007	Position input 5			
9B	008	Position input 6			
10A	009	Position input 7			
10B	010	Position input 8			
11A	011	Position input 9			
11B	012	Position input 10			
12A	013	Position input 11			
12B	014	Teach mode setting			
13A	015	JOG+ on 1st axis	While the signal is input, the 1st axis is moved in the + (positive) direction.		
13B	300	Alarm	Turns off when an alarm occurs. (contact B)		
14A	301	Ready	Turns on when the controller starts up normally and is in an operable state.		
14B	302	Positioning complete	Turns on when the movement to the destination is complete.		
15A	303	Home return complete	Turns on when the home return is complete.		
15B	304	Servo ON	Turns on when servo is ON.		
16A	305	-	-		
16B	306	System battery error	Turns on when the system battery runs low (warning level).		
17A	307	-	-		
17B	N		0V input	Connect 0V.	

Positioner, DS-S-C1 Compatible Mode

Pin No.	Category	Port No.	Positioner, DS-S-C1 Compatible Mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	Position No. 1000	(Same as ports 004 through 015)	
2A		017	-	-	
2B		018	-	-	
3A		019	-	-	
3B		020	-	-	
4A		021	-	-	
4B		022	-	-	
5A		023	CPU reset	Resets the system to the same state as when the power is turned on.	
5B		000	Start	Starts moving to selected position No.	
6A		001	Hold (Pause)	Pauses the motion when turned ON, and resumes when turned OFF.	
6B		002	Cancel	Stops the motion when turned ON. The remaining motion is canceled.	
7A		003	Interpolation setting	When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.	
7B		004	Position No. 1	Specifies the position numbers to move to, using ports 004 to 016. The number can be specified in BCD.	
8A	005	Position No. 2			
8B	006	Position No. 4			
9A	007	Position No. 8			
9B	008	Position No. 10			
10A	009	Position No. 20			
10B	010	Position No. 40			
11A	011	Position No. 80			
11B	012	Position No. 100			
12A	013	Position No. 200			
12B	014	Position No. 400			
13A	015	Position No. 800			
13B	300	Alarm	Turns off when an alarm occurs. (contact A)		
14A	301	Ready	Turns on when the controller starts up normally and is in an operable state.		
14B	302	Positioning complete	Turns on when the movement to the designated position is complete.		
15A	303	-	-		
15B	304	-	-		
16A	305	-	-		
16B	306	System battery error	Turns on when the system battery runs low (warning level).		
17A	307	-	-		
17B	N		0V input	Connect 0V.	

Controller

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

Table of Specifications

	Item	Specifications
Basic specifications	Connected actuator	RCP3/PCP2 series actuator (*1)
	Input voltage	24VDC ±10%
	Power supply capacity	Control power supply (Max. 1.2A) + Motor power supply (see table below)
	Dielectric strength voltage	500VDC 10Ω or higher
	Withstand voltage	AC500V 1 minute
	Rush current	Maximum 30A
	Vibration resistance	XYZ directions 10 to 57Hz, one side amplitude: 0.035mm (continuous), 0.075mm (intermittent) 58 to 150Hz 4.9 m/S ² (continuous), 9.8 m/S ² (intermittent)
Control specifications	Maximum total output of connected axis	-
	Position detection method	Incremental encoder
	Speed setting	1 mm/sec and up, the maximum depends on the actuator
	Acceleration setting	0.01G and up, the maximum depends on the actuator
	Operating method	Program operation / Positioner operation (switchable)
Program	Programming language	Super SEL language
	Number of programs	64 programs
	Number of program steps	2000 steps
	Number of multi-tasking programs	8 programs
	Positioning points	1500 points
	Data storage device	FLASHROM (a system-memory backup battery can be added as an option)
Communications	Data input method	Touch panel teaching pendant or PC dedicated teaching software
	Number of I/Os	24 input points / 8 output points (NPN or PNP selectable)
	I/O power	Externally supplied 24VDC ±10%
	PIO cable	CB-DS-PIO □□□ (supplied with the controller)
	Serial communications function	RS232C (half-pitch connector) / USB connector
	Field network	Device Net, CC-Link, PROFIBUS
	General specifications	Protection function
	Ambient operating humidity and temperature	0 to 40°C , 10 to 95% RH (non-condensing)
	Ambient atmosphere	Free from corrosive gases. In particular there shall be no significant dust.
	Protection class	IP20
	Mass	approx. 450g
	External dimensions	43mm (W)×159mm (H)×110mm (D)

(*1) High thrust type (RA10C), high speed type (HS8C / HS8R) and water proof type (RCP2W-SA16) are not operable.

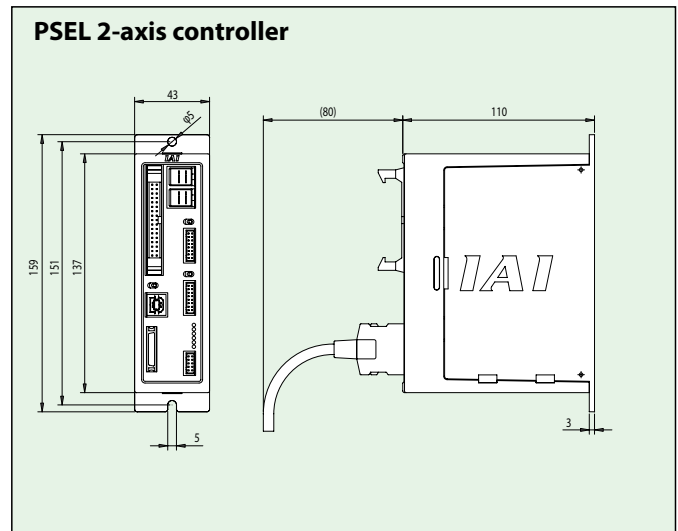
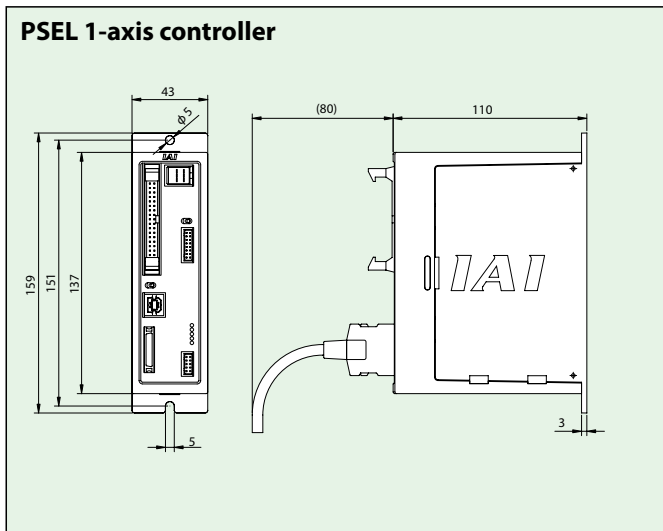
		1-axis specification	2-axis specification
Motor power supply capacity (Note 2)	Motor type	Maximum (Note 3)	Maximum (Note 3)
	20P, (20SP), 28P, 28SP motors	2.0A	4.0A
	35P, 42P, 56P motor		

(Note 2) For both 1-axis and 2-axis specifications, approx. 30A rush current flows for 5 ms when the control power supply is turned on.

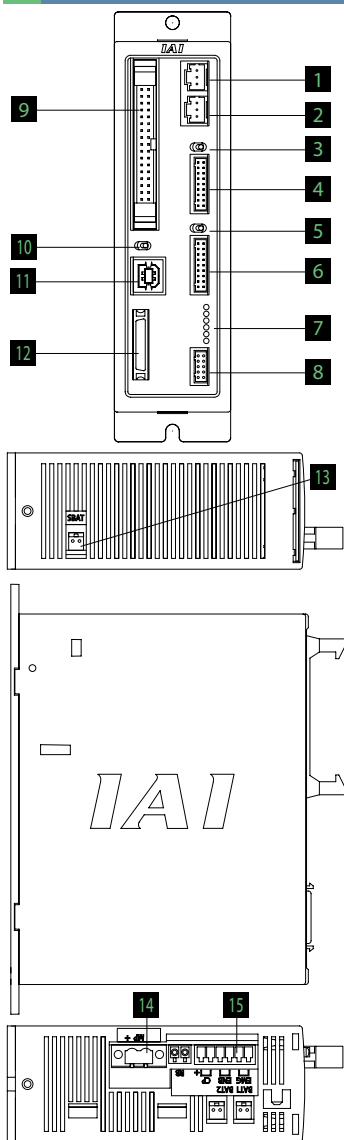
(Note 3) After servo ON, an excitation detection is performed. In that case, the current is maximized. (Approx. 100 msec.)

However, if motor drive power supply is turned on after a shut-down, approx. 6.0A and approx. 12.0A current flows to axis-1 and axis-2 respectively. (Approx. 1 to 2 msec)

External dimensions



Name of Each Part



1 Motor connector for axis 1

Connects the motor cable of the axis 1 actuator.

2 Motor connector for axis 2

Connects 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

Connects 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

Connects the encoder cable of the axis 2 actuator.

7 Status indicator LEDs

These LEDs are used to indicate the operating condition of the controller.

The LED status indicators are as follows:

PWR : Power is input to controller.

RDY : The controller is ready to perform program operation.

ALM : The controller is abnormal.

EMG : An emergency stop is actuated and the drive source is cut off.

SV1 : The axis 1 actuator servo is on.

SV2 : 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 codes.

9 I/O Connector

34-pin flat cable connector for DIO (24IN/8OUT interface).

I/O power is also supplied to the controller via this connector (Pin No. 1 and No. 34).

10 Mode switch

This switch is used to specify the operation 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 in 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 communications are cut off.

12 Teaching Tool Connector

A half-pitch I/O 26-pin connector that connects a teaching tool when the operation 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 (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 Phoenix Contact 6-pin, 2-piece connector.

Simple Absolute Unit

Features When the simple absolute unit is used, a home return operation is not needed, making an immediate start of operations possible right after the power is ON. The encoder data can be retained up to 20 days.

Model PCON-ABU

Specifications

Item	Specifications			
Model	PCON-ABU			
Connected actuator	RCP3/RCP2 Series (*1)			
Controller connecting cable (included)	Model CB-PC-PJ002 (0.2m)			
Simple absolute unit	Model ABU			
Backup battery (included)	Model AB-7 (Ni-MH battery/ life time approx. 3 years)			
Power supply voltage	24VDC ±10%			
Power supply current	max300mA			
Ambient operating temperature	0 to 40°C (preferably approx. 20°C)			
Ambient operating humidity	95% RH or lower (non condensing)			
Operating ambience	No corrosive gases. Specially no dust.			
Mass	330g			
Allowable encoder revolution during the data retaining (*2)	800rpm	400rpm	200rpm	100rpm
Retaining hours for positioning data (*2)	120h	240h	360h	480h

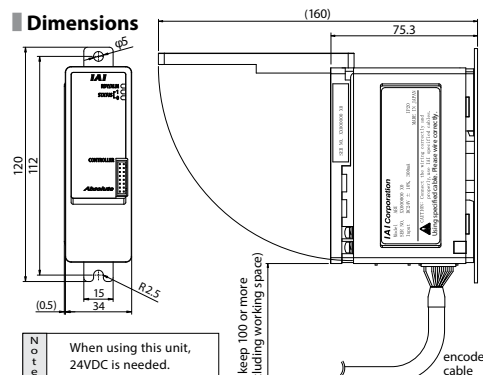
(*1) Not compatible with RCP2-RA10C/HS8C/HS8R/RCP2CR-HS8C/RCP2W-SA16C/RA10C.

(*2) The position data retaining hours vary depending on the setting value for the allowable revolution of encoder during the data retaining. (800rpm→120h/400rpm→240h/200rpm→360h/100rpm→480h)

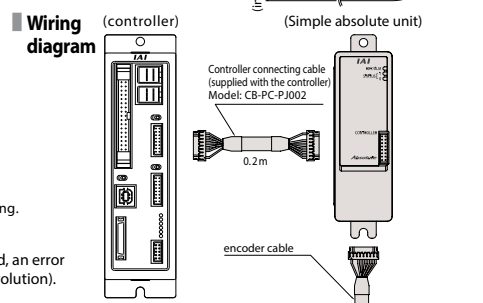
Note

While the encoder data is retained, if the actuator slider and rod are operated at higher than a certain speed, an error occurs. Refer to the above specifications of the simple absolute unit for the allowable speed (number of revolution).

Dimensions



Wiring diagram



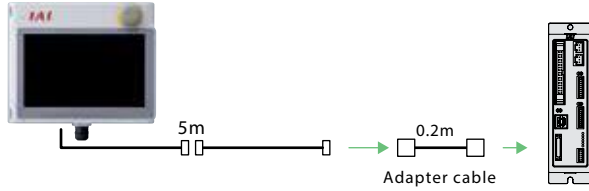
Options

Touch Panel Teaching Pendant

Features This teaching device has functions such as position inputs, test runs and monitoring.

Model TB-02-□

Configuration



Specifications

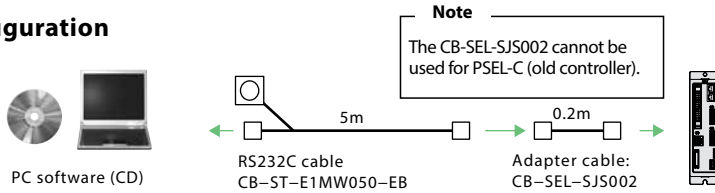
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0-40°C
Ambient operating humidity	20-85% RH (non-condensing)
Protective class	IP20
Mass	470g (TB-02 only)

PC dedicated teaching software (Windows only)

Features Startup support software for inputting programs/positions, performing test runs and monitoring. More functions are added for debugging, enabling the start-up time to shorten.

Model IA-101-X-MW-JS (with RS232C cable + adapter cable)

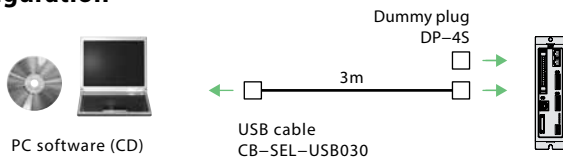
Configuration



Note
The CB-SEL-SJS002 cannot be used for PSEL-C (old controller).

Model IA-101-X-USBS (with USB cable)

Configuration



Note
Dummy plug DP-4S cannot be used for PSEL-C (old controller).

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

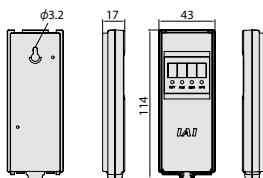
Windows versions: 7/8/8.1/10



Panel Unit

Features Display device that shows the error code from the controller and the current running program number.

Model PU-1 (cable length: 3m)



System Memory Backup Battery

Features This battery is required when you are using global flags in the program and you want to retain your data even after the power has been turned OFF.

Model AB-5-CS (with case)
AB-5 (stand-alone battery)



Dummy Plug

Features When connecting the PSEL controller to a computer with a USB cable, this plug needs to be connected to the teaching tool connector to shut off the enable circuit. (PC dedicated teaching software IA-101-X-USB includes this plug.)

Model DP-4S

* Cannot be used for PSEL-C.



Options

USB Cable

Features A cable for connecting the controller to the USB port to a computer. A controller with no USB port (e.g. XSEL) can be connected to the USB port of a computer by connecting an RS232C cable to the USB cable via a USB adapter. (Refer to the PC dedicated teaching software IA-101-X-USBMW.)

Model CB-SEL-USB030 (cable length: 3m)

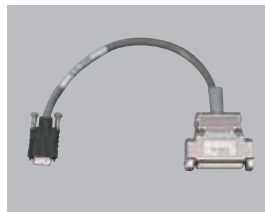


Adapter Cable

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

Model CB-SEL-SJS002 (cable length: 0.2m)

* Cannot be used for the PSEL-C.



Maintenance Parts

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-253 for actuators to be connected.)

■ Applicable cable

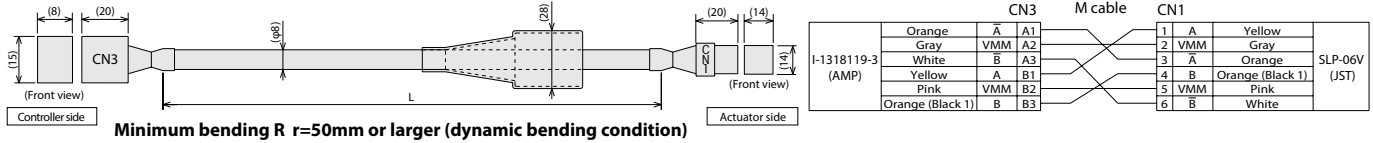
*1 Robot cable is the standard.

Product type	Motor-encoder integrated type robot cable	Motor cable *1	Encoder cable	Encoder robot cable
① RCP3	CB-PCS-MPA□□□	-	-	-
② RCP2CR	GRS/GRM/GR3SS/GR3SM	-	-	-
③ RCP2W	RTBS/RTBSL/RTCS/RTCSL/RTB/RTBL/RTC/RTCL/RTBB/RTBL/RTCB/RTCBL	CB-PCS2-MPA□□□	-	-
④ RCP2	RTBS/RTBSL/RTCS/RTCSL	-	-	-
⑤ RCP2	GRSS/GRLS/GRST/GRHM/GRHB/SRA4R/SRG54R/SRGD4R	CB-PCS-MPA□□□	-	-
⑥ RCP2CR RCP2W	Models other than the above (①~⑤)	-	CB-RCP2-MA□□□	CB-RCP2-PB□□□ CB-RCP2-PB□□□-RB

Product type	PIO flat cable
⑦ PSEL-CS	CB-DS-PIO□□□

Model CB-RCP2-MA□□□

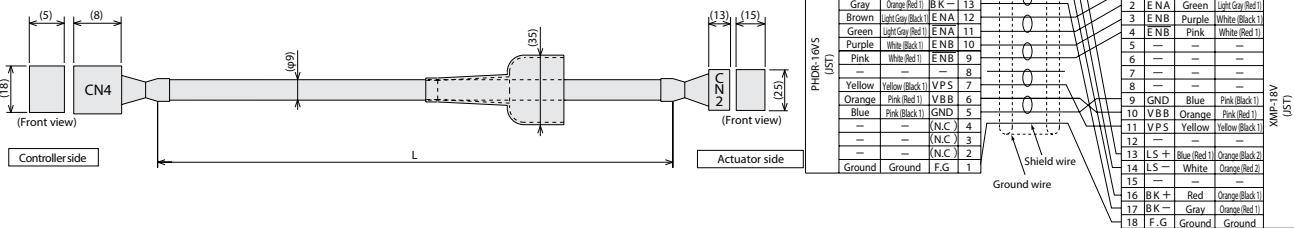
* Enter the cable length (L) into □□□.
Maximum 20m. Ex: 080=8m



Model CB-RCP2-PB□□□/CB-RCP2-PB□□□-RB

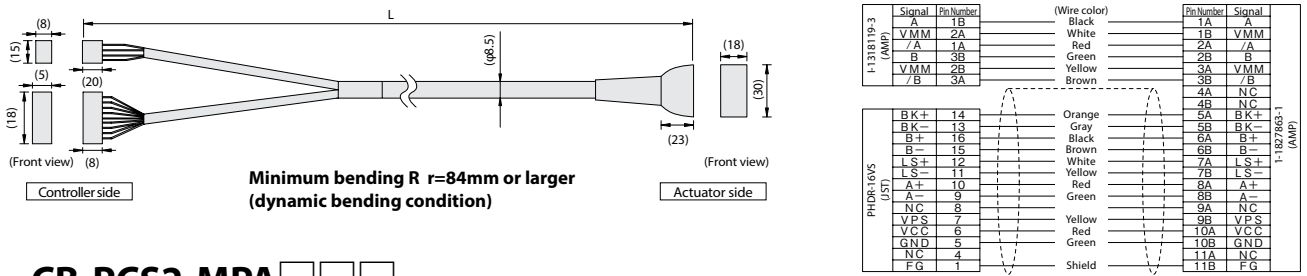
* Enter the cable length (L) into □□□.
Maximum 20m. Ex: 080=8m

Minimum bending R r=50mm or larger (dynamic bending condition).
* Only the robot cable can be used in the cable track.

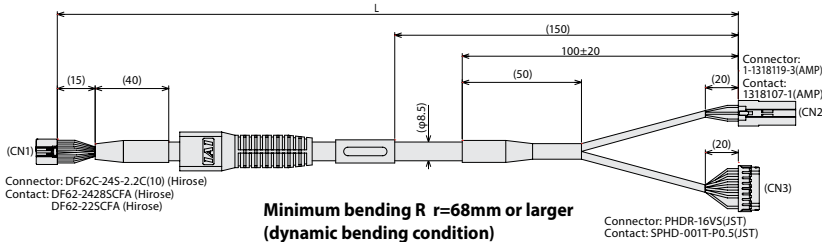


Model CB-PCS-MPA□□□

* Enter the cable length (L) into □□□.
Maximum 20m. Ex: 080=8m



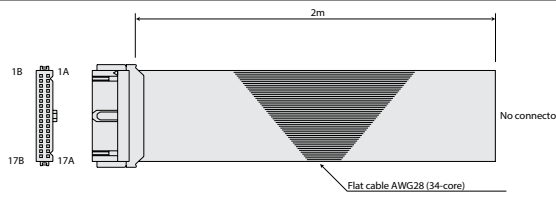
Model CB-PCS2-MPA□□□



Wire diameter	Cable color	Signal	Pin	Wire diameter	Cable color	Signal	Pin
AWG22	Blue	φ A	3	AWG22	Blue	φ A	3
AWG22	Orange	VMM	5	AWG22	Orange	VMM	5
AWG22	Brown	φ B	10	AWG22	Brown	φ B	10
AWG22	Gray	VMM	9	AWG22	Gray	VMM	9
AWG22	Green	φ/A	4	AWG22	Green	φ/A	4
AWG22	Red	φ/B	15	AWG22	Red	φ/B	15
AWG26	Black	LS +	8	AWG26	Black	LS +	8
AWG26	Yellow	LS -	14	AWG26	Yellow	LS -	14
AWG26	White	N.C	4	AWG26	White	N.C	4
AWG26	Green	A +	1	AWG26	Green	A +	1
AWG26	Brown	A -	11	AWG26	Brown	A -	11
AWG26	Gray	B +	11	AWG26	Gray	B +	11
AWG26	Red	B -	16	AWG26	Red	B -	16
AWG26	Blue	BK +	20	AWG26	Blue	BK +	20
AWG26	Orange	BK -	2	AWG26	Orange	BK -	2
AWG26	Gray	V.C.C	13	AWG26	Gray	V.C.C	13
AWG26	Red	GND	7	AWG26	Red	GND	7
AWG26	Brown	V.P.S	18	AWG26	Brown	V.P.S	18
AWG26	White	N.C	19	AWG26	White	N.C	19
AWG26	-	N.C	19	AWG26	-	N.C	19
AWG26	-	N.C	23	AWG26	-	N.C	23
AWG26	Green	F.G	24	AWG26	Green	F.G	24

Model CB-DS-PIO□□□

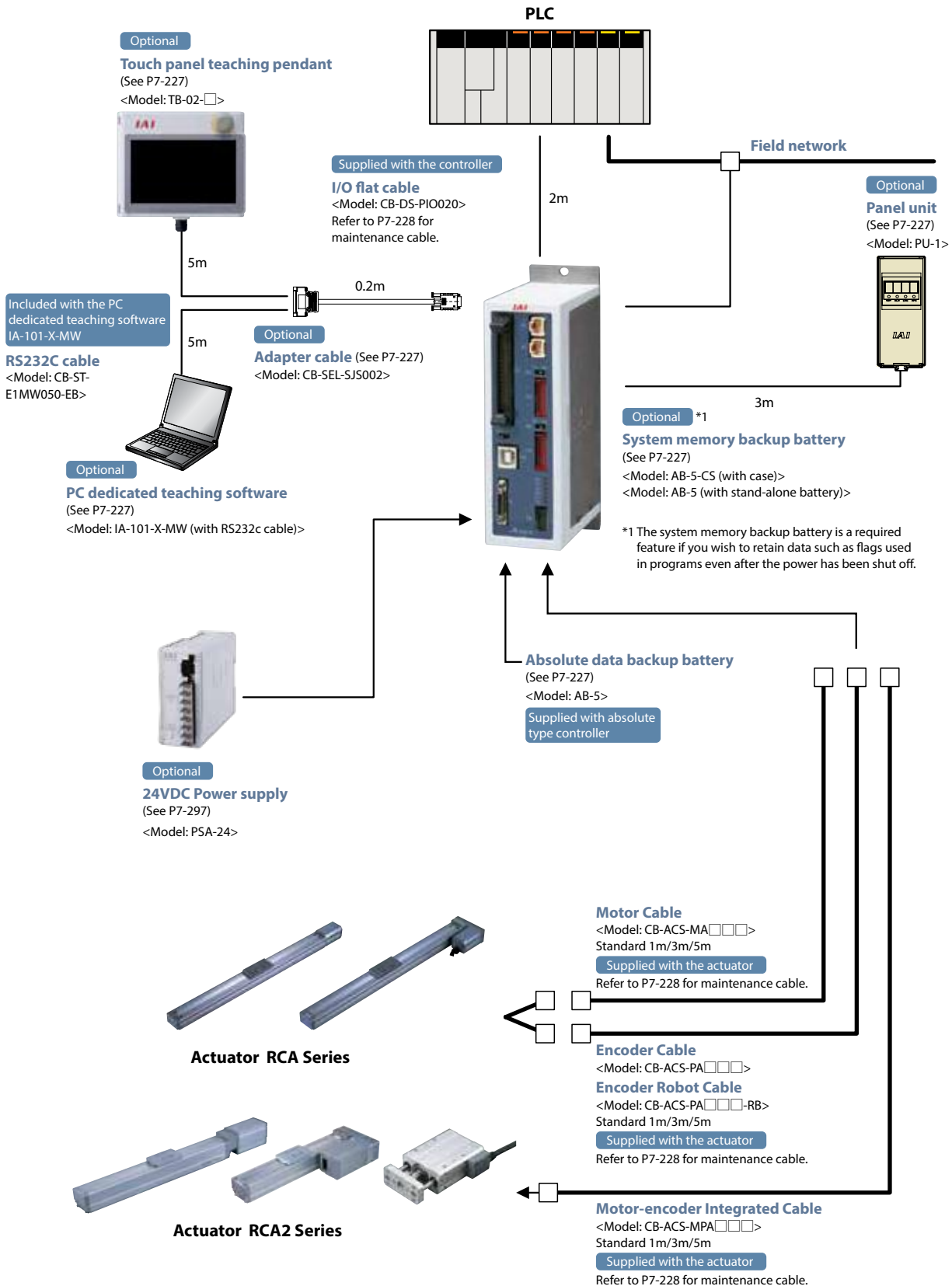
* Enter the cable length (L) into □□□.
Maximum 20m. Ex: 080=8m



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

- Controller
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

System configuration



Controller

EC

RCP6S

RCON

MCON

PCON

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

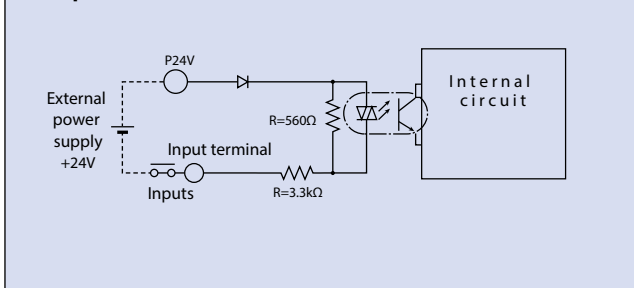
TB-03

I/O Specifications

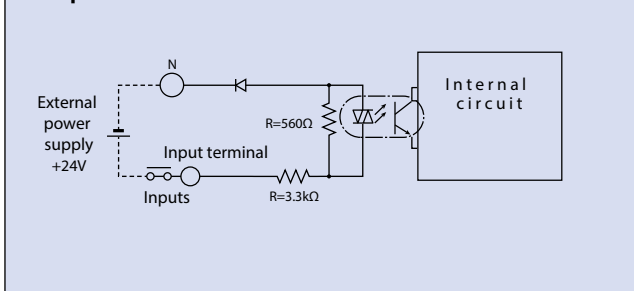
Input section External input specifications

Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage (Min.) NPN: 16VDC / PNP: 8VDC OFF voltage (Max.) NPN: 5VDC / PNP: 19VDC
Isolation method	Photocoupler

NPN Specifications



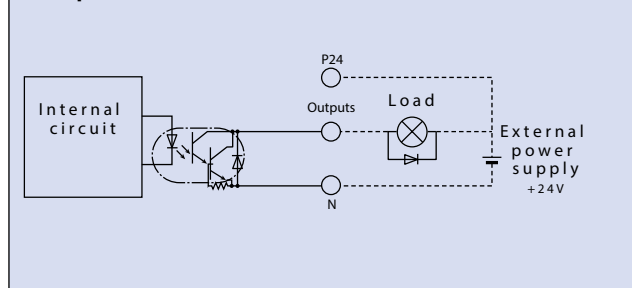
PNP Specifications



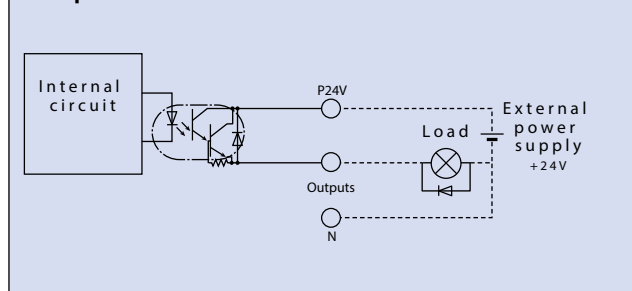
Output section External output specifications

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point, 400mA / 8 points total
Leakage current (max.)	Max. 0.1mA / point
Isolation method	Photocoupler

NPN Specifications



PNP Specifications



Explanation I/O Signal Functions

Two modes can be selected for the ASEL controller: "Program Mode," in which the actuator is operated by entering a program, and "Positioner Mode," in which PLC signals are received and the actuator is moved to designated positions.

The Positioner Mode has five input patterns listed below to enable various applications.

Controller Function by Type

Operation mode	Features
Program mode	Various operations including linear/arc interpolation operation, ideal path operation for dispensing, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode This is the basic mode from which operations can be conducted by designating position numbers and inputting the start signal. Push-motion operations and linear interpolation operation of 2 axes are also possible.
	Product change mode Multiple parts 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 This mode enables the actuator to move by an external signal, and the stop position to be registered as position data.
	DS-S-C1 compatible mode When using a DS-S-C1 controller, you can replace it with an ASEL controller without having to change the host programs. * This mode does not ensure actuator compatibility.

Explanation of I/O Signal Functions

Program mode

Pin No.	Category	Port No.	Program mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	Select program No.1	Selects the program number to start. (Input as BCD values to ports 016 to 022)	
2A		017	Select program No.2		
2B		018	Select program No.4		
3A		019	Select program No.8		
3B		020	Select program No.10		
4A		021	Select program No.20		
4B		022	Select program No.40		
5A		023	CPU reset		Resets the system to the same state as when the power is turned on.
5B		000	Start		Starts the program selected by ports 016 to 022.
6A		001	General-purpose input		Waits for external input via program instructions.
6B		002	General-purpose input		
7A		003	General-purpose input		
7B		004	General-purpose input		
8A		005	General-purpose input		
8B	006	General-purpose input			
9A	007	General-purpose input			
9B	008	General-purpose input			
10A	009	General-purpose input			
10B	010	General-purpose input			
11A	011	General-purpose input	Turns off when an alarm occurs. (Contact B)		
11B	012	General-purpose input			
12A	013	General-purpose input			
12B	014	General-purpose input			
13A	015	General-purpose input			
13B	300	Alarm			
14A	301	Ready		Turns on when the controller starts up normally and is in an operable state.	
14B	302	General-purpose output	These outputs can be turned ON/OFF as desired via program instructions.		
15A	303	General-purpose output			
15B	304	General-purpose output			
16A	305	General-purpose output			
16B	306	General-purpose output			
17A	307	General-purpose output			
17B	N		0V input	Connect 0V.	

Positioner mode

Pin No.	Category	Port No.	Positioner Standard Mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	Position input 10	Specifies the position numbers to move to, using ports 007 to 019. The number can be specified either as BCD or binary.	
2A		017	Position input 11		
2B		018	Position input 12		
3A		019	Position input 13		
3B		020	--		
4A		021	--		
4B		022	--		
5A		023	Error reset		Resets minor errors. (Severe errors require a restart.)
5B		000	Start		Starts moving to the selected position.
6A		001	Home return		Performs Home Return.
6B		002	Servo ON		Switches between Servo ON and OFF.
7A		003	Push		Performs a push motion.
7B		004	Pause		Pauses the motion when turned OFF, and resumes motion when turned ON.
8A		005	Cancel		Stops the motion when turned OFF. The remaining motion is canceled.
8B	006	Interpolation settings	When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.		
9A	007	Position input 1	Specifies the position numbers to move to, using ports 007 to 019. The number can be specified either as BCD or binary.		
9B	008	Position input 2			
10A	009	Position input 3			
10B	010	Position input 4			
11A	011	Position input 5			
11B	012	Position input 6			
12A	013	Position input 7			
12B	014	Position input 8			
13A	015	Position input 9			
13B	300	Alarm	Turns off when an alarm occurs. (Contact B)		
14A	301	Ready	Turns on when the controller starts up normally and is in an operable state.		
14B	302	Positioning complete	Turns on when the movement to the destination is complete.		
15A	303	Home Return complete	Turns on when the home return operation is complete.		
15B	304	Servo On output	Turns on when servo is ON.		
16A	305	Pushing complete	Turns on when a push motion is complete.		
16B	306	System battery error	Turns on when the system battery runs low (warning level).		
17A	307	Absolute encoder battery error	Turns on when the battery for the absolute encoder runs low (warning level).		
17B	N		0V input	Connect 0V.	

Controller

EC

RCP6S

RCON

MCON

PCON

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

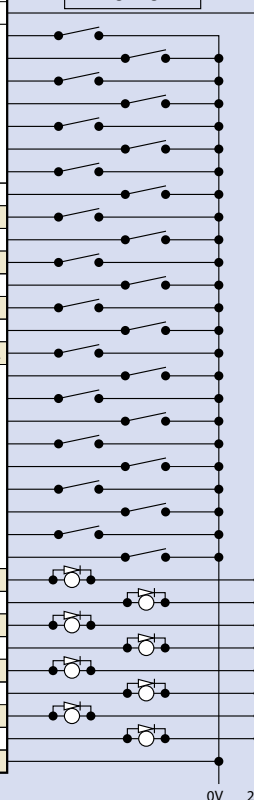
TB-03

Explanation of I/O Signal Functions

Positioner, Product-Type Change Mode

Pin No.	Category	Port No.	Positioner Product Type Change Mode	Functions	
1A	P24		24V input	Connect 24V.	
1B	Input	016	Position/Product Type Input 10	Specifies the position numbers to move to, and the product type numbers, using ports 007 to 022. The position and product type numbers are assigned by parameter settings. The number can be specified either as BCD or binary.	
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		Resets minor errors. (Severe errors require a restart.)
5B		000	Start		Starts moving to the selected position.
6A		001	Home Return		Performs Home Return.
6B		002	Servo ON		Switches between Servo ON and OFF.
7A		003	Push		Performs a push motion.
7B		004	Pause		Pauses the motion when turned OFF, and resumes motion when turned ON.
8A	005	Cancel	Stops the motion when turned OFF. The remaining motion is canceled.		
8B	006	Interpolation settings	When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.		
9A	007	Position/Product Type Input 1	Specifies the position numbers to move to, and the product type numbers, using ports 007 to 022. The position and product type numbers are assigned by parameter settings. The number can be specified either as BCD or binary.		
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	Turns off when an alarm occurs (Contact B).	
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.	
14B		302	Positioning complete	Turns on when the movement to the destination is complete.	
15A		303	Home Return complete	Turns on when the home return operation is complete.	
15B		304	Servo ON output	Turns on when servo is ON.	
16A		305	Pushing complete	Turns on when a push motion is complete.	
16B		306	System battery error	Turns on when the system battery runs low (warning level).	
17A	307	Absolute encoder battery error	Turns on when the battery for the absolute encoder runs low (warning level).		
17B	N		0V input	Connect 0V.	

Wiring diagram

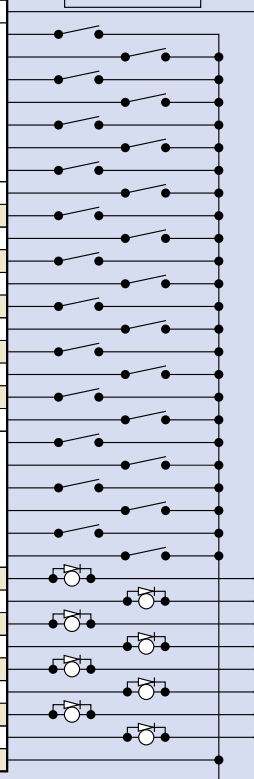


0V 24

Positioner, 2-axis Independent Mode

Pin No.	Category	Port No.	Positioner 2-axis Independent Model	Functions	
1A	P24		24V input	Connect 24V.	
1B	Input	016	Position input 7	Specifies the position numbers to move to, using port 010 to 022. The position numbers on the 1st and 2nd axes are assigned by parameter settings. The number can be specified either as BCD or binary.	
2A		017	Position input 8		
2B		018	Position input 9		
3A		019	Position input 10		
3B		020	Position input 11		
4A		021	Position input 12		
4B		022	Position input 13		
5A		023	Error reset		Resets minor errors. (Severe errors require a restart.)
5B		000	Start 1		Starts moving to the selected position on the 1st axis.
6A		001	Home return 1		Performs Home Return on the 1st axis.
6B		002	Servo ON 1		Switches between servo ON and OFF for the 1st axis.
7A		003	Pause 1		Pauses the motion on 1st axis when turned OFF, and resumes motion when turned ON.
7B		004	Cancel 1		Cancels the movement on the 1st axis.
8A	005	Start 2	Starts the movement to the selected position number on the 2nd axis.		
8B	006	Home return 2	Performs home return on the 2nd axis.		
9A	007	Servo ON 2	Switches between servo ON and OFF for the 2nd axis.		
9B	008	Pause 2	Pauses the motion on 2nd axis when turned OFF, and resumes when turned ON.		
10A	009	Cancel 2	Cancels the movement on the 2nd axis.		
10B	010	Position input 1	Specifies the position numbers to move to, using ports 010 to 022. The position numbers on the 1st and 2nd axes are assigned by parameter settings. The number can be specified either as BCD or binary.		
11A	011	Position input 2			
11B	012	Position input 3			
12A	013	Position input 4			
12B	014	Position input 5			
13A	015	Position input 6			
13B	Output	300	Alarm	Turns off when an alarm occurs. (contact B)	
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.	
14B		302	Positioning complete 1	Turns on when the movement to the specified position on the 1st axis is complete.	
15A		303	Home Return complete 1	Turns on when home return on the 1st axis is complete.	
15B		304	Servo ON output 1	Turns on when the 1st axis is in a servo ON state.	
16A		305	Positioning complete 2	Turns on when the movement to the specified position on the 2nd axis is complete.	
16B		306	Home Return complete 2	Turns on when home return on the 2nd axis is complete.	
17A	307	Servo ON output 2	Turns on when the 2nd axis is in a servo ON state.		
17B	N		0V input	Connect 0V.	

Wiring diagram

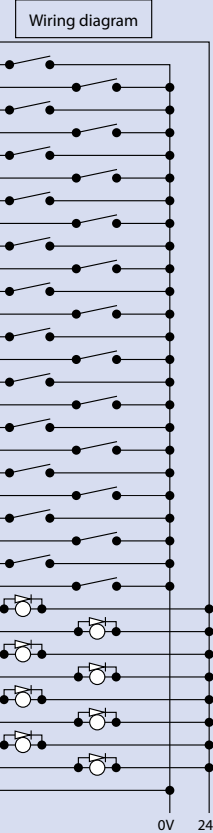


0V 24

Explanation of I/O Signal Functions

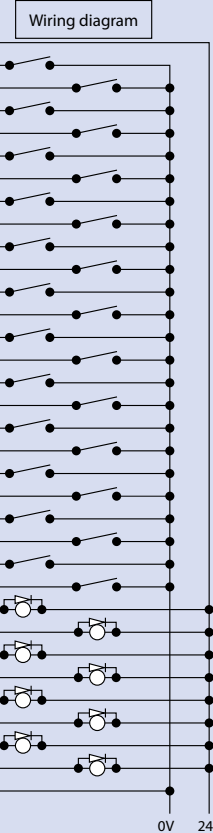
Positioner, Teaching Mode

Pin No.	Category	Port No.	Positioner Teaching Mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	JOG- on 1st axis	While the signal is on, the 1st axis is moved in the - (negative) direction.
2A		017	JOG+ on 2nd axis	While the signal is on, the 2nd axis is moved in the + (positive) direction.
2B		018	JOG- on 2nd axis	While the signal is on, the 2nd axis is moved in the - (negative) direction.
3A		019	Specify inching (0.01mm)	Specifies how much to move during inching. (The travel distance is the total of the specified values of ports 019 to 022.)
3B		020	Specify inching (0.1mm)	
4A		021	Specify inching (0.5mm)	
4B		022	Specify inching (1mm)	
5A		023	Error reset	Resets minor errors. (Severe errors require a restart.)
5B		000	Start	Starts moving to selected position.
6A		001	Servo ON	Switches between Servo ON and OFF.
6B		002	Pause	Pauses the motion when turned OFF, and resumes motion when turned ON.
7A		003	Position input 1	Ports 003 to 013 are used to specify the position number to move, and the position number for inputting the current position. When the teaching mode setting on port No. 014 is in the ON state, and the start signal on port No. 000 is ON, the current value is written to the specified position number.
7B		004	Position input 2	
8A	005	Position input 3		
8B	006	Position input 4		
9A	007	Position input 5		
9B	008	Position input 6		
10A	009	Position input 7		
10B	010	Position input 8		
11A	011	Position input 9		
11B	012	Position input 10		
12A	013	Position input 11		
12B	014	Teaching mode setting		
13A	015	JOG+ on 1st axis	While the signal is input, the 1st axis is moved in the + (positive) direction.	
13B	Output	300	Alarm	Turns off when an alarm occurs. (Contact B)
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.
14B		302	Positioning complete	Turns on when the movement to the destination is complete.
15A		303	Home return complete	Turns on when the home return operation is complete.
15B		304	Servo ON output	Turns on when servo is ON.
16A		305	—	—
16B		306	System battery error	Turns on when the system battery runs low (warning level).
17A	307	Absolute battery error	Turns on when the battery for the absolute encoder runs low (warning level).	
17B	N		0V input	Connect 0V.



Positioner, DS-S-C1 Compatible Mode

Pin No.	Category	Port No.	Positioner DS-S-C1 Compatible Mode	Functions
1A	P24		24V input	Connect 24V.
1B	Input	016	Position No. 1000	(Same as ports 004 to 015)
2A		017	—	—
2B		018	—	—
3A		019	—	—
3B		020	—	—
4A		021	—	—
4B		022	—	—
5A		023	CPU reset	Resets the system to the same state as when the power is turned on.
5B		000	Start	Starts moving to selected position.
6A		001	Hold (Pause)	Pauses the motion when turned ON, and resumes when turned OFF.
6B		002	Cancel	Stops the motion when turned ON. The remaining motion is canceled.
7A		003	Interpolation settings	When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.
7B		004	Position No.1	Ports 004 through 016 are used to specify the position number to move. The numbers are 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	Turns off when an alarm occurs. (Contact A)
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.
14B		302	Positioning complete	Turns on when the movement to the destination is complete.
15A		303	—	—
15B		304	—	—
16A		305	—	—
16B		306	System battery error	Turns on when the system battery runs low (warning level).
17A	307	Absolute encoder battery error	Turns on when the battery for the absolute encoder runs low (warning level).	
17B	N		0V input	Connect 0V.



