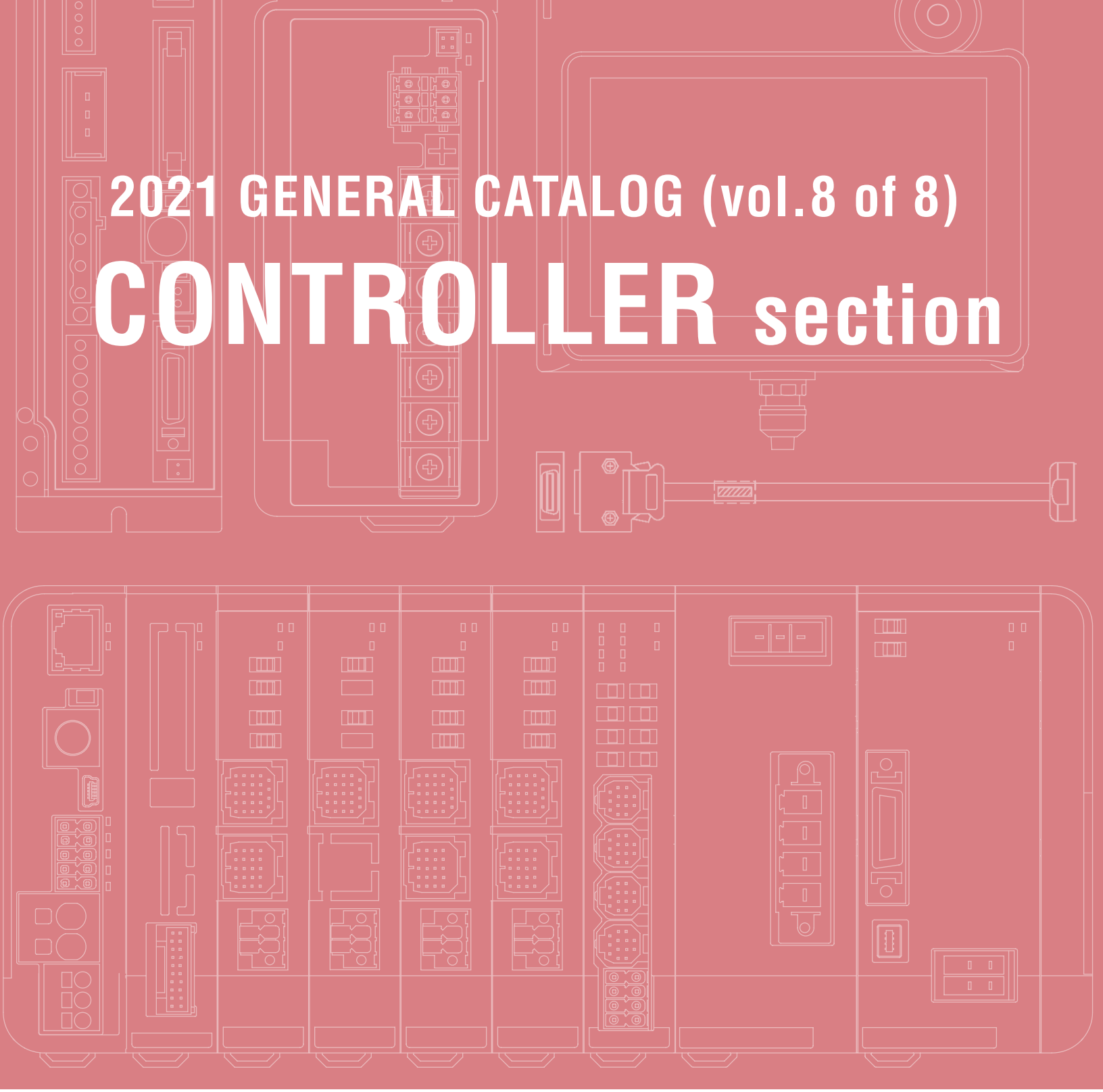
2021 GENERAL CATALOG (vol.8 of 8)

CONTROLLER section



IAI
Quality and Innovation

www.intelligentactuator.com

Controller

R-unit
RCP6S
PCON
ACON/DCON
SCON
SSEL
MSEL
XSEL
PSA-24
TB-02
TB-03

R-unit

PCON

ACON

DCON

SCON-CB

SSEL

MSEL

XSEL

PSA-24

TB-02

TB-03

MEMO

MEMO

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

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.

Controller separate type

Controller integrated type

ELECYLINDER

Gateway for network connection

REC

See P8-75

Controller for single axis

Position controller
24VDC/AC100V/AC200V type

PCON／ACON／DCON／SCON

See P8-13

R-unit Series

Unit-linkage system position controller
24VDC/200VAC types

RCON

See P8-60

Controller for multi-axes

Program controller
AC100V/AC200V type

MSEL／SSEL／XSEL

See P8-15

Unit-linkage system program controller
24VDC/200VAC types

RSEL

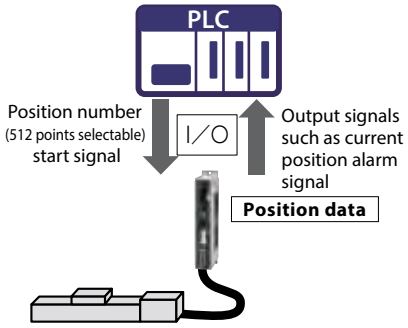
See P8-67

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.

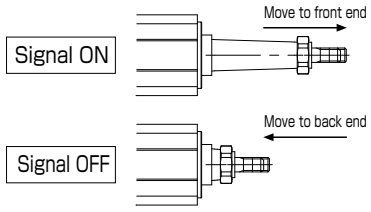
1 No programming needed

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 Controllers

■Positioning is possible for up to 512 points (Except for RCON).

■Compatible with pulse train input control (Except for RCON).

■PCON-CB and RCON provide 1.5 times of max. speed and 2 times of payload compared to conventional models when combined with RCP6, RCP5 and RCP4.

■ACON and SCON provide max. 4.5G of acceleration/deceleration thanks to the off-board tuning function.

■RCON is a unit connection system and can operate up to 16 axes of actuators.

■Setting of an absolute specification by PCON, ACON, SCON or RCON, 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.

PCON

See P8-153

ACON／DCON

See P8-189

SCON

See P8-215

RCON

See P8-60

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.

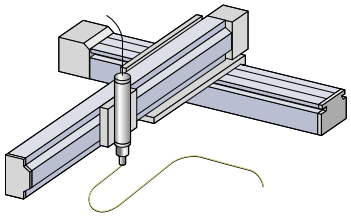
1 High-level control available using simple language

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	Cmnd	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	

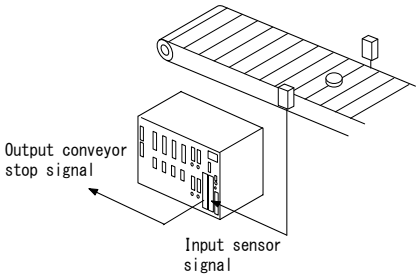
2 Interpolation possible up to 8 axes

Simultaneous operations of actuators are possible for up to 2 axes for SSEL controller, up to 4 axes for MSEL controller and up to 8 axes for RSEL/XSEL controller, respectively.
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.

RSEL

* Battery-less absolute type actuator + controller (battery-less abso specification).
* Incremental type actuator + simple abso unit + controller.

SSEL/XSEL

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

MSEL

* Iincremental type actuator + batery box + controller (simple asbo spec)
* Baterry-less absolute type actuator + controler (battery-less abso spec)

RSEL Controller

- Highly functional controller that enables simultaneous operations up to 8 axes.
- Different types of drivers can be combined thanks to the unit-linkage system..
- Driver unit can be shared with RCON.
- Supports control of cartesian type 6-axis robots.
- Possible to register positioning points up to 36,000.
- Supports battery-less absolute encoder, simple abso unit, incremental encoder and quasi-abso encoder.

See P8-67

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.
- Possible to register positioning points up to 20,000.
- 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.
- Controller power supply is single-phase AC100V/200V for SSEL.

See P8-245

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 P8-259

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 P8-273

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 February 2021

Controller series		Ellipsis	position controller						program controller					
			PCON -CB	ACON -CB	SCON -CB	SCON-CB (servo press specification)	DCON -CB	RCON	SSEL	TTA	RSEL	MSEL	XSEL -P/Q	XSEL -RA/SA
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 Fleld 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					128	20000	30000	36000	30000	20000	55000
Operating method	Position No. Movement by specifying positions		●	●	●	●	●	●	●	●	●	●	●	●
	Direct number Movement by specifying direct values		●	●	●	–	●	●	–	–	–	–	–	–
Reference page for controllers			P8-153	P8-189	P8-215	P8-231	P8-189	P8-60	P8-245	P5-581	P8-67	P8-259	P8-273	P8-273

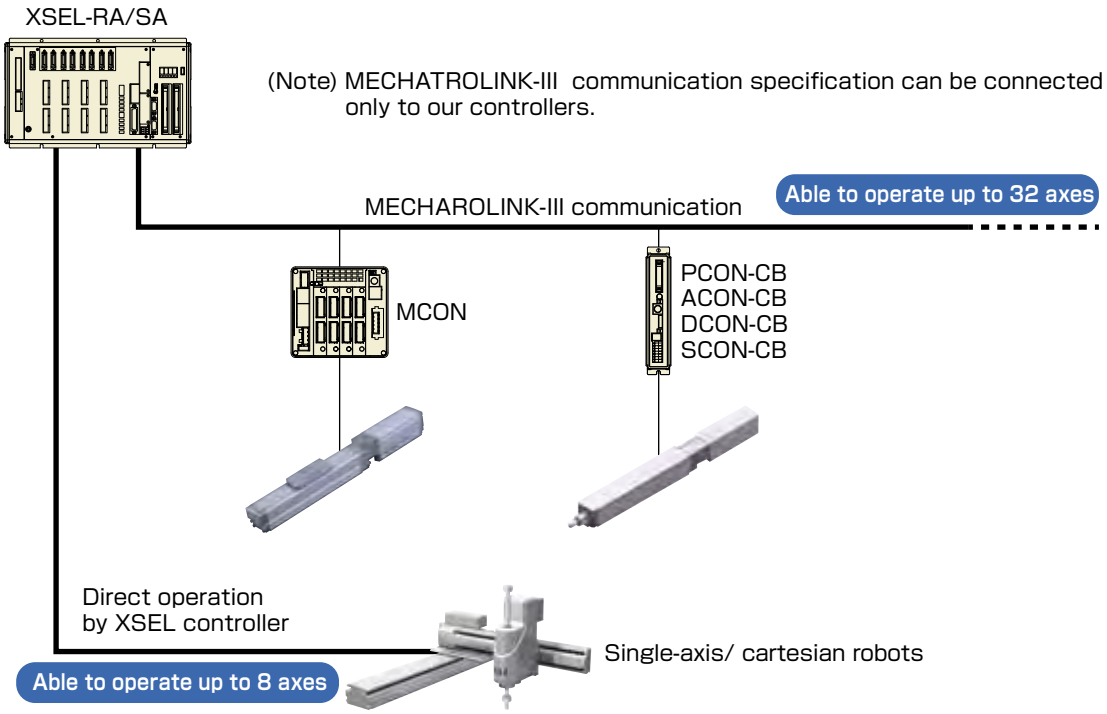
(*1) MECHATROLINK I/II is treated as an intelligent I/O, and supports only non-synchronous communication. MECHATROLINK III is compatible with the standard ServoProfile.
(*2) When it is operated by movement by specifying direct values, the number of positioning points is unlimited.
(*3) Able to cope with 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

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.

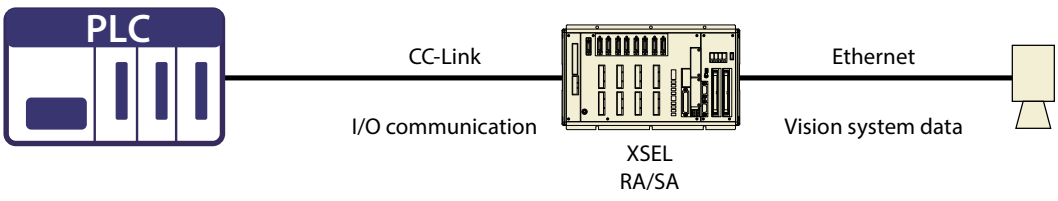
(2) No communication programs needed

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>

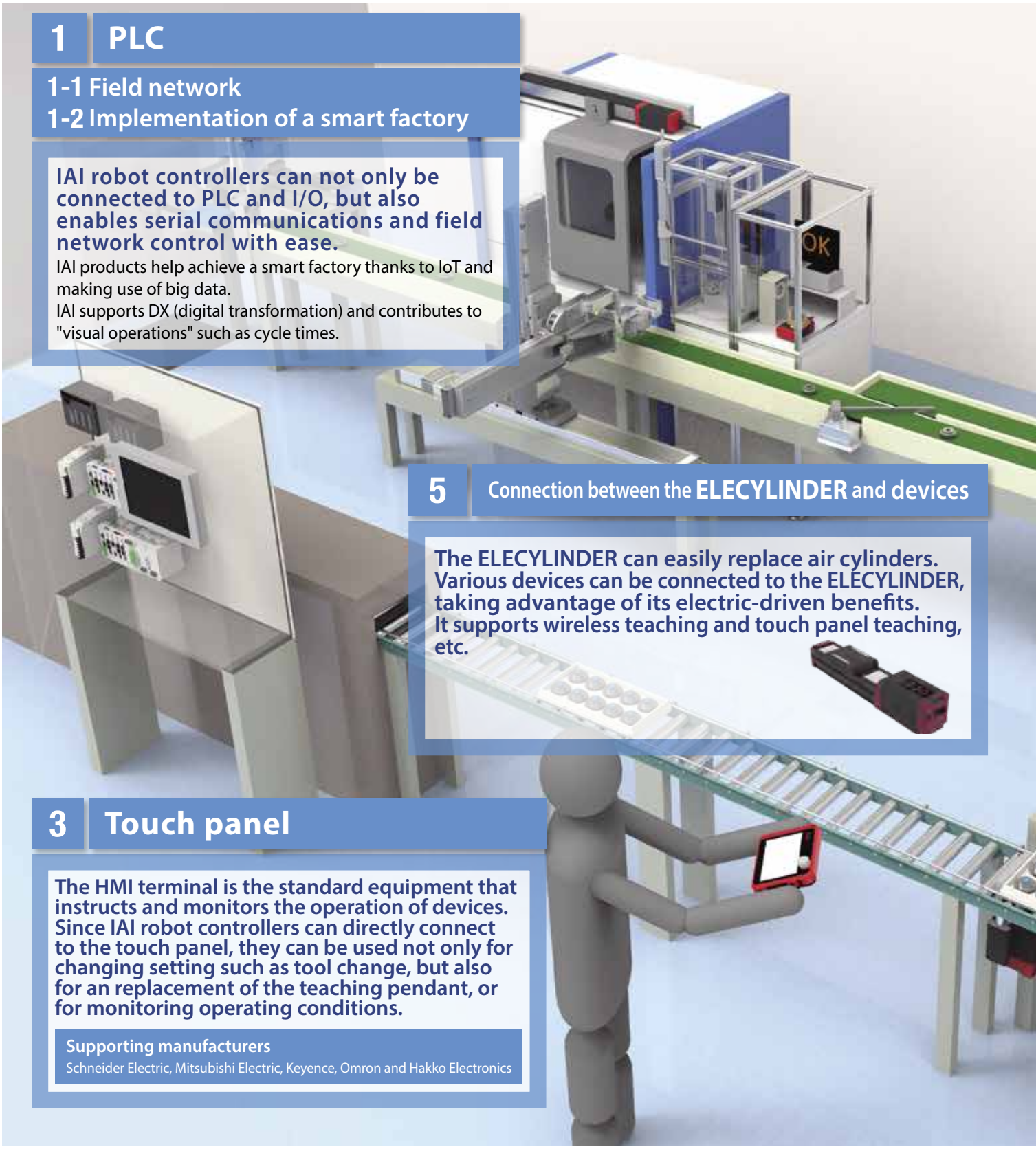
- MECHATROLINK I/II is treated as an intelligent I/O, and supports only non-synchronous communication commands.
- MECHATROLINK III is compatible with the standard servo profile.
- When controlling rotary actuators using MECHATROLINK III, indexing operations are not possible.
  Please make sure to read the "Caution on rotary selection" on P1-320.

<SSCNET Ⅲ/H>　<EtherCAT motion specification>

- When controlling rotary actuators, indexing operations are not possible.
  Please make sure to read the "Caution on rotary selection" on P1-320.

Devices that can be connected to IAI products

IAI products are connectable with various FA devices easily.



1 PLC

1-1 Field network
1-2 Implementation of a smart factory

IAI robot controllers can not only be connected to PLC and I/O, but also enables serial communications and field network control with ease.

IAI products help achieve a smart factory thanks to IoT and making use of big data.
IAI supports DX (digital transformation) and contributes to "visual operations" such as cycle times.

5 Connection between the ELECYLINDER and devices

The ELECYLINDER can easily replace air cylinders. Various devices can be connected to the ELECYLINDER, taking advantage of its electric-driven benefits. It supports wireless teaching and touch panel teaching, etc.

3 Touch panel

The HMI terminal is the standard equipment that instructs and monitors the operation of devices. Since IAI robot controllers can directly connect to the touch panel, they can be used not only for changing setting such as tool change, but also for an replacement of the teaching pendant, or for monitoring operating conditions.

Supporting manufacturers
Schneider Electric, Mitsubishi Electric, Keyence, Omron and Hakko Electronics

2 Motion network

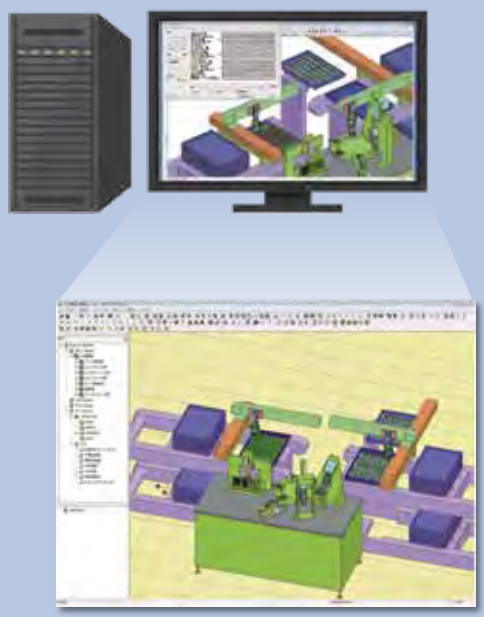
Together with the suppliers' motor drivers, IAI products can achieve motion control such as synchronized motions, interpolation motions and cam motions.

EtherCAT
SSCNET III/H
MECHATROLINK

4 3D Simulator

Simulators are increasingly used because they enable debugging in advance without producing actual devices. IAI also enables device-less debugging through OPC servers.

TAKEBISHI
DxpSERVER



Devices that can be connected to IAI products

1 Connection with PLCs

1 ▶ Field networks

IAI supports all types of networks for information control, device and sensor systems.

Information control system
to manage the whole production line.

Device system
to manage inside the device.

Sensor system
for small volume/multiple branches.

CC-Link IE Field　EtherCAT®
EtherNet/IP™　PROFINET®　MECHATROLINK
CC-Link　DeviceNet™　PROFIBUS®
CompoNet™

Controllers compatible with field networks


RCON


PCON


ACON


DCON


SCON

Field network operating modes

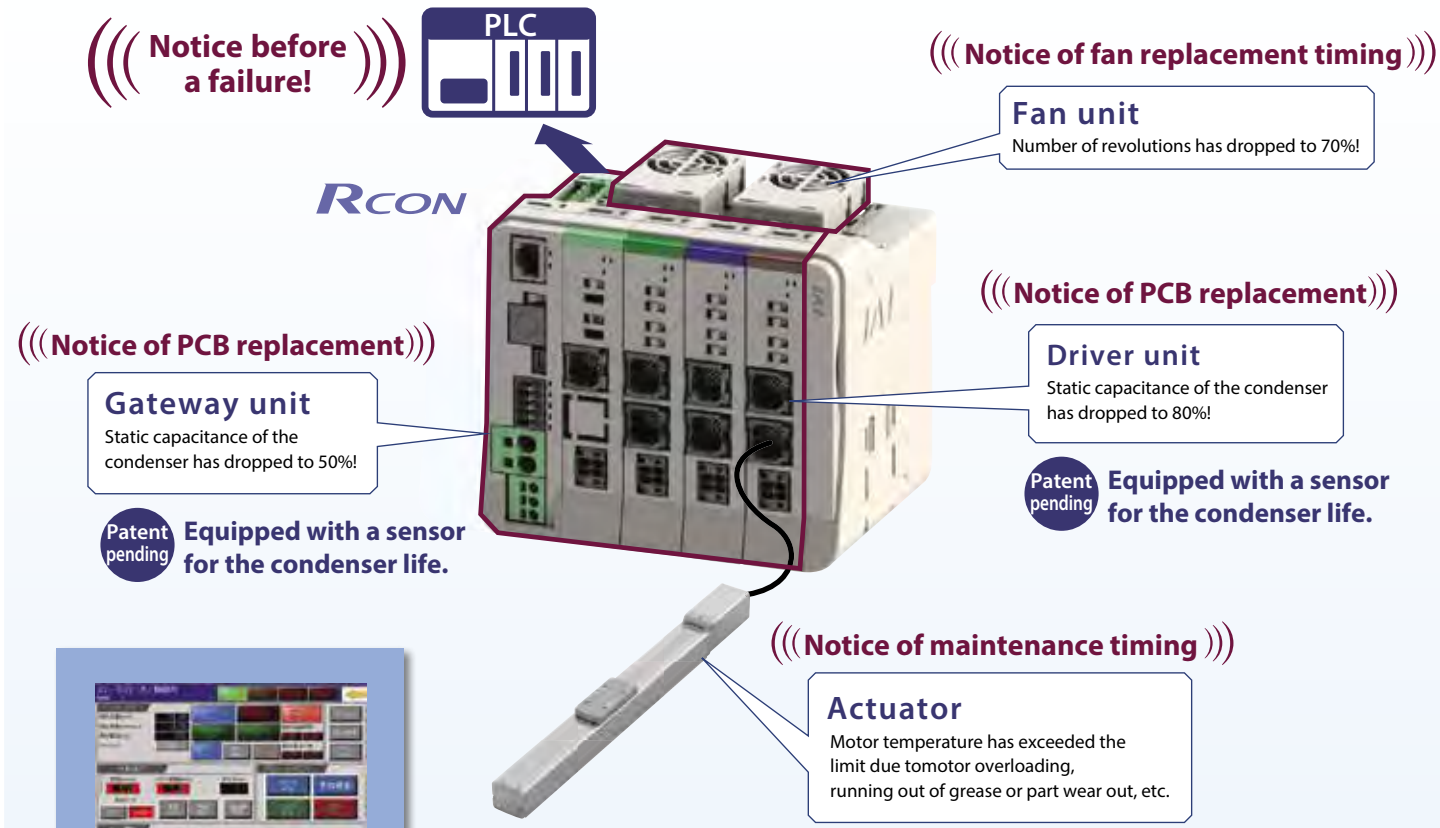
Operations are performed by writing necessary data (target position, velocity, acceleration/deceleration, push force current, etc.) from PLC to the designated address.

Operation mode	Content	Description
Direct numerical control	Target position, velocity, acceleration/deceleration and push current limit can be designated numerically. present speed ad command current value can also be monitored.	PLC → Target position, Positioning width, Speed, Acceleration, Push force %, Control signal PLC ← electric current position, electric current value (command value), present speed (command value), Alarm code, Status signal 
Position/ Simple direct numerical value	Target positions can directly be designated numerically. Other operation conditions (such as velocity and acceleration/deceleration) are to be input in the position data and used by specifying the position No.	PLC → Target position, Target position No., Control signal PLC ← Current position, Complete position No., Status signal. 
Remote IO mode	This mode operates by controlling the ON/OFF bits via network like the PIO specification.	PLC → Target position No., Control signal PLC ← Complete position No., Status signal 

* The above shows typical operating modes for IAI controllers.
* Refer to the controller chapter of the General Catalog or the Operating Manual for details.

2▶ Implementation of a smart factory

Supporting IoT by "visualization."



Example **Touch panel shows**

- Current position
- Present speed
- electric current value, etc.

- Grease replenish timing
- Part replacement timing
- Mechanical adjustment timing

and so on.

Noticed before a serious breakdown.

Necessary maintenance can be forecast in advance.

Information that can be uploaded to host unit.

The following information can be acquired from the IAI controller via network communications and Modbus.

Total number of travels	Present speed	Alarm code
Total number of travels	Current position	Input-output status of the I/O port
Total hours of fan operations	Command electric current value	Judgement result (zone signal ON/OFF)
Cumulative hours after turning on the power	Safety speed Enable/Disable	Press program judgement (servo press)
		Actual load on the loadcell (servo press)

Devices that can be connected to IAI products

2 Motion network

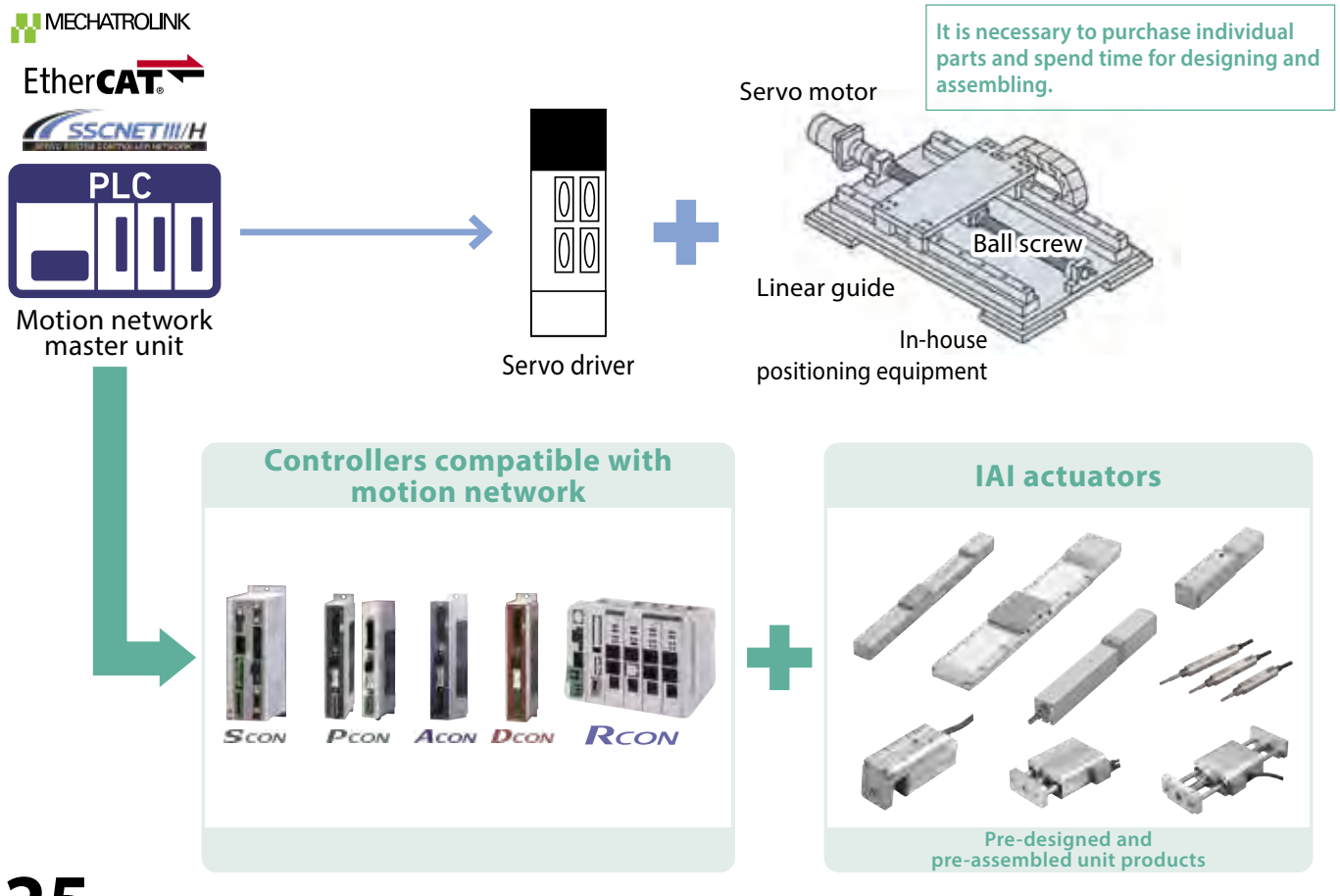
A wide variety of controllers support motion network.

Motion network

MECHATROLINK　EtherCAT　SSCNET III/H

Cost reduction for designing and assembling

Costs for designing and assembling can be reduced without changing the existing control method if the in-house positioning equipment that uses motors, ball screws and linear guides is replaced with a wide variety of IAI products.



Controllers compatible with motion network

Motion network \ Controller	RCON	SCON	PCON ACON DCON
MECHATROLINK (supports III only)	◎	◎	◎
EtherCAT	◎	◎	
SSCNET III/H	◎		

About each controller

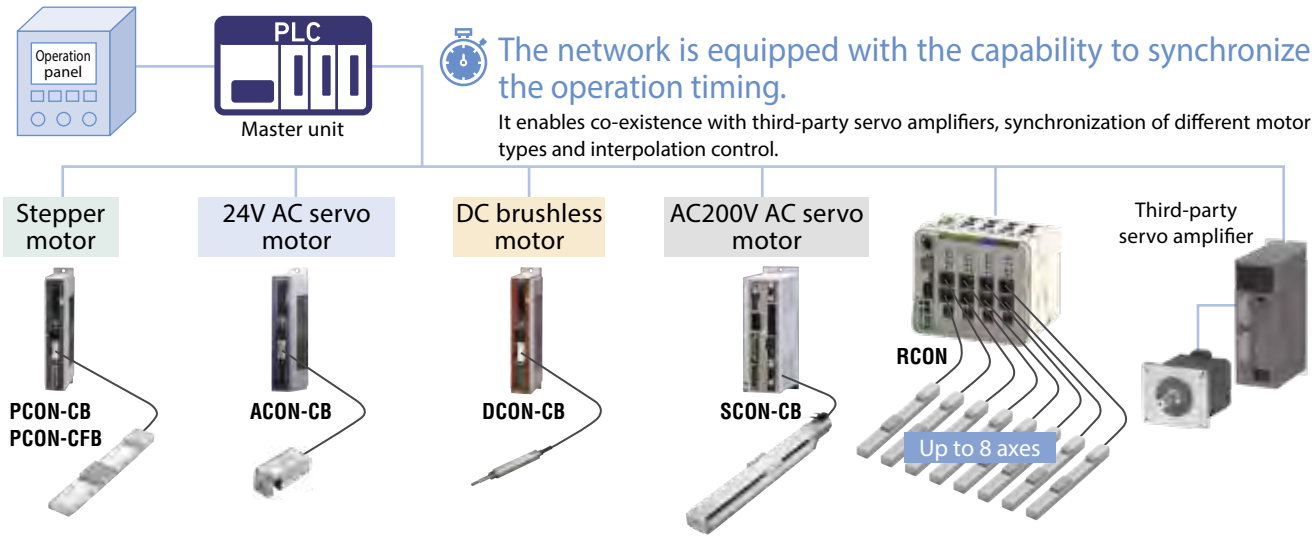
RCON
Network controller for the driver-linkage type.
Different types of drivers including stepper motor and AC servo motor can be used together.
The controller becomes compact when connecting multiple axes.

SCON
Single-axis controller for a 200V AC servo motor.

PCON·ACON·DCON
Single-axis controller for a 24V motor.
PCON is for a stepper motor, ACON for an AC servo motor and DCON for a brushless DC motor.

Note Indexing operations are not possible when controlling a rotary actuator by using MECHATROLINK III, EtherCAT motion or SSCNET III/H.

Connection image



A variety of monitoring from the PLC

IAI products can be monitored from the motion network master unit.

Position | Velocity | Electric current value, number of revolutions

It is also possible to set up various parameters.

Program resources of the control system can also be reused.
In addition to designing and assembling costs, programing costs can be reduced, too.

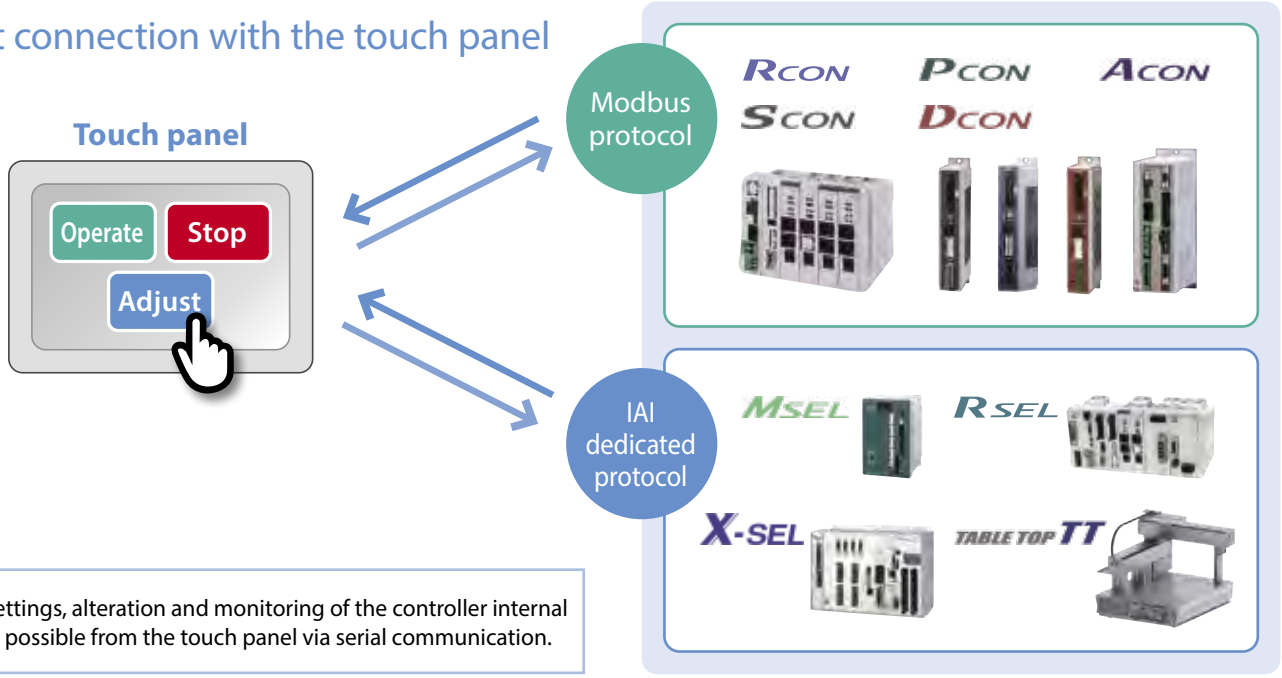
Example) Monitoring of position, velocity and electric current value by SysmacStudio (made by OMRON).

Devices that can be connected to IAI products

3 Connection with the touch panel

1 ▶ Connection method

Direct connection with the touch panel



Direct settings, alteration and monitoring of the controller internal data are possible from the touch panel via serial communication.

● Refer to each third-party's website for connectable products.

Specific example

Example Testing equipment

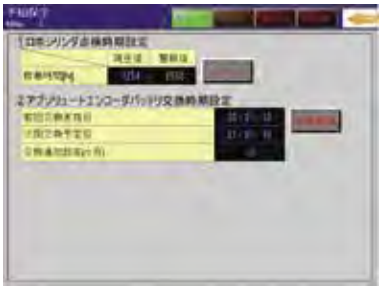
Display and control are integrated into one

LT4000M series

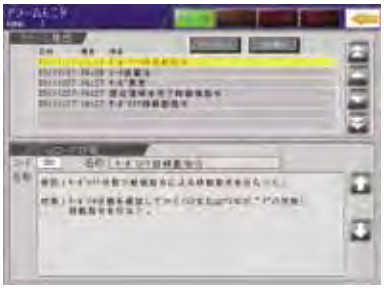
A simple configuration can be achieved thanks to the built-in I/Os in the screen that enables connections with various devices.

Status monitor

Preventive maintenance



Alarm code monitor

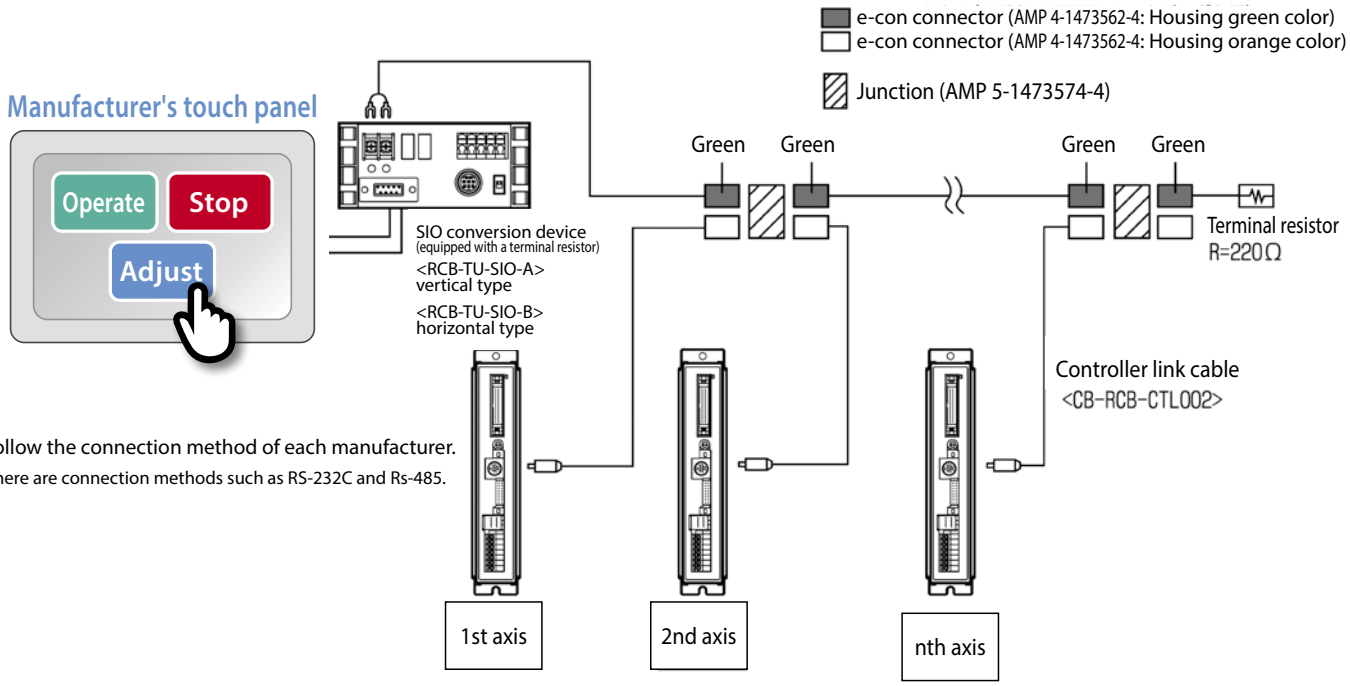


2▶ Compatible manufacturers (direct connection with the touch panel)

Manufacturer	Supporting touch panel series name	Applicable controller	Template screen
Scheider Electric	SP5000 GP4000 LT4000M LT3000	RCON, PCON, ACON, SCON	
		RSEL, XSEL, ASEL, PSEL, SSEL, TTA	
		EC	
Omron	NS	PCON, ACON, SCON	
Mitsubishi Electric	GOT2000 GOT1000	PCON, ACON, SCON	
		XSEL, ASEL, PSEL, SSEL	
	GOT2000 GT27/25	EC	
Keyence	VT5 VT3	PCON, ACON, SCON	
		XSEL, ASEL, PSEL, SSEL, TTA	
Hakko electronics	V9 TS2060	PCON, ACON, SCON	
		XSEL, ASEL, PSEL, SSEL	

- Template screen examples can be downloaded from each manufacturer's website.
- Refer to each manufacturer's website for connectable models.

Basic connection example (for multiple axis connection)



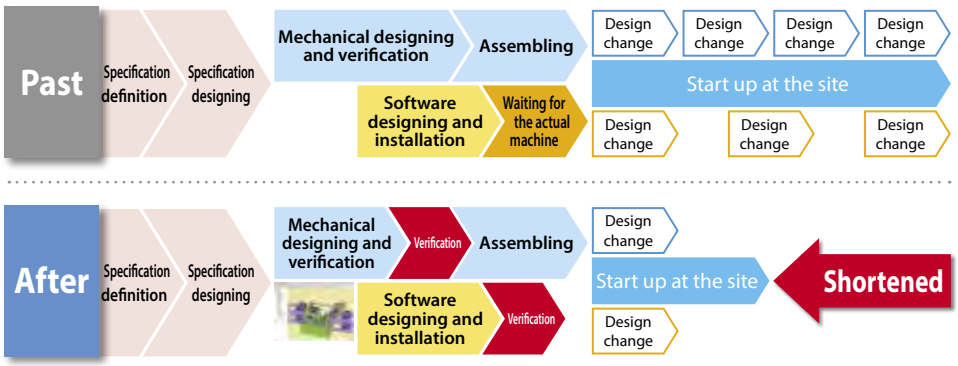
- Follow the connection method of each manufacturer.
  There are connection methods such as RS-232C and Rs-485.

Devices that can be connected to IAI products

4 Connection with the 3D simulator

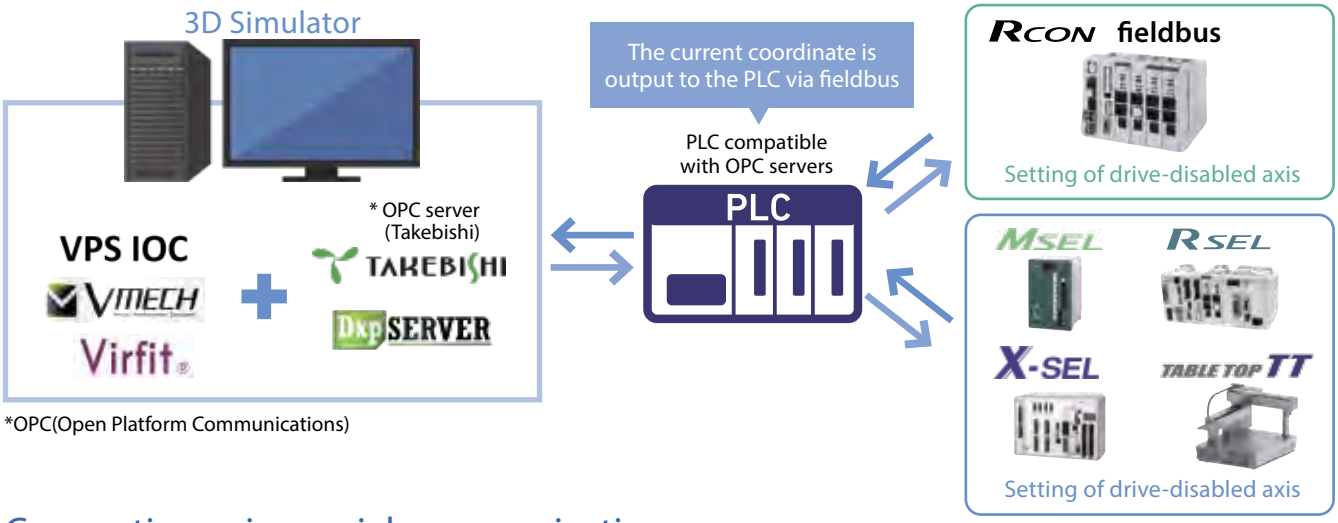
Reduced work for control software developers

■ In-advance verification using the virtual mechanism made of a 3D CAD model is possible.
■ It is possible to shorten the lead time for manufacturing and to reduce man-hour for reworking.



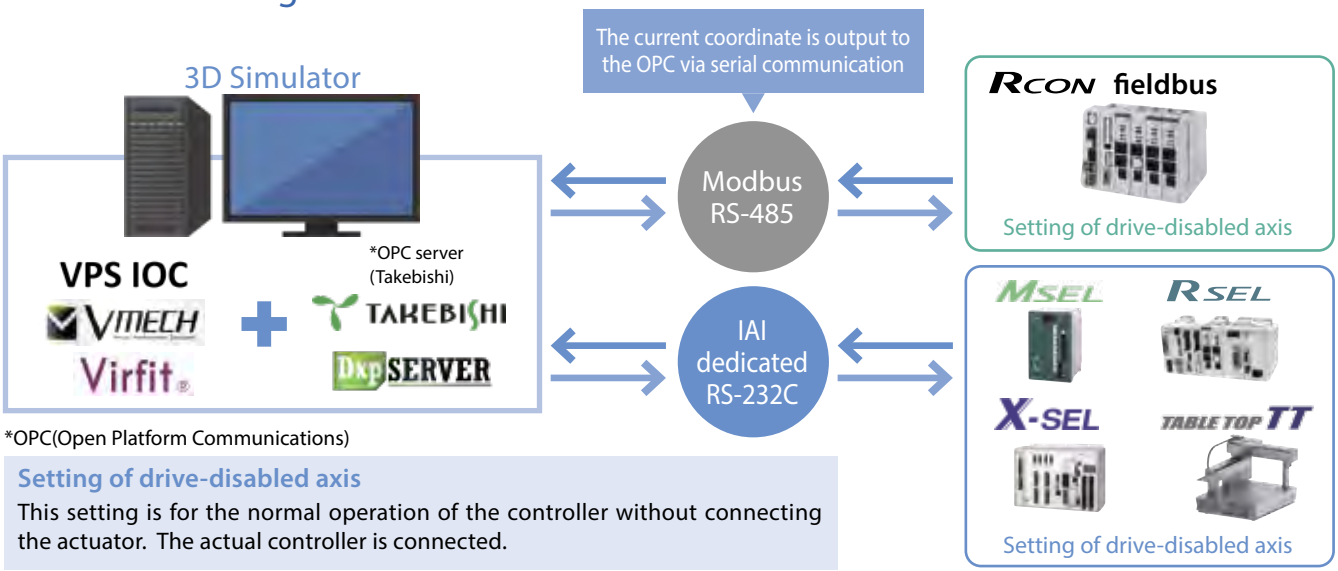
It supports the 3D simulator via Takebishi's OPC server.
The 3D simulator shortens adjustment time for the actual machine.

Connection using field networks



*OPC(Open Platform Communications)

Connection using serial communication



*OPC(Open Platform Communications)

Setting of drive-disabled axis
This setting is for the normal operation of the controller without connecting the actuator. The actual controller is connected.

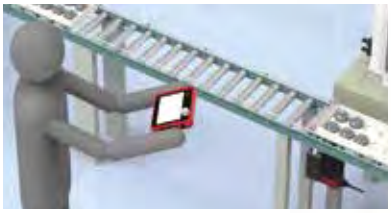
5 Connection between an **ELECYLINDER** and devices

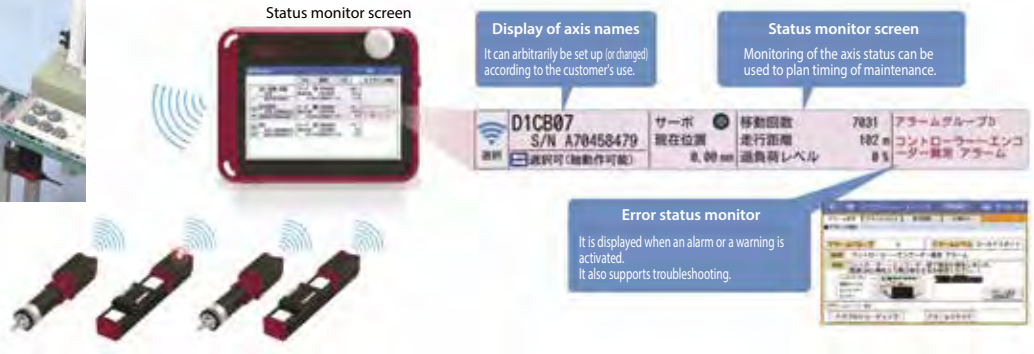
Connection with field networks

I/O signals can be transmitted via network to operate the **ELECYLINDER**.

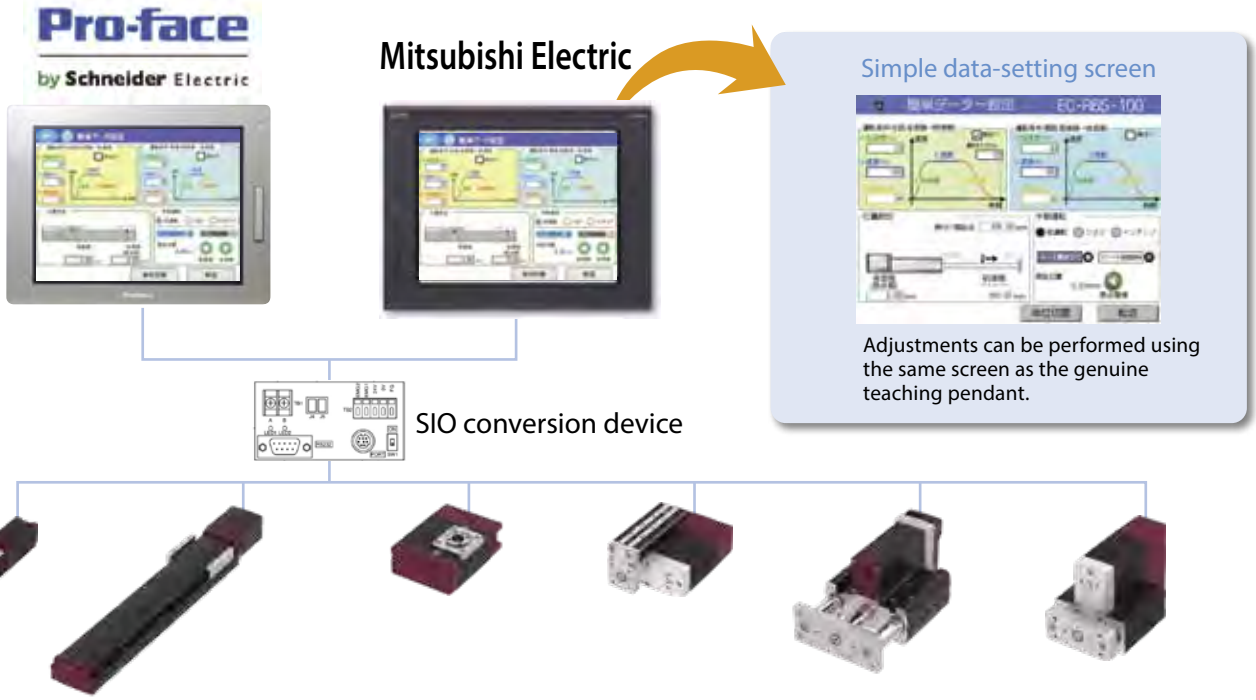
Wireless teaching

Wireless setting is possible. It is possible to set up and adjust the ELECYLINDER that is installed in high or narrow places.





Direct connection between the touch panel and **ELECYLINDER**



● Refer to each third-party's website for connectable products.

Safety Category Compliant Types

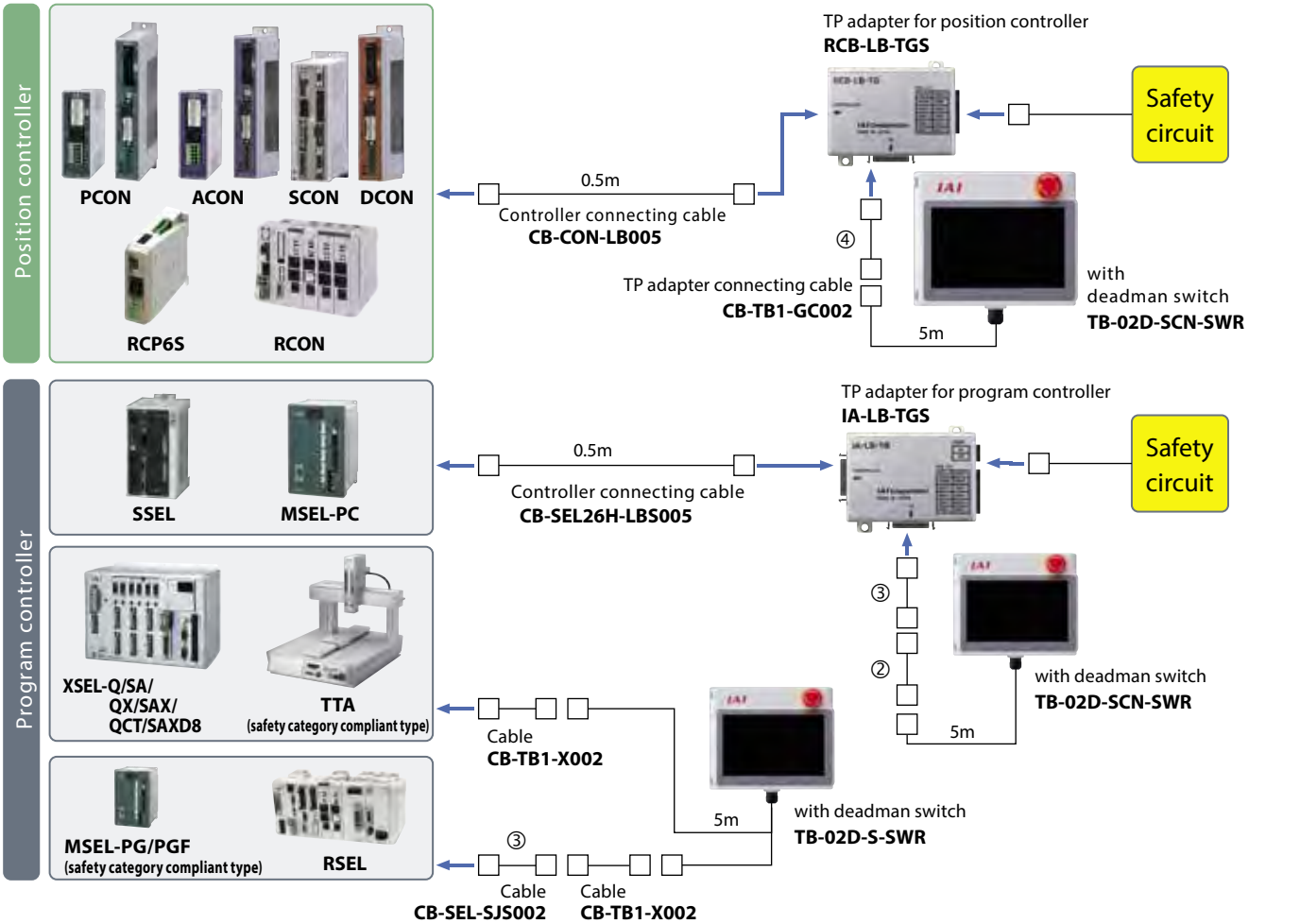
<Compliance of controllers with the Safety category>

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 can be achieved.

Controller type	Safety category	ISO standard
RCP6S	B~4	ISO13849-1
RCON-GWG	B~4	
PCON-CB/CGB/CFB/CGFB	B~4	
ACON-CB/CGB	B~4	
DCON-CB/CGB	B~4	
SCON-CB/CGB	B~4	
RSEL-G	B~4	
SSEL-CS	B~4	
MSEL-PC/PG/PGF	B~4	
XSEL-Q/SA/QX/SAX/QCT/SAXD8	B~4	
TTA	B~4	

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

*1 Compliant with Category 4 when the dummy plug is attached.



MEMO

MEMO

R-unit Selection method

Make sure that the connecting actuator is compatible with the R-unit.

Make sure that the applicable controllers of the selected actuator include the R-unit (RCON/RSEL).

Applicable controller

Actuators shown in this page can be operated by the following controllers. Select a type that is suitable for the use.

Name	External view	Max. connectable axes	Power supply voltage	Control method													Max. positioning points	Reference page
				Positioner	Pulse train	Program	Network * select											
							DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT	SSN	ECM	
MSEL-PC/PG		4	Single phase AC100-230V	–	–	●	●	●	–	●	–	–	–	●	●	●	–	–	30000 (768 for network specification)	8-259
PCON-CB/CGB		1	DC24V	● * Select	● * Select	–	●	●	●	●	●	●	●	●	●	●	–	–	512	8-153
PCON-CYB/PLB/POB		1		● * Select	● * Select	–	–	–	–	–	–	–	–	–	–	–	–	–	64	8-179
RCON		16 (8 for ML3, SSN, ECM)		–	–	–	●	●	●	●	–	–	●	●	●	●	●	●	128 (No position data for ML3, SSN, ECM)	8-47
RSEL		8		–	–	●	●	●	●	●	–	–	–	●	●	●	–	–	36000	8-49

Or, make sure that the below mentioned notes are specified.

(Note) Refer to P8-17 for abbreviated network such as DV and CC.

(Note) An extension unit (RCON-EXT) and SCON are necessary for connection with the R-unit (RCON/RSEL).

When an ELECYLINDER is connected, select a unit under the following conditions.

- If the ELECYLINDER controls everything via field network: Select REC.
- If control is performed together with actuators other than ELECYLINDER: Select RCON.

Note

- Refer to P8-90 for actuators that are not connectable.

Select a control method from the three mentioned below !

Confirm the control method and the maximum connectable axes, and check the selection page of each unit.

Positioner type
Max. connectable axes: 16 axes
RCON
〉〉〉 Go to P8-35

Program type
Max. connectable axes: 8 axes
RSEL
〉〉〉 Go to P8-39

Unit dedicated to ELECYLINDER
Max. connectable axes: 16 axes
REC
〉〉〉 Go to P8-43

RCON Selection method

Step 1 Step 2 Step 3 Step 4

Selection is to be made according to Steps 1 to 4.

Step 1 Selection of the master unit

Select the type, field network and option to determine the RCON master unit model.

Master unit model

RCON – [ ] – [ ] – [ ]

Series | Type | I/O | Option

Type	
GW	Standard type
GWG	Safety category compatible type

I/O	
DV	DeviceNet
CC	CC-Link
CIE	CC-Link IE Field
PR	PROFIBUS-DP
EC	EtherCAT
ECM	EtherCAT Motion
EP	EtherNet/IP
PRT	PROFINET IO
ML3	MECHATROLINK-III
SSN	SSCNET III /H

Option	
ET	with ET Ethernet
FU□	Equipped with fan unit(□: specify the number from 1 to 8)
TRN	Without terminal unit

Note

- The number of maximum connectable axes differs depending on the I/O type. Refer to P8-109 for details.
- The number of fan units to be installed is one half of the total number of the 24V driver units that are selected in Step 2. If the total number of 24V driver units is an odd number, add "1."
- When selecting RCON-SC-1 at Step 2, choose "without terminal unit."

Step 2 Selection of driver unit model

Selection of the unit model to be connected to the actuator.
The connecting unit differs according to the motor type.

Driver unit model

RCON – [Type] – [Number of axes]

Series

Type	
PC	Stepper motor
PCF	High-thrust stepper motor
AC	AC servo motor
DC	DC brushless motor
SC	200V AC servo motor

* Type: SC is equipped standard with a fan unit.

Number of axes	
1	1-axis spec.
2	2-axis spec.

* Type: PCF and SC can selected only 1-axis.

Type		Motor type	
24V specification	PC	20P	20□stepper motor
		20SP	20□stepper motor (for RA*C)
		28P	28□stepper motor
		35P	35□stepper motor
		42P	42□stepper motor
		42SP	42□stepper motor (for RCP4-RA5C)
		56P	56□stepper motor
	PCF	56SP	56□high-thrust type stepper motor
		60P	60□high-thrust type stepper motor
		86P	86□high-thrust type stepper motor
	AC	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
	DC	3D	2.5W DC brushless motor
200V specification	SC	60	60W servo motor
		100	100W servo motor
		100S	100W servo motor (for LSA)
		150	150W servo motor
		200	200W servo motor
		200S	200W servo motor (for LSA and DD)
		300S	300W servo motor (for LSA)
		400	400W servo motor
		600	600W servo motor
		750	750W servo motor

When selecting a driver unit (RCON-SC-1), select one unit of apower unit.

* Supplied with a terminal unit.select one unit of apower unit.
Equipped standard with a fan unit.

Power unit model

RCON – **PS2** – **3**

Series Type Power supply voltage

Power supply voltage	
3	3-phase/Single phase 200V

CHECK!

Confirmation method of the motor type

<Product page>

RCS4-SA4C

■ Model Specification Items

RCS4	- SA4C	- WA	- 60
Series	Type	Encoder type: WA Battery-less absolute	Motor Type: 60 Servo motor 60W

When connecting an actuator of simple absolute specification, select a simple absolute unit.

* Refer to P8-61 for details of the simple absolute unit.

Simple absolute unit model

RCON – **ABU** – [Type]

Series Absolute unit Type

Type	
P	Stepper motor
A	AC servo motor

When connecting an ELECYLINDER, select an EC connection unit.
Up to 4 axes can be connected to one unit.

EC connection unit model

RCON – **EC** – **4**

Series Type Number of axes

RCON Selection method

Step 3 Model selection of the expansion unit

When connecting an actuator using an expansion unit, select the following unit and SCON controller.

* See P8-62 for details.

Expansion unit model

RCON – EXT

Series: RCON
Expansion: EXT = SCON expansion

SCON controller model

SCON – [Type] – [Motor type] [Encoder type] [Option] – **RC** – **0** – [Power supply voltage]

Refer to P8-217 for model selection items.

Step 4 Confirming the power supply capacity (connectability check)

Make sure that all the actuators selected can be connected to one system by calculating each power capacity.

❶ Control power capacity

Make sure that the total power capacity of each unit selected and the ELECYLINDER is less than the electric current limit value.

* Refer to P8-92 for the power capacity.

Item	Electric current limit value
Control power	Less than 9.0A

❷ Motor power capacity

Make sure that the total electric current value of selected actuators (motors) connected to the 24V driver unit is less that the limit value.

* Refer to P8-92 for the electric current value for each motor..

Item	Electric current limit value
Motor power	Less than 37.5A

❸ Motor wattage

Make sure that the total wattage of the actuators connected to the 200V driver unit is less than the total wattage of the maximum connectable axes.

* Calculate the wattage value of each actuator motor type.

Item		Total wattage of the maximum connectable axes
Motor power capacity	Single-phase AC200V	1,600W
	Three-phase AC200V	2,400W

When all the values are under the limit, "Selection is complete." Order the units you selected in steps 1 to 3.

RSEL Selection method

Step 1 Step 2 Step 3 Step 4

Selection is to be made according to Steps 1 to 4.

Step 1 Selection of the master unit

Select the type, field network and option to determine the RSEL master unit model.

Master unit model

RSEL – G – [ ] – [ ] – [ ]

Series – Type – I/O – I/O cable length – Option

I/O	
E	Not used
NP	PIO specification (NPN 16/16)
PN	PIO specification (PNP 16/16)
DV	DeviceNet
DV2	DeviceNet (with 2-way connector)
CC	CC-Link
CC2	CC-Link (with 2-way connector)
CIE	CC-Link IE Field
PR	PROFIBUS-DP
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

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

* When an I/O type other than PIO specification is selected, it will be "0 (no cable)."

Option	
FU☐	Equipped with fan unit(☐ : specify the number from 1 to 5)
TRN	Without terminal unit

Note

- The number of fan units to be installed is one half of the total number of the 24V driver units that is selected in Step 2. If the total number of 24V driver units is an odd number, add "1."
- When selecting RCON-SC-1 in Step 2, choose "without terminal unit."

Step 2 Selection of driver unit model

Selection of the unit model to be connected to the actuator.
The connecting unit differs according to the motor type.

Driver unit model

RCON – [ ] – [ ]

Series / Type / Number of axes

PC	Stepper motor
PCF	High-thrust stepper motor
AC	AC servo motor
DC	DC brushless motor
SC	200V AC servo motor

* Type: SC is equipped standard with a fan unit.

1	1-axis spec.
2	2-axis spec.

* Type: PCF and SC can selected only 1-axis.

Type		Motor type	
24V specification	PC	20P	20□stepper motor
		20SP	20□stepper motor (for RA*C)
		28P	28□stepper motor
		35P	35□stepper motor
		42P	42□stepper motor
		42SP	42□stepper motor (for RCP4-RA5C)
		56P	56□stepper motor
	PCF	56SP	56□high-thrust type stepper motor
		60P	60□high-thrust type stepper motor
		86P	86□high-thrust type stepper motor
	AC	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
	DC	3D	2.5W DC brushless motor
200V specification	SC	60	60W servo motor
		100	100W servo motor
		100S	100W servo motor (for LSA)
		150	150W servo motor
		200	200W servo motor
		200S	200W servo motor (for LSA and DD)
		300S	300W servo motor (for LSA)
		400	400W servo motor
		600	600W servo motor
		750	750W servo motor

When selecting a driver unit (RCON-SC-1), select one unit of apower unit.

* Supplied with a terminal unit.select one unit of apower unit.
Equipped standard with a fan unit.

Power unit model

RCON – PS2 – 3

Series / Type / Power supply voltage

3	3-phase/Single phase 200V

CHECK!

Confirmation method of the motor type

<Product page>

RCS4-SA4C

■ Model Specification Items

RCS4	SA4C	WA	60
Series	Type	Encoder type	Motor Type
		WA: Battery-less absolute	60: Servo motor 60W

When connecting an actuator of simple absolute specification, select a simple absolute unit.

* Refer to P8-68 for details of the simple absolute unit.

Simple absolute unit model

RCON – ABU – [ ]

Series / Absolute unit / Type

P	Stepper motor
A	AC servo motor

RSEL Selection method

Step 3 Model selection of the expansion unit

When connecting an actuator using an expansion unit, select the following unit and SCON controller.

* See P8-69 for details.

Expansion unit model

RCON – [ ] – [ ]

Series / Expansion / II/O cable length

EXT	SCON expansion
EXT-NP	EXT-NP PIO/SIO/SCON expansion (NPN specification)
EXT-PN	EXT-PN PIO/SIO/SCON expansion (PNP specification)

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

* In case the SCON expansion (EXT) is selected, it is not needed to select this.

SCON controller model

SCON – [ ] – [ ] [ ] [ ] – **RC** – **0** – [ ]

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

Refer to P8-217 for model selection items.

When I/O points are to be expanded, select the following unit.

* See P8-69 for details.

PIO unit model

RCON – [ ] – [ ]

Series / Expansion / I/O cable length

NP	PIO (NPN specification)
PN	PIO (PNP specification)

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

Step 4 Confirming the power supply capacity (connectability check)

Make sure that all the actuators selected can be connected to one system by calculating each power capacity.

❶ Control power capacity

Make sure that the total power capacity of each unit selected is less that the electric current limit value.

* Refer to P8-92 for the power capacity.

Item	Electric current limit value
Control power	Less than 9.0A

❷ Motor power capacity

Make sure that the total electric current value of selected actuators (motors) connected to the 24V driver unit is less that the limit value.

* Refer to P8-92 for the electric current value for each motor..

Item	Electric current limit value
Motor power	Less than 37.5A

❸ Motor wattage

Make sure that the total wattage of the actuators connected to the 200V driver unit is less than the total wattage of the maximum connectable axes.

* Calculate the wattage value of each actuator motor type.

Item		Total wattage of the maximum connectable axes
Motor power capacity	Single-phase AC200V	1,600W
	Three-phase AC200V	2,400W

When all the values are under the limit, "Selection is complete." Order the units you selected in steps 1 to 3.

REC Selection method

Step 1 — Step 2 — Step 3

Selection is to be made according to Steps 1 to 3.

Step 1 Selection of the master unit

Select the type, field network and option to determine the REC master unit model.

Master unit model

REC – GW – ☐

Series — Type — I/O type

DV	DeviceNet
CC	CC-Link
CIE	CC-Link IE Field
PR	PROFIBUS-DP
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

Step 2 Selection of EC connection unit

Determine the number of EC connection units.
Up to 4 axes can be connected to one unit.

EC connection unit model

RCON – EC – 4

Series — Type — Number of axes

Step 3

Confirming the power supply capacity (connectability check)

Make sure that all the ELECYLINDER selected can be connected to one system by calculating each power capacity.

❶ Control power capacity

Make sure that the total electric current value of each unit connected to REC and the ELECYLINDER is less than the electric current limit value.

* Refer to P8-92 for the power capacity.

Item	Electric current limit value
Control power	Less than 9.0A

❷ Motor power capacity

Make sure that the total electric current value of ELECYLINDERs (motors) connected to the EC connection unit is less than the limit value.

* Refer to P8-92 for the electric current value for each motor..

Item	Electric current limit value
Motor power capacity	Less than 37.5A

When all the values are under the limit, "Selection is complete." Order the units you selected in steps 1 to 2.

R-unit

Unit-linkage type controller

CE RoHS 10 c UL us (*1)

(*1) Acquisitions depend on the model. See P8-88 to -90 for details.

Positioner Type

RCON

R-unit

Program Type

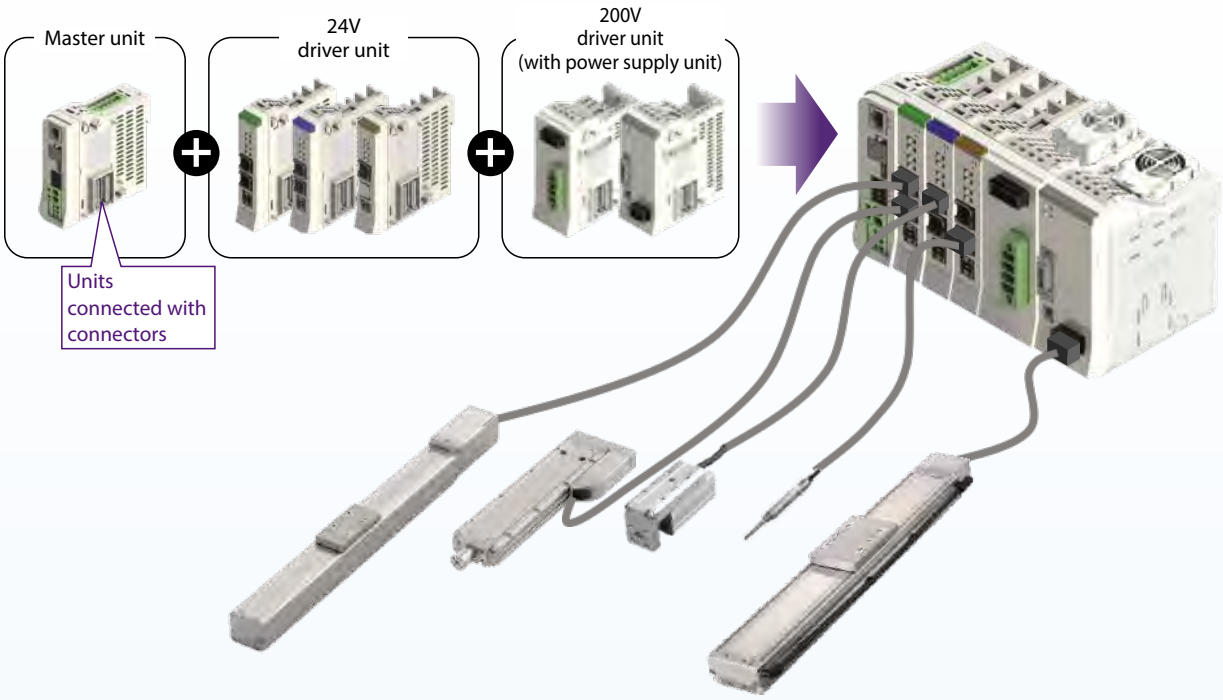
RSEL

ELECYLINDER Drive Unit

REC

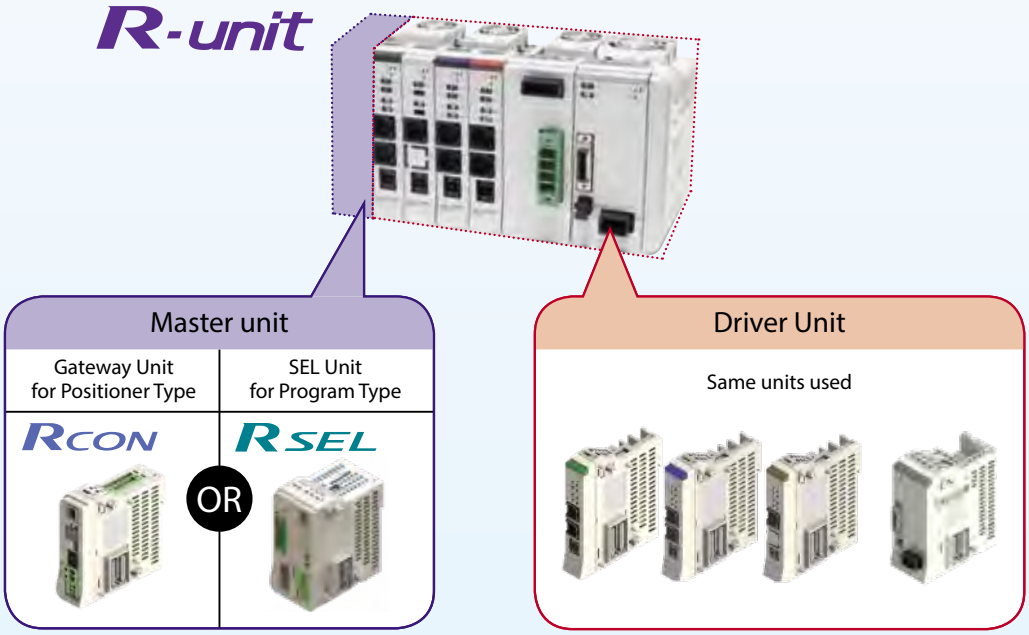
Unit-connecting controllers support a wide array of combinations!

Combine a driver unit with the exact number of required axes for a more compact controller and reduced installation space.
This allows for mixed control of an actuator with both a 24V motor and 200V motor.



Use the same driver units

The system can be changed just by switching out the master unit based on the control method.
This allows the same driver units to be used.

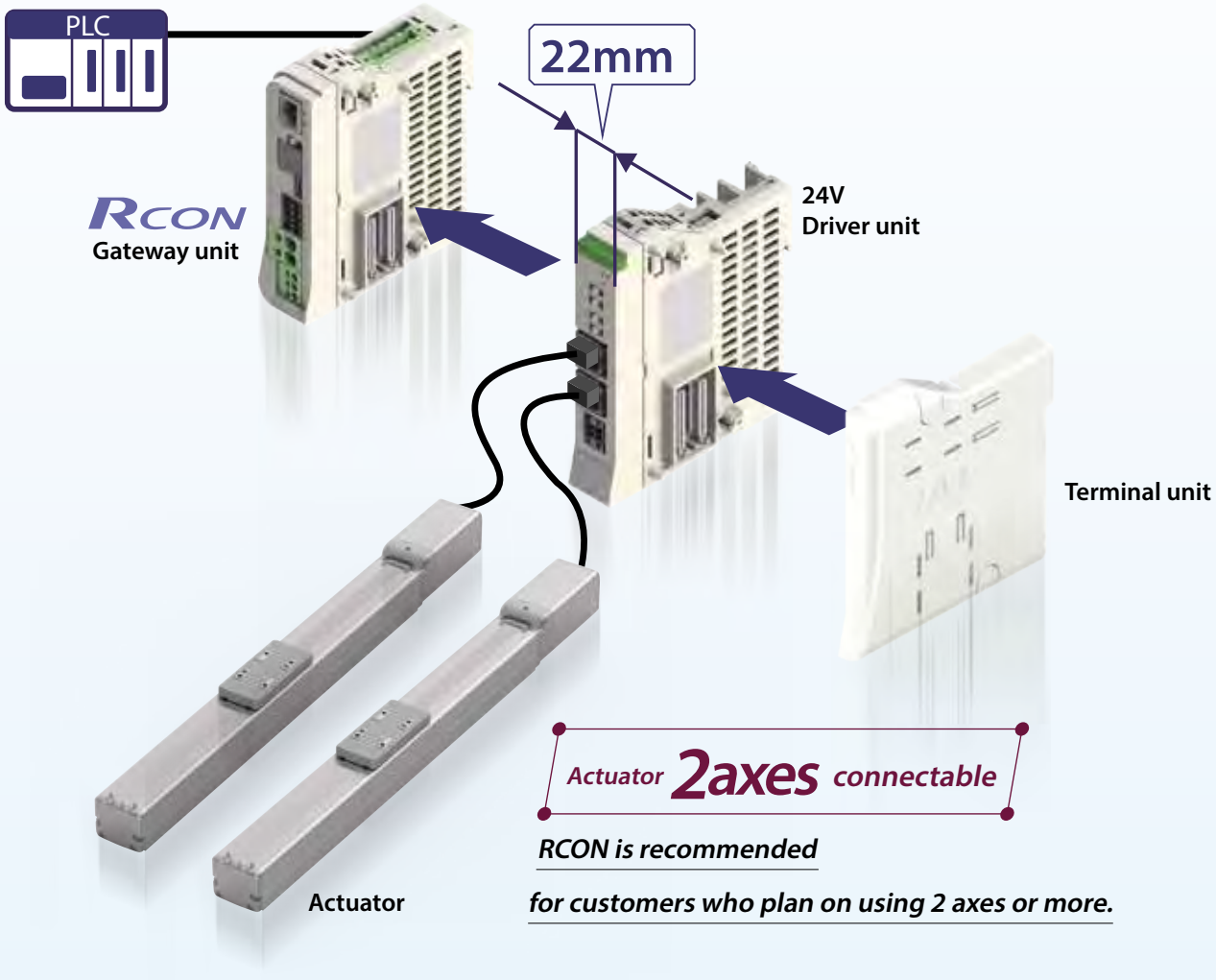


Saves space inside the control panel

RCON

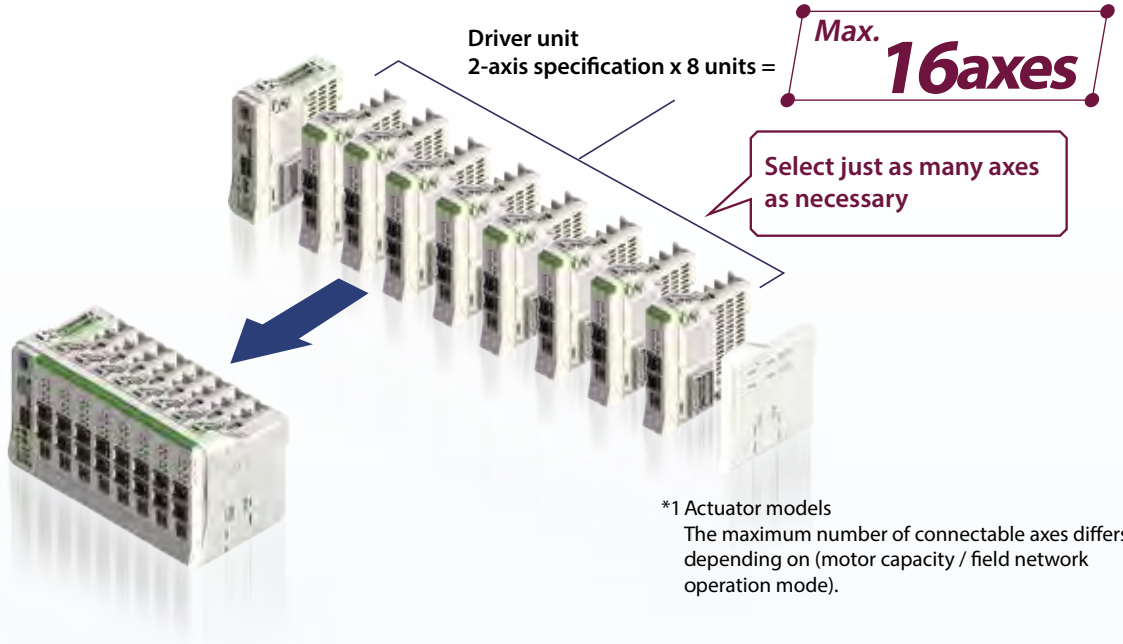
RCON is recommended for actuators with two axes or more.

Up to 2 axes of actuators can be connected to one driver unit with 22mm width, making it ideal for saving space in the control panel.



Up to 16 axes*1 of actuators can be connected.

There will be no wasted space as only the necessary driver units will be added.



*1 Actuator models
The maximum number of connectable axes differs depending on (motor capacity / field network operation mode).

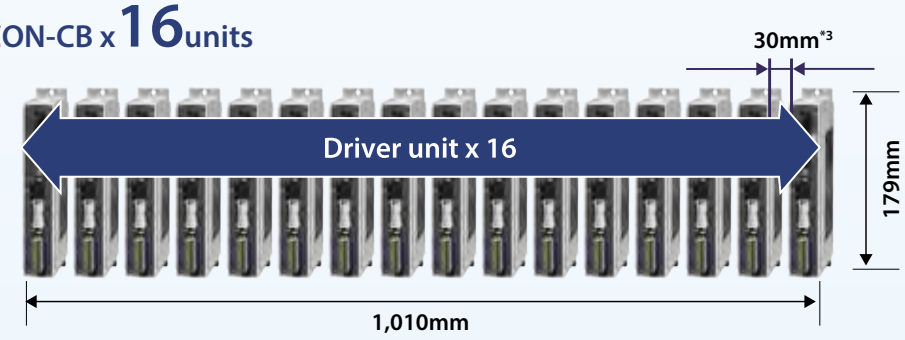
Saves up to 85%*2 of control panel space and reduces costs by as much as 60%.

*2 IAI product comparison

Up to about 85% of control panel space can be saved,
compared with models that connect a 1-axis actuator to a single driver unit.

The conventional type ([Comparison example] below) requires network options installed to match the number of controllers.
RCON can control driver units for up to 16 axes of actuators with a single gateway,
allowing cost reductions up to 60%. It is especially recommended when using multiple axes.

PCON-CB x 16units



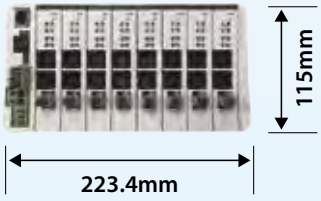
PCON-CB
CC-Link specification x 16 units

*3 Minimum distance required for natural heat dissipation of the controller

60% cost reduction

RCON x 16-axis connection specification

85% Space saving

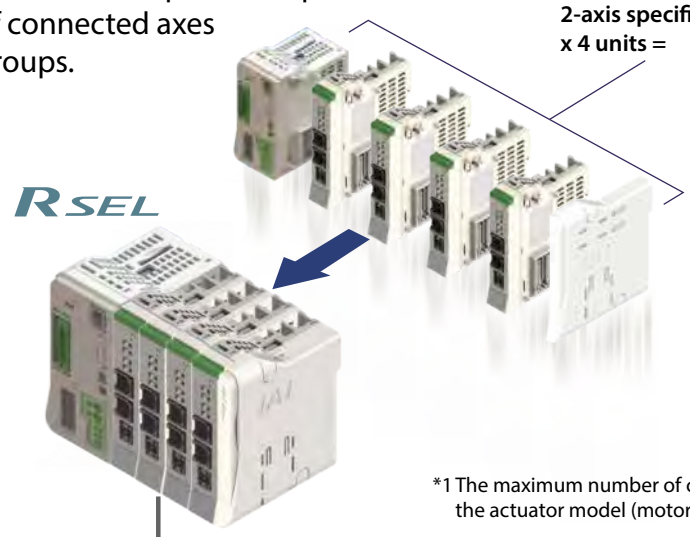


RCON
CC-Link specification
stepper motor 16 axes

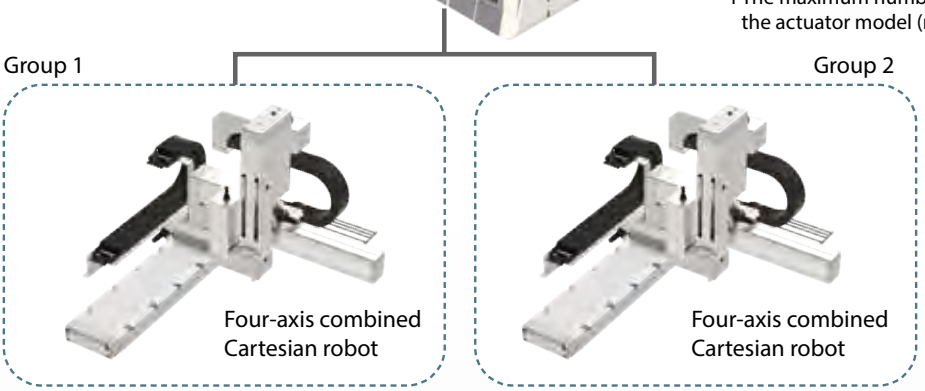
RSEL

Compact program controller that connects up to 8 axes*1 of actuators

Supports both linear and arc interpolation operations.
Also allows control of connected axes to be split into two groups.



*1 The maximum number of connectable axes differs depending on the actuator model (motor capacity).

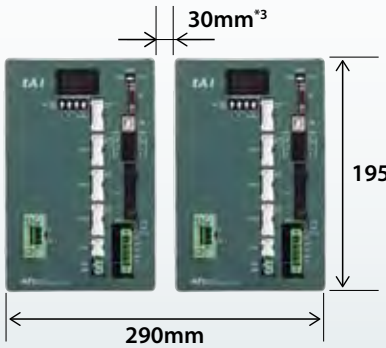


Max. 67%*2 space savings inside the control panel

*2 IAI product comparison

Up to about 67% of control panel space can be saved,
compared with models that connect a 4-axis actuator to a single driver unit.

MSEL x2units (8-axis connection)

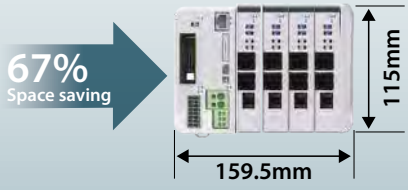


MSEL
CC-Link specification
8 axes (4 axes x 2 units)

44% cost reduction

*3 Minimum distance required for natural heat dissipation of the controller

RSEL x8-axis connection specification

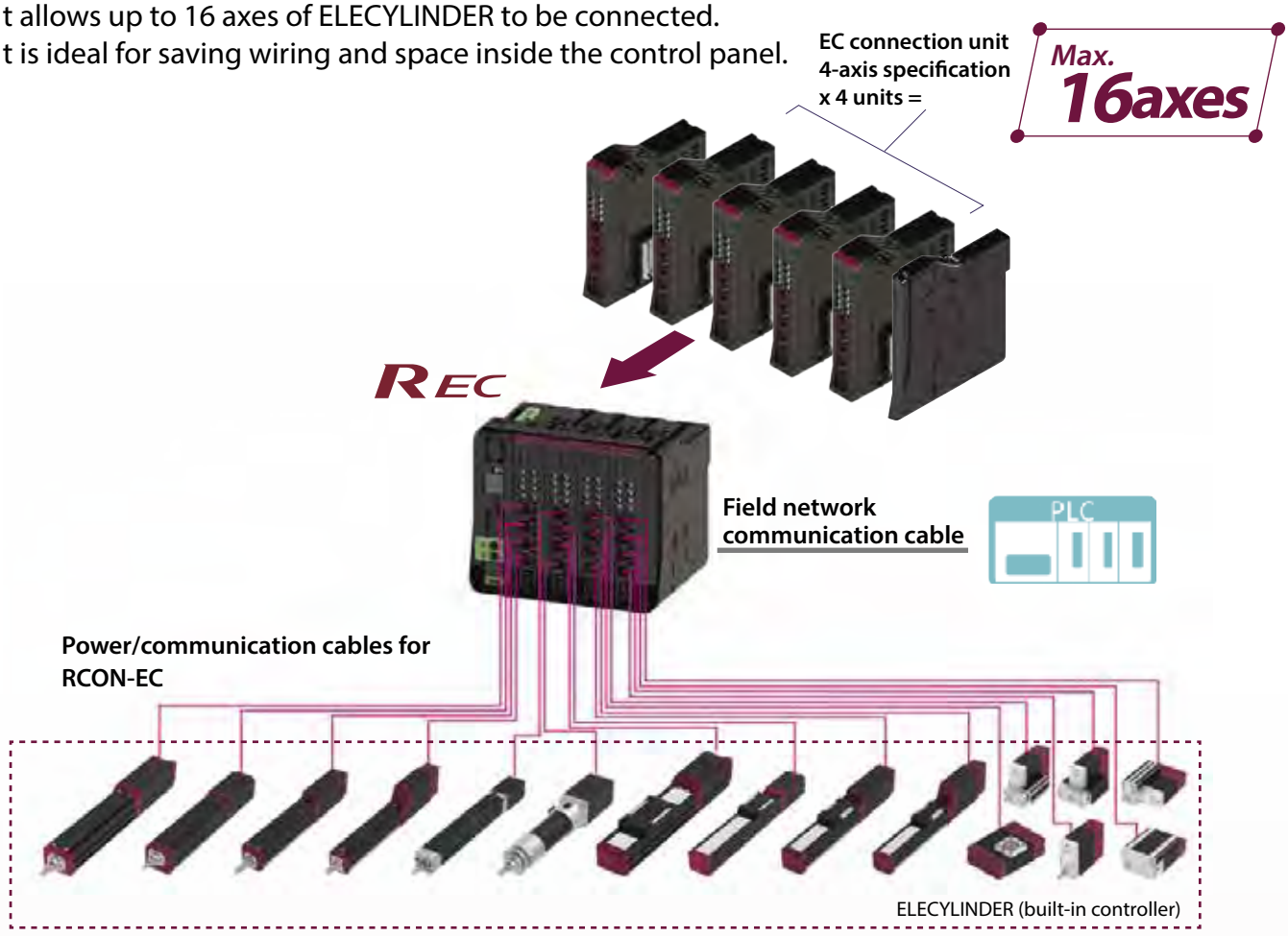


RSEL
CC-Link specification
stepper motor 8 axes

REC

Connect ELECYLINDER to a field network

This field network connection unit is specifically for use with ELECYLINDER.
It allows up to 16 axes of ELECYLINDER to be connected.
It is ideal for saving wiring and space inside the control panel.



EC connection unit can be connected with other driver units connected to RCON

Connect to RCON to allow mixed connections with ROBO Cylinder and single axis robots.

Seven high-performance functions that only IAI is capable of delivering

High function1 Compatibility: No.1 in the industry with nine field network types supported

IAI controller can be connected to various field networks as remote I/O station.

* Connectable networks differ depending on the series.

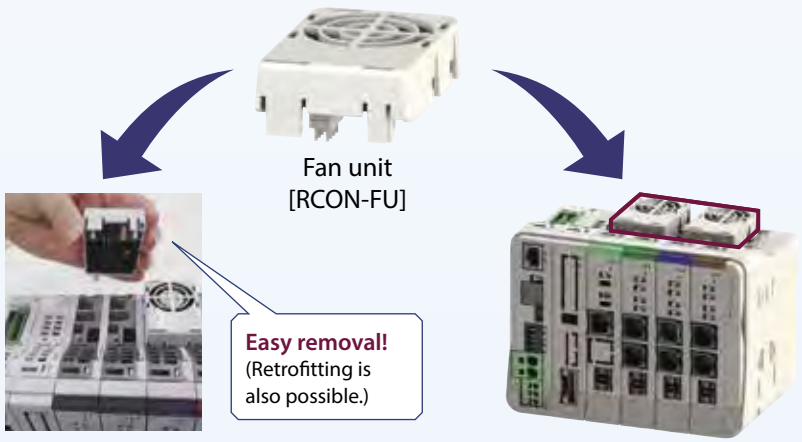
CC-Link CC-Link IE Field DeviceNet EtherNet/IP EtherCAT PROFIBUS PROFINET MECHATROLINK SSCNETIII/H SERVO SYSTEM CONTROLLER NETWORK

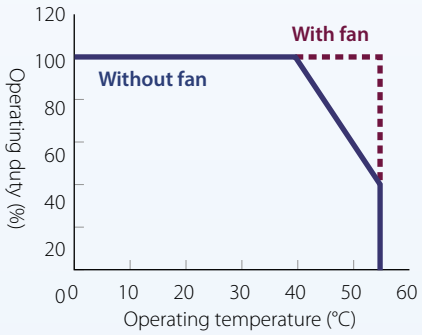
High function2 Supports controller installation environment temperatures of 0 ~ 55°C

Install the optional fan unit to enable use in environments of 0 to 55°C without lowering actuator operating duty ratio. (One fan is required for each SEL unit and for every two 24V driver units.)
A fan unit is required for 200V power supply units and 200V driver units.

* Simple absolute units support 0~40°C.

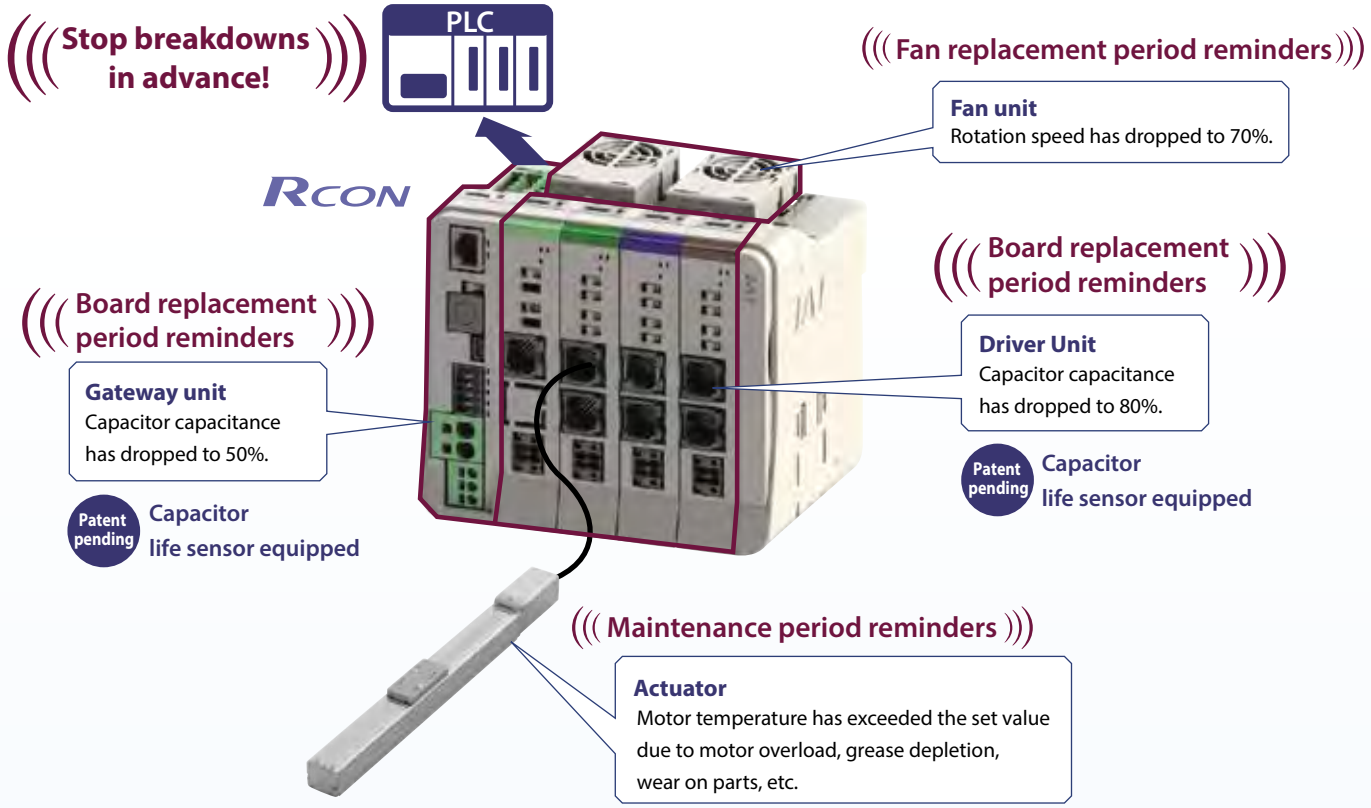
REC supports 55°C without a fan.





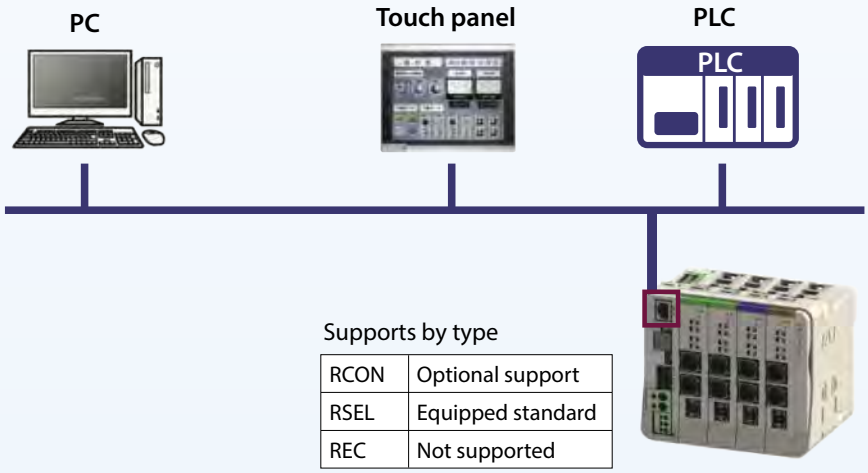
High function3 Predictive maintenance/preventative maintenance function

R-unit have a preventative maintenance function for the capacitor and a predictive maintenance function for the fan unit and actuator.