- Controller
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Table of Specifications

	Item	Specifications
Basic specifications	Connected actuator	RCA/RCA2 Series actuator
	Input voltage	24VDC ±10%
	Power supply capacity	Control power supply (max. 1.2A) + motor power supply (see the table below)
	Dielectric strength voltage	500VDC 10MΩ or higher
	Withstand voltage	500VAC 1 min.
	Rush current	Max. 30A
Control specifications	Vibration resistance	XYZ directions 10 to 57Hz, One side amplitude: 0.035mm (continuous), 0.075mm (intermittent) 58 to 150Hz 4.9 m/S ² (continuous), 9.8m/S ² (intermittent)
	Number of control axes	1 axis / 2 axes
	Maximum total output of connected axes	60W (30W + 30W)
	Position detection method	Incremental encoder / Absolute encoder / Battery-less absolute encoder
	Speed setting	1 mm/s and up, the maximum depends on the actuator.
	Acceleration setting	0.01G and up, the maximum depends on the actuator.
Program	Operating method	Program operation / Positioner operation (switchable)
	Programming language	Super SEL language
	Number of programs	64 programs
	Number of program steps	2000 steps
	Number of multi-tasking programs	8 programs
	Positioning points	1500 points
Communication	Data memory device	FLASHROM (A system-memory backup battery can be added as an option)
	Data input method	Touch panel teaching pendant or PC dedicated teaching software
	Number of I/Os	24 input points / 8 output (NPN or PNP selectable)
	I/O power	Externally supplied 24VDC±10%
	PIO cable	CB-DS-PIO □□□ (supplied with the controller)
	Serial communications function	RS232C (D-sub half pitch connector) / USB connector
General specifications	Field network	Device Net, CC-Link, PROFIBUS
	Protection function	Motor over-current, motor drive temperature check, overload check, encoder open-circuit, soft limit over, system error, battery error, etc.
	Ambient operating humidity and temperature	0 to 40°C , 10 to 95% RH (non-condensing)
	Ambient atmosphere	Free from corrosive gases, In particular, there shall be no significant dust.
	Protection class	IP20
	Mess	Approx. 450g
External dimensions	43mm(W)×159mm(H)×110mm(D)	

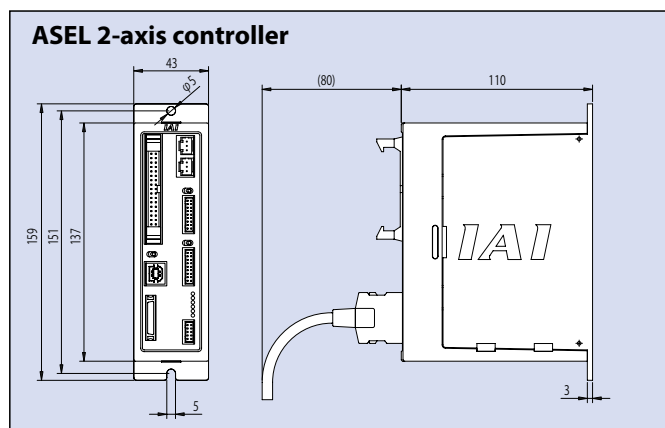
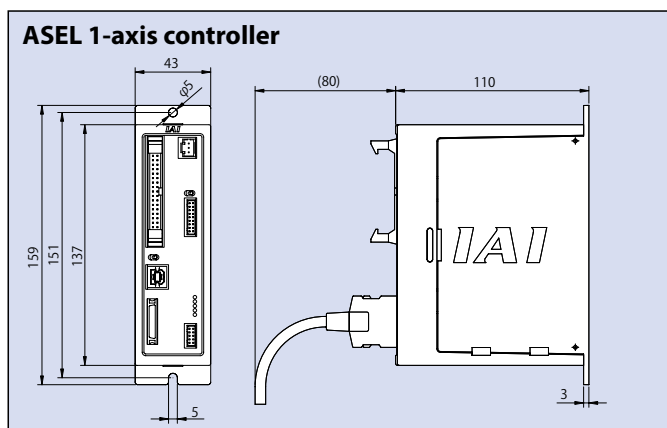
Motor power supply capacity (Note 1)	Actuator type	1-axis specification				2-axis specification				
		Standard specifications/high acceleration and deceleration model		Power-saving		Standard specifications/high acceleration and deceleration model		Power-saving		
		Rated	Max. (Note 2)	Rated	Max. (Note 3)	Rated	Max. (Note 2)	Rated	Max. (Note 3)	
MSCON	RCA RCA2	10W, 20W [Model number: 20]	1.3A	4.4A	1.3A	2.5A	2.6A	8.8A	2.6A	5.0A
		30W	1.3A	4.0A	1.3A	2.2A	2.6A	8.0A	2.6A	4.4A
		20W [Model number: 20S] SA4, RA3, TA5 type dedicated	1.7A	5.1A	1.7A	3.4A	3.4A	10.2A	3.4A	6.8A
	RCL	2W	0.8A	4.6A	—	—	1.6A	9.2A	—	—
		5W	1.0A	6.4A	—	—	2.0A	12.8A	—	—
		10W	1.3A	6.4A	—	—	2.6A	12.8A	—	—

(Note 1) For both 1-axis and 2-axis specifications, approx. 30.0A rush current flows for 5ms when the control power supply is turned on.

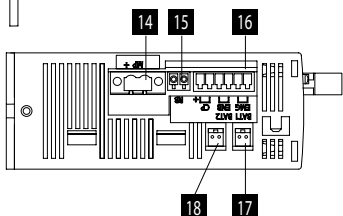
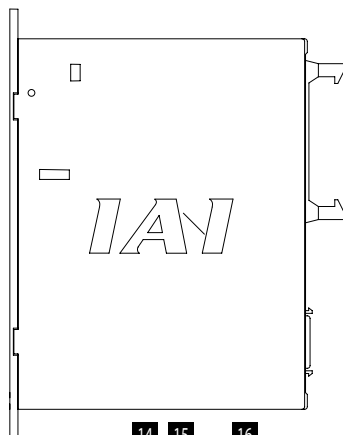
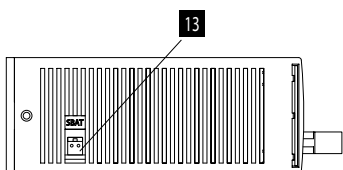
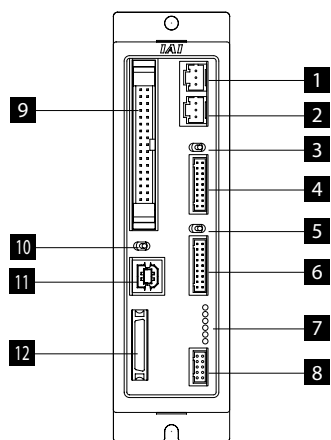
(Note 2) Max. current at accelerating/decelerating.

(Note 3) Current reaches the maximum when detecting the servo motor excitation phase at the first servo on after the power is on. (Normal: approx. 1 to 2 sec., max.: 10 sec.)

External Dimensions



Name of Each Part



1 Motor connector for axis 1

Connects the motor cable of the axis 1 actuator.

2 Motor connector for axis 2

Connects 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

Connects 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

Connects the encoder cable of the axis 2 actuator.

7 Status indicator LEDs

These LEDs are used to indicate the operating condition of the controller.

The LED status indicators are as follows:

PWR : Power is input to controller.

RDY : The controller is ready to perform program operation.

ALM : The controller is abnormal.

EMG : An emergency stop is actuated and the drive source is cut off.

SV1 : The axis 1 actuator servo is on.

SV2 : 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 codes.

9 I/O Connector

A connector for interface I/Os.

34-pin flat cable connector for DIO (24IN/8OUT) interface.

I/O power is also supplied to the controller via this connector (Pin No. 1 and No. 34).

10 Mode switch

This switch is used to specify the operation 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 in 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 Tool Connector

A half-pitch I/O 26-pin connector that connects a teaching tool when the operation 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 (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 resistance that must be connected when the built-in regenerative resistance alone does not offer sufficient capacity in high-acceleration/ high-load operation, etc. Whether or not an external regenerative resistance 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 enables switch. It consists of a Phoenix Contact 6-pin 2-piece connector.

17 Absolute-data backup battery connector for axis 1

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

18 Absolute-data backup battery connector for axis 2

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

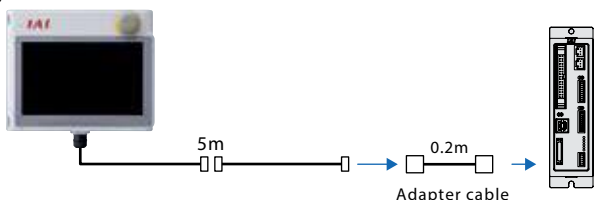
Options

Touch Panel Teaching Pendant

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

Model TB-02-□

Configuration



Specifications

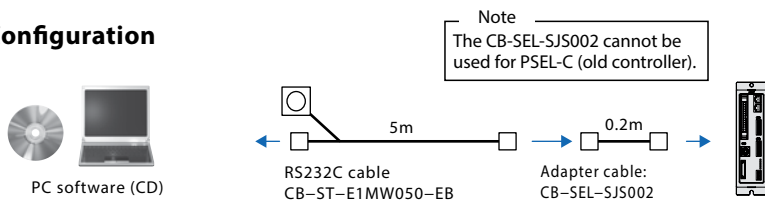
Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operational temperature	0 to 40°C
Ambient operational humidity	20 to 85% RH (non-condensing)
Protection class	IP20
Mess	470g (TB-02 only)

PC dedicated teaching software (Windows only)

Features A startup support software for entering programs/positions, performing test runs, and monitoring. More functions have been added for debugging, and improvements have been made to shorten the start-up time.

Model IA-101-X-MW-JS (with RS232C cable + conversion cable)

Configuration

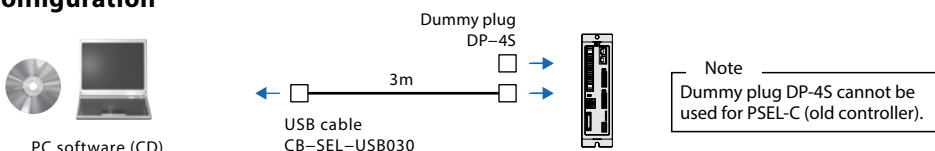


Compatible with Windows ver.: 7/8/8.1/10



Model IA-101-X-USBS (with USB cable)

Configuration

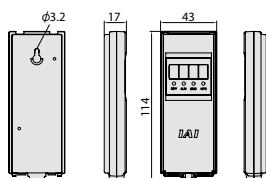


Note
Only versions 7.0.0.0 and later can be used with the PSEL controller.

Panel Unit

Features Display device that shows the error code or currently running program from the controller.

Model PU-1 (cable length: 3m)



Absolute Data Backup Battery

Features Battery for saving absolute data, when operating an actuator with an absolute encoder. Same as the battery used for system memory backup.

Model AB-5



System Memory Backup Battery

Features This battery is required when you are using global flags in the program and you want to retain your data even after the power has been turned OFF.

Model AB-5-CS (with case)
AB-5 (stand-alone battery)



Options

Dummy Plug

Features When connecting the ASEL controller to a computer with a USB cable, this plug needs to be connected to the teaching tool connector to shut off the enable circuit. (PC dedicated teaching software IA-101-X-USB includes this plug.)

Model DP-4S

* Cannot be used for ASEL-C.



USB Cable

Features A cable for connecting the controller to the USB port to a computer. A controller with no USB port (e.g. XSEL) can be connected to the USB port of a computer by connecting an RS232C cable to the USB cable via a USB adapter. (See PC software IA-101-X-USBMW)

Model CB-SEL-USB030 (cable length: 3m)

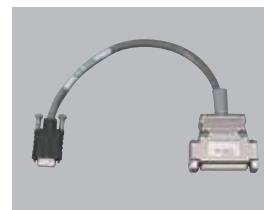


Adapter Cable

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

Model CB-SEL-SJS002 (cable length: 0.2m)

* Cannot be used for ASEL-C.



Maintenance Parts

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-253 for the actuators to be connected.)

■ Applicable cable

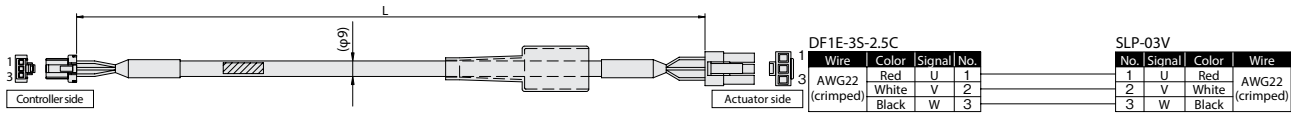
* This standard motor cable is a robot cable.

Product model		Motor-encoder integrated robot cable	Motor cable *1	Encoder cable	Encoder robot cable
RCL		CB-ACS-MPA□□□□	-	-	-
RCA2/RCA2W			-	-	-
RCA	SRA4R SRGS4R SRGD4R		-	-	-
RCACR RCAW	Models other than specified above	-	CB-ACS-MA□□□□	CB-ACS-PA□□□□	CB-ACS-PA□□□□-RB

Product model	PIO flat cable
ASEL-CS	CB-DS-PIO□□□□

Model CB-ACS-MA□□□□

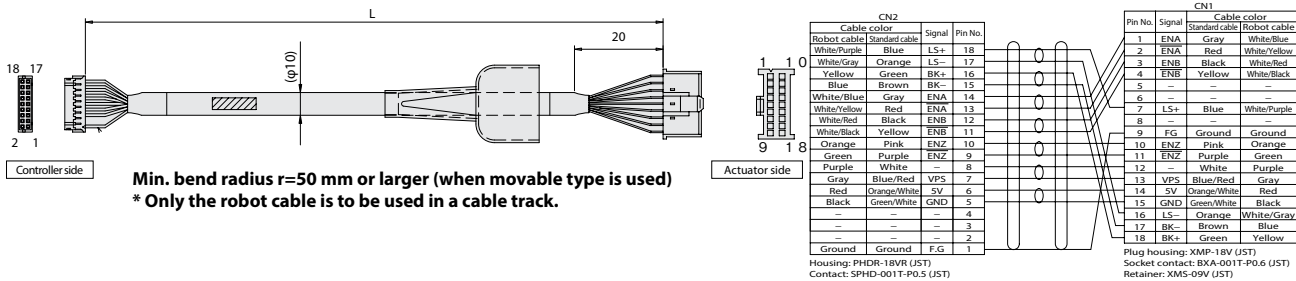
* Enter the cable length (L) into □□□□. Maximum 20 m. Ex: 080=8m



Min. bend radius r=50 mm or larger (when movable type is used)

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

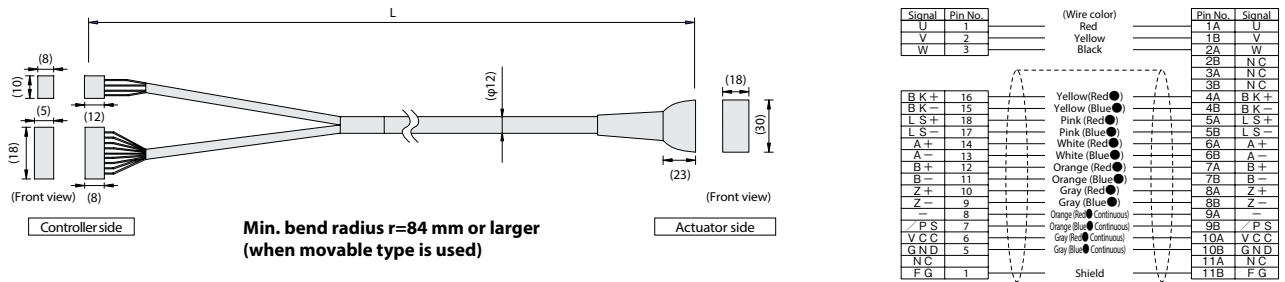
* Enter the cable length (L) into □□□□. Maximum 20 m. Ex: 080=8m



Min. bend radius r=50 mm or larger (when movable type is used)
* Only the robot cable is to be used in a cable track.

Model CB-ACS-MPA□□□□

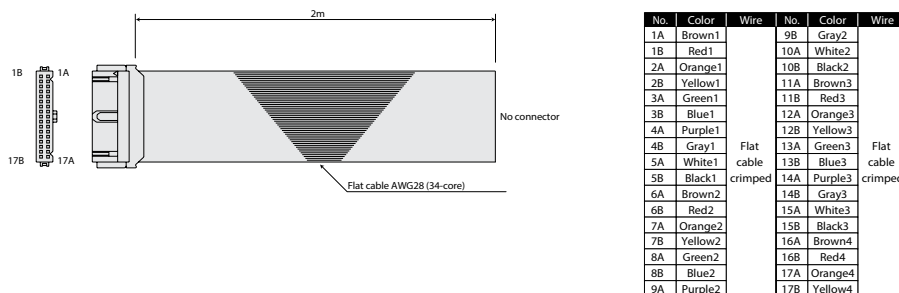
* Enter the cable length (L) into □□□□. Maximum 20 m. Ex: 080=8m



Min. bend radius r=84 mm or larger (when movable type is used)

Model CB-DS-PIO□□□□

* Enter the cable length (L) into □□□□. Maximum 20 m. Ex: 080=8m



SSEL



Program Controller for Single-axis robot / Cartesian robot / Linear servo / ROBO Cylinder RCS2/RCS3/RCS4



List of models

Program controller for operating 200V servo actuators. One unit can handle various controls.

Type	CS	
Name	Program mode	Positioner mode
External view		
Description	Both the actuator operation and communication with external equipment can be handled by a single controller. When two axes are connected, arc interpolation, path operations, and synchronization can be performed.	Up to 20000 positioning points are supported. Push-motion operations and teaching operations are also possible.
Position points	20000 points	

			20~150W	200W	300~400W	600W	750W
			1 axis	Battery-less absolute Incremental	○	○	○
		Absolute	○	○	○	○	○
2 axis	Battery-less absolute Incremental		○	○	○	○	○
		Absolute	○	○	○	○	○

Model

* 2nd axis specs not applicable to the single-axis model.

SSEL - CS - [] - [] [] [] - ([] [] []) - [] - [] - []

Series Type Number of axes (Specs for 1st axis) (Specs for 2nd axis) I/O type I/O cable length Power voltage

Motor Encoder Option Motor Encoder Option

CS Standard type

1	Single-axis model
2	2-axis model

12	12W	150	150W
20	20W	200	200W
30D	30W	200S	200W
30R	30W	300S	300W
60	60W	400	400W
100	100W	600	600W
100S	100W	750	750W

(Ex.) 12: compatible with servomotor

Note

Basically, the type of motor is the same as that of the electric actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.

<30D, 30R compatible actuators>

- Controller motor type "30D" ...30W actuators except for RS
- Controller motor type "30R" ...RS

WAI	Battery-less absolute incremental
A	Absolute
G	Quasi-absolute (*4)

(*4) Dedicated to LSAS Series

B	Brake
C	Creep sensor
HA	High accel./decel.
L	Home sensor/LS-compatible
M	Master axis spec

WAI	Battery-less absolute incremental
A	Absolute
G	Quasi-absolute (*4)

(*4) Dedicated to LSAS Series

B	Brake
C	Creep sensor
HA	High accel./decel.
L	Home sensor/LS-compatible
S	Master axis spec

1	Single-phase AC100V
2	Single-phase AC200V

* Please confirm that the power supply voltage is compatible with the actuator you are selecting.

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

* The I/O cable length is "0" if a field network specification is selected.

NP	PIO NPN (standard)
PN	PIO PNP
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP
EP	EtherNet/IP
IA	IA network communication board

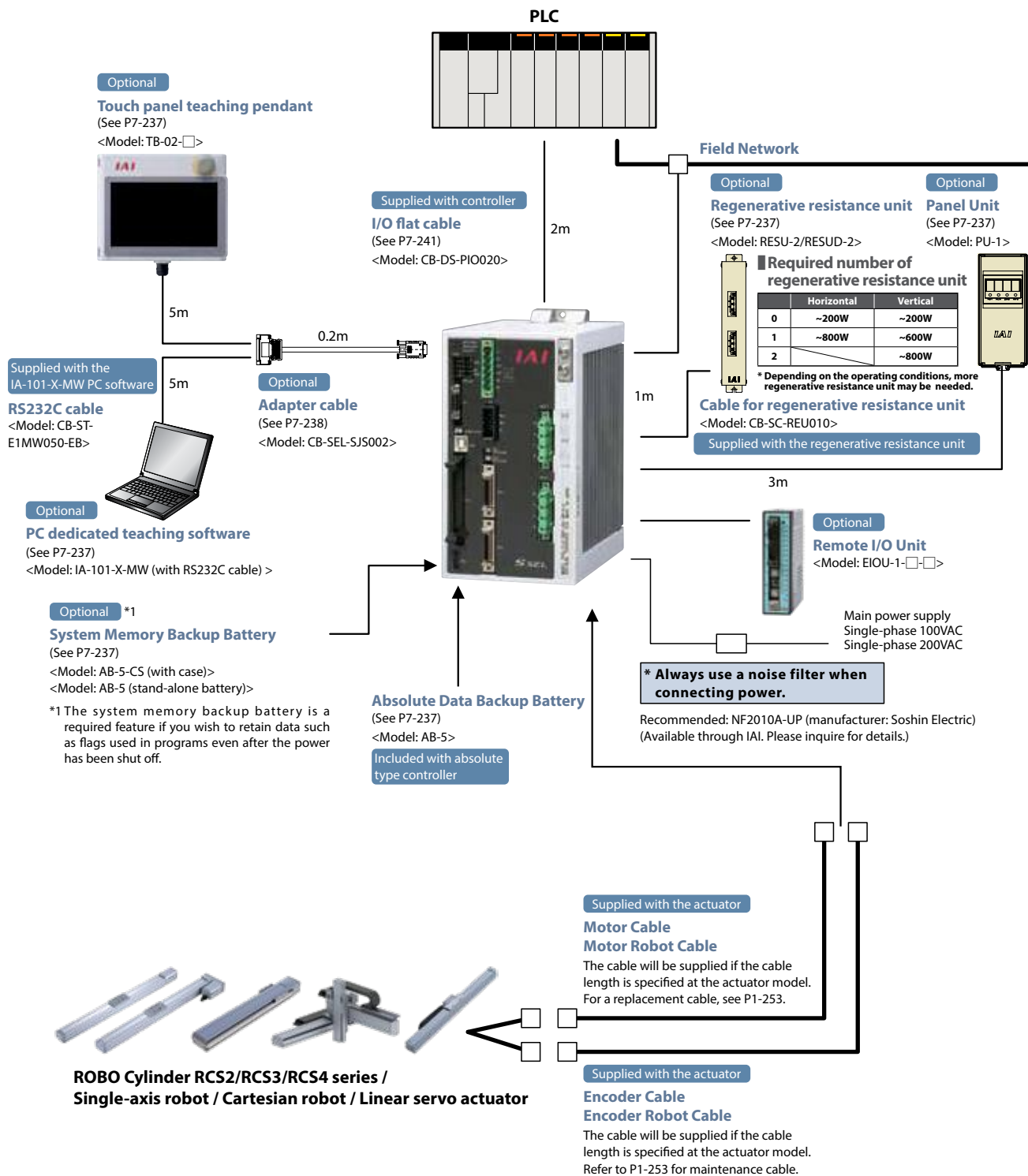
* When using the remote I/O unit (EIOU), an IA net connection board is necessary.

12	12W	150	150W
20	20W	200	200W
30D	30W	200S	200W
30R	30W	300S	300W
60	60W	400	400W
100	100W	600	600W
100S	100W	750	750W

(Ex.) 12: compatible with servomotor

System Configuration

Controller



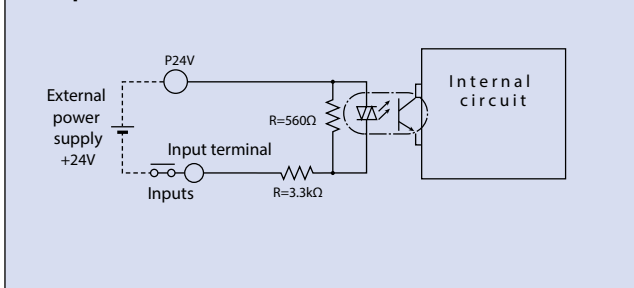
- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL**
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

I/O Specifications

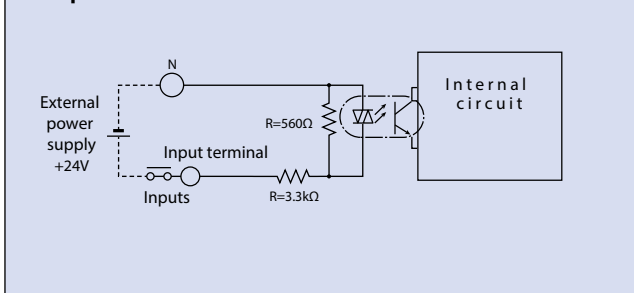
Input Section External input specifications

Item	Specifications
Input voltage	24VDC \pm 10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage (min.) NPN: 16VDC / PNP: 8VDC OFF voltage (max.) NPN: 5VDC / PNP: 19VDC
Isolation method	Photocoupler

NPN Specifications



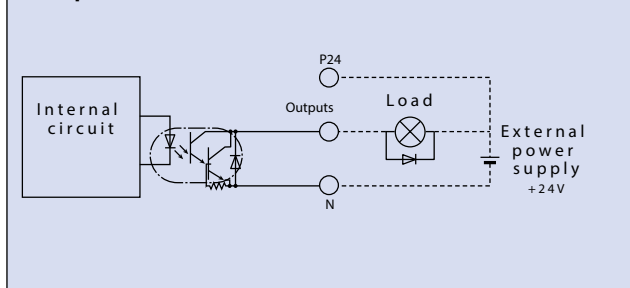
PNP Specifications



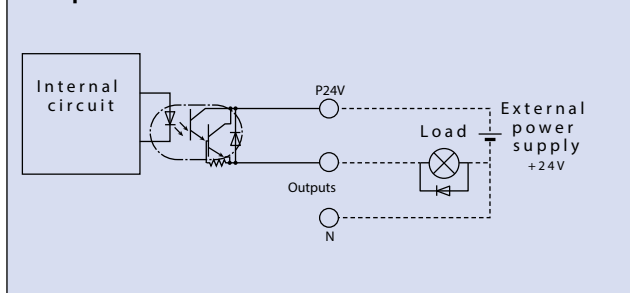
Output Section

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point, 400mA / 8 points total
Leakage current (max.)	Max. 0.1mA / point
Isolation method	Photocoupler

NPN Specifications



PNP Specifications



Explanation of I/O Signal Functions

Two modes can be selected for the SSEL controller: "Program Mode," in which the actuator is operated by entering a program, and "Positioner Mode," in which PLC signals are received and the actuator is moved to designated positions.

The Positioner Mode has the five input patterns listed below to enable various applications.

Controller Function by Type

Operation mode	Features	
Program mode	Various operations including linear/arc interpolation operation, ideal path operation for dispensing etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.	
Positioner mode	Standard mode	This is the basic mode from which operations can be conducted by designating position numbers and inputting the start signal. Push-motion operation and teaching operation are also possible.
	Product change mode	Multiple parts 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 2-axis controller, each axis can be commanded and operated separately.
	Teaching mode	In this mode, the actuator moves based on an external signal, when the actuator is stopped, the current location can be registered as position data.
	DS-S-C1 compatible mode	If you were using a DS-S-C1 controller, you can replace it with the PSEL controller without having to change the host programs. * This mode does not ensure actuator compatibility.

Explanation of I/O Functions

Program mode

Pin No.	Category	Port No.	Program mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	Select program No.1	Selects the program number to start. (Input as BCD values to ports 016 to 022)	
2A		017	Select program No.2		
2B		018	Select program No.4		
3A		019	Select program No.8		
3B		020	Select program No.10		
4A		021	Select program No.20		
4B		022	Select program No.40		
5A		023	CPU reset		Resets the system to the same state as when the power is turned on.
5B		000	Start		Starts the program selected by ports 016 to 022.
6A		001	General-purpose input		Waits for external input via program instructions.
6B		002	General-purpose input		
7A		003	General-purpose input		
7B		004	General-purpose input		
8A		005	General-purpose input		
8B	006	General-purpose input			
9A	007	General-purpose input			
9B	008	General-purpose input			
10A	009	General-purpose input			
10B	010	General-purpose input			
11A	011	General-purpose input	Turns off when an alarm occurs. (Contact B)		
11B	012	General-purpose input			
12A	013	General-purpose input			
12B	014	General-purpose input			
13A	015	General-purpose input			
13B	300	Alarm			
14A	301	Ready		Turns on when the controller starts up normally and is in an operable state.	
14B	302	General-purpose output	These outputs can be turned ON/OFF as desired via program instructions.		
15A	303	General-purpose output			
15B	304	General-purpose output			
16A	305	General-purpose output			
16B	306	General-purpose output			
17A	307	General-purpose output			
17B	N		0V input	Connect 0V.	

Positioner Standard Mode

Pin No.	Category	Port No.	Positioner Standard Mode	Functions	Wiring diagram
1A	P24		24V input	Connect 24V.	
1B	Input	016	Position input 10	Specifies the position numbers to move to, using port number 007 to 019. The number can be specified either as BCD or binary.	
2A		017	Position input 11		
2B		018	Position input 12		
3A		019	Position input 13		
3B		020	Position input 14		
4A		021	Position input 15		
4B		022	Position input 16		
5A		023	Error reset		Resets minor errors. (Severe errors require a restart.)
5B		000	Start		Starts moving to the selected position.
6A		001	Home return		Performs Home Return.
6B		002	Servo ON		Switches between Servo ON and OFF.
7A		003	Push		Performs a push motion.
7B		004	Pause		Pauses the motion when turned OFF, and resumes motion when turned ON.
8A		005	Cancel		Stops the motion when turned OFF. The remaining motion is canceled.
8B		006	Interpolation settings		When this signal turned ON for a 2-axis model, the actuator moves by linear interpolation.
9A	007	Position input 1	Specifies the position numbers to move to, using ports 007 to 019. The number can be specified either as BCD or binary.		
9B	008	Position input 2			
10A	009	Position input 3			
10B	010	Position input 4			
11A	011	Position input 5			
11B	012	Position input 6			
12A	013	Position input 7			
12B	014	Position input 8			
13A	015	Position input 9			
13B	300	Alarm	Turns off when an alarm occurs. (Contact B)		
14A	301	Ready	Turns on when the controller starts up normally and is in an operable state.		
14B	302	Positioning complete	Turns on when the movement to the destination is complete.		
15A	303	Home Return complete	Turns on when the home return operation is complete.		
15B	304	Servo On output	Turns on when servo is ON.		
16A	305	Pushing complete	Turns on when a push motion is complete.		
16B	306	System battery error	Turns on when the system battery runs low (warning level).		
17A	307	Absolute encoder battery error	Turns on when the battery for the absolute encoder runs low (warning level).		
17B	N		0V input	Connect 0V.	

Controller

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

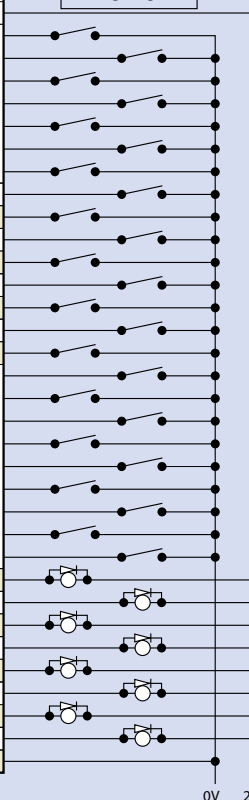
TB-03

Explanation of I/O Signal Functions

Positioner, Product-Type Change Mode

Pin No.	Category	Port No.	Program mode	Functions	
1A	P24		24V Input	Connect 24V.	
1B	Input	016	Position/product Type.Input 10	Specifies the position numbers to move to, and the product type numbers, using port 007 to 022. The position and product type numbers are assigned by parameter settings. The number can be specified either as BCD or binary.	
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		Resets minor errors. (Severe errors require a restart.)
5B		000	Start		Starts moving to selected position.
6A		001	Home return		Performs a home return.
6B		002	Servo ON	Switches between Servo ON and OFF.	
7A		003	Pushing	Performs a push motion.	
7B		004	Pause	Pauses the motion when turned OFF, and resumes motion when turned ON. (Contact B)	
8A		005	Cancel	Stops the motion when turned OFF. The remaining motion is cancelled. (Contact B)	
8B		006	Interpolation setting	When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.	
9A		007	Position/product Type Input 1	Specifies the position numbers to move to, and the product type numbers, using ports 007 to 022. The position and product type numbers are assigned by parameter settings. The number can be specified either as BCD or binary.	
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	Turns on when an alarm occurs. (Contact B)	
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.	
14B		302	Positioning complete	Turns on when moving to the specified position is completed.	
15A		303	Home position complete	Turns on when returning to the home position is completed.	
15B		304	Servo ON output	Turns on when servo is ON.	
16A		305	Pushing complete	Turns on when push motion is complete.	
16B		306	System battery error	Turns on the alarm level when the system battery runs low.	
17A	307	Absolute battery error	Turns on the alarm level when the absolute battery runs low (warning level).		
17B	N		0V Input	Connect 0V.	

Wiring diagram

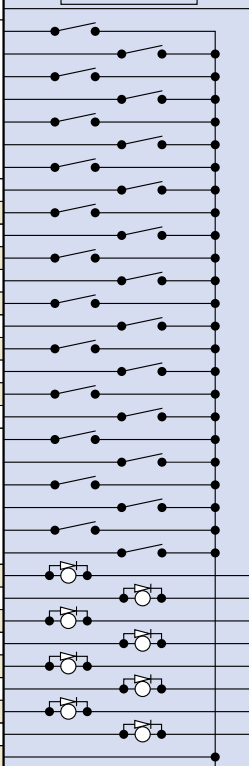


0V 24

Positioner, 2-axis Independent Mode

Pin No.	Category	Port No.	Program mode	Functions
1A	P24		24V Input	Connect 24V.
1B	Input	016	Position Input 7	Specifies the position numbers to move to, using ports 010 to 022. The position numbers on the 1st and 2nd axes are assigned by parameter settings. The number can be specified either as BCD or binary.
2A		017	Position Input 8	
2B		018	Position Input 9	
3A		019	Position Input 10	
3B		020	Position Input 11	
4A		021	Position Input 12	
4B		022	Position Input 13	
5A		023	Error reset	Resets minor errors. (Severe errors require a restart.)
5B		000	Start 1	Starts moving to selected position on the first axis.
6A		001	Home return 1	Performs a home return on the 1st axis.
6B		002	Servo ON 1	Switches over the servo ON/OFF for the 1st axis.
7A		003	Pause 1	Performs a push motion on 1st axis and resumes motion when turned ON (B contact).
7B		004	Cancel 1	Stops the motion on the 1st axis when turned OFF. The remaining motion is cancelled. (Contact B)
8A	005	Start 2	Starts the movement to the selected position number on the 2nd axis.	
8B	006	Home return 2	Performs home return on the 2nd axis.	
9A	007	Servo On 2	Switches between servo ON and OFF for the 2nd axis.	
9B	008	Pause 2	Pauses the motion on 2nd axis when turned OFF, and resumes when turned ON. (Contact B)	
10A	009	Cancel 2	Cancels the movement on the 2nd axis. (Contact B)	
10B	010	Position input 1	Selects the position No. using ports 010 to 022. Parameters are used to assign the position numbers of 1st axis and 2nd axis. Either BCD or binary numbers can be used.	
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	Turns on when an alarm occurs. (Contact B)
14A		301	Ready	Turns on when the controller starts up normally and is in an operable state.
14B		302	Positioning complete 1	Turns on when the movement to the specified position on the 1st axis is complete.
15A		303	Home position complete 1	Turns on when home return on the 1st axis is complete.
15B		304	Servo ON output 1	Turns on when the 1st axis is in a servo ON state.
16A		305	Positioning complete 2	Turns on when the movement to the specified position on the 2nd axis is complete.
16B		306	Home return complete 2	Turns on when home return on the 2nd axis is complete.
17A	307	Servo On output 2	Turns on when the 2nd axis is in a servo ON state.	
17B	N		0V Input	Connect 0V.

Wiring diagram

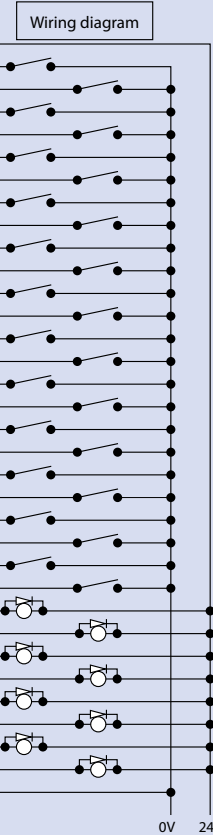


0V 24

Explanation of I/O Signal Functions

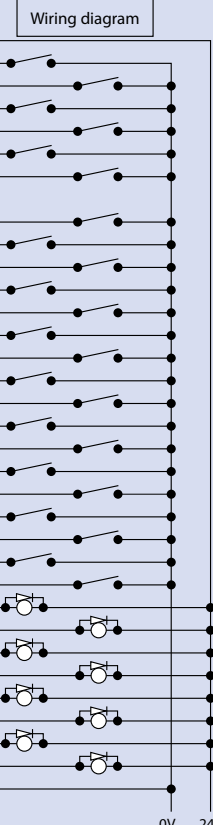
Positioner, Teaching Mode

Pin No.	Category	Port No.	Positioner product change mode	Functions
1A	P24		24V Input	Connect 24V.
1B	Input	016	JOG- on 1st axis	While the signal is ON, the 1st axis is moved in the - (negative) direction.
2A		017	JOG+ on 2nd axis	While the signal is ON, the 2nd axis is moved in the + (positive) direction.
2B		018	JOG- on 2nd axis	While the signal is ON, the 2nd axis is moved in the - (negative) direction.
3A		019	Specify inching (0.01mm)	Specifies how much to move during inching. (The travel distance is the total of the specified values of ports 019 to 022.)
3B		020	Specify inching (0.1mm)	
4A		021	Specify inching (0.5mm)	
4B		022	Specify inching (1mm)	
5A		023	Error reset	Resets minor errors. (Severe errors require a restart.)
5B		000	Start	Starts moving to selected position.
6A		001	Servo ON	Switches between servo ON and OFF.
6B		002	Pause	Pauses the motion when turned OFF, and resumes motion when turned ON. (Contact B)
7A		003	Position Input 1	Ports 003 to 013 are used to specify the position number to move, and the position number for inputting the current position. When the teaching mode setting on port 014 is in the ON state, and the start signal on port No. 000 is ON, the current value is written to the specified position number.
7B		004	Position Input 2	
8A	005	Position Input 3		
8B	006	Position Input 4		
9A	007	Position Input 5		
9B	008	Position Input 6		
10A	009	Position Input 7		
10B	010	Position Input 8		
11A	011	Position Input 9		
11B	012	Position Input 10		
12A	013	Position Input 11		
12B	014	Teaching mode setting		
13A	015	JOG+ on 1st axis	While the signal is input, the 1st axis is moved in the + (positive) direction.	
13B	300	Alarm	Turns on when an alarm occurs. (Contact B)	
14A	301	Ready	Turns on when the controller starts up normally and is in an operable state.	
14B	302	Positioning complete	Turns on when moving to the specified position is completed.	
15A	303	Home position complete	Turns on when returning to the home position is completed.	
15B	304	Servo ON output	Turns on when servo is ON.	
16A	305	-	-	
16B	306	System battery error	Turns on the alarm level when the system battery voltage is low.	
17A	307	Absolute battery error	Turns on the alarm level when the absolute battery voltage is low.	
17B	N		0V Input	Connect 0V.



Positioner, DS-S-C1 Compatible Mode

Pin No.	Category	Port No.	Program mode	Functions	
1A	P24		24V Input	Connect 24V.	
1B	Input	016	Position No. 1000	Ports 004 through 016 are used to specify the position number to move. The numbers are specified as BCD.	
2A		017	Position No. 2000		
2B		018	Position No. 4000		
3A		019	Position No. 8000		
3B		020	Position No. 10000		
4A		021	Position No. 20000		
4B		022	NC (*1)		
5A		023	CPU reset		Resets the system to the same state as when the power is turned on.
5B		000	Start		Starts moving to selected position.
6A		001	Hold (Pause)		Stops the motion when turned ON and resumes when turned OFF. (Contact A)
6B		002	Cancel		Pauses the motion when turned ON, The remaining motion is canceled.
7A		003	Interpolation setting		When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.
7B		004	Position No.1		
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	300	Alarm	Turns on when an alarm occurs. (Contact A)		
14A	301	Ready	Turns on when the controller starts up normally and is in an operable state.		
14B	302	Positioning complete	Turns on when moving to the specified position is complete..		
15A	303	-	-		
15B	304	-	-		
16A	305	-	-		
16B	306	System battery error	Turns on the alarm level when the system battery runs low.		
17A	307	Absolute battery error	Turns on the alarm level when the absolute battery runs low (warning level).		
17B	N		0V Input	Connect 0V.	



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

Controller

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

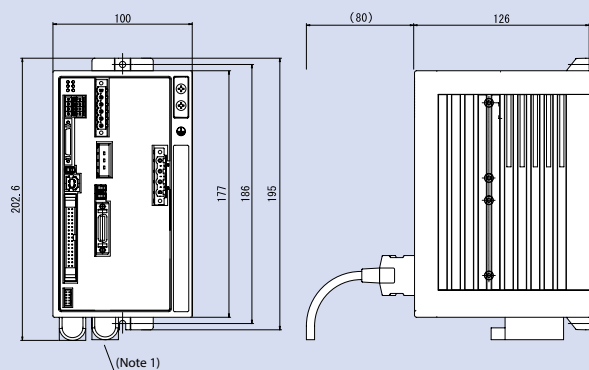
TB-03

Table of Specifications

	Item	Specifications
Basic specifications	Connected actuator	RCS2 / RCS3 /RCS4 series / Single-axis robot / Cartesian robot / Linear servo actuator
	Input voltage	Single-phase 100VAC to 115VAC ±10% Single-phase 200VAC to 230VAC ±10%
	Power supply capacity	Maximum 1660VA (for 400W, 2-axis operation)
	Dielectric strength voltage	500VDC 10MΩ or higher
	Withstand voltage	500VAC 1 min.
	Rush current	Control power 15A / Motor power 37.5A Control power 30A / Motor power 75A
	Vibration resistance	XYZ directions 10 to 57Hz, One side amplitude: 0.035mm (continuous), 0.075mm (intermittent) 58 to 150Hz 4.9 m/s ² (continuous), 9.8m/s ² (intermittent)
Control specifications	Number of control axes	1 axis / 2 axes
	Maximum total output of connected axes	400W 800W
	Position detection method	Incremental encoder / Absolute encoder / Battery-less absolute encoder
	Speed setting	1 mm/s and up, the maximum depends on the actuator.
	Acceleration setting	0.01G and up, the maximum depends on the actuator.
Program	Operating method	Program operation / Positioner operation (switchable)
	Programming language	Super SEL language
	Number of programs	128 programs
	Number of program steps	9999 steps
	Number of multi-tasking programs	8 programs
	Positioning points	2000 points
	Data memory device	FLASHROM (A system-memory backup battery can be added as an option)
Communication	Data input method	Touch panel teaching pendant or PC dedicated teaching software
	Number of I/Os	24 input points / 8 output (NPN or PNP selectable)
	I/O power	Externally supplied 24VDC ±10%
	PIO cable	CB-DS-PIO □□□ (supplied with the controller)
	Serial communications function	RS232C (D-sub half-pitch connector) / USB connector
General specifications	Field network	Device Net, CC-Link, PROFIBUS, EtherNet/IP, IA Net
	Protection function	Motor over-current, motor drive temperature check, overload check, encoder open-circuit, soft limit over, system battery error, etc.
	Ambient operating humidity and temperature	0 to 40°C , 10 to 95% RH (non-condensing)
	Ambient atmosphere	Free from corrosive gases, In particular, there shall be no significant dust.
	Protection class	IP20
	Weight	1.4kg
	External dimensions	100mm(W)×202.6mm(H)×126mm(D)

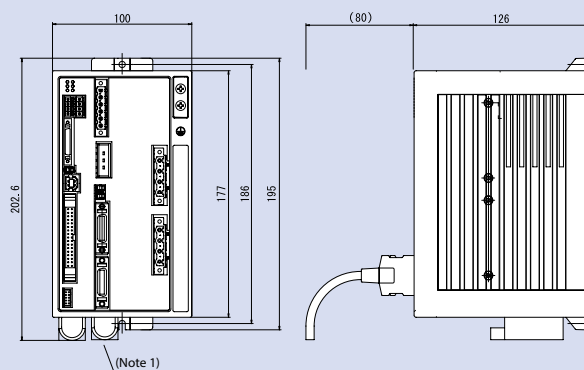
External Dimensions

SSEL 1-axis controller



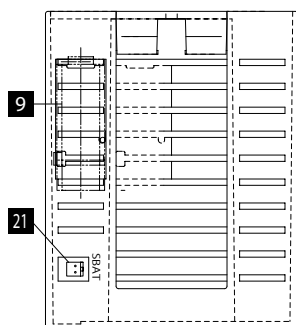
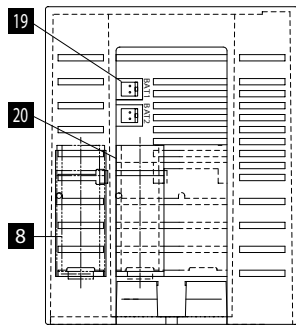
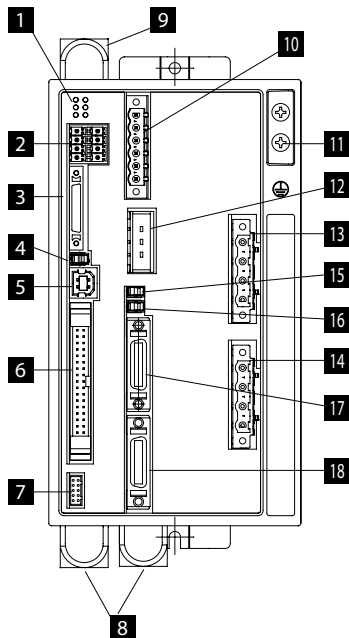
(Note 1) Absolute data back-up battery.
Not installed with incremental specification.

SSEL 2-axis controller



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

Name of Each Part



1 Status indicator LEDs

These LEDs are used to indicate the operating condition of the controller.

The LED status indicators are as follows:

- PWR** : Power is input to controller.
- RDY** : The controller is ready to perform program operation.
- ALM** : The controller is abnormal.
- EMG** : An emergency stop is actuated and the drive source is cut off.
- SV1** : The axis 1 actuator servo is on.
- SV2** : The axis 2 actuator servo is on.

2 System I/O connector

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

3 Teaching Tool Connector

A half-pitch I/O 26-pin connector that connects a teaching tool when the operation 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 operation 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 in 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.
34-pin flat cable connector for DIO (24IN/8OUT interface).
I/O power is also supplied to the controller via this connector (Pin No. 1 and No. 34).

7 Panel unit connector

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

8 Absolute data backup battery

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

9 System-memory backup battery connector (optional)

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 optional. Specify it if necessary.

10 Power supply connector

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

11 Grounding screw

Protective grounding screw. Always ground this screw.

12 External regenerative resistor connector

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

13 Motor connector for axis 1

Connects the motor cable of the axis 1 actuator.

14 Motor connector for axis 2

Connects the 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

Connects the encoder cable of the axis 1 actuator.

18 Encoder connector for axis 2

Connects the encoder cable of the axis 2 actuator.

19 Absolute-data backup battery connector for axis 1

A connector for the battery that backs up absolute data for axis 1 when the actuator uses an absolute encoder.

20 Absolute-data backup battery connector for axis 2

A connector for the battery that backs up absolute data for axis 2 when the actuator uses an absolute encoder.

21 System-memory backup battery connector

A connector for the system-memory backup battery.

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON -CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

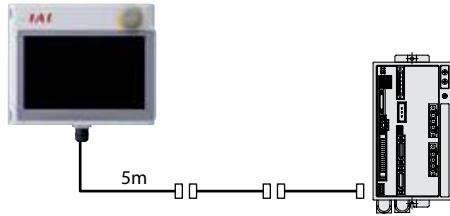
Options

Touch Panel Teaching Pendant

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

Model TB-02-□

Configuration



Specifications

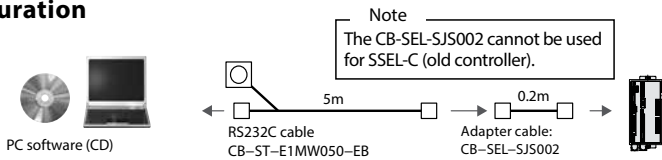
Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operational temperature	0 to 40°C
Ambient operational humidity	20 to 85% RH (non-condensing)
Protection class	IP20
Mess	470g (TB-02 only)

PC dedicated teaching software (Windows only)

Features A startup support software for entering programs/positions, performing test runs, and monitoring. More functions have been added for debugging, and improvements have been made to shorten the start-up time.

Model IA-101-X-MW-JS (with RS232C cable + adapter cable)

Configuration



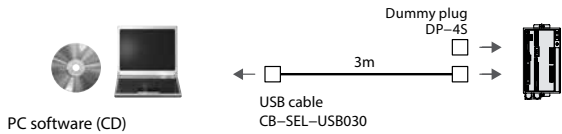
Note
The CB-SEL-SJS002 cannot be used for SSEL-C (old controller).

Compatible with Windows ver.: 7/8/8.1/10



Model IA-101-X-USBS (with USB cable)

Configuration



Note
Dummy plug DP-45 cannot be used for SSEL-C (old controller).

Note
Only versions 6.0.0.0 and later can be used with the SSEL controller.

Regenerative Resistance Unit

Features A unit that converts the regenerative current, generated during the acceleration/ deceleration of the motor, into heat. In the table on the right, check the total power output of the actuator to see if a regenerative resistance unit is needed.

Model RESU-2 (standard)
RESUD-2 (DIN rail mount)

Specifications	Model	RESU-2	RESUD-2
Weight of main unit		approx 0.4kg	
Internal regenerative resistance		235Ω 80W	
Installation		Screw mounting	DIN rail mounting
Connection cable		CB-SC-REU010	

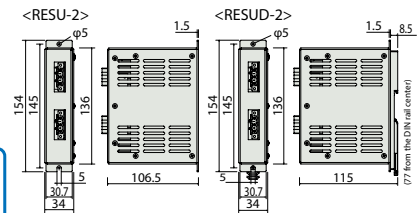
Required number of units

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

* Depending on the operating conditions, more regenerative resistors may be needed.

* When two regenerative units are required, please use one RESU-2 and one RESU-1 (Please refer to P7-288).

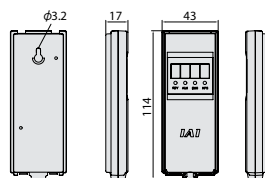
External dimensions



Panel Unit

Features Display device that shows the error code from the controller or the currently running program number.

Model PU-1 (cable length: 3m)



Absolute Data Backup Battery

Features Battery for saving absolute data, when operating an actuator with an absolute encoder. Same as the battery used for system memory backup.

Model AB-5



System Memory Backup Battery

Features This battery is required when you are using global flags in the program and you want to retain your data even after the power has been turned OFF.

Model AB-5-CS (with case)
AB-5 (stand-alone battery)



Options

Dummy Plug

Features When connecting the SSEL controller to a computer with a USB cable, this plug needs to be connected to the touch panel teaching port connector to shut off the enable circuit.
(PC dedicated teaching software IA-101-X-USB includes this plug.)

Model DP-4S

* Cannot be used for SSEL-C.



USB Cable

Features A cable for connecting the controller to the USB port to a computer. A controller with no USB port (e.g. XSEL) can be connected to the USB port of a computer by connecting an RS232C cable to the USB cable via a USB adapter. (See PC software IA-101-X-USBMW) Refer to the PC dedicated teaching software IA-101-X-USBMW.

Model CB-SEL-USB030 (cable length: 3m)



Adapter Cable

Features This conversion cable is used to connect the D-sub, 25 pin connector of the touch panel teaching pendant or PC dedicated teaching software to the teaching connector (half pitch) of the SSEL controller.

Model CB-SEL-SJS002 (cable length: 0.2m)

* Cannot be used for SSEL-C.



Maintenance Parts

When you need Maintenance Parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Please refer to P1-253 for actuators to be

Table of applicable cables

Product model		Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W) RCS3(CR)	Models other than ② - ④ .		CB-RCS2-PA □□□	CB-X3-PA □□□
②	RCS2	RT	CB-RCC-MA □□□ -RB	CB-RCS2-PLA □□□	CB-X2-PLA □□□
③		RA13R (without load cell/ without brake) *2		CB-RCS2-PLA □□□	CB-X2-PLA □□□
④		RA13R (without load cell/ with brake) *2		CB-RCS2-PLA □□□ * Between controller and brake is CB-RCS2-PLA □□□	CB-X2-PLA □□□ * Between controller and brake is CB-X2-PLA □□□
⑤		RCS4(CR)		CB-RCC-MA □□□	CB-RCC-MA □□□ -RB
⑥	NS	without LS	CB-X-MA □□□	-	CB-X3-PA □□□
⑦		with LS		-	CB-X2-PLA □□□
⑧	LSAS	N		-	CB-X1-PA □□□
⑨	LSA	S/H/L/N		-	CB-X3-PA □□□
⑩		W	CB-XMC-MA □□□	-	CB-X2-PLA □□□
⑪	IS(P)WA	S/M/L	CB-XEU-MA □□□	-	CB-X1-PA □□□ -WC
⑫	Models other than ① - ⑪ .		CB-X-MA □□□	-	CB-X1-PA □□□ (in case of 20m or shorter)*1 CB-X1-PA □□□ -AWG24 (in case of 21m or longer)
⑬	Models other than ① - ⑪ with LS specification			-	CB-X1-PLA □□□ (in case of 20m or shorter)*1 CB-X1-PLA □□□ -AWG24 (in case of 21m or longer)

* Cables for other than the battery-less absolute specification are CB-X1-PA□□□/CB-X1-PLA□□□, even when the length is 20m or longer.

Product model	PIO flat cable
⑭ SSEL-CS	CB-DS-PIO□□□

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

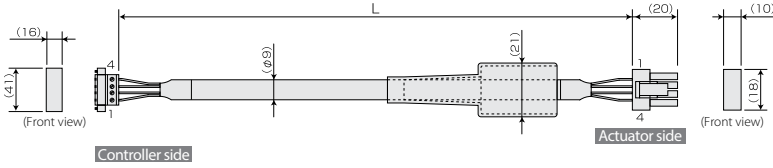
TB-03

Maintenance Parts

When you need Maintenance Parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-253 for the actuators to be connected.)

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

* Enter the cable length (L) into .
Maximum 30m. Ex.: 080=8m

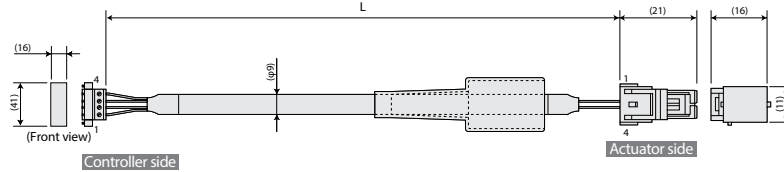


Wire	Color	Signal	No.	No.	Signal	Color	Wire
0.75sq	Green	PE	1	1	U	Red	0.75sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Min. bend radius r=51 mm or larger (when movable type is used)
* Only the robot cable is to be used in a cable track.

Model **CB-XMC-MA**

* Enter the cable length (L) into . Ex.: 080=8m
The maximum length is 20m for SCON/SSEL and 30m for XSEL.

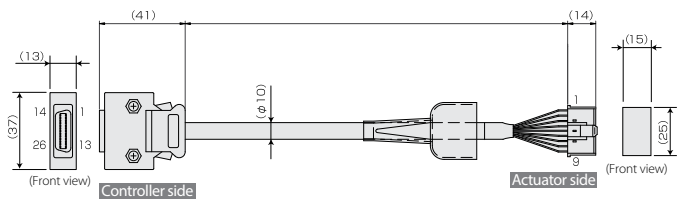


Wire	Color	Signal	No.	No.	Signal	Color	Wire
1.25sq	Green	PE	1	1	U	Red	1.25sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Min. bend radius r=55 mm or larger (when movable type is used)
* The robot cable is used as standard.

Model **CB-RCS2-PA** (for RCS2/RCS3/RCS4) / **CB-X3-PA** (for RCS2/RCS3/RCS4)

* Enter the cable length (L) into .
Maximum 30m.. Ex.: 080=8m



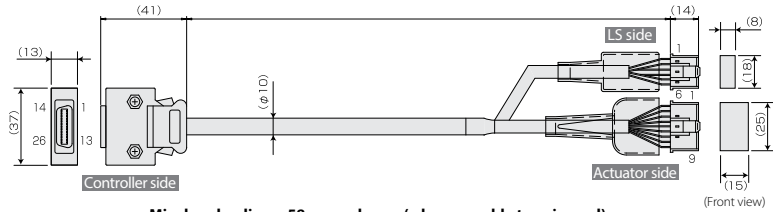
Wire (RCS2)	Color (X3)	Signal	No.	No.	Signal	Color (X3)	Wire
-	-	-	10	10	A-	Pink	White/Blue
-	-	E24V	12	12	A	Purple	White/Yellow
Gray/White	White/Green	OV	13	13	B+	White	White/Red
Brown/White	White/Orange	LS	26	26	B-	Blue/Red	White/Black
-	-	CREEP	25	25	B+	Black	White/Yellow
-	-	OT	24	24	B-	Blue/Red	White/Black
-	-	RSV	23	23	B+	Black	White/Yellow
-	-	-	8	8	-	-	-
-	-	-	18	18	-	-	-
-	-	-	19	19	-	-	-
Pink	White/Blue	A+	2	2	A+	Pink	White/Blue
Purple	White/Yellow	A-	2	2	A-	Purple	White/Yellow
White	White/Red	B+	3	3	B+	White	White/Red
Blue/Red	White/Black	B-	4	4	B-	Blue/Red	White/Black
Orange/White	White/Purple	Z+	5	5	Z+	Orange/White	White/Purple
Green/White	White/Gray	Z-	6	6	Z-	Green/White	White/Gray
Blue	Orange	SRD+	7	7	LS+	Brown/White	White/Orange
Orange	Green	SRD-	8	8	LS-	-	-
Black	Purple	BAT+	14	14	FG	Ground	Ground
Yellow	Gray	BAT-	15	15	SD	Blue	Orange
Green	Red	VCC	16	16	SD	Orange	Green
Brown	Black	GND	17	17	BAT+	Black	Purple
Gray	Blue	BKR+	20	20	BAT-	Yellow	Gray
Red	Yellow	BKR+	21	21	VCC	Green	Red
-	-	-	22	22	GND	Brown	Black
-	-	-	16	16	LS-	Gray/White	White/Green
-	-	-	17	17	BK-	Gray	Blue
-	-	-	18	18	BK+	Red	Yellow

The shield is connected to the hood by a clamp.
Ground wire and shield braiding

Min. bend radius r=58 mm or larger (when movable type is used)
* Only the robot cable is to be used in a cable track.

Model **CB-RCS2-PLA** (for RCS2 rotary) / **CB-X2-PLA** (for NS with LS and RCS2 rotary)

* Enter the cable length (L) into .
Maximum 30m.. Ex.: 080=8m



Wire (RCS2)	Color (X2)	Signal	No.	No.	Signal	Color (X2)	Wire
-	-	-	10	10	A-	Pink	White/Blue
-	-	E24V	12	12	A	Purple	White/Yellow
Gray/White	White/Green	OV	13	13	B+	White	White/Red
Black/White	Brown/Blue	LS	26	26	B-	Blue/Red	White/Black
Black/White	Brown/Yellow	CREEP	25	25	B+	Black	White/Yellow
Yellow/Black	Brown/Red	OT	24	24	B-	Blue/Red	White/Black
Pink/Black	Brown/Black	RSV	23	23	B+	Black	White/Yellow
-	-	-	8	8	-	-	-
-	-	-	18	18	-	-	-
-	-	-	19	19	-	-	-
Pink	White/Blue	A+	1	1	A+	Pink	White/Blue
Purple	White/Yellow	A-	2	2	A-	Purple	White/Yellow
White	White/Red	B+	3	3	B+	White	White/Red
Blue/Red	White/Black	B-	4	4	B-	Blue/Red	White/Black
Orange/White	White/Purple	Z+	5	5	Z+	Orange/White	White/Purple
Green/White	White/Gray	Z-	6	6	Z-	Green/White	White/Gray
Blue	Orange	SRD+	7	7	LS+	Brown/White	White/Orange
Orange	Green	SRD-	8	8	LS-	-	-
Black	Purple	BAT+	14	14	FG	Ground	Ground
Blue	Gray	BAT-	15	15	SD	Blue	Orange
Green	Red	VCC	16	16	SD	Orange	Green
Brown	Black	GND	17	17	BAT+	Black	Purple
Gray	Blue	BKR+	20	20	BAT-	Yellow	Gray
Red	Yellow	BKR+	21	21	VCC	Green	Red
-	-	-	22	22	GND	Brown	Black
-	-	-	16	16	LS-	Gray/White	White/Green
-	-	-	17	17	BK-	Gray	Blue
-	-	-	18	18	BK+	Red	Yellow

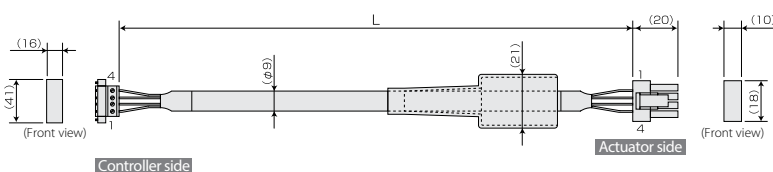
The shield is connected to the hood by a clamp.
Ground wire and shield braiding
(Wire color of White/Blue shows band color/isolation color)

Min. bend radius r=58 mm or larger (when movable type is used)
* Only the robot cable is to be used in a cable track.

* The above shows a wiring diagram for the encoder robot cable. For the encoder cable, see CB-RCS2-PLA in P 7-241.

Model **CB-X-MA**

* Enter the cable length (L) into .
Maximum 30m.. Ex.: 080=8m

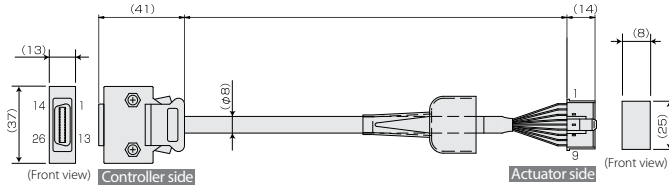


Wire	Color	Signal	No.	No.	Signal	Color	Wire
0.75sq	Green	PE	1	1	U	Red	0.75sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

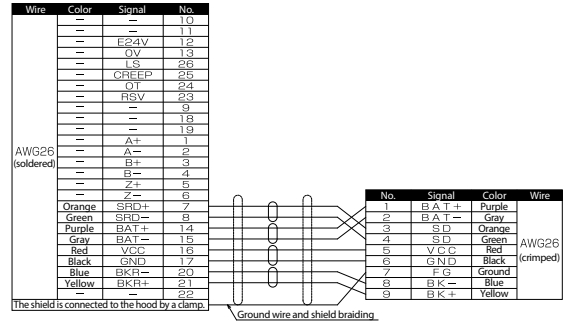
Min. bend radius r=51 mm or larger (when movable type is used)
* The robot cable is used as standard.

Model **CB-X1-PA**

* Enter the cable length (L) into .
Maximum 30m. Ex.: 080=8m

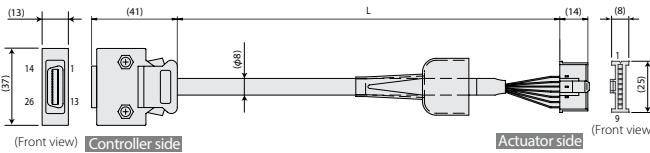


Min. bend radius $r=44$ mm or larger (when movable type is used)
* The robot cable is used as standard.
* If you require a cable of 21m or longer for ISB, ISDB, or ISDBCR (battery-less absolute encoders), select CB-X1-PA -AWG24.

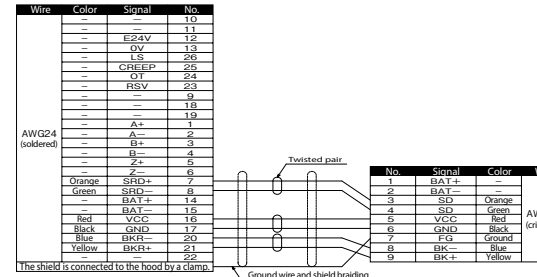


Model **CB-X1-PA** -AWG24

* Specify the cable length in .
Maximum length is 30m. Ex.: 210=21m

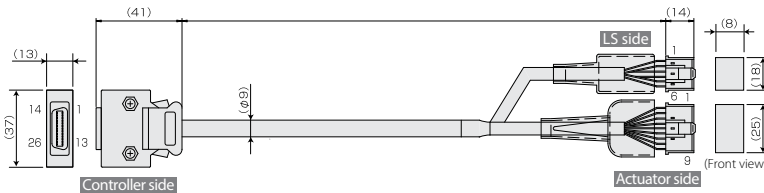


Minimum bending radius $r=44$ mm or more (Dynamic bending condition).
* The robot cable is used as standard.

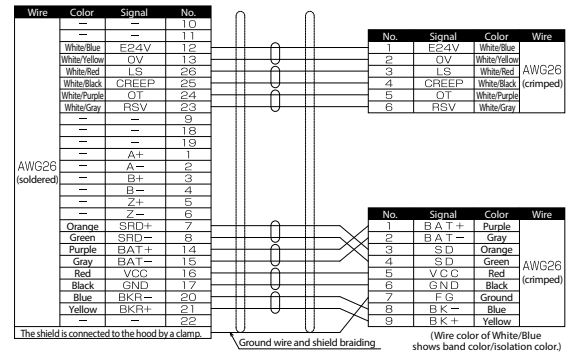


Model **CB-X1-PLA**

* Enter the cable length (L) into .
Maximum 30m. Ex.: 080=8m

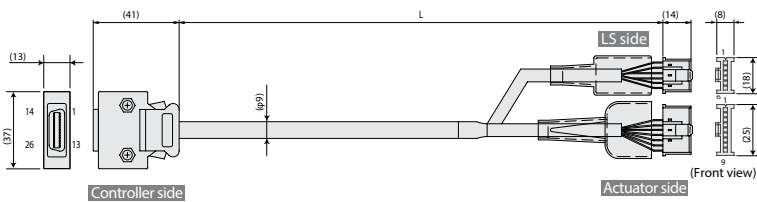


Min. bend radius $r=51$ mm or larger (when movable type is used)
* The robot cable is used as standard.
* If you require a cable of 21m or longer for ISB, ISDB, or ISDBCR (battery-less absolute encoders), select CB-X1-PLA -AWG24.

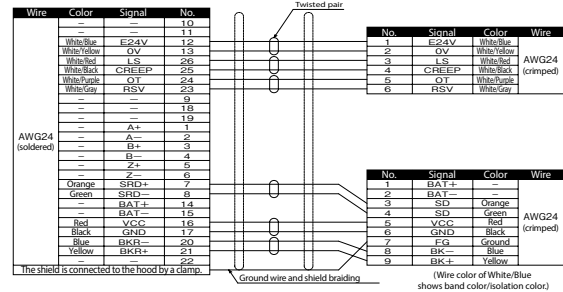


Model **CB-X1-PLA** -AWG24

* Specify the cable length in .
Maximum 30m. Ex.: 210=21m

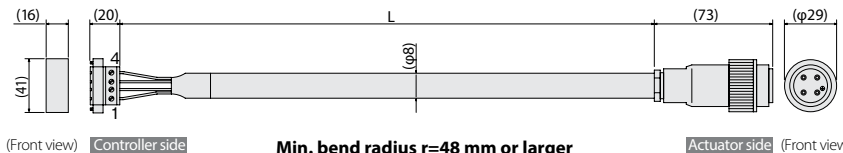


Minimum bending radius $r=54$ mm or more (Dynamic bending condition).
* The robot cable is used as standard.

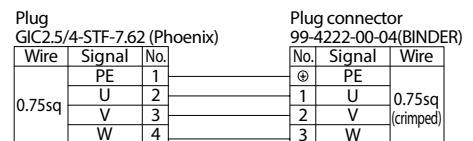


Model **CB-XEU-MA**

* Enter the cable length (L) into .
Maximum 30m. Ex.: 080=8m

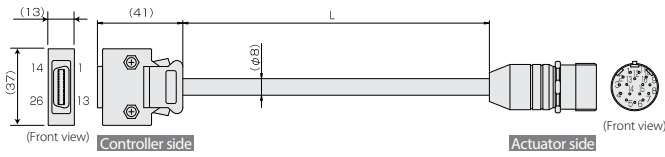


Min. bend radius $r=48$ mm or larger (when movable type is used)
* The robot cable is used as standard.



Model CB-X1-PA -WC

* Specify the cable length in .
Maximum length is 30m. Ex.: 080=8m



Min. bend radius $r=44$ mm or larger (when movable type is used)
* The robot cable is used as standard.

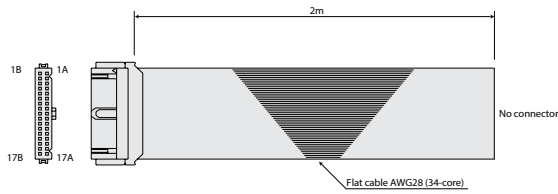
Wire	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CREEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	1
—	—	A-	2
—	—	B+	3
—	—	B-	4
—	—	Z+	5
—	—	Z-	6
—	—	SRD+	7
—	—	SRD-	8
Green	—	—	—
Purple	BAT+	14	—
Gray	BAT-	15	—
Red	VCC	16	—
Black	GND	17	—
Blue	BKR-	20	—
Yellow	BKR+	21	—
—	—	—	22

No.	Signal	Color	Wire
1	SD	Orange	—
2	SD	Green	—
3	—	—	—
4	—	—	—
5	—	—	—
6	—	—	—
7	—	—	—
8	—	—	—
9	—	—	—
10	VCC	Red	—
11	GND	Black	—
12	BAT+	Purple	—
13	BAT-	Gray	—
14	—	—	—
15	BK-	Blue	—
16	BK+	Yellow	—

The shield is connected to the hood by a clamp. Ground wire and shield braiding. The shield is connected to the hood by a clamp.
(Wire color of White/Blue shows band color/isolation color.)

Model CB-DS-PIO

* Specify the cable length in .
Maximum length is 10m. Ex.: 080=8m



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

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

MSEL



**Program Controller
for RCP6/RCP5/RCP4/RCP3/RCP2/IXP
Wrist Unit WU**



Features

1 Possible to control up to 4 axes of ROBO Cylinder with stepper motor.

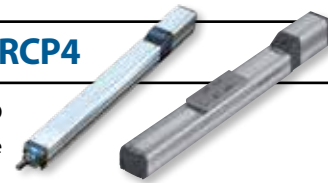
The conventional program controller could control up to 2 axes of actuators with stepper motor. The MSEL controller can control up to 4 axes. Interpolation operation is also possible, expanding applications.

Examples of Combinations

3-axis Cartesian (Stepper Motor)	RCP6	IXP (3-axis specification)	RCP2
	+		
		+	
Available to Connect up to 4 Axes			

2 Available to Connect ROBO Cylinders RCP6, RCP5 and RCP4

By applying to PowerCON, it is now possible to perform interpolation operations with ROBO Cylinders RCP6, RCP5 and RCP4, which are applicable for high-output driver, but were not feasible with the program controller PSEL in the past.



3 Cable Reduction and Space-saving

In the past, to control actuators of 4 axes, two 2-axis controllers (PSEL) and a 24V power supply were needed. Due to the built-in power source, one MSEL controller can control 4 axes.

In case of controlling 4 axes of actuators

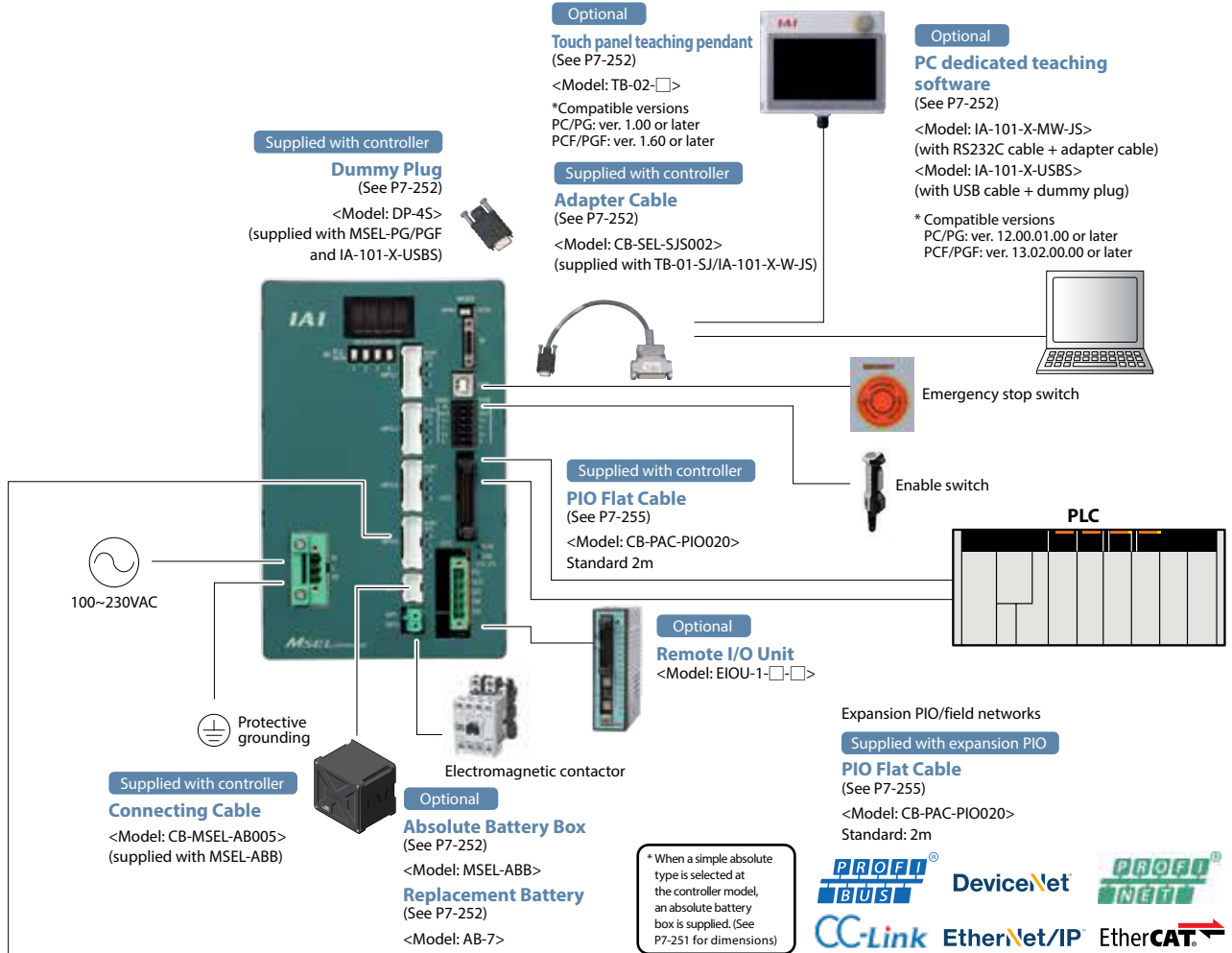
Conventional product	PSEL 2units + PS241 (24V power supply)	New	MSEL one unit
		Cable Reduction Applicable for 100 to 230VAC built-in power source.	
		Cost Reduction Approx. 36% reduced	

4 Equipped with Expansion I/O Slot

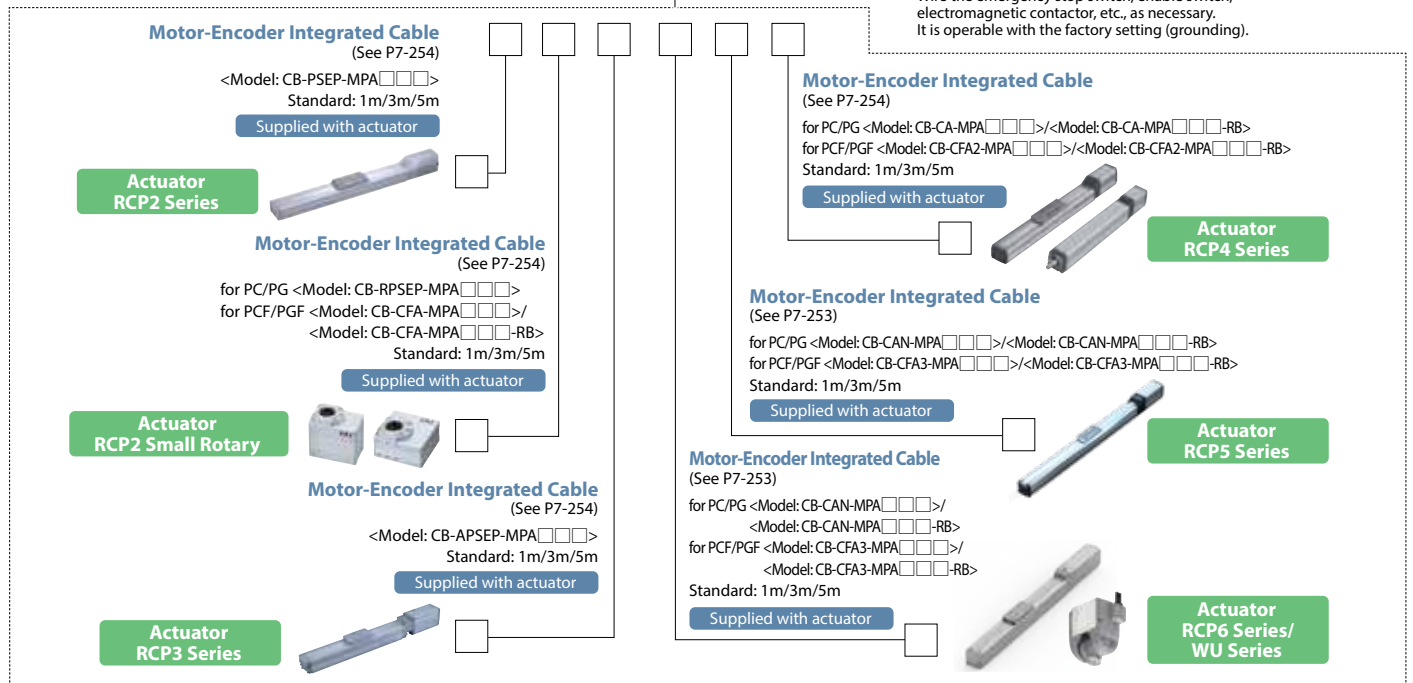
In addition to the standard I/O (IN 16 points / OUT 16 points), one slot is available as an expansion I/O slot. One expansion I/O can be selected from PIO (IN 16 points/OUT 16 points) or from various communication boards.

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL**
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

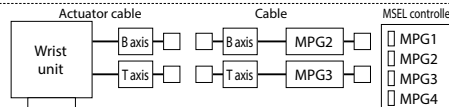
System Configuration



<Connectable Actuators>




Note
 When using the wrist unit, wire it so that the symbols shown on the "actuator cable," "cable," and "controller" will coincide with each other. The drawing on the right shows an example of the wrist unit connecting to the 2nd and 3rd axes of the MSEL controller.



- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

For IXP (PowerCON SCARA)

List of Models

Name	Controller for PowerCON SCARA			
External view				
Type	PCX3	PGX3	PCX4	PGX4
Category	3-axis standard	3-axis safety category compliant	4-axis standard	4-axis safety category compliant
Connected actuator	IXP 3-axis specification		IXP 3-axis specification + additional axis (including gripper specification) IXP 4-axis specification	
Standard I/O	NPN, PNP(16IN/16OUT)			
Number of positions	30,000			
Power voltage	Single-phase 100 to 230VAC			

Model

MSEL — [] — [] — **WAI** [] — [] — **WAI** [] — [] — [] — [] — **4** — []

Controller type SCARA type Encoder Option Motor Encoder Option Standard I/O Expansion I/O PIO Cable Power voltage Mounting specification

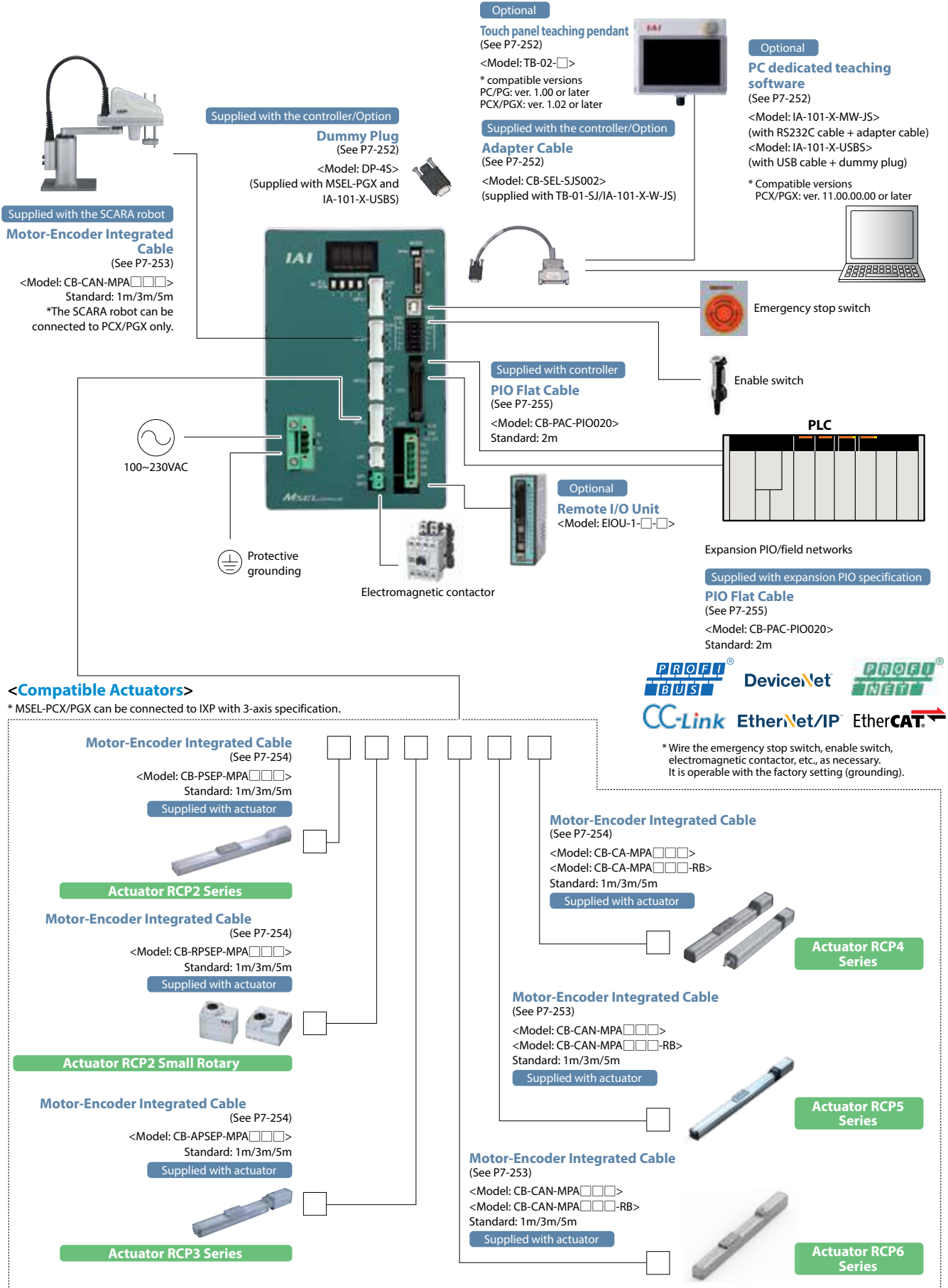
PCX3	3-axis standard	<table border="1"> <tr><td>B</td><td>Brake</td></tr> </table> <p>* An arm length of 550 and 650 can only be selected. Make sure to select it when the workpiece is 4 kg or larger.</p>	B	Brake	<table border="1"> <tr><td>20P</td><td>20□</td></tr> <tr><td>20SP</td><td>20□</td></tr> <tr><td>28P</td><td>28□</td></tr> <tr><td>28SP</td><td>28□</td></tr> <tr><td>35P</td><td>35□</td></tr> <tr><td>42P</td><td>42□</td></tr> <tr><td>42SP</td><td>42□</td></tr> <tr><td>56P</td><td>56□</td></tr> </table> <p>(EX) 20P: 20□ stepper motor compatible</p> <p>Note</p> <p>Basically, the type of motor is the same as that of the electric actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection: (Actuators for 28SP) ● Controller motor type "28SP" ...RCP2-RA3C</p>	20P	20□	20SP	20□	28P	28□	28SP	28□	35P	35□	42P	42□	42SP	42□	56P	56□	<table border="1"> <tr><td>NP</td><td>NPN</td></tr> <tr><td>PN</td><td>PNP</td></tr> </table>	NP	NPN	PN	PNP	<table border="1"> <tr><td>E</td><td>Not used</td></tr> <tr><td>NP</td><td>Expansion PIO board (NPN)</td></tr> <tr><td>PN</td><td>Expansion PIO board (PNP)</td></tr> <tr><td>DV</td><td>DeviceNet board</td></tr> <tr><td>DV2</td><td>DeviceNet board (with 2-way connector)</td></tr> <tr><td>CC</td><td>CC-Link board</td></tr> <tr><td>CC2</td><td>CC-Link board (with 2-way connector)</td></tr> <tr><td>PR</td><td>PROFIBUS-DP board</td></tr> <tr><td>EP</td><td>EtherNet/IP board</td></tr> <tr><td>EC</td><td>EtherCAT</td></tr> <tr><td>PRT</td><td>PROFINET IO</td></tr> <tr><td>SE1</td><td>RS232C</td></tr> <tr><td>SE2</td><td>RS485C</td></tr> <tr><td>IA</td><td>IA Net</td></tr> </table>	E	Not used	NP	Expansion PIO board (NPN)	PN	Expansion PIO board (PNP)	DV	DeviceNet board	DV2	DeviceNet board (with 2-way connector)	CC	CC-Link board	CC2	CC-Link board (with 2-way connector)	PR	PROFIBUS-DP board	EP	EtherNet/IP board	EC	EtherCAT	PRT	PROFINET IO	SE1	RS232C	SE2	RS485C	IA	IA Net	<table border="1"> <tr><td>4</td><td>100-230VAC</td></tr> </table>	4	100-230VAC	<table border="1"> <tr><td>Blank</td><td>Screw fixation</td></tr> <tr><td>DN</td><td>DIN rail mount</td></tr> </table>	Blank	Screw fixation	DN	DIN rail mount
B	Brake																																																														
20P	20□																																																														
20SP	20□																																																														
28P	28□																																																														
28SP	28□																																																														
35P	35□																																																														
42P	42□																																																														
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56P	56□																																																														
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PN	PNP																																																														
E	Not used																																																														
NP	Expansion PIO board (NPN)																																																														
PN	Expansion PIO board (PNP)																																																														
DV	DeviceNet board																																																														
DV2	DeviceNet board (with 2-way connector)																																																														
CC	CC-Link board																																																														
CC2	CC-Link board (with 2-way connector)																																																														
PR	PROFIBUS-DP board																																																														
EP	EtherNet/IP board																																																														
EC	EtherCAT																																																														
PRT	PROFINET IO																																																														
SE1	RS232C																																																														
SE2	RS485C																																																														
IA	IA Net																																																														
4	100-230VAC																																																														
Blank	Screw fixation																																																														
DN	DIN rail mount																																																														
PGX3	3-axis safety category compliant	<table border="1"> <tr><td>Blank</td><td>No option</td></tr> <tr><td>B</td><td>Brake</td></tr> </table>	Blank	No option	B	Brake	<table border="1"> <tr><td>0</td><td>No cable</td></tr> <tr><td>2</td><td>2m (standard)</td></tr> <tr><td>3</td><td>3m</td></tr> <tr><td>5</td><td>5m</td></tr> </table>	0	No cable	2	2m (standard)	3	3m	5	5m																																																
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PCX4	4-axis standard	<table border="1"> <tr><td>3N1808</td><td>IXP-3N1808</td></tr> <tr><td>4N1808</td><td>IXP-4N1808</td></tr> <tr><td>3N2508</td><td>IXP-3N2508</td></tr> <tr><td>4N2508</td><td>IXP-4N2508</td></tr> <tr><td>3N2508GM</td><td>IXP-3N2508GM</td></tr> <tr><td>3□3515</td><td>IXP-3□3515</td></tr> <tr><td>4□3515</td><td>IXP-4□3515</td></tr> <tr><td>3N3515GM</td><td>IXP-3N3515GM</td></tr> <tr><td>3N3510GL</td><td>IXP-3N3510GL</td></tr> <tr><td>3□4515</td><td>IXP-3□4515</td></tr> <tr><td>4□4515</td><td>IXP-4□4515</td></tr> <tr><td>3N4515GM</td><td>IXP-3N4515GM</td></tr> <tr><td>3N4510GL</td><td>IXP-3N4510GL</td></tr> <tr><td>3□5520</td><td>IXP-3□5520</td></tr> <tr><td>4□5520</td><td>IXP-4□5520</td></tr> <tr><td>3N5515GL</td><td>IXP-3N5515GL</td></tr> <tr><td>3N5515GW</td><td>IXP-3N5515GW</td></tr> <tr><td>3□6520</td><td>IXP-3□6520</td></tr> <tr><td>4□6520</td><td>IXP-4□6520</td></tr> <tr><td>3N6515GL</td><td>IXP-3N6515GL</td></tr> <tr><td>3N6515GW</td><td>IXP-3N6515GW</td></tr> </table>	3N1808	IXP-3N1808	4N1808	IXP-4N1808	3N2508	IXP-3N2508	4N2508	IXP-4N2508	3N2508GM	IXP-3N2508GM	3□3515	IXP-3□3515	4□3515	IXP-4□3515	3N3515GM	IXP-3N3515GM	3N3510GL	IXP-3N3510GL	3□4515	IXP-3□4515	4□4515	IXP-4□4515	3N4515GM	IXP-3N4515GM	3N4510GL	IXP-3N4510GL	3□5520	IXP-3□5520	4□5520	IXP-4□5520	3N5515GL	IXP-3N5515GL	3N5515GW	IXP-3N5515GW	3□6520	IXP-3□6520	4□6520	IXP-4□6520	3N6515GL	IXP-3N6515GL	3N6515GW	IXP-3N6515GW	<table border="1"> <tr><td>Blank</td><td>Screw fixation</td></tr> <tr><td>DN</td><td>DIN rail mount</td></tr> </table>	Blank	Screw fixation	DN	DIN rail mount														
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* The additional axis can be selected only when the controller type is a 4-axis, and the SCARA type is a 3-axis (without gripper).