High function4 Ethernet-equipped

Supports Ethernet connections. (Excluding REC.)



Supports by type

RCON	Optional support
RSEL	Equipped standard
REC	Not supported

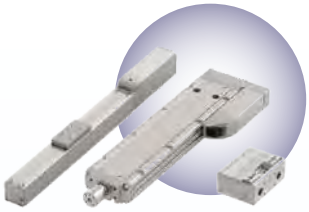
High function5 Highest number of connection actuators in the industry! Can be connected with 947 IAI actuators*

* See P.8-90 for connectable actuators.
(As of February 2021)

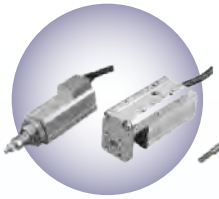
● Models with 24V motors

Supports actuators equipped with a battery-less absolute encoder
as well as those with simple absolute encoders and incremental encoders.

RCP Series

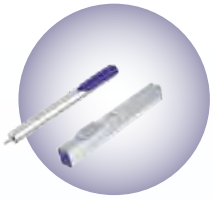


RCA Series



RCD Series

RCL Series



24V driver unit

WU Series

IK Series

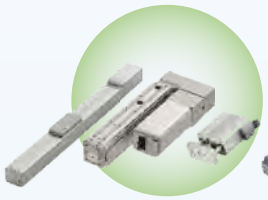
EC Series

EC connection unit

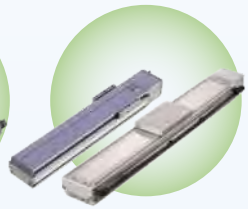
● Models with 200V motors

These products are capable of driving actuators equipped with 200V, 60W to 750W motors.
200V driver units support actuators equipped with battery-less absolute encoders and incremental encoders.
When connecting to extended unit+SCON, actuators equipped with 12W to 3300W motors are operable and all encoders are supported.

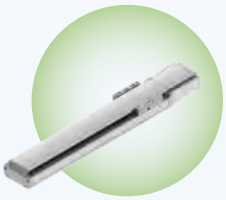
RCS Series



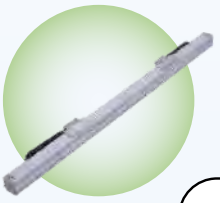
IS(D)B Series



SSPA Series



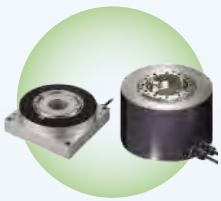
LSA Series



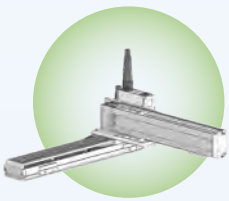
200V driver unit
+ power supply unit

NS(A) Series

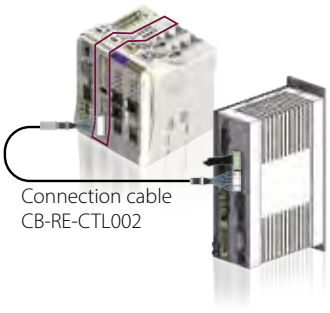
DD(A) Series



ICSB Series



Expansion unit
+ SCON connection



Connection cable
CB-RE-CTL002

High function6 Motor power cutoff method can be selected

In accordance with customer safety function applications, the motor power cutoff method at emergency stop can be selected through the RCON wiring method.

Actuator
All-axis motor power cutoff

(Gateway unit)
All-axis motor power port

Actuator
Single-axis motor power cutoff

(24V driver unit)
Single-axis drive-source cutoff terminal

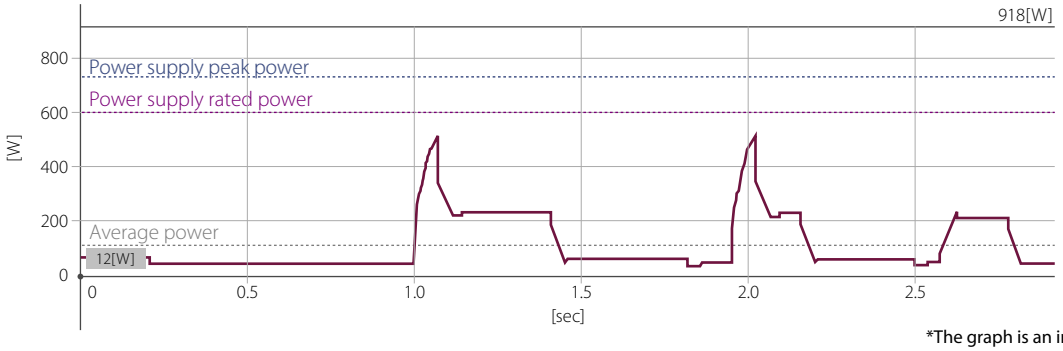
(200V driver unit)
Single-axis driver stop power cutoff terminal

High function7 Helps visualize equipment with 24V power monitor

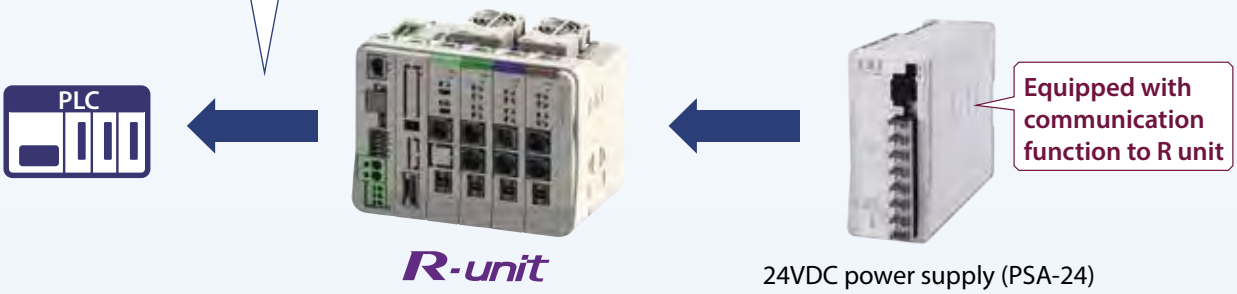
Helps visualize equipment.

The following IAI 24VDC power supply (PSA-24) monitoring can be output to a PLC via an R-unit.

● Output voltage ● Output current ● Power load factor ● Total energizing time
● Internal temperature ● Low fan speed warning



*The graph is an image.



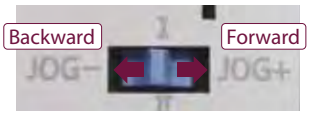
24VDC power supply (PSA-24)

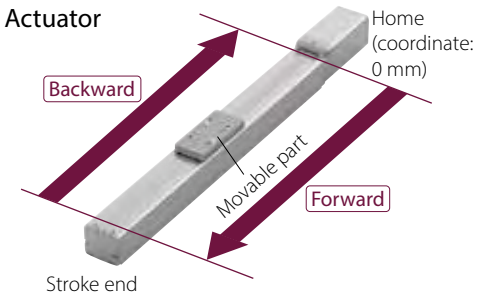
MEMO

Easy start-up and maintenance.

The actuator movable parts for each axis can be moved forward/backward, even without a teaching pendant or PC teaching software.

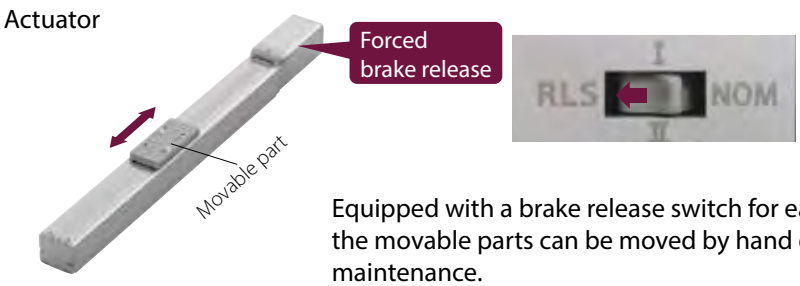
Each axis JOG (+/-) switch





JOG switch enabled in manual mode with PC software/teaching pendant manual operation window closed.

Each axis brake release switch



Equipped with a brake release switch for each axis, the movable parts can be moved by hand during maintenance.

USB port

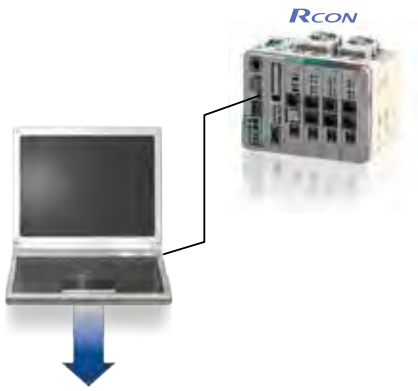
Connection to a PC is possible using a commercial USB cable.
Dedicated cables are not required.
*Compatible with miniUSB (mini-B).

RCON

Easy to program even for a beginner!

The PC-dedicated teaching software "IA-OS" supports users.

Even beginners can operate easily with troubleshooting information.

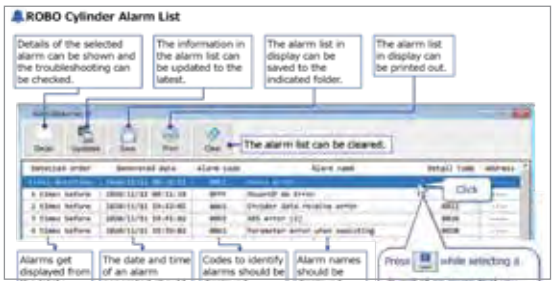


Troubleshooting Examples

Even if it fails, it can be repaired immediately. In case of trouble, IAI's troubleshooting is displayed.

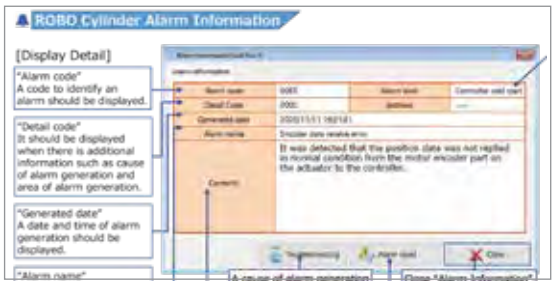
Alarm List

An alarm list with alarms generated in the past (history) with troubleshooting information.



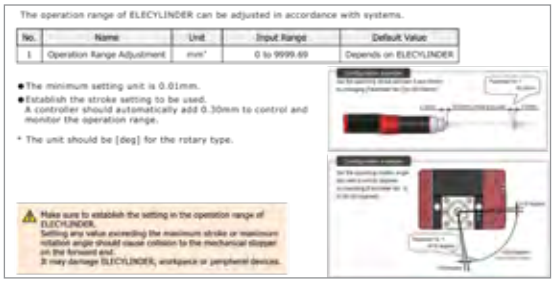
Alarm Information

Alarm details / troubleshooting information.



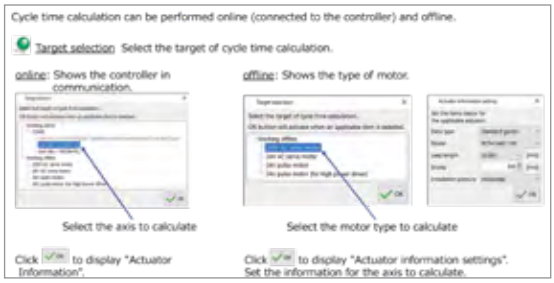
Parameter Edit : Operation Range Adjustment

The operation range of ELECYLINDER can be adjusted in accordance with system.



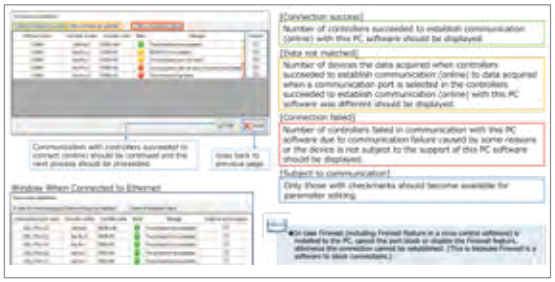
Cycle Time Calculation

Calculating the time required for operation from data such as the actuator used and the transportation load.



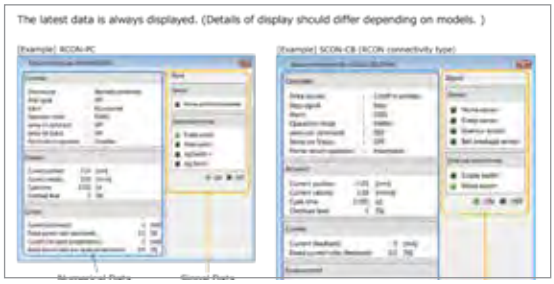
Communication Establishment

Success or failure of connectivity establishment is displayed.



Status Monitor

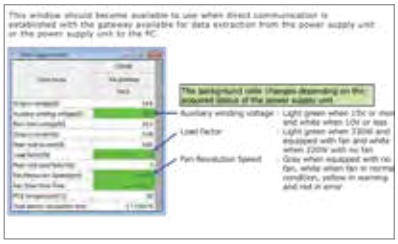
The latest status data is displayed.



Troubleshooting Examples

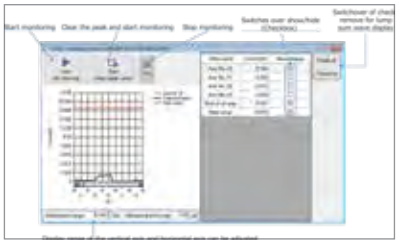
Power Supply Monitor

Check the data that the power supply unit possesses.



Current Consumption Wave Monitor

Displays time-dependent change of the current of each controller and the total current of all the controllers.



Velocity and Current Monitoring

Displays time-dependent change of the velocity, current and deviation in a graph.

I/O Data Monitor

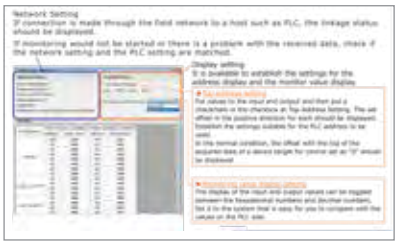
Check the status of signals in the input and output ports.

Network Data Monitor (Single axis controller)

Displays the data to be communicated between an external device and applicable controllers.

Network Data Monitor (for Gateway)

Data for communication between Gateway and an external device is displayed.



Servo Monitor

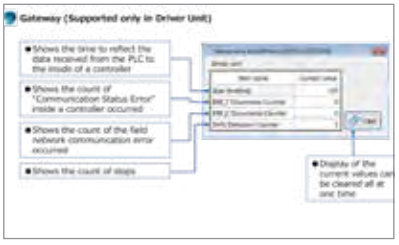
Time variation of data is displayed.

Maintenance Data (Robo Cylinder)

Displays the necessary information for maintenance.

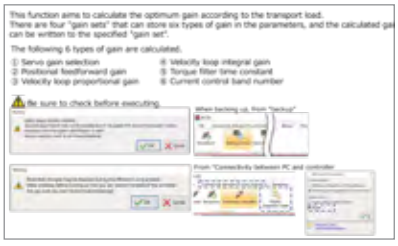
Maintenance Data (Gateway)

Displays the necessary information for maintenance.



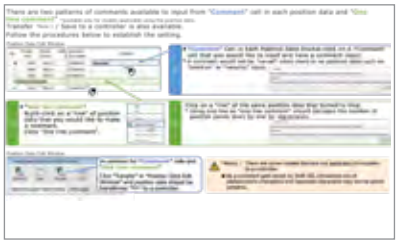
Offboard Tuning

Set a more suitable gain based on the data such as the actuator to be used and the transport load.



Comment

A comment is available for input.



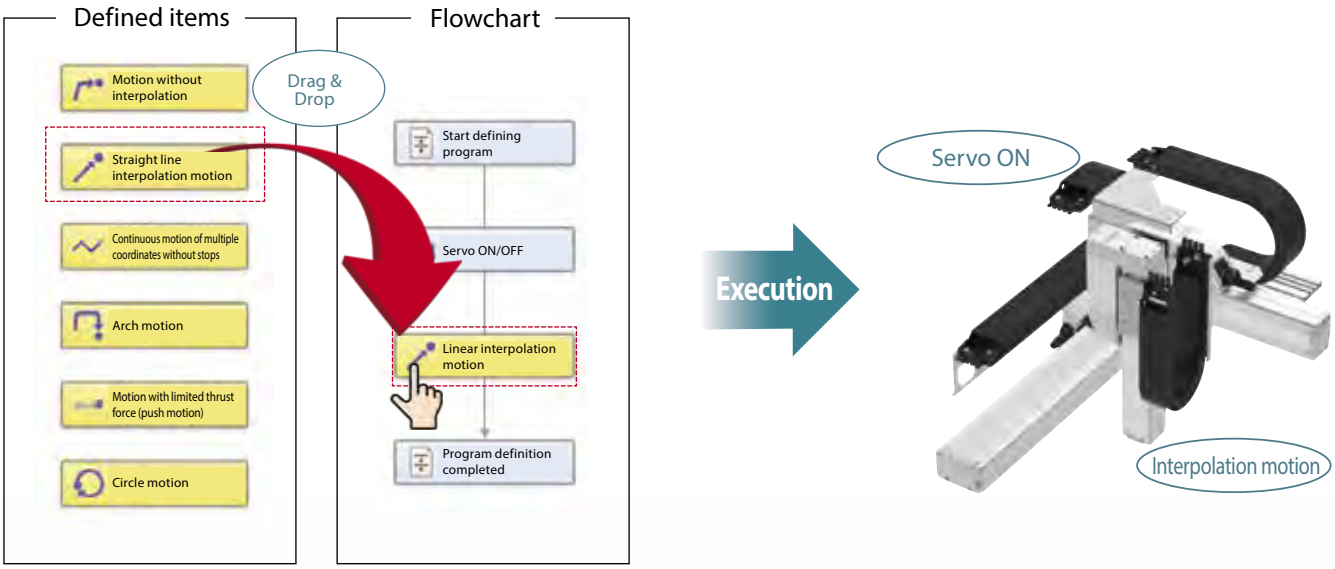
RSEL

Easy to program even for a beginner!

The "SEL Programming Tool" of the PC-dedicated teaching software "IA-101" supports users.

The "SEL Programming Tool" generates SEL programs by arranging the items whose operations are defined. Therefore, programming is possible without learning the SEL language.

The PC-dedicated teaching software for RSEL supports V.14.00.00.00 or later.

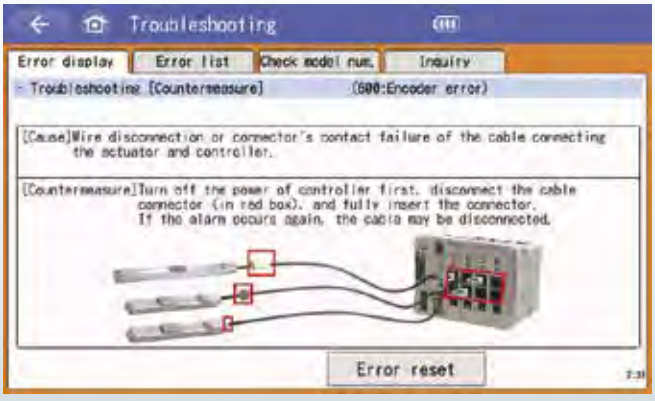


Troubleshooting by the teach pendant

Troubleshooting function has been added to the teaching pendant for program controller (TB-02/03).
It guides troubleshooting by selecting Yes/No of the trouble symptoms.
(Available for Ver. 2.70 and later)

<Description of error>

<Countermeasure>



Model Selection

Select from three types of R-unit, based on your operation method and models to connect.

Positioner Type

● For situations where the stop position will be registered in the position data, and then the position number will be specified for operation.

Max. number of connected axes: 16 axes

RCON

Refer to the selection pages beginning from P. 8-60

Program Type

● For situations where Cartesian coordinate system operation is performed for multiple axes combining single axes.

Max. number of connected axes: 8 axes

RSEL

Refer to the selection pages beginning from P. 8-67

ELECYLINDER Unit

● For situations where ELECYLINDER with ACR option is operated over a fieldbus.

Max. number of connected axes: 16 axes

REC

Refer to the selection pages beginning from P. 8-75

RCON Selection Method

Step 1 Select the actuators to connect. (Up to 16 axes.)

* Make sure to select an optional "ACR" for the **ELECYLINDER** model.

<Selection example>

RCD Series | RCP2 Series | RCA2 Series | RCP6 Series | RCS4 Series | ISB Series | DDA Series | EC Series

Step 2 Gateway unit selection

Select the gateway unit model from the network type.

(Note) Some limitations apply on the number of max. connectable axes of actuators, depending on the network and operation mode. See P.48 and P.71 for details.

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/ECM
EtherNet/IP	RCON-GW/GWG-EP
PROFINET	RCON-GW/GWG-PRT
MECHATROLINK	RCON-GW/GWG-ML3
SSCNETIII/H SERVO SYSTEM CONTROLLER NETWORK	RCON-GW/GWG-SSN

<Selection example>

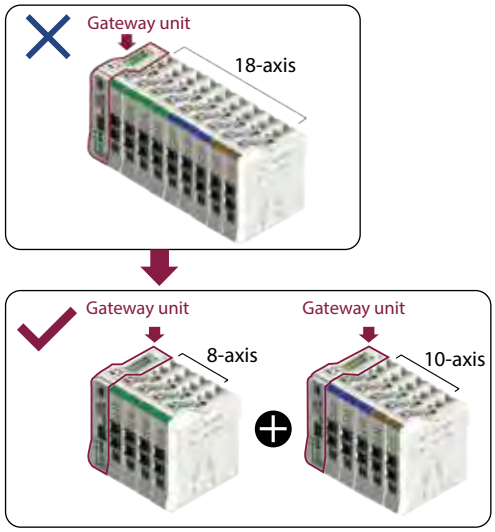
Selection 1

* GW: Gateway unit of standard specifcations.
GWG: Gateway unit of safety category type.

Caution

Only one gateway unit can be connected per system. Split this among two or more units to connect 17 or more axes or if the power capacity is exceeded.

Example: When connecting 18 axes



Step 3 Classify actuator types into three categories.

*See P. 8-90 for actuators that cannot be connected.

Actuator type		Selected actuator
Models with 24V motors	RCP2/3/4/5/6 Series RCA/2 Series RCD Series RCL Series	<Selection example> RCD, RCP2, RCA2, RCP6
Models with 200V motors	RCS2/3/4 Series IS(D)B Series SSPA Series LSA Series NS(A) Series DD(A) Series	<Selection example> RCS4, ISB, DDA
ELECYLINDER (model with 24V motor)	EC Series	<Selection example> EC with ACR option

Step 4 24V driver unit selection (models with 24V motors)

Select the driver unit model and number of units according to the series name and motor type of the actuator.

Actuator		24V driver unit			<Selection example>	
Series	Motor type	External view	Number of axes connected to actuator	Model	Classification	Required units
RCP2 RCP3 RCP4 RCP5 RCP6	20P, 28P 35P, 42P 56P	Stepper motor 	2-axis specification	RCON-PC-2	 RCP2-RTC RCP2-GRSS	1 ← Selection 2
			1-axis specification	RCON-PC-1	 RCP6-TA4C	1 ← Selection 2
	High thrust motor 56SP, 60P 86P		1-axis specification	RCON-PCF-1	 RCP6-RRA8R	1 ← Selection 2
RCA RCA2 RCL	2 5 10 20, 20S 30	AC servo motor 	2-axis specification	RCON-AC-2	 RCA2-GS3NA RCA2-TCA4NA	1 ← Selection 2
			1-axis specification	RCON-AC-1	-	-
RCD	3D	DC brush-less motor 	2-axis specification	RCON-DC-2	-	-
			1-axis specification	RCON-DC-1	 RCD-RA1DA	1 ← Selection 2

Step 5 Simple absolute unit selection

For actuators which are to use the simple absolute specification, select a number of simple absolute units (RCON-ABU-A/P) according to the number of axes.

* Connect to the driver unit with a cable (CB-ADPC-MPA005). The cable is supplied with the simple absolute unit.

Note: The ambient operating temperature of the simple absolute unit is within the range of 0~40℃.


RCON-ABU-A


RCON-ABU-P


Simple absolute battery

<Selection example>

This is an example in which a 2-axis RCA2 Series actuator is selected for simple absolute specification.

RCON-AC-2

Actuators to be made compatible with simple absolute


RCA2-GS3NA


RCA2-TCA4NA

Simple absolute unit

RCON-ABU-A x 2

← Selection 3

Step 6 EC connection unit selection (ELECYLINDER model)

To connect an EC Series product, select the required number of connection units based on the number of units for connecting EC.

Actuator		EC connection unit			<Selection example>	
Series	Motor type	External view	Number of axes connected to actuator	Model	Classification	Required units
EC	28P, 35P 42P, 56P		4-axis specification	RCON-EC-4	 EC-S6 with ACR option	1 ← Selection 4

Step 7 Classify models with 200V motors into two categories.

Models are classified as axes connected to a 200V driver unit and axes connected to an expansion unit.

Connection unit	Actuator specifications	Selected actuator
200V driver unit	Specification that meets all conditions below (Motor wattage [W]) 60W~750W (Encoder type) Incremental Battery-less Absolute	 RCS4-RA6C-WA-100  ISB-LXM-WA-200
Expansion unit	Other than the 200V driver unit specification	 DDA-LT18CS-AM-200 *This is because the absolute multi-rotation specification cannot be connected using a 200V driver unit.

Step 8 200V driver unit selection

Select one 200V power supply unit and a number of driver units according to the actuators to connect.

Unit name	External view	Number of axes connected to actuator	Model	<Selection example> Classification	Required units	
200V power supply unit		-	RCON-PS2-3	-	1	Selection 5
200V driver unit		1-axis specification	RCON-SC-1	 RCS4  ISB	2	Selection 5

Step 9 Expansion unit selection

(1) Select one if there are any actuators connected with an expansion unit.

Unit name	External view	Number of axes connected to actuator	Model	<Selection example> Classification	Required units	
SCON expansion unit		Max. 16 axes	RCON-EXT	 DDA	1	Selection 6

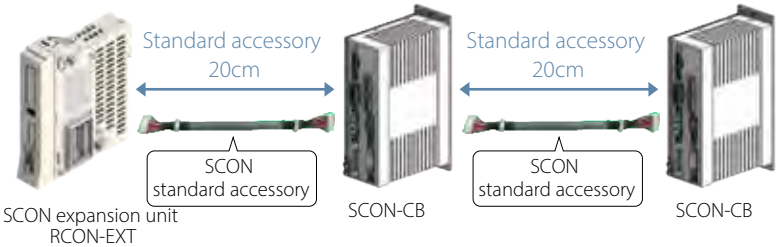
(2) Select a number of controllers (SCON-CB) to connect through the expansion unit according to the number of connected actuators.

*A number of SCON-CBs must be purchased according to the number of connected axes. (Max. number of connections: 16 axes.)

Controller	External view	Number of axes connected to actuator	I/O type	<Selection example> Classification	Required units	
SCON-CB/CGB		1-axis specification	SCON-**-RC-*	 DDA	1	Selection 7

● Example of connecting an expansion unit and SCON-CB

One cable (CB-RE-CTL002) is supplied as standard with SCON-CB for RCON connection.



Additional information

If the connection cable is too short, purchase a separate cable to make the connection.

Model: CB-RE-CTL□□□ See P.8-127

x Required number of units

Caution: The maximum cable length between devices is 3m.
The total cable length is 10m (max.).

Step 10 Calculation of various unit control power capacities (CP)

Make sure that the total control power capacity of the units and ELECYLINDER connected to RCON is as follows.

Item	Average current
Control power (CP)	9.0A or less

How to check

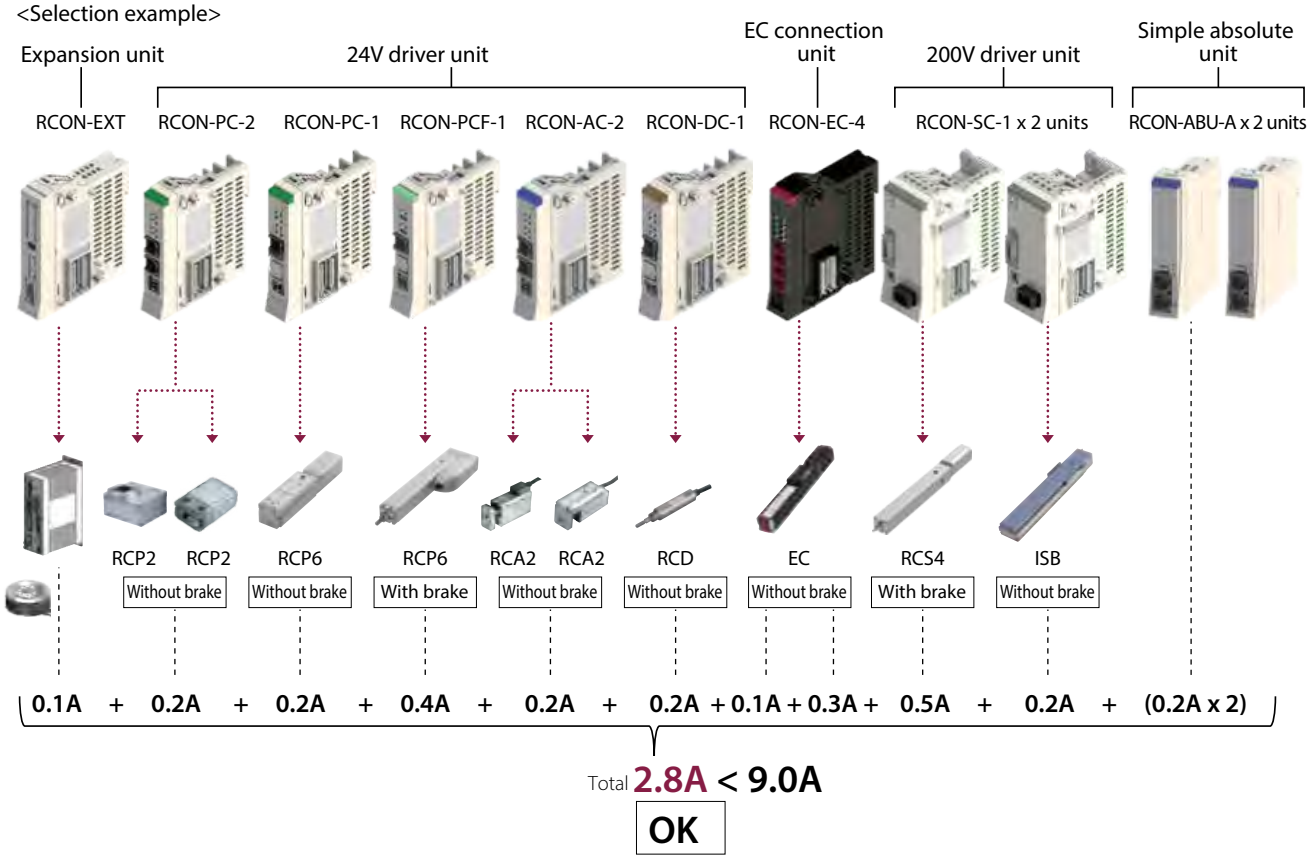
Add up while checking the "Control power capacity list" below.

Control power capacity list

Item	Specifications			Power capacity	<Selection example>
Control power capacity (per unit)	Master unit (including terminal unit)	Gateway unit	Without Ethernet	0.8A	
			With Ethernet	1.0A	
	24V driver unit (common for all types)	Without brake		0.2A	x 4 units
		With brake (1-axis specification)		0.4A	x 1 unit
		With brake (2-axis specification)		0.6A	
	200V driver unit	Without brake		0.2A	x 1 unit
		With brake		0.5A	x 1 unit
	Expansion unit			0.1A	x 1 unit
	Simple absolute unit (common to all types)			0.2A	x 2 units
	EC connection unit (per unit)			0.1A	x 1 unit
	24V specification ELECYLINDER (per axis)	Without brake		0.3A	x 1 axis
		With brake		0.5A	
	200V specification ELECYLINDER (per axis)	Without brake		0.32A	
		With brake		1.2A	

* For selection of the unit, power capacity of the master unit is not included for calculation.

<Selection example>



(The total was confirmed to be 9.0A or less. If the value is larger than 9.0A, another gateway unit is required.)

Step 11 Calculation of various unit motor power capacities (MP)

Make sure that the total motor power capacity of the units connected to RCON is as follows.

Item	Average current
Motor power (MP)	37.5A or less

How to check

Add up while checking the "Motor power capacity list" below.
If the maximum current is listed, add the maximum current.
If not, add the rated current.

● 24V driver unit

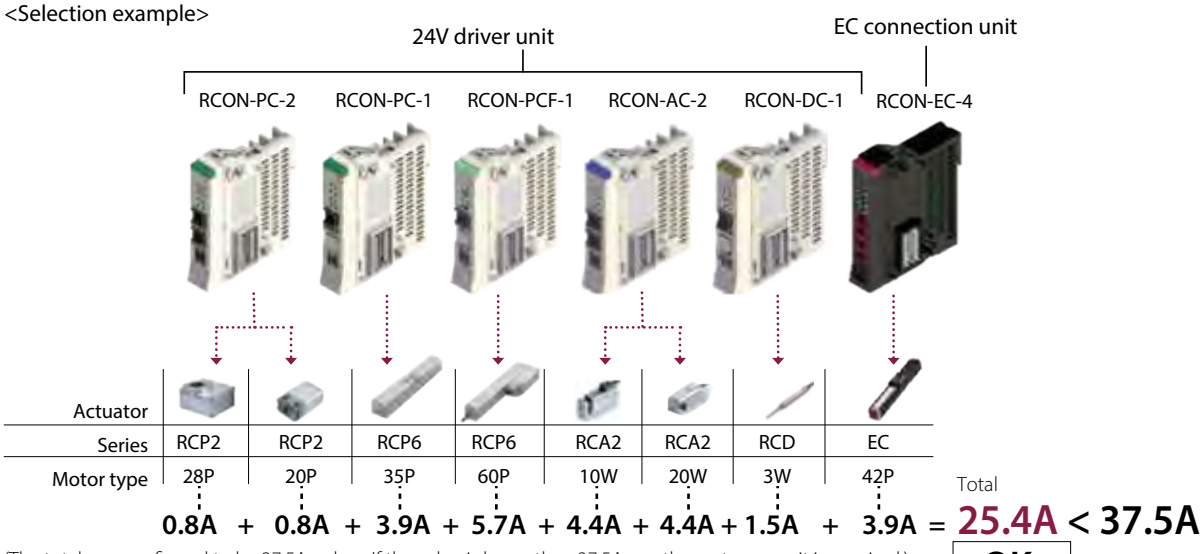
Item	Actuator/driver unit				Rated current	Max. current		<Selection example>
		Series	Motor type			When energy-saving is set		
Motor power capacity (per 1-axis actuator)	Stepper motor /RCON-PC	RCP2 RCP3	20P/20SP/28P	Without PowerCON	0.8A	-	-	x 2 axes
			28P*/35P/42P/56P		1.9A	-	-	
		RCP4 RCP5 RCP6	28P/35P/42P/ 42SP/56P	Without PowerCON	1.9A	-	-	
				With PowerCON	2.3A	-	3.9A	x 1 axis
	Stepper motor /RCON-PCF	RCP2 RCP4 RCP5 RCP6	56SP/60P/ 86P	Without PowerCON	5.7A	-	-	x 1 axis
	AC servo motor /RCON-AC	RCA RCA2	5W	Standard / Hi-accel./decel.	1.0A	-	3.3A	
			10W	Standard / Hi-accel./decel. / Energy-saving	1.3A	2.5A	4.4A	x 1 axis
			20W		1.3A	2.5A	4.4A	x 1 axis
			20W(20S)		1.7A	3.4A	5.1A	
			30W		1.3A	2.2A	4.0A	
		RCL	2W	Standard / Hi-accel./decel.	0.8A	-	4.6A	
			5W		1.0A	-	6.4A	
			10W		1.3A	-	6.4A	
	DC brush-less motor /RCON-DC	RCD	3W	Standard	0.7A	-	1.5A	x 1 axis

* Applicable models: RCP2-RA3, RCP2-RGD3

● EC connection unit

Item	Actuator/EC connection unit				Power source current			<Selection example>
		Series	Motor type	Type	Energy-saving disabled		Energy-saving enabled	
					Power source current	Maximum		
Motor power capacity (per 1-axis actuator)	24V stepper motor	EC	35P/42P/56P	Other than the below	2.3A	3.9A	1.9A	x 1 axis
			28P	S3□/RR3□	-	-	1.9A	
				RP4/GS4/GW4/TC4/TW4/ RTC9/GRB10/GRB13	-	-	1.7A	
			20P	GRB8	-	-	0.7A	

<Selection example>



Total

0.8A + 0.8A + 3.9A + 5.7A + 4.4A + 4.4A + 1.5A + 3.9A = 25.4A < 37.5A

(The total was confirmed to be 37.5A or less. If the value is larger than 37.5A, another gateway unit is required.)

OK

Step 12 200V motor power limiting

Make sure that the total motor wattage (W) of the actuators connected to RCON-SC is as follows.

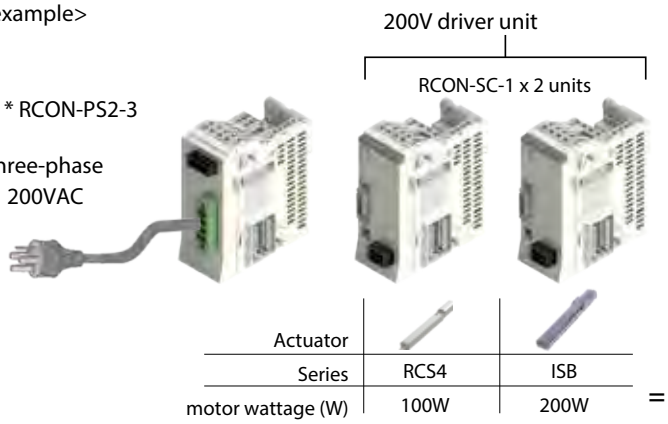
*Some limitations apply. See "Actuators that cannot connect to R-unit" (P. 8-90) for details.

Connected power	Total max. output of connected axes
Three-phase 200VAC	2,400W
Single-phase 200VAC	1,600W

How to check

Confirm the motor wattage (W) in the actuator specifications.

<Selection example>



* Only one RCON-PS2-3 can be used per RCON/RSEL system.

Actuator Series	RCS4	ISB
motor wattage (W)	100W	200W

Total = 300W < 2,400W

OK

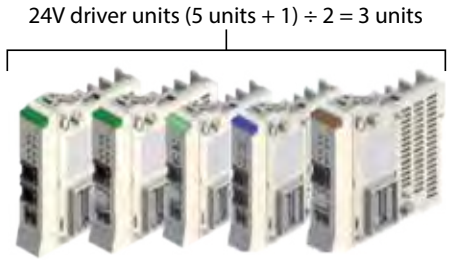
Step 13 Fan unit selection

If the controller installation environment may exceed 40°C, a fan unit will be required. (Up to 55°C.)*

(1) 24V driver unit fan unit

The number of fan units is the total number of driver units divided by 2.
If the total number of 24V driver units is an odd number, add 1 to the total number and divide it by 2.
When ordering, be sure to specify the gateway unit model.

<Selection example>

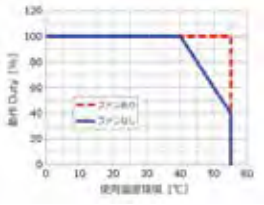


Fan unit [RCON-FU] x 3 units

Selection 8

Note: The ambient operating temperature of the simple absolute unit is within the range of 0~40°C even when a fan unit is installed.

*The operating temperature of the gateway unit/driver unit is within the range of 0~55°C.
However, temperature derating may occur depending on whether a fan unit is installed.
Operation without derating is possible without a fan unit at 0 ~ 40°C;
however, at 40 ~ 55°C, actuator operating duty must be reduced by 20% every 5°C.



(2) 200V driver unit and power supply unit fan units

A single fan unit is always included with each installation unit. (There is no need to specify the model.)

<Selection example>

200V driver units x 2 units

RCON-FUH x 2 units (supplied)

200V power supply unit

RCON-FU x 1 unit (supplied)

Step 14 Terminal units

Select the terminal unit to connect based on the unit connected to the left of the terminal unit.
(Units are designed to prevent incorrect connections. Confirm the model first before installing a unit.)

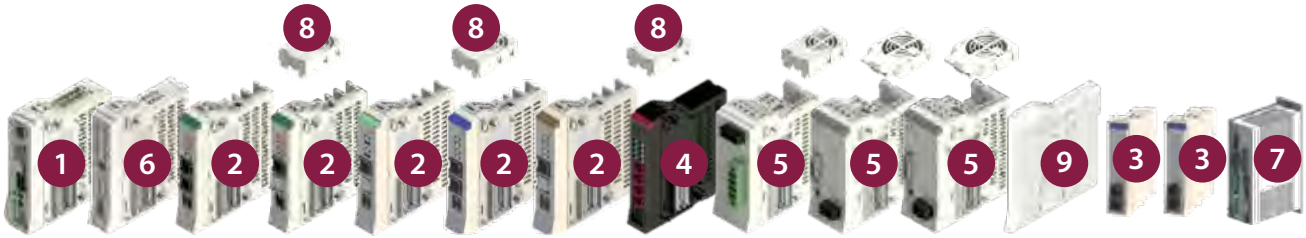
Unit connected to left	Terminal unit single product model number	Supplied unit and cautions when ordering
RCON-SC	RCON-GW-TRS	Supplied with 200V power supply unit (select "TRN (no terminal unit)" for the gateway unit option) ← Selection 9
Other than RCON-SC	RCON-GW-TR	Supplied with gateway unit

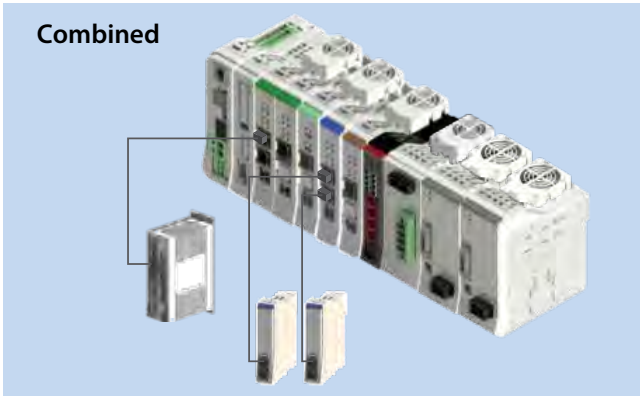
Step 15 Unit models to be ordered

Order using the model name for each unit.

<Selection example>

Order model (x number of units)	Name/specification	
RCON-GW-CC-FU3-TRN	Gateway unit (with 3 fans, without terminal unit)	1 8
RCON-EXT	SCON expansion unit	6
RCON-PC-2	24V driver unit (RCP Series connection, 2-axis specification)	2
RCON-PC-1	24V driver unit (RCP Series connection, 1-axis specification)	2
RCON-PCF-1	24V driver unit (RCP Series connection, 1-axis specification, for high thrust)	2
RCON-AC-2	24V driver unit (RCA Series connection, 2-axis specification)	2
RCON-DC-1	24V driver unit (RCD Series connection, 1-axis specification)	2
RCON-ABU-A x 2 units	Simple absolute unit (for RCA Series connection)	3
RCON-EC-4	EC connection unit	4
RCON-PS2-3	200V power supply unit	5 9
RCON-SC-1 x 2 units	200V driver unit	5
SCON-***-RC	RCON connection specification SCON controller *Select the model to order based on the actuator to connect.	7





RSEL Selection Method

Step 1 Select the actuator to connect. (Up to 16 axes)

<Selection example>

RCS2 Series | RCA2 Series | RCP6 Series | WU Series | RCS4 Series | IS(P)B Series

Step 2 SEL unit selection

Select the SEL unit model from the following I/O types.

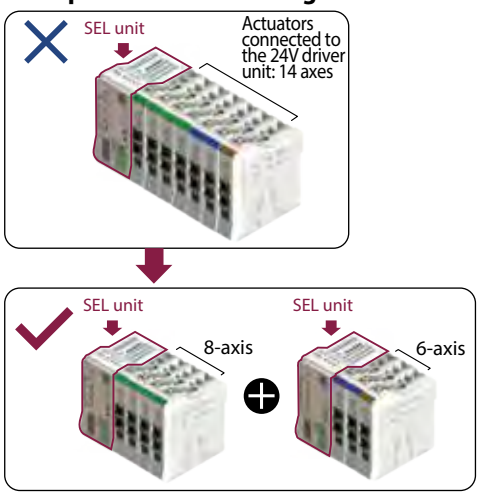
I/O type		SEL unit model
Not used		RSEL-G-E
PIO specification	NPN	RSEL-G-NP
	PNP	RSEL-G-PN
DeviceNet		RSEL-G-DV
DeviceNet	(Bifurcated connector supplied)	RSEL-G-DV2
CC-Link		RSEL-G-CC
CC-Link	(Bifurcated connector supplied)	RSEL-G-CC2
CC-Link IE Field		RSEL-G-CIE
PROFIBUS		RSEL-G-PR
EtherCAT		RSEL-G-EC
EtherNet/IP		RSEL-G-EP
PROFINET		RSEL-G-PRT

Selection 1

Caution

Only one SEL unit can be connected per system. Split this among two or more units to connect more than the maximum connectable axes or if the power capacity is exceeded.

Example: When connecting 14 axes



Step 3 Classify actuator types into three categories.

*See P. 8-90 for actuators that cannot be connected.

Actuator type		Selected actuator
Models with 24V motors	RCP2/3/4/5/6 Series RCA/2 Series RCD Series RCL Series WU Series	<Selection example> RCA2 RCP6 WU
Models with 200V motors	RCS2/3/4 Series IS(D)B Series SSPA Series LSA Series NS(A) Series DD(A) Series	<Selection example> RCS2 RCS4 ISB ISPB

Step 4 24V driver unit selection (models with 24V motors)

Select the driver unit model and number of units according to the series name and motor type of the actuator.

Actuator		24V driver unit			<Selection example>	
Series	Motor type	External view	Number of axes connected to actuator	Model	Classification	Required units
RCP2 RCP3 RCP4 RCP5 RCP6 WU	20P, 28P 35P, 42P 56P	Stepper motor 	2-axis specification	RCON-PC-2	 WU-S	1 ← Selection 2
			1-axis specification	RCON-PC-1	 RCP6-RTFML	1 ← Selection 2
	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-axis specification	RCON-AC-1	 RCA2-GS3NA	1 ← Selection 2
RCD	3D	DC brush-less motor 	2-axis specification	RCON-DC-2	-	-
			1-axis specification	RCON-DC-1	-	-

Step 5 Simple absolute unit selection

For actuators which are to use the simple absolute specification, select a number of simple absolute units (RCON-ABU-A/P) according to the number of axes.

* Connect to the driver unit with a cable (CB-ADPC-MPA005).
  The cable is supplied with the simple absolute unit.

Note: The ambient operating temperature of the simple absolute unit is within the range of 0~40°C.


RCON-ABU-A


RCON-ABU-P


Simple absolute battery

<Selection example>

This is an example in which an RCA2 Series actuator is selected for simple absolute specification.

RCON-AC-1


RCA2-GS3NA

Actuators to be made compatible with simple absolute

Simple absolute unit
RCON-ABU-A

← Selection 3

Step 6 Classify models with 200V motors into two categories.

Models are classified as axes connected to a 200V driver unit and axes connected to an expansion unit.

Connection unit	Actuator specifications	Selected actuator
200V driver unit	Specification that meets all conditions below (Motor wattage [W]) 60W~750W (Encoder type) Incremental Battery-less Absolute	 RCS4-WRA16R-WA-400  IS(P)B-LXL-WA-400
Expansion unit	Other than the 200V driver unit specification	 RCS2-RTC8L-I-20

* This is because the 20W specification cannot be connected to RCON-SC.

Step 7 200V driver unit selection

Select one 200V power supply unit and a number of driver units according to the actuators to connect.

Unit name	External view	Number of axes connected to actuator	Model	<Selection example> Classification	Required units	
200V power supply unit		-	RCON-PS2-3	-	1	Selection 4
200V driver unit		1-axis specification	RCON-SC-1	 RCS4 ISB	3	Selection 4

Step 8 Expansion unit selection

(1) Select only one of two models listed below if there are any 100/200VAC servo actuators connected with an expansion unit. (Those two different type can not be used in one system.)

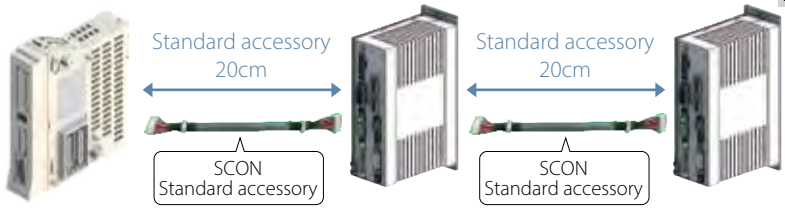
Unit name	External view	Number of axes connected to actuator	Model	<Selection example> Classification	Required units	
SCON expansion unit		Max. 8 axes	RCON-EXT	-	-	
Expansion unit		Max. 8 axes	RCON-EXT-NP/PN	 RCS2-RTC8L-I-20	1	Selection 5

(2) Select a number of controllers (SCON) to connect through the expansion unit according to the number of connected actuators. *A number of SCONs must be purchased according to the number of connected axes. (Max. number of connections: 8 axes.)

Controller	External view	Number of axes connected to actuator	I/O type	<Selection example> Classification	Required units	
SCON-CB/CGB		1-axis specification	SCON-**-RC-*	 RCS2-RTC8L-I-20	1	Selection 6

● Example of connecting an SCON connection expansion unit and SCON-CB

One cable (CB-RE-CTL002) is supplied as standard with SCON-CB for RSEL connection.



SCON expansion unit RCON-EXT — SCON-CB — SCON-CB

Additional information If the connection cable is too short, purchase a separate cable to make the connection.

Model: CB-RE-CTL□□□
See P. 8-127

x Required number of units

Caution: The maximum cable length between devices is 3m. The total cable length is 10m (max.).

(3) When selecting a PIO unit

A PIO unit can be connected to increase the number of PIO IO points. (The maximum number of input points is 144 and maximum number of output points is 144.)
There are 16 input points and 16 output points for a single unit, with a maximum of 8 units connected.
(If connecting a PIO/SIO/SCON expansion unit, the maximum will be 7 units.)

If the number of input points or output points is evenly divisible by 16, order that number of PIO units.
If the number is not evenly divisible, order a number of PIO expansion units equal to the number rounded up to the next whole number.

<Selection example>

In this example, the number of NPN specification IO points is increased by 24 input points and 20 output points.

24 input points ÷ 16 = 1.5

2 units

PIO unit [RCON-NP]

Selection 7

Step 9 Calculation of various unit control power capacities (CP)

Make sure that the total control power capacity of the units connected to RSEL is as follows.

Item	Average current
Control power (CP)	9.0A or less

How to check

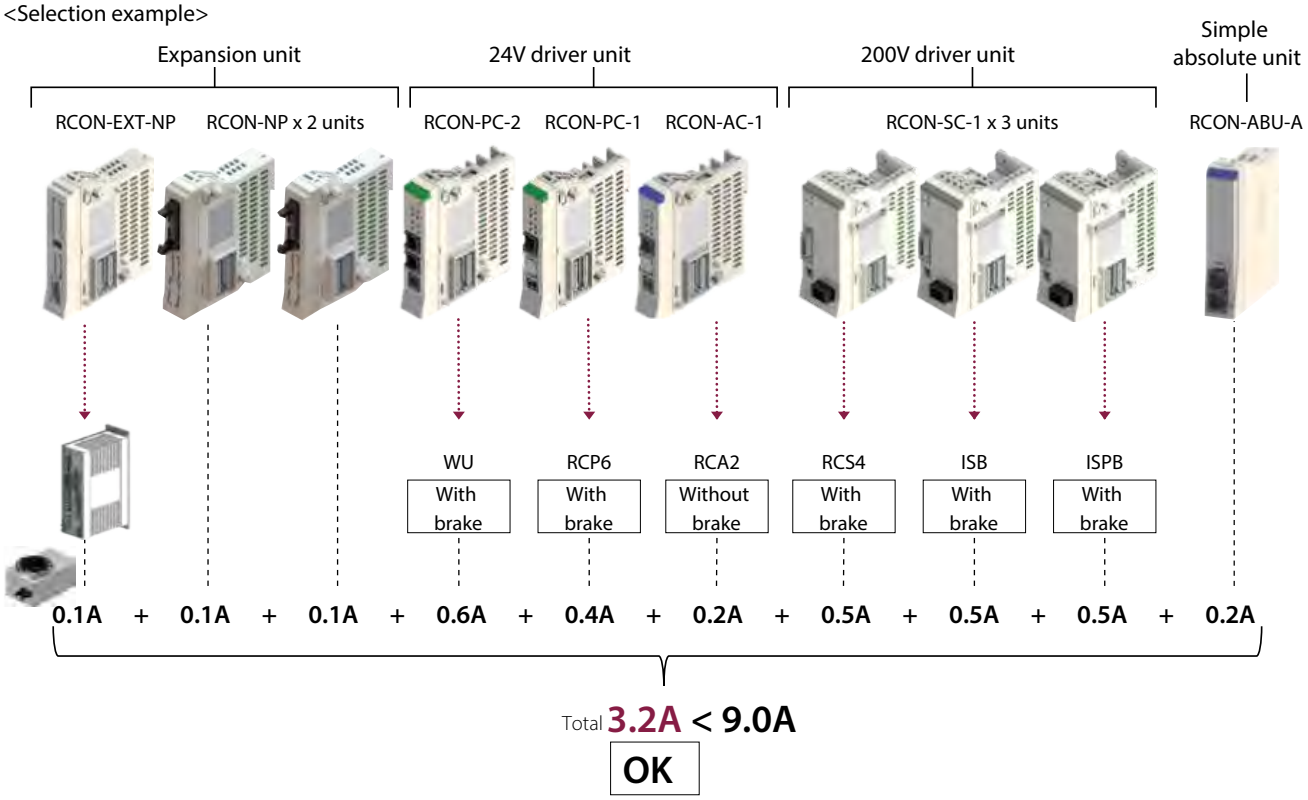
Add up while checking the "Control power capacity list" below.

Control power capacity list

Item	Specifcation		Power capacity	<Selection example>
Control power capacity (per unit)	Master unit (including terminal unit)	SEL unit	1.2A	
	24V driver unit (common for all types)	Without brake	0.2A	x 1 unit
		With brake (1-axis specification)	0.4A	x 1 unit
		With brake (2-axis specification)	0.6A	x 1 unit
	200V driver unit	Without brake	0.2A	
		With brake	0.5A	x 3 units
	Expansion unit (common for all types)		0.1A	x 3 units
	Simple absolute unit (common to all types)		0.2A	x 1 unit

*Power capacity of master unit not included in calculation.

<Selection example>



(The total was confirmed to be 9.0A or less. If the value is larger than 9.0A, another SEL unit is required.)

Step 10 Calculation of various unit motor power capacities (MP)

Make sure that the total motor power capacity of the units connected to RSEL is as follows.

Item	Average current
Motor power (MP)	37.5A or less

How to check

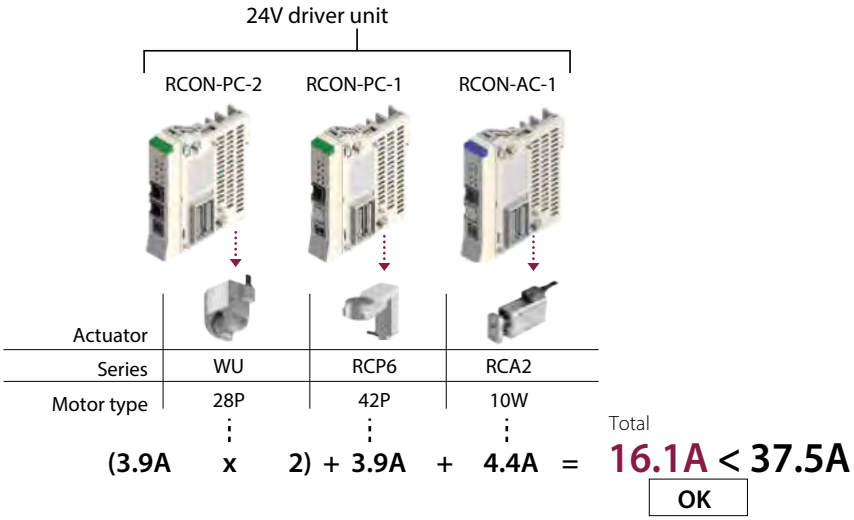
Add up while checking the "Motor power capacity list" below.
If the maximum current is listed, add the maximum current.
If not, add the rated current.

● 24V driver unit

Item	Actuator/driver unit	Series	Motor type		Rated current	Max. current		<Selection example>
						When energy-saving is set		
Motor power capacity (per 1-axis actuator)	Stepper motor /RCON-PC	RCP2 RCP3	20P/20SP/28P	Without PowerCON	0.8A	-	-	
			28P* /35P/42P/56P		1.9A	-	-	
		RCP4 RCP5 RCP6 WU	28P/35P/42P/ 42SP/56P	Without PowerCON	1.9A	-	-	
				With PowerCON	2.3A	-	3.9A	x 3 axes
	Stepper motor /RCON-PCF	RCP2 RCP4 RCP5 RCP6	56SP/60P/86P	Without PowerCON	5.7A	-	-	
	AC servo motor /RCON-AC	RCA RCA2	5W	Standard / Hi-accel./decel.	1.0A	-	3.3A	
			10W	Standard / High accel/decel / Energy saving	1.3A	2.5A	4.4A	x 1 axis
			20W		1.3A	2.5A	4.4A	
			20W(20S)		1.7A	3.4A	5.1A	
			30W		1.3A	2.2A	4.0A	
		RCL	2W	Standard / Hi-accel./decel.	0.8A	-	4.6A	
			5W		1.0A	-	6.4A	
			10W		1.3A	-	6.4A	
	DC brush-less motor /RCON-DC	RCD	3W	Standard	0.7A	-	1.5A	

* Applicable models: RCP2-RA3, RCP2-RGD3

<Selection example>



(3.9A x 2) + 3.9A + 4.4A = Total 16.1A < 37.5A

OK

(The total was confirmed to be 37.5A or less. If the value is larger than 37.5A, another SEL unit is required.)

Step 11 200V motor power limiting

Make sure that the total motor wattage (W) of the actuators connected to RCON-SC is as follows.

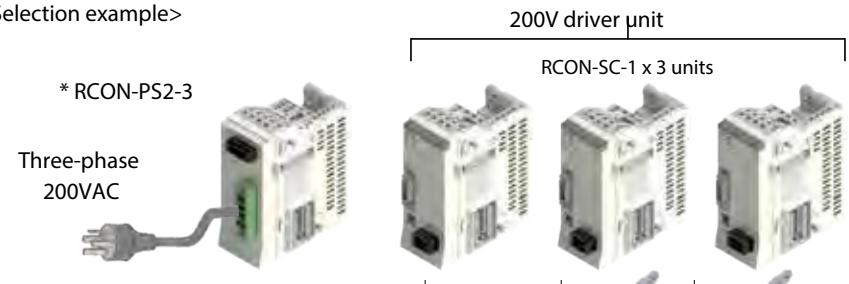
*Some limitations apply. See "Actuators that cannot connect to R-unit" (P. 8-90) for details.

Connected power	Total max. output of connected axes
Three-phase 200VAC	2,400W
Single-phase 200VAC	1,600W

How to check

Confirm the motor wattage (W) in the actuator specifications.

<Selection example>



* Only one RCON-PS2-3 can be used per RCON/RSEL system.

Total
= 1,200W < 2,400W
OK

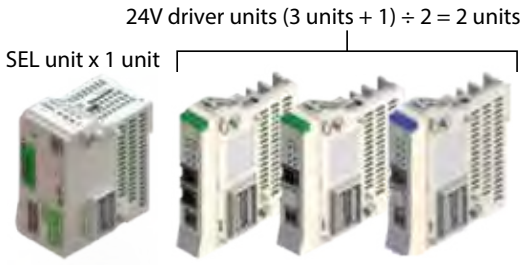
Step 12 Fan unit selection

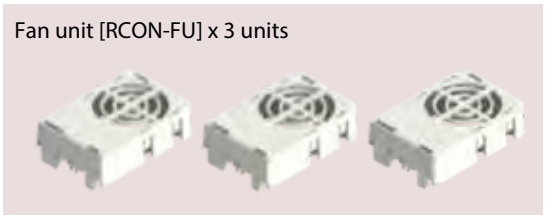
If the controller installation environment may exceed 40°C, a fan unit will be required. (Up to 55°C.)*

(1) SEL unit and 24V driver unit fan units

A single fan unit can be installed to a SEL unit.
The number of fan units for 24V driver units is the total number of 24V driver units divided by 2.
If the total number of 24V driver units is an odd number, add 1 to the total number and divide it by 2.
When ordering, be sure to specify the number of units for the SEL unit model.

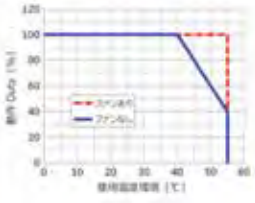
<Selection example>





Note: The ambient operating temperature of the simple absolute unit is within the range of 0~40°C even when a fan unit is installed.

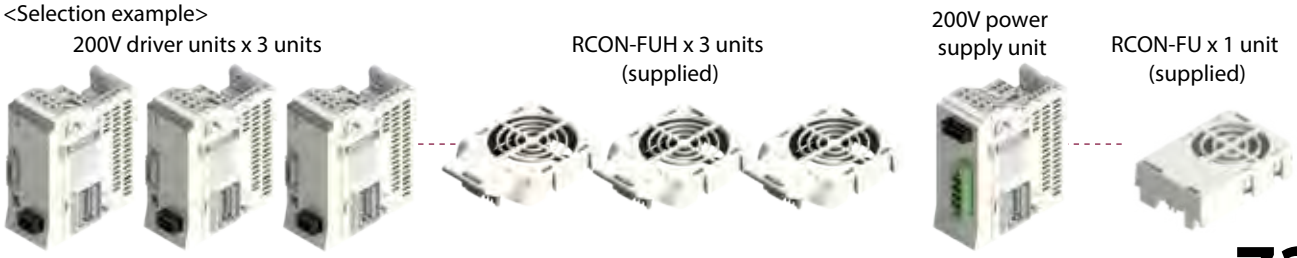
*The operating temperature of the gateway unit/driver unit is within the range of 0~55°C.
However, temperature derating may occur depending on whether a fan unit is installed.
Operation without derating is possible without a fan unit at 0 to 40°C;
however, at 40 to 55°C, actuator operating duty must be reduced by 20% every 5°C.



(2) 200V driver unit and 200V power supply unit fan units

A single fan unit is always included with each installation unit. (There is no need to specify the model.)

<Selection example>



Step 13 Terminal units

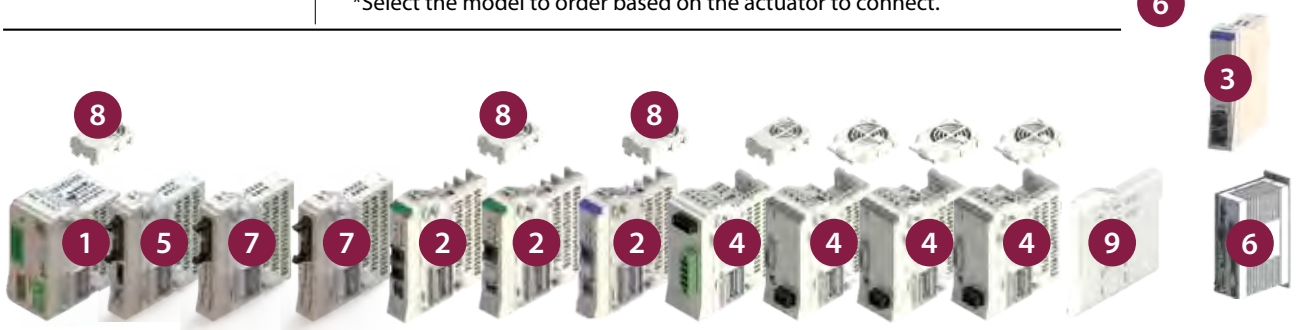
Select the terminal unit to connect based on the unit connected to the left of the terminal unit.
(Units are designed to prevent incorrect connections. Confirm the model first before installing a unit.)

Unit connected to left	Terminal unit single product model number	Supplied unit and cautions when ordering
RCON-SC	RCON-GW-TRS	Supplied with 200V power supply unit (select "TRN (no terminal unit)" for the SEL unit option). ← Selection 9
Other than RCON-SC	RCON-GW-TR	Supplied with SEL unit.

Step 14 Unit models to be ordered

Order using the model name for each unit.
<Selection example>

Order model (x number of units)	Name/specification	
RSEL-G-DV2-FU3-TRN	SEL unit (with 3 fans, without terminal unit)	1 8
RCON-EXT-NP	PIO/SIO/SCON expansion unit	5
RCON-NP x 2 units	PIO unit	7
RCON-PC-2	24V driver unit (RCP Series connection, 2-axis specification)	2
RCON-PC-1	24V driver unit (RCP Series connection, 1-axis specification)	2
RCON-AC-1	24V driver unit (RCA Series connection, 1-axis specification)	2
RCON-ABU-A	Simple absolute unit (for RCA Series connection)	3
RCON-PS2-3	200V power supply unit	4 9
RCON-SC-1 x 3 units	200V driver unit	4
SCON-***-RC	RCON connection specification SCON controller *Select the model to order based on the actuator to connect.	6



Combined

MEMO

REC selection method

Step 1 Select the ELECYLINDER with ACR option to connect. (Up to 16 axes.)

* Make sure to select optional "ACR" as the ELECYLINDER model.

<Selection example>

EC-S6☐AH EC-S7☐AH EC-S3 EC-TC4 EC-GS4 EC-RR6 EC-S13

Step 2 EC gateway unit selection

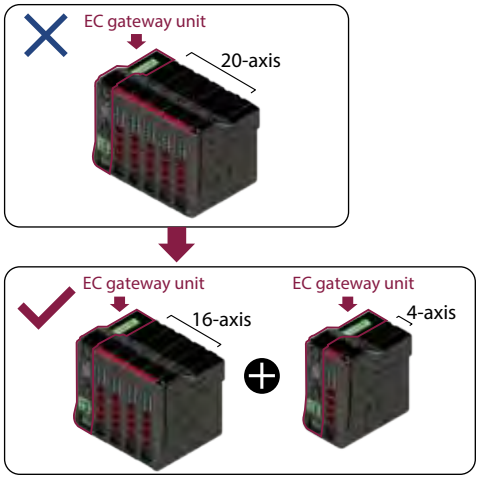
Select the EC gateway unit model from the network type.

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

<Selection example>
Selection 1

Caution
Only one EC gateway unit can be connected per system.
Split this among two or more units to connect 17 or more axes or if the power capacity is exceeded.

Example: When connecting 20 axes



Step 3 EC connection unit selection

Up to 4 axes of ELECYLINDER can be connected to one EC connection unit.
Select the required number of EC connection units based on the number of units for connecting ELECYLINDER.

Actuator	EC connection unit			<Selection example>	
Series	External view	Number of axes connected to actuator	Model	Classification	Required units
EC		4-axis specification	RCON-EC-4	 EC Series x 7 axes	2

Selection 2

Step 4 Calculation of control power capacity (CP)

Make sure that the total control power capacity of the units connected to REC and the ELECYLINDER is as follows.

Item	Average current
Control power (CP)	Less than 9.0A

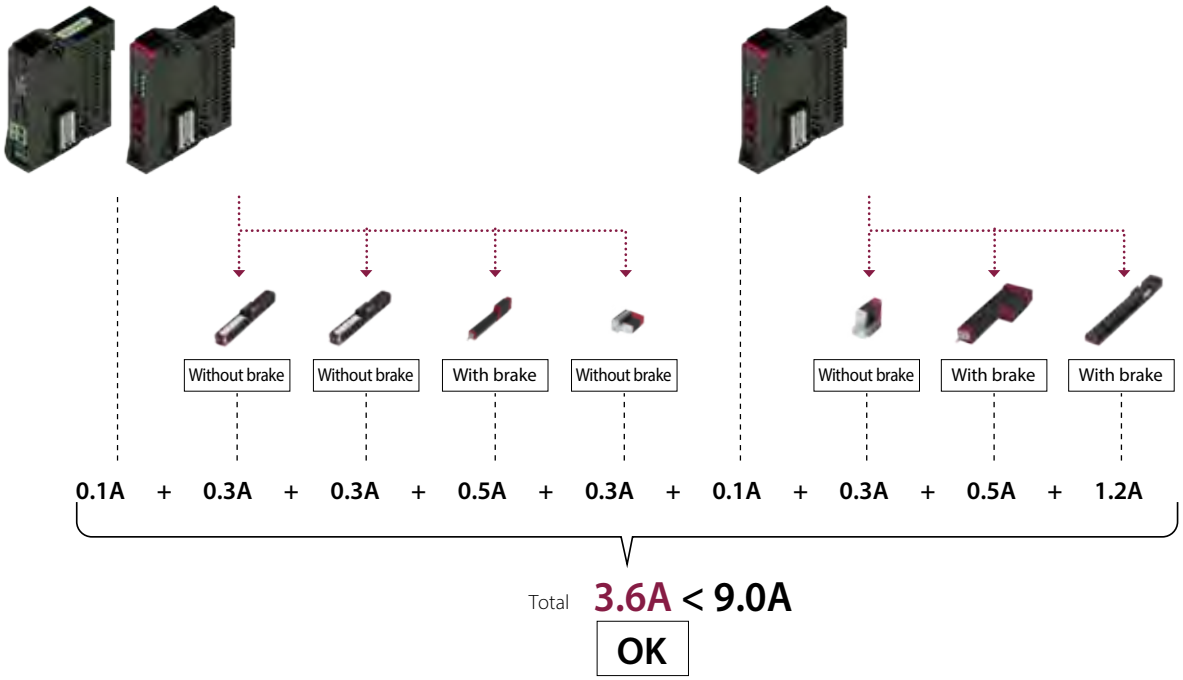
Method of confirmation

Add electric current values according to the following "Control power capacity table."

Item	Specification		Power source current	
Control power capacity	Master unit		0.8A	
	EC connection unit		0.1A	x 2 units
	24V specification ELECYLINDER (per one axis)	Without brake	0.3A	x 4 axes
		With brake	0.5A	x 2 axes
	200V specification ELECYLINDER (per one axis)	Without brake	0.32A	
		With brake	1.2A	x 1 axis

* Do not include master unit power capacity in the calculation.

<Selection example>



Total **3.6A < 9.0A**

OK

(It has been confirmed that the total current is less than 9.0A. If it is greater than 0.9A, another gateway unit is needed.)

Step 5 Calculation of motor power capacity (MP)

Make sure that the total motor power capacity of the units connected to REC is as follows.

Item	Average current
Motor power (MP)	37.5A or less

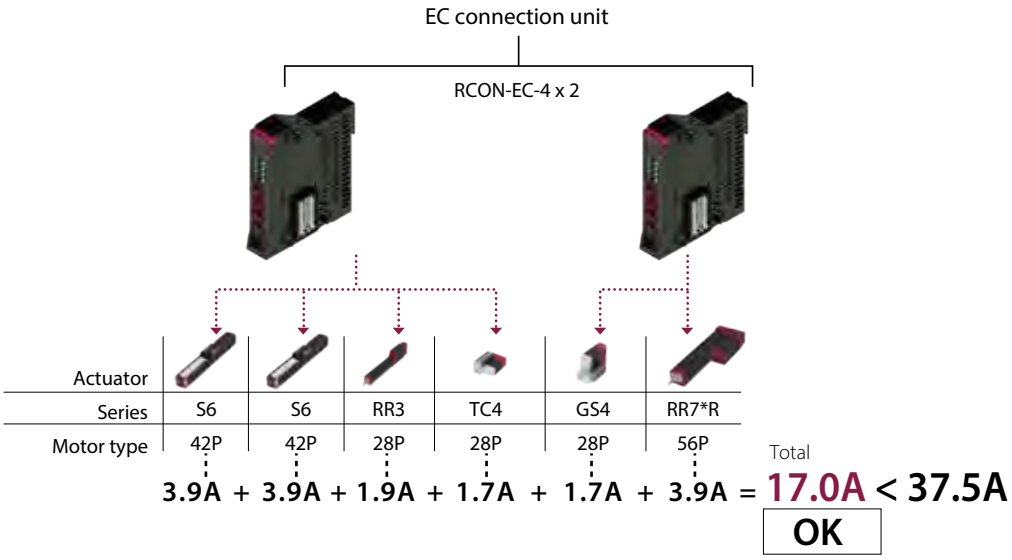
How to check

Add up while checking the "Motor power capacity list" below.
If the maximum current is listed, add the maximum current.
If not, add the rated current.

Motor power capacity list

Item	Actuator / connection unit				Power source current			<Selection example>
		Series	Motor type	Type	Energy-saving disabled		Energy-saving enabled	
					Rate current	Max.		
Motor power capacity (per 1-axis actuator)	24V stepper motor	EC	35P/42P/56P	Other than the below	2.3A	3.9A	1.9A	x 4 axes
			28P	S3□/RR3□	-	-	1.9A	x 1 axis
				RP4/GS4/GW4/TC4/ TW4/RTC9/GRB10/GRB12	-	-	1.7A	x 2 axes
			20P	GRB8	-	-	0.7A	

<Selection example>



(The total was confirmed to be 37.5A or less. If the value is larger than 37.5A, another EC gateway unit is required.)

Step 6 Selection of 200V specification motor power

When connecting a 200V specification ELECYLINDER, select the number of DC power source for driving motors according to the total motor wattage.

DC power source for driving motors

Connecting power	Max. connectable axes (per one power source)	Max. wattage of connected motors
PSA-200-1 (AC100V)	6 axes	800W
PSA-200-2 (AC200V)	6 axes	1,600W

How to check

Confirm the motor wattage from the actuator specification.

<Selection example>

DC power source (AC100V)

Series	EC-S13
Motor wattage	200W

Total

= 200W < 800W (1 unit)

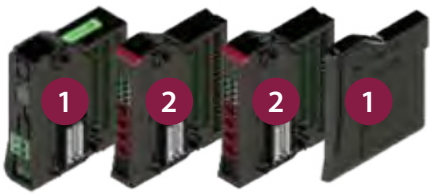
OK

Step 7 Unit models to be ordered

Order using the model name for each unit.

<Selection example>

Order model (x number of units)	Name/specification	
REC-GW-CC	EC gateway unit (with terminal unit)	1
RCON-EC-4 x 2 units	EC connection unit	2



Combined

Model specification items

RCON

RSEL

REC

(1) Master unit

RCON – □ – □ – □

Series | Type | I/O type | Options

Type	
GW	Standard type
GWG	Safety category spec type

I/O type	
CC	CC-Link connection specification
CIE	CC-Link IE Field connection specification
DV	DeviceNet connection specification
EC	EtherCAT connection specification
EP	EtherNet/IP connection specification
ECM	EtherCAT motion connection specification
PR	PROFIBUS-DP connection specification
PRT	PROFINET IO connection specification
ML3	MECHATROLINK III connection specification
SSN	SSCNET III/H connection specification

Options	
ET	Ethernet-equipped
FU□	Fan unit mounting (□: Specify the number of units, 1 ~ 8)
TRN	Without terminal unit

*· For fan units, this is the number connected to the 24V driver unit.
· A terminal unit is required during operation.
However, when connecting/ordering an RCON-SC, select the "TRN" to connect the terminal unit that is supplied with the 200V power supply unit.

RSEL – G – □ – □ – □

Series | Type | I/O type | I/O Cable Length | Options

I/O type	
E	Not used
NP	PIO specification (NPN16/16)
PN	PIO specification (PNP16/16)
CC	CC-Link connection specification
CC2	CC-Link connection specification (bifurcated connector supplied)
CIE	CC-Link IE Field connection specification
DV	DeviceNet connection specification
DV2	DeviceNet connection specification (bifurcated connector supplied)
EC	EtherCAT connection specification
EP	EtherNet/IP connection specification
PR	PROFIBUS-DP connection specification
PRT	PROFINET IO connection specification

I/O Cable Length	
0	Without cable
2	2m (Standard)
3	3m
5	5m

*If a specification other than PIO was selected for the I/O type, this will be "0 (without cable)".

Options	
FU□	Fan unit mounting (□: Specify the number of units, 1 ~ 5)
TRN	Without terminal unit

*· For fan units, this is the number connected to the master unit and 24V driver unit.
· A terminal unit is required during operation.
However, when connecting/ordering an RCON-SC, select the "TRN" to connect the terminal unit that is supplied with the 200V power supply unit.

REC – GW – □ – □

Series | Type | I/O type | Options

I/O type	
CC	CC-Link connection specification
CIE	CC-Link IE Field connection specification
DV	DeviceNet connection specification
EC	EtherCAT connection specification
EP	EtherNet/IP connection specification
PR	PROFIBUS-DP connection specification
PRT	PROFINET IO connection specification

Options	
TRN	Without terminal unit

* A terminal unit is required during operation.

(2) Driver unit

RCON – [ ] – [ ]

Series | Type | Number of Axes

PC	Stepper motor
PCF	High thrust stepper motor
AC	AC servo motor
DC	DC brush-less motor
SC	200V AC servo motor

1	1-axis specification
2	2-axis specification

*Type: Only 1-axis can be selected for PCF and SC.

24V specification

Type: PC 1.2A motor 1 axis 2 axes	20P	20□ stepper motor
	20SP	20□ stepper motor (For RA2AC/RA2BC)
	28P	28□ stepper motor
	35P	35□ stepper motor
	42P	42□ stepper motor
	42SP	42□ stepper motor (For RCP4-RA5C)
	56P	56□ stepper motor
Type: PCF 4A motor 1 axis	56SP	56□ high thrust stepper motor
	60P	60□ high thrust stepper motor
	86P	86□ high thrust stepper motor
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 brush-less motor

200V specification

Type: SC 60-750W motor 1 axis	30R	30W (for RS)
	60	60W servo motor
	100	100W servo motor
	100S	100W servo motor (for LSA)
	150	150W servo motor
	200	200W servo motor
	200S	200W servo motor (for LSA, DD)
	300S	300W servo motor (for LSA)
	400	400W servo motor
	600	600W servo motor
	750	750W servo motor

(3) Expansion unit

RCON – [ ] – [ ]

Series | Expansion | I/O Cable Length

EXT	SCON expansion
EXT-NP	PIO/SIO/SCON expansion (NPN specification)
EXT-PN	PIO/SIO/SCON expansion (PNP specification)
NP	PIO (NPN specification)
PN	PIO (PNP specification)

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

*No I/O cable length selection required if SCON expansion (EXT) is selected.

(4) EC connection unit

RCON – EC – 4

Series | Type | Number of Axes

* EC without ACR option cannot be connected to RCON-EC even though the cable for RCON-EC connection is used.

(5) Simple absolute unit

RCON – ABU – [ ]

Series | Absolute Unit | Type

P	Stepper motor
A	AC servo motor

(6) 200V power supply unit

RCON – PS2 – 3 – [ ]

Series | Type | Power supply voltage | Options

3	Three-phase/single-phase 200V

TRN	Without terminal unit

Only one RCON-PS2-3 can be used per RCON/RSEL.

(7) SCON controller (RCON-EXT connection specification)

SCON – [ ] – [ ] [ ] [ ] – **RC** – **0** – [ ]

Type | Motor type | Encoder Type | Options | I/O type | I/O Cable Length | Power supply voltage

Refer to P. 8-217 for model selection items.

Unit lineup

(1) Master unit

Model		RCON-GW/GWG									
I/O type		Field network									
		CC-Link	CC-Link IE Field	DeviceNet	EtherCAT		EtherNet/IP	PROFIBUS	PROFINET	MECHATROLINK	SSCNET III/H
		CC-Link connection specification	CC-Link IE Field connection specification	DeviceNet connection specification	EtherCAT connection specification	EtherCAT motion connection specification	EtherNet/IP connection specification	PROFIBUS-DP connection specification	PROFINET IO connection specification	MECHATROLINK-III connection specification	SSCNET III/H connection specification
I/O type model number		CC	CIE	DV	EC	ECM	EP	PR	PRT	ML3	SSN
Without fan		○	○	○	○	○	○	○	○	○	○
With 24V driver fan	FU1	○	○	○	○	○	○	○	○	○	○
	FU2	○	○	○	○	○	○	○	○	○	○
	FU3	○	○	○	○	○	○	○	○	○	○
	FU4	○	○	○	○	○	○	○	○	○	○
	FU5	○	○	○	○	○	○	○	○	○	○
	FU6	○	○	○	○	○	○	○	○	○	○
	FU7	○	○	○	○	○	○	○	○	○	○
	FU8	○	○	○	○	○	○	○	○	○	○

Model		RSEL-G									
I/O type		Not used	PIO connection		Field network						
			NPN specification	PNP specification	CC-Link	CC-Link IE Field	DeviceNet	EtherCAT	EtherNet/IP	PROFIBUS	PROFI NET
					CC-Link connection specification	CC-Link IE Field connection specification	DeviceNet connection specification	EtherCAT connection specification	EtherNet/IP connection specification	PROFIBUS-DP connection specification	PROFI NET connection specification
I/O type model number		E	NP	PN	CC/CC2	CIE	DV/DV2	EC	EP	PR	PRT
Without fan		○	○	○	○	○	○	○	○	○	○
With 24V driver fan	FU1	○	○	○	○	○	○	○	○	○	○
	FU2	○	○	○	○	○	○	○	○	○	○
	FU3	○	○	○	○	○	○	○	○	○	○
	FU4	○	○	○	○	○	○	○	○	○	○
	FU5	○	○	○	○	○	○	○	○	○	○

Model		REC-GW						
I/O type		Field network						
		CC-Link	CC-Link IE Field	DeviceNet	EtherCAT	EtherNet/IP	PROFIBUS	PROFI NET
		CC-Link connection specification	CC-Link IE Field connection specification	DeviceNet connection specification	EtherCAT connection specification	EtherNet/IP connection specification	PROFIBUS-DP connection specification	PROFI NET connection specification
I/O type model number		CC	CIE	DV	EC	EP	PR	PRT

(2) Driver unit

Series code		RCON				
Motor type		24V				200V
		Stepper motor		AC servo motor	DC brush-less motor	AC servo motor
		Standard type	High thrust type			
Type code		PC	PCF	AC	DC	SC
Number of Axes	1	○	○	○	○	○
	2	○	○	○	○	○

(3) Expansion unit

Series code	RCON				
Type name	SCON expansion	PIO/SIO/SCON expansion		PIO	
		NPN specification	PNP specification	NPN specification	PNP specification
Type code	EXT	EXT-NP	EXT-PN	NP	PN

(4) EC connection unit

Series code	RCON
Type name	EC connection unit
Type code	EC-4

(5) Simple absolute unit

Series model	RCON	
Motor type	Stepper motor	AC servo motor
Type code	ABU-PC	ABU-AC

(6) 200V power supply unit

Series code	RCON
Type name	200V power supply unit
Type code	PS2-3

(7) SCON controller (RCON-EXT connection specification)

Model	SCON-CB/CGB	
I/O type	RCON connection specification	
I/O type model number	RC	
Supported encoders	Battery-less absolute Incremental Quasi absolute Index absolute	Absolute Absolute multi-rotation
12~150W	○	○
200W	○	○
(100S/200S/300S)	○	○
300~400W	○	○
600W	○	○
750W	○	○
3000~3300W	○	○

* Refer to P. 8-217 for applicable actuators.

System configuration

RCON

Options
PC teaching software
(See P. 8-117)
<Model: RC/EC PC Software>

Options
Teaching pendant
(See P. 8-117)
<Model: TB-03><Model: TB-02>

PLC

Field network

DeviceNet, CC-Link, CC-Link IE Field, EtherCAT, EtherNet/IP, PROFIBUS-DP, PROFINET IO, EtherCAT motion, MECHATROLINK-III and SSCNET III/H

Supplied with GWG specification
Dummy plug
(See P. 8-120)
<Model: DP-5>

Supplied with gateway unit
System I/O connector
(See P. 8-120)
<Model: DFMC1,5/5-ST-3,5>

Options
Fan unit
(See P. 8-119)
<Model: RCON-FU>

For RC/EC PC Software: USB cable

For RCM-101-USB: Supplied with PC teaching software

Options
24VDC power supply
(See P. 8-119)
<Model: PSA-24>

Supplied with SCON-(RC specification)

Supplied with 200V driver unit

Dummy plug
(See P. 8-120)
<Model: DP-6>

Connection cable
(See P. 8-127)
<Model: CB-RE-CTL002>

RCON-EXT connection specification SCON controller [I/O type: RC]
(See P. 8-217)

Supplied with 24V driver unit
Drive source shutoff connector
(See P. 8-120)
<Model: DFMC1,5/2-STF-3,5>

Options
Regenerative resistance unit Note 1
(See P. 8-120)
<Model: RESU-2/ RESUD-2>

Supplied with power supply unit

Power supply connector
(See P. 8-120)
<Model: SPC5/4-STF-7,62>

Supplied with simple absolute unit
Connection cable
(See P.8-123)
<Model: CB-ADPC-MPA005>

Supplied with expansion unit
Terminal connector
(See P. 8-120)
<Model: RCON-EXT-TR>

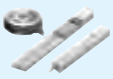
Options
Simple absolute unit
(See P. 8-106)
<Model: RCON-ABU-P (for stepper motor)>
<Model: RCON-ABU-A (for AC servo motor)>

Supplied with EC connection unit
Drive source shutoff connector
(See P. 8-120)
<Model: DFMC1,5/4-ST-3,5>

Motor power
Three-phase/ single-phase
200VAC

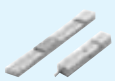
Motor-encoder cables / power/communication cables (EC connection)*1

Connection with "expansion unit"
RCS2/3/4 Series
IS(D)B Series
SSPA Series
DD(A) Series
LSA Series

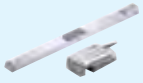


*See P. 8-90 for actuators that cannot be connected.

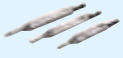
Connection with "24V driver unit"
RCP2/3/4/5/6 Series



RCA/2 Series

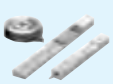


RCD Series



Connection with "EC connection unit"
EC Series *2

Connection with "200V driver unit"
(60W~750W equipped actuator)
RCS2/3/4 Series
IS(D)B Series
SSPA Series
DD(A) Series
LSA Series



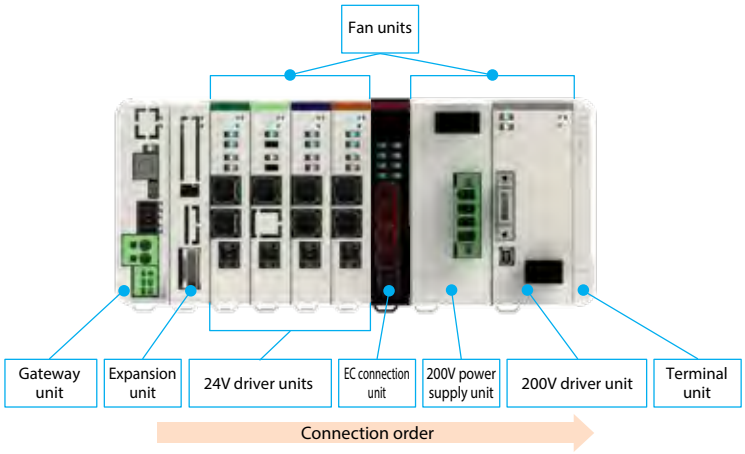
*See P. 8-90 for actuators that cannot be connected.

*1 The motor/encoder cable is supplied with the actuator.
The motor/encoder cables are different according to the actuator type to be connected.
Prepare power/communication cables separately for the number of connected axes.
Refer to P. 8-121 to order a cable alone.

*2 : When connecting 200V specification, a DC power source for driving motors is needed. Refer to P8-119 for details.
Note 1: A 60W regenerative resistor is built-in both RCON-SC and RCON-PS2. There is generally no need for regenerative resistance. However, if there is insufficient regenerative resistance, use the external "regenerative resistance unit".

Unit configuration

RCON has a locking configuration and uses the unit connection method. Units that can be connected will have the same connector.
However, there are restrictions on unit arrangement. Connect each unit with these restrictions in mind.
Connect each prepared unit in order starting from the left, with the gateway unit serving as the standard unit when looking at the front surface.
*The system will not operate normally if units are not connected in the following order.



*RCON-EC for EC ACR connection not compatible.

Unit name	Number of connected units	Additional information
Gateway unit	1	Placed at far left
Expansion unit	1	Placed to right of gateway unit
24V driver unit	(Max.) 16	Can be rearranged within the unit area
EC connection unit	(Max.) 4	
200V power supply unit	1	Make sure to connect to the left of the leftmost connected 200V driver unit
200V driver unit	(Max.) 16	Can be rearranged within the 200V driver unit area
Terminal unit	1	Place at far right (type differs according to driver connected to left)

* Some limitations apply on the number of connectable axes. See P. 8-109 for details.
* The EC connection unit alone cannot be connected.
Make sure to connect together with a 24V driver unit or a 200V driver unit.

■ Unit name and single product model number list

Product name		Model	Reference page
Master unit/gateway unit	DeviceNet connection specification	RCON-GW/GWG-DV	P8-93
	CC-Link connection specification	RCON-GW/GWG-CC	P8-94
	CC-Link IE Field connection specification	RCON-GW/GWG-CIE	P8-95
	PROFIBUS-DP connection specification	RCON-GW/GWG-PR	P8-96
	EtherCAT connection specification	RCON-GW/GWG-EC	P8-97
	EtherCAT motion connection specification	RCON-GW/GWG-ECM	P8-97
	EtherNet/IP connection specification	RCON-GW/GWG-EP	P8-98
	PROFINET IO connection specification	RCON-GW/GWG-PRT	P8-99
	MECHATROLINK-III connection specification	RCON-GW/GWG-ML3	P8-100
	SSCNET III/H connection specification	RCON-GW/GWG-SSN	P8-101
Expansion unit	SCON expansion	RCON-EXT	P8-105
24V driver unit	Stepper motor 1-axis specification	RCON-PC-1	P8-103
	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	
	DC brush-less motor 2-axis specification	RCON-DC-2	
EC connection unit	EC connection unit 4-axis specification	RCON-EC-4	P8-106
200V power supply unit	200VAC input power supply	RCON-PS2-3	P8-104
200V driver unit	AC200V motor 1-axis specification	RCON-SC-1	P8-104
Terminal unit	For 24V	RCON-GW-TR	P8-107
	For 200V	RCON-GW-TRS	
Simple absolute unit	For RCON-PC	RCON-ABU-P	P8-106
	For RCON-AC	RCON-ABU-A	
Fan unit	Other than the below	RCON-FU	P8-119
	For 200V driver	RCON-FUH	

System configuration

RSEL

PLC

Options
PC teaching software
(See P. 8-118)
<Model: XSEL PC Software, IA-101-X>

Options
Teaching pendant
(See P. 8-117)
<Model: TB-03><Model: TB-02>

SEL unit (NP/PN specification) option
PIO cable
(See P. 8-127)
<Model: CB-PAC-PIO***>

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

Supplied with SEL unit
Dummy plug
(See P. 8-120)
<Model: DP-4S>

Supplied with SEL unit
System I/O connector
(See P. 8-120)
<Model: DFMC1,5/8-ST-3,5>

Options
Fan unit
(See P. 8-119)
<Model: RCON-FU(H)>

For XSEL PC Software : USB cable, Ethernet cable

For IA-101-X(A): Supplied with PC teaching software

Options
24VDC power supply
(See P. 8-119)
<Model: PSA-24>

Supplied with unit
SCON connection, PIO/SIO connection
Expansion SIO port connector
(See P. 8-120)
<Model: FMC1,5/3-STF-3,5>

Supplied with 200V driver unit
Dummy plug
(See P. 8-120)
<Model: DP-6>

Supplied with SCON (RC specification)
Connection cable
(See P. 8-127)
<Model: CB-RE-CTL002>

RCON-EXT connection specification
SCON controller
[I/O type: RC]
(See P. 8-217)

Supplied with 24V driver unit
Drive source shutoff connector
(See P. 8-120)
<Model: DFMC1,5/2-STF-3,5>

Options
Regenerative resistance unit (Note 1)
(See P. 8-120)
<Model: RESU-2/ RESUD-2>

Supplied with power supply unit
Power supply connector
(See P. 8-120)
<Model: SPC5/4-STF-7,62>

Motor power
Three-phase/ single-phase
200VAC

Supplied with simple absolute unit
Connection cable
(See P. 8-123)
<Model: CB-ADPC-MPA005>

Supplied with SCON connection expansion unit
Terminal connector
(See P. 82)
<Model: RCON-EXT-TR>

Options
Simple absolute unit
(See P. 8-106)
<Model: RCON-ABU-P (for stepper motor)>
<Model: RCON-ABU-A (for AC servo motor)>

Motor-encoder cable*

Connectable actuators

Connection with "expansion unit"
RCS2/3/4 Series
IS(D)B Series
SSPA Series
DD(A) Series
LSA Series
* See P. 8-90 for actuators that cannot be connected.

Connection with "24V driver unit"
RCP2/3/4/5/6 Series
WU Series
RCA/2 Series
RCD Series

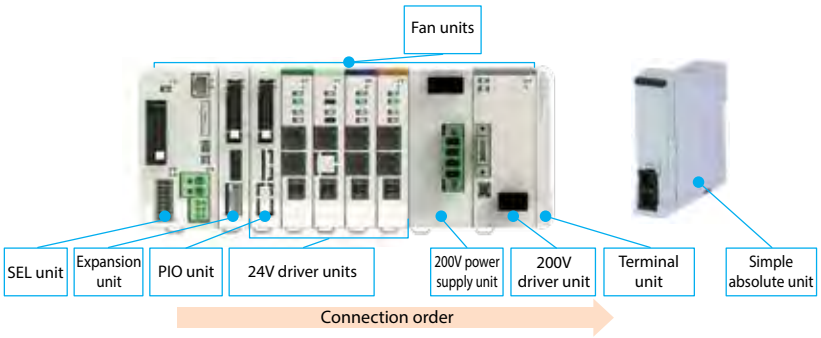
Connection with "200V driver unit"
(60W~750W equipped actuator)
RCS2/3/4 Series
IS(D)B Series
SSPA Series
DD(A) Series
LSA Series
*See P. 8-90 for actuators that cannot be connected.

*1 The motor/encoder cable is supplied with the actuator.
The motor/encoder cables are different according to the actuator type to be connected.
See P. 8-121 when ordering a spare cable.

Note 1: A 60W regenerative resistor is built-in both RCON-SC and RCON-PS2. There is generally no need for regenerative resistance. However, if there is insufficient regenerative resistance, use the external "regenerative resistance unit".

Unit configuration

RSEL has a locking configuration and uses the unit connection method. Units that can be connected will have the same connector. However, there are restrictions on unit arrangement. Connect each unit with these restrictions in mind.
Connect each prepared unit in order starting from the left, with the SEL unit serving as the standard unit when looking at the front surface.
* The system will not operate normally if units are not connected in the following order.



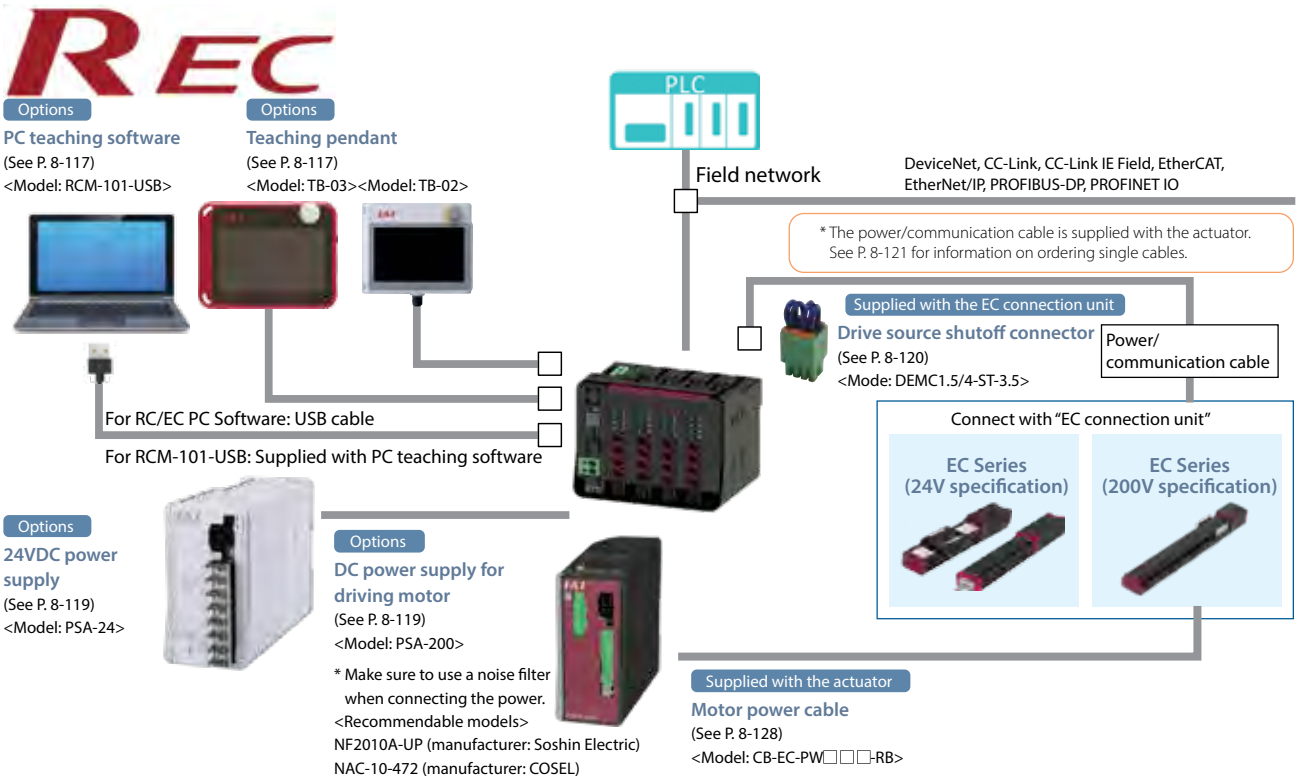
Unit name	Number of connected units	Additional information
SEL unit	1	Placed at far left
Expansion unit (SCON connection specification)	1 *	Select either type
Expansion unit (PIO unit)	(Max.) 8	If connecting a PIO/SIO/SCON expansion unit, the maximum will be 7
24V driver unit	(Max.) 8 *	Can be rearranged within the 24V driver unit
200V power supply unit	1	Make sure to connect to the left of the leftmost connected 200V driver unit
200V driver unit	(Max.) 8	Can be rearranged within the 200V driver unit
Terminal unit	1	Place at far right (type differs according to driver connected to left)

* Ensure that there are 8 or less total axes to connect.