* If CC2 or DV2 is selected, a 2-way connector is supplied for branch wiring.
* When using the remote I/O unit (EIOU), an IA net connection board is necessary.

* The signs below are specified in the □:
N: Standard specification
C: Clean specification
W: Dust- & splash-proof

System Configuration



Controller

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB

DCON-CB

ACON DCON

SCON -CB

SCON-CB (Servo press)

SCON -LC

SCON -CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

Basic Controller Specifications

Specification item		Description			
Power input voltage		Single phase 100~230VAC±10%			
Power supply current		2.9Atp.(100VAC), 1.4Atp.(200VAC), 1.2Atp.(230VAC)			
Power supply frequency range		50/60Hz±5%			
Motor type		Stepper motor (servo control)			
Compatible encoder		Incremental encoder/battery-less absolute encoder			
Data storage device		FlashROM/FRAM			
Number of program steps		9,999			
Number of positions		30,000			
Number of programs		255			
Number of multi-task programs		16			
Operation mode	Serial communication	<input type="radio"/>			
	Program	<input type="radio"/>			
SIO interface	Communication method	RS232C (asynchronous communications)			
	Communication speed	9.6, 19.2, 38.4, 57.6, 76.8, 115.2kbps			
	Hot swapping	<table border="1"> <tr> <td>TP port</td> <td>×</td> </tr> <tr> <td>USB</td> <td><input type="radio"/></td> </tr> </table>	TP port	×	USB
TP port	×				
USB	<input type="radio"/>				
Standard PIO interface	Input specification	Number of input points	16 points		
		Input voltage	24VDC ±10%		
		Input current	7mA / circuit		
		ON voltage	Min. 16VDC		
		OFF voltage	Max. 5VDC		
		Leak current	Allowable leak current: Max. 1mA		
	Output specification	Number of output points	16 points		
		Load voltage	24VDC ±10%		
		Maximum current	100mA/point, 400mA/8 points (Note 1)		
		Saturated voltage	Max.3V		
		Leak current	Max.0.1mA		
		Isolation method	Photocoupler insulation		
Compliant extended I/O interface		Expansion PIO NPN specification (16IN/16OUT)			
		Expansion PIO PNP specification (16IN/16OUT)			
		CC-Link (remote device station), DeviceNet, PROFIBUS-DP, PROFINET IO, EtherCAT, EtherNet/IP, IA Net, RS232C, RS485			
Calendar/clock function	Retention time	Approx. 10 days			
	Charge time	Approx. 100 hours (fully charged) * Data can be retained even when the batteries are not fully charged.			
Protective functions		Over current, temperature check, fan speed monitoring, encoder open-circuit check, etc.			
Operating temperature range		0~40°C			
Operating humidity range		85% RH or lower (no condensing)			
Installation	Installation direction	Vertical installation (exhaust side up)			
	Installation method	Screw mount or DIN rail mount			
Rush current		15Atp.(100VDC), 30Atp.(200VDC): 5ms or less. (Ambient temperature 25°C/AC ON/OFF no cycling of power)			
Air cooling method		Forced air cooling			
External dimensions		130 mm wide x 195 mm high x 125 mm deep			
Mass		Approx. 1400g			

(Note 1) The total load current shall be 400mA for every eight points from standard I/O No. 316. (The maximum current per points shall be 100mA.)

PIO Signal Chart

Standard PIO connector, Expansion PIO connector, Pin layouts

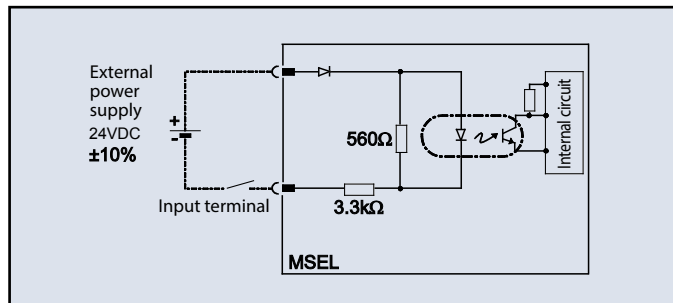
Pin No.	Category	Assignment	Pin No.	Category	Assignment
1A	24V	P24	1B	Output	OUT0
2A	24V	P24	2B		OUT1
3A	—	—	3B		OUT2
4A	—	—	4B		OUT3
5A	Input	IN0	5B		OUT4
6A		IN1	6B		OUT5
7A		IN2	7B		OUT6
8A		IN3	8B		OUT7
9A		IN4	9B		OUT8
10A		IN5	10B		OUT9
11A		IN6	11B		OUT10
12A		IN7	12B		OUT11
13A		IN8	13B		OUT12
14A		IN9	14B		OUT13
15A		IN10	15B		OUT14
16A		IN11	16B	OUT15	
17A		IN12	17B	—	
18A		IN13	18B	—	
19A		IN14	19B	0V	N
20A	IN15	20B	0V	N	

Internal Circuits for Standard I/O (NPN Specifications)

[Input Section] External input specifications (NPN specifications)

Item	Specifications
Input voltage	24VDC $\pm 10\%$
Input current	7mA / circuit
On/Off voltage	On voltage... Min. 16.0VDC Off voltage... max. 5.0VDC
Insulation method	Photocoupler insulation

* The port numbers in the circuit diagram below represent the factory-set port numbers.
 * When the input is off, the allowable leak current is 1mA max.

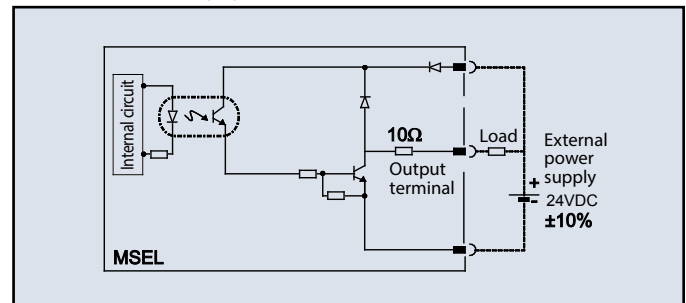


* For the standard IO (PNP specifications), refer to the operation manual.

[Output Section] External output specifications (NPN specifications)

Item	Specifications	Use
Load voltage	24VDC $\pm 10\%$	TD62084 (or equivalent)
Maximum load current	100mA / point, 400mA/8 points (Note)	
Leak current	Leak current... max. 0.1 mA/point	
Insulation method	Photocoupler insulation	

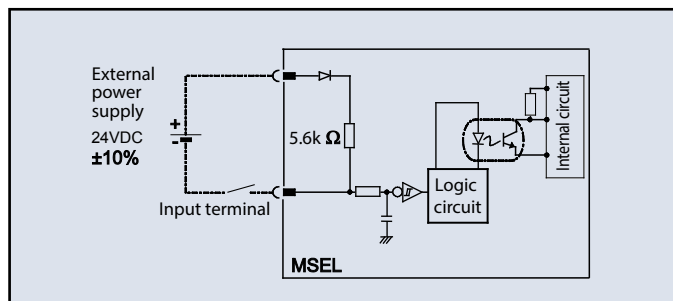
* The port numbers in the circuit diagram below represent the factory-set port numbers.
 Note: The total load current shall be 400 mA for every eight points from standard I/O No. 316. (The maximum current per point shall be 100mA.)



Internal Circuits for Standard I/Os (PNP Specifications)

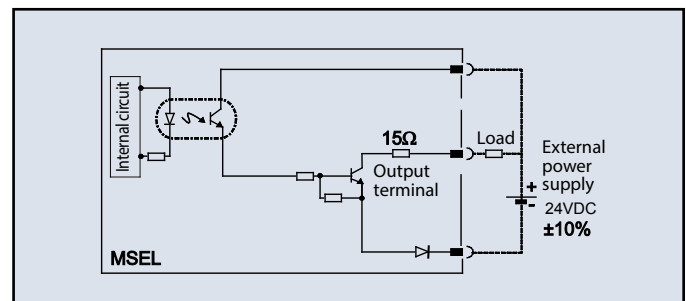
[Input Section] External input specifications

Item	Specifications
Number of input points	16 points
Input voltage	24VDC $\pm 10\%$
Input current	4mA / circuit
On/Off voltage	On voltage... Min. 18VDC (3.5mA) Off voltage... Max. 6VDC(1mA)
Insulation method	Photocoupler insulation

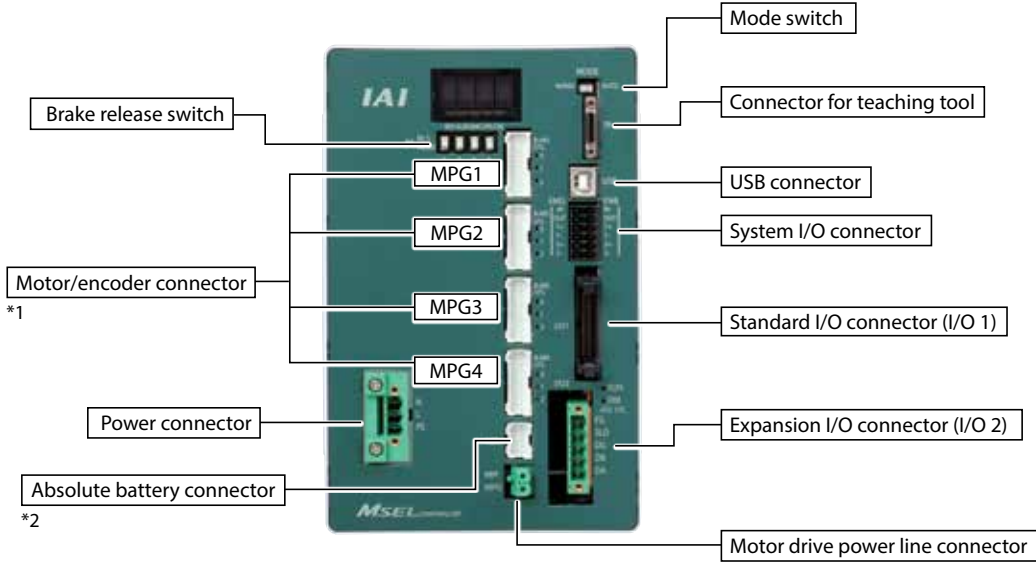


[Output Section] External output specifications

Item	Specifications
Number of output points	16 points
Rated load current	24VDC $\pm 10\%$
Maximum current	50mA / circuit
Insulation method	Photocoupler insulation



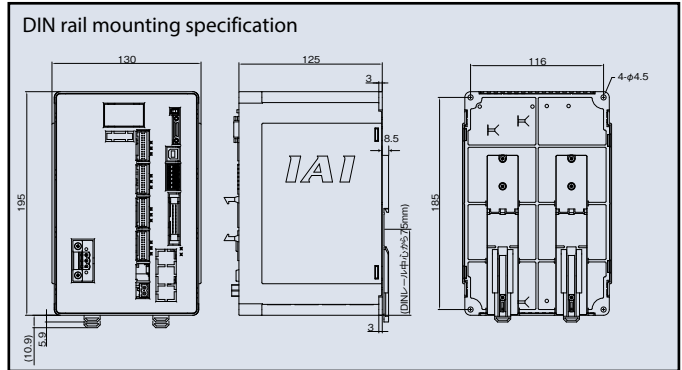
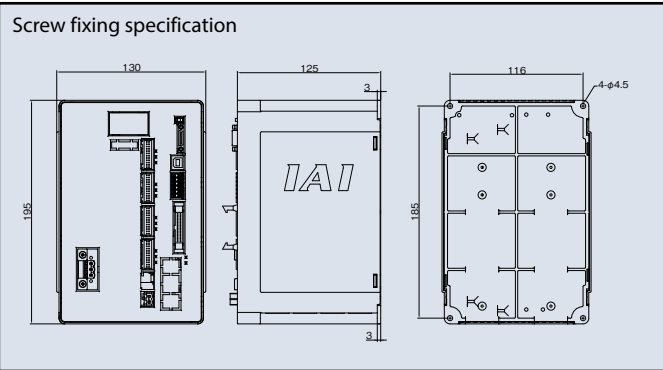
Name of Each Part



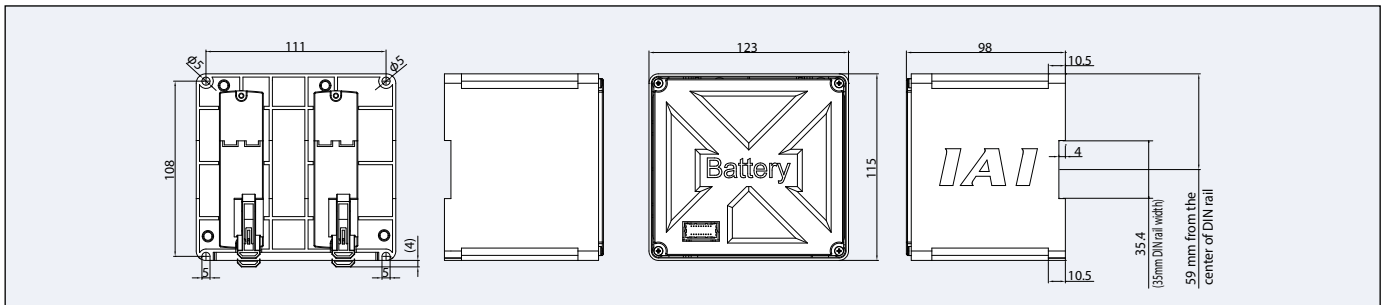
*1: Do not connect a wrong motor to the MPG1, MPG2, MPG3 or MPG4 connectors. It may cause malfunction or failure.
 *2: Not available for MSEL-PCX/PGX.

External Dimensions

Controller



Absolute Battery Box



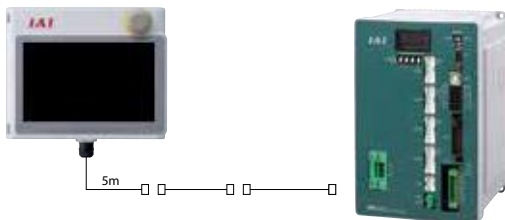
Options

Touch Panel Teaching Pendant

Features A teaching device offering program/position inputs, trial operations and monitoring functions.

Model number TB-02-□

Configuration



Specifications

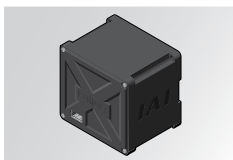
Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~85%RH (No-condensing)
Protective structure	IP20
Mass	470g (TB-02 unit only)

Absolute Battery Box

Outline If the absolute position encoder specification is selected with code ABB, the absolute battery box is included with the controller. However, if the battery box is ordered as a separate unit, it does not include the battery. Purchase the battery separately if needed (model: AB-7).

Model MSEL-ABB (battery not included)

Exterior dimensions See P7-251



* The cable to connect the absolute battery box and MSEL (Model CB-MSEL-AB005) are supplied with the absolute battery box. Simple absolute type (Model: ABB) can be selected only for the MSEL-PC/PG/PCF/PGF.

Dummy Plug

Features This plug is required for the safety category compliant specification (MSEL-PG/PGX/PGF) and when the MSEL is operated using a USB cable. (Supplied with MSEL-PG/PGF type and PC dedicated teaching software IA-101-X-USBS.)

Model number DP-4S



Adapter Cable

Features Converts the D sub 25 pin connector of the touch panel teaching pendant or RS232C cable to MSEL teaching connector. (Comes with TB-01-SJ and IA-101-X-MW-JS.)

Model number CB-SEL-SJS002



Replacement Battery

Features The replacement battery for the absolute battery box.

Model AB-7

* Same quantity of absolute battery units is required as the number of axes.

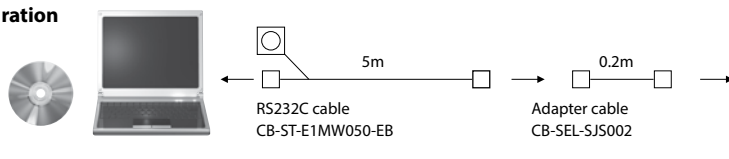


PC dedicated teaching software

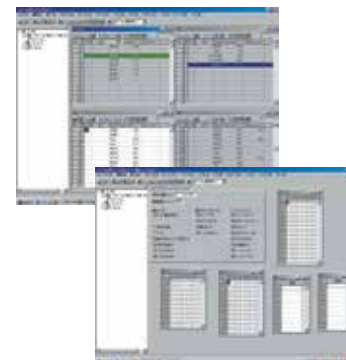
Features The startup support software provides program/position input, test operation and monitoring functions, among others. With its enhanced functions required for debugging, this software helps shorten the startup time.

Model number IA-101-X-MW-JS (with RS232C cable + Connector adapter cable)

Configuration

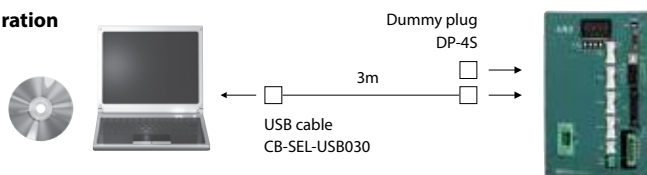


Compatible Windows: 7/8/8.1/10



Model number IA-101-X-USBS (with USB cable + dummy plug)

Configuration



The MSEL-PC/PG are supported by ver. 12.00.01.00 or later.

The CB-ST-E1MW050-EB cannot be used when "Building an enable system that uses a system I/O connector and external power supply" or "Building a redundant safety circuit." (The CB-ST-A2MW050-EB must be used instead.)

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Maintenance Parts

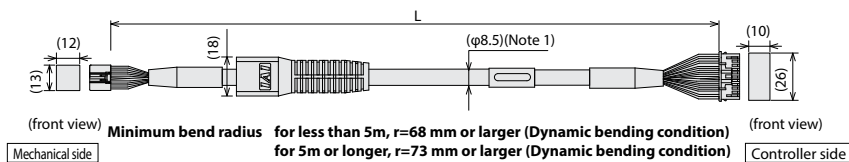
When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-253 for the actuators to be connected.)

Table of Applicable Cables

Product Model		Motor-Encoder Integrated Cable	Motor-Encoder Integrated Cable
①	RCP6 RCP6CR RCP6W	SA8/WSA16 RA8/RRA8 WRA16 CB-CFA3-MPA□□□	CB-CFA3-MPA□□□-RB
②		Models other than the above CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
③	RCP5 RCP5CR RCP5W	RA8/RA10 RA7C High thrust type CB-CFA3-MPA□□□	CB-CFA3-MPA□□□-RB
④		Models other than the above CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
⑤	RCP4 RCP4CR RCP4W	SA3/RA3 RCP4 Gripper RCP4 Stopper cylinder CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
⑥		Models other than the above CB-CA-MPA□□□(MSEL-PC/PG用) CB-CFA2-MPA□□□(MSEL-PCF/PGF用)	CB-CA-MPA□□□-RB(MSEL-PC/PG用) CB-CFA2-MPA□□□-RB(MSEL-PCF/PGF用)
⑦	RCP3	-	CB-APSEP-MPA□□□
⑧	RCP2	RTBS/RTBSL RTCS/RTCSL -	CB-RPSEP-MPA□□□
⑨	RCP2CR RCP2W	GRS/GRM GR3SS/GR3SM RT8 CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
⑩		GRSS/GRLS/GRST GRHM/GRHB SRA4R/SRG54R SRGD4R -	CB-APSEP-MPA□□□
⑪	RCP2 RCP2CR RCP2W	HS8C/HS8R SA16C RA8C/RA8R RA10C CB-CFA-MPA□□□	CB-CFA-MPA□□□-RB
⑫		Models other than the above -	CB-PSEP-MPA□□□

Model **CB-CAN-MPA□□□/CB-CAN-MPA□□□-RB**

* Enter the cable length (L) into □□□. Maximum length 20m.
Ex.: 080=8m



* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.
* Only the robot cable is to be used in a cable rack.

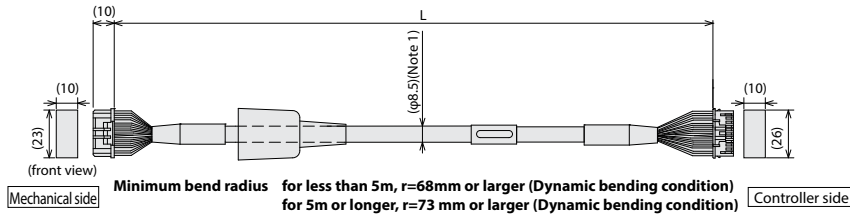
(Note 1) If the cable is 5m or longer, $\phi 9.1$ cable diameter applies for a non-robot cable and $\phi 10$ for a robot cable.

Pin No.	Signal	Pin No.	Signal
3	$\phi A/U$	1	ϕA
5	VMM/V	2	VMM
10	$\phi A/W$	3	ϕB
9	$\phi B/$	4	VMM
4	VMM/-	5	ϕA
15	$\phi B/$	6	ϕB
8	LS+/BK+	7	LS+
14	LS-/BK-	8	LS-
12	-/A+	11	SA(mABS)
17	-/A-	12	SB(mABS)
1	A+/B+	13	A+
6	A-/B-	14	A-
11	B+/Z+	15	B+
16	B-/Z-	16	B-
20	BK+/LS+	9	BK+
2	BK-/LS-	10	BK-
21	LS GND	17	VCC
7	VPS	19	GND
15	VCC	18	VPS
13	GND	20	LS GND
19	—	22	—
22	BAT+	21	—(CFvcc)
23	—	23	—
24	FG	24	FG

Spare Parts

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

* Enter the cable length (L) into . Maximum length 20m.
Ex.: 080=8m



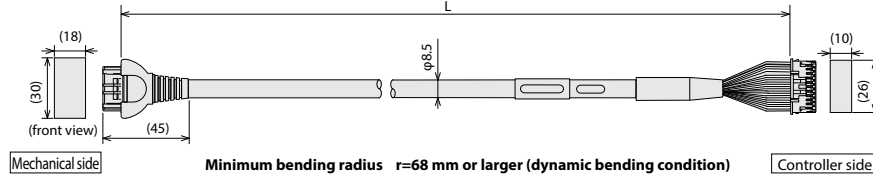
* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.
* Only the robot cable is to be used in a cable rack.

(Note 1) If the cable is 5m or longer, $\phi 9.1$ cable diameter applies for a non-robot cable and $\phi 10$ for a robot cable.

Mechanical side 1-1827863-1 (AMP)		Controller side PADP-24V-1-S (JST)	
Pin No.	Signal	Pin No.	Signal
A1	ϕ A	1	ϕ A
B1	VMM	2	VMM
A2	ϕ A	5	ϕ A
B2	ϕ B	3	ϕ B
A3	VMM	4	VMM
B3	ϕ B	6	ϕ B
A4	LS+	7	LS+
B4	LS-	8	LS-
A6	---	11	---
B6	---	12	---
A7	A+	13	A+
B7	A-	14	A-
A8	B+	15	B+
B8	B-	16	B-
A5	BK+	9	BK+
B5	BK-	10	BK-
A9	LS GND	20	LS GND
B9	VPS	18	VCC
A10	VCC	17	VCC
B10	GND	19	GND
A11	---	21	---
B11	FG	22	---
		23	---
		24	FG

Model **CB-APSEP-MPA**

* Enter the cable length (L) into . Maximum length 20m.
Ex.: 080=8m

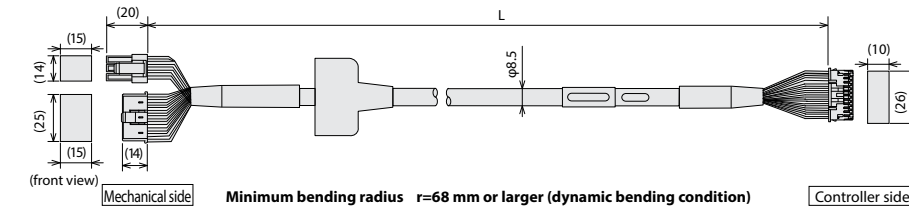


Mechanical side Terminal No.	(PCON)(ACON)	Controller side Terminal No.
A1	[ϕ A]U	1
B1	[VMM](V)	2
A2	[ϕ A]W	5
B2	[ϕ B](-)	3
A3	[VMM](-)	4
B3	[ϕ B](-)	6
A4	[LS+](BK+)	7
B4	[LS-](BK-)	8
A6	[(-)](A+)	11
B6	[(-)](A-)	12
A7	[A+](B+)	13
B7	[A-](B-)	14
A8	[B+](Z+)	15
B8	[B-](Z-)	16
A5	[BK+](LS+)	9
B5	[BK-](LS-)	10
A9	GNDLS	20
B9	VPS	18
A10	VCC	17
B10	GND	19
A11	NC	21
B11	Shield (FG)(FG)	24
	NC	22
	NC	23

Model **CB-PSEP-MPA**

* The robot cable is standard.

* Enter the cable length (L) into . Maximum length 20m.
Ex.: 080=8m

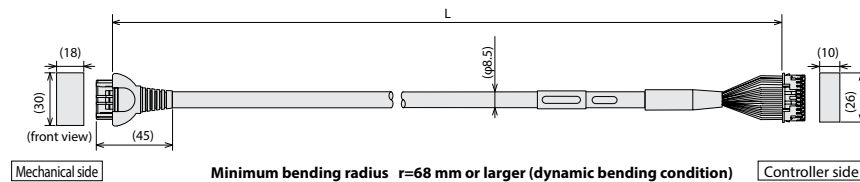


Mechanical side Terminal No.		Controller side Terminal No.
1	[ϕ A]	1
2	[VMM]	2
4	[ϕ B]	3
5	[ϕ A]	4
3	[ϕ A]	5
6	[ϕ B]	6
16	[BK+]	9
17	[BK-]	10
5	NC	11
6	NC	12
13	[LS+]	7
14	[LS-]	8
1	[A+]	13
2	[A-]	14
3	[B+]	15
4	[B-]	16
10	[VCC]	17
11	[VPS]	18
9	[GND]	19
12	[Spare]	20
15	NC	21
7	NC	22
8	NC	23
18	Shield [FG]	24

Model **CB-RPSEP-MPA**

* The robot cable is standard.

* Enter the cable length (L) into . Maximum length 20m.
Ex.: 080=8m



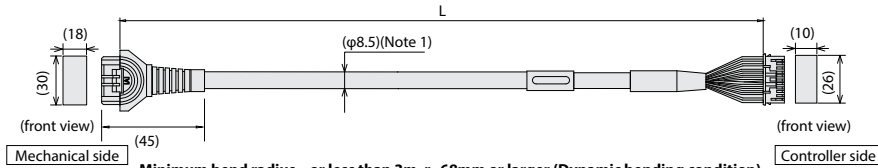
Mechanical side Terminal No.		Controller side Terminal No.
A1	[ϕ A]	1
B1	[VMM]	2
A2	[ϕ A]	5
B2	[ϕ B]	3
A3	[VMM]	4
B3	[ϕ B]	6
A6	[LS+]	7
B6	[LS-]	8
A7	[A+]	13
B7	[A-]	14
A8	[B+]	15
B8	[B-]	16
A4	NC	---
A5	[BK+]	9
B5	[BK-]	10
A9	[GNDLS]	20
B9	[VPS]	18
A10	[VCC]	17
B10	[GND]	19
A11	NC	21
B11	Shield (FG)(FG)	24
	NC	22
	NC	23

Maintenance Parts

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-253 for the actuators to be connected.)

Model **CB-CFA3-MPA**□□□□ / **CB-CFA3-MPA**□□□□-**RB**

* Enter the cable length (L) into □□□. Maximum length 20m.
Ex.: 080=8m



Minimum bend radius or less than 3m, r=68mm or larger (Dynamic bending condition)
for 3m or longer, r=73 mm or larger (Dynamic bending condition)

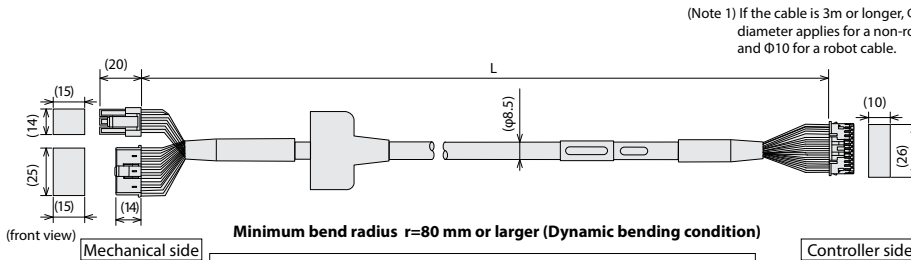
* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.
* Only the robot cable is to be used in a cable rack.

(Note 1) If the cable is 3m or longer, $\phi 9.1$ cable diameter applies for a non-robot cable and $\phi 10$ for a robot cable.

Mechanical side 1-1827863-1 (AMP)		Controller side PADP-24V-1-S (JST)	
Pin No.	Signal	Pin No.	Signal
A1	ϕ A	1	ϕ A
B1	VMM	2	VMM
A2	ϕ -A	5	ϕ -A
B2	ϕ -B	3	ϕ -B
A3	VMM	4	VMM
B3	ϕ -B	6	ϕ -B
A4	LS+	7	LS+
B4	LS-	8	LS-
A6	SA(mABS)	11	SA(mABS)
B6	SB(mABS)	12	SB(mABS)
A7	A+	13	A+
B7	A-	14	A-
A8	B+	15	B+
B8	B-	16	B-
A5	BK+	9	BK+
B5	BK-	10	BK-
A9	LS_GND	20	LS_GND
B9	VPS	18	VPS
A10	VCC	21	VCC
B10	GND	19	GND
A11	—	17	—
B11	FG	22	—
		23	—
		24	FG

Model **CB-CFA-MPA**□□□□ / **CB-CFA-MPA**□□□□-**RB**

* Enter the cable length (L) into □□□. Maximum length 20m.
Ex.: 080=8m



Minimum bend radius r=80 mm or larger (Dynamic bending condition)

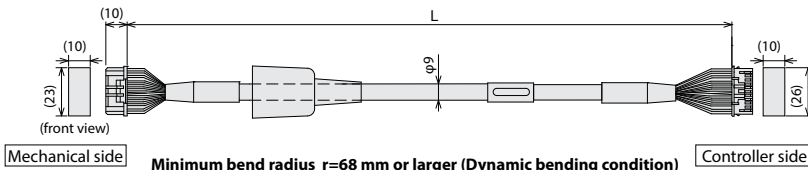
* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.

(Note 1) If the cable is 3m or longer, $\phi 9.1$ cable diameter applies for a non-robot cable and $\phi 10$ for a robot cable.

Mechanical side SLP-06V (JST)		Controller side PADP-24V-1-S (JST)	
Pin No.	Signal	Pin No.	Signal
1	ϕ A	1	ϕ A
2	VMM	2	VMM
4	ϕ -B	3	ϕ -B
5	VMM	4	VMM
3	ϕ -A	5	ϕ -A
6	ϕ -B	6	ϕ -B
5	NC	11	NC
6	NC	12	NC
13	LS+	7	LS+
14	LS-	8	LS-
1	A+	13	A+
2	A-	14	A-
3	B+	15	B+
4	B-	16	B-
16	BK+	9	BK+
17	BK-	10	BK-
12	VCC	21	VCC
9	GND	19	GND
11	VPS	18	VPS
10	NC	20	NC
18	FG	24	FG
15	NC	17	NC
7	NC	22	NC
8	NC	23	NC

Model **CB-CFA2-MPA**□□□□ / **CB-CFA2-MPA**□□□□-**RB**

* Enter the cable length (L) into □□□. Maximum length 20m.
Ex.: 080=8m



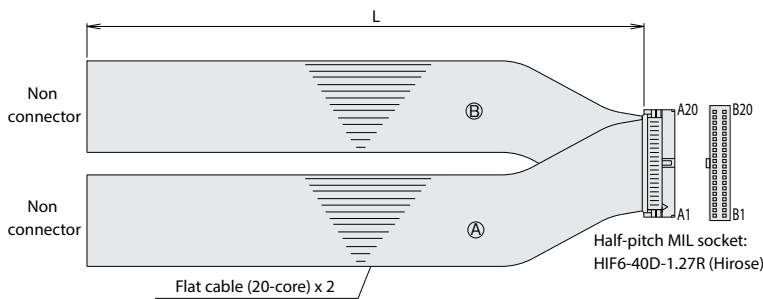
Minimum bend radius r=68 mm or larger (Dynamic bending condition)

* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.

Mechanical side 1-1827863-1 (AMP)		Controller side PADP-24V-1-S (JST)	
Pin No.	Signal	Pin No.	Signal
A1	ϕ A	1	ϕ A
B1	VMM	2	VMM
A2	ϕ -A	5	ϕ -A
B2	ϕ -B	3	ϕ -B
A3	VMM	4	VMM
B3	ϕ -B	6	ϕ -B
A4	LS+	7	LS+
B4	LS-	8	LS-
A6	—	11	—
B6	—	12	—
A7	A+	13	A+
B7	A-	14	A-
A8	B+	15	B+
B8	B-	16	B-
A5	BK+	9	BK+
B5	BK-	10	BK-
A9	LS_GND	20	LS_GND
B9	VPS	18	VPS
A10	VCC	21	VCC
B10	GND	19	GND
A11	—	17	—
B11	FG	22	—
		23	—
		24	FG

Model **CB-PAC-PIO**□□□□

* Enter the cable length (L) into □□□. Maximum length 10m.
Ex.: 080=8m



HIF6-40D-1.27R				HIF6-40D-1.27R			
No.	Signal	Cable color	Wiring	No.	Signal	Cable color	Wiring
A1	24V	Brown-1	Flat cable (A) (Crimped) AWG28	B1	OUT0	Brown-3	Flat cable (B) (Crimped) AWG28
A2	24V	Red-1		B2	OUT1	Red-3	
A3	—	Orange-1		B3	OUT2	Orange-3	
A4	—	Yellow-1		B4	OUT3	Yellow-3	
A5	IN0	Green-1		B5	OUT4	Green-3	
A6	IN1	Blue-1		B6	OUT5	Blue-3	
A7	IN2	Purple-1		B7	OUT6	Purple-3	
A8	IN3	Gray-1		B8	OUT7	Gray-3	
A9	IN4	White-1		B9	OUT8	White-3	
A10	IN5	Black-1		B10	OUT9	Black-3	
A11	IN6	Brown-2		B11	OUT10	Brown-4	
A12	IN7	Red-2		B12	OUT11	Red-4	
A13	IN8	Orange-2		B13	OUT12	Orange-4	
A14	IN9	Yellow-2		B14	OUT13	Yellow-4	
A15	IN10	Green-2		B15	OUT14	Green-4	
A16	IN11	Blue-2		B16	OUT15	Blue-4	
A17	IN12	Purple-2		B17	—	Purple-4	
A18	IN13	Gray-2		B18	—	Gray-4	
A19	IN14	White-2		B19	0V	White-4	
A20	IN15	Black-2		B20	0V	Black-4	

Area with horizontal dotted lines for writing notes.

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

X-SEL



Program Controller
for Single-axis robot / Cartesian robot / Linear servo /
RCS4/RCS3/RCS2 series.



List of models

Multi-axial program controller for operating servo motor actuators. Up to 8 axes can be simultaneously controlled.

Type	RA	SA	P/PCT (*1)	Q/QCT (*1)
External view				
Description	Standard specification	Safety category compliant	Standard specification	Safety category compliant
Maximum number of control axes	8 axes		6 axes	
Number of positions	Maximum 55000 positions (It varies depending on the number of axes.) (See specification table on P7-265.)		20000 positions	
Total number of programs	255		128	
Number of program steps	20000		9999	
Total number of connectable W	Single-phase 1600W/3-phase 2400W		Single-phase 1600W / 3-phase 2400W	
Motor power supply voltage	Single-phase 200VAC/230VAC ±10% 3-phase 200VAC/230VAC ±10%		Single-phase 200VAC/230VAC ±10% 3-phase 200VAC/230VAC ±10%	
Control power voltage	Single-phase 200VAC/230VAC ±10%		Single-phase 200VAC/230VAC ±10%	
Safety category (*2)	Category B	Category 4	Category B	Category 4
Overseas standard	CE		CE	
Expanded motion control function	Able to control up to 32 additional axes. (Only for the IAI controllers that are compatible with MECHATROLINK III)		Able to control up to 16 additional axes. (Only for the IAI controllers that are compatible with pulse-train control)	
Communication port	Ethernet	Equipped as standard: 10/100/1000BASE-T(RJ-45)	Option board compatible: 10/100BASE-T(RJ-45)	
	USB2.0	Equipped as standard: USB2.0(Mini-B)	-	
	General-purpose RS232C communication port	1 channel (max. 230.4 kbps)	2 channels (max. 115.2 kbps)	

(*1) The PCT/QCT types are controllers for high-speed axes (CT4).

(*2) Compliance with the Safety Category requires the customer to install a safety circuit externally to the controller.

Model

[XSEL-RA/SA Type]

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

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

Series Type Number of axes Motor Encoder Option (Note) (Specs for 1st axis) (Specs for axes 2-8) Motor Encoder Option (Note) Network dedicated slot (slot 1) (slot 2) I/O slot (slot 1) (slot 2) I/O cable length Power voltage

RA	Standard type															
SA	Safety category compliant type															

1	1-axis spec	5	5-axis spec
2	2-axis spec	6	6-axis spec
3	3-axis spec	7	7-axis spec
4	4-axis spec	8	8-axis spec

12	12W	150	150W
20	20W	200	200W
30D	30W	200S	200W
30R	30W	400	400W
60	60W	600	600W
100	100W	750	750W
100S	100W		

(Ex) 12: 12W servo motor compatible

Note
Basically, the type of motor is the same as that of the electric actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.
(30D/30R/200S compatible actuators)
● Controller motor type "30D"...30W actuator other than RS
● Controller motor type "30R"... RS

WAI	Battery-less absolute incremental
A	Absolute specification
G	Quasi-absolute
AI	Index absolute
AM	Multi-rotation absolute

B	Brake
C	Creep sensor
HA	High accel./decel.
L	Home sensor/LS compatible
M	Master axis spec
S	Slave axis spec

E	Not used
EP	EtherNet/IP
EC	EtherCAT

E	Not used
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP

E	Not used	P1	IN 32/OUT 16 (PNP)
N1	IN 32/OUT 16 (NPN)	P2	IN 16/OUT 32 (PNP)
N2	IN 16/OUT 32 (NPN)	P3	IN 48/OUT 48 (PNP)
N3	IN 48/OUT 48 (NPN)		

(*) Network dedicated slots 1 and 2 are for specific network boards. Specify the right symbol from available ones.
(*) Network dedicated slots and I/O slots can be used together.

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

(*) If an I/O board (N□/P□) is not selected at the I/O slot, specify the I/O cable length as 0 (no cable).