■ Unit name and single product model number list

Product name		Model	Reference page
Master unit/ SEL unit	No IO connection specification	RSEL-G-E	P8-102
	PIO (NPN) connection specification	RSEL-G-NP	
	PIO (PNP) connection specification	RSEL-G-PN	
	DeviceNet connection specification	RSEL-G-DV	P8-93
	DeviceNet connection specification (bifurcated connector supplied)	RSEL-G-DV2	
	CC-Link connection specification	RSEL-G-CC	P8-94
	CC-Link connection specification (bifurcated connector supplied)	RSEL-G-CC2	
	CC-Link IE Field connection specification	RSEL-G-CIE	P8-95
	PROFIBUS-DP connection specification	RSEL-G-PR	P8-96
	EtherCAT connection specification	RSEL-G-FC	P8-97
	EtherNet/IP connection specification	RSEL-G-EP	P8-98
	PROFINET IO connection specification	RSEL-G-PRT	P8-99
Expansion unit	SCON expansion	RCON-EXT	P8-105
	PIO/SIO/SCON expansion (NPN specification)	RCON-EXT-NP	
	PIO/SIO/SCON expansion (PNP specification)	RCON-EXT-PN	
	PIO (NPN specification)	RCON-NP	
	PIO (PNP specification)	RCON-PN	
24V driver unit	Stepper motor 1-axis specification	RCON-PC-1	P8-103
	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	
	DC brush-less motor 2-axis specification	RCON-DC-2	
200V power supply unit	200VAC input power supply	RCON-PS2-3	P8-104
200V driver unit	AC200V motor 1-axis specification	RCON-SC-1	P8-104
Terminal unit	For 24V	RCON-GW-TR	P8-107
	For 200V	RCON-GW-TRS	
Simple absolute unit	For RCON-PC	RCON-ABU-P	P8-106
	For RCON-AC	RCON-ABU-A	
Fan unit	Other than the below	RCON-FU	P8-119
	For 200V driver	RCON-FUH	

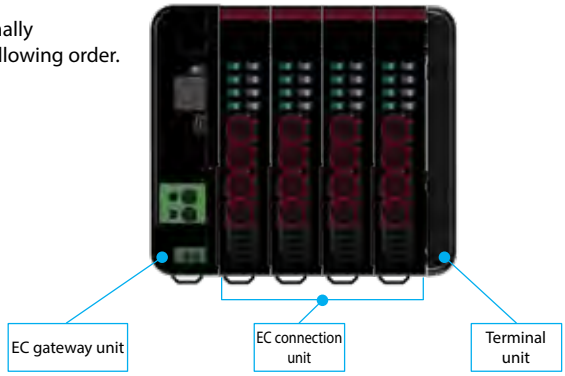
System configuration



Unit Configuration

The REC has a unit-connecting configuration. Every unit has the same connector and locking configuration. However, there are restrictions on unit arrangement. Connect each unit with these restrictions in mind. Connect each prepared unit in order starting from the left, with the EC gateway unit serving as the standard unit when looking at the front surface.

* The system will not operate normally if units are not connected in the following order.



Unit name	Number of connected units	Additional information
EC gateway unit	1	Placed at far left
EC connection unit	(Max.) 4	Can be rearranged within the unit area (max. number of connectable axes is 16 axes)
Terminal unit	1	Placed at far right

Product name		Model	Reference page
Master unit/ EC gateway unit	DeviceNet connection specification	REC-GW-DV	P8-93
	CC-Link connection specification	REC-GW-CC	P8-94
	CC-Link IE Field connection specification	REC-GW-CIE	P8-95
	PROFIBUS-DP connection specification	REC-GW-PR	P8-96
	EtherCAT connection specification	REC-GW-EC	P8-97
	EtherNet/IP connection specification	REC-GW-EP	P8-98
	PROFINET IO connection specification	REC-GW-PRT	P8-99
EC connection unit	EC connection unit 4-axis specification	RCON-EC-4	P8-106
Terminal unit	For REC	RCON-GW-TRE	P8-107

General specifications

RCON

Item			Specifications						
Power supply voltage			24VDC ± 10% 200VAC~230VAC ±10% (power supply unit)						
Power supply current			Differs with system configuration						
Number of axes controlled			1 to 16 axes *Refer to the "Max. number of connectable axes" (P. 8-109).						
Supported encoders		24V series	Incremental (including ABZ parallel) Battery-less absolute *1						
		200V series	Incremental (including ABZ parallel), battery-less absolute, quasi absolute, index absolute (SCON connection specification) absolute, absolute multi-rotation						
Supported field networks			CC-Link, CC-Link IE Field, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS-DP, PROFINET IO, EtherCAT motion, MECHATROLINK-III, SSCNET III/H						
Configuration units			Gateway unit, driver unit, SCON expansion unit, EC connection unit, power supply unit, fan unit, terminal unit, simple absolute unit.						
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			Collective system support with gateway unit STOP signal input, equipped with connectors capable of shutting off the drive power supply to individual axes of each driver unit						
Data recording device			FRAM 256kbit (gateway unit, 24V driver unit) SRAM 4Mbit (200V driver unit)						
Data input method	Teaching port		Touch panel teaching pendant						
	USB		PC teaching software						
Ethernet (optional)			10/100BASE-T (RJ-45 connector)						
			XSEL serial communication protocol (format B) *1						
Calendar function	Retention function		Approx. 10 days						
	Charging time		Approx. 100 hours						
Safety category compliance			B (the safety category specification supports up to 4 external circuits)						
Protection functionality			Overcurrent, abnormal humidity, encoder disconnection, overload						
Preventative/predictive maintenance function			Low electrolytic capacitor capacity and low fan rotation speed						
Ambient operating temperature			(Without fan) 0~40°C, (with fan) 0~55°C *0~40°C for simple absolute units						
Ambient operating humidity			5%RH ~ 85%RH (non-condensing, no frost)						
Operating atmosphere			Avoid corrosive gas and excessive dust						
Vibration resistance			Frequency: 10~57Hz / Amplitude: 0.075mm, Frequency: 57~150Hz / Acceleration: 9.8m/s^2 XYZ directions Sweep time: 10 minutes Number of sweeps: 10 times						
Shock resistance			Drop height: 800mm 1 corner, 3 edges, 6 faces						
Electric shock protection mechanism		24V	Class III						
		200V	Class I						
Degree of protection			IP20						
Insulation withstanding voltage			500VDC 10MΩ						
Cooling method			Natural cooling and forced cooling by fan unit (option)						
Connections between each unit			Unit connection method						
Installation/mounting method			DIN rail (35mm) mounting						
Regulations/standards	Unit name		Gateway unit	24V driver unit	200V driver unit	200V power supply unit	Simple absolute unit	SCON expansion unit	EC connection unit
	CE Marking		○	○	○	○	○	○	○
	UL		○	○	— (Applying)	— (Applying)	○	○	— (Applying)

*1: In the case of field network (SSN), the RCP5 (encoder resolution 800) is treated as incremental setting.

■ RSEL-G

Item		Specifications	
Power supply voltage		24VDC ±10% 200VAC~230VAC ±10% (power supply unit)	
Power supply current		Differs with system configuration	
Number of axes controlled		1 to 8 axes	
Supported encoders	24V series	Incremental (including ABZ parallel) Battery-less absolute	
	200V series	Incremental (including ABZ parallel), battery-less absolute, quasi absolute, index absolute (SCON connection specification) absolute, absolute multi-rotation	
Supported field networks		CC-Link, CC-Link IE Field, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS-DP, PROFINET IO	
Configuration units		SEL unit, driver unit, SCON expansion unit, PIO/SIO/SCON expansion unit, PIO unit, power supply unit, fan unit, terminal unit, simple absolute unit, EC connection unit	
Serial communication function	Teaching port	Communication method	RS232C
		Communication speed	Max. 115.2kbps
	USB port	Communication method	USB
		Communication speed	12Mbps full speed
		Ethernet (RJ-45), PSA-24 communication	
Emergency stop/Enable operation		Collective system support with SEL unit STOP signal input	
Data recording device		Flash ROM + non-volatile RAM (FRAM) *No battery required	
Safety category compliance		B (the safety category specification supports up to 4 external circuits)	
Safety circuit configuration		Duplication allowed	
Emergency stop input		B contact input (external power supply, duplication possible, can be selected from internal power supply)	
Enable input		B contact input (external power supply, duplication possible, can be selected from internal power supply)	
Speed setting		From 1mm/s upper limit depends on the actuator specification	
Acceleration/deceleration setting		From 0.01G upper limit depends on the actuator specification	
Number of axis groups		2 (max. 8 axes per group)	
Programming language		Super SEL language	
No. of programs		512 (up to 99 [BCD specification] or 255 [binary specification] can be selected by input signal)	
Number of programmable steps		20,000 steps	
Multi-tasking programs		16 programs	
Number of positions		36,000 positions (varies based on number of axis groups)	
Data input method	Teaching port	Touch panel teaching pendant, PC teaching software	
	USB	PC teaching software	
	Ethernet		
Standard input/output (when selecting PIO specification)		(I/O slot selection) Input 16 points/output 16 points	
Expansion I/O		Up to 8 PIO units can be connected	
Ethernet		10/100BASE-T (RJ-45 connector)	
		XSEL serial communication protocol (format B)*1	
USB		USB 2.0 (Mini-B), XSEL serial communication protocol (format B)*1	
Clock function	Retention time	Approx. 10 days	
	Charging time	Approx. 100 hours	
SD card		SD/SDHC (used only for update function)	
Protection functionality		Overcurrent, abnormal temperature, encoder disconnection, overload	
Preventative/predictive maintenance function		Low electrolytic capacitor capacity and low fan rotation speed	
Ambient operating temperature		(Without fan) 0~40°C, (with fan) 0~55°C *0~40°C for simple absolute units	
Ambient operating humidity		5%RH ~ 85%RH (non-condensing, no frost)	
Operating atmosphere		Avoid corrosive gas and excessive dust	
Vibration resistance		Frequency: 10~57Hz/Amplitude: 0.075mm, Frequency: 57~150Hz/Acceleration: 9.8m/s^2 XYZ directions Sweep time: 10 minutes Number of sweeps: 10 times	
Shock resistance		Drop height: 800mm 1 corner, 3 edges, 6 faces	
Electric shock protection mechanism	24V	Class III	
	200V	Class I	
Degree of protection		IP20	
Insulation withstanding voltage		500VDC 10MΩ	
Cooling method		Natural cooling and forced cooling by fan unit (option)	
Connections between each unit		Unit connection method	
Installation/mounting method		DIN rail (35mm) mounting	

Regulations/standards	Unit name	SEL unit	24V driver unit	200V driver unit	200V power supply unit	Simple absolute unit	SCON expansion unit	PIO/SIO/SCON expansion unit	PIO unit
	CE Marking	○	○	○	○	○	○	○	○
	UL	○	○	— (Applying)	— (Applying)	○	○	○	○

*1 XSEL serial communication protocol (format B) can communicate only with 1 port.
The order of priority is teaching port (high priority), USB, then Ethernet (low priority), with no response for low priority.

■ REC-GW

Item		Specifications	
Power supply voltage		24VDC ±10%	
Power supply current		Differs with system configuration	
Number of axes controlled		1~16-axis	
Supported encoders	EC connection	ELECYLINDER connection only Incremental, battery-less absolute	
Supported field networks		CC-Link, CC-Link IE Field, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS-DP, PROFINET IO	
Configuration units		EC gateway unit, EC connection unit, terminal unit	
Data input method		Teaching port	Touch panel teaching pendant
		USB	PC teaching software
Serial communication function	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 full speed
Emergency stop/Enable operation		Equipped with connectors capable of shutting off the drive power supply to individual axes of the EC connection unit	
Safety category compliance		Not applicable	
Ambient operating temperature		0~55℃	
Ambient operating humidity		5%RH ~ 85%RH (non-condensing, no frost)	
Operating atmosphere		Avoid corrosive gas and excessive dust	
Vibration resistance		Frequency: 10~57Hz / Amplitude: 0.075mm, Frequency: 57~150Hz / Acceleration: 9.8m/s^2 XYZ directions Sweep time: 10 minutes Number of sweeps: 10 times	
Shock resistance		Drop height: 800mm 1 corner, 3 edges, 6 faces	
Electric shock protection mechanism		Class III	
Degree of protection		IP20	
Insulation withstanding voltage		500VDC 10MΩ	
Cooling method		Natural cooling	
Connections between each unit		Unit connection method	
Installation/mounting method		DIN rail (35mm) mounting	
Regulations/standards	Unit name	EC gateway unit	EC connection unit
	CE Marking	○	○
	UL	○	○

■ Actuators not connectable to the R-unit.

Master unit	Unit	Driver unit		Expansion unit	EC connection unit (RCON-EC)
		24V driver unit (RCON-PC/PCF/AC/DC)	200V driver unit (RCON-SC)	SCON expansion unit/POI/SIO/ SCON expansion unit (RCON-EXT)	
	Actuator	24V stepper motor/ 24V AC servo motor/ actuator equipped with DC brush-less motor	Actuator equipped with 200V AC servo motor		ELECYLINDER
RCON (Note 1)		Wrist unit: WU Table top: TT(A) SCARA robot: IXP (Actuators that fall under the following specifications) Actuators equipped with an absolute encoder	Servo press: RCS2/RCS3 Linear servo: LSA-W21H LSA-W21S (single-phase power supply) SCARA robot: IX/IXA ROBO Cylinder: RCS3-CT8C/CTZ5C (single-phase power supply) Single-axis robot: IS(P)B-WXM/WXMX (single-phase power supply) Single-axis robot: ZR Rotary: DD/DDA (single phase power supply) <Actuators to meet the following specifications> * Actuators equipped with less than 60W and more than 750W motors. (Except RS-30) * Actuators equipped with an absolute encoder and multi-rotation absolute.	Servo press: RCS2/RCS3 Linear servo: LSA-W21H SCARA robot: IX/IXA Single-axis robot: ZR * The RCON cannot connect to PIO/SIO/SCON expansion units.	ELECYLINDERs that have no "ACR" in the option model code
RSEL		Table top: TT(A) SCARA robot: IXP (Actuators that fall under the following specifications) Actuators equipped with an absolute encoder			Not connectable
REC		Not connectable	Not connectable	Not connectable	ELECYLINDERs that have no "ACR" in the option model code

(Note 1) The motion network specification cannot connect to the following actuators (units).
* Index mode of Rotary [Network not supported: ECM, ML3, SSN]
* LSAS actuator [Network not supported: SSN]
* ELECYLINDER (RCON-EC) [Network not supported: ECM, ML3, SSN]

Encoder resolution

Item	Motor type	Model		Encoder type	Value [pulse/r]
24V driver unit	Stepper motor	RCP6		Battery-less Absolute	8192
		RCP5/RCP4/RCP3/RCP2		Battery-less Absolute	800
				Incremental	
		WU		Battery-less Absolute	8192
	AC servo motor	RCA		Battery-less Absolute	16384
				Incremental	800
		RCA2	☐☐N/NA Other than the above	Incremental	1048 800
	DC brush-less motor	RCD	RA1R/GRSN RA1DA/GRSNA	Incremental	480
200V driver unit	AC servo motor	RCS4/RCS3		Battery-less Absolute	16384
				Incremental	
		RCS2	☐☐5N	Incremental	1600
			SR☐7BD	Incremental	3072
			Models other than the above	Incremental	16384
				Battery-less Absolute	
		ISB/ISDB		Battery-less Absolute	131072
				Incremental	16384
		ISDBCR/SSPA/ISA/ISDA/IF/FS		Battery-less Absolute	131072
				Incremental	16384
		NSA		Battery-less Absolute	131072
		NS	S☐	Incremental	2400
			Models other than the above		16384
		LSA/LSAS		Incremental	Resolution 0.001mm
		DD/DDA	☐18S	Index absolute/multi-rotation	131072
			☐18P	Index absolute/multi-rotation	1048576
EC connection unit	Stepper motor	EC		Battery-less Absolute Incremental	800
	AC servo motor			Battery-less Absolute	16384

Generated heat (per unit)

Unit name	Unit model	Type	Value
24V driver unit	RCON-PC	PowerCON: No	5.0W
		PowerCON: Yes	8.0W
	RCON-PCF	PowerCON: No	19.2W
	RCON-AC	Standard / High accel/decel / Energy saving	4.5W
	RCON-DC	Standard	3.0W
200V driver unit	RCON-SC		54W
Power supply unit	RCON-PS2		42W

Inrush current

Unit name	Unit model	Type	Value
24V driver unit	RCON-PC		8.3A
	RCON-PCF		10A
	RCON-AC		10A
	RCON-DC		10A
200V driver unit	RCON-SC		25A
EC connection unit	RCON-EC	(For 4-axis connection)	40A

Power capacity

For R-unit, make sure for each unit that the calculated results for control power and motor power do not exceed the current limit value for selection calculation, based on the connection configuration.
When selecting a 200V driver unit, ensure that the total motor wattage (W) does not exceed the total wattage (W) for the maximum number of connectable axes. Only one RCON-PS2-3 can be used per RCON/RSEL system.
When connecting a 200V specification ELECYLINDER, select the number of DC power sources for driving motors according to the total motor wattage.
*The maximum number of connectable axes varies by series.

Current limit value

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

Total motor wattage (W)

Item		Total wattage (W) for max. number of connectable axes
Motor power	Single-phase 200VAC	1,600W
	Three-phase 200VAC	2,400W

DC power supply for driving motor

Connected power supply	Max. number of connected axes (per power supply unit)	Max. number of connected motor wattage
AC100V	6-axis	800W
AC200V	6-axis	1,600W

Power supply capacity

<Control power>

Item	Specification			Power capacity
Control power capacity (per unit)	Master unit (including terminal unit)	Gateway unit	Without Ethernet	0.8A
			With Ethernet	1.0A
		SEL unit		1.2A
		EC gateway unit		0.8A
	24V driver unit (common for all types)	Without brake		0.2A
		With brake (1-axis specification)		0.4A
		With brake (2-axis specification)		0.6A
	200V driver unit (including 200V power supply unit)	Without brake		0.2A
		With brake		0.5A
	Expansion unit (common for each unit)			0.1A
	Simple absolute unit (common to all types)			0.2A
	EC connection unit (per unit)			0.1A
	24V specification ELECYLINDER (per axis)	Without brake		0.3A
		With brake		0.5A
	200V specification ELECYLINDER (per axis)	Without brake		0.32A
		With brake		1.2A

* Calculate all the axes of connected ELECYLINDERs.
(Note) Do not include power capacity of the master unit in the calculation.
The 24V power source current of the 200V power unit is small and not necessary to include in the calculation.

<Motor power>

● 24V driver unit

Item	Actuator/driver unit				Rated current	Max. current	
		Series	Motor type			When energy-saving is set	
Motor power capacity (per 1-axis actuator)	Stepper motor /RCON-PC	RCP2 RCP3	20P/20SP/28P	Without PowerCON	0.8A	-	-
			28P*/35P/42P/56P		1.9A	-	-
		RCP4 RCP5 RCP6	28P/35P/42P/ 42SP/56P	Without PowerCON	1.9A	-	-
				With PowerCON	2.3A	-	3.9A
	Stepper motor /RCON-PCF	RCP2 RCP4 RCP5 RCP6	56SP/60P/86P	Without PowerCON	5.7A	-	-
	AC servo motor /RCON-AC	RCA RCA2	5W	Standard / Hi-accel./decel.	1.0A	-	3.3A
			10W	Standard / High accel./decel. 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	Standard / Hi-accel./decel.	0.8A	-	4.6A
			5W		1.0A	-	6.4A
			10W		1.3A	-	6.4A
	DC brush-less motor /RCON-DC	RCD	3W	Standard	0.7A	-	1.5A

* Applicable models: RCP2-RA3, RCP2-RGD3

● EC connection unit

Item	Actuator/connection unit				Power supply current		
		Series	Motor type	Type	Energy-saving disabled		Energy-saving enabled
					Rated current	Max.	
Motor power capacity (per 1-axis actuator)	24V stepper motor	EC	35P/42P/56P	Other than the below	2.3A	3.9A	1.9A
			28P	S3□/RR3□	-	-	1.9A
				RP4/GS4/GW4/TC4/TW4/ RTC9/GRB10/GRB12	-	-	1.7A
			20P	GRB8	-	-	0.7A

Configuration unit description

Master unit

Features This unit is used in order to connect to the field network.
It connects a 24VDC power supply and teaching.
(A terminal unit is supplied.)
These models have no options.

DeviceNet connection specification

RCON

Model: **RCON-GW/GWG-DV**

RSEL

Model: **RSEL-G-DV/DV2**

REC

Model: **REC-GW-DV**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC ± 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)		
Operating atmosphere	Avoid corrosive gas and excessive dust		
Safety category compliance	GWG specification: 4 compatible	4 compatible	-
Degree of protection	IP20		
Mass	167g	270g	135g
Accessories	(GWG specification) Dummy plug DP-5	Dummy plug DP-4S	-
External dimensions	W30mm×H115mm×D95mm	W56.6mm×H115mm×D95mm	W30mm×H115mm×D95mm
PC teaching software	RCM-101-USB	IA-101-N/X-*	RCM-101-USB
Teaching pendant	TB-02/TB-03		

A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

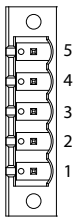
Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	MSTB2,5/5-STF-5,08 AUM	Standard accessories
		TMSTBP2,5/5-STF-5,08 AUM (bifurcated) *For DV2	Standard accessories
	Controller side	MSTB2,5/5-GF-5,08 AU	

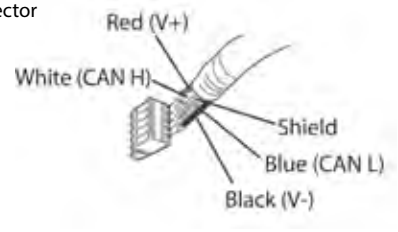
Network connection cable

Pin No.	Signal name (color scheme)	Description	Compatible wire diameter
1(6)	V- (black)	Power supply cable - side	DeviceNet dedicated cable
2(7)	CAN L (blue)	Signal data Low side	
3(8)	-	Drain (shield)	
4(9)	CAN H (white)	Signal data High side	
5(10)	V+ (red)	Power supply cable + side	

*() indicates the bifurcated connector specification

Network connector





CC-Link connection specification

RCON

Model: **RCON-GW/GWG-CC**

RSEL

Model: **RSEL-G-CC/CC2**

REC

Model: **REC-GW-CC**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC ± 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)		
Operating atmosphere	Avoid corrosive gas and excessive dust		
Safety category compliance	GWG specification: 4 compatible	4 compatible	-
Degree of protection	IP20		
Mass	167g	270g	135g
Accessories	(GWG specification) Dummy plug DP-5	Dummy plug DP-4S	-
External dimensions	W30mm×H115mm×D95mm	W56.6mm×H115mm×D95mm	W30mm×H115mm×D95mm
PC teaching software	RCM-101-USB	IA-101-N/X-*	RCM-101-USB
Teaching pendant	TB-02/TB-03		

A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

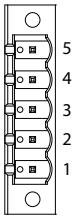
Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	MSTB2,5/5-STF-5,08 AU With 110Ω/130Ω terminal resistor	Standard accessories
		TMSTBP2,5/5-STF-5,08 AU *For CC2 With 110Ω/130Ω terminal resistor	Standard accessories
	Controller side	MSTB2,5/5-GF-5,08 AU	

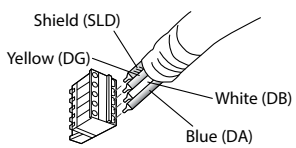
Network connection cable

Pin No.	Signal name (color scheme)	Description	Compatible wire diameter
1(6)	DA (blue)	Signal line A	CC-Link dedicated cable
2(7)	DB (white)	Signal line B	
3(8)	DG (yellow)	Digital ground	
4(9)	SLD	Connects the shield of shielded cables (5-pin FG and control power connector 1-pin FG connected internally)	
5	FG	Frame ground (4-pin SLD and control power connector 1-pin FG connected internally)	

*() indicates the bifurcated connector specification

Network connector





CC-Link IE field connection specification

RCON

Model: **RCON-GW/GWG-CIE**

RSEL

Model: **RSEL-G-CIE**

REC

Model: **REC-GW-CIE**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC ± 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)		
Operating atmosphere	Avoid corrosive gas and excessive dust		
Safety category compliance	GWG specification: 4 compatible	4 compatible	-
Degree of protection	IP20		
Mass	167g	270g	135g
Accessories	(GWG specification) Dummy plug DP-5	Dummy plug DP-4S	-
External dimensions	W30mm×H115mm×D95mm	W56.6mm×H115mm×D95mm	W30mm×H115mm×D95mm
PC teaching software	RCM-101-USB	IA-101-N/X-*	RCM-101-USB
Teaching pendant	TB-02/TB-03		

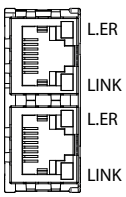
A fan unit must be attached during use in environments exceeding 40°C (excluding REC)
CC-link IE Basic is not supported.

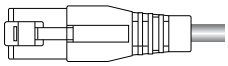
Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	Ethernet ANSI/TIA/EIA-568-B Category 5e or higher shielded 8P8C modular plug (RJ45)	To be prepared by the customer
	Controller side	Ethernet ANSI/TIA/EIA-568-B Category 5e or higher shielded 8P8C modular plug (RJ45)	

Network connection cable

Pin No.	Signal name	Description	Compatible wire diameter
1	TP0+	Data 0+	For the Ethernet cable, use a straight STP cable of Category 5e or higher.
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-	

Network connector





PROFIBUS-DP connection specification

RCON

Model: **RCON-GW/GWG-PR**

RSEL

Model: **RSEL-G-PR**

REC

Model: **REC-GW-PR**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC ± 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)		
Operating atmosphere	Avoid corrosive gas and excessive dust		
Safety category compliance	GWG specification: 4 compatible	4 compatible	-
Degree of protection	IP20		
Mass	167g	270g	135g
Accessories	(GWG specification) Dummy plug DP-5	Dummy plug DP-4S	-
External dimensions	W30mm×H115mm×D95mm	W56.6mm×H115mm×D95mm	W30mm×H115mm×D95mm
PC teaching software	RCM-101-USB	IA-101-N/X-*	RCM-101-USB
Teaching pendant	TB-02/TB-03		

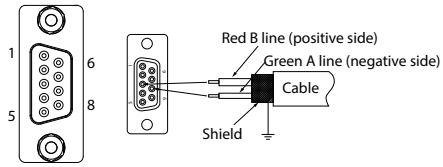
A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	9-pin D sub connector (male)	To be prepared by the customer
	Controller side	9-pin D sub connector (female)	

Network connection cable

Pin No.	Signal name	Description	Compatible wire diameter
1	NC	Not connected	PROFIBUS-DP dedicated cable (type A: EN5017)
2	NC	Not connected	
3	B-Line	Signal line B (RS-485)	
4	RTS	Transmission request	
5	GND	Signal GND (insulation)	
6	+5V	+5 V output (isolated)	
7	NC	Not connected	
8	A-Line	Signal line A (RS-485)	
9	NC	Not connected	

Network connector



EtherCAT/EtherCAT motion connection specification

RCON

Model: **RCON-GW/GWG-EC/ECM**

RSEL

Model: **RSEL-G-EC**

REC

Model: **REC-GW-EC**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC ± 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)		
Operating atmosphere	Avoid corrosive gas and excessive dust		
Safety category compliance	GWG specification: 4 compatible	4 compatible	-
Degree of protection	IP20		
Mass	167g	270g	135g
Accessories	(GWG specification) Dummy plug DP-5	Dummy plug DP-4S	-
External dimensions	W30mm×H115mm×D95mm	W56.6mm×H115mm×D95mm	W30mm×H115mm×D95mm
PC teaching software	RCM-101-USB	IA-101-N/X-*	RCM-101-USB
Teaching pendant	TB-02/TB-03		

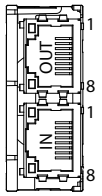
A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

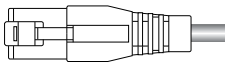
Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher shielded 8P8C modular plug (RJ45)	To be prepared by the customer
	Controller side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher shielded 8P8C modular jack (RJ45)	

Network connection cable

Pin No.	Signal name	Description	Compatible wire diameter
1	TD +	Transmit data +	For the Ethernet cable, use a straight STP cable of Category 5 or higher.
2	TD -	Transmit data -	
3	RD +	Receive data +	
4	-	Not used	
5	-	Not used	
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

Network connector





EtherNet/IP connection specification

RCON

Model: **RCON-GW/GWG-EP**

RSEL

Model: **RSEL-G-EP**

REC

Model: **REC-GW-EP**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC ± 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)		
Operating atmosphere	Avoid corrosive gas and excessive dust		
Safety category compliance	GWG specification: 4 compatible	4 compatible	-
Degree of protection	IP20		
Mass	167g	270g	135g
Accessories	(GWG specification) Dummy plug DP-5	Dummy plug DP-4S	-
External dimensions	W30mm×H115mm×D95mm	W56.6mm×H115mm×D95mm	W30mm×H115mm×D95mm
PC teaching software	RCM-101-USB	IA-101-N/X-*	RCM-101-USB
Teaching pendant	TB-02/TB-03		

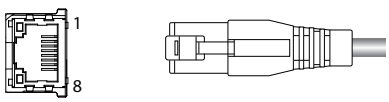
A fan unit must be attached during use in environments exceeding 40°C (excluding REC)
Explicit messaging is not supported. (Implicit messaging only).

Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher shielded 8P8C modular plug (RJ45)	To be prepared by the customer
	Controller side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher shielded 8P8C modular jack (RJ45)	

Network connection cable

Pin No.	Signal name	Description	Compatible wire diameter
1	TD +	Transmit data +	For the Ethernet cable, use a straight STP cable of Category 5 or higher.
2	TD -	Transmit data -	
3	RD +	Receive data +	
4	-	Not used	
5	-	Not used	
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

Network connector



PROFINET IO connection specification

RCON

Model: **RCON-GW/GWG-PRT**

RSEL

Model: **RSEL-G-PRT**

REC

Model: **REC-GW-PRT**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC ± 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)		
Operating atmosphere	Avoid corrosive gas and excessive dust		
Safety category compliance	GWG specification: 4 compatible	4 compatible	-
Degree of protection	IP20		
Mass	167g	270g	135g
Accessories	(GWG specification) Dummy plug DP-5	Dummy plug DP-4S	-
External dimensions	W30mm×H115mm×D95mm	W56.6mm×H115mm×D95mm	W30mm×H115mm×D95mm
PC teaching software	RCM-101-USB	IA-101-N/X-*	RCM-101-USB
Teaching pendant	TB-02/TB-03		

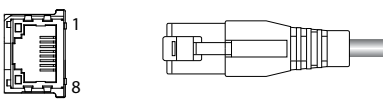
A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher shielded 8P8C modular plug (RJ45)	To be prepared by the customer
	Controller side	Ethernet ANSI/TIA/EIA-568-B Category 5 or higher shielded 8P8C modular jack (RJ45)	

Network connection cable

Pin No.	Signal name	Description	Compatible wire diameter
1	TD +	Transmit data +	For the Ethernet cable, use a straight STP cable of Category 5 or higher.
2	TD -	Transmit data -	
3	RD +	Receive data +	
4	-	Not used	
5	-	Not used	
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

Network connector



MECHATROLINK-III connection specification

Model: **RCON-GW/GWG-ML3**

Specifications

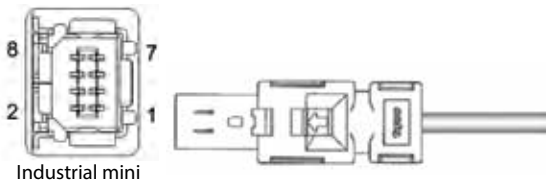
	RCON
Operation type	Positioner Type
Power supply input voltage	24VDC ± 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4
Degree of protection	IP20
Mass	167g
Accessories	(GWG specification) Dummy plug DP-5
External dimensions	W30mm×H115mm×D95mm
PC software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

* When using in an environment of above 40 °C, make sure to use a fan unit.

Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
Network	Cable side	Industrial mini I/O plug	To be prepared by the customer
	Controller side	Industrial mini I/O receptacle	

Network connection cable

Pin No.	Signal name	Description	Compatible wire diameter
1	TD +	Transmit data +	Use a cable for MECHATROLINK- III.
2	TD -	Transmit data -	
3	RD +	Receive data +	
4	-	Not used	
5	-	Not used	
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	



Industrial mini I/O connector (controller side)

SSCNET Ⅲ/H connection specification

RCON

Model: **RCON-GW/GWG-SSN**

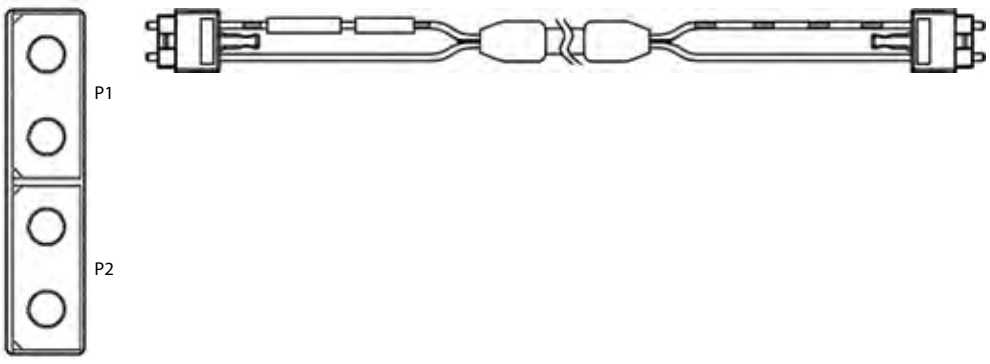
Specifications

	RCON
Operation type	Positioner Type
Power supply input voltage	24VDC ± 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4
Degree of protection	IP20
Mass	167g
Accessories	(GWG specification) Dummy plug DP-5
External dimensions	W30mm×H115mm×D95mm
PC software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

* When using in an environment of above 40 °C, make sure to use a fan unit.

Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
Network	Cable side	PF-2D103(JAE)	To be prepared by the customer
	Controller side	DC9510(HITACHI)	

Connector for network



No I/O connection specification

Specifications

	RSEL
Operation type	Program Type
Power supply input voltage	24VDC ± 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C#, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	4 compatible
Degree of protection	IP20
Mass	270g
Accessory	Dummy plug DP-4S
External dimensions	W56.6mm×H115mm×D95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

Model: **RSEL-G-E**

Connector		Cable connector model (manufacturer)	Remarks
System IO	Cable side	DFMC1,5/8-ST-3,5 (Phoenix Contact)	

NPN/PNP connection specification

Specifications

	RSEL
Operation type	Program Type
Power supply input voltage	24VDC ± 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	4 compatible
Degree of protection	IP20
Mass	270g
Accessory	Dummy plug DP-4S, PIO cable CB-PAC-PIO***
External dimensions	W56.6mm×H115mm×D95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

Model: **RSEL-G-NP/PN**

Connector		Cable connector model (manufacturer)	Remarks
System IO	Cable side	DFMC1,5/8-ST-3,5 (Phoenix Contact)	
IO slot	Cable side	HIF6-40PA-1,27R*	Options
	Controller side	HIF6-40PA-1,27DS(71)	

*Connect an IO cable (CB-PAC-PIO□□□)

Refer to P8-108 for the PIO signal table and internal circuit.

Configuration unit description

Driver unit

Features A controller unit for actuator control.

24V driver unit for RCP series connection

A driver unit for stepper motor connection.
Can be connected to all RCP series actuators.

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

Specifications

Power	24VDC ± 10%
Control power	(Without brake) 0.2A (With brake, 1-axis specification) 0.4A (With brake, 2-axis specification) 0.6A
Ambient operating temperature & humidity	(Without fan) 0~40°C (With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	(1-axis specification) 175g (2-axis specification) 180g
External dimensions	W22.6mm × H115mm × D95mm
Accessories	Drive source shutoff connector (DFMC1,5/2-STF-3,5)
Compatible Type	RCON/RSEL

24V driver unit for RCA series connection

A driver unit for AC servo motor connection.
Can be connected to all RCA series actuators.

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

Specifications

Power	24VDC ± 10%
Control power	(Without brake) 0.2A (With brake, 1-axis specification) 0.4A (With brake, 2-axis specification) 0.6A
Ambient operating temperature & humidity	(Without fan) 0~40°C (With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	(1-axis specification) 175g (2-axis specification) 180g
External dimensions	W22.6mm × H115mm × D95mm
Accessories	Drive source shutoff connector (DFMC1,5/2-STF-3,5)
Compatible Type	RCON/RSEL

24V driver unit for RCD series connection

A driver unit for DC brush-less motor connection.
Can be connected to all RCD series actuators.

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

Specifications

Power	24VDC ± 10%
Control power	(Without brake) 0.2A (With brake, 1-axis specification) 0.4A (With brake, 2-axis specification) 0.6A
Ambient operating temperature & humidity	(Without fan) 0~40°C (With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	(1-axis specification) 175g (2-axis specification) 180g
External dimensions	W22.6mm × H115mm × D95mm
Accessories	Drive source shutoff connector (DFMC1,5/2-STF-3,5)
Compatible Type	RCON/RSEL

Configuration unit description

200V driver unit

200V AC motor-equipped actuator connection

This driver unit connects 200VAC servo actuators from 60W to 750W.

Model	Type	Compatible motor capacity
RCON-SC-1	1-axis connection	60W/100W/150W/200W 300W/400W/600W/750W

Specifications

Control power input specification	24VDC ±10%
Control power	(Without brake) 0.2A (With brake) 0.5A
Ambient operating temperature & humidity	(With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	438g
External dimensions	W45.2mm×H115mm×D95mm
Accessories	Fan unit RCON-FU, Dummy plug DP-6
Compatible Type	RCON/RSEL

Example: With 3-pharse 200VAC power supply (max 2400W), 6 axes of 400W types can be connected with 6 units of RCON-SC-1 and 1unit of RCON-PS2-3.

200V power supply unit

This power supply unit is for 200VAC input only.
A 200V driver unit must be connected.

Model
RCON-PS2-3

*A terminal unit is supplied (RCON-GW-TRS).

Specifications

Motor power input voltage	Single-phase/three-phase 200VAC~230VAC ±10%
Maximum power capacity	(Single phase) 1,600W, (three-phase) 2,400W
Ambient operating temperature & humidity	(With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	393g
External dimensions	W45.2mm×H115mm×D95mm
Accessories	Fan unit RCON-FU, Power supply connector SPC5/4-STF-7,62
Compatible Type	RCON/RSEL

* A noise filter is installed inside.

Configuration unit description

Other Units

SCON expansion unit

SCON-CB/CGB can be connected to operate an actuator with 200V motor.

RCON RSEL

Model
RCON-EXT

Specifications

Power	24VDC ± 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	99g
External dimensions	W22.6mm × H115mm × D95mm
Accessories	Terminal connector RCON-EXT-TR
Compatible Type	RCON/RSEL

PIO/SIO/SCON expansion unit

This specification model allows PIO/SIO to be connected to an expansion unit for connecting SCON-CB/CGB.

RSEL

Model
RCON-EXT-NP (NPN specification)
RCON-EXT-PN (PNP specification)

Specifications

Power	24VDC ± 10%
Control power	0.1A
Input Output	Input 16 points, Output 16 points
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	110g
External dimensions	W22.6mm×H115mm×D95mm
Accessories	Expansion SIO port connector FMC1,5/3-STF-3,5 Terminal connector RCON-EXT-TR PIO cable CB-PAC-PIO*** (In case the cable length model other than "0" is specified)
Compatible Type	RSEL

PIO unit

This unit is for PIO expansion.

RSEL

Model
RCON-NP (NPN specification)
RCON-PN (PNP specification)

Specifications

Power	24VDC ± 10%
Control power	0.1A
Input Output	Input 16 points, Output 16 points
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	105g
External dimensions	W22.6mm×H115mm×D95mm
Accessories	PIO cable CB-PAC-PIO*** (In case the cable length model other than "0" is specified)
Compatible Type	RSEL

* Refer to P8-108 for the PIO signal table and internal circuit.

■ EC connection unit

This unit allows up to 4 axes of ELECYLINDER with ACR option to be connected.

RCON RSEL REC

Model
RCON-EC-4

Specifications

Power	24VDC ± 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	123g
External dimensions	W22.6mm×H115mm×D95mm
Accessories	Drive source shutoff connector (DFMC1,5/4-ST-3,5 (REC))
Compatible Type	RCON/REC

Simple absolute unit

*For 24V driver connection

This unit is to be connected when using an actuator with incremental specification as absolute specification.

RCON RSEL

Model	Type	Compatible motor
RCON-ABU-P	For RCP series connection	Stepper motor
RCON-ABU-A	For RCA series connection	AC servo motor

Specifications

Power	24VDC ± 10%
Control power	0.2A
Absolute battery model	AB-7
Battery voltage	3.6V
Charging time	Approx. 72 hours
Ambient operating temperature & humidity	0~40°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	271g (including 173g for absolute battery)
External dimensions	W22.6mm×H115mm×D95mm
Accessories	Cable (CB-ADPC-MPA005)
Compatible Type	RCON/RSEL

Configuration unit description

Terminal unit

A terminal resistor for returning RCON/RSEL serial communication and input/output signals. (Supplied with purchase of gateway unit.)

Model
RCON-GW-TR

Specifications

Power	24VDC ± 10%
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	48g
External dimensions	W12.6mm × H115mm × D95mm
Compatible Type	RCON without RCON-PS2-3 RSEL without RCON-PS2-3

200V terminal unit

This terminal resistor is for connecting a 200VAC driver unit. (Supplied with purchase of power supply unit.)

Model
RCON-GW-TRS

Specifications

Power	24VDC ± 10%
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	40g
External dimensions	W12.6mm×H115mm×D95mm
Compatible Type	RCON with RCON-PS2-3 RSEL with RCON-PS2-3

REC terminal unit

This terminal resistor is for connecting an EC module only. (Supplied with purchase of gateway unit.)

Model
RCON-GW-TRE

Specifications

Power	24VDC ± 10%
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	48g
External dimensions	W12.6mm×H115mm×D95mm
Compatible Type	REC

PIO signal chart

Standard PIO connector, expansion PIO connector pin layout

Category	Pin No.	Assignment	Pin No.	Category	Assignment
24V	1A	P24	1B	Output	OUT0
24V	2A	P24	2B		OUT1
-	3A	-	3B		OUT2
-	4A	-	4B		OUT3
Input	5A	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

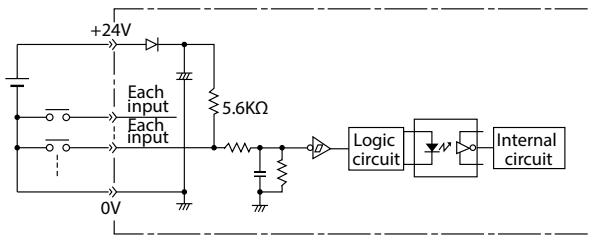
* The same assignment will be applied to each unit even for an expansion unit (PIO specification).

I/O internal circuit

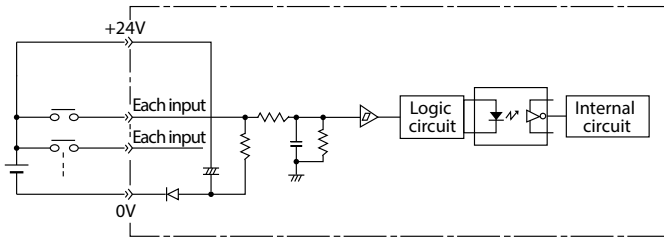
[Input]

Item	Specifications
Number of input	16 points
Input voltage	24VDC ± 10%
Input current	4mA/1 circuit
On/off voltage	On voltage: Min. 18VDC (3.5mA) Off voltage: Max. 6VDC (1mA)
Isolation method	Photocoupler

[NPN specification]



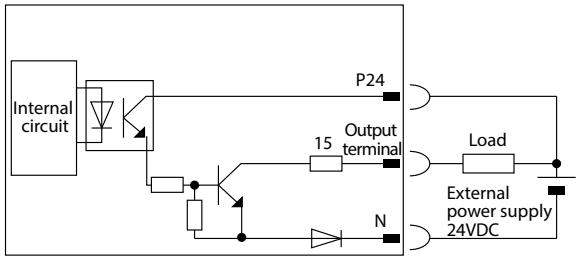
[PNP specification]



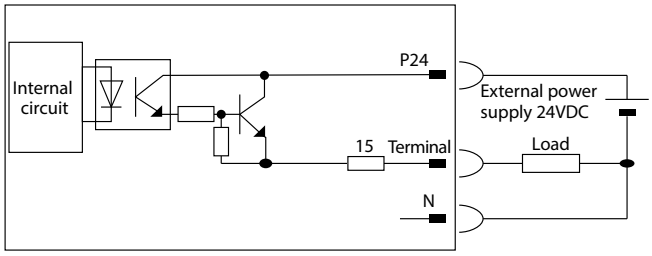
[Output]

Item	Specifications
Output current	16 points
Rated load voltage	24VDC ± 10%
Max. current	50mA/1 circuit
Isolation method	Photocoupler

[NPN specification]



[PNP specification]



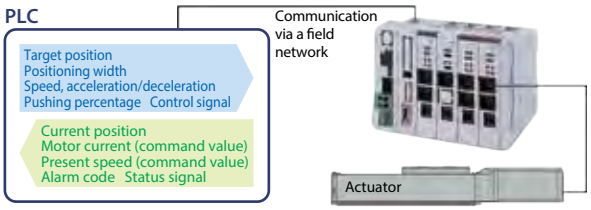
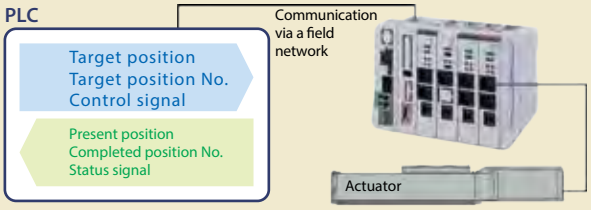
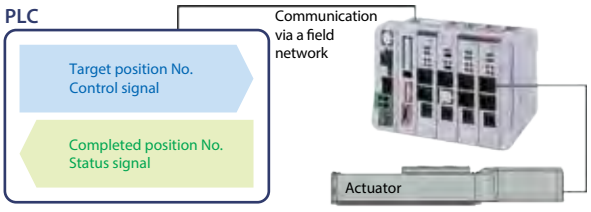
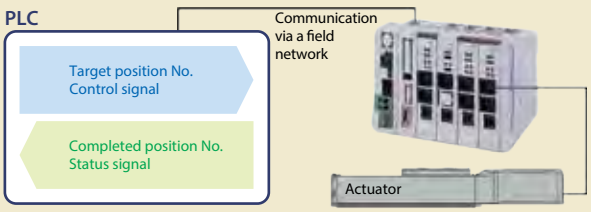
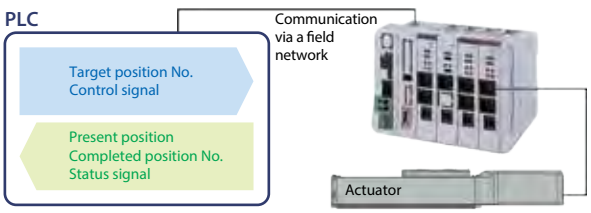
Maximum connectable axes by RCON-GW operation mode

The max. number of connectable axes when all the axes operate in the same operation mode.
* If different operation modes exist, confirm using the model selection software.

Field network \ Operation mode	Remote I/O						Motion network
	Direct numerical control mode	Simple direct mode	Positioner mode 1	Positioner mode 2	Positioner mode 3	Positioner mode 5	
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	
EtherCAT motion	-	-	-	-	-	-	8 axes
MECHATROLINK-III	-	-	-	-	-	-	8 axes
SSCNET III/H	-	-	-	-	-	-	8 axes

Field Network operation mode (EtherCAT motion, MECHATOROLINK-III and SSCNET III/H are excluded)

The RCON-GW field network control operation mode can be selected from the following control modes. Data required for operation (target position, speed, acceleration, push current value, etc.) are written by a connected PLC or other host controller into the specified addresses. * The EC connection unit is not supported.

Operation mode	Description	Overview
Direct numerical control mode	This mode allows designating the target position, speed, acceleration/deceleration, and current limit value for pushing numerically. Also, it is capable of monitoring the present position, present speed, and the command current value with 0.01mm increments.	
Simple direct value mode	Can modify any of the stored target positions by numerical value. Also allows monitoring of the present position numerically with 0.01mm increments.	
Positioner 1 mode	Can store up to 128 points of position data, and can move to the stored position. Also allows monitoring of the present position numerically with 0.01mm increments.	
Positioner 2 mode	Can store up to 128 points of position data, and can move to the stored position. This mode does not allow monitoring of the present position. This mode has less in/out data transfer volume than the Positioner 1 mode.	
Positioner 3 mode	Can store up to 128 points of position data, and can move to the stored position. This mode does not allow monitoring of the present position. This mode has less in/out data transfer volume than the Positioner 2 mode, and controls travel with the minimum of signals.	
Positioner 5 mode	Can store up to 16 points of position data, and can move to the stored position. This mode has less in/out data transfer volume and fewer positioning tables than the Positioner 2 mode, and allows monitoring of the present position numerically with 0.1mm increments.	

List of functions by operation mode (EtherCAT motion, MECHATOROLINK-Ⅲ and SSCNET Ⅲ/H are excluded)

	Direct numerical control mode	Simple direct value mode	Positioner 1 mode	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Number of positioning points	Unlimited	128 points	128 points	128 points	128 points	16 points
Home return motion	○	○	○	○	○	○
Positioning operation	○	○	△	△	△	△
Speed, acceleration/ deceleration settings	○	△	△	△	△	△
Different acceleration and deceleration settings	×	△	△	△	△	△
Pitch feed (incremental)	○	△ (Note 1)	△	△	×	△
JOG operation	△	△	△	△	×	△
Position data writing	×	×	○	○	×	×
Push-motion operation	○	△	△	△	△	△
Speed changes while traveling	○	△	△	△	△	△
Pausing	○	○	○	○	○	○
Zone signal output	△(2 points)	△(2 points)	△(2 points)	△(2 points)	△(1 point)	△(2 points)
Position zone signal output	×	△	△	△	×	×
Overload warning output	○	○	○	○	×	○
Vibration control (Note 2)	×	△	△	△	△	△
Collision detection function (Note 3)	×	△	△	△	△	△
Current position reading (Note 4) (resolution)	○(0.01mm)	○(0.01mm)	○(0.01mm)	×	×	○ (Note 5) (0.1mm)

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

Note 1: Up to 128 points of position data can be set.

Note 2: This function is limited to the AC servo motor specification.

Note 3: This function is limited to the stepper motor specification.

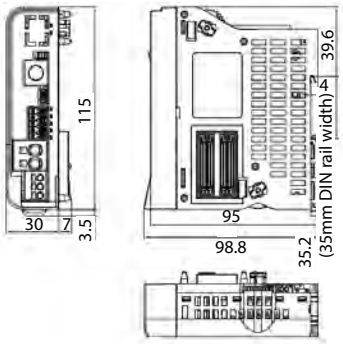
Note 4: The resolution to control a DD motor is 0.001 degree (0.01 degree for positioner 5 mode only).

Note 5: The maximum output value in positioner 5 mode is 3,276.7mm (327.67 degrees for DD motor).
To control the actuator in an operation range exceeding the maximum value, select a different operation mode.

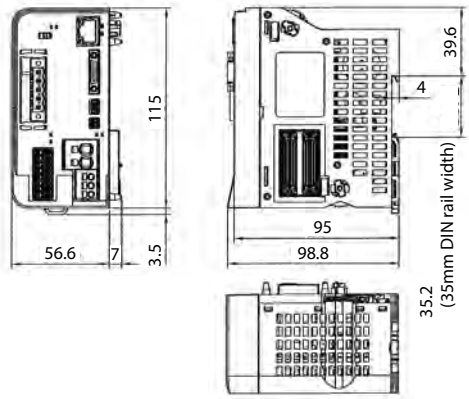
External dimensions

Master unit

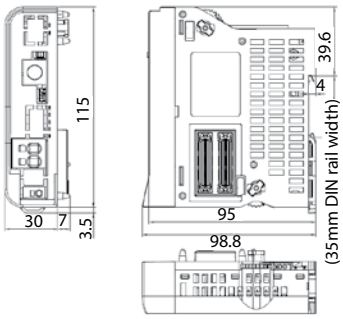
RCON



RSEL

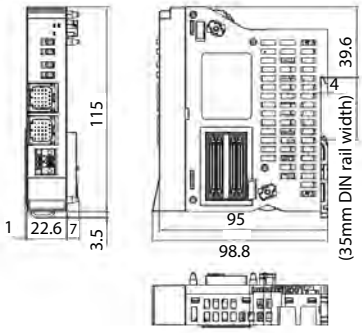


REC

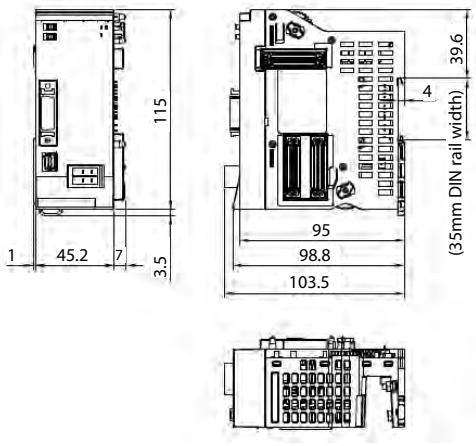


Driver Unit

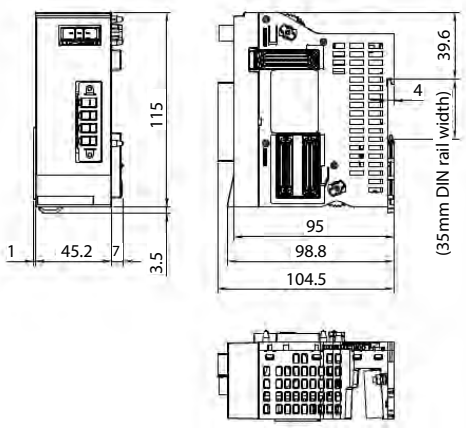
24V



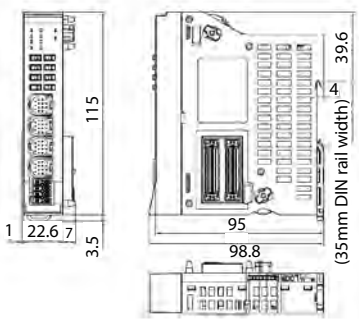
200V



200V power supply unit



EC connection unit

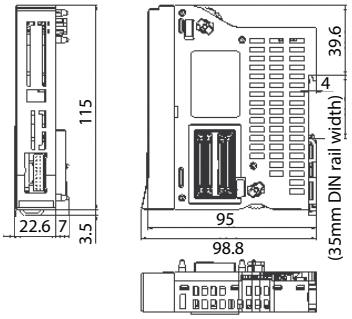


External dimensions

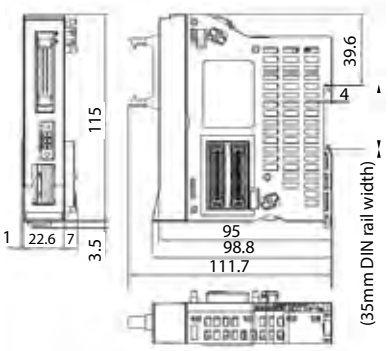
CAD drawings are downloadable from IAI website. www.iai-robot.co.jp 2D CAD 3D CAD

Expansion unit

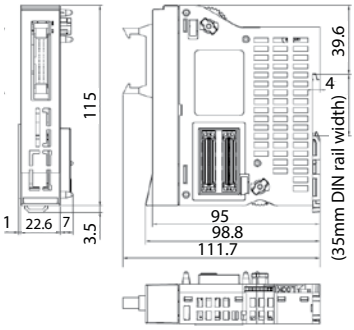
SCON expansion



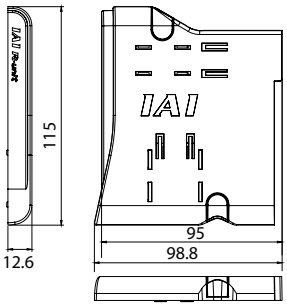
PIO/SIO/SCON expansion



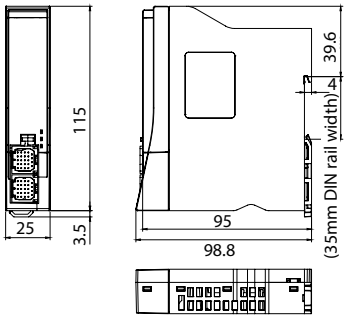
PIO



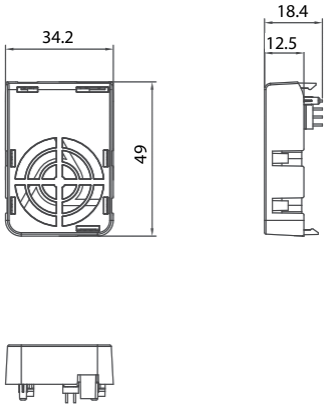
Terminal unit



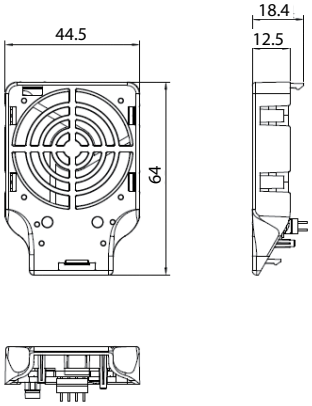
Simple absolute unit



Fan unit



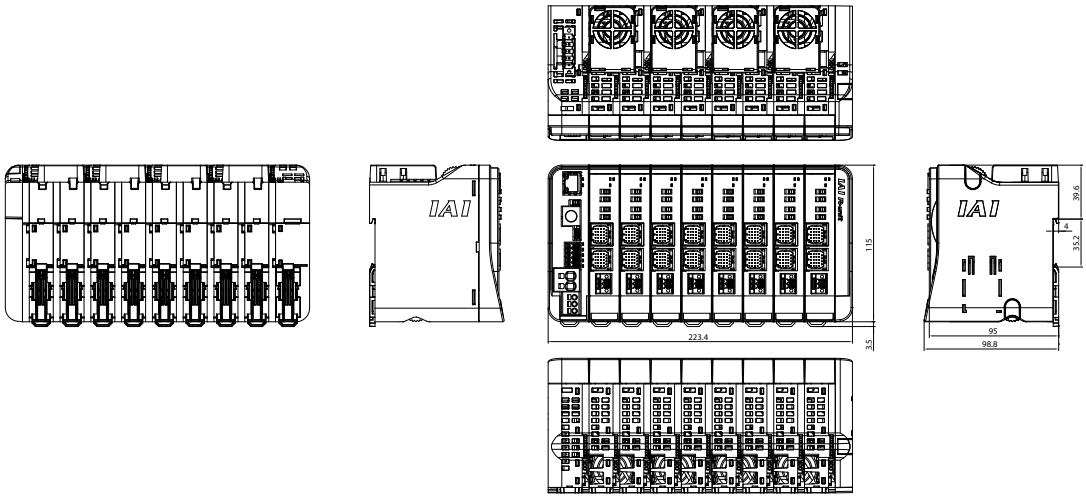
For 200V driver



Unit combination examples

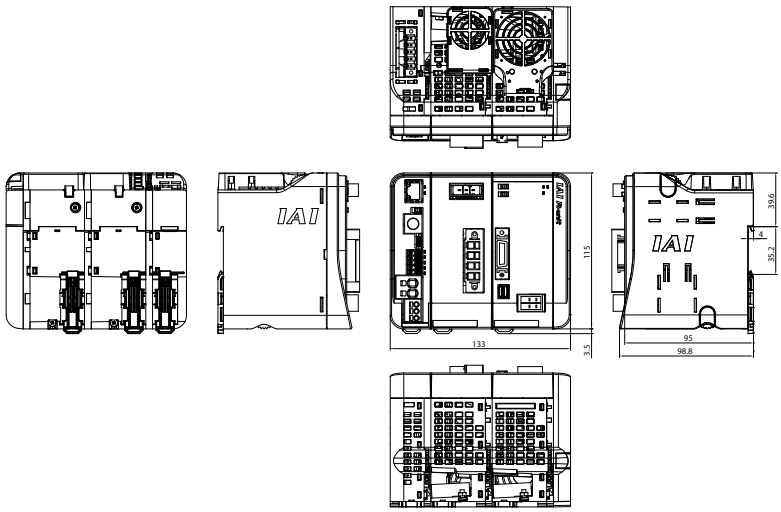
RCON

8 24V driver units (16 axes)
With fan



RCON

1 200V driver unit (1 axis)

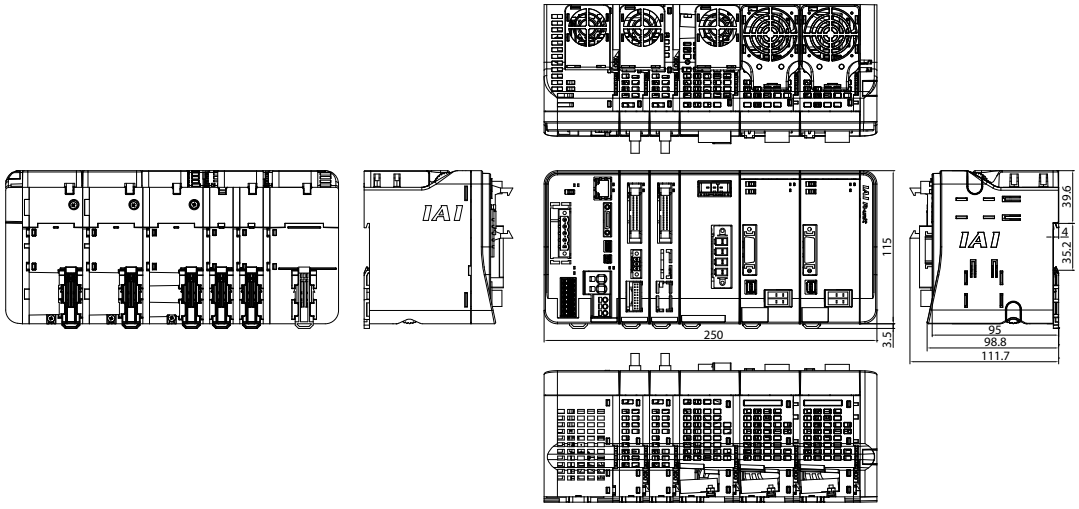


Unit combination examples

CAD drawings are downloadable from IAI website. www.iai-robot.co.jp 2D CAD 3D CAD

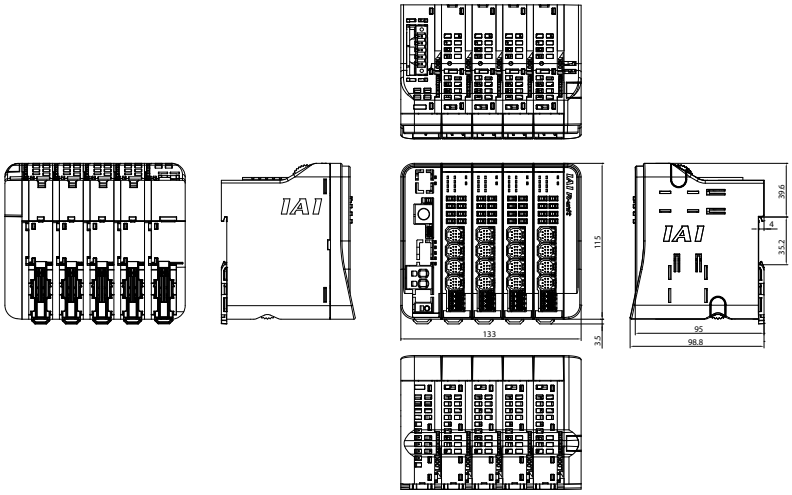
RSEL

Expansion unit (SCON connection, PIO unit)
2 200V drivers (2 axes)
With fan



REC

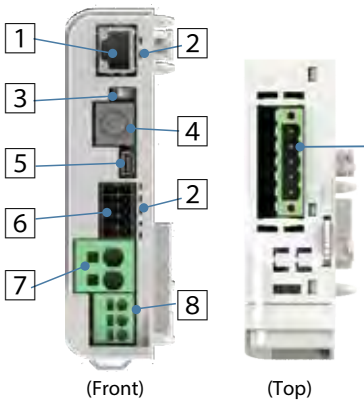
For 4 EC connection units (16 axes)



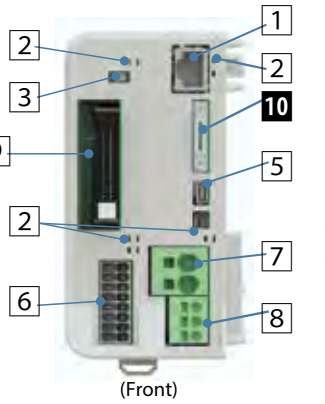
Name of Each Component

Master unit

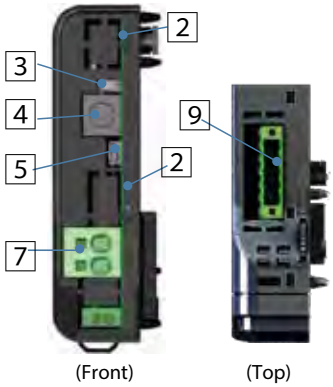
RCON-GW/GWG



RSEL-G



REC-GW



1 EtherNet connector
A connector for connecting to EtherNet.
(Selected as option for RCON.)

2 Status LED
Represents the state of the controller.

3 AUTO/MANU switch
A switch for automatic/manual operation.

4 SIO connector
A connector for connecting the teaching pendant and PC teaching software cable.

5 USB connector
A connector for connecting the PC teaching software cable.

6 System I/O connector
A connector with a serial communication line for STOP input and PSA-24.
Allows for external AUTO/MANU switching input for RCON.

7 Motor power connector
Motor power +24V supply connector.

8 Control power connector
A connector for connecting control power +24V and FG.

9 Fieldbus connector/IO connector
A connector for connecting the fieldbus connector selected in I/O type.

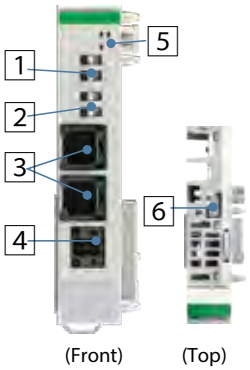
10 Teaching connector
A connector for connecting the teaching pendant and PC dedicated software via RS232.

11 Memory card slot
Insert an SD/SDHC card to perform updates.

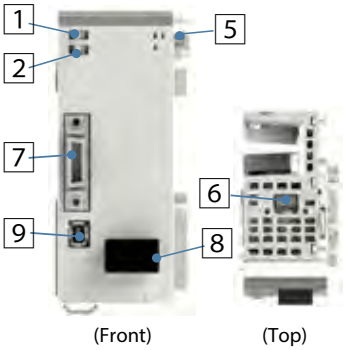
12 Fan connector
A connector to attach the fan unit.

Driver Unit

24V series



200V series



1 Jog switch
A switch used for jog operations.

2 Brake release switch
The forced brake release switch.
(On NOM side during normal operation.)

3 MPG connector
A connector to connect the motor encoder cable for actuators equipped with a 24V stepper motor, AC servo motor, or DC brush-less motor.

4 Drive source shutoff connector
A connector that allows for drive power shutoff input for each actuator.

5 Status LED
Represents the state of the controller.

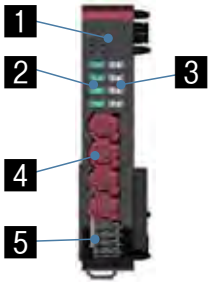
6 Fan connector
A connector to attach the fan unit.

7 Encoder connector
Connects the 200V actuator encoder cable.

8 Motor connector
Connects the 200V actuator motor cable.

9 Driver stop connector
Shuts off power supply to the motor in the internal circuit.

EC connection unit



1 Status LED
Represents the state of the controller.

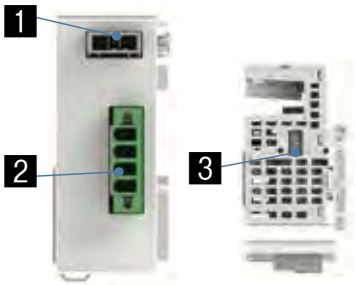
2 Jog switch
A switch used for jog operations.

3 Brake release switch
The forced brake release switch. (On NOM side during normal operation.)

4 EC connector
A connector to connect to ELECYLINDER. (with ACR option only.)

5 Drive source shutoff connector
A connector that allows for drive power shutoff input for each actuator.

Power supply unit



(Front) (Top)

1 External regenerative resistance connector
A connector to connect to an external regenerative resistance unit.

2 200VAC input connector
A connector for three-phase/single-phase 200VAC.

3 Fan connector
A connector to connect the fan unit.

Expansion unit

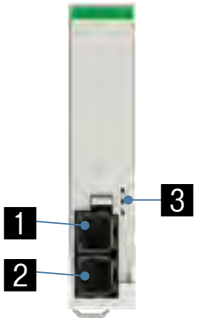
RCON-EXT-NP/PN RCON-NP/PN RCON-EXT

1 PIO cable connector
A connector for expansion PIO.
*One RCON/RSEL system can include both NPN type IO (RCON).

2 SIO cable connector
A connector for expansion communication.

3 SCON cable connector
A connector to connect an interface cable to connect to SCON.

Simple absolute unit



1 Actuator cable connector
A connector to connect to the actuator.

2 Driver cable connector
A connector to connect to the driver unit.

3 Status LED
Represents the state of the battery.

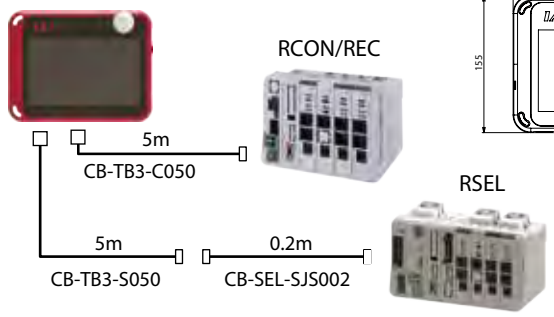
Options

Touch panel teaching pendant

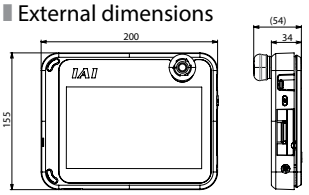
Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

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

Configuration



External dimensions

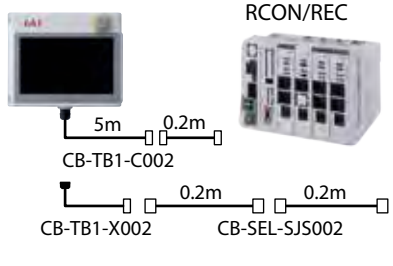


Specifications

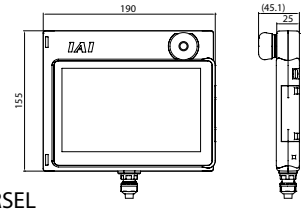
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	5~85% RH (non-condensing)
Environmental resistance	IPX0
Mass	670g (TB-03 unit only)
Charging method	Wired connection with dedicated AC adapter/ controller
Wireless connection	Bluetooth4.2 class2

Model **TB-02(D)-□** (Please contact IAI for the current supported versions.)

Configuration



External dimensions



Specifications

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	5~85% RH (non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

PC Teaching Software (Windows only)

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

For RCON/REC

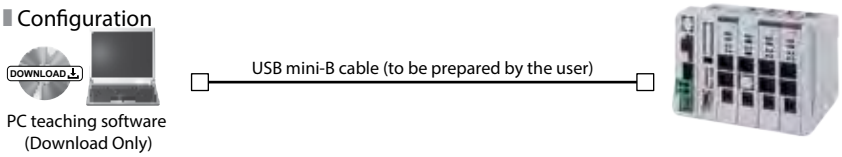
Model **IA-OS** (Please contact IAI for the current supported versions.)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Supported Windows versions: 7/10

or PC Software downloaded link

Configuration



PC teaching software (Download Only)

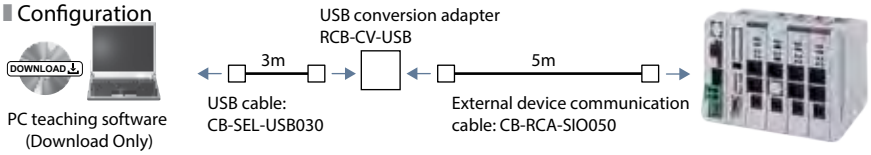
Model **IA-OS-C** (Please contact IAI for the current supported versions.)

(with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Supported Windows versions: 7/10

Configuration



PC teaching software (Download Only)

XSEL PC dedicated teaching software for RSEL

Model **IA-101-N** (Software only)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Features PC teaching software (Download Only) only.
If you want to connect both the controller and PC side with your USB cable or Ethernet cable, only the software needs to be purchased. A cable that meet the following specifications is to be prepared by the customer.

Notes
When operating the actuator by USB connection, be sure to connect the stop switch to the system I/O connector.

Configuration Please contact IAI for the current supported versions.

	Controller side connector	Maximum cable length
USB cable specification	USB Mini-B	5m
Ethernet cable specification*	10/100/1000BASE-T (RJ-45)	100m

PC teaching software (Download Only)

USB cable (to be prepared by the user)

***Ethernet cable (to be prepared by the user)**

* In order to use EtherNet cable, parameters need to be set by other cables of IA-101-X-MW-JS or USB mini-B.

DP-4S Dummy Plug (included to the RSEL-G, or supplied by customer)

Supported Windows versions: 7/10

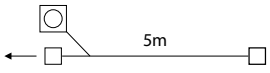
Software Download Link will be provided.

Model **IA-101-X-MW-JS** (including RS232C cable + connector conversion cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration Please contact IAI for the current supported versions.

PC teaching software (Download Only)



RS232C cable
CB-ST-E1MW050-EB

Connector conversion cable
CB-SEL-SJS002

Supported Windows versions: 7/10

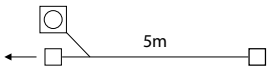
CB-ST-E1MW050-EB cannot be used "when building an enable system using an external power supply using the system I/O connector" or "when building a duplex safety circuit". (The use of CB-ST-A2MW050-EB is required.)

Model **IA-101-XA-MW** (including RS232C cable * Compliant with safety category 4)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration Please contact IAI for the current supported versions.

PC teaching software (Download Only)



RS232C cable
CB-ST-A2MW050-EB

Connector adapter cable CB-SEL-SJS002 is required, but not included with this model.
*Please order it if needed.

Supported Windows versions: 7/10

24 VDC power supply

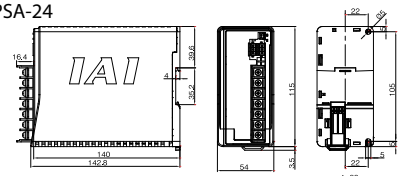
Overview The recommended power supply for connection to R-units. The power supply is the same height as RCON and can be easily installed on control panels. It can also be connected to R-units to monitor power status.

Model **PSA-24 (without fan)**

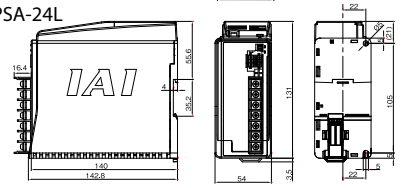
Model **PSA-24L (with fan)**

External dimensions

PSA-24



PSA-24L



Specifications Table

Item	Specification	
	100VAC input	200VAC input
Power input voltage range	100VAC~230VAC ±10%	
Input power supply current	3.9A or less	1.9A or less
Power capacity	Without fan: 250VA With fan: 390VA	Without fan: 280VA With fan: 380VA
Inrush current*1	Without fan: 17A (typ) With fan: 27.4A (typ)	Without fan: 34A (typ) With fan: 54.8A (typ)
Generated heat	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 more	90% or more
Parallel connection*3	Max.: 5 units	

*1 The pulse width of flowing inrush current is less than 5ms.
*2 In order to enable parallel operation, this power supply can vary the output voltage according to the load. Therefore, the power supply unit is dedicated for IAI controllers.
*3 Parallel connection cannot be used under the following conditions.
- Parallel connection of PSA-24 (specification without fan) and PSA-24L (specification with fan)
- Parallel connection with a power supply unit other than this power supply
- Parallel connection with PS-24

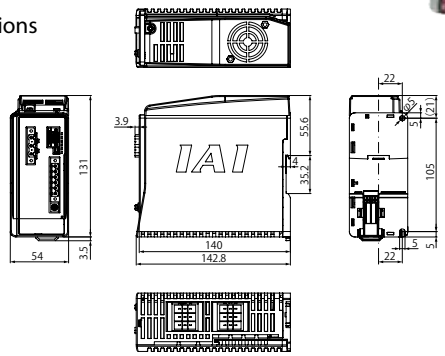
DC power supply for driving motors

Features This unit supplies DC power for driving the 200V specification ELECYLINDER. One unit can supply power for up to 6 axes. (Within the max. connectable wattage)

Model **PSA-200-1**
(Input voltage: Single phase AC100V, Max. 800W connectable)

PSA-200-2
(Input voltage: Single phase AC200V, Max. 1600W connectable)

External dimensions



Specifications

Power input voltage range		Single phase AC100V specification: AC100 - 115V ±10% Single phase AC200V specification: AC200 - 230V ±10%
Input frequency range		50/60Hz ±5%
Rush current (Note 1)	55°C	Control power: 60A Motor power: 70A
Output voltage		DC280V typ
Max. motor connectable wattage		Input voltage: Single phase AC100V, Max. 800W Input voltage: Single phase AC200V, Max. 1600W
Max. number of drivable axes		6 axes
Momentary power failure resistance		50Hz: 20ms, 60Hz: 16ms
Withstand voltage		AC1500V between primary and FG, for 1 minute
Insulation resistance		DC500V between secondary and FG, 10Ω or higher
Leak current		Total 3.1 mA (when a recommended noise filter is used and 6 axes are connected)
Electric shock protection mechanism		Class 1 Basic insulation

(Note 1) Rush current flows for approx. 20ms after turning on the power. Be aware that the rush current varies according to the power line impedance and internal element temperature (thermistor).

Maintenance Parts

Fan unit

Overview This is an option to forcibly cool down the driver unit.

Model **RCON-FU**

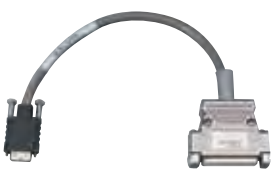
For 200V driver

Model **RCON-FUH**

Connector conversion cable

Features Converts a touch panel teaching pendant or RS232C cable D-sub 25-pin connector to an RSEL teaching connector. (TB-02/TB-03-S, IA-101-X-MW-JS accessory.)

Model **CB-SEL-SJS002**



Dummy plug

For RCON-GWG
Model **DP-5**

For 200V driver
Model **DP-6**

For RSEL
Model **DP-4S**

System I/O connector

Overview A connector for emergency stop input, operation mode switching input from exterior, etc.

For RCON-GW(G)
Model **DFMC1,5/5-ST-3,5**

For RSEL
Model **DFMC1,5/8-ST-3,5 (RSEL)**

Drive source shutoff connector

Overview A drive source shutoff input connector.

For 24V driver
Model **DFMC1,5/2-STF-3,5**

For EC connection unit
Model **DFMC1,5/4-ST-3,5 (REC)**

200V power supply connector

For 200V power supply
Model **SPC5/4-STF-7,62**

Terminal connector

Overview Required as a terminal resistor when connecting SCON.
Model **RCON-EXT-TR**

Expansion SIO port connector

For PIO/SIO/SCON connection
Model **FMC1,5/3-STF-3,5**

Replacement battery

Overview A replacement battery for the simple absolute unit.
Model **AB-7**

Regenerative resistance unit

Overview A unit that converts to heat the regenerative current generated when the motor decelerates.
The 200V driver unit and 200V power supply unit are equipped with regenerative resistance inside.
However, when energy generates at the same time, external regenerative resistance units are necessary.

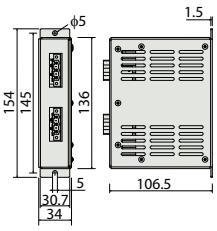
Model **RESU-2** (standard specification)/
RESUD-2 (DIN rail mounting specification)

Specifications

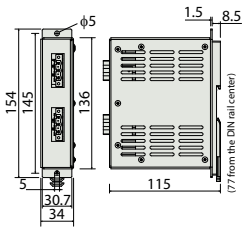
Model	RESU-2	RESUD-2
Mass	approx. 0.4kg	
Internal regenerative resistance value	235Ω 80W	
Mounting method	Screw mount	DIN rail mount
Supplied cable	CB-SC-REU010	

External dimensions

<RESU-2>



<RESUD-2>



*When two regenerative units are required, please use one RESU-2 and one RESU-1 (Refer to the General Catalog 2021).

Maintenance parts (Cables)

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

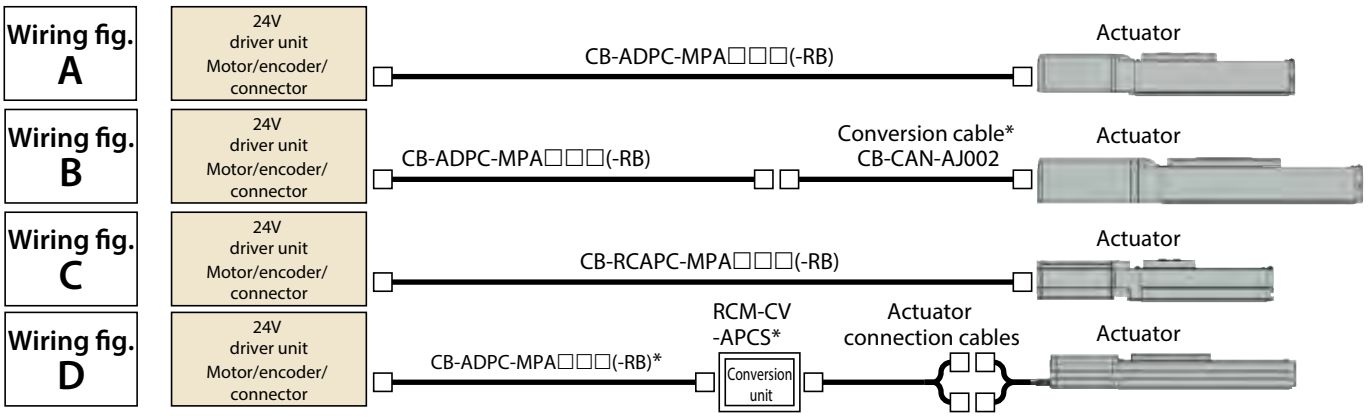
Table of compatible cables

Motor encoder cable for 24V driver connection

Cable model name search system is recommendable!
URL:https://www.iai-robot.co.jp/cablesearch/search.aspx

No.	Actuator		Applicable controller symbol	Max. cable length	Connection cable(Note 2)	Conversion unit	Wiring fig.
	Series	Type			Integrated motor-encoder cable (-RB: Robot cable) [Actuator connection cables]		
(1)	RCP6 RCP6CR RCP6W RCP5 RCP5CR RCP5W	Other than high thrust type(Note 1)	P5	20m	CB-ADPC-MPA□□□(-RB)	-	A
(2)		High thrust type(Note 1)	P6	20m	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (conversion cable)	-	B
(3)	RCP4 RCP4CR RCP4W	Gripper (GR*), ST4525E, SA3/RA3	P5	20m	CB-ADPC-MPA□□□(-RB)	-	A
(4)		High thrust type(Note 1)	P6	20m	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (conversion cable)	-	B
(5)		Other than (3), (4)	P5	20m	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (conversion cable)	-	B
(6)	RCP3			20m	CB-RCAPC-MPA□□□(-RB)	-	C
(7)	RCP2 RCP2CR RCP2W	RCP2 (standard type) rotary compact type RCP2-RTBS/RTBSL/RTCS/RTCSL	P5	20m	CB-ADPC-MPA□□□(-RB) [CB-RPSEP-MPA□□□]	Required	D
(8)		RCP2CR (clean room type), RCP2W (dust-proof/splash-proof type) Rotary (RT*) of above types GRS/GRM/GR3SS/GR3SM of above types	P5	20m	CB-ADPC-MPA□□□(-RB)	-	A
(9)		GRSS/GRLS/GRST/GRHM/GRHB of all types (standard / clean room / dust-proof/ splash-proof) Short type (RCP2 only) RCP2-SRA4R/SRGS4R/SRGD4R	P5	20m	CB-RCAPC-MPA□□□(-RB)	-	C
(10)		High thrust type(Note 1)	P6	20m	CB-ADPC-MPA□□□(-RB) [CB-CFA-MPA□□□(-RB)]	Required	D
(11)		Other than (7)~(10)	P5	20m	CB-ADPC-MPA□□□(-RB) [CB-PSEP-MPA□□□]	Required	D
(12)	RCA2/RCA2CR/RCA2W, RCL		A6	20m	CB-RCAPC-MPA□□□(-RB)	-	C
(13)	RCA2/RCA2CR/RCA2W small connector specification (CNS option)		A6	20m	CB-ADPC-MPA□□□(-RB)	-	A
(14)	RCA RCACR RCAW	Short type (RCA only) RCA-SRA4R/SRGS4R/SRGD4R	A6	20m	CB-RCAPC-MPA□□□(-RB)	-	C
(15)		Other than (14)	A6	20m	CB-ADPC-MPA□□□(-RB) [CB-ASEP2-MPA□□□]	Required	D
(16)	RCD	RCD-RA1DA, RCD-GRSNA	D6	20m	CB-ADPC-MPA□□□(-RB)	-	A
(17)	WU		PM2	20m	CB-ADPC-MPA□□□(-RB)	-	A

Note 1: An actuator that uses a high thrust stepper motor (56SP, 60P, 86P)
Note 2: Up to 20m from each driver unit to the actuator, with or without the conversion unit.
Note that the maximum length from the driver unit to the RCD actuator will be 10m.



* Not supplied even if the cable length is specified in the actuator model name. Must be prepared even if the model name is specified separately.

Motor encoder cable for 200V driver connection

No.	Actuator		Applicable controller code	Max. cable length	Connection cable (Note 3)			
	Series	Type			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
(1)	RCS4 RCS4CR		T4	20m	CB-RCC1-MA□□□	CB-X2-MA□□□	-	CB-X1-PA□□□
(2)	RCS3(P) RCS3(P)CR	CTZ5C CT8C	T4	20m	CB-RCC1-MA□□□	CB-X2-MA□□□	-	CB-X1-PA□□□
(3)		Other than (2)	T4	20m	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-RCS2-PA□□□	CB-X3-PA□□□
(4)	RCS2 RCS2CR RCS2W	RTC□L RT6	T4	20m	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-RCS2-PLA□□□	CB-X2-PLA□□□
(5)		Other than (4)	T4	20m	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-RCS2-PA□□□	CB-X3-PA□□□
(6)	RCS2 (No load cell)	RA13R	T4	20m	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-RCS2-PLA□□□	CB-X2-PLA□□□
(7)		RA13R with brake (with brake box)					[Actuator to brake box] CB-RCS2-PLA□□□ [Brake box to controller] CB-RCS2-PLA□□□	[Actuator to brake box] CB-X2-PLA□□□ [Brake box to controller] CB-X2-PLA□□□
(8)		RA13R with brake (without brake box)					[Actuator to brake box] CB-RCS2-PLA□□□	[Actuator to brake box] CB-X2-PLA□□□
(9)	IS(P)B IS(P)DB IS(P)DBCR	Other than (10)	T4	30m	-	CB-X2-MA□□□	-	CB-X1-PA□□□ *Use the following cable for a cable length of 21m or greater CB-X1-PA□□□-AWG24
(10)		(Option: When limit switch was selected)	T4	30m	-	CB-X2-MA□□□	-	CB-X1-PLA□□□ *Use the following cable for a cable length of 21m or greater CB-X1-PLA□□□-AWG24
(11)	IS(P)A IS(P)DA IS(P)DACR SSPA SSPDACR IF FS RS	Other than (12)	T4	30m	-	CB-X2-MA□□□	-	CB-X1-PA□□□
(12)		(Option: When limit switch was selected)	T4	30m	-	CB-X2-MA□□□	-	CB-X1-PLA□□□
(13)	NSA		T4	30m	-	CB-X2-MA□□□	-	CB-X1-PA□□□
(14)	NS	Other than (15)	T4	30m	-	CB-X2-MA□□□	-	CB-X3-PA□□□
(15)		(Option: When limit switch was selected)	T4	30m	-	CB-X2-MA□□□	-	CB-X2-PLA□□□
(16)	DD DDCR DDW DDA DDACR	T18□ LT18□	T4	30m	-	CB-X2-MA□□□	-	CB-X3-PA□□□
(17)		H18□ LH18□	T4	30m	-	CB-XMC1-MA□□□	-	CB-X3-PA□□□
(18)	LSA	W□□□	T4	20m	-	CB-XMC1-MA□□□	-	CB-X2-PLA□□□
(19)		Other than (18)	T4	20m	-	CB-X2-MA□□□	-	CB-X3-PA□□□
(20)	LSAS		T4	20m	-	CB-X2-MA□□□	-	CB-X1-PA□□□
(21)	ISWA ISPWA		T4	30m	-	CB-XEU1-MA□□□	-	CB-X1-PA□□□-WC

Note 3: The max. cable length between each driver and actuator differs depending on the series. Refer to the cable length table in respective actuator pages for details.

Communication cable

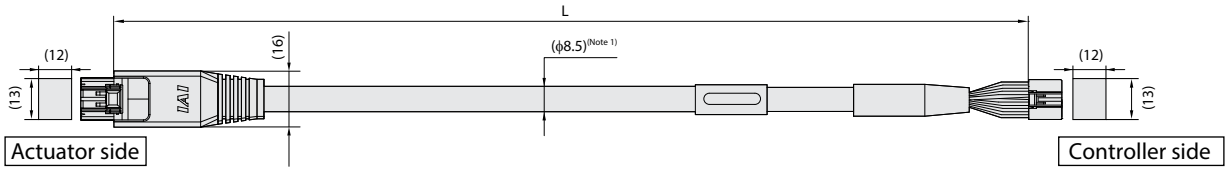
Name	Model
SCON connection cable (for RCON-EXT connection)	CB-RE-CTL□□□
PIO flat cable (for RSEL, expansion PIO connection)	CB-PAC-PIO□□□
Power/communication cables for RCON-EC	CB-REC-PWBIO□□□-RB
Power/communication cables for RCON-EC (4-way connector)	CB-REC2-PWBIO□□□-RB

Motor power cable for 200V specification ELECYLINDER

Name	Model
Motor power cable	CB-EC-PW□□□-RB

Model CB-ADPC-MPA□□□/CB-ADPC-MPA□□□-RB

*Please indicate the cable length (L) in □□□, e.g.) 030 = 3m, maximum 20m



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 designed for flex-resistance: Please use the robot cable if the cable needs to be installed through the cable track.

(Note 1) If the cable length is over 5m, ϕ9.1 cable diameter applies.

DF62DL-24S-2.2C (HIROSE ELECTRIC CO., LTD.)

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

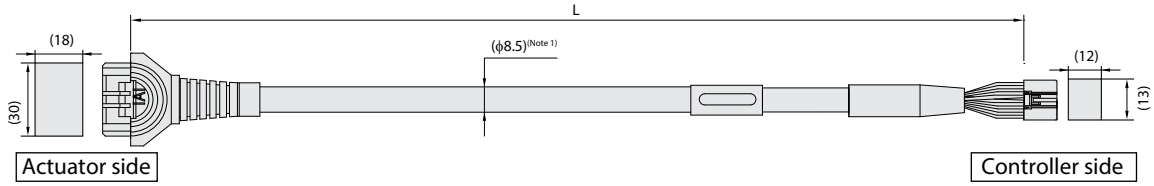
Purple (AWG26)

DF62DL-24S-2.2C (HIROSE ELECTRIC CO., LTD.)

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

Model CB-RCAPC-MPA□□□/CB-RCAPC-MPA□□□-RB

*Please indicate the cable length (L) in □□□, e.g.) 030 = 3m, maximum 20m



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 designed for flex-resistance: Please use the robot cable if the cable needs to be installed through the cable track.

(Note 1) If the cable length is over 3m, ϕ9.1 cable diameter applies.

1-1827863-1(AMP)

Color		Signal name			Pin No.
Standard cable	Robot cable	DC	AC	PC	
Blue (AWG22/19)	Black (AWG22/19)	U	U	ϕA	A1
Orange (AWG22/19)	White (AWG22/19)	V	V	VMM	B1
Brown (AWG22/19)	Green (AWG22/19)	-	-	ϕB	B2
Gray (AWG22/19)	Yellow (AWG22/19)	-	-	VMM	A3
Green (AWG22/19)	Brown (AWG22/19)	W	W	ϕ_A	A2
Red (AWG22/19)	Red (AWG22/19)	-	-	ϕ_B	B3
Light blue (AWG26)	White (AWG26)	A+	A+	SA[mABS]	A6
Orange (AWG26)	Yellow (AWG26)	A-	A-	SB[mABS]	B6
Green (AWG26)	Red (AWG26)	B+	B+	A+	A7
Brown (AWG26)	Green (AWG26)	B-	B-	A-	B7
Gray (AWG26)	Black (AWG26)	HS1_IN	Z+/SA[mABS]	B+	A8
Red (AWG26)	Brown (AWG26)	HS2_IN	Z-/SB[mABS]	B-	B8
Black (AWG26)	Blue (AWG26)	-	VPS/BAT-	VPS	B9
Yellow (AWG26)	Pink (AWG26)	-	BK+	LS+	A4
Light blue (AWG26)	Black (AWG26)	-	LS+	BK+	A5
Orange (AWG26)	Brown (AWG26)	-	LS-	BK-	B5
Gray (AWG26)	White (AWG26)	VCC	VCC	VCC	A10
Red (AWG26)	Yellow (AWG26)	GND	GND	GND	B10
Brown (AWG26)	Red (AWG26)	-	BK-	LS-	B4
Green (AWG26)	Green (AWG26)	HS3_IN	LS_GND	LS_GND	A9
-	-	-	-	-	A11
-	-	-	-	-	-
-	-	-	-	-	-
Black (AWG26)	Green (AWG26)	FG	FG	FG	B11

Purple (AWG26)
Pink (AWG26)

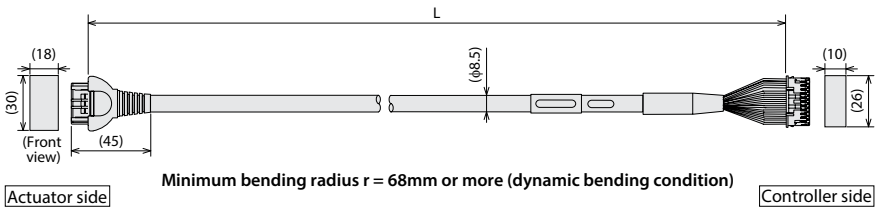
DF62DL-24S-2.2C (HIROSE ELECTRIC CO., LTD.)

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

Model CB-RPSEP-MPA□□□

* Only the robot cable is available for this model.