2	Single-phase 200VAC
2L	Linear dedicated Single-phase 200VAC
3	3-phase 200VAC
3L	Linear dedicated 3-phase 200VAC

* Note: When selecting a single-axis or Cartesian robots.

The total wattage for a single-axis and Cartesian robot that can be connected to XSEL-RA/SA type is 2400W for a 3-phase specification, and 1600W for a single-phase specification. The maximum wattage for one axis is 750W, but the total wattage of each axis should not exceed the specified wattage.

NOTE XSEL-RA/SA type cannot be connected to the following models:

- LSA Series, ● RCS2-SRA7/SRGS7/SRGD7,
- RCS2-□□5N (Incremental), ● NS-SXM□/SZM□ (Incremental),
- Servo press

Example of the model by controller type

The following is examples of models by controller type.

For details of I/O slots, refer to the table of "Installable I/O specification by Controller" on P7-262.

[XSEL- RA/SA Type]

XSEL - RA - 4 - 200A - 100A - 60A - 30A - EPDV - N1E - 2 - 3

Series Type Number of axes Connected actuator motor wattage, encoder type Network dedicated slots 1/2 Slot 1/2 I/O cable length Power voltage

I/O slot description

[XSEL- P/Q Type]

XSEL - P - 4 - 200A - 100A - 60A - 30A - CC - N1 - N1N1E - 2 - 3

Series Type Number of axes Connected actuator motor wattage, encoder type Network dedicated slots 1 Slot 1 Slot 2/3/4 * I/O cable length Power voltage

I/O slot description

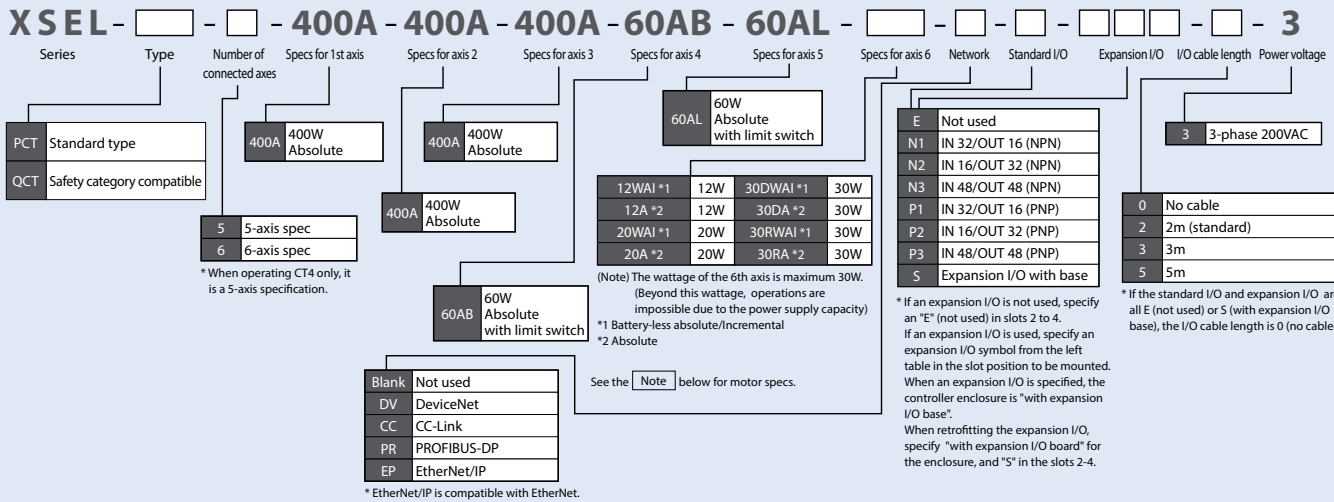
Model

[XSEL-PCT/QCT]

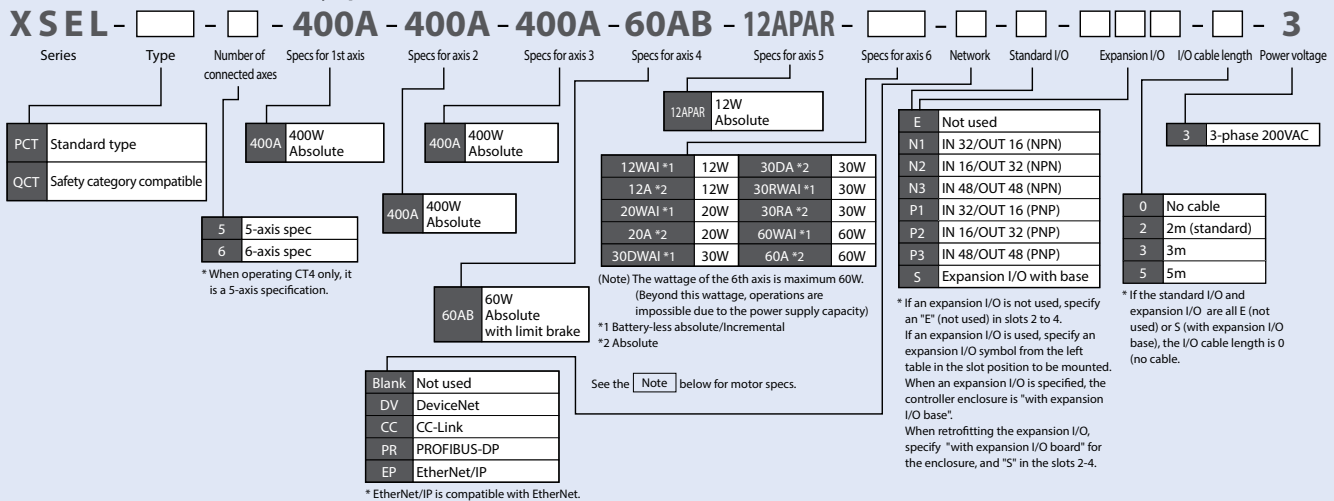
* This controller is dedicated to the high-speed axis (CT4).

Model for CT4 Series

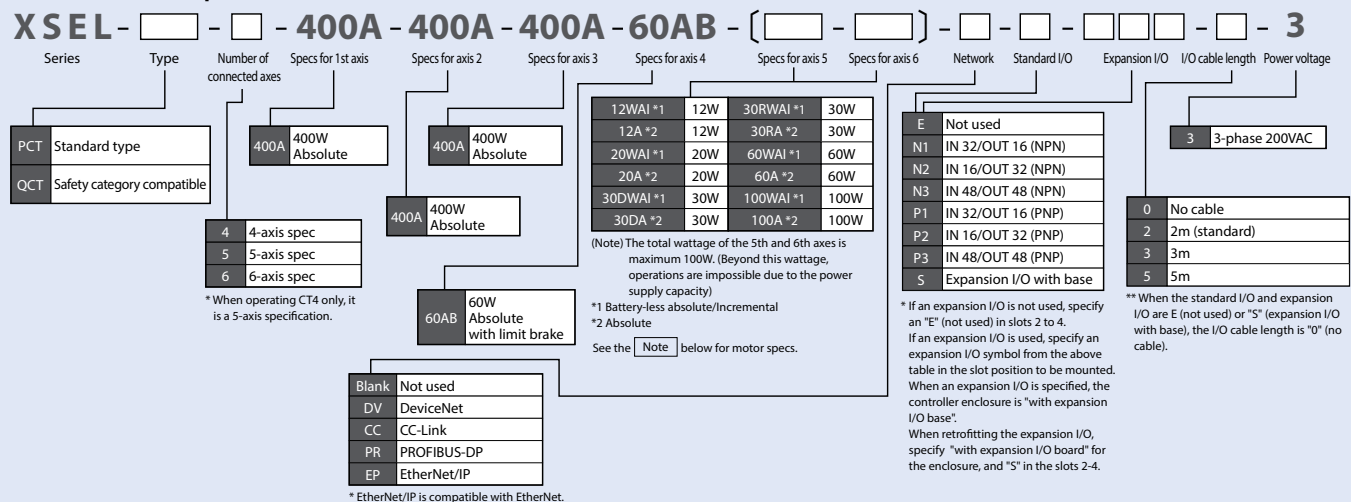
<Cartesian 4-axes + Rotational axis Specification>



<Cartesian 4-axes + Pick & Rotary Specifications>



<Cartesian 4-axes Specifications>



Note

Basically, the type of motor is the same as that of the electric actuator to be connected. However, in some models the controller and actuator motor types do not match.

Applicable models are listed below for selection. (30D/30R/200S compatible actuators)

● Controller motor type "30D"...30W actuator other than RS ● Controller motor type "30R"... RS ● Controller motor type "200S"...DD-LT18, DD-T18, DDCR-LT18, DDCR-T18.

System Configuration

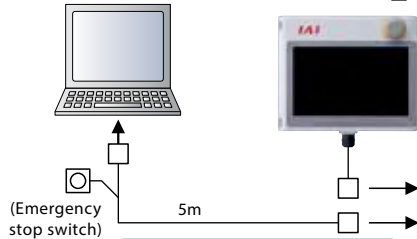
XSEL-RA

Optional

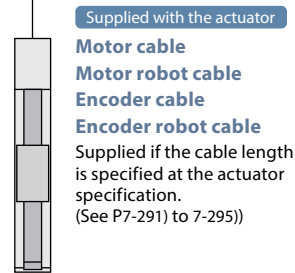
PC dedicated teaching software

(See P7-274) *Ⓟ=PC side, Ⓞ=Controller side

- ⓅRS232-ⓄRS232
<Model: IA-101-X-MW>
 - ⓅUSB-ⓄRS232
<Model: IA-101-X-USBMW>
 - ⓅUSB-ⓄUSB/Ethernet
<Model: IA-101-N>
- Compatible with Ver. 13.00.00.00 or later



Included with PC dedicated teaching software
Communication cable
<Model: CB-ST-E1MW050-EB>



Supplied with the actuator
Motor cable
Motor robot cable
Encoder cable
Encoder robot cable
Supplied if the cable length is specified at the actuator specification. (See P7-291) to 7-295))

Connectable Actuator
<Refer to the product page of each actuator>

Optional
Touch panel teaching pendant
(See P7-274)
<Model: TB-02-□>

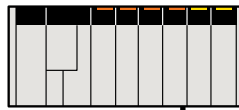
Supplied with the controller
Dummy Plug
(See P7-273)
<Model: DP-2>

Supplied with the controller
PIO Cable
(See P7-295)
<Model: CB-X-PIO020>
Standard: 2m
(Supplied with the PIO controller)

Supplied with the regenerative unit
Regenerative unit cable 1m

Regenerative Unit
Please refer to P7-273 for the necessary number of regenerative units.

PLC



Field Network

- DeviceNet
 - CC-Link
 - PROFIBUS-DP
 - EtherCAT
 - EtherNet/IP
- EtherNet/IP is compatible with EtherNet

Extended Motion
(Cable is supplied by the customer) □ PCON/ACON/SCON-CB MCON (MECHATROLINK Link III specification)

Motor power supply
3-phase/single-phase
200VAC/230VAC

Control power supply
Single-phase
200VAC/230VAC

Brake release power
24VDC

Power for I/O
24VDC

* When connecting the power, make sure to mount the following filters or equivalent:

- Noise filter recommended model
3-phase TAC-20-683 (maker: COSEL)
Single-phase NBH-20-432 (maker: COSEL)
- Ring core recommended model
ESD-R-25 (maker: NEC Tokin)
- Clamp filter recommended model
Control power: ZCAT3035-133 (maker TDK)
Motor power RFC-H13 (maker: Kitagawa)
- Surge protector recommended model
3-phase RAV-781BXZ-4
Single-phase RAV-781BWZ-2A (maker: Okaya Electric)

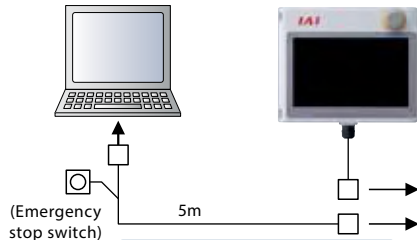
XSEL-SA

Optional

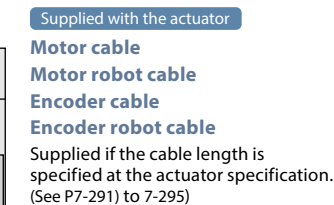
PC dedicated teaching software

(See P7-274) *Ⓟ=PC side, Ⓞ=Controller side

- ⓅRS232-ⓄRS232
<Model: IA-101-XA-MW>
 - ⓅUSB-ⓄRS232
<Model: IA-101-X-USBMW>
 - ⓅUSB-ⓄUSB/Ethernet
<Model: IA-101-N>
- Compatible with Ver. 13.00.00.00 or later



Included with PC dedicated teaching software
Communication cable
<Model: CB-ST-A2MW050-EB>



Supplied with the actuator
Motor cable
Motor robot cable
Encoder cable
Encoder robot cable
Supplied if the cable length is specified at the actuator specification. (See P7-291) to 7-295))

Connectable Actuator
<Refer to the product page of each actuator>

Optional
Touch panel teaching pendant
(See P7-274)
<Model: TB-02-□>

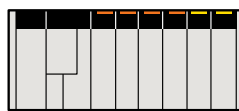
Supplied with the controller
Dummy Plug
(See P7-273)
<Model: DP-2>

Supplied with the controller
PIO Cable
(See P7-295)
<Model: CB-X-PIO020>
Standard: 2m
(Supplied with the PIO controller)

Supplied with the regenerative unit
Regenerative unit cable 1m

Regenerative Unit
Please refer to P7-273 for the necessary number of regenerative units.

PLC



Field network

- DeviceNet
 - CC-Link
 - PROFIBUS-DP
 - EtherCAT
 - EtherNet/IP
- EtherNet/IP is compatible with EtherNet.

Extended motion
(The cable is to be prepared by the customer.) □ PCON/ACON/SCON-CB MCON (MECHATROLINK III specification)

Motor power supply
3-phase/single-phase
200VAC/230VAC

Control power supply
Single-phase
200VAC/230VAC

Brake release power
24VDC

Power for I/O
24VDC

Drive power shut-off circuit
(supplied by customer) * Contact us for the detail of the power shut-off circuit.

* When connecting the power, make sure to mount the following filters or equivalent:

- Noise filter recommended model
3-phase TAC-20-683 (maker: COSEL)
Single-phase NBH-20-432 (maker: COSEL)
- Ring core recommended model
ESD-R-25 (maker: NEC Tokin)
- Clamp filter recommended mode
Control power: ZCAT3035-133 (maker TDK)
Motor power RFC-H13 (maker: Kitagawa)
- Surge protector recommended model
3-phase RAV-781BXZ-4
Single-phase RAV-781BWZ-2A (maker: Okaya Electric)

Connectable I/O Models by Controller Type

Specifications of the connectable I/O (input/output) vary according to the XSEL controller type.

Confirm the I/O type connectable to the controller to be used.
Refer to the table below to confirm installable I/O specification for the controller to be used.
* Refer to the each controller model for the description of the symbols specified for each slot.

Controller Type	External view	Connectable I/O by I/O Slot					
		Network dedicated slot 1	Network dedicated slot 2	Slot 1	Slot 2	Slot 3	Slot 4
RA type SA type		E EP EC	E DV CC PR	E N1 N2 N3 P1 P2 P3	E N1 N2 N3 P1 P2 P3	(not applicable)	(not applicable)
P type Q type PCT type QCT type	Standard specification 	(not applicable)	(not applicable)	E N1 N2 N3 P1 P2 P3	(not applicable)	(not applicable)	(not applicable)
	with expansion slot specification 	(not applicable)	(not applicable)	E N1 N2 N3 P1 P2 P3	E N1 N2 N3 P1 P2 P3 S	E N1 N2 N3 P1 P2 P3 S	E N1 N2 N3 P1 P2 P3 S

System Configuration

XSEL-P/Q/PCT/QCT

Connectable Actuators

- XSEL-P/Q (See the product page of each actuator)
- XSEL-PCT/QCT

CT4
* Note that the 5th and 6th axes of XSEL-P/Q/PCT/QCT types are not operable.
LSA Series, RCS2-RA7/SRA7/SRGS7/SRGD7 and the following models' incremental specifications: RCS2-□□5N (small) Series, NS-SXM□/SZM□.

Supplied with the actuator

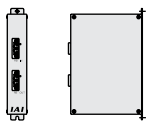
- Motor Cable
- Motor Robot cable
- Encoder cable
- Encoder robot cable

Supplied if the cable length is specified at the actuator specification.
Refer to P1-253 for maintenance cable.

Supplied with the regenerative unit

Regenerative unit cable 1m

Regenerative Unit



Please refer to P7-273 for the necessary number of regenerative units.

External Device

PLC, etc.

Supplied with the controller

I/O flat cable 2m (See P7-295)

Field Network Connection

- Device Net
- CC-Link
- PROFIBUS-DP
- EtherNet/IP

EtherNet/IP is compatible with EtherNet

Serial Communication Port Standard 2ch for RS232

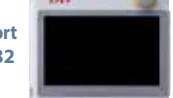
Optional

PC dedicated teaching software for RS232

(See P7-274)
<Model: IA-101-X-MW>
<Model: IA-101-X-USBMW> (for P/PCT)
<Model: IA-101-XA-MW> (for Q/QCT)

Optional
Touch panel teaching pendant (See P7-274)
<Model: TB-02-□>

5m



(Emergency stop switch)

Included with PC dedicated teaching software

Communication cable
<Model: CB-ST-E1MW050-EB> (for P/PCT)
<Model: CB-ST-A2MW050-EB> (for Q/QCT)

Expansion I/O

- PIO board
- * The controller enclosure changes when an expansion I/O is attached to the P/Q types. (Refer to the above "Connectable I/O by Controller Type".)

Control Power

Single-phase 200VAC

Power Supply for Motor Driving

3-phase 200V AC(Q type)

System I/O

- Emergency stop
- Enable
- System ready

Brake I/O

Power supply 24VDC

Drive power shut-off circuit
(supplied by customer)

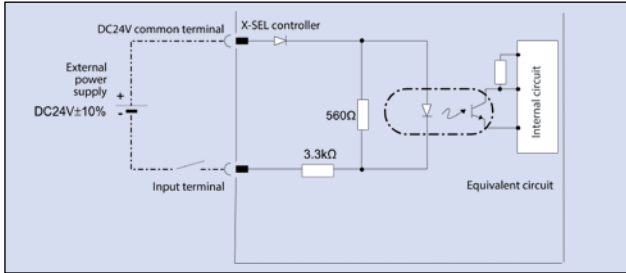
Necessary only for Q type (Not necessary for P type)

- *When connecting the power, make sure to mount the following filters or equivalent:
- Noise filter recommended model
3-phase TAC20-683 (maker: COSEL)
Single-phase NBH-20-432 (maker: COSEL)
 - Ring core recommended model
ESD-R-25 (maker: NECT Tokin)
 - Clamp filter recommended model
Control power: ZCAT3035-1330 (maker: TDK)
Motor power RFC-H13 (maker: Kitagawa Industry)
3-phase RAV-781BXZ-4
 - Surge protector recommended model
Single-phase RAV-781BWZ-2A (maker: Okaya Electric)

I/O Wiring Diagram

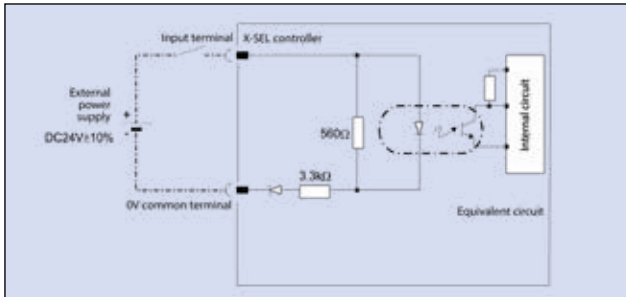
Input Section External input specification (NPN specification)

Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage...min. 16.0VDC / OFF voltage ... max. 5.0VDC
Isolation method	Photocoupler



Input Section External input specification (PNP specification)

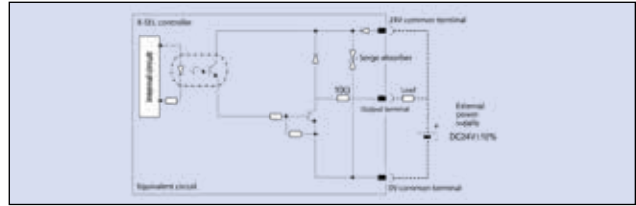
Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage...min. 8VDC / OFF voltage ... max. 19VDC
Isolation method	Photocoupler



Output Section External input specification (NPN specification)

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point 400mA / 8 ports (note)
Leak current	Max. 0.1 mA / point
Isolation method	Photocoupler

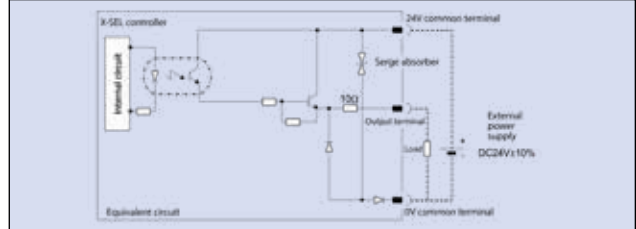
(Note) The maximum total load current is 400mA for every 8 ports starting from output port No. 300. (The total current between the output port No. 300 + n to No. 300 + n + 7 is 400mA maximum, where n=0 or a multiple of 8.)



Output Section External input specification (PNP specification)

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point 400mA / 8 ports *
Leak current	Max. 0.1 mA / point
Isolation method	Photocoupler

(Note) The maximum total load current is 400mA for every 8 ports starting from output port No. 300. (The total current between the output port No. 300 + n to No. 300 + n + 7 is 400mA maximum, where n=0 or a multiple of 8.)



I/O Signals Table

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

Pin No.	Classification	Port No.	Standard settings
1			24V connection
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	Select program (PRG No.1)
10		008	Select program (PRG No.2)
11		009	Select program (PRG No.4)
12		010	Select program (PRG No.8)
13		011	Select program (PRG No.10)
14		012	Select program (PRG No.20)
15		013	Select program (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		—	0V connect

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

Pin No.	Classification	Standard settings
1		Connect 24V.
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		0V connect

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

Pin No.	Classification	Standard settings
1		Connect 24V.
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		0V connect

Standard Multi-point I/O Signal Table (when N3 or P3 is selected)

Pin No.	Classification	Port No.	Standard settings
1	—	—	External power supply (24VDC) Pin No.2-25/51-74)
2	Input	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	Select program (PRG No.1)
10		008	Select program (PRG No.2)
11		009	Select program (PRG No.4)
12		010	Select program (PRG No.8)
13		011	Select program (PRG No.10)
14		012	Select program (PRG No.20)
15		013	Select program (PRG No.40)
16		014	General-purpose input
17		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	—	—	External power supply (24VDC) Pin No.27-50/76-99)
27	Input	024	General-purpose input
28		025	General-purpose input
29		026	General-purpose input
30		027	General-purpose input
31		028	General-purpose input
32		029	General-purpose input
33		030	General-purpose input
34		031	General-purpose input
35		032	General-purpose input
36		033	General-purpose input
37		034	General-purpose input
38		035	General-purpose input
39		036	General-purpose input
40		037	General-purpose input
41		038	General-purpose input
42		039	General-purpose input
43		040	General-purpose input
44		041	General-purpose input
45		042	General-purpose input
46		043	General-purpose input
47		044	General-purpose input
48		045	General-purpose input
49		046	General-purpose input
50	047	General-purpose input	
51	Output	300	Alarm output
52		301	Ready output
53		302	Emergency stop output
54		303	General-purpose output
55		304	General-purpose output
56		305	General-purpose output
57		306	General-purpose output
58		307	General-purpose output
59		308	General-purpose output
60		309	General-purpose output
61		310	General-purpose output
62		311	General-purpose output
63		312	General-purpose output
64		313	General-purpose output
65		314	General-purpose output
66		315	General-purpose output
67		316	General-purpose output
68		317	General-purpose output
69		318	General-purpose output
70		319	General-purpose output
71		320	General-purpose output
72		321	General-purpose output
73		322	General-purpose output
74	323	General-purpose output	
75	—	—	External power supply (0V) Pin No.2-25/51-74)
76	Output	324	General-purpose output
77		325	General-purpose output
78		326	General-purpose output
79		327	General-purpose output
80		328	General-purpose output
81		329	General-purpose output
82		330	General-purpose output
83		331	General-purpose output
84		332	General-purpose output
85		333	General-purpose output
86		334	General-purpose output
87		335	General-purpose output
88		336	General-purpose output
89		337	General-purpose output
90		338	General-purpose output
91		339	General-purpose output
92		340	General-purpose output
93		341	General-purpose output
94		342	General-purpose output
95		343	General-purpose output
96		344	General-purpose output
97		345	General-purpose output
98		346	General-purpose output
99	347	General-purpose output	
100	—	—	External power supply (0V) Pin No.27-50/76-99)

Expansion Multi-point I/O Signal Table (when N3 or P3 is selected)

Pin No.	Classification	Port No.	Standard settings
1	—	—	External power supply (24VDC) Pin No.2-25/51-74)
2	Input	—	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		—	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	—	—	External power supply (24VDC) Pin No.27-50/76-99)
26	Input	—	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 input
35		—	General-purpose input
36		—	General-purpose input
37		—	General-purpose input
38		—	General-purpose input
39		—	General-purpose input
40		—	General-purpose input
41		—	General-purpose input
42		—	General-purpose input
43		—	General-purpose input
44		—	General-purpose input
45		—	General-purpose input
46		—	General-purpose input
47		—	General-purpose input
48		—	General-purpose input
49	—	General-purpose input	
50	—	—	General-purpose output
51	Output	—	General-purpose output
52		—	General-purpose output
53		—	General-purpose output
54		—	General-purpose output
55		—	General-purpose output
56		—	General-purpose output
57		—	General-purpose output
58		—	General-purpose output
59		—	General-purpose output
60		—	General-purpose output
61		—	General-purpose output
62		—	General-purpose output
63		—	General-purpose output
64		—	General-purpose output
65		—	General-purpose output
66		—	General-purpose output
67		—	General-purpose output
68		—	General-purpose output
69		—	General-purpose output
70		—	General-purpose output
71		—	General-purpose output
72		—	General-purpose output
73		—	General-purpose output
74	—	—	General-purpose output
75	—	—	External power supply (0V) Pin No.2-25/51-74)
76	Output	—	General-purpose output
77		—	General-purpose output
78		—	General-purpose output
79		—	General-purpose output
80		—	General-purpose output
81		—	General-purpose output
82		—	General-purpose output
83		—	General-purpose output
84		—	General-purpose output
85		—	General-purpose output
86		—	General-purpose output
87		—	General-purpose output
88		—	General-purpose output
89		—	General-purpose output
90		—	General-purpose output
91		—	General-purpose output
92		—	General-purpose output
93		—	General-purpose output
94		—	General-purpose output
95		—	General-purpose output
96		—	General-purpose output
97		—	General-purpose output
98		—	General-purpose output
99	—	—	General-purpose output
100	—	—	External power supply (0V) Pin No.27-50/76-99)

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

Table of Specifications

RA/SA (Safety Category Compliant Type)

Item	Description		
Controller type	RA	SA	
Compatible motor output	20W~750W		
Number of control axes	1 to 8 axes		
Maximum connected axes output	[3-phase specification] max. 2400W [Single-phase specification] max. 1600W		
Motor power voltage	[3-phase specification] 200VAC/230V AC±10% [Single-phase specification] 200VAC/230VAC ±10%		
Control power input	Single phase 200VSC/230VAC ±10%		
Power supply frequency	50/60Hz		
Insulation resistance	10MΩ or more (between the power-supply terminal and I/O terminals, and between all external terminals and enclosure, at 500VDC)		
Withstand voltage	1500VAC (One minute)		
Power supply capacity (max)	5094VA (at the maximum connecting axis output)		
Position detection method	Incremental/absolute/battery-less absolute		
Safety circuit configuration	Redundancy not supported	Redundancy supported	
Drive power shut-off system	Internal cutoff relay	External safety circuit	
Emergency stop input	B contact input (internal power supply model)	B contact input (external power supply, double redundant)	
Enable input	B contact input (internal power supply model)	B contact input (external power supply, double redundant)	
Speed setting	1mm/s~ The maximum depends on actuator specifications		
Acceleration/deceleration setting	0.01G~ The maximum depends on actuator specifications		
Programming language	Super SEL language		
Number of programs	255 programs		
Number of program steps	20000 steps (total)		
Number of multi-tasking programs	16 programs		
Number of positions	Varies according to the number of controlled axes: 1-axis: 55000 3-axis: 41250 5-axis: 33000 7-axis: 27500 2-axis: 47142 4-axis: 36666 6-axis: 30000 8-axis: 25384		
Data memory device	Flash ROM + Non-volatile RAM (FRAM): no system battery (button battery) needed		
Data input method	By touch panel teaching pendant or PC dedicated teaching software.		
Standard input/output	48-point I/O PIO board (NPN/PNP), 96-point I/O PIO board (NPN/PNP), 2 boards can be installed.		
Serial communications function	Teaching pendant port (25 pin D-sub), USB port (mini-B), 1ch RS232C port (9 pin D-sub), Ethernet (RJ-45)		
Fieldbus communication function	DeviceNet,CC-Link,PROFIBUS-DP, EtherNet/IP,EtherCAT (EtherNet/IP, EtherCAT and DeviceNet, CC-Link and PROFIBUS-DP can be installed simultaneously)		
Clock function	Retention time: approx. 10 days Recharging time: approx. 100 hours		
Regenerating resistance	1 kΩ/20W regenerative resistance included (expandable by installing external regenerative resistance units)		
Absolute battery	AB-5 (built-in inside controller)		
Protective function	Motor overcurrent, overload, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, absolute battery error., etc.		
Mass	No absolute battery unit	[4-axis specification] approx. 4.4 kg [8-axis specification] approx. 5.3 kg	[4-axis, 3-phase: approx. 4.4 kg], [4-axis, single-phase: approx. 5.0 kg]
	With absolute battery unit	[4-axis specification] approx. 5.0 kg [8-axis specification] approx. 6.0 kg	[8-axis, 3-phase: approx. 5.4 kg], [8-axis, single-phase: approx. 6.0 kg]
Ambient operating temperature/humidity/atmosphere	0 to 40°C, 85%RH or lower (non-condensing). Free from corrosive gases. In particular, there shall be no significant dust.		

* Refer to the operation manual, or contact us for the power supply capacity, etc.

Table of Specifications

P/Q (Safety Category Compliant Type)/PCT/QCT (Safety Category Compliant Type)

Item	Description												
	P/PCT						Q/QCT						
Connecting actuator	Actuator that can be connected only to RCS3/RCS2/IS(P)B/IS(P)A/IS(P)DB/IS(P)DBCR/IS(P)DACR/IF/FS/RS/linear PCT, QCT: CT4												
Compatible motor output (W)	20/30/60/100/150/200/300/400/600/750/1000												
Number of controlled axes	1-axis	2-axes	2-axes	4-axes	5-axes	6-axes	1-axis	2-axes	2-axes	4-axes	5-axes	6-axes	
Maximum connected axes	Max2400W (single-phase AC200V specification is 1600W)												
Control power input	200VDC/230VAC Single-phase ±10%						200VAC/230VAC Single-phase ±10%						
Motor power input	200VDC/230VAC Single-phase/3-phase ±10%						200VAC/230VAC Single-phase/3-phase ±10%						
Power supply frequency	50/60Hz												
Insulation resistance	10MΩ or more (between the power-supply terminal and I/O terminals, and between all external terminals and enclosure, at 500VDC)												
Withstand voltage	1500VAC (one minute)						1500VAC (one minute)						
Power supply capacity (*1)	P/Q	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA
	PCT/QCT	-	-	-	Max 4019VA	Max 4265VA	Max 4271VA	-	-	-	Max 4019VA	Max 4265VA	Max 4271VA
Position detection method	Battery-less absolute encoder/incremental encoder (wiring-saving type) Multi-rotation data backup absolute encoder (wiring-saving type)												
Safety circuit configuration	Redundancy not supported						Redundancy supported						
Drive power shut-off system	Internal cutoff relay						External safety circuit						
Enable input	B contact input (internal power supply model)						B contact input (external power supply, double redundant)						
Speed setting	1 mm/sec and up, the maximum depends on actuator specifications												
Acceleration/deceleration setting	0.01G and up, the maximum depends on actuator specifications												
Programming language	Super SEL language												
Number of programs	128 programs												
Number of program steps	9999 steps (total)												
Number of multi-tasking programs	16 programs												
Number of positions	20000 positions (total)												
Data memory device	Flash ROM + SRAM (battery backup)												
Data input method	By touch panel teaching pendant or PC dedicated teaching software												
Standard input/output	Input/Output 48-point PIO board (NPN/PNP), input/output 96-point PIO board (NPN/PNP), 1 board can be installed												
Extended input/output	Input/output 48-point PIO board (NPN/PNP), input/output 96-point PIO board (NPN/PNP), Up to 3 boards can be installed												
Serial communications function	Teaching Pendant (25-pin D-sub) Port + 2ch RS232C Port (9-pin D-sub x 2) included as standard												
Protective function	Motor overcurrent, overload, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, battery error.												
RC gateway function	1ch RS485 port (9-pin D-sub) (serial communication (RS232C). Either one of this port or channel 2 can be used.												
Temperature/humidity/atmosphere	0 to 40°C, 10 to 95% (non-condensing). Free from corrosive gases. In particular, there shall be no significant dust.												
Mass (*2)	5.2kg			5.7kg			4.5kg			5kg			
Accessories	I/O flat cable												

*1: When the connected axes represent the maximum wattage.

*2 Including the absolute battery, brake mechanism and expansion I/O box.

External Dimensions

■ RA/SA (Safety Category Compliant Type)

Controller specifications	Front view		Side view	
	Battery-less absolute specification/Incremental specification/ Quasi-absolute specification/Index absolute specification	Absolute specification/Multi-rotation absolute specification		
RA Single-phase/ 3-phase specifications	1 to 4 axis specifications 	Absolute specification/Multi-rotation absolute specification 	 (Battery-less specification/ Incremental specification/ Quasi-absolute specification/ Index absolute specification)	
	5 to 8 axis specifications 	Absolute specification/Multi-rotation absolute specification 		
SA Single-phase specifications	1 to 4 axis specifications 	Absolute specification/Multi-rotation absolute specification 		 Absolute specification/ Multi-rotation absolute specification
	5 to 8 axis specifications 	Absolute specification/Multi-rotation absolute specification 		
3-phase specifications	1 to 4 axis specifications 	Absolute specification/Multi-rotation absolute specification 		
	5 to 8 axis specifications 	Absolute specification/Multi-rotation absolute specification 		

* If the connected axes include even one axis of absolute specification, the external dimensions are of the absolute specification.

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

External Dimensions

■ P/PCT/Q/QCT (Safety Category Compliant Type)

XSEL-P/Q/PCT types vary their shapes and dimensions according to the controller specifications (encoder type, brake, I/O expansion, power supply specifications). Confirm the dimensions to suit the desired type and number of axes.

(Note)
The external dimensions of the Q type, single-phase 200V specification are different from that for the P type.

[XSEL-P/PCT]

		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	Battery-less absolute/incremental	Absolute	Battery-less absolute/incremental	Absolute	
	Brake	None	Yes	None	Yes	
	I/O	Standard only	Standard only	Standard+Expansion	Standard+Expansion	
Single-phase specifications	1 to 4 axis specifications					
	5 to 6 axis specifications					
3-phase specifications	1 to 4 axis specifications		*P/PCT		*P/PCT	
	5 to 6 axis specifications		*P/PCT		*P/PCT	

* PCT applies only to those specified as **P/PCT" whereas P applies to all.

Controller

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

External Dimensions

■ P/PCT/Q/QCT (Safety Category Compliant Type)

XSEL-P/Q/PCT types vary their shapes and dimensions according to the controller specifications (encoder type, brake, I/O expansion, power supply specifications). Confirm the dimensions to suit the desired type and number of axes.

(Note)
The external dimensions of the Q type, single-phase 200V specification are different from that of the P type.

[XSEL-Q/QCT]

		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	Battery-less absolute/ incremental	Absolute	Battery-less absolute/ incremental	Absolute	
	Brake	None	Yes	None	Yes	
	I/O	Standard only	Standard only	Standard+Expansion	Standard+Expansion	
Single-phase specifications	1 to 4 axis specifications					
	5 to 6 axis specifications					
3-phase specifications	1 to 4 axis specifications		*Q/QCT 		*Q/QCT 	
	5 to 6 axis specifications		*Q/QCT 		*Q/QCT 	

*QCT applies only to those specified as "**Q/QCT" whereas Q applies to all.

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

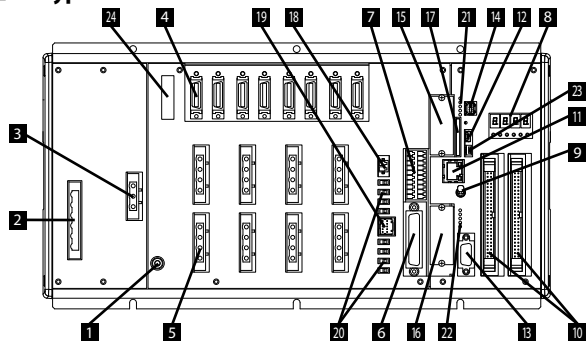
PSA-24

TB-02

TB-03

Part Names

■ RA Type



1 FG Connection Terminal

A terminal for connecting to the FG (frame ground) on the enclosure. Make sure to ground properly to take measure for noise.

2 AC Power Input Connector

200VAC 3-phase input connector. It consists of six terminals including motor power-supply, control power-supply and PE terminals. Standard equipment only includes a terminal block.

[NOTE] Due to risk of electrical shock, do not touch this connector while power is supplied.

3 External Regenerative Unit Connector

A connector for the regenerative resistance unit that must be connected when the built-in regenerative resistance 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 the specific application such as the axis configuration.

4 Encoder, Axis sensor Connector

A connector to connect axis sensors such as actuator encoder and LS, CREEP, OT, etc. * LS, CREEP and OT are options.

5 Motor Cable Connector

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

6 Teaching Connector

This connector is for connecting the IAI touch panel teaching pendant or PC (PC dedicated teaching software) to operate and configure the system.

7 System I/O Connector

A connector for managing the safety operation functions of the controller. The safety category compliant specification enables a safety circuit to configure up to category 4 by using this connector and an external safety circuit.

8 Panel Window

This window has a 4-digit, 7-segment LED and 6 LED lamps showing the system status.

9 Mode Switch

This is a switch to designate the operating mode. It is a toggle switch with a lever-lock to prevent misoperations. Pull the locking toggle switch forward to use.

Switch position	Function
MANU (manual mode)	Top position Teaching tool is enabled.
AUTO (automatic mode)	Bottom position Teaching is disabled. (Note) Make sure to attach the dummy plug to the above 6 Teaching connector. If it is not attached, the emergency stop will not be released.

10 Standard I/O Connector

A 48- or 96-point DIO board

11 EtherNet Connector

A communication board to connect to EtherNet communication devices.

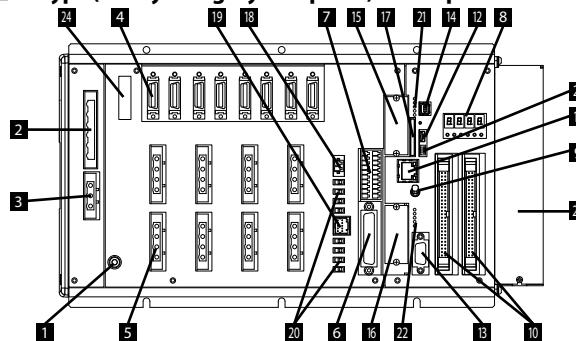
12 USB Connector

A USB device connector to connect to a PC.

13 General-purpose RS232C Port Connector

A port to connect general-purpose RS232C devices.

■ SA Type (Safety Category Compliant, with 3-phase absolute unit)



14 Extended Motion Control Connector

A connector to connect the IAI controller (MECHATROLINK III specification).

15 Field Network Board (optional) Slot 1

A field network board (optional) for the EtherNet/IP or EtherCAT is connected.

16 Field Network Board (optional) Slot 2

A field network board (optional) for the CC-Link, DeviceNet or PROFIBUS-DP is connected.

17 SD Card Slot Connector

This connector is used to update the system. It does not function under the normal operation.

18 Brake Power Input Connector

A power input connector for driving the actuator brake. 24VDC must be supplied externally. If this power supply is not provided, the actuator brake cannot be released. Be certain that power is supplied to axes with a brake.

19 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 connector to manually operate the actuator after the controller has experienced a power failure or malfunction.

20 Brake Release Switch

This switch is to forcibly release (excitation-release) the actuator brake. To operate the actuator manually at the time of start up, teaching or in abnormal condition, move the switch to the RLS side to release the brake forcibly. Unless otherwise necessary, the switch should be in the NOM side.

Switch Position		Function
RLS (Brake release)	Left side	The brake is forcibly released.
NOM (automatic mode)	Right side	The brake is automatically controlled by the controller. Servo ON: Brake released Servo OFF: Brake effective

Brake axes of some controllers for SCARA are not equipped with this switch.

21 System Operation Status LED Lamp 1

This LED lamp indicates the operating status of system operations (motion control master, SD card) and network interface 1.

22 System Operation Status LED Lamp 2

This LED lamp indicates the operating status of system operations (main CPU) and network interface 2.

23 System Operation Setting Switch

A 4-polar DIP switch to set up the system operation mode.

24 Conveyor Tracking Connector

A connector to connect an encoder for conveyor tracking. It is included as standard for the controller for SCARA.

25 Absolute Battery Unit

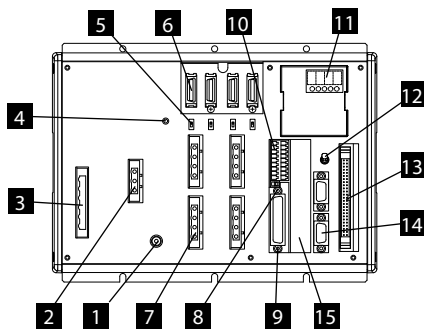
This unit comes with the absolute specification.

Controller

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Part Names

P/PCT (Standard 4-axis)



1 FG Connection Terminal

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

2 External Regeneration Unit Connector

A connector for the regenerative resistance unit that must be connected when the built-in regenerative resistance 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

200VAC 3-phase input connector. It consists of six terminals including motor power-supply, control power-supply and PE terminals. Standard equipment includes only a terminal block.

[NOTE] Due to risk of electrical shock, do not touch this connector while power is supplied.

4 Control Power Monitor LED

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

5 Enable/Disable Switch for Absolute Battery

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

6 Encoder/Axis Sensor Connector

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

7 Motor Connector

A connector for driving the motor in the actuator.

8 Teaching Pendant Type Selection Switch

This switch is for selecting the type of touch panel teaching pendant to connect to the teaching connector 9. Switch between an IAI standard touch panel teaching pendant and the ANSI compatible touch panel teaching pendant. Operate the switch on the front face of the board according to the touch panel teaching pendant used.

9 Teaching Connector

The teaching interface is used for connecting the IAI touch panel teaching pendant or the PC (PC dedicated teaching software) to operate and configure the system, etc.

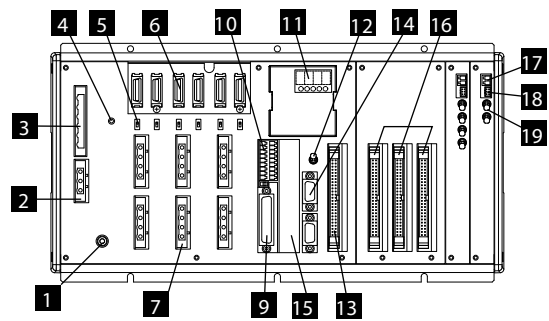
10 System I/O Connector

A connector for managing the safety operation functions of the controllers. Controllers of the global specification let you configure a safety circuit conforming to safety categories of up to 4 using this connector and an external safety circuit.

11 Panel Window

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

Q/QCT (Absolute brake unit +6-axis with extended base)



Description of five LEDs

Name	Status when LED is lit
RDY	CPU Ready (programs can be run)
ALM	CPU Power (system down level error) CPU hardware problem
EMG	Emergency stop status, CPU hardware problem, or power system hardware problem
PSE	Power system hardware problem
CLK	System lock problem

12 Mode switch

This is a locking toggle switch for designating the controller operating mode. Pull the switch forward to use. The top position indicates the MANU (manual operation) mode, while the bottom position indicates the AUTO (automatic operation) mode. Teaching can only be performed in manual operation. In addition, automatic operations using external I/Os are not possible in the MANU mode.

13 Standard I/O Connector

50-pin flat connectors structure, comprised of 32 input / 16 output DIOs.

Outline of Standard I/O Interface Specifications

Item	Details
Connector name	I/O
Applicable connector	50-pin, flat connector
Power supply	Power is supplied through connector pins No.1 and 50.
Input	32 points (including general-purpose and dedicated inputs)
Output	16 points (including general-purpose and dedicated inputs)
Connected to	External PLC, sensors, etc.

14 General-purpose RS232C Port Connector

This port is for connecting general-purpose RS232C equipment. (2 channels are available)

15 Field Network Board Slot

A slot that accepts a fieldbus interface module.

16 Expansion I/O Board (optional)

Slots that accept optional expansion I/O boards.

17 Auxiliary Power (Brake etc.) Input Connector

A power input connector for driving the actuator brake. DC 24V must be supplied externally. If this power supply is not provided, the actuator brake cannot be released. Be certain that power is supplied to the brake-equipped axis. Use a shielded cable for the brake power cable, and connect the shielding on the 24V power supply side.

18 Brake Release Switch Connector

A connector for the switch that releases the actuator brake externally to the controller. Shorting the COM terminal and BKMRL* terminal of this connector will release the brake. Use this method if you wish to manually operate the actuator after the controller has experienced a power failure or malfunction.

19 Brake Switch

Locking toggle switch for releasing the axis brake. Pull the switch forward to use. Setting it to the top position (RLS side) forcibly releases the brake, while setting it to the bottom position (NOM side) causes the controller to automatically control the brake.

Option Table for XSEL Controller

Item		Description	Expansion I/O Model (Note 1)	Model for option single unit
Touch panel teaching pendant		Standard type	—	TB-02-SCN
		Safety category compliant	—	TB-02D-SCN
PC dedicated teaching software		for DOS/V	—	IA-101-X-MW
		Safety category compliant	—	IA-101-XA-MW
		for USB port	—	IA-101-X-USBMW
Expansion I/O board	PIO board	Expansion PIO (Input 32/Output 16, NPN)	N1	IA-103-X-32
		Expansion PIO (Input 32/Output 16, PNP)	P1	IA-103-X-32-P
		Expansion PIO (Input 16/Output 32, NPN)	N2	IA-103-X-16
		Expansion PIO (Input 16/Output 32, PNP)	P2	IA-103-X-16-P
	Network board	DeviceNet (Input 256/Output 256)	DV	(Not available)
		CC-Link (Input 256/Output 256)	CC	(Not available)
		PROFIBUS-DP (Input 256/Output 256)	PR	(Not available)
		EtherNet/IP board EtherNet	—	(Not available)
	Multi-point I/O board	Multi-point I/O board (Input 48/Output 48, NPN)	N3	IA-IO-3204-NP
		Multi-point I/O board (Input 48/Output 48, PNP)	P3	IA-IO-3204-PN
Connecting unit for ROBO Cylinder gateway (Note 2)			—	RCB-CV-GW CB-RCB-SIO050 CB-RCB-CTL 002
Regenerative resistance unit			—	RESU-1
Absolute data backup battery			—	AB-5

(Note 1) Represents the symbol of the expansion I/O within the controller model.

(Note 2) Not necessary for XSEL-R/S/RX/SX/RXD/SXD.

Calculation of Wattage for Connectable Actuators with Single-Phase

For the LSA/LSAS (linear actuator) connecting to the single-phase specification, calculate the wattage based on the "Controller Wattage Calculation Output" in the table below. The total wattage of LSA/LSA actuators and other actuators should be 1600W or smaller. XSEL-RA/SA can be connected only with LSAS.

$1600W \geq \text{LSA/LSAS total wattage (Controller Wattage Calculation Output)} + \text{total wattage (motor } W \times \text{number of axes)}$ for actuators other than LSA/LSAS.

Table of Wattage Calculation for LSA/LSAS with single-phase specification

Actuator Model	Driver output (W)	Number of sliders (pc)	Controller Wattage Calculation Output (W)	Actuator Model	Driver output (W)	Number of sliders (pc)	Controller Wattage Calculation Output (W)
S6SS	100	1	300	H8SM/L15SM	200	2	1200
S6SM	100	2	600	H8HS	200	1	600
S8SS	100	1	300	H8HM	200	2	1200
S8SM	100	2	600	N15SS	200	1	600
S8HS	100	1	300	N15SM	200	2	1200
S8HM	100	2	600	N15HS	200	1	600
N10SS	100	1	300	N15HM	200	2	1200
N10SM	100	2	600	N19SS	300	1	600
S10SS	100	1	300	N19SM	300	2	1200
S10SM	100	2	1200	W21SS	400	1	800
S10HS	200	1	600	W21SM	400	2	1600
S10HM	200	2	1200	W21HS	1000	1	1500
H8SS/L15SS	200	1	600	W21HM (*)	1000	2	3000

(*) Not operable with single-phase specification.

Calculation of wattage when connecting RCS3-CT8C, CTZ5C to XSEL-RA/SA/P/Q.

When connecting RCS3-CT8C, CTZ5C to XSEL-P/Q, calculate the wattage by converting the wattage as follows.

The power supply voltage is limited to 3-phase, 200V.

RCS3-CT8C 400W → 800W RCS3-CTZ5C 60W → 120W

Calculation of Wattage when connecting direct drive motors

When connecting the DD/DDA motor Series, calculate the wattage based on the "Controller Wattage Calculation Output" table below. The number of actuators should be equal to or less than the maximum connectable number.

The total wattage of DD/DDA Series actuators and other actuators should be 1600W or smaller.

Table of Wattage Calculation for DD/DDA motors with single-phase specification

Actuator Model	Driver output (W)	DD/DDA motor Number of max. connectable motors	Controller Wattage Calculation Output (W)
LT18S/LT18CS	200	2	600
LH18S/LH18CS	600	1	1200

Table of Wattage Calculation for DD/DDA motors with 3-phase specification

Actuator Model	Driver output (W)	DD/DDA motor Number of max. connectable motors	Controller Wattage Calculation Output (W)
LT18S/LT18CS	200	8	200
LH18S/LH18CS	600	2	600

Options

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Regenerative Resistance Unit

Model RESU-1 (Standard specification)
RESUD-1 (DIN rail mount specification)

Details
This unit converts to heat the regenerative current produced when the motor decelerates. Although the controller has a built-in regenerative resistor, its capacity may not be enough if the axis is positioned vertically and the load is large. In such a case, one or more regenerative units will be required. (Refer to the table at right)

Specifications

Item	RESU-1	RESUD-1
Main unit mass	Approx. 0.4 kg	
Built-in regenerative resistor	235Ω 80W	
Unit mounting method	Screw mount	DIN rail mount
Accessory	CB-ST-REU010	

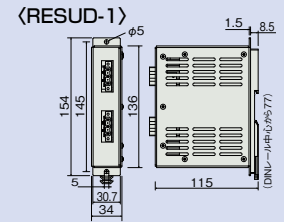
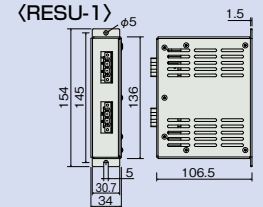
Installation standard Determined by the total motor capacity of the connected axes.

Horizontal use

Number of connecting units	P/Q/R/S Type
0	~100W
1	~600W
2	~1200W
3	~1800W
4	~2400W

Vertical use

Number of connecting units	P/Q/R/S Type
0	~100W
1	~600W
2	~1000W
3	~1400W
4	~2000W
5	~2400W



Absolute Data Backup Battery (for XSEL-P/Q/RA/SA)

Model AB-5
Features Absolute data backup battery for operating actuators with absolute specification.



Expansion PIO Board

Details An optional board for adding I/O (input/output) points. With the general-purpose and large-capacity types, up to 3 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.)

Field Network Connection Board

Model DV/CC/PR/EP/EC (* specified within the controller model)

Details When specifying a field network option at the controller I/O, a field network board is installed in the I/O slot.

<Table of applicable networks>

	DeviceNet	CC-Link	PROFIBUS-DP	EtherNet/IP	EtherCAT
XSEL-P/Q	●	●	●	● (Note 1)	×
XSEL-RA/SA	●	●	●	● (Note 1)	●

(Note) The number of input/output points is input 256 points / output 256 points per one board (only one board can be installed).
(Note 1) The EtherNet/IP specification can support the Ethernet (PCP/IP: message communications) by setting parameters.

Dummy Plug

Model DP-2

Features A dummy plug to be attached to the teaching connector when the touch panel teaching pendant is not connected.

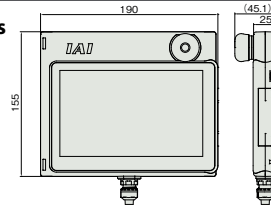
Options

Touch panel teaching pendant

Features A teaching device having functions of position inputs, trial operations, monitoring, etc.

Model TB-02-□

External dimensions



Specifications

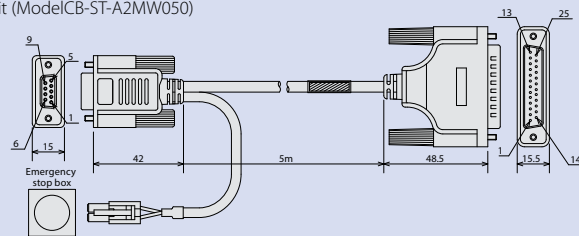
Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Operating ambient temperature	0~40°C
Operating ambient humidity	20 to 85%RH (non-condensing)
Protective class	IP20
Mass	470g (TB-02 single unit only)

PC dedicated teaching software (Windows only)

Model IA-101-X-MW

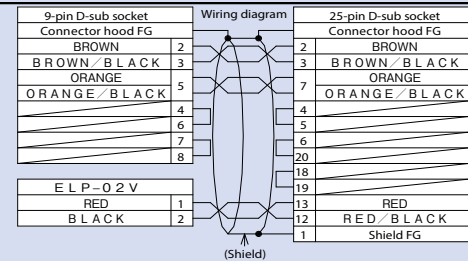
Features Startup support software for inputting programs/positions, performing test runs and monitoring. More functions are added for debugging, enabling the start-up time to shorten.

Details Software (CD-ROM), compatible Windows: XP SP2 or later/Vista 7/8
PC connecting cable 5m + emergency stop box (Model CB-ST-E1MW050-EB)
PC connecting cable single unit (Model CB-ST-A2MW050)



Note

- * Versions older than 3.0.0 cannot be used for the XSEL-P type.
- * Versions older than 2.0.0 cannot be used for the SCARA type.
- * Use IA-101-XA-MW if you use a safety category 4 compliant controller.
- * Cannot be used for the XSEL-Q/QX/S/SX/SXD types.
- * When you separately order a PC connecting cable for a maintenance purpose, beware that the cable single unit model is CB-ST-E1MW050, but when ordering it together with the emergency stop box, the model is CB-ST-E1MW050-EB.



Safety category 4 compliant PC dedicated software (for XSEL-Q/QX/SA/SAX)

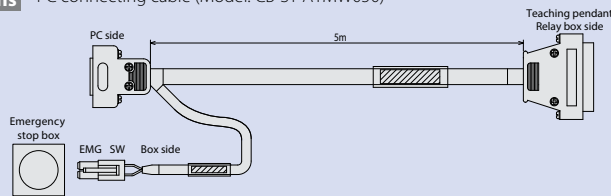
Model IA-101-XA-MW

* Exclusive use for XSEL-Q/QX/S/SX.
Cannot be used for other controllers.

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.
PC connecting cable is compatible to safety category 4 by duplicating the emergency stop circuits.

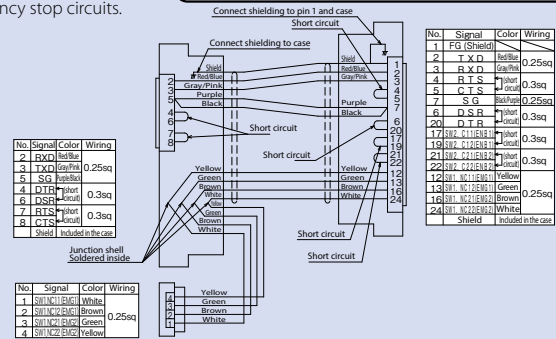
Details Software (CD-ROM)
(Accessories) Compatible Windows: 7/8/8.1/10
PC connecting cable 5m + emergency stop box (Model: CB-ST-A2MW050-EB)

Dimensions PC connecting cable (Model: CB-ST-A1MW050)



NOTE

When ordering a separate replacement PC cable the model number for the cable only is CB-ST-E1MW050, and for cable with the emergency stop box is CB-ST-E1MW050-EB.
If a teaching tool is not used, connect the dummy plug DP-2 (supplied with the controller, to the teaching connector.

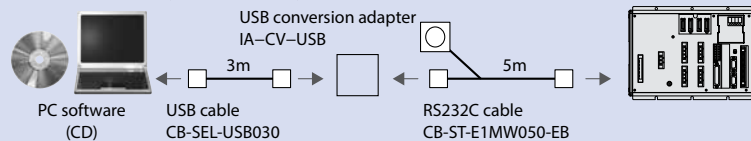


USB-compatible PC software

Model IA-101-X-USBMW

Features Software available by PC's USB port by connecting a USB conversion adapter to a RS232C cable.

Description Software (CD-ROM)
Compatible Windows: 7/8/8.1/10
PC connecting cable 5m + emergency stop box + USB conversion adapter + USB cable 3m



PC dedicated teaching software (for XSEL-RA/SA/RAX/SAX)

Model IA-101-N

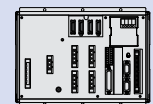
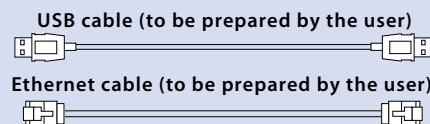
Features Contains only the PC dedicated teaching software (CD-ROM).
Order only the software when connecting both the controller and PC sides by USB cable or Ethernet cable. The cable that meets the following specifications is supplied by the customer.

Details Software (CD-ROM), compatible Windows: XP SP2 or later/Vista 7/8

NOTE

When operating an actuator by USB connection, make sure to attach a stop switch to the system I/O connector.
If an emergency switch cannot be prepared, use the "IA-101-X-USBMW" with an emergency stop.

	Controller side connector	Max. cable length
USB cable specification	USB Mini-B	5m
Ethernet cable specification	10/100/1000BASE-T (RJ-45)	5m



X-SEL



**SCARA Robot
Program Controller**



(*1) Not compliant when connected to NNN10040/12040.

List of Models

Multi-Axes program controller enabling SCARA robot operation. Allows simultaneous control of up to 8 axes.

Type name		RAX	RAXD8	SAX	SAXD8	PX	QX
Connectable axes	IX	One SCARA / Single-axis and Cartesian	For two SCARA robots	One SCARA / Single-axis and Cartesian	For two SCARA robots	One SCARA / Single-axis and Cartesian	For one SCARA robot / Single-axis and Cartesian robot
	IXA	One SCARA / Single-axis and Cartesian				—	—
External view							
Type		Standard specification		Safety category compliant		Standard specification	Safety category compliant
Max. number of controlled axes		8-axis				6-axis	
No. of positions		(4-axis specification) Maximum 36,666 positions (Varies depending on the number of axes. Refer to the specification table (P7-283) for details.)				20,000 positions	
Number of programs		255				128	
Number of program steps		20000				9999	
Total allowable wattage		Three-phase 2,400W				Three-phase 2,400W	
Motor input power supply voltage		Three-phase AC200V/230V ±10%				Three-phase AC200V/230V ±10%	
Control power supply voltage		Single phase AC200V/230V ±10%				Single phase AC200V/230 ±10%	
Safety category (*1)		B		Safety category 4 compatible		B	Safety category 4 compatible
Overseas standard		CE				CE	
ROBO Cylinder control function (*2)		Able to control up to 32 additional axes (only IAI controllers compatible with MECHATROLINK-III)				Able to control up to 16 additional axes	
Communication port	Ethernet	Equipped as standard: 10/100/1000BASE-T(RJ-45)				Option board compliant: 10/100BASE-T(RJ-45)	
	USB2.0	Equipped as standard: USB2.0(Mini-B)				—	
	General-purpose RS-232C communication port	1 channel (maximum 230.4kbps)				2 channel (maximum 115.2kbps)	

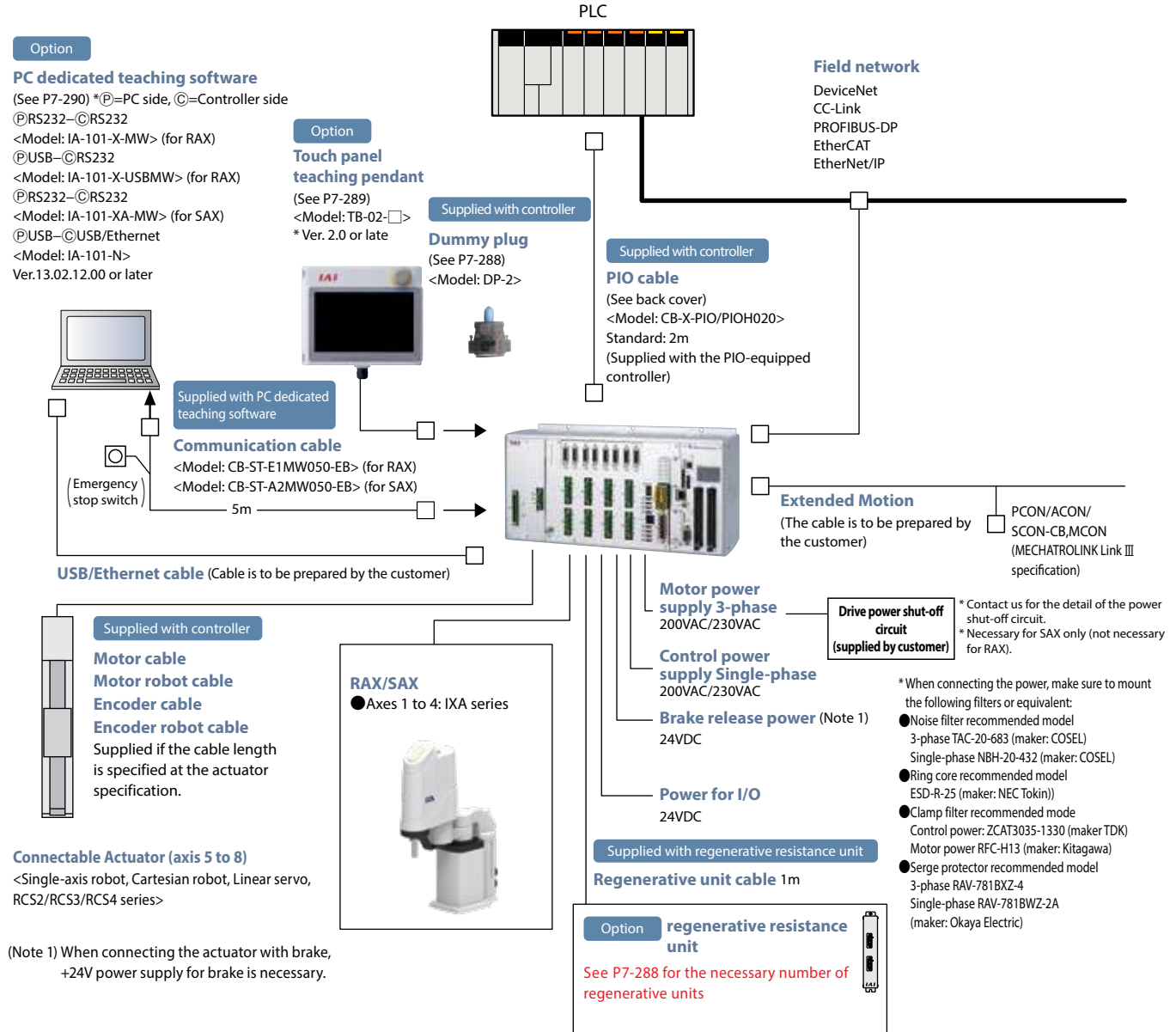
(*1) To comply with the safety category, the customer will need to install a safety circuit external to the controller.

(*2) Synchronous control is not available.

● For SCARA robot IXA

System configuration

■ XSEL-RAX/SAX types



● For SCARA robot IX

Model

[XSEL-RAX/SAX Type]

(Additional axis content 5th~8th axes)

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

Series Type SCARA Robot Main Body Type Motor Type Encoder Type Options Network Dedicated Slot(s) (Slot 1) (Slot 2) I/O Slot(s) (Slot 1) (Slot 2) I/O Cable Length Power Supply Voltage

RAX4	SCARA 1 unit									
RAX5	SCARA +1-axis									
RAX6	SCARA +2-axes									
RAX7	SCARA +3-axes									
RAX8	SCARA +4-axes									
SAX4	SCARA 1-unit Safety category compliant									
SAX5	SCARA +1-axis Safety category compliant									
SAX6	SCARA +2-axes Safety category compliant									
SAX7	SCARA +3-axes Safety category compliant									
SAX8	SCARA +4-axes Safety category compliant									

* Only SAX4 can select NNN10040/12040.

WAI	Battery-less absolute incremental
A	Absolute
G	Quasi absolute
AI	Index absolute
AM	Absolute multi-rotation

B	Brake equipped specification
C	Creep sensor specification
HA	HI-accel./decel. specification
L	Home sensor/LS compatible
M	Master axis specified
S	Slave axis specified

E	Not used
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP

E	Not used
EP	EtherNet/IP
EC	EtherCAT

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)

(* Selectable boards are fixed for the network dedicated slot.
 (* The network dedicated slot and I/O slot can be used together.)

12	12Wr	150	150W
20	20W	200	200W
30D	30W for DS	200S	200W for linear
30R	30W for RS	300	300W
60	60W	400	400W
100	100W	600	600W
100S	100W for linear	750	750W

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

3	3-phase 200V
---	--------------

NNN1205~8040H	Standard type	TNN3015H~3515H	Wall-mounting type
NNN10040~12040	Standard type	UNN3015H~3515H	Wall-mounting inverse type
NNN1205B~1805B	Standard ultra-compact type with brake	HNN5020H~8040H	Ceiling-mounting type
NSNS016H~6016H	High-speed type	INN5020H~8040H	Inverse type
NNC1205~8040H	Clean room type		
NNC1205B~1805B	Clean room ultra-compact type with brake		
NNW2515H~8040H	Splash-proof type		

Note: When the brake option is selected with IX-NNN or NNC 1205/1505/1805, be sure to specify the model number of the IX type with the brake option (1205B/1505B/1805B).

(Example) 12:12W Servo motor type

Note

Basically, the type of motor is the same as that of the electric actuator to be connected. However, in some models the controller and actuator motor types do not match. Applicable models are listed below for selection.

<30D / 30R / 200S Target Actuators>

- Controller motor type [30D]: 30W actuator other than RS
- Controller motor type [30R]: RS
- Controller motor type [200S]: DD-LT18□, DD-T18□, DDRC-LT18□, DDRC-T18□

* Note for selecting single-axis robots

Conditions of the connectable single-axis robot vary depending on the type of the SCARA robot operated.

For details, refer to the "unconnectable actuator" on 7-286.

[XSEL-RAXD8/SAXD8 Type]

XSEL - [] - [] - [] - [] [] [] - [] [] - [] [] - [] [] - [] []

Series Type SCARA Robot Main Body Type 1 SCARA Robot Main Body Type 2 Network Dedicated Slot(s) (Slot 1) (Slot 2) I/O Slot(s) (Slot 1) (Slot 2) I/O Cable Length Power Supply Voltage

RAXD8	SCARA 2-unit specification								
SAXD8	SCARA 2-unit Safety category compliant type								

E	Not used
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP

E	Not used
EP	EtherNet/IP
EC	EtherCAT

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)

(* Selectable boards are fixed for the network dedicated slot.
 (* The network dedicated slot and I/O slot can be used together.)

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

3	3-phase 200V
---	--------------

NNN1205~6030H	Standard type		
NNN1205B~1805B	Standard ultra-compact type with brake		
NNC1205~6030H	Clean room type		
NNC1205B~1805B	Clean room ultra-compact type with brake		
NNW2515H~6030H	Splash-proof type		
TNN3015H~3515H	Wall-mounting type		
UNN3015H~3515H	Wall-mounting inverse type		
HNN5020H~6020H	Ceiling-mounting type		
INN5020H~6020H	Inverse type		

Note: When the brake option is selected with IX-NNN or NNC 1205/1505/1805, be sure to specify the model number of the IX type with the brake option (1205B/1505B/1805B).

* Note for selecting SCARA robots

Depending on the first SCARA robot connected, the connectable second SCARA robot is limited.

Please refer to "Non-connectable Actuators" on P7-280.

● For SCARA robot IX

Non-connectable actuators

For XSEL-PX/QX (5 and 6 axes)

Linear servo actuator (other than LSAS series), RCS2-□□5N (incremental specification), RCS2-SRA7BD/SRGS7BD/ SRGD7BD, NS-SXM□/SZM□ (both incremental specification only)

For XSEL-RAX/SAX (5 to 8 axes)

Linear servo actuator (other than LSAS series), RCS2-□□5N (incremental specification), RCS2-SRA7BD/SRGS7BD/ SRGD7BD, NS-SXM□/SZM□ (both incremental specification only), RCS2-RA13R (with load cell), RCS3-RA□R

Limitations on additional axis connection

■ **Limitations on additional axis actuator when connecting XSEL-RAX/SAX**

For SCARA controllers, there is a limit to the total motor wattage of the additional axis actuator motors that can be connected to besides SCARA robots. Make sure that it does not exceed the "total wattage and max. number of connectable axes" specified in the table below.

SCARA type		Total wattage and max. number of connectable axes
		3-phase specification
Mini type	NN*1205 / NN*1505 / NN*1805	1500W 4 axes (max. 750W/axis)
Small high-speed type	NN*2515H / TNN3015H / UNN3015H NN*3515H / TNN3515H / UNN3515H	1500W 4 axes (max. 750W/axis)
Medium high-speed type	NN*50□□H / HNN5020H / INN5020H NN*60□□H / HNN6020H / INN6020H	600W 4 axes (max. 600W/axis)
Large high-speed type	NN*70□□H / HNN70□□H / INN70□□H NN*80□□H / HNN80□□H / INN80□□H	Cannot be connected
High-speed type	NSN5016H / NSN6016H	Cannot be connected

■ **Limitations on connectable SCARA robots when connecting XSEL-RAXD/SAXD**

Controllers for SCARA can connect max. two SCARA robots, but there is a limitation for the combination. Please select a connectable combination.

SCARA robot models for 2 robot combinations			
1st robot		2nd robot	
Ultra-compact type	NN*1205 / NN*1505 / NN*1805	Ultra-compact type	Medium high-speed type
Mini high-speed type	NN*2515H / NN*3515H TNN3015H / UNN3015H TNN3515H / UNN3515H		Mini high-speed type
Medium high-speed type	NN*50□□H / NN*60□□H HNN5020H / INN5020H HNN6020H / INN6020H		
Large high-speed type	NN*70□□H / NN*80□□H HNN70□□H / INN70□□H HNN80□□H / INN80□□H	Cannot be connected	
High-speed type	NSN5016H / NSN6016H	Cannot be connected	

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

● For SCARA robot IX

System Configuration

■ XSEL-RAX/RAXD/SAX/SAXD Type

Option

PC dedicated teaching software

(See P7-289) *Ⓟ=PC side, Ⓞ=Controller side
 ⓅRS232-ⓄRS232
 <Model: IA-101-X-MW> (for RAX/RAXD)
 ⓅUSB-ⓄRS232
 <Model: IA-101-X-USBMW> (for RAX/RAXD)
 ⓅRS232-ⓄRS232
 <Model: IA-101-XA-MW> (for SAX/SAXD)
 ⓅUSB-ⓄUSB/Ethernet
 <Model: IA-101-N>
 Ver.13.00.00.00 or later

Option

Touch panel teaching pendant

(See P7-289)
 <Model: TB-02-□>
 * Ver. 1.30 or later

Supplied with controller

Dummy plug
 (See P7-288)
 <Model: DP-2>

PLC

Field network

DeviceNet
 CC-Link
 PROFIBUS-DP
 EtherCAT
 EtherNet/IP

Ethernet/IP specification can support Ethernet.

Supplied with controller

PIO cable
 (See P7-295)
 <Model: CB-X-PIO/PIOH020>
 Standard: 2m
 (Supplied with the PIO-equipped controller)

Supplied with PC dedicated teaching software

Communication cable
 <Model: CB-ST-E1MW050-EB> (for RAX/RAXD)
 <Model: CB-ST-A2MW050-EB> (for SAX/SAXD)
 5m

USB/Ethernet cable (Cable is to be prepared by the customer)

Expanded motion control

(Cable is to be prepared by the customer)
 PCON/ACON/
 SCON-CB,MCON
 (MECHATROLINK III specification)

Included with the actuator

RAX/SAX
Motor cable
Motor robot cable
Encoder cable
Encoder robot cable
 These items will be provided if the cable length is specified in the actuator model number. (See P7-291 to 7-295)

RAX/SAX
 ● 1st~4th axes:
 IX Series
RAXD/SAXD
 ● 1st~8th axes:
 IX Series (2 units)

Note
 The motor cable and encoder cable of the SCARA robot depends on the type of SCARA. Please see the SCARA robot specification for more information.

Connectable actuators (5th~8th axes)

<Single-axis Robot, Cartesian Robot, Linear Servo, RCS2/RCS3 Series>

(Note 1) When connecting an actuator with brake, the brake power supply +24V is required.

Motor power 3-phase
 200VAC/230VAC

Control power supply Single-phase
 200VAC/230VAC

Power supply for (Note 1)
brake release
 24VDC

I/O power supply
 24VDC

Supplied with regenerative resistance unit

Regenerative resistance unit cable 1m

Option **Regenerative resistance unit**

Please refer to P7-288 for the necessary number of regenerative resistance units..

Drive-source cutoff circuit
 (To be prepared by the customer)

* Please contact IAI for more information regarding the drive-source cutoff circuit.
 * Required for SAX/SAXD type only (Not required for RAX/RAXD type)

* When connecting a power supply, be sure to install the following filters or equivalent.

- Recommended noise filters
 Three-phase: TAC-20-683 (COSEL)
 Single phase: NBH-20-432 (COSEL)
- Recommended ring core
 ESD-R-25 (NEC TOKIN)
- Recommended clamp filters
 For control power supply: ZCAT3035-1330 (TDK)
 For motor power supply: RFC-H13 (Kitagawa Industries)
- Recommended surge protectors
 Three-phase: R/A/V-781BXZ-4
 Single phase: R/A/V-781BWZ-2A (Okaya Electric Industries)

Controller

EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

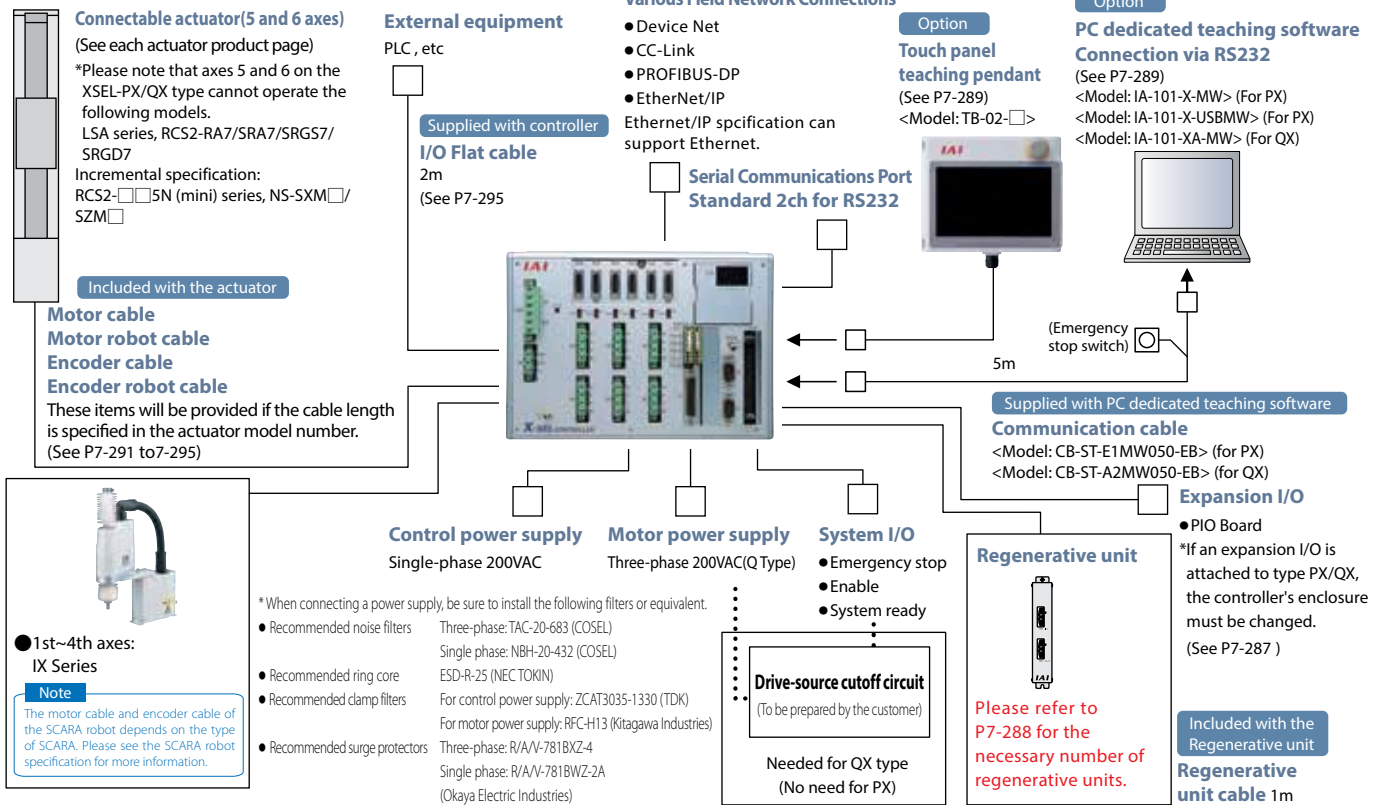
(SCARA)

PSA-24

TB-02

TB-03

XSEL-PX/QX Type



Controller

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)**
- PSA-24
- TB-02
- TB-03

Specifications Table

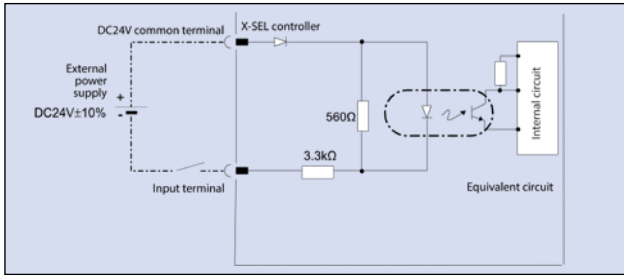
Controller type	RAX/RAXD type	SAX/SAXD type	PX type	QX type
Compatible motor output	12W~750W			
Number of controlled axes	connection with IXA	Axes 1-4: SCARA robot, Axes 5-8: Additional axes		—
	connection with IX	Axes 1-4: SCARA robot, Axes 5-8: SCARA robot or additional axes		Axes 1-4: SCARA robot, Axes 5-6: additional axes
Max. output of connected axes	[Three-phase] Up to 2400W			
Control power supply input	Single-phase 200VAC/230V ±10%			
Power frequency	50/60Hz			
Insulation resistance	10MΩ or more (Between the power supply terminal and I/O terminal, and between the external terminal batch and case, at 500VDC)			
Withstand voltage	1500 VAC (1 min)			
Power capacity (max)	5094VA (at max. output of connected axes)		6962.1VA	
Position detection method	Incremental, absolute, battery-less absolute		Incremental, absolute, Serial encoder quasi absolute, battery-less absolute	
Safety circuit configuration	Redundancy not possible	Redundancy possible	Redundancy not possible	Redundancy possible
Drive-source cutoff method	Internal relay cut-off	External safety circuit	Internal relay cut-off	External safety circuit
Emergency stop input	B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)	B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)
Enable input	B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)	B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)
Speed setting	1mm/s~ Upper limit depends on the actuator specification			
Acceleration/deceleration setting	0.01G~ Upper limit depends on the actuator specification			
Programming language	Super SEL language			
Number of programs	255 programs		128 programs	
Number of program steps	20,000 steps (total)		9,999 steps (total)	
No. of multi-tasking programs	16 programs			
Number of positions	Varies by the number of controlled axes 4-axis: 36,666, 5-axis: 33,000, 6-axis: 30,000, 7-axis: 27,500, 8-axis: 25,384		20,000	
Data recording element	Flash ROM + non-volatile RAM (FRAM): system battery (button battery) not required		Flash ROM+SRAM battery backup	
Data input method	By touch panel teaching pendant or PC dedicated teaching software			
Standard I/O	I/O 48-point PIO board (NPN/PNP), I/O 96-point PIO board (NPN/PNP) 2 boards attachable		I/O 48-point, I/O 96-point max.1 board attachable	
Expansion I/O	None		I/O 48-point, I/O 96-point max. 3 boards attachable	
Serial communication function	Teaching port (D-sub25 pin), USB port (Mini-B) 1ch RS232C port (D-sub 9 pin), Ethernet (RJ-45)		Teaching port (D-sub25 pin)	
RC gateway function	None		With RS232C	
Fieldbus communication function	DeviceNet, CC-Link, PROFIBUS-DP, EtherNet/IP, EtherCAT (EtherNet/IP, EtherCAT and DeviceNet, CC-Link, and PROFIBUS-DP can be installed at the same time)		DeviceNet, CC-Link, PROFIBUS, EtherNet/IP, Ethernet	
Clock function	Retention time: about 10 days Charging time: about 100 hours		None	
Regenerative resistor	Built-in 1kΩ/20W regenerative resistor (Can be expanded by external regenerative resistance unit connection)		Built-in 1kΩ/20W regenerative resistor (Can connect external regenerative resistance unit connection)	
Absolute battery	AB-5 (built-in controller) * When additional axes are absolute specification / multi-rotation absolute specification.			
Protection function	Motor overcurrent, overload, motor driver temperature check, overload check, encoder disconnection detection, soft limit over, system malfunction, absolute battery error, etc.			
Ambient operating temperature, humidity and ambience	0 ~ 40°C, 85% RH or less (non-condensing), avoid corrosive gas and excessive dust			

* For the power supply capacity etc., please refer to the operation manual or contact IAI.

I/O Wiring Diagram

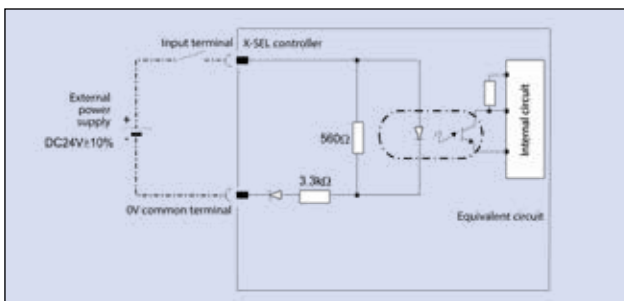
Input External input specification (NPN specification)

Item	Specification
Input voltage	24VDC ± 10%
Input current	7mA, 1 circuit
ON/OFF voltage	ON voltage: min. 16.0VDC; OFF voltage: max. 5.0VDC
Isolation method	Photocoupler isolation



Input External input specification (PNP specification)

Item	Specification
Input voltage	24VDC ± 10%
Input current	7mA, 1 circuit
ON/OFF voltage	ON voltage: min. 8VDC; OFF voltage: max. 19VDC
Isolation method	Photocoupler isolation

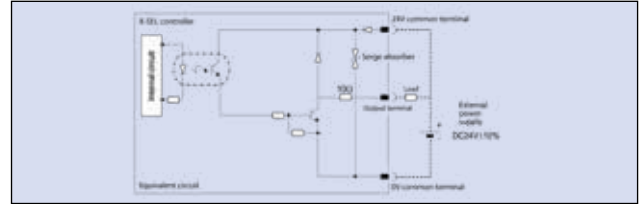


Output External input specification (NPN specification)

Item	Specification
Load voltage	24VDC
Maximum load current	100mA/1 port 400mA/8 ports. (Note)
Leakage current	Max. 0.1mA/1 contact
Isolation method	Photocoupler isolation

TD62084 (equivalent) used

Note: The maximum total load current is 400mA for every 8 ports starting from output port No. 300. (The total current between the output port No. 300 + n to No. 300 + n + 7 is 400mA maximum, where n=0 or a multiple of 8.)

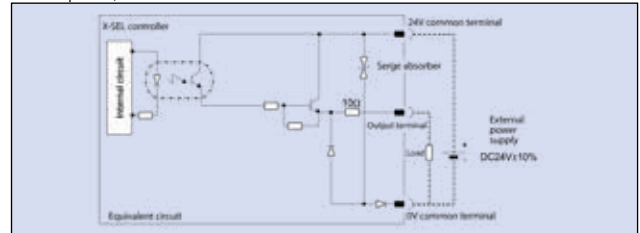


Output External input specification (PNP specification)

Item	Specification
Load voltage	24VDC
Maximum load current	100mA/1 port 400mA/8 ports. (Note)
Leakage current	Max. 0.1mA/1 contact
Isolation method	Photocoupler isolation

TD62784 (equivalent) used

Note: The maximum total load current is 400mA for every 8 ports starting from output port No. 300. (The total current between the output port No. 300 + n to No. 300 + n + 7 is 400mA maximum, where n=0 or a multiple of 8.)