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



Minimum bending radius r = 68mm or more (dynamic bending condition)

1-1827863-1 (AMP)

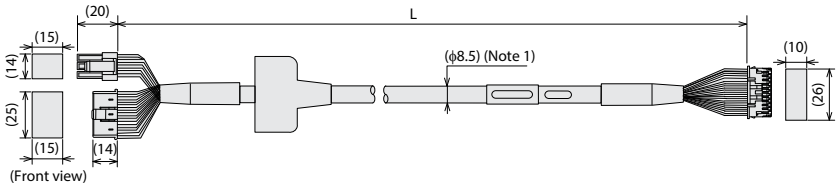
Color	Signal	Pin No.
Black (AWG22)	ϕA	A1
White (AWG22)	VMM	B1
Brown (AWG22)	ϕ_A	A2
Green (AWG22)	ϕB	B2
Yellow(AWG22)	VMM	A3
Red (AWG22)	ϕ_B	B3
Orange (AWG26)	LS+	A6
Gray (AWG26)	LS-	B6
Red (AWG26)	A+	A7
Green (AWG26)	A-	B7
Black (AWG26)	B+	A8
Brown (AWG26)	B-	B8
-	-	B4
-	-	A11
Black (AWG26)	BK+	A5
Brown (AWG26)	BK-	B5
Green (AWG26)	LS_GND	A9
Red (AWG26)	VPS	B9
White (AWG26)	VCC	A10
Yellow (AWG26)	GND	B10
-	-	A4
Shield	FG	B11

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	ϕA	Blue (AWG22)
2	VMM	Orange (AWG22)
5	ϕ_A	Green (AWG22)
3	ϕB	Brown (AWG22)
4	VMM	Gray (AWG22)
6	ϕ_B	Red (AWG22)
7	LS+	Light blue (AWG26)
8	LS-	Orange (AWG26)
13	A+	Green (AWG26)
14	A-	Brown (AWG26)
15	B+	Gray (AWG26)
16	B-	Red (AWG26)
11	-	Black (AWG26)
12	-	Yellow (AWG26)
9	BK+	Light blue (AWG26)
10	BK-	Orange (AWG26)
20	LS_GND	Green (AWG26)
18	VPS	Brown (AWG26)
17	VCC	Gray (AWG26)
19	GND	Red (AWG26)
21	-	-
22	-	-
23	-	-
24	FG	Shield

Model CB-CFA-MPA□□□/CB-CFA-MPA□□□-RB

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



Minimum bending radius r = 80mm or more (dynamic bending condition)

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

(Note 1) ϕ9.1 when the cable length is longer than 3m.

SLP-06V (JST)

Color		Signal	Pin No.
Standard cable	Robot cable		
Blue(AWG22/19)	Blue (AWG22/19)	ϕA	1
Orange (AWG22/19)	Orange (AWG22/19)	VMM	2
Brown (AWG22/19)	Brown (AWG22/19)	ϕB	4
Gray (AWG22/19)	Gray (AWG22/19)	VMM	5
Green (AWG22/19)	Green (AWG22/19)	ϕ/A	3
Red (AWG22/19)	Red (AWG22/19)	ϕ/B	6

XMP-18V (JST)

Light blue (AWG26)	-	NC	5
Orange (AWG26)	-	NC	6
Green (AWG26)	Green (AWG26)	LS+	1
Brown (AWG26)	Brown (AWG26)	LS-	2
Gray (AWG26)	Gray (AWG26)	A+	3
Red (AWG26)	Red (AWG26)	A-	4
Black (AWG26)	Black (AWG26)	B+	11
Yellow (AWG26)	Yellow (AWG26)	B-	13
Light blue (AWG26)	Light blue (AWG26)	BK+	16
Orange (AWG26)	Orange (AWG26)	BK-	17
Green (AWG26)	Green (AWG26)	LS_GND	10
Brown (AWG26)	Brown (AWG26)	LS-	14
Gray (AWG26)	Gray (AWG26)	VCC	12
Red (AWG26)	Red (AWG26)	GND	9
Black	Shield	FG	18
-	-	NC	15
-	-	NC	7
-	-	NC	8

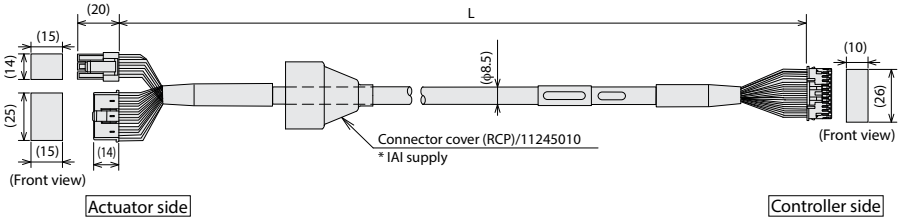
PADP-24V-1-S (JST)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	ϕA	Blue (AWG22/19)	Blue (AWG22/19)
2	VMM	Orange (AWG22/19)	Orange (AWG22/19)
3	ϕB	Brown (AWG22/19)	Brown (AWG22/19)
4	VMM	Gray (AWG22/19)	Gray (AWG22/19)
5	ϕ/A	Green (AWG22/19)	Green (AWG22/19)
6	ϕ/B	Red (AWG22/19)	Red (AWG22/19)
11	NC	(Light blue (AWG26))	-
12	NC	(Orange (AWG26))	-
13	LS+	Green (AWG26)	Green (AWG26)
14	LS-	Brown (AWG26)	Brown (AWG26)
15	A+	Gray (AWG26)	Gray (AWG26)
16	A-	Red (AWG26)	Red (AWG26)
18	B+	Black (AWG26)	Black (AWG26)
7	B-	Yellow (AWG26)	Yellow (AWG26)
9	BK+	Light blue (AWG26)	Light blue (AWG26)
10	BK-	Orange (AWG26)	Orange (AWG26)
20	(LS_GND)	(Green (AWG26))	(Green (AWG26))
8	LS-	Brown (AWG26)	Brown (AWG26)
21	VCC	Gray (AWG26)	Gray (AWG26)
19	GND	Red (AWG26)	Red(AWG26)
24	FG	Black	Shield
17	NC	-	-
22	NC	-	-
23	NC	-	-

Model CB-PSEP-MPA□□□

* Only the robot cable is available for this model.

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



Minimum bending radius r = 68mm or more (dynamic bending condition)

SLP-06V (JST)

Color	Signal	Pin No.
Black (AWG22)	ϕA	1
White (AWG22)	VMM	2
Brown (AWG22)	ϕ/A	3
Red (AWG22)	ϕB	4
Green (AWG22)	VMM	5
Yellow (AWG22)	ϕ/B	6

XMP-18V (JST)

Color	Signal	Pin No.
White (AWG25)	A+	1
Yellow (AWG25)	A-	2
Red(AWG25)	B+	3
Green (AWG25)	B-	4
	N.C.	5
	N.C.	6
	N.C.	7
	N.C.	8
Red (AWG25)	GND	9
White (AWG25)	VCC	10
Yellow (AWG25)	VPS	11
Green (AWG25)	(reserve)	12
Black (AWG25)	LS+	13
Brown (AWG25)	LS-	14
	N.C.	15
Orange (AWG25)	BK+	16
Gray (AWG25)	BK-	17
Shield (AWG25)	F.G	18

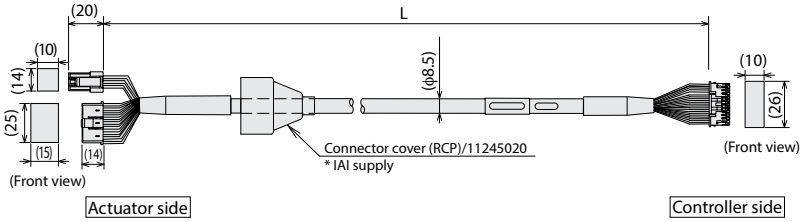
PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	ϕA	Black (AWG22)
2	VMM	White (AWG22)
3	ϕB	Red (AWG22)
4	VMM	Green (AWG22)
5	ϕ/A	Brown (AWG22)
6	ϕ/B	Yellow (AWG22)
7	LS+	Black (AWG25)
8	LS-	Brown (AWG25)
9	BK+	Orange (AWG25)
10	BK-	Gray (AWG25)
11	N.C.	
12	N.C.	
13	A+	White (AWG25)
14	A-	Yellow (AWG25)
15	B+	Red (AWG25)
16	B-	Green (AWG25)
17	VCC	White (AWG25)
18	VPS	Yellow (AWG25)
19	GND	Red (AWG25)
20	(reserve)	Green (AWG25)
21	N.C.	
22	N.C.	
23	N.C.	
24	FG	Shield (AWG25)

Model CB-ASEP2-MPA□□□

* Only the robot cable is available for this model.

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



Minimum bending radius r = 68mm or more (dynamic bending condition)

SLP-03V (JST)

Color	Signal	Pin No.
Red (AWG22)	U	1
Yellow (AWG22)	V	2
Black (AWG22)	W	3

MP-18V (JST)

Color	Signal	Pin No.
White (AWG25)	A+	1
Yellow (AWG25)	A-	2
Red (AWG25)	B+	3
Green (AWG25)	B-	4
	N.C.	5
Green (AWG25)	(reserve)	6
Black (AWG25)	LS+	7
	N.C.	8
Shield (AWG25)	F.G.	9
Black (AWG25)	Z+/SD+	10
Brown (AWG25)	Z-/SD-	11
White (AWG22)	BAT+	12
Red (AWG25)	VPS/BAT-	13
White (AWG25)	VCC	14
Yellow (AWG25)	GND	15
Brown (AWG25)	LS-	16
Gray (AWG25)	BK-	17
Orange (AWG25)	BK+	18

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	U	Red (AWG22)
2	V	Yellow (AWG22)
3	N.C.	
4	N.C.	
5	W	Black (AWG22)
6	N.C.	
7	BK+	Orange (AWG25)
8	BK-	Gray (AWG25)
9	LS+	Black (AWG25)
10	LS-	Brown (AWG25)
11	A+	White (AWG25)
12	A-	Yellow (AWG25)
13	B+	Red (AWG25)
14	B-	Green (AWG25)
15	Z+/SD+	Black (AWG25)
16	Z-/SD-	Brown (AWG25)
17	VCC	White (AWG25)
18	VPS/BAT-	Red (AWG25)
19	GND	Yellow (AWG25)
20	(reserve)	Green (AWG25)
21	BAT+	White (AWG22)
22	N.C.	
23	N.C.	
24	F.G	Shield (AWG25)

Model CB-RCC1-MA□□□/CB-X2-MA□□□

*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 30m

Controller side

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.**

(Note) Non-robot cables are φ7.
Robot cables are φ8.5.

Actuator side

F35FDC-04V-K (J.S.T. Mfg. Co., Ltd.)

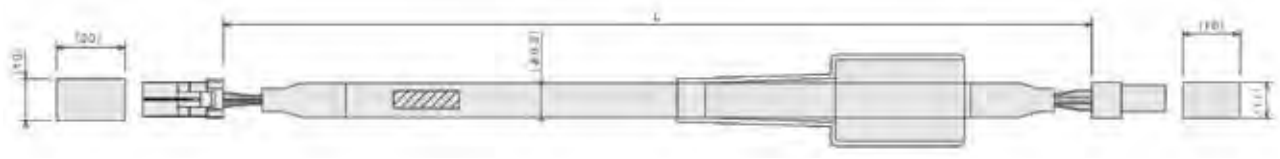
Wiring	Color	Signal	No.
0.75sq (crimped)	Red	U	B1
	White	V	B2
	Black	W	A1
	Green	PE	A2

SLP-04V (J.S.T. Mfg. Co., Ltd.)

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

Model CB-XMC1-MA□□□

*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 30m



Controller side

Minimum bending radius r = 55mm or more (Dynamic bending condition)

* Only the robot cable is available for this model.

Actuator side

F35FDC-04V-K (J.S.T. Mfg. Co., Ltd.)

Wiring	Color	Signal	No.
1.25sq (crimped)	Red	U	B1
	White	V	B2
	Black	W	A1
	Green	PE	A2

SLP-04V

No.	Signal	Color	Wiring
1	U	Red	1.25sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Model CB-XEU1-MA□□□

*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 30m

Controller side

Minimum bending radius r = 48mm or more (Dynamic bending condition)

* Only the robot cable is available for this model.

Actuator side

F35FDC-04V-K (J.S.T. Mfg. Co., Ltd.)

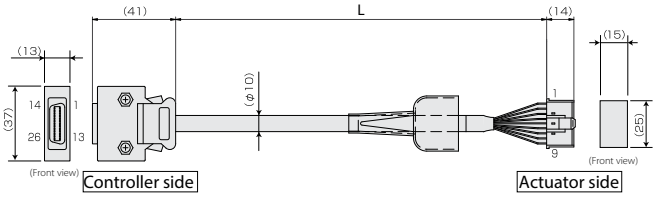
Wiring	Color	Signal	No.
0.75sq (crimped)	1 with white character in black	U	B1
	2 with white character in black	V	B2
	3 with white character in black	W	A1
	Green/yellow	PE	A2

99-4222-00-04(binder)

No.	Signal	Color	Wiring
1	U	1 with white character in black	0.75sq (crimped)
2	V	2 with white character in black	
3	W	3 with white character in black	
⊕	PE	Green/yellow	

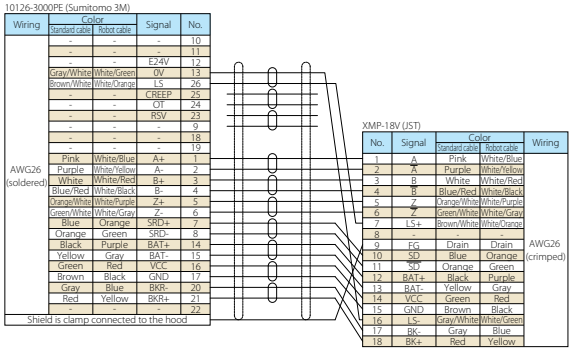
Model CB-RCS2-PA□□□/CB-X3-PA□□□

*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 30m



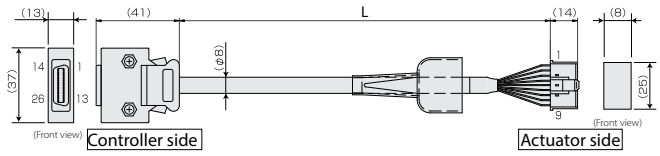
Minimum bending radius r = 58mm or more (Dynamic bending condition)

* Please use the robot cable if the cable needs to be installed through the cable track.



Model CB-X1-PA□□□

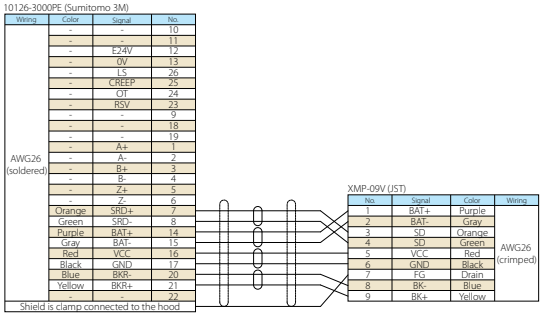
*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 20m



Minimum bending radius r = 44mm or more (Dynamic bending condition)

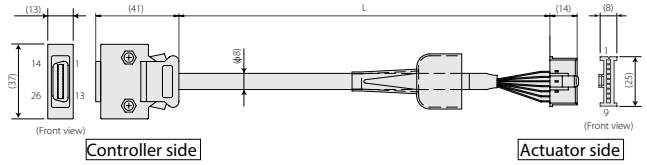
* Only the robot cable is available for this model.

*If you require a cable 21m or longer for ISB/ISDB/ISDBCR/NSA (encoder type is battery-less absolute), select CB-X1-PA □□□ -AWG24.



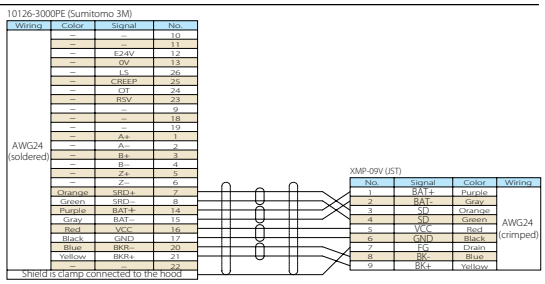
Model CB-X1-PA□□□-AWG24

*Please indicate the cable length (L) in □□□, e.g.) 210 = 21m, maximum 30m



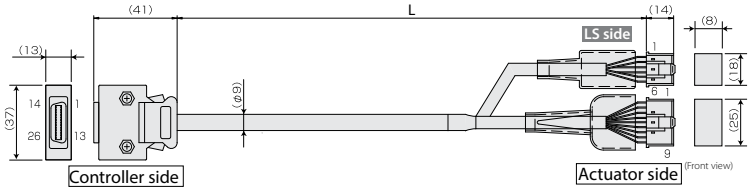
Minimum bending radius r = 44mm or more (Dynamic bending condition)

* Only the robot cable is available for this model.



Model CB-X1-PLA□□□

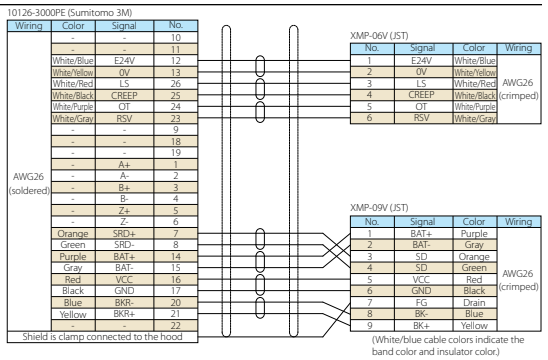
*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 30m



Minimum bending radius r = 54mm or more (Dynamic bending condition)

* Only the robot cable is available for this model.

*If you require ISB/ISDB/ISDBCR (encoder type is battery-less absolute) with the cable of 21m or more, select the CB-X1-PLA □□□ -AWG24.

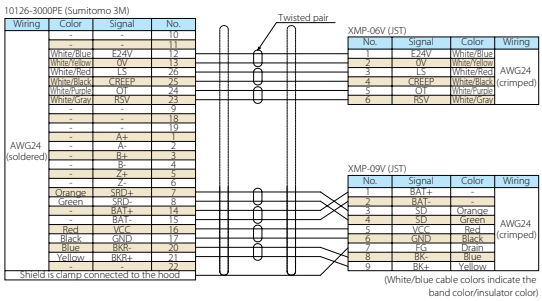


Model CB-X1-PLA□□□-AWG24

*Please indicate the cable length (L) in □□□, e.g.) 210 = 21m, maximum 30m

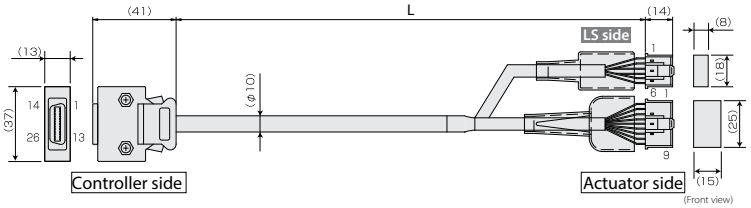
Minimum bending radius r = 54mm or more (Dynamic bending condition)

* Only the robot cable is available for this model.



Model CB-X2-PLA□□□

*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 30m



Minimum bending radius r = 50mm or more (Dynamic bending condition)
*Please use the robot cable if the cable needs to be installed through the cable track.

10126-3000PE (Sumitomo 3M)

Wiring	Color	Signal	No.
AWG26 (soldered)	-	-	10
	-	-	11
	White/Orange	E24V	12
	White/Green	0V	13
	Brown/Blue	LS	26
	Brown/Yellow	CREEP	25
	Brow/Red	01	24
	Brown/Black	RSV	23
	-	-	9
	-	-	18
	-	-	19
	White/Blue	A+	1
	White/Yellow	A−	2
	White/Red	B+	3
	White/Black	B−	4
	White/Purple	Z+	5
	White/Gray	Z−	6
	Orange	SRD+	7
	Green	SRD−	8
	Purple	BAT+	14
	Gray	BAT−	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR−	20
	Yellow	BKR+	21
	-	-	22

Shield is clamp-connected to the hood.

XMP-06V (JST)

No.	Signal	Color	Wiring
1	E24V	White/Orange	AWG26 (crimped)
2	0V	White/Green	
3	LS	Brown/Blue	
4	CREEP	Brown/Yellow	
5	01	Brow/Red	
6	RSV	Brown/Black	

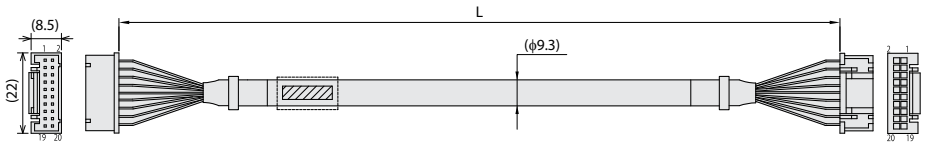
XMP-18V (JST)

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

(White/Blue color indicates band color/insulation color)

Model CB-RE-CTL□□□

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



PUDP-20V-S (JST)

Wiring	Color	Signal	No.
7 to 12 pins AWG26 (crimped)	Black	24V	1
	Yellow	0V	2
	Pink	DRV_DY	3
	White	DRV_RA	4
	Purple	DRV_DZ	5
	Blue/Red	DRV_RB	6
	Orange/White 1 series dot	AM_SD+	7
	Green/White	AM_SD-	8
	Brown/White	ACT_PULSE+	9
	Gray/White	ACT_PULSE-	10
	Red/White	SYNC_PULSE+	11
	Black/White	SYNC_PULSE-	12
	Yellow/Black	RTC_1Hz	13
	Pink/Black	CONE_IN	14
	Purple/White	STOP	15
	White/Blue	ENABLE	16
	-	-	17
	Orange/White 2 series dot	GW_RESET_IN	18
	Drain	FG	19
	-	-	20

Wiring fig.

UL1061 AWG26 (Black)

PUDP-20V-S (JST)

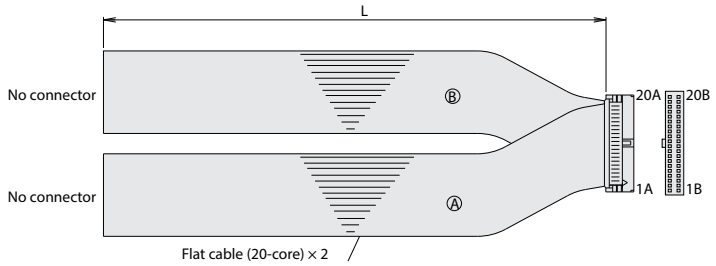
No.	Signal	Color	Wiring
1	24V	Black	7 to 12 pins AWG26 (crimped)
2	0V	Yellow	
3	DRV_DY	Pink	
4	DRV_RA	White	
5	DRV_DZ	Purple	
6	DRV_RB	Blue/Red	
7	AM_SD+	Orange/White 1 series dot	
8	AM_SD-	Green/White	
9	ACT_PULSE+	Brown/White	
10	ACT_PULSE-	Gray/White	
11	SYNC_PULSE+	Red/White	
12	SYNC_PULSE-	Black/White	
13	RTC_1Hz	Yellow/Black	
14	CONE_IN	Pink/Black	
15	STOP	Purple/White	
16	ENABLE	White/Blue	
17	-	-	
18	GW_RESET_IN	Orange/White 2 series dot	
19	FG	Drain	
20	-	-	

(The line color blue/red indicates insulator color/dot mark color)

UL1061 AWG26 (Black)

Model CB-PAC-PIO□□□

*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 10m



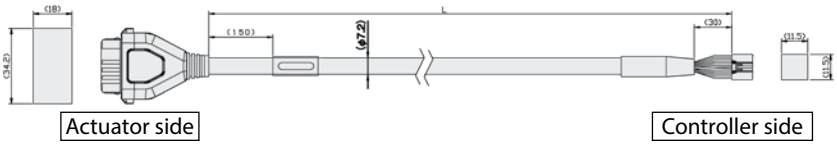
HIF6-40D-1. 27R

No.	Signal name	Cable color	Wiring
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded)
2A	24V	Red-1	
3A	-	Orange-1	
4A		Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	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	Flat cable Ⓑ (pressure-welded) AWG28
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Gray-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B	OUT15	Blue-4	
17B	-	Purple-4	
18B		Gray-4	
19B	0V	White-4	
20B	0V	Black-4	

Model CB-REC-PWBIO□□□-RB

*Please indicate the cable length (L) in □□□, e.g.) 030 = 3m, maximum 10m



Minimum bending radius r = 58mm or more (Dynamic bending condition)
* Only the robot cable is available for this model.

3-1871946-6

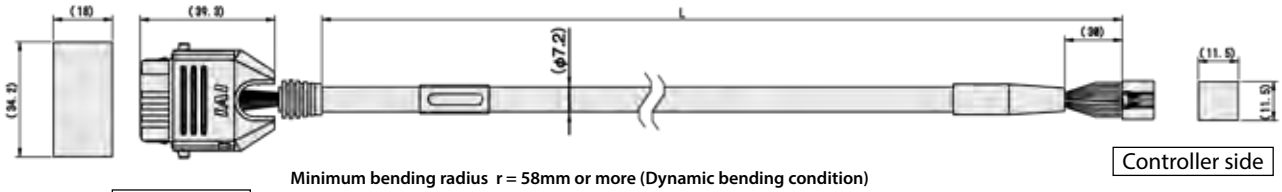
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V(MP)	B1
Light blue (AWG22)	24V(CP)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	SD+	B6
White (AWG26)	SD-	A6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
Brown (AWG26)	BKRLS	B2

DF62C-13S-2.2C(18)

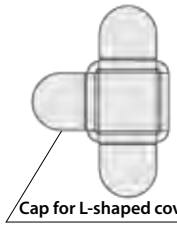
Pin No.	Signal name	Color
2	0V	Black (AWG18)
1	24V(MP)	Red (AWG18)
12	24V(CP)	Light blue (AWG22)
7	OUT0	Orange (AWG26)
8	OUT1	Yellow (AWG26)
9	OUT2	Green (AWG26)
6	SD+	Pink (AWG26)
10	SD-	White (AWG26)
3	INO	Blue (AWG26)
4	IN1	Purple (AWG26)
5	IN2	Gray (AWG26)
11	BKRLS	Brown (AWG26)
13	FG	Green (AWG26)

Model CB-REC2-PWBIO□□□-RB

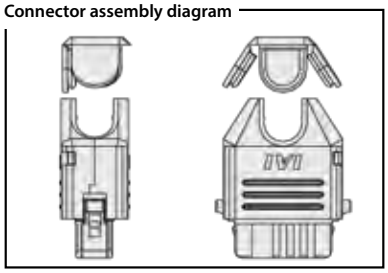
*Please indicate the cable length (L) in □□□, e.g.) 030 = 3m, maximum 10m



Minimum bending radius r = 58mm or more (Dynamic bending condition)
* Only the robot cable is available for this model.



Connector assembly diagram



1-1871946-6

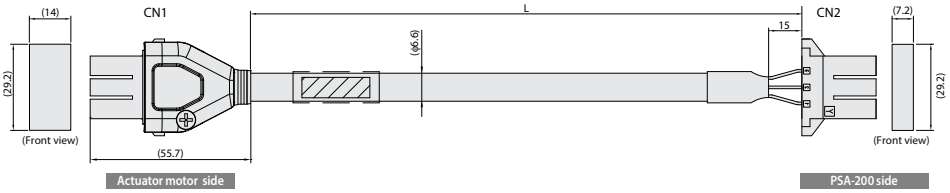
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V(MP)	B1
Light blue (AWG22)	24V(CP)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Yellow-Green (AWG26)	SD+	B6
Light gray (AWG26)	SD-	A6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
Brown (AWG26)	BKRLS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

DF62C-13S-2C(18)

Pin No.	Signal name	Color
2	0V	Black (AWG22)
1	24V(MP)	Red (AWG22)
12	24V(CP)	Light blue (AWG22)
7	OUT0	Orange (AWG26)
8	OUT1	Yellow (AWG26)
9	OUT2	Green (AWG26)
6	SD+	Yellow-Green (AWG26)
10	SD-	Light gray (AWG26)
3	INO	Blue (AWG26)
4	IN1	Purple (AWG26)
5	IN2	Gray (AWG26)
11	BKRLS	Brown (AWG26)
13	FG	Green (AWG26)

Model CB-EC-PW□□□-RB

*Please indicate the cable length (L) in □□□, e.g.) 030 = 3m, maximum 10m

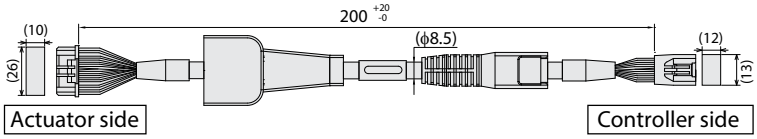


Color	Signal name	Pin No.
Red (AWG18)	MP	1
Black (AWG18)	MN	2
Green/Yellow (AWG18)	PE	3

Pin No.	Signal name	Color
1	MP	Red (AWG18)
2	MN	Black (AWG18)
3	PE	Green/Yellow (AWG18)

Minimum bending radius r = 40mm or more (Dynamic bending condition)
* Only the robot cable is available for this model.

Model CB-CAN-AJ002



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

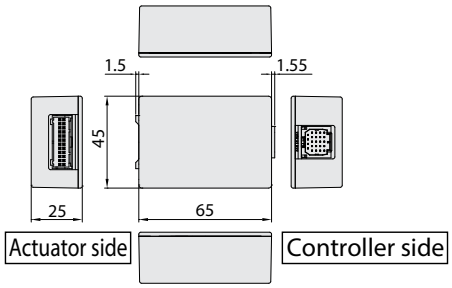
1-1827863-1 (AMP)

Color	Signal name			Pin No.
	PC	AC	DC	
Black (AWG22)	φA	U	U	A1
White (AWG22)	VMM	V	V	B1
Green (AWG22)	φB	-	-	B2
Yellow (AWG22)	VMM	-	-	A3
Brown (AWG22)	φ_A	W	W	A2
Red (AWG22)	φ_B	-	-	B3
White (AWG26)	SA[mABS]	A+	A+	A6
Yellow (AWG26)	SB[mABS]	A-	A-	B6
Red (AWG26)	A+	B+	B+	A7
Green (AWG26)	A-	B-	B-	B7
Black (AWG26)	B+	Z+/SA[mABS]	HS1_IN	A8
Brown (AWG26)	B-	Z-/SB[mABS]	HS2_IN	B8
Blue (AWG26)	VPS	VPS/BAT-	-	B9
Pink (AWG26)	LS+	BK+	-	A4
Black (AWG26)	BK+	LS+	-	A5
Brown (AWG26)	BK-	LS-	-	B5
White (AWG26)	VCC	VCC	VCC	A10
Yellow (AWG26)	GND	GND	GND	B10
Red (AWG26)	LS-	BK	-	B4
Green (AWG26)	LS_GND	LS_GND	HS3_IN	A9
-	-	-	-	A11
Green (AWG26)	FG	FG	FG	B11

DF62B-24EP-2.2C (HIROSE ELECTRIC CO., LTD.)

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

Model RCM-CV-APCS



RSEL

Unit-linkage controller

CE RoHS cULus (*1)

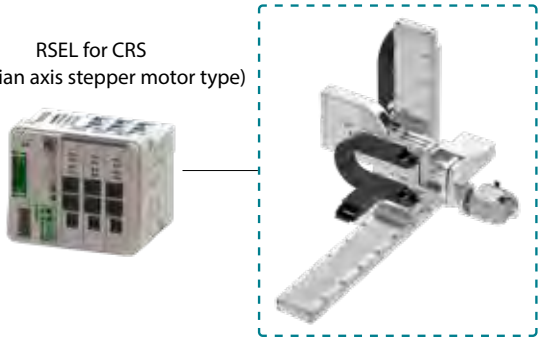
(*1) Mounting conditions differ depending on the model. Refer to P8-131 for details.

Features

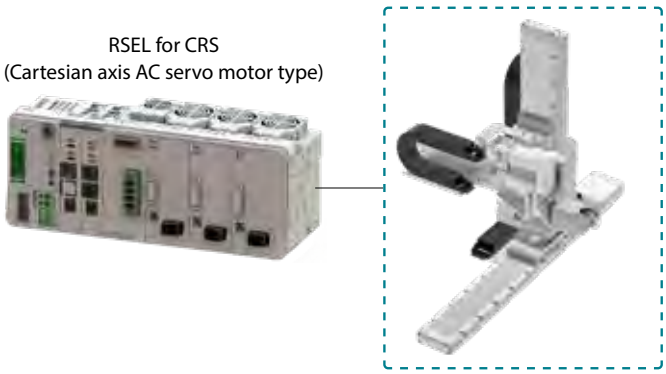
RSEL is a linkage type controller of units necessary for the CRS series.

The RSEL controller that enables free combinations is now joined by new controllers that combine necessary units for the CRS series Cartesian 6-axis robot.
Refer to P8-132 for the configuration of the units.

RSEL for CRS
(Cartesian axis stepper motor type)



RSEL for CRS
(Cartesian axis AC servo motor type)



Two driver units of two axes can be added

The RSEL controller can be connected to up to 8 axes.
Because of this, the CRS series of 6 axes can be additionally added (*) two axes of driver units.
(*) Purchase driver units separately. See P8-132 or details.

(Example)

RSEL 6 axes for CRS

Up to 2 axes for driver unit

CRS 6 axes

Up to 2 axes

Table of models

Controller type	SXBA	SXGA	SXZCY	SXZCZ	SXZDY	SXZDZ	SXBB	SXGB	SXZEY	SXZEZ
Connected axis (*1)	CRS-XBA	CRS-XGA	CRS-XZCY	CRS-XZCZ	CRS-XZDY	CRS-XZDZ	CRS-XBB	CRS-XGB	CRS-XZEY	CRS-XZEZ
External view	 * External view without additional axes						 * External view without additional axes			

(*1) Two extra axes can be added by installing driver units.

Model specification items

RSEL – [Series] – [Type] – [I/O type] – [I/O cable length] – [Option]

Type	
SXBA	for CRS-XBA
SXBB	for CRS-XBB
SXGA	for CRS-XGA
SXGB	for CRS-XGB
SXZCY	for CRS-XZCY
SXZCZ	for CRS-XZCZ
SXZDY	for CRS-XZDY
SXZDZ	for CRS-XZDZ
SXZEY	for CRS-XZEY
SXZEZ	for CRS-XZEZ

I/O type	
E	Not used
NP	PIO (NPN)
PN	PIO (PNP)
DV	DeviceNet
DV2	DeviceNet (with 2-way connector)
CC	CC-Link
CC2	CC-Link (with 2-way connector)
CIE	CC-Link IE Field
PR	PROFIBUS-DP
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

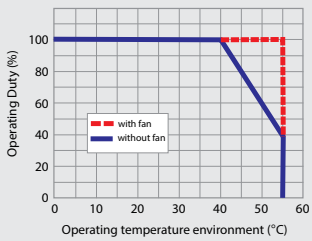
I/O cable length	
0	Without cable
2	2m (standard)
3	3m
5	5m

(*) When I/O type is other than PIO specification, choose "0 (no cable)."

Option	
FN	Fan unit

(*) When this option is selected, the RSEL-G and RCON-PC come with a fan unit. (RCON-SC is equipped standard with a fan unit.)

The operating temperature range for the SEL unit and driver unit is 0 to 55°C.
However, a fan unit is needed when the SEL unit is used in an environment exceeding 40°C.
There is temperature derating for the driver unit depending on the existence of a fan unit.
When a fan unit is not used, operations are possible without derating in temperature between 0 and 40°C. For temperature between 0 and 55°C, actuator's duty ratio has to be derated by 20% for every 5°C.



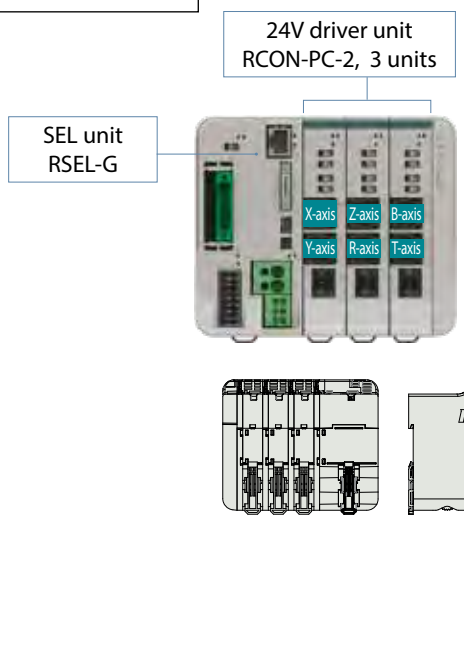
Basic specificatins

Item		Specification							
Power supply voltage		24VDC ±10% AC200V - 230V±10% (200V power unit)							
Power source current		Differs depending on the system configuration							
Axis control		1 - 8 axes							
Supported encoders	24V system	Incremental (including ABZ parallel) Battery-less absolute							
	200V system	Incremental (including ABZ parallel), Battery-less absolute, Quasi absolute, Index absolute, (SCON connection spec.) absolute, Multi-rotation absolute.							
Supported field networks		CC-Link, CCinkIE Field, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS-DP, PROFINET IO							
Configuration of units		SEL unit, Driver unit, Expansion unit, Power unit, Fan unit, Terminal unit, Simple absolute unit							
Serial communication function	Teaching port	Communication method	RS232C						
		Communication speed	Max. 115.2kbps						
	USB port	Communication method	USB port						
		Communication speed	12Mbps full speed						
		Ethernet (RJ-45), PSA-24 communications							
Emergency stop/ Enable operation		The stop signal of the SEL unit activates the whole system							
Data storage device		FlashROM+non-volatile RAM (FRAM) * no battery needed							
Supports safety category		B (supports up to 4 using external circuit)							
Safety circuit configuration		Duplex circuit possible							
Emergency stop input		B-contact input (External electricity supply, duplex possible, selectable by internal electricity supply)							
Enable input		B-contact input (External electricity supply, duplex possible, selectable by internal electricity supply)							
Speed setting		0.01G and up. The upper limit depends on the actuator specification.							
Acceleration/deceleration setting		0.01G and up. Upper limit depends on actuator spec.							
Number of axis groups		2 (up to 8 axes per 1 group)							
Programing language		Super SEL language							
Number of programs		512 (99 for input signal with BCD designation and up to 255 with binary designation)							
Number of program steps		20,000 steps							
Multi-task program		16 programs							
Number of positions		36,000 positions (varies depending on the number of axis groups)							
Data input method	Teaching port	Touch panel teaching pendant, PC compatible teaching soft							
	USB	PC compatible teaching software							
	Ethernet								
Standard input/output		(I/O slot selection) input 16 points/output 16 points							
Expansion input/output		Up to 8 PIO units possible							
Ethernet		10/100BASE-T (RJ-45 connector)							
		XSEL serial communication protocol (format B) *1							
USB		USB2.0 (Mini-B), XSEL serial communication protocol (Format B) *1							
Clock function	Retention time	Approx. 10 days							
	Recharging time	Approx. 100 hours							
SD card		SD/SDHC (only update function is used)							
Protection function		Over current, abnormal temperature, encoder disconnection, over load							
preventative & predictive maintenance		Reduction in electrolytic condenser capacity and number of revolutions							
Ambient operating temperature		Without fan: 0 - 40°C, With fan: 0 - 55°C *Simple absolute unit: 0 - 40°C							
Operating ambient humidity		5%RH - 85%RH (non-condensing, no frost)							
Operating ambient humidity		Not exposed to corrosive gases and dust							
Vibration resistance		Number of vibration: 10 - 57Hz, Amplitude: 0.075mm, Number of vibrations: 57 - 150Hz, Acceleration: 9.8m/s2, Sweepage time in the XYZ directions: 10 minutes, Number of sweepages: 10 times							
Shock resistance		Drop height 800mm, one corner, 3 edges, 6 surfaces							
Electric shock protection mechanism	24V	Class III							
	200V	Class I							
Degree of protection		IP20							
Dielectric strength voltage		500VDC, 10MΩ							
Cooling method		Natural cooling, (optional) forced cooling by fan unit							
Connection between each units		Unit linkage method							
Mounting method		DIN rail (35mm) mounting							
Regulations and Standards	Unit name	SEL unit	24V driver unit	200V driver unit	200V power unit	Simple absolute unit	SCON extension unit	PIO/SIO/SCON extension unit	PIO unit
	CE marking	○	○	— (To be acquired)	— (To be acquired)	○	○	○	○
	UL	○	○	— (To be acquired)	— (To be acquired)	○	○	○	○

*1: The XSEL serial communication protocol (format B) has only one port for communication.
Priority is high for the teaching port and low for USB and Ethernet. The low priority will not respond.

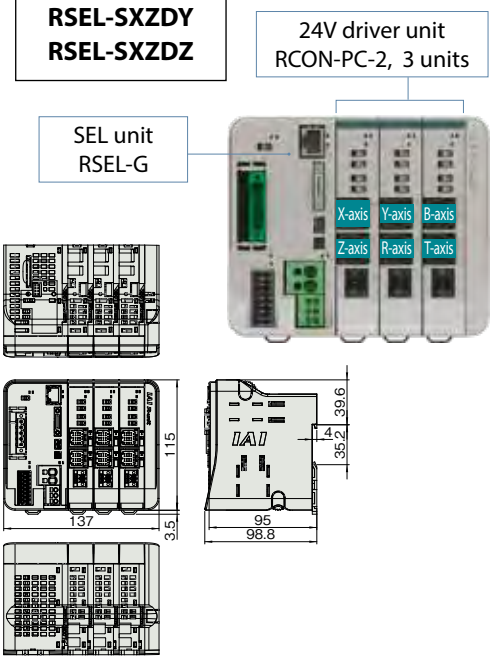
Unit configuration and external dimensions

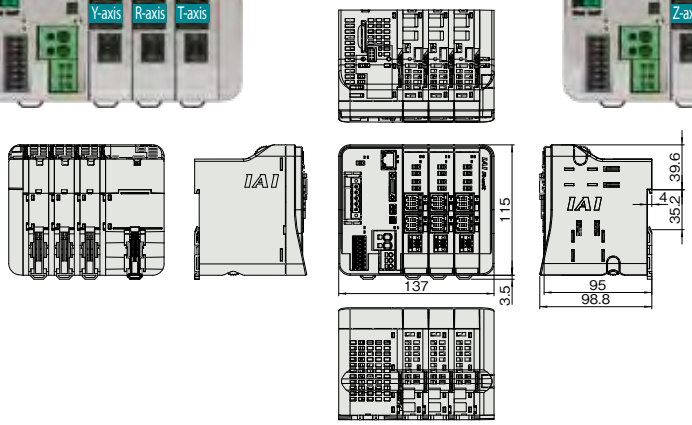
RSEL-SXBA
RSEL-SXGA



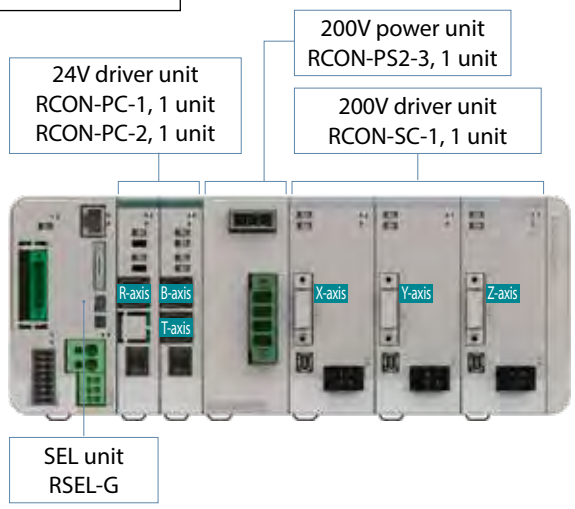
RSEL-SXZCY
RSEL-SXZCZ
RSEL-SXZDY
RSEL-SXZDZ

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

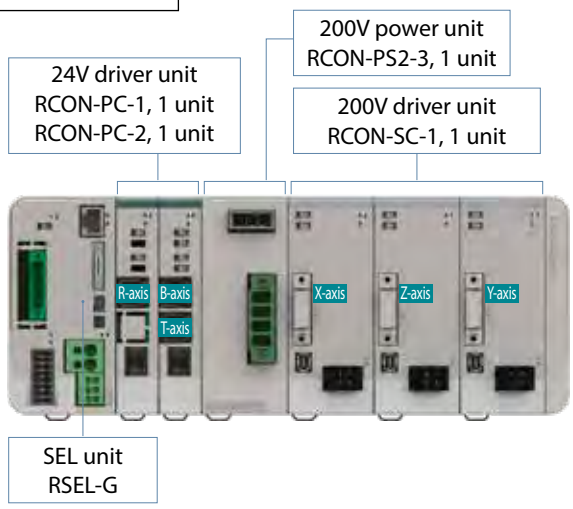


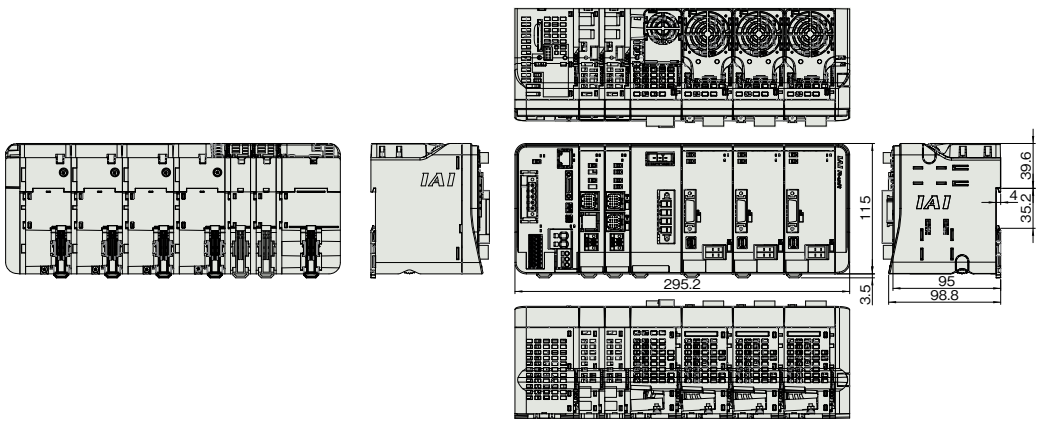


RSEL-SXBB
RSEL-SXGB



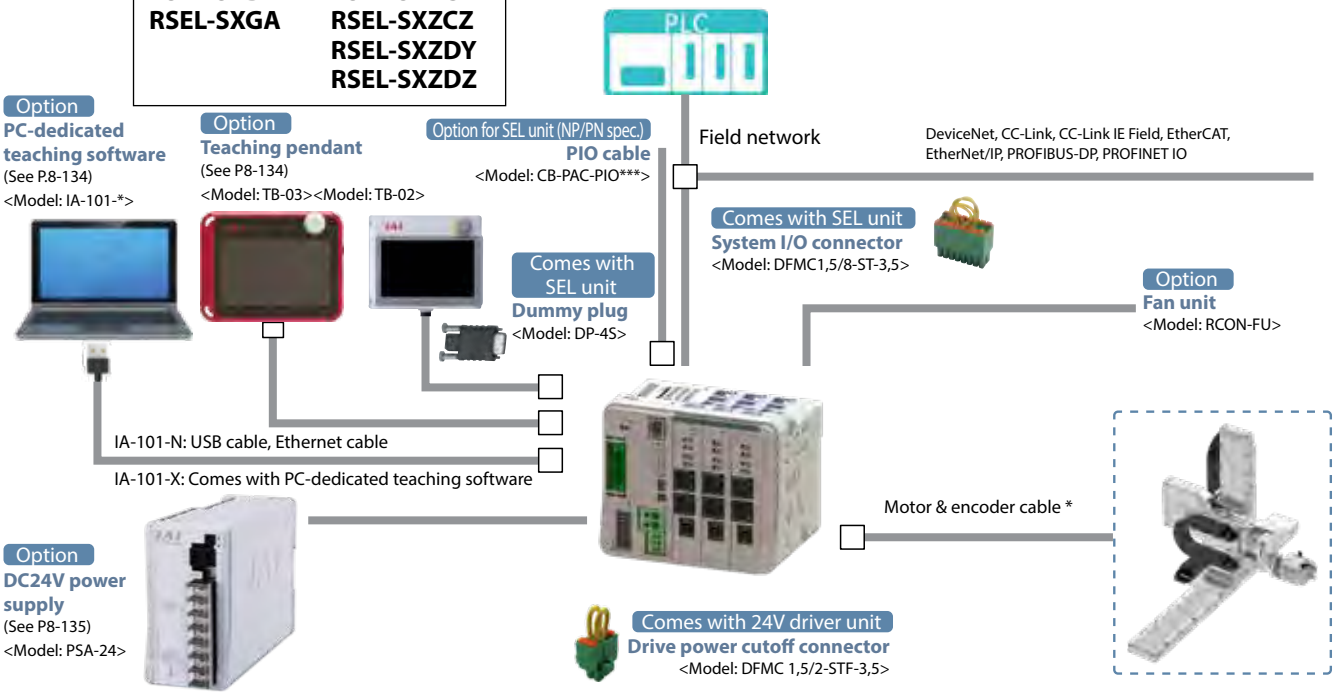
RSEL-SXZEY
RSEL-SXZEZ



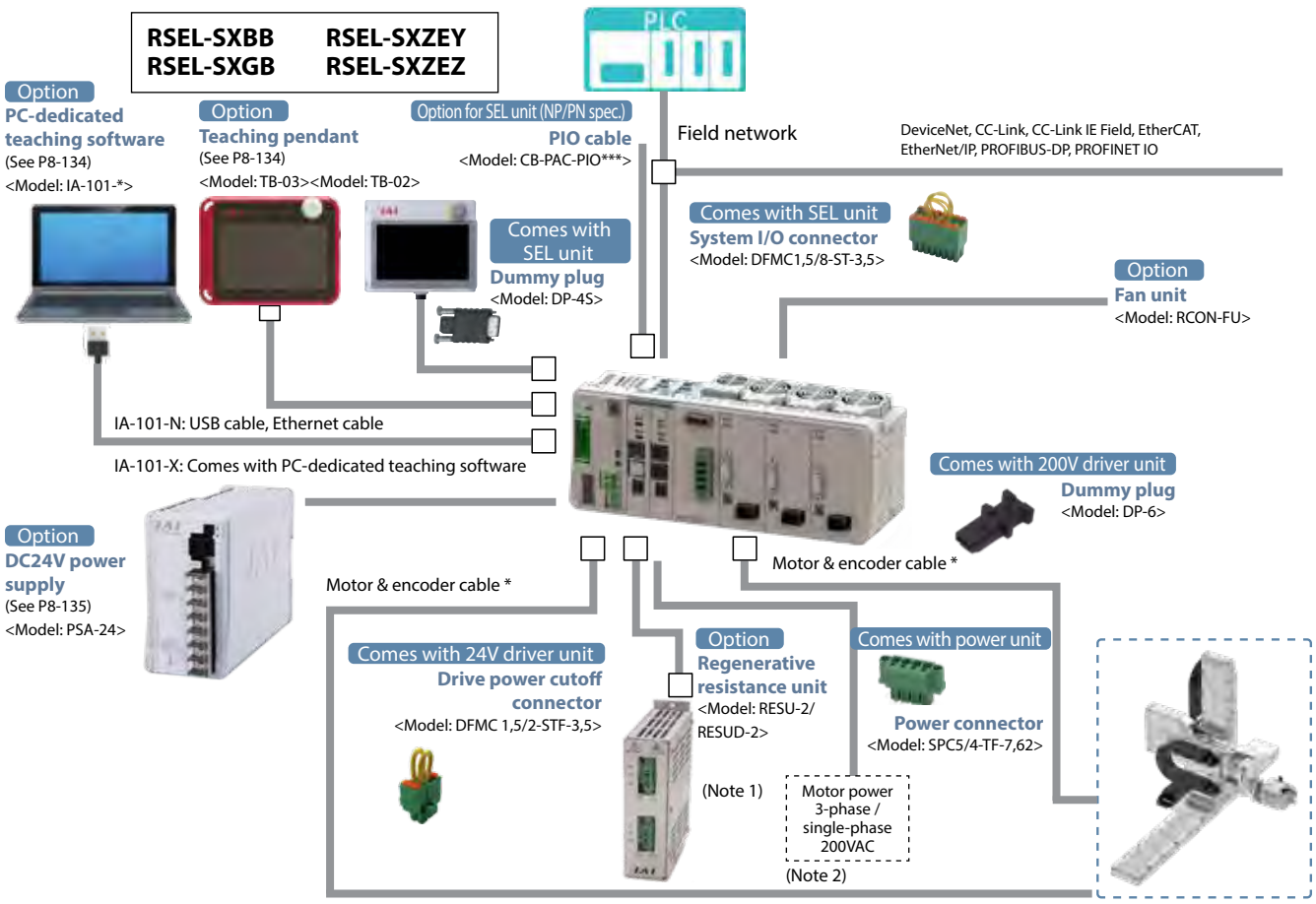


System configuration

RSEL-SXBA **RSEL-SXZCY**
RSEL-SXGA **RSEL-SXZCZ**
RSEL-SXZDY
RSEL-SXZDZ



RSEL-SXBB **RSEL-SXZEY**
RSEL-SXGB **RSEL-SXZEZ**



Note 1: The RCON-SC and RCON-PS2 are equipped with a 60W regenerative resistance unit respectively.
Basically, a regenerative resistance unit is not needed, but if it is not enough, use external resistance unit(s).