I/O Signal Table

Standard I/O signal table (When N1 or P1 is selected)

Pin No.	Category	Port No.	Standard setting
1			24V connection
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 No. (PRG №1)
10		008	Program No. (PRG №2)
11		009	Program No. (PRG №4)
12		010	Program No. (PRG №8)
13		011	Program No. (PRG №10)
14		012	Program No. (PRG №20)
15		013	Program No. (PRG №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		—	0V connection

Expanded I/O signal table (When N1 or P1 is selected)

Pin No.	Category	Standard setting
1		24V connection
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		0V connection

Expanded I/O signal table (When N2 or P2 is selected)

Pin No.	Category	Standard setting
1		24V connection
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		0V connection

Controller

EC

RCP6S

RCON

MCON -C/LC

PCON -CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Controller

EC

RCP6S

RCON

MCON
-C/LC

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-LC

SCON
-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Standard multi-point I/O signal table (When N3 or P3 is selected)

Pin No.	Category	Port No.	Standard setting
1	-	-	External power supply (24VDC) for the pin No. 2~25, 51~74
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 No. (PRG No 1)
10	-	008	Program No. (PRG No 2)
11	-	009	Program No. (PRG No 4)
12	-	010	Program No. (PRG No 8)
13	-	011	Program No. (PRG No 10)
14	-	012	Program No. (PRG No 20)
15	-	013	Program No. (PRG No 40)
16	-	014	General-purpose input
17	-	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	-	-	External power supply (24VDC) for the pin No. 27~50/76~99
27	-	024	General-purpose input
28	-	025	General-purpose input
29	-	026	General-purpose input
30	-	027	General-purpose input
31	-	028	General-purpose input
32	-	029	General-purpose input
33	-	030	General-purpose input
34	-	031	General-purpose input
35	-	032	General-purpose input
36	-	033	General-purpose input
37	-	034	General-purpose input
38	-	035	General-purpose input
39	-	036	General-purpose input
40	-	037	General-purpose input
41	-	038	General-purpose input
42	-	039	General-purpose input
43	-	040	General-purpose input
44	-	041	General-purpose input
45	-	042	General-purpose input
46	-	043	General-purpose input
47	-	044	General-purpose input
48	-	045	General-purpose input
49	-	046	General-purpose input
50	-	047	General-purpose input
51	-	300	Alarm output
52	-	301	Ready output
53	-	302	Emergency stop output
54	-	303	General-purpose output
55	-	304	General-purpose output
56	-	305	General-purpose output
57	-	306	General-purpose output
58	-	307	General-purpose output
59	-	308	General-purpose output
60	-	309	General-purpose output
61	-	310	General-purpose output
62	-	311	General-purpose output
63	-	312	General-purpose output
64	-	313	General-purpose output
65	-	314	General-purpose output
66	-	315	General-purpose output
67	-	316	General-purpose output
68	-	317	General-purpose output
69	-	318	General-purpose output
70	-	319	General-purpose output
71	-	320	General-purpose output
72	-	321	General-purpose output
73	-	322	General-purpose output
74	-	323	General-purpose output
75	-	-	External power supply (0V) for the pin No. 2~25, 51~74
76	-	324	General-purpose output
77	-	325	General-purpose output
78	-	326	General-purpose output
79	-	327	General-purpose output
80	-	328	General-purpose output
81	-	329	General-purpose output
82	-	330	General-purpose output
83	-	331	General-purpose output
84	-	332	General-purpose output
85	-	333	General-purpose output
86	-	334	General-purpose output
87	-	335	General-purpose output
88	-	336	General-purpose output
89	-	337	General-purpose output
90	-	338	General-purpose output
91	-	339	General-purpose output
92	-	340	General-purpose output
93	-	341	General-purpose output
94	-	342	General-purpose output
95	-	343	General-purpose output
96	-	344	General-purpose output
97	-	345	General-purpose output
98	-	346	General-purpose output
99	-	347	General-purpose output
100	-	-	External power supply (0V) for the pin No. 27~50, 76~99

Expanded multi-point I/O signal table (When N3 or P3 is selected)

Pin No.	Category	Port No.	Standard setting
1	-	-	External power supply (24VDC) for the pin No. 2~25, 51~74
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	-	-	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	-	-	External power supply (24VDC) for the pin No. 27~50/76~99
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 input
35	-	-	General-purpose input
36	-	-	General-purpose input
37	-	-	General-purpose input
38	-	-	General-purpose input
39	-	-	General-purpose input
40	-	-	General-purpose input
41	-	-	General-purpose input
42	-	-	General-purpose input
43	-	-	General-purpose input
44	-	-	General-purpose input
45	-	-	General-purpose input
46	-	-	General-purpose input
47	-	-	General-purpose input
48	-	-	General-purpose input
49	-	-	General-purpose input
50	-	-	General-purpose input
51	-	-	General-purpose output
52	-	-	General-purpose output
53	-	-	General-purpose output
54	-	-	General-purpose output
55	-	-	General-purpose output
56	-	-	General-purpose output
57	-	-	General-purpose output
58	-	-	General-purpose output
59	-	-	General-purpose output
60	-	-	General-purpose output
61	-	-	General-purpose output
62	-	-	General-purpose output
63	-	-	General-purpose output
64	-	-	General-purpose output
65	-	-	General-purpose output
66	-	-	General-purpose output
67	-	-	General-purpose output
68	-	-	General-purpose output
69	-	-	General-purpose output
70	-	-	General-purpose output
71	-	-	General-purpose output
72	-	-	General-purpose output
73	-	-	General-purpose output
74	-	-	General-purpose output
75	-	-	External power supply (0V) for the pin No. 2~25, 51~74
76	-	-	General-purpose output
77	-	-	General-purpose output
78	-	-	General-purpose output
79	-	-	General-purpose output
80	-	-	General-purpose output
81	-	-	General-purpose output
82	-	-	General-purpose output
83	-	-	General-purpose output
84	-	-	General-purpose output
85	-	-	General-purpose output
86	-	-	General-purpose output
87	-	-	General-purpose output
88	-	-	General-purpose output
89	-	-	General-purpose output
90	-	-	General-purpose output
91	-	-	General-purpose output
92	-	-	General-purpose output
93	-	-	General-purpose output
94	-	-	General-purpose output
95	-	-	General-purpose output
96	-	-	General-purpose output
97	-	-	General-purpose output
98	-	-	General-purpose output
99	-	-	General-purpose output
100	-	-	External power supply (0V) for the pin No. 27~50, 76~99

External Dimensions

XSEL-RAX/RAXD/SAX/SAXD

Controller Specification		Front View		Side View
		Without absolute battery unit	With absolute battery unit	
RAX RAXD	Three-phase specification	4-axis specification 		
		5~8-axis specification 		
SAX SAXD	Three-phase specification	4-axis specification 		
		5~8-axis specification 		

* If absolute specification is included for more than 1 connected single actuator, the external dimensions will be that of the absolute specification.
 When only a SCARA robot is connected, the external dimensions are that of the no-absolute battery unit type, because the SCARA robot is equipped with a battery.
 For the large type SCARAs (arm length 700/800) and high speed types, the controller size is the same as the 8-axis specification.

Controller

EC

RCP6S

RCON

MCON

PCON

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON

SCON-CB

SCON-LC

SCON-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL (SCARA)

PSA-24

TB-02

TB-03

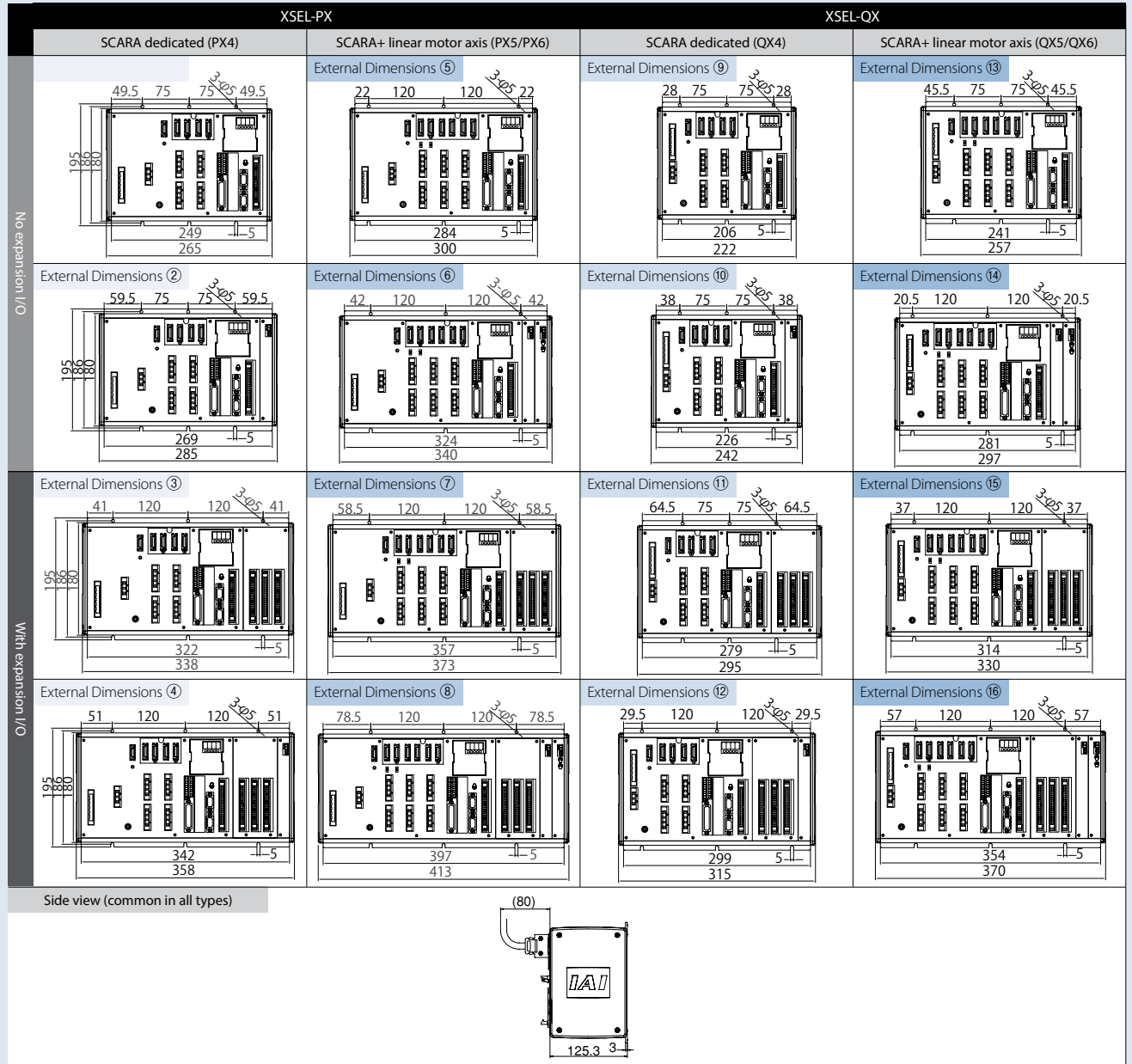
External Dimensions

■ PX type/QX (safety category specification) type

The X-SEL PX/QX types have different dimensions in accordance with type of connecting SCARA (arm length), number of axes ,with/without I/O expansion and type of linear motor axis. Please select the controller number from the table below and see the drawing of the same number.

SCARA main body		Controller							
Type	Arm length	Large capacity type (PX)				Large capacity safety category compliant type(QX)			
		SCARA dedicated (PX4)		SCARA+ linear motor axis (PX5/PX6)		SCARA dedicated (QX4)		SCARA+ linear motor axis (QX5/QX6)	
		No expansion I/O	With expansion I/O	No expansion I/O	With expansion I/O	No expansion I/O	With expansion I/O	No expansion I/O	With expansion I/O
Standard type	120~180	External Dimensions ① ^{(*)1}	External Dimensions ③ ^{(*)2}	External Dimensions ⑤ ^{(*)3}	External Dimensions ⑦ ^{(*)4}	External Dimensions ⑨	External Dimensions ⑪	External Dimensions ⑬ ^{(*)5}	External Dimensions ⑮ ^{(*)6}
Clean type		External Dimensions ②	External Dimensions ④	External Dimensions ⑥	External Dimensions ⑧	External Dimensions ⑩	External Dimensions ⑫	External Dimensions ⑭	External Dimensions ⑯
Wall-mounting type	250~600	External Dimensions ②	External Dimensions ④	External Dimensions ⑥	External Dimensions ⑧	External Dimensions ⑩	External Dimensions ⑫	External Dimensions ⑭	External Dimensions ⑯
Ceiling-mounting type	700~800	External Dimensions ⑥ ^{(*)7}	External Dimensions ⑧ ^{(*)7}	—	—	External Dimensions ⑭ ^{(*)7}	External Dimensions ⑯ ^{(*)7}	—	—
High-speed type	500~600	External Dimensions ⑥ ^{(*)7}	External Dimensions ⑧ ^{(*)7}	—	—	External Dimensions ⑭ ^{(*)7}	External Dimensions ⑯ ^{(*)7}	—	—

(*)1 For brake equipped specification, please select external dimension ② .
 (*)2 For brake equipped specification, please select external dimension ④ .
 (*)3 When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑥ .
 (*)4 When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑧ .
 (*)5 When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑩ .
 (*)6 When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑫ .
 (*)7 Please select 6-axis specification for 4-axis specification because motor wattage of SCARA robot is high.



*The controller height is universal for all types.

Option

Regenerative resistance unit

Model RESU-1 (Standard specification)
RESUD-1 (DIN rail mounting specification)

Description
Unit that converts the regenerative current generated during motor deceleration to heat. Although the controller is equipped with a regenerative resistor inside, an additional external regenerative resistance unit may be necessary if the load in the vertical axis is large and the capacity is insufficient.

Specification

Model	RESU-1	RESUD-1
Unit weight	About 0.4kg	
Built-in regenerative resistance value	235Ω 80W	
Unit mounting method	Screw mount	DIN rail mount
Attached cable	CB-ST-REU010	

<When connecting a single axis robot>

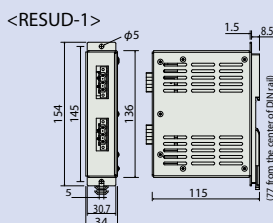
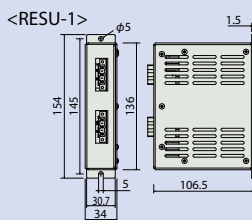
Installation criteria Determined by the total motor wattage of connected axes.

Horizontal specification

Total motor wattage	Required number of regenerative resistors
~100W	0
~600W	1
~1200W	2
~1800W	3
~2400W	4

Vertical specification

Total motor wattage	Required number of regenerative resistors
~100W	0
~600W	1
~1000W	2
~1400W	3
~2000W	4
~2400W	5



<When connecting a SCARA robot>

Installation criteria

Connection with IXA

Model	Number of necessary regenerative units
NNN 3015	2
45 □ □	
60 □ □	
NSN 3015	3
45 □ □	
60 □ □	

Connection with IX

Model number	Required number of regenerative resistors	
NNN 1205	0	
1505		
1805		
NNN 2515H	1	
TNN 3015H		
UNN 3515H		
HNN 50**H	3	
INN 60**H		
NNC 70**H		
NSN	80**H	4
	10040	
	12040	
	5016H	
6016H	3	

*The required number is for a single SCARA robot. When connecting a single axis robot as an additional axis, be sure to add regenerative resistors for the single axis robot.

Examples: When operating IX-NNN2515H and ISA-MXM (200W).
IXA-3NNN3015: 2 required
ISB-MXM (200W): 1 required
Therefore, 2 regenerative resistance units are required.

Absolute data backup battery

Model AB-5
Features Absolute data storage battery for operating an actuator of the absolute specification.



Dummy plug

Model DP-2
Features A dummy plug to be attached to the teaching connector when PC-dedicated teaching software or the touch panel teaching pendant is not connected.



Connecting board for field network

Model DV/CC/PR/EP/EC (* Specify from controller models)

Description When selecting a field network option as the I/O type for the controller, the correct board for the field network will be installed in the I/O slot.

<Network table>

	DeviceNet	CC-Link	PROFIBUS-DP	EtherNet/IP	EtherCAT
XSEL-PX/QX	●	●	●	● (Note1)	×
XSEL-RX/SX	●	●	●	● (Note1)	●

Note1 EtherNet/IP specification can support EtherNet (TCP/IP:message communication) by setting parameter.

- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

Option

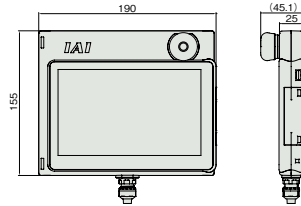
Touch Panel Teaching Pendant

Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring

Model **TB-02** □

Standard price → See P7-301

External dimensions



Specification

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	20~85% RH (non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

PC dedicated teaching software (for XSEL-RA/RXA/RXAD/P/QX)

Model **IA-101-X-MW**

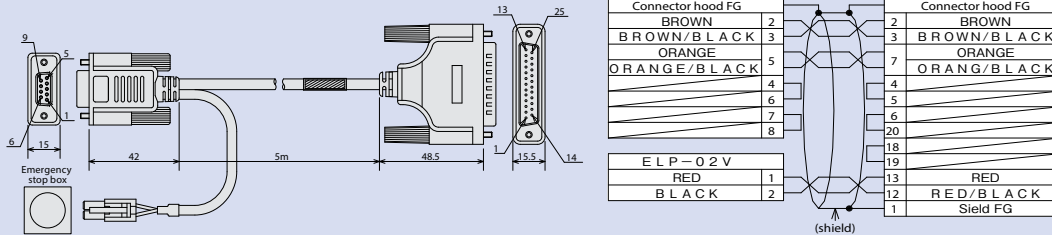
Features This is start-up support software which comes equipped with functions such as program/position input, trial operation and monitoring. The functions required for troubleshooting have been significantly improved to reduce the start-up time.

Description Software (CD-ROM), supported Windows: 7/8/8.1/10

(Accessories) 5m PC connection cable + emergency stop box (Model CB-ST-E1MW050-EB)

Notes

- * When using a Safety Category 4 compliant controller, please use IA-101-XA-MW.
- * Cannot be used for XSEL-SA/SAX/SAXD/Q/QX types.
- * When separately ordering a PC connection cable for maintenance, the model number will be CB-ST-E1MW050 for the cable only and CB-ST-E1MW050-EB when the emergency stop box is also ordered as a set.



Safety category 4 compliant PC dedicated software (for XSEL-SA/SAX/SAXD/Q/QX)

Model **IA-101-XA-MW** * Only for XSEL-SA/SAX/SAXD.

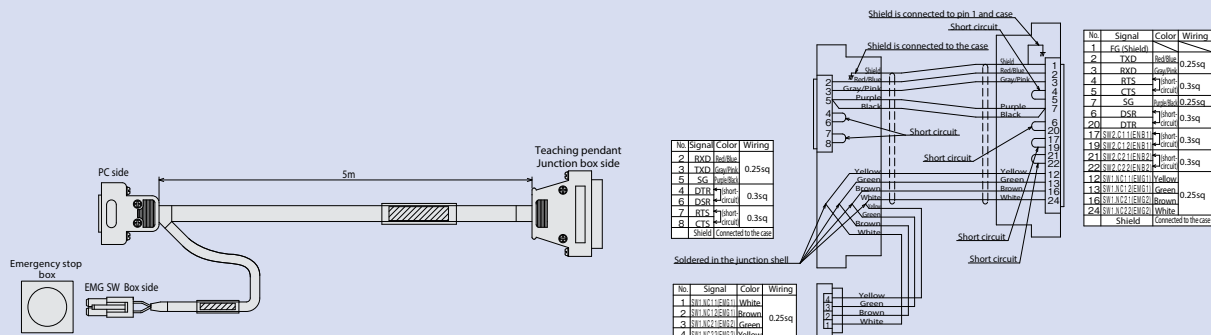
Features This is start-up support software which comes equipped with functions such as program/position input, trial operation and monitoring. The functions required for troubleshooting have been significantly improved to reduce the startup time. In addition, the PC connection cable has a duplex circuit for emergency stop to comply to the Safety Category 4.

Description Software (CD-ROM), supported Windows: 7/8/8.1/10

(Accessories) PC connection cable 5m + emergency stop box (Model CB-ST-A2MW050-EB)

Note

When separately ordering a PC connection cable for maintenance, the model number will be CB-ST-A1MW050 for the cable only and CB-ST-A1MW050-EB when the emergency stop box is also ordered as a set. If you do not use a teaching tool, connect the dummy plug DP-2 that comes with the controller to the teaching connector.



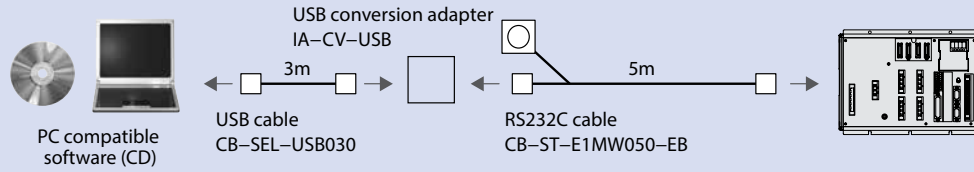
USB compatible PC dedicated teaching software (for XSEL-RA/RXA/RXAD/P/PX)

Model IA-101-X-USBMW

Features This software enables the USB port on a PC to connect with the controller via an RS232C cable with a USB conversion adaptor.

Details Software (CD-ROM), compatible Windows: 7/8/8.1/10

(Accessories) 5m PC connection cable + emergency stop box + USB adapter + USB cable 3m



PC dedicated teaching software (for XSEL-RA/SA/RAX/SAX/P/PX/Q/QX)

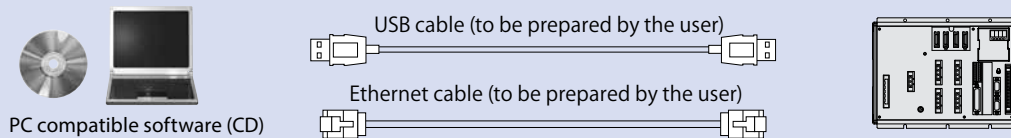
Model IA-101-N

Features It only comes with the PC compatible software (DVD-ROM). If you want to connect both the controller and PC sides with a USB cable or Ethernet cable, only the software needs to be purchased. A cable that meets the following specifications is to be prepared by the customer.

Note
When operating the actuator by USB connection, be sure to connect the stop switch to the system I/O connector. If an emergency switch is not available, use the emergency stop-equipped model "IA-101-X-USBMW".

Description Software (CD-ROM), compatible Windows: 7/8/8.1/10

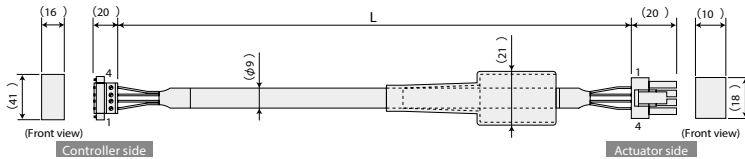
	Controller side connector	Maximum cable length
USB cable specification	USB Mini-B	5m
Ethernet cable specification	10/100/1000BASE-T(RJ-45)	5m



- EC
- RCP6S
- RCON
- MCON -C/LC
- PCON -CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON DCON
- SCON -CB
- SCON-CB (Servo press)
- SCON -LC
- SCON -CAL
- MSCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)**
- PSA-24
- TB-02
- TB-03

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

* Please indicate the cable length (L) in □□□□, maximum 30m, E.g.) 080 = 8m

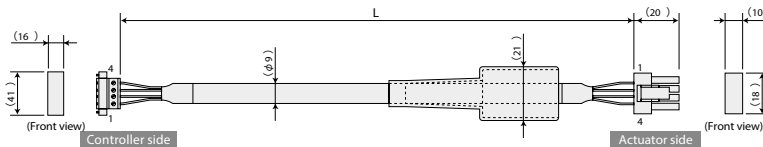


Wiring	Signal	No	No	Signal	Wiring
0.75 sq	PE	1	1	U	0.75sq (Crimped)
	U	2	2	V	
	V	3	3	W	
	W	4	4	PE	

Minimum bending radius $r = 50\text{mm}$ or more (Dynamic bending condition)
* Only the robot cable can be used inside the cable rack.

Model **CB-X-MA** □□□□

* Please indicate the cable length (L) in □□□□, maximum 30m, E.g.) 080 = 8m

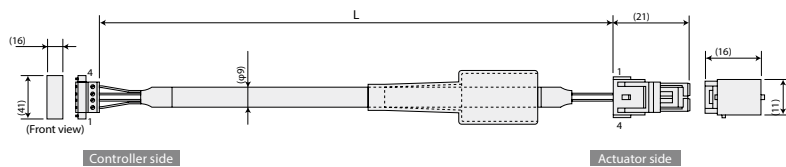


Wiring	Color	Signal	No	No	Signal	Color	Wiring
0.75 sq	Green	PE	1	1	U	Red	0.75sq (Crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

Model **CB-XMC-MA** □□□□

* Please indicate the cable length (L) in □□□□, maximum 30m, E.g.) 080 = 8m

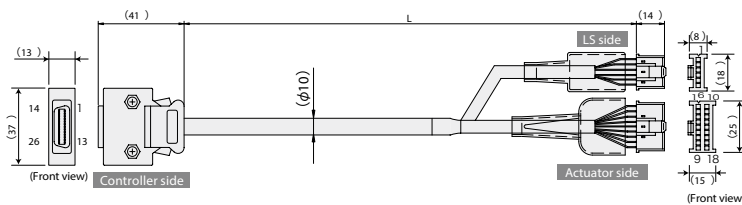


Wiring	Color	Signal	No	No	Signal	Color	Wiring
1.25sq	Green	PE	1	1	U	Red	1.25sq (Crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Minimum bending radius $r = 55\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

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

* Please indicate the cable length (L) in □□□□, maximum 30m, E.g.) 080 = 8m



Minimum bending radius $r = 50\text{mm}$ or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

[Encoder cable]

[Encoder cable] (Controller side)				[Encoder cable] (Actuator side)			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
—	—	—	10	1	E24V	Brown/White	Orange
—	—	—	11	2	OV	Gray/White	White/Green
Brown/White	White/Orange	E24V	12	3	LS	Red/White	Brown/Blue
Gray/White	White/Green	OV	13	4	CREEP	Black/White	Brown/Yellow
Red/White	Brown/Blue	LS	26	5	OT	Yellow/Black	Brown/Red
Black/White	Brown/Yellow	CREEP	25	6	RSV	Pink/Black	Brown/Black
Yellow/Black	Brown/Red	OT	24	—	—	—	—
Pink/Black	Brown/Black	RSV	23	—	—	—	—
—	—	—	9	—	—	—	—
—	—	—	18	—	—	—	—
—	—	—	19	—	—	—	—
Pink	White/Blue	A+	1	1	A+	Pink	White/Blue
Purple	White/Yellow	A-	2	2	A-	Purple	White/Yellow
White	White/Red	B+	3	3	B+	White	White/Red
Blue/Red	White/Black	B-	4	4	B-	Blue/Red	White/Black
Orange/White	White/Purple	Z+	5	5	Z+	Orange/White	White/Purple
Green/White	White/Gray	Z-	6	6	Z-	Green/White	White/Gray
Blue	Orange	SRD+	7	7	—	—	—
Orange	Green	SRD-	8	8	—	—	—
Black	Purple	BAT+	14	9	FG	Drain	Drain
Yellow	Gray	BAT-	15	10	SD	Blue	Orange
Green	Red	VCC	16	11	SD	Orange	Green
Brown	Black	GND	17	12	BAT+	Black	Purple
Gray	Blue	BKR-	20	13	BAT-	Gray	Gray
Red	Yellow	BKR+	21	14	VCC	Green	Red
—	—	—	22	15	GND	Brown	Black
—	—	—	—	16	—	—	—
—	—	—	—	17	BK-	Gray	Blue
—	—	—	—	18	BK+	Red	Yellow

Shield is clamp connected to the hood.
(White/blue cable colors indicate the band color/insulator color)

[Encoder robot cable]

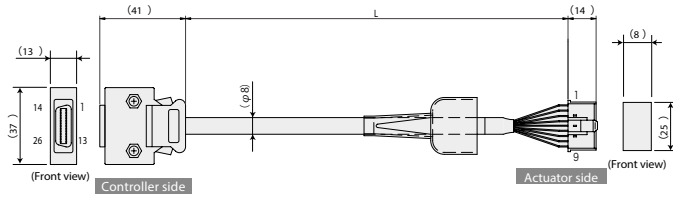
[Encoder robot cable] (Controller side)				[Encoder robot cable] (Actuator side)			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
—	—	—	10	1	E24V	White/Orange	White/Orange
—	—	—	11	2	OV	White/Green	White/Green
White/Orange	E24V	12	12	3	LS	Brown/Blue	Brown/Blue
White/Green	OV	13	13	4	CREEP	Brown/Yellow	Brown/Yellow
Brown/Blue	LS	26	26	5	OT	Brown/Red	Brown/Red
Brown/Yellow	CREEP	25	25	6	RSV	Brown/Black	Brown/Black
Brown/Red	OT	24	24	—	—	—	—
Brown/Black	RSV	23	23	—	—	—	—
—	—	—	9	—	—	—	—
—	—	—	18	—	—	—	—
—	—	—	19	—	—	—	—
White/Blue	A+	1	1	1	A	White/Blue	White/Blue
White/Yellow	A-	2	2	2	A	White/Yellow	White/Yellow
White/Red	B+	3	3	3	B	White/Red	White/Red
White/Black	B-	4	4	4	B	White/Black	White/Black
White/Purple	Z+	5	5	5	Z	White/Purple	White/Purple
White/Gray	Z-	6	6	6	Z	White/Gray	White/Gray
Orange	SRD+	7	7	7	—	—	—
Green	SRD-	8	8	8	—	—	—
Purple	BAT+	14	14	9	FG	Drain	Drain
Gray	BAT-	15	15	10	SD	Orange	Orange
Red	VCC	16	16	11	SD	Green	Green
Black	GND	17	17	12	BAT+	Purple	Purple
Blue	BKR-	20	20	13	BAT-	Gray	Gray
Yellow	BKR+	21	21	14	VCC	Red	Red
—	—	—	22	15	GND	Black	Black
—	—	—	—	16	—	—	—
—	—	—	—	17	BK-	Blue	Blue
—	—	—	—	18	BK+	Yellow	Yellow

Shield is clamp connected to the hood.
(White/blue cable colors indicate the band color/insulator color)

Maintenance Parts

Controller

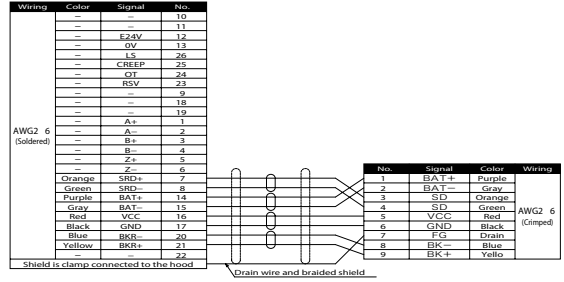
Model CB-X1-PA



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
 * The robot cable is used as standard.

* For ISB · ISDB · ISDBC · NSA (Encoder types are battery-less absolute) with the cable length of 21m or longer, please select CB-X1-PA -AWG 24.

* Please indicate the cable length (L) in , maximum 30m, E.g.) 080 = 8m



EC

RCP6S

RCON

MCON

-C/LC

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

ASEL

SSEL

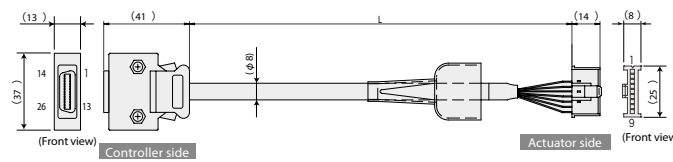
MSEL

PSEL

ASEL

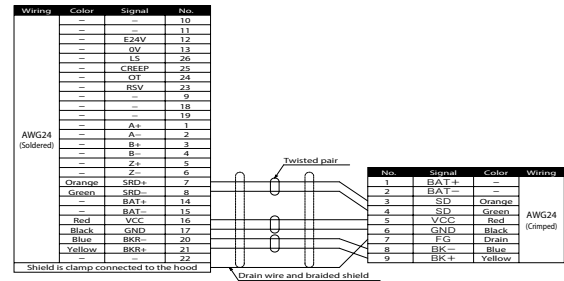
SSEL

Model CB-X1-PA -AWG24

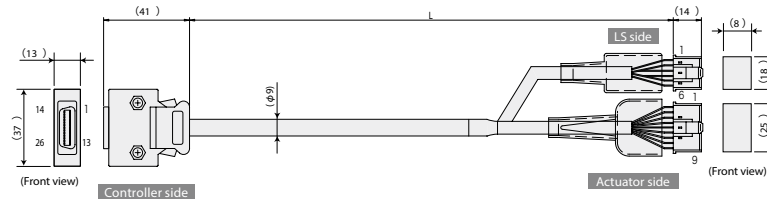


Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
 * The robot cable is used as standard.

* Please indicate the cable length (L) in , maximum 30m, E.g.) 210 = 21m



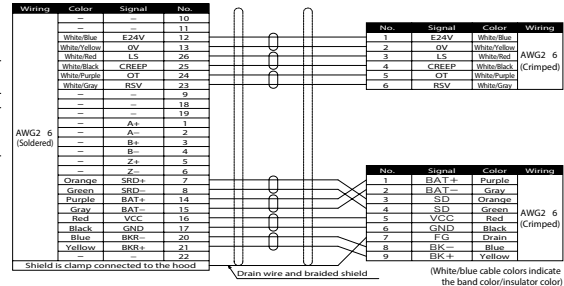
Model CB-X1-PLA



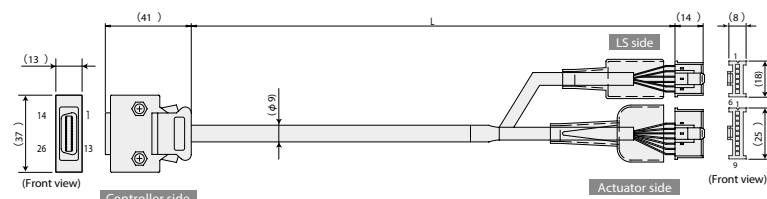
Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)
 * The robot cable is used as standard.

* If you require ISB/ISDB (with battery-less absolute encoder) with the cable of 21m or longer, select the CB-X1-PLA -AWG24.

* Please indicate the cable length (L) in , maximum 30m, E.g.) 080 = 8m

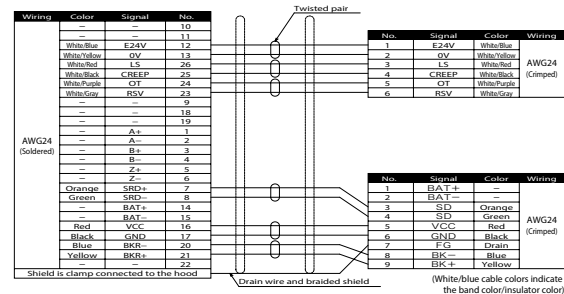


Model CB-X1-PLA -AWG24



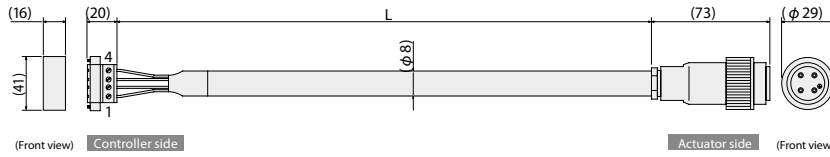
Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)
 * The robot cable is used as standard.

* Please indicate the cable length (L) in , maximum 30m, E.g.) 210 = 21m



Model CB-XEU-MA

* Please indicate the cable length (L) in , maximum 30m, E.g.) 080 = 8m

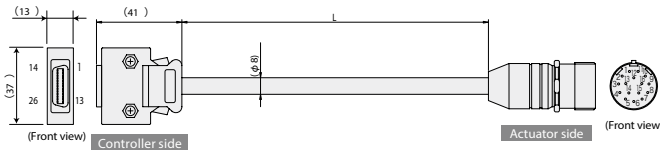


Plug G C2.5/4-S T F-7.62 (Phoenix)				Plug connector 99-4222-00-04 (BINDER)			
Wiring	Signal	No		No	Signal	Wiring	
	PE	1		①	PE		
0.75sq	U	2		1	U	0.75sq	
	V	3		2	V	(Crimped)	
	W	4		3	W		

Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

Model CB-X1-PA -WC

* Please indicate the cable length (L) in , maximum 30m, E.g.) 080 = 8m



Minimum bending radius $r = 38\text{mm}$ or more (Dynamic bending condition)
* The robot cable is used as standard.

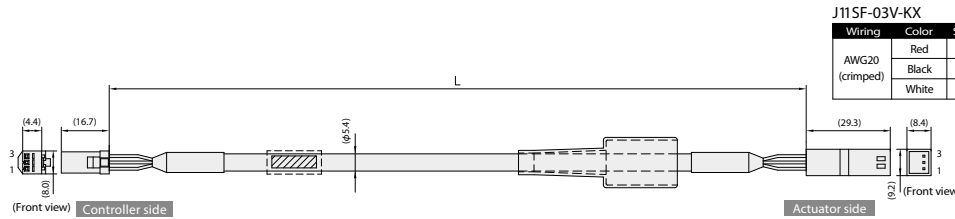
Wiring	Color	Signal	No.
--	--	--	10
--	E24V	--	12
--	0V	--	13
--	LS	--	26
--	CREEP	--	25
--	OT	--	24
--	RSV	--	23
--	--	--	9
--	--	--	18
--	--	--	19
--	A+	--	1
--	A-	--	2
--	B+	--	3
--	B-	--	4
--	Z+	--	5
--	Z-	--	6
--	SRD+	--	7
--	SRD-	--	8
Green	BAT+	--	14
Purple	BAT-	--	15
Gray	VCC	--	16
Red	GND	--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

No.	Signal	Color	Wiring
1	SD	Orange	
2	SD	Green	
3	--	--	
4	--	--	
5	--	--	
6	--	--	
7	--	--	
8	--	--	
9	--	--	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT-	Gray	
14	--	--	
15	BK-	Blue	
16	BK+	Yellow	

Shield is clamp connected to the hood
Drain wire and braided shield
Shield is connected to the grounding sleeve
(White/blue cable colors indicate the band color/insulator color)

Model CB-DDB-BK

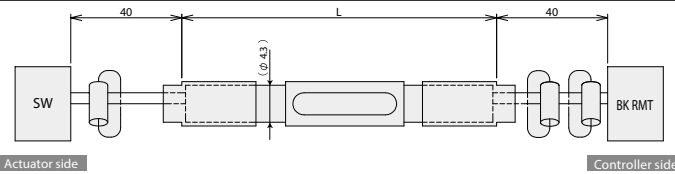
* Please indicate the cable length (L) in , maximum 20m, E.g.) 080 = 8m



J11SF-03V-KX				J11SFM-03V-KX			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG20 (crimped)	Red	+	3	3	+	Red	
	Black	--	2	2	--	Black	AWG20 (crimped)
	White	FG	1	1	FG	White	

Model CB-IXA-BK -1

* Please indicate the cable length (L) in , maximum 15m, E.g.) 050 = 5m

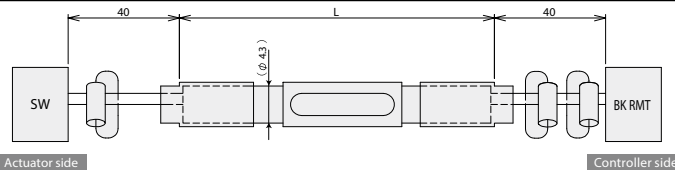


Connector	Color	Signal	Pin No.	Pin No.	Signal	Color	Connector
SW	Red	BK3	1	A2	BK3	Red	BK RMT
	White	COM	2	A3	COM	White	
	--	--	3	Rest	--	--	

Sheath

Model CB-IXA-BK -2

* Please indicate the cable length (L) in , maximum 15m, E.g.) 050 = 5m

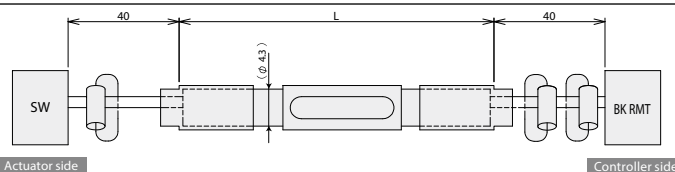


Connector	Color	Signal	Pin No.	Pin No.	Signal	Color	Connector
SW	Red	BK4	1	B2	BK4	Red	BK RMT
	White	COM	2	A3	COM	White	
	--	--	3	Rest	--	--	

Sheath

Model CB-IXA-BK -3

* Please indicate the cable length (L) in , maximum 15m, E.g.) 050 = 5m



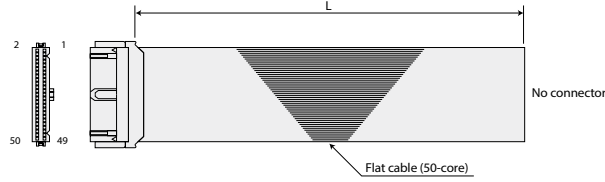
Connector	Color	Signal	Pin No.	Pin No.	Signal	Color	Connector
SW	Red	BK5	1	A4	BK5	Red	BK RMT
	White	COM	2	A3	COM	White	
	--	--	3	Rest	--	--	

Sheath

Model CB-X-PIO

* Please indicate the cable length (L) in , maximum 10m, E.g.) 080 = 8m

Controller



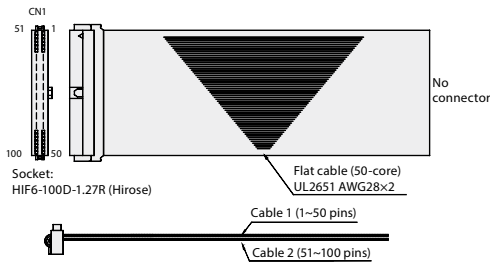
No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown 1		18	Gray 2		35	Green 4	
2	Red 1		19	White 2		36	Blue 4	
3	Orange 1		20	Black 2		37	Purple 4	
4	Yellow 1		21	Brown-3		38	Gray 4	
5	Green 1		22	Red 3		39	White 4	
6	Blue 1		23	Orange 3		40	Black 4	
7	Purple 1		24	Yellow 3		41	Brown-5	
8	Gray 1		25	Green 3		42	Red 5	
9	White 1		26	Blue 3		43	Orange 5	
10	Black 1		27	Purple 3		44	Yellow 5	
11	Brown-2		28	Gray 3		45	Green 5	
12	Red 2		29	White 3		46	Blue 5	
13	Orange 2		30	Black 3		47	Purple 5	
14	Yellow 2		31	Brown-4		48	Gray 5	
15	Green 2		32	Red 4		49	White 5	
16	Blue 2		33	Orange 4		50	Black 5	
17	Purple 2		34	Yellow 4				

EC

RCP6S

Model CB-X-PIOH

* Please indicate the cable length (L) in , maximum 10m, E.g.) 080 = 8m



Cable 1						Cable 2													
Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function					
-	1	Brown-1	-	External power supply (24VDC) for the pin No. 2-25, 51-74	26	Blue-3	-	External power supply (24VDC) for the pin No. 27-50, 76-99	51	Brown-1	300	Alarm function	76	Blue-3	324	General-purpose output			
2	Red-1	000		Program start	27	Purple-3	004		General-purpose input	52	Red-1	301		Ready output	77	Purple-3	325		General-purpose output
3	Orange-1	001		General-purpose input	28	Gray-3	025		General-purpose input	53	Orange-1	302		Emergency stop output	78	Gray-3	326		General-purpose output
4	Yellow-1	002		General-purpose input	29	White-3	026		General-purpose input	54	Yellow-1	303		General-purpose output	79	White-3	327		General-purpose output
5	Green-1	003		General-purpose input	30	Black-3	027		General-purpose input	55	Green-1	304		General-purpose output	80	Black-3	328		General-purpose output
6	Blue-1	004		General-purpose input	31	Brown-4	028		General-purpose input	56	Blue-1	305		General-purpose output	81	Brown-4	329		General-purpose output
7	Purple-1	005		General-purpose input	32	Red-4	029		General-purpose input	57	Purple-1	306		General-purpose output	82	Red-4	330		General-purpose output
8	Gray-1	006		General-purpose input	33	Orange-4	030		General-purpose input	58	Gray-1	307		General-purpose output	83	Orange-4	331		General-purpose output
9	White-1	007		Program No. (PRG No.1)	34	Yellow-4	031		General-purpose input	59	White-1	308		General-purpose output	84	Yellow-4	332		General-purpose output
10	Black-1	008		Program No. (PRG No.2)	35	Green-4	032		General-purpose input	60	Black-1	309		General-purpose output	85	Green-4	333		General-purpose output
11	Brown-2	009		Program No. (PRG No.4)	36	Blue-4	033		General-purpose input	61	Brown-2	310		General-purpose output	86	Blue-4	334		General-purpose output
12	Red-2	010		Program No. (PRG No.8)	37	Purple-4	034		General-purpose input	62	Red-2	311		General-purpose output	87	Purple-4	335		General-purpose output
13	Orange-2	011		Program No. (PRG No.10)	38	Gray-4	035		General-purpose input	63	Orange-2	312		General-purpose output	88	Gray-4	336		General-purpose output
14	Yellow-2	012		Program No. (PRG No.20)	39	White-4	036		General-purpose input	64	Yellow-2	313		General-purpose output	89	White-4	337		General-purpose output
15	Green-2	013		Program No. (PRG No.40)	40	Black-4	037		General-purpose input	65	Green-2	314		General-purpose output	90	Black-4	338		General-purpose output
16	Blue-2	014		General-purpose input	41	Brown-5	038		General-purpose input	66	Blue-2	315		General-purpose output	91	Brown-5	339		General-purpose output
17	Purple-2	015		General-purpose input	42	Red-5	039		General-purpose input	67	Purple-2	316		General-purpose output	92	Red-5	340		General-purpose output
18	Gray-2	016		General-purpose input	43	Orange-5	040		General-purpose input	68	Gray-2	317		General-purpose output	93	Orange-5	341		General-purpose output
19	White-2	017		General-purpose input	44	Yellow-5	041		General-purpose input	69	White-2	318		General-purpose output	94	Yellow-5	342		General-purpose output
20	Black-2	018		General-purpose input	45	Green-5	042		General-purpose input	70	Black-2	319		General-purpose output	95	Green-5	343		General-purpose output
21	Brown-3	019		General-purpose input	46	Blue-5	043		General-purpose input	71	Brown-3	320		General-purpose output	96	Blue-5	344		General-purpose output
22	Red-3	020		General-purpose input	47	Purple-5	044		General-purpose input	72	Red-3	321		General-purpose output	97	Purple-5	345		General-purpose output
23	Orange-3	021		General-purpose input	48	Gray-5	045		General-purpose input	73	Orange-3	322		General-purpose output	98	Gray-5	346		General-purpose output
24	Yellow-3	022		General-purpose input	49	White-5	046		General-purpose input	74	Yellow-3	323		General-purpose output	99	White-5	347		General-purpose output
25	Green-3	023		General-purpose input	50	Black-5	047		General-purpose input	75	Green-3	-	External power supply (0V) for the pin No. 2-25, 51-74	100	Black-5	-	External power supply (0V) for the pin No. 27-50, 76-99		

PCON

PCON -C/LC

PCON -CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-LC

SCON

-CAL

MSCON

PSEL

ASEL

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

PSA-24



Model PSA-24/PSA-24L

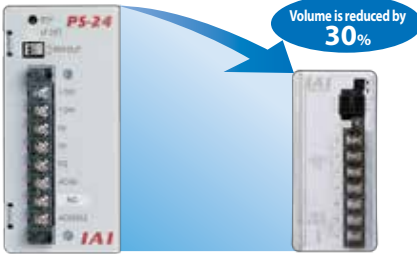
24VDC Power supply



Features

Compact

Compared with the conventional 24V power supply, it has a compact size, allowing a smaller installation space.

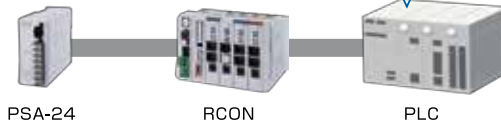
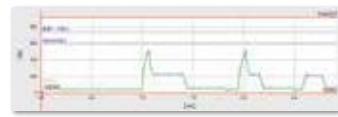


PS-24 **NEW** PSA-24

Output of internal data from the power supply

Possible to monitor the following data by connecting with RCON:

- Output voltage
- Output current
- Load factor
- Cumulative energizing time
- Internal temperature
- Alarm for low fan rotational speed



Power supply calculator

By simulating actuator operations in advance, an optimum power supply capacity and the required number of power supply units are calculated.

Enter conditions of the actuators to be connected and set up operation patterns. Operation patterns can easily be set up by icons.

Enter conditions of the actuators.



Setting operation patterns.



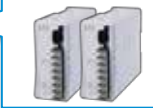
Calculation results

The power supply capacity and the required number of power supply units are displayed. Current values and axis operation status are also displayed.

Calculation results are displayed.



Required number of power supply units

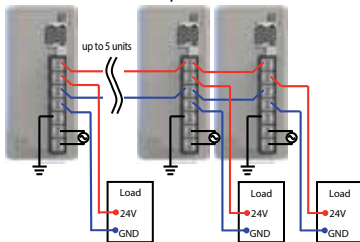


Current value graph

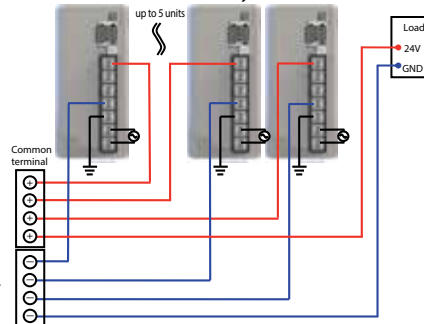


Parallel operation of up to 5 units is possible

In case of multiple loads



One load only



The number of parallel connections and allowable power supply

Number of units connected	Rated current [A]		Peak current [A]
	PSA-24 (without fan)	PSA-24L (with fan)	
1	8.5	13.8	17.0
2	15.3	24.8	30.6
3	22.95	37.3	45.9
4	30.6	49.7	61.2
5	38.25	62.1	76.5

(Note) Parallel operations under the following condition are not possible.
 * Parallel connection of PSA-24 (without fan specification) and PSA-24L (with fan specification).
 * Parallel connection with a power supply other than this unit.
 * Parallel connection with PS-24.

Specifications

tem		Specifications		Conditions
		PSA-24 (without fan)	PSA-24L (with fan)	
Power source voltage range		100VAC ~ 230VAC ±10%		
Power current	100VAC	2.5A or less	3.9A or less	Continuous rated output 204W
	200VAC	1.4A or less	1.9A or less	Continuous rated output 204W
Power frequency range		50/60 Hz± 5%		
Power supply capacity	100VAC	250VA	390VA	Continuous rated output 204W
	200VAC	280VA	380VA	Continuous rated output 204W
Inrush Current (Note 1)	100VAC	27.4A (typ)		When Cold-started (40°C)
	200VAC	54.8A (typ)		
Momentary power failure resistance	50Hz	20 ms		
	60Hz	16 ms		
Electric shock protection mechanism		Class 1		
Efficiency	100VAC	86% or more		Continuous rated output 204W
	200VAC	90% or more		
Output voltage range (Note 2)		24V±10%		
Continuous rated output		8.5A (204W)	13.8A (330W)	
Peak output		17A (408W)		
Protective function		Protection against over current, over heat and over load.		
		Protection against over voltage, input low voltage and fan rotation		
Ambient operating temperature		0°C ~ +55°C (derating)		
Ambient operating humidity		85% RH or less		No condensing
Ambient operating atmosphere		Not exposed to corrosive gases or dusts.		
Vibration resistance		Oscillation frequency: 10-57Hz / Amplitude: 0.075mm Oscillation frequency: 57-150Hz / Acceleration: 9.8m/S ² Sweepage time of XYZ each direction: 10 minutes Number of sweepages: 10 times		
Shock resistance		Drop height 800mm, one corner, 3 edges, 6 surfaces		
Electric shock protection mechanism		Class I		
Degree of protection		Not applicable		
Calorific value	100VAC	28.6W		Continuous rated output 204W
	200VAC	20.4W		Continuous rated output 204W
Cooling method		Natural air cooling	Forced air cooling by fan unit	
Withstand voltage	AC input - DC output	Leak current 10mA		3000VAC, 1 minute
	AC input - FG	Leak current 10mA		2000VAC, 1 minute
	DE output - FG	Leak current 25mA		500VAC, 1 minute
Insulation resistance	AC input - DC output	500VAC 50MΩ or higher		
	AC input - FG	500VAC 50MΩ or higher		
	DE output - FG	500VAC 50MΩ or higher		
Leak current (Note 3)	100VAC	0.40mA typ		
	200VAC	0.75mA typ		
Safety standard		UL61010, EN61010-1		
		KC(EMC), EN55011		
Mass		805g	845g	

(Note 1) The pulse width of rush current is less than 5ms. During a parallel operation, the rush current will be multiplied by the number of units.

Please carefully select taking the characteristics into account, so that the breaker is not activated due to rush current.

(Note 2) This power supply features changing output voltage according to load to make enable parallel operations possible.

Therefore, this unit is for an exclusive use of IAI controllers. Please refer to the operation manual about output voltage by overload.

(Note 3) Represents leak current of the power supply unit.

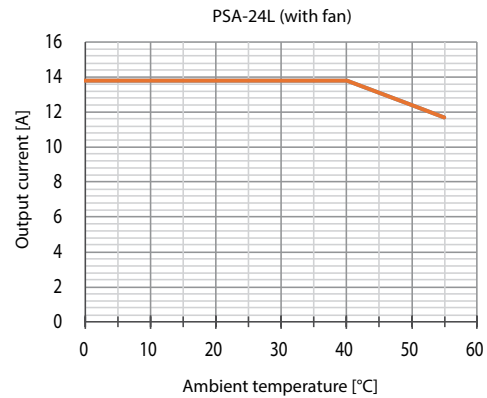
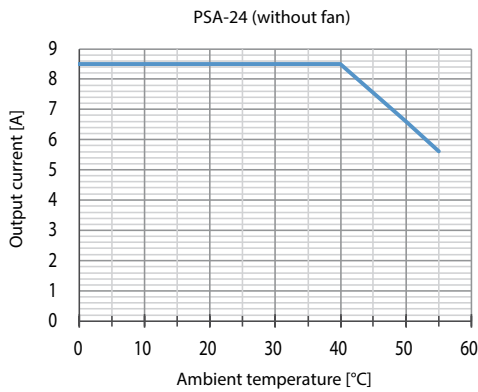


Caution

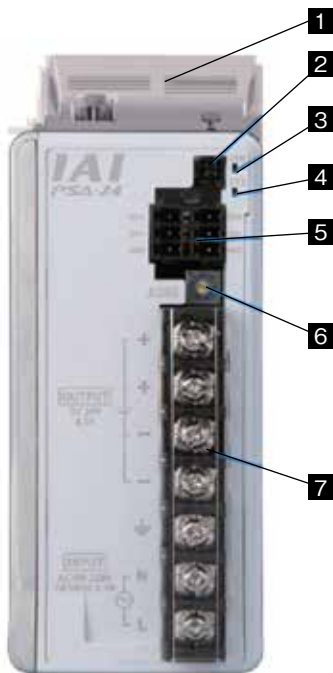
- **This power supply is not a constant voltage power supply. The output voltage changes with the load (voltage decreases according to the load factor).**
- **Therefore, do not connect any equipment other than IAI actuators.**
- **Up to 5 units can be operated in parallel. Do not use any power supplies other than this power supply at the same time for parallel operations.**
- **Note that serial operations are not possible.**
- **When operating multiple units of PSA-24 (without fan) in a row, allow at least 10mm space between the units. (No space is necessary for the units with fan.)**
- **The PSA-24 (without fan) has a natural air-cooled power supply. Please give due consideration to natural convection so that heat does not build up around the power supply.**
- **The enclosure of this product also has a heat radiating effect. Do not touch it after installation as it may result in severe burns.**

Derating against ambient temperature

When the ambient temperature is higher than 40°C, please lower the output power according to the derating curve shown below.



Part Names



1 Fan unit

A unit to be connected when using at the rated continuous output 330W (PSA-24L).

2 Fan connecting unit

A connector for fan connection when using at the rated continuous output 330W.

3 Fan alarm LED 4 Normal operation LED

Two LEDs for indicating the conditions of the fan and the power supply.

Name	Panel mark	Color	Condition	Description
Fan alarm LED	FAN	Orange	Lighting	Abnormal fan rotation
			Flashing	Alarm for fan rotation
			Lights out	Normal fan rotation
Normal operation LED	SYS	Green	Lighting	Normal operation
			Lights out	Stopping

5 Connector for communications

A connector for monitoring the status data in the power supply by communication

6 Address switch for communications

Setting assigned communication slave addresses by connecting multiple power supplies via multi-drop.

7 Terminals for power supply

To connect the wiring for the AC input, frame grounding and output voltage.

TB-02

Touch Panel Teaching Pendant TB-02
for Position controller and Program controller in common



Features

- The 7" full color touch panel screen that enlarges the buttons and letters for better visibility and operability.
 - When used with a program controller, it has the same functions as the previous model. When used with position controllers, new functions, such as the guide function, have been installed, and it is easy to set the model using the interactive method.
 - It can be used for both position controllers and program controllers.
(Excludes models prior to RCP2 for the CON series and models prior to SEL-E/G)
 - For the standard specification, a Thickness of 25mm has been achieved.
 - Saving program/data into SD memory card.
 - Screen shot function convenient for procedure manual creation and recording conditions has been equipped.
- Various new functions for easy operation and enhanced support functions (2~13,18,19 are functions for position controllers)

1	Main Menu	Menu-driven screen using icons for better visibility..
2	Position Editing Guide	A function that guides through position data setting method using an interactive method.
3	I/O Control Guide	A function that guides through the I/O operation method of the position controller using an interactive method.
4	Simple Program Setting	A function through which the operation method, position, and speed can be input using an interactive method.
5	Off-board Tuning	A function for setting optimum control parameters (various gains) and calculating cycle times by inputting operating conditions.
6	Trouble Shooting	A function that displays detailed alarm information when a problem occurs and the steps to deal with the trouble using an interactive method.
7	Maintenance Parts List	A function that display the time for regular maintenance and the maintenance parts list for parts exchange at the time malfunction.
8	Startup Screen Setting	A function for selecting the startup screen and hiding the guide function icon of the main menu.
9	Pulse-train Control Setting	A function that makes input easy by putting together the setting for the pulse-train control related parameters on a special screen.
10	Glossary of Terms	A function that displays the explanation of terms from the catalog and terms related to position controller operation.
11	Gateway Setting/Monitoring	A function for setting and monitoring the gateway unit in a gateway system for MCON/MSEP-C/RCP6S.
12	Simple Program	A function for performing easy programs such as repeating positioning and setting stopping time.
13	Servo Monitoring	A monitoring function to check the actual operation condition with displays of waveforms.
14	Teaching Update	A function that enables the user to update the software.
15	Screen shot	A function for saving a bmp file of the screen shot into SD card by pressing and holding the bottom right section of the screen.
16	Large Monitor	A function to use the 7" full color touch panel screen that enlarges the buttons and letters for better visibility and operability.
17	Multi-language	Shows Japanese, English or Chinese.
18	Network data	Displays I/O data between the host PLC and controller when connecting a single-axis controller of network specification.
19	Press program function	Edit and conduct a test run for press program when connecting controller for servo press.

New Functions example

Main Menu

Icons are arranged for each menu for easy selection.



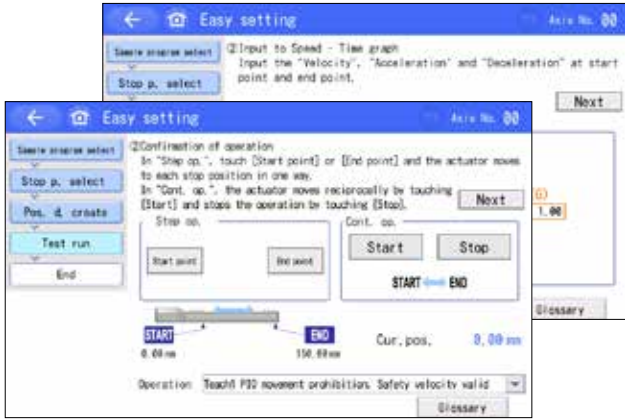
Position Editing Guide

Interactive guidance for setting the position data.



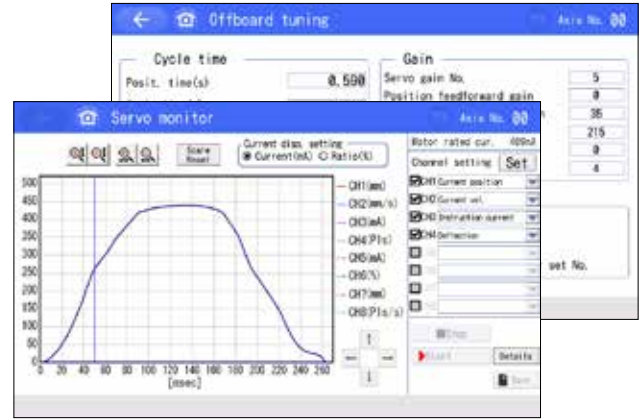
Simple Program Setting

This is a guide screen that allows easy position setting for even those operating for the first time.



Off-board Tuning

A function for calculating the setting of the optimal gain and cycle time by inputting the operating conditions.



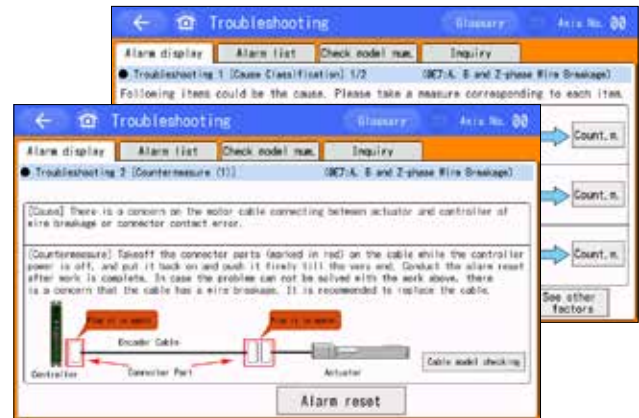
Explanation of Terms

A function that displays the explanation of terms from the catalog and terms related to position controller operation.



Troubleshooting

Simply selecting YES/NO for the circumstances of the problem allows it to guide through the steps for dealing with the problem.



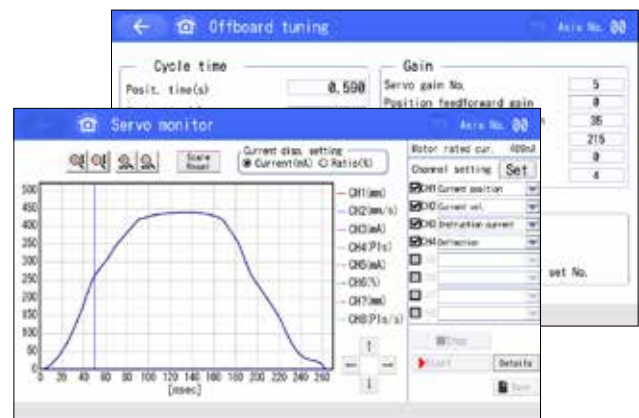
Maintenance Parts List

The maintenance parts list can be checked by inputting the model.



Servo monitor

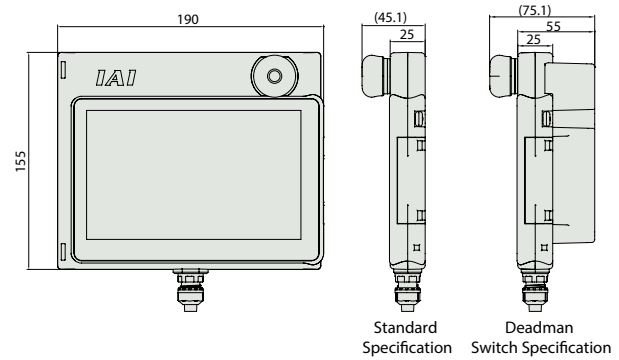
It is possible to display the graphs of the current position of the actuator, speed, electric current value variation, etc.



Specifications

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temp.	0 ~ 40°C
Ambient operating humidity	20 ~ 80%RH (Non-condensing)
Environmental resistance	IP20
Overseas standard	CE
Mass	470g (TB-02 box only) + 330g (5m cable) 600g (TB-02D box only) + 330g (5m cable)
Cable length	5m (Standard cable is attached to the box)

External Dimensions



Models

This teaching pendant is compatible with all the controller listed below. Select the cable in the table that suits the controller.

* The recommended color of the emergency stop switch is gray when the controller is a standard specification, and is red (model: -SWR) when the controller is a safety category compliant specification.

Teaching Pendant + Cable as a Set

Type	Model Number	Specification	Included Cable	
			For Position Controller	For Program Controller
Models common in the position controllers and program controllers.	TB-02-SC	Standard specification (Gray stop switch)	①CB-TB1-C002	②CB-TB1-X002 + ③CB-SEL-SJS002
	TB-02-SC-SWR	Standard specification (Red stop switch)		
	TB-02D-SC	Deadman switch specification (Gray stop switch)		
	TB-02D-SC-SWR	Deadman switch specification (Red stop switch)		
Models dedicated to position controllers	TB-02-C	Standard specification (Gray stop switch)	①CB-TB1-C002	
	TB-02-C-SWR	Standard specification (Red stop switch)		
	TB-02D-C	Deadman switch specification (Gray stop switch)		
	TB-02D-C-SWR	Deadman switch specification (Red stop switch)		
Models dedicated to program controllers	TB-02-S	Standard specification (Gray stop switch)	②CB-TB1-X002 + ③CB-SEL-SJS002	
	TB-02-S-SWR	Standard specification (Red stop switch)		
	TB-02D-S	Deadman switch specification (Gray stop switch)		
	TB-02D-S-SWR	Deadman switch specification (Red stop switch)		

* The following options can be specified at the end of the model number: . Factory setting in English: -ENG Factory setting in Chinese: -CHI (Default factory setting is Japanese)

Teaching Pendant Only (No Cable Included)

Type	Model Number	Specification
Models common in position controllers and program controllers	TB-02-SCN	Standard specification (Gray stop switch)
	TB-02-SCN-SWR	Standard specification (Red stop switch)
	TB-02D-SCN	Deadman switch specification (Gray stop switch)
	TB-02D-SCN-SWR	Deadman switch specification (Red stop switch)

Individual Cable Only

Type	Model Number
Position controller connection cable	①CB-TB1-C002
	②CB-TB1-X002
Program controller connection cable	③CB-SEL-SJS002 (Adapter cable)*
TP adapter connection cable	④CB-TB1-GC002

* Use with CB-TB1-X002 when connecting to ASEL, PSEL, SSEL, and MSEL.

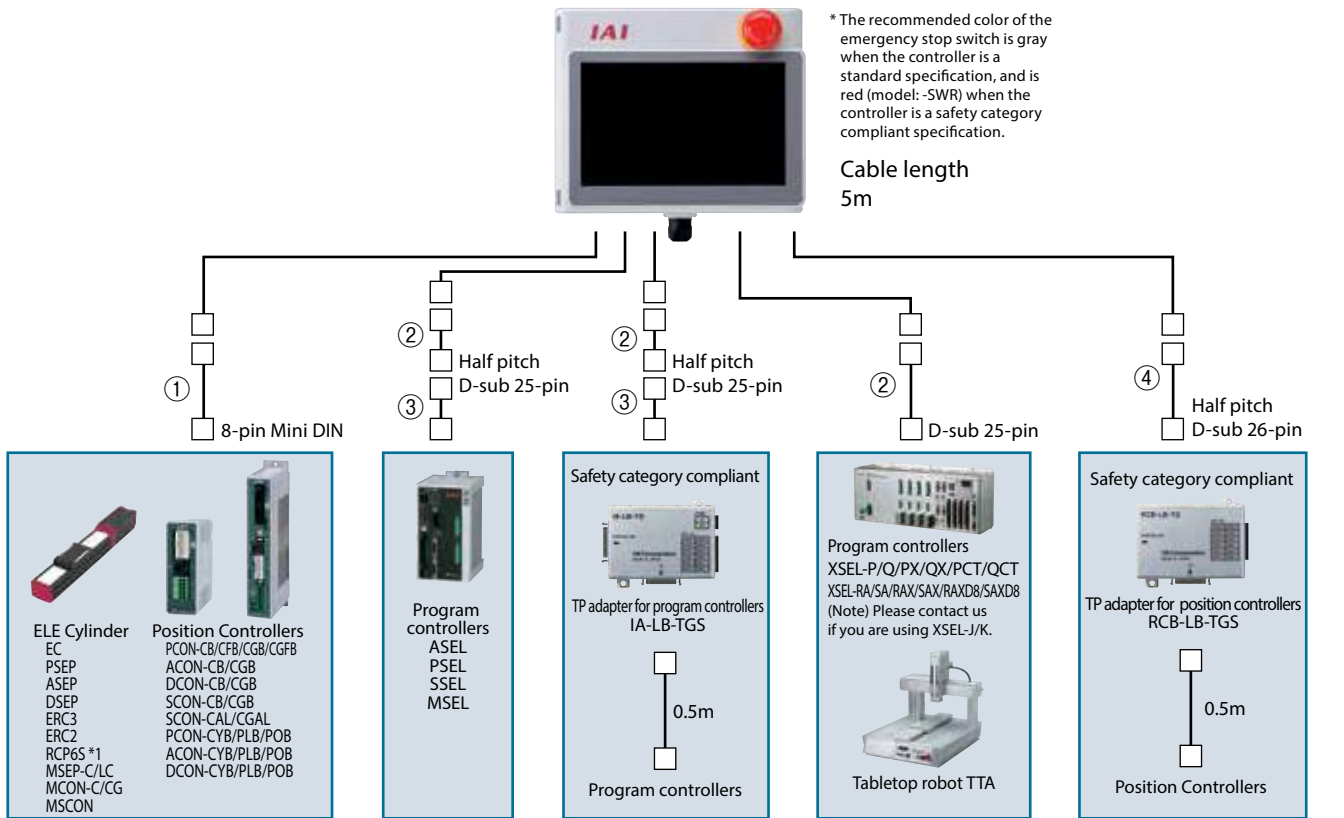
Options

Name	Model Number	Description
Strap	STR-1	Connected to the teaching pendant.
Grip belt	GRP-1	Supporting belt to hold the pendant with the left hand.
Spiral cord	SIC-1	A cord to connect the pendant and the supplied stylus.

(Note) Please contact us if you are using XSEL-J/K/JX/KX.

Applicable Controllers/Safety category compliant

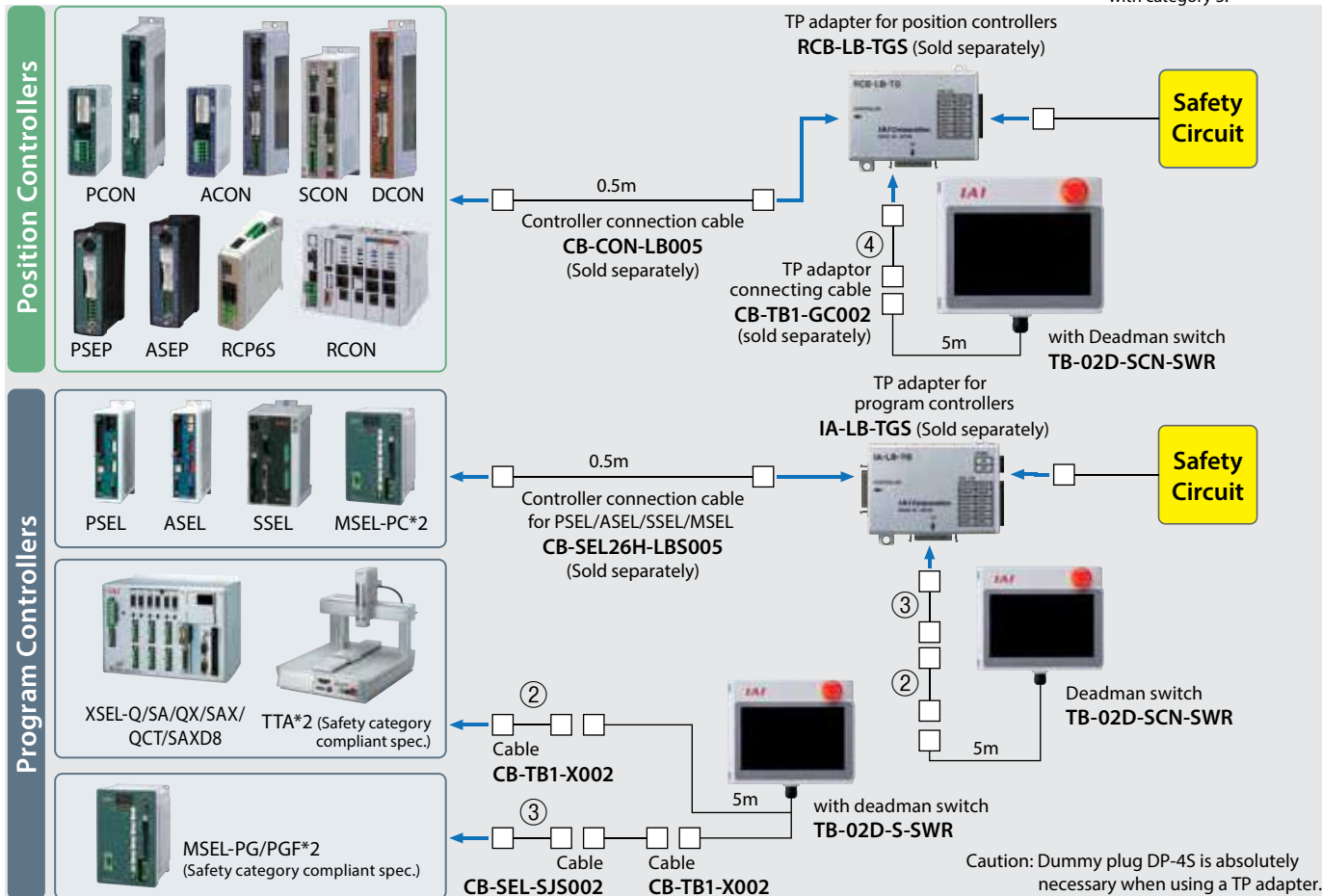
Controller



*1 A gateway unit or a PLC connection unit is necessary to operate RCP6S.

*1 Compliant with category 4 when fitting the dummy plug.
*2 MSEL and TTA are compliant with category 3.

Compatibility with safety category will be constituted as below. Compliant with Safety Category up to B4*1*2



Caution: Dummy plug DP-4S is absolutely necessary when using a TP adapter.

- EC
- RCP6S
- RCON
- MCON-C/LC
- PCON-CB/CFB
- PCON
- ACON-CB
- DCON-CB
- ACON
- DCON
- SCON-CB
- SCON-CB (Servo press)
- SCON-LC
- SCON-CAL
- MCON
- PSEL
- ASEL
- SSEL
- MSEL
- XSEL
- XSEL (SCARA)
- PSA-24
- TB-02
- TB-03

TB-03

Touch Panel Teaching Pendant TB-03
for Position controller and Program controller in common

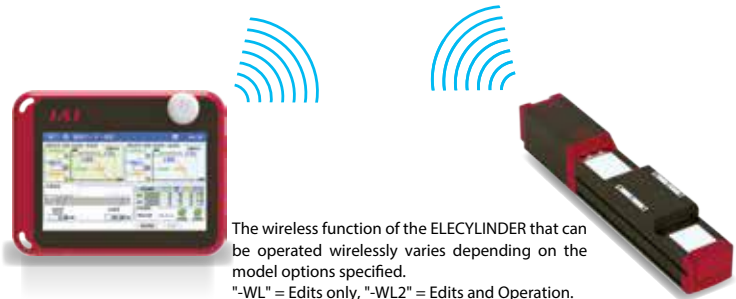


Features

1 Set operating conditions with wireless connection

Position adjustments, operating conditions setting and actuator operations can be performed from outside the equipment, even without a cable connection to the ELECYLINDER actuators.

* Stop switch is enabled only during "cable connection".
 Please be careful that it is disabled during "wireless connection".



2 Status monitoring makes daily maintenance easier and shortens trouble recovery time

TB-03 can monitor the operating status of up to 16 axes while receiving wireless data from the ELECYLINDER. Recovery time can also be shortened by troubleshooting via wireless communications.

Axis Name Display
 Can be configured (changed) arbitrarily according to customer applications.

Status Monitor
 Shows the axis conditions, indicating the maintenance timing.

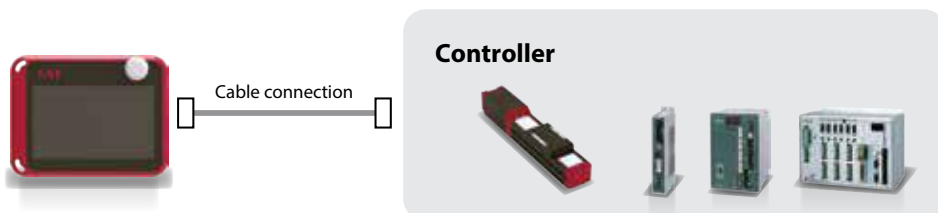
Error Status Monitor
 Alarms and warnings are displayed when generated. Useful for troubleshooting.

EC2	Servo	Travel Cnt.	S2	Alarm Group	Warnin
S/N A70761788	Cur. pos.	Travel Dist.	1 m	Maintenance warning 1	
Select Selectable	0.00 mm	Over load Lv.	12 %		

Troubleshooting screen

3 Supports ELECYLINDER / Position Controller / Program Controller

The dedicated cable can connect the TB-03 to all the controllers. The same functions and operations of the previous TB-02 are available.



Wired or wireless can be selected at the ELECYLINDER model option.

Model Number

One unit supports all the controllers*. Select the right connecting cable according to the controller to be used. Also select the AC adapter for charging the main unit according to the operating environment.

Model **TB-03-** **Cable** - **AC adapter**

● Body + cable + AC adapter set model

Connected controller	Model		Cable	
	Body + cable	AC adapter	For ELECYLINDER/ position controller	For program controller
ELECYLINDER Position Controller	TB-03-C	(Blank)/C/E/K N *2	① CB-TB3-C050	-
Program Controller	TB-03-S	(Blank)/C/E/K N *2	-	② CB-TB3-S050 + ③ CB-SEL-SJS002
ELECYLINDER Position Controller Program Controller	TB-03-SC	(Blank)/C/E/K	① CB-TB3-C050	② CB-TB3-S050 + ③ CB-SEL-SJS002 (conversion cable) *3
		N *2		
	TB-03-SCN *1	(Blank)/C/E/K N *2	-	-

*1 No cable

*2 No AC adapter

*3 Note Conversion cable

● Connection cable model number

Connected controller	Model
ELECYLINDER Position Controller	① CB-TB3-C050
Program Controller	② CB-TB3-S050
	③ CB-SEL-SJS002 (conversion cable) *3

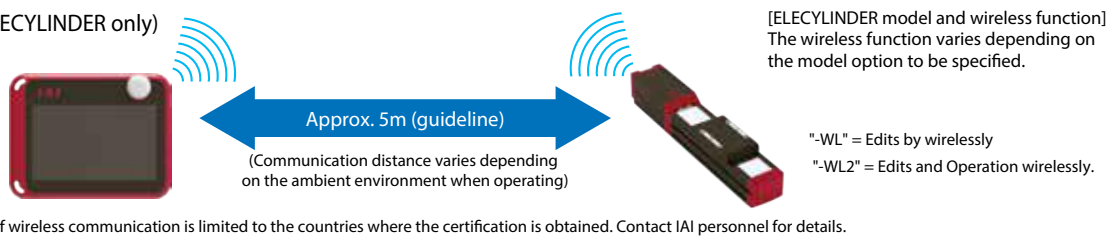
*3 Use with the ② cable when connecting to ASEL, PSEL, SSEL, or MSEL

● AC adapter single product model number

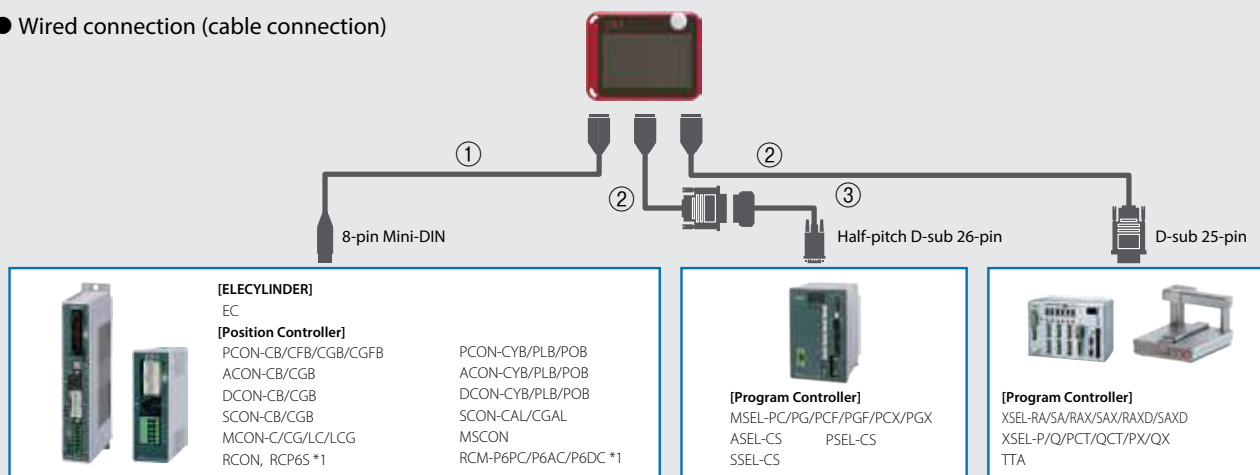
Connected controller	Model	Specification	Single product model number
ELECYLINDER Position Controller Program Controller	(Blank)	For Japan/North America/Thailand	UN318-5928
	C	For China	UNZ318-5928
	E	For Europe	UNE318-5928
	K	For Korea	UNR318-5928

Connection

● Wireless connection (ELECYLINDER only)



● Wired connection (cable connection)



*1 To operate RCP6S and RCM-P6, a gateway unit or a PLC connecting unit is necessary.

Specifications

Power input	24VDC ±10% [supplied from controller]
Voltage range	5.9VDC (5.7 to 6.3V) [supplied from AC adapter]
Power consumption	3.6W or less
Consumption current	150mA (supplied from controller)
Ambient operating temperature	0 to 40°C (no condensation or freezing)
Ambient operating humidity	85% RH or less (no condensation or freezing)
Ambient storage temperature	-20 to 40°C
Vibration resistance	10 to 57Hz Amplitude 0.075mm
Degree of protection	IPX0
Mass	670g (body) + approx. 285g (dedicated cable)
Liquid crystal	7" TFT color WVGA (800 x 480)
External memory	SD/SDHC memory card interface mounted (1G to 32G)
Charging method	Wired connection with dedicated AC adapter/controller
Language support	Japanese/English/Chinese

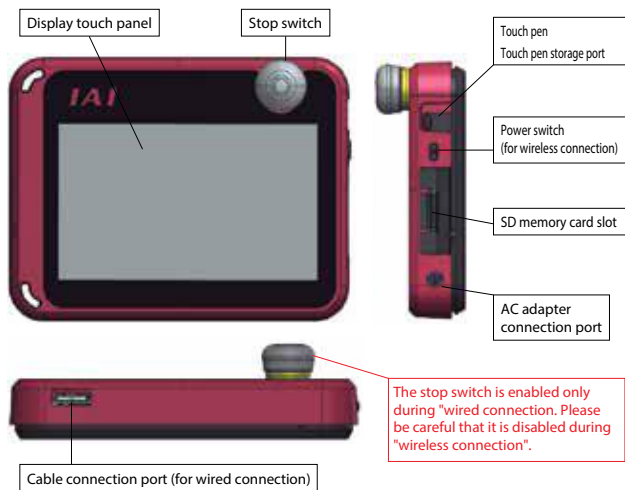
Wireless Function (when connected to ELECYLINDER only)

Wireless connection	Bluetooth 4.2 Class 2
Wireless function	Data setting / monitoring function / axis operation
Operation command/stop command	Position move / jog / inching
Max. number of connectable axes	16-axes
Operation	Battery (AB-7) operation
Wireless operating time	Max. 4 hours (battery driven)
Battery life	Cycle durability 300 times

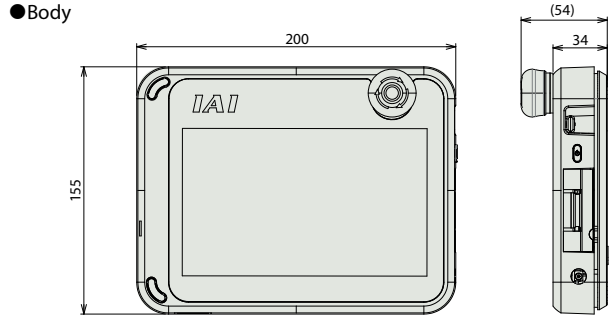
AC Adapter Common Specifications

Power input voltage range	Single-phase 100 to 240VAC ±10%
Power supply current	0.4A max.
Consumption current	2.8A max.
Output voltage	5.9VDC (5.7 to 6.3V)
Charging time	Approx. 3 hours
Cable length	1500 ±100mm

Part Name

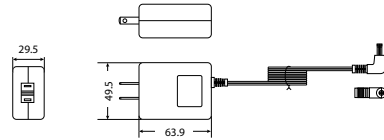


External Dimensions

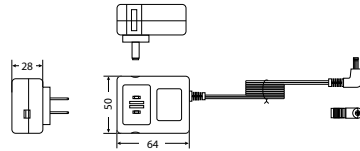


● Body

For Japan/North America/Thailand: UN318-5928

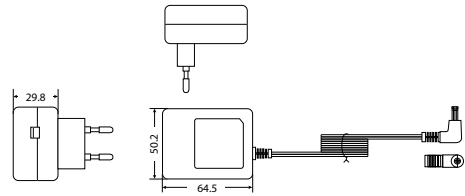


For China: UNZ318-5928



For Europe: UNE318-5928

For Korea: UNR318-5928



Options

● Strap: STR-1



● Spiral cable: SIC-1



● Grip belt: GRP-2



■ Maintenance Parts

Battery unit: AB-7



Cautions on axis-operations using wireless connection

This device (V2.30 or later) is capable of operating the ELECYLINDER having option code: WL2 by wireless connection. For the operation, make sure to confirm the safety according to the following items.

- When connected wirelessly, **the stop switch of the main unit does not function.**
Prepare a device or circuit that stops the operation in case of emergency.



- In ELECYLINDER operations using wireless connection, there is a function to perform operation tests (moving to the forward and backward ends, jog and inching). However, **it is not for automatic operations.** Configure a system of the equipment according to risks of the operating environment.
- **Make sure to conduct a risk assessment according to the requirements of the standard required for the built-in equipment.** Dangerous operations, such that the machine has to be stopped automatically when control signals are not received due to communication interruptions, are not allowed.
- A stop motion of axis operations via wireless connection cannot be used as the safety function of EN ISO 13849-1: 2015. It does not conform to the Safety Category B and 1 to 4 of EN ISO 13849-1: 2015.

Cautions on the use of wireless connections

- This product uses 2.4GHz band wave called the ISM band (radio frequency 2,400 to 2483.5MHz, wireless output +5dBm).
- Since this frequency band is used for various devices such as microwaves and wireless LANs, wireless communications may be interrupted due to radio disturbances.
- In other countries (regions), it is required to acquire a certification in conformity with the regulations of the concerned country (region).

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■ **Contact us for your local distributor information.**

The information contained in this booklet may change without prior notice due to product improvement.

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