Note 2: RCON-PS2 is quipped with an internal nose filter. Install another nose filer in order to comply with CE marking or equivalent.
The recommendable noise filter:
for 3-phase: TAC-20-683 (manufacturer COSEL)
for single-phase: NBH-20-432 (manufacturer COSEL)

* Motor & encoder cable comes with the actuator.
The cable varies depending on the actuator type to be used.
When ordering a replacement cable, see P8-137.

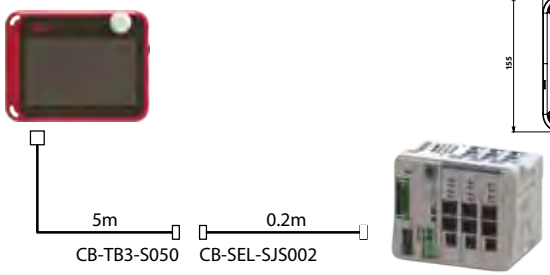
Option

Touch panel teaching pendant

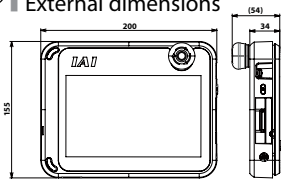
Feature: A teaching device with functions such as position teaching, trial operation, and monitoring.

Model: **TB-03-☐** (See IAI website for supported versions.)

Configuration



External dimensions

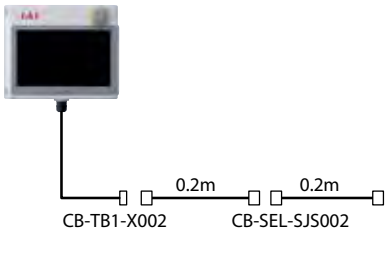


Specifications

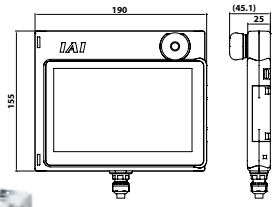
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operation temp.	0-40℃
Ambient operation humidity	5%RH - 85%RH (noon-condensing)
Degree of protection	IPX0
Mass	670g (TB-03 unit only)
Recharging method	Dedicated AC adaptor/ Wired connection with controller

Model: **TB-02(D)-☐** (See IAI website for supported versions.)

Configuration



External dimensions



Specifications

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operation temp.	0-40℃
Ambient operation humidity	5%RH - 85%RH (noon-condensing)
Degree of protection	IP20
Mass	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

Model: **IA-101-N** (Software only)

Features: PC teaching software (Download Only) only.
If you want to connect both the controller and PC side with your USB cable or Ethernet cable, only the software needs to be purchased. A cable that meet the following specifications is to be prepared by the customer.
* Please purchase through your distributor and a download link will be sent to your valid email address.

Warning
Make sure to connect a stop switch on the system I/O connector when operating an actuator with USB connection.
If an emergency switch is not used, use "IA-101-X-USBMW" that has an emergency stop switch.

Supported Windows versions: 7/10

Software Download Link will be provided.

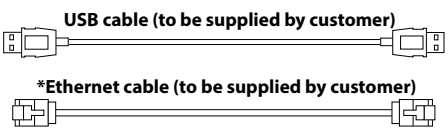
Configuration (See IAI website for supported versions.)

	Controller side connector	Max. cable length
USB cable specification	USB Mini-B	5m
Ethernet cable specification*	10/100/1000BASE-T (RJ-45)	100m

PC teaching software (Download Only)

USB cable (to be supplied by customer)

***Ethernet cable (to be supplied by customer)**



* In order to use EtherNet cable, parameters need to be set by other cables of IA-101-X-MW-JS or USB mini-B.

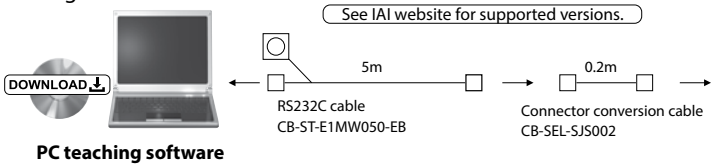
DP-4S Dummy Plug (included to the RSEL-G, or supplied by customer)

Model: **IA-101-X-MW-JS** (including RS232C cable + connector conversion cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Supported Windows versions: 7/10

Configuration (See IAI website for supported versions.)



PC teaching software (Download Only)

The CB-ST-E1MW050-EB cannot be used when "building an enable system that uses system I/O connector with external power supply" or when "building a duplex safety circuit." (It is necessary to use CB-ST-A2MW050-EB)

PC dedicated teaching software (Windows only)

Model **IA-101-XA-MW** (including RS232C cable * Compliant with safety category 4)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Supported Windows versions: 7/10

Configuration

See IAI website for supported versions.

PC teaching software (Download Only)

5m

RS232C cable
CB-ST-A2MW050-EB

0.2m

Connector adapter cable
CB-SEL-SJS002 is required, but not included with this model.
*Please order it if needed.

24V power supply

Description Recommended power supply for the RSEL controller.
It can easily be installed thanks to the same height as that of the RSEL controller.
It can also be connected to the RSEL controller to monitor the condition of power supply.

Model **PSA-24 (without fan)**

Model **PSA-24L (with fan)**

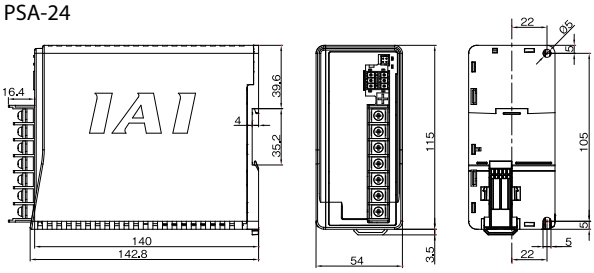
Specifications

Item	Specification	
	100VAC	200VAC
Input power voltage	100VAC-230VAC ±10%	
Input current	3.9A or less	1.9A or less
Power capacity	without fan: 250VA with fan: 390VA	without fan: 280VA with fan: 380VA
Inrush current *1	without fan: 17A (typ) with fan: 27.4A (typ)	without fan: 34A (typ) with fan: 54.8A (typ)
Heat quantity	28.6W	20.4W
Output voltage *2	24V±10%	
Continuous rated output	without fan: 8.5A (204W)	with fan: 13.8A (330W)
Peak output	17A (408W)	
Efficiency	86% or more	90% or more
Parallel connection *3	Up to 5 units	

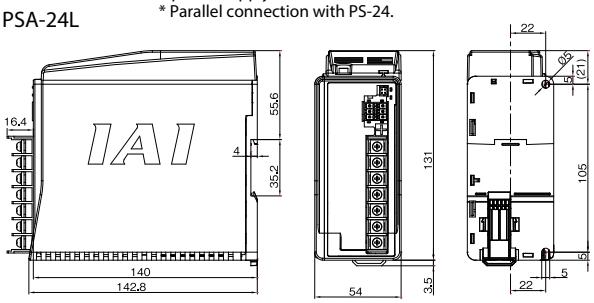
*1 The pulse width of the inrush current is 5ms or less.
*2 For parallel operation, this power supply unit changes output voltage according to load. Therefore, this power supply unit is for an exclusive use for IAI controllers.
*3 Parallel connection is impossible on the following conditions:
* Parallel connection of PSA-24 (without fan) and PSA-24L (with fan).
* Parallel connection with power unit other than this power supply unit.
* Parallel connection with PS-24.

External dimensions

PSA-24



PSA-24L



Maintenance parts

Fan unit

Description: Option for forced cooling of the driver unit.

Model: **RCON-FU**

for 200V driver

Model: **RCON-FUH**

Dummy plug

for RSEL

Model: **DP-4S**

for 200 driver

Model: **DP-6**

Connector conversion cable

Feature: It converts touch panel teaching pendant and RS232C cable Dsub25 pin connector to RSEL teaching connector. (The cable comes with TB-02/TB-03-SJ, IA-101-X-MW-JS).

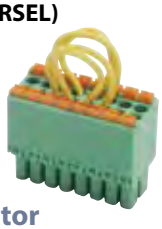
Model: **CB-SEL-SJS002**

System I/O connector

Description: Connector for emergency stop signal input and external signal to switch operation mode.

For RSEL

Model: **DFMC1,5/8-ST-3,5(RSEL)**



Drive power cutoff connector

Description: A connector for drive power cutoff.

For 24V driver

Model: **DFMC1,5/2-STF-3,5**

200V power supply connector

for 200V power supply

Model: **SPC5/4-STF-7,62**

Regenerative resistance unit

Description: This unit converts the regenerative current that generates when motor slows down into heat. The 200V driver unit and 200V power unit are equipped with internal regenerative resistor. However, when energy by speed reduction generates at the same timing, external regenerative resistance unit(s) is/are needed.

Model: **RESU-s** (standard) **/ RESUD-2** (DIN rail mount spec.)

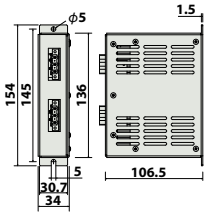
* When two regenerative resistance units are needed, use one each of RESU-2 and RESU-1. (See P8-304).

Specifications

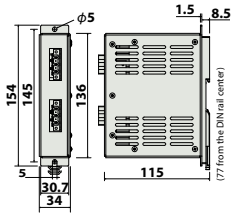
Model	RESU-2	RESUD-2
Mass	approx. 0.4 kg	
Internal regenerative resistor	235Ω 80W	
Mounting method	Screw mount	DIN rail mount
Accessory cable	CB-SC-REU010	

External dimensions

<RESU-2>



<RESUD-2>



Maintenance parts (cable)

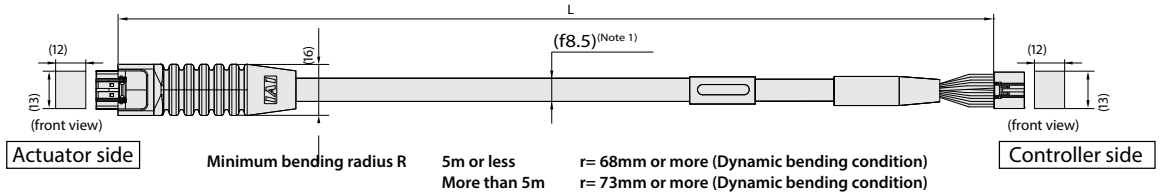
When placing an order for a replacement cable, please use the model name shown below.

Actuator		Connection cable
Type	Configured axis	Motor & encoder cable (-RB: Robot cable)
CRS-XBA CRS-XGA CRS-XZCY CRS-XZCZ CRS-XZDY CRS-XZDZ	All axes	CB-ADPC-MA□□□(-RB)
CRS-XBB CRS-XGB CRS-XZEY CRS-XZEZ	R and BT axes	

Actuator		Connection cable		
Type	Configured axis	Motor cable	Motor robot cable	Encoder robot cable
CRS-XBB CRS-XGB CRS-XZEY CRS-XZEZ	X, Y and Z axes	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-X1-PA□□□

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

* Specify cable length (L) in □□□.
Up to 15m is available for CRS. (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 designed for flex-resistance: Please use the robot cable if the cable needs to be installed through the cable track.

(Note 1) If the cable length is over 5m, ϕ9.1 cable diameter applies.

DF62DL-24S-2.2C(Hirose)

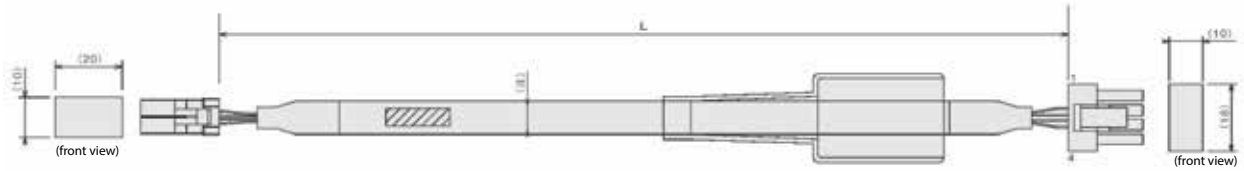
Color		Signal name	Pin No.
Standard cable	Robot cable		
Blue (AWG22/19)	Black (AWG22/19)	ΦA	3
Orange (AWG22/19)	White (AWG22/19)	VMM	5
Brown (AWG22/19)	Green (AWG22/19)	ΦB	10
Gray (AWG22/19)	Yellow (AWG22/19)	VMM	9
Green (AWG22/19)	Brown (AWG22/19)	Φ_A	4
Red (AWG22/19)	Red (AWG22/19)	Φ_B	15
Light blue (AWG26)	White (AWG26)	SA[mABS]	12
Orange (AWG26)	Yellow (AWG26)	SB[mABS]	17
Green (AWG26)	Red (AWG26)	A+	1
Brown (AWG26)	Green (AWG26)	A-	6
Gray (AWG26)	Black (AWG26)	B+	11
Red (AWG26)	Brown (AWG26)	B-	16
Black (AWG26)	Blue (AWG26)	VPS	18
Yellow (AWG26)	Pink (AWG26)	LS+	8
Light blue (AWG26)	Black (AWG26)	BK+	20
Orange (AWG26)	Brown (AWG26)	BK-	2
Gray (AWG26)	White (AWG26)	VCC	21
Red (AWG26)	Yellow (AWG26)	GND	7
Brown (AWG26)	Red (AWG26)	LS-	14
Green (AWG26)	Green (AWG26)	LS_GND	13
-	-	-	19
Pink (AWG26)	Orange (AWG26)	CF_VCC	22
-	-	-	23
Black (AWG26)	Green (AWG26)	FG	24

DF62DL-24S-2.2C(Hirose)

Pin No.	Signal name	Color	
		Standard cable	Robot cable
3	ΦA	Blue (AWG22/19)	Black (AWG22/19)
5	VMM	Orange (AWG22/19)	White (AWG22/19)
10	ΦB	Brown (AWG22/19)	Green (AWG22/19)
9	VMM	Gray (AWG22/19)	Yellow (AWG22/19)
4	Φ_A	Green (AWG22/19)	Brown (AWG22/19)
15	Φ_B	Red (AWG22/19)	Red (AWG22/19)
12	SA[mABS]	Light blue (AWG26)	White (AWG26)
17	SB[mABS]	Orange (AWG26)	Yellow (AWG26)
1	A+	Green (AWG26)	Red (AWG26)
6	A-	Brown (AWG26)	Green (AWG26)
11	B+	Gray (AWG26)	Black (AWG26)
16	B-	Red (AWG26)	Brown (AWG26)
18	VPS	Black (AWG26)	Blue (AWG26)
8	LS+	Yellow (AWG26)	Pink (AWG26)
20	BK+	Light blue (AWG26)	Black (AWG26)
2	BK-	Orange (AWG26)	Brown (AWG26)
21	VCC	Gray (AWG26)	White (AWG26)
7	GND	Red (AWG26)	Yellow (AWG26)
14	LS-	Brown (AWG26)	Red (AWG26)
13	LS_GND	Green (AWG26)	Green (AWG26)
19	-	-	-
22	CF_VCC	Pink (AWG26)	Orange (AWG26)
23	-	-	-
24	FG	Black (AWG26)	Green (AWG26)

Model CB-RCC1-MA□□□/CB-X2-MA□□□

* Indicate the cable length (L) in □□□, maximum 15m for CRS. (Ex.) 080=8m



Minimum bending R r=51mm or more (dynamic bending condition)
* Only robot cables can be used in the cable track.
Non-robot cables are Φ7.6 and robot cables are Φ8.5.

F35FDC-04V-K (JST)

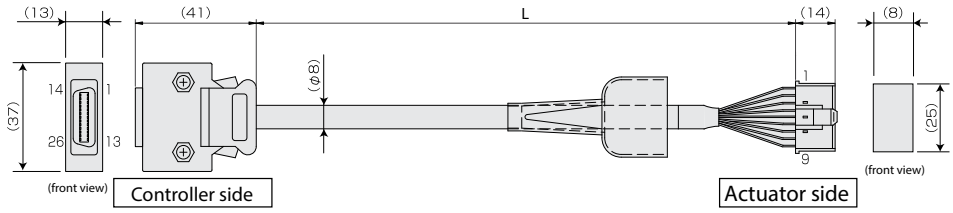
Wiring	Color	Signal	No.
O.75sq (crimped)	Red	U	B1
	White	V	B2
	Black	W	A1
	Green	PE	A2

SLP-04V (JST)

No.	Signal	Color	Wiring
1	U	Red	O.75sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Model CB-X1-PA□□□

* Indicate the cable length (L) in □□□, maximum 15m for CRS. (Ex.) 080=8m



Minimum bending R r=44mm or more (dynamic bending condition)
* The robot cable is used as standard.

10126-3000PE (Sumitomo 3M)

Wiring	Color	Signal	No.
AWG26 (soldered)	–	–	10
	–	–	11
	–	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
	Orange	SRD+	7
	Green	SRD–	8
	Purple	BAT+	14
	Gray	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22
Shield is clamp-connected to the hood.			

Drain wire and shield braided

XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	Purple	AWG26 (crimped)
2	BAT–	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK–	Blue	
9	BK+	Yellow	

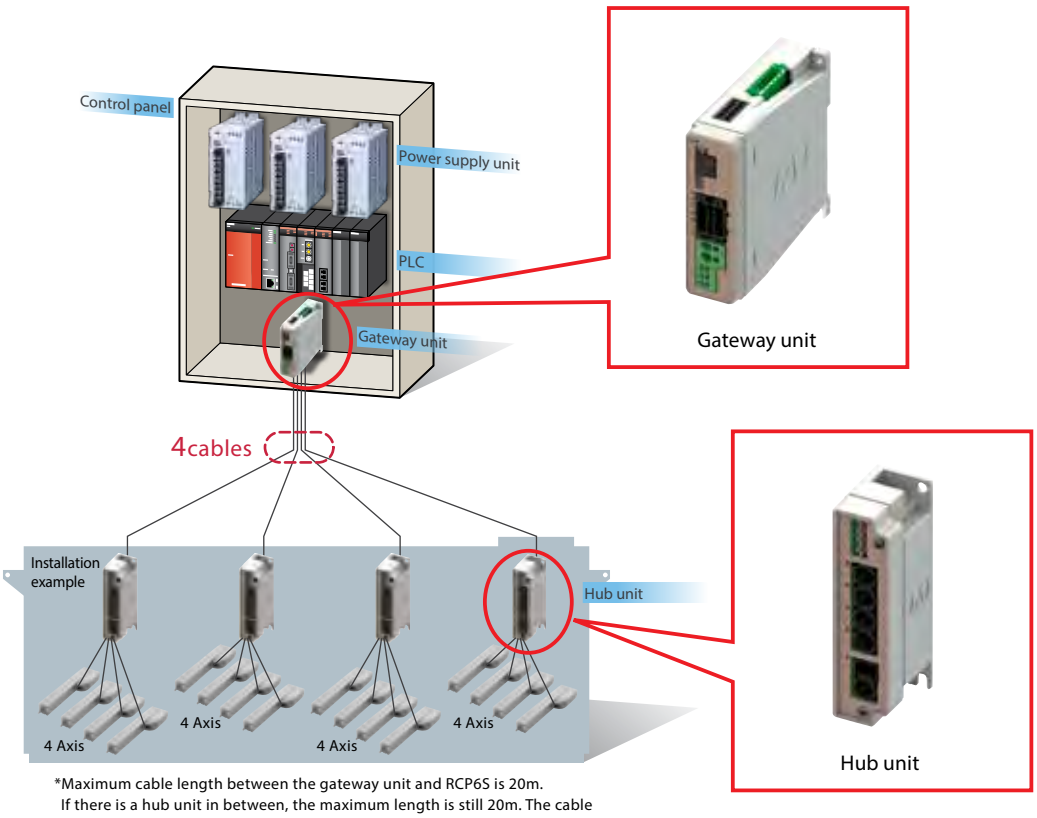
RCP6S with Built-in Controller

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 P8-141 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 P8-141
◯Hub unit:	This unit can expand the number of axes connected to the gateway unit.	→ See P8-145
◯PLC connection unit:	This unit is used to connect RCP6S directly to the PLC using serial communication.	→ See P8-146
◯Controller for RCP6S Gateway:		
	Controllers for connection of actuators other than RCP6S to an RCP6S gateway within the system.	→ See P8-147

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 × Number of actuator + 0.6A (gateway unit) + 0.3A × Number of hub unit ····· 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 × 0.7A ····· 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 x 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

RCM — P6GW □ — □

RCM: Series
P6GW: Type
□: Field network

(Blank)	Standard
G	Safety category compliant type

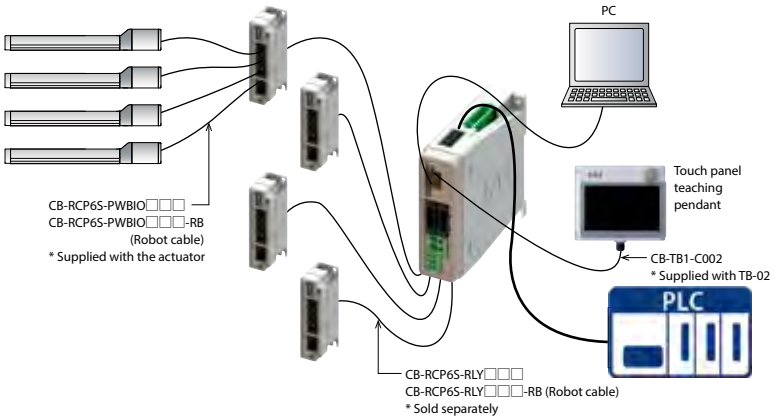
CC	CC-Link connection specification
DV	DeviceNet connection specification
PR	PROFIBUS-DP connection specification
EC	EtherCAT connection specification
EP	EtherNet/IP connection specification
PRT	PROFINET IO connection specification

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 P8-145.

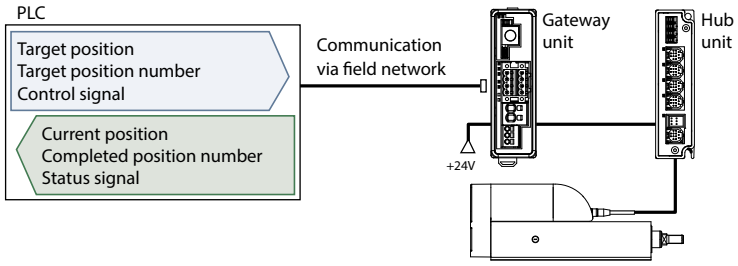
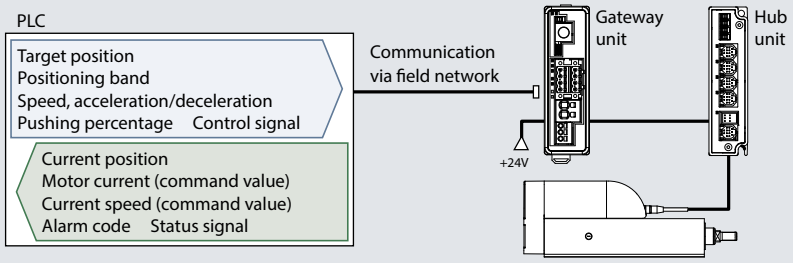
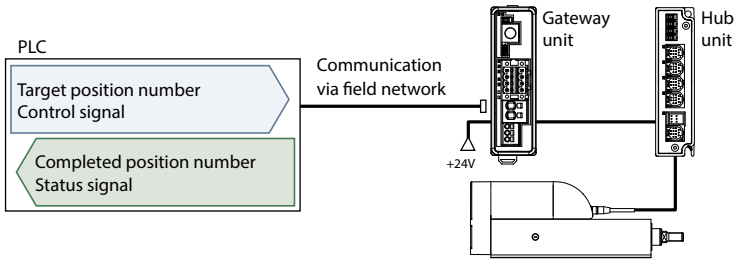
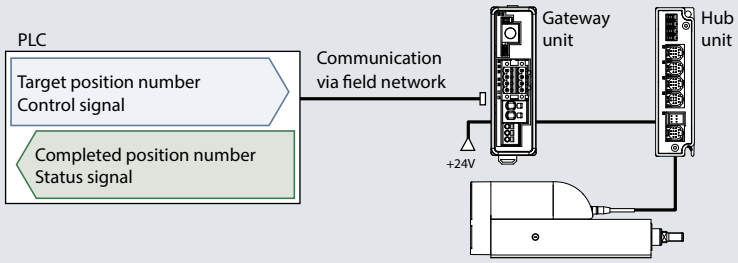
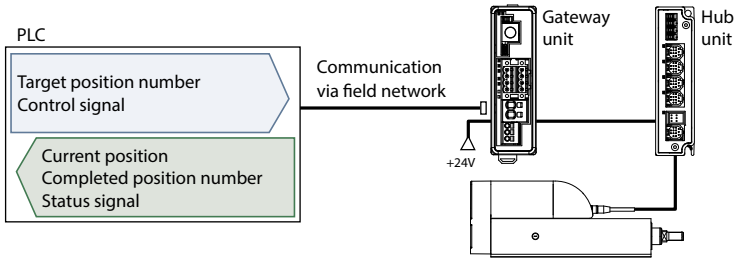
The Number of Connectable Axes:

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.

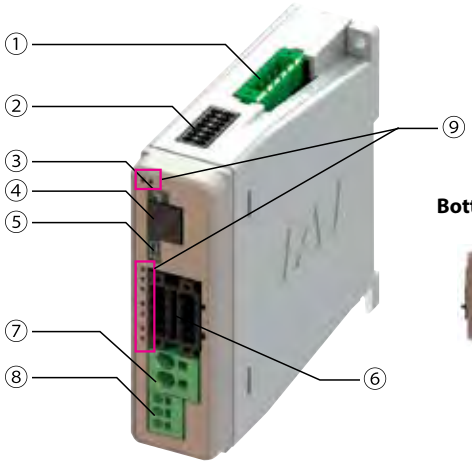
Operation mode	Description	Overview
Positioner 1/ Simple direct numerical value mode (Simple direct mode)	Positioner 1 mode can store up to 768 points of position data, and can move to the stored position. Both modes allow monitoring the current position numerically with 0.01mm increments. The simple 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.	

List of functions by operation mode

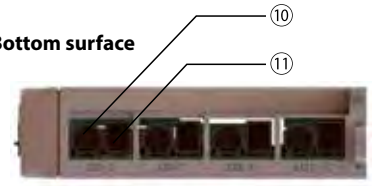
	Simple direct value mode	Positioner 1 mode	Direct numerical control mode (Direct indication/Full mode)	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Number of positioning points	768	768	Unlimited	768	256	16
Home return operation	○	○	○	○	○	○
Positioning operation	○	△	○	△	△	△
Speed, acceleration/deceleration 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



Bottom surface



①Field network connector
The connector used to connect to the field network.

②System 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.

③Operation mode setting switch
For switching the operation mode between automatic (AUTO) and manual (MANU).

④SIO connector
Connector for connecting the touch panel teaching pendant and PC dedicated teaching software.

⑤USB connector
Connector for connecting the PC dedicated teaching software.

⑥Drive 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.

⑦Motor power supply connector
For 24VDC motor power supply for a gateway unit.

⑧Control power supply connector
The connector for the gateway unit 24VDC control power supply and the frame ground (FG).

⑨Status display LED

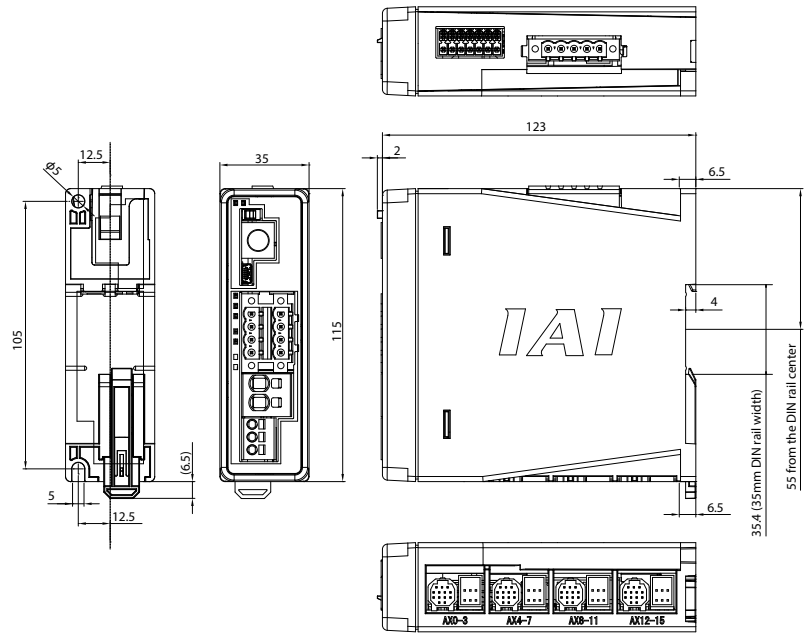
Code	LED	Display color and operating status
LED1	SYS	System status Ready (Green), Alarm (Red)
LED2	AUTO	Operation mode (AUTO/MANU) status Automatic operation mode (Green)
LED3	EMG	Emergency stop (EMG) status Emergency stop (EMG) (Red)
LED4	T. ERR	Bus communication error in the controller T.ERR (Orange)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

⑩Axis 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.

⑪Axis power supply connector
The connector used to supply 24VDC motor power via gateway unit to either a RCP6S or a hub unit.

■External Dimensions

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD



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 P8-141

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 P8-141 for details and confirm the "Number of connectable axes".

Model Configuration

RCM — P6HUB — □

RCM	Series
P6HUB	Type
□	Mounting specification

(Blank)	Screw mounting specification
DN	DIN rail mounting specification

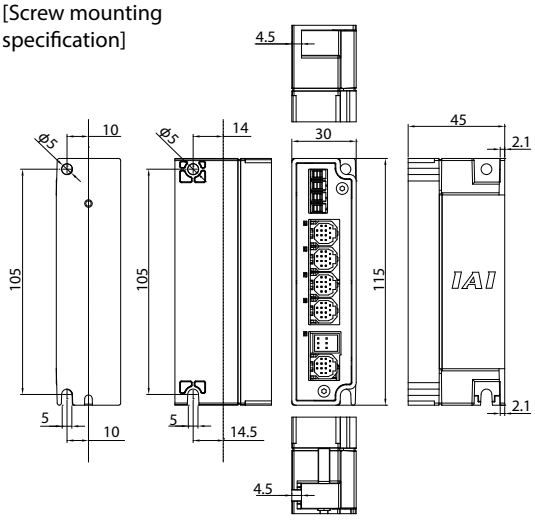
Specification

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)

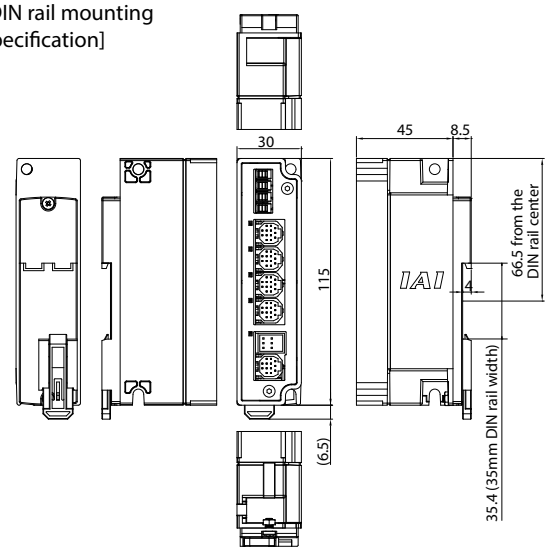
External Dimensions

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

[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.

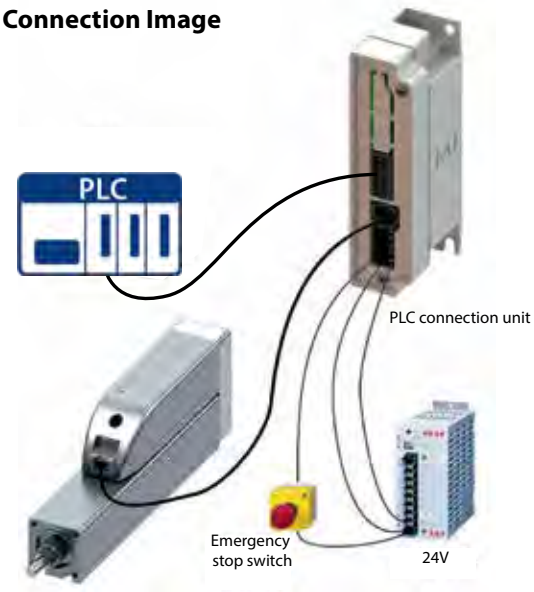
Model Configuration

RCB — P6PLC — □

	Series	Type	Mounting specification

(Blank)	Screw mounting specification
DN	DIN rail mounting specification

Connection Image

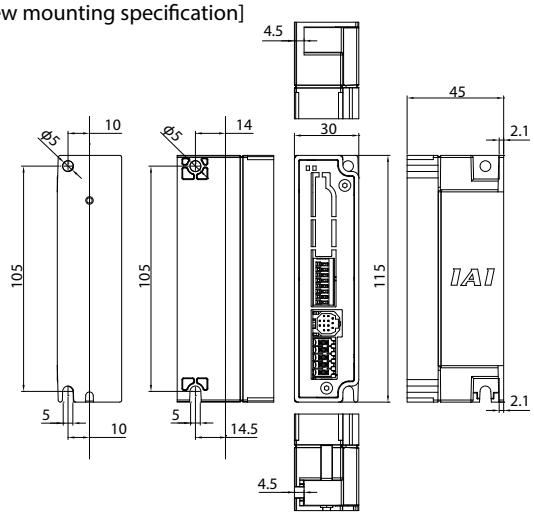


Specification

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)

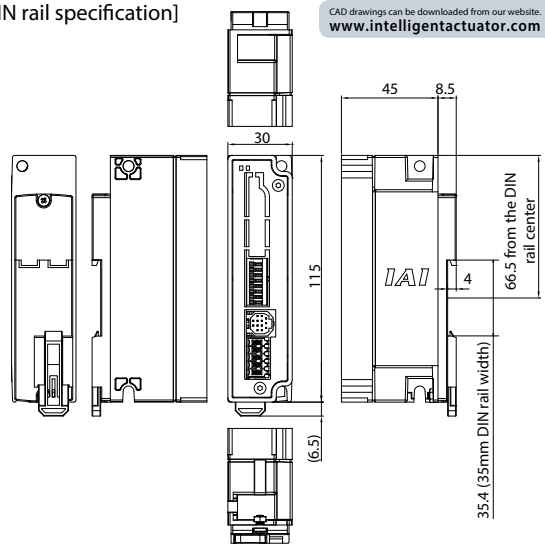
External Dimensions

[Screw mounting specification]



[DIN rail specification]

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD



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 P8-142 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

Type	
P6PC	Stepper motor
P6AC	Servo motor
P6DC	Brush-less DC motor type

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□				

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

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

Options	
HA	High acceleration/deceleration specifications *1
LA	Energy saving compatible *1

*1: RCA series dedicated

I/O Type	
SE	SIO specifications

I/O Cable Length	
0	No cable

Input Power	
0	24VDC

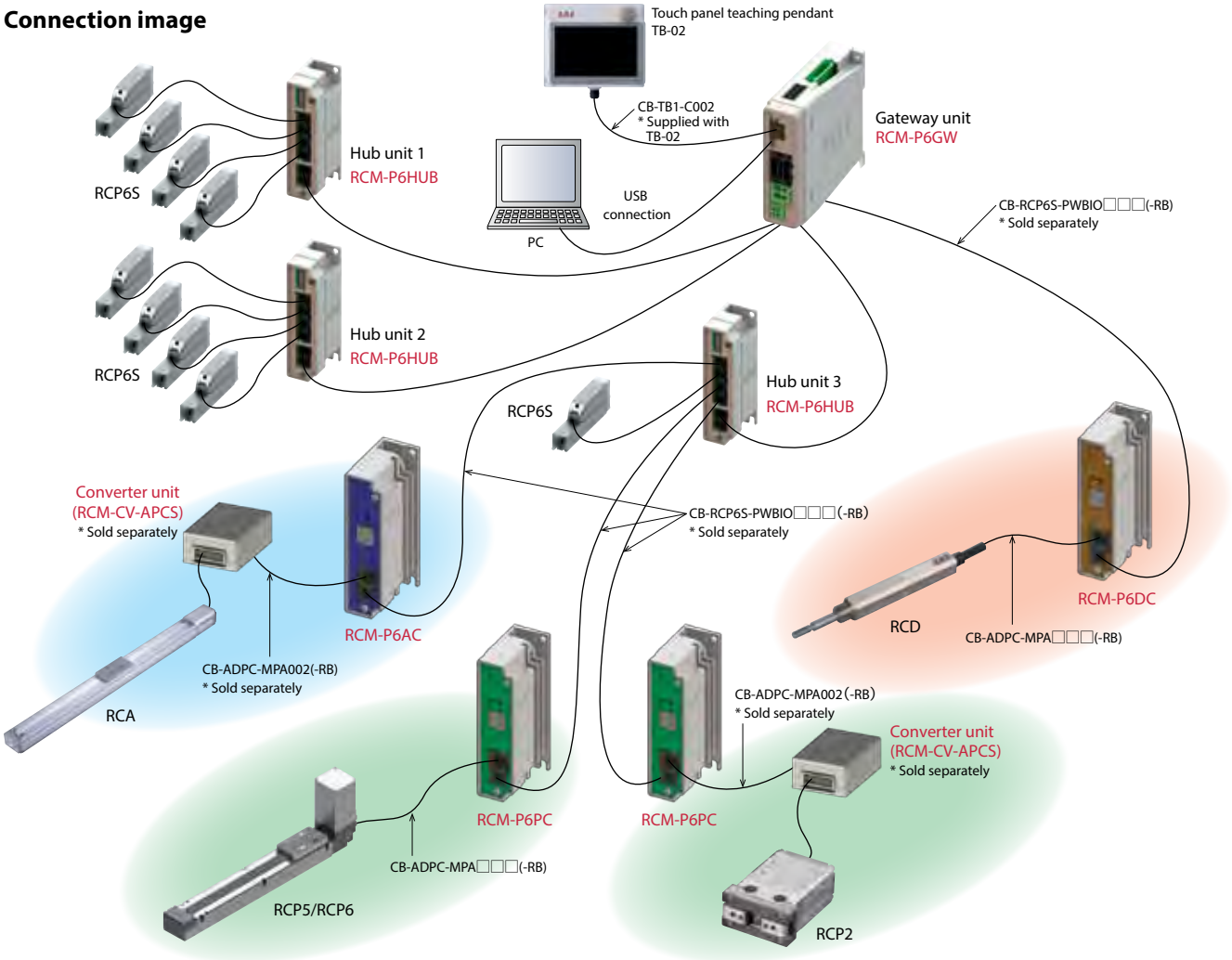
Mounting Specifications	
Blank	Screw mounting specification
DN	DIN rail mounting specification

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.

Connection image

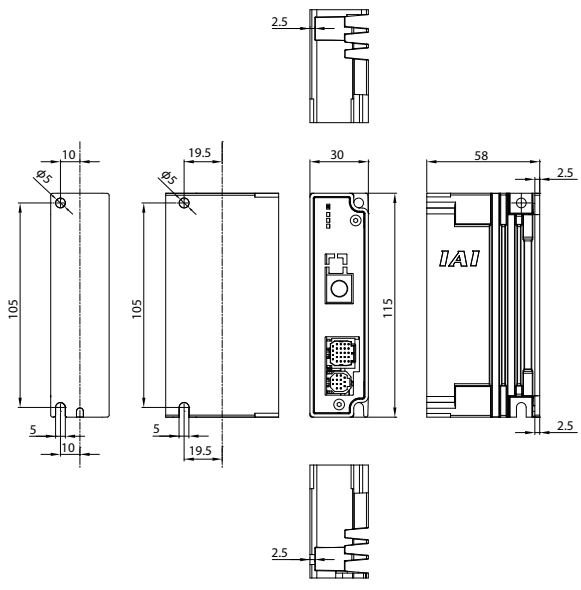


* As with some RCP 5 / RCP 6, some conversion units are unnecessary. Please confirm on P8-150.
* The field network can be used by connecting to a gateway unit.
* Please contact IAI if you require a simple absolute encoder specification type.
* Maximum cable length between the gateway unit and actuator is 20m for RCM-P6PC and RCM-P6AC, and 10m for RCM-P6DC.

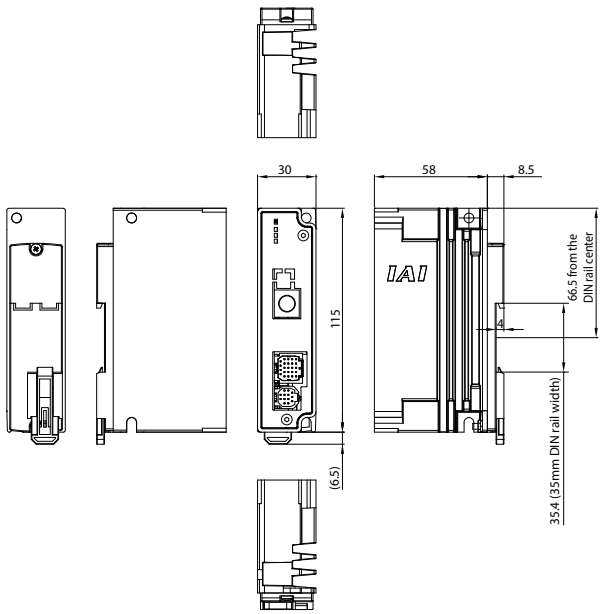
CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

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	• High-resolution battery-less absolute encoder: 8192 pulses/rev • Battery-less absolute encoder: 800 pulses/rev • Incremental encoder: 800 pulses/rev		• 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		• 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-RRA4C	—
RCP6-RRA6C	—
RCP6-RRA7C	—
RCP6-RRA4R	—
RCP6-RRA6R	—
RCP6-RRA7R	—
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-SRGS4R	—
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-GRSWL	—
RCP4-GRLM	—
RCP4-GRLL	—
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-RRA4C	—
RCP6W-RRA6C	—
RCP6W-RRA7C	—
RCP6W-RRA4R	—
RCP6W-RRA6R	—
RCP6W-RRA7R	—
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"c

RCM-P6DC Ccompatible actuators

Rod Type	
Model	Conversion unit
RCD-RA1DA	—

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

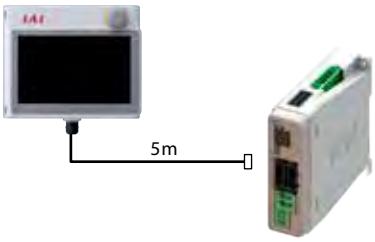
Option

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	5%RH - 85%RH (non-condensing, no frost)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

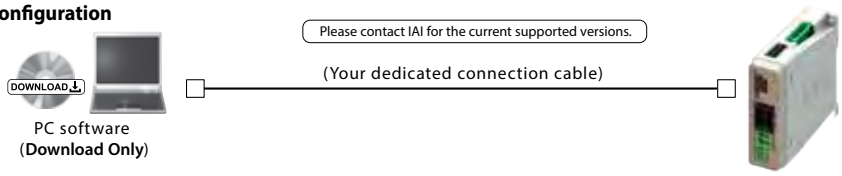
Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Supported Windows versions: 7/10

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

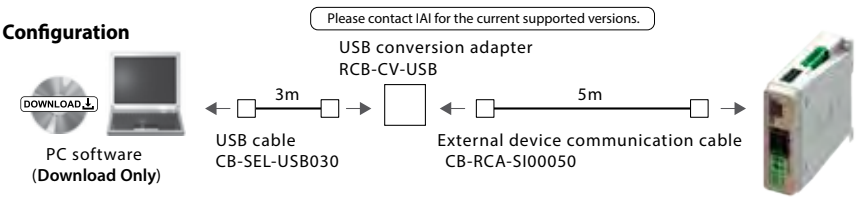
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



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 P8-139 and P8-148.

■ 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

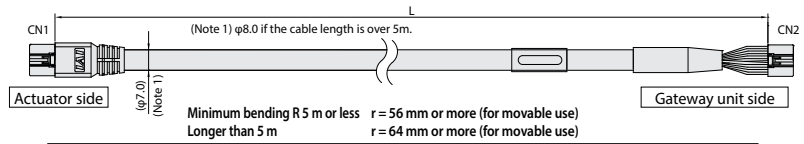
Connection destination		Conversion unit	Actuator connected to RCM-P 6□C
RCM-P6□C	Standard cable	CB-ADPC-MPA□□□	
	Robot cable	CB-ADPC-MP□□□-RB	

* When the connected actuator is RCP3/RCA2/RCA2CR/RCAW series, the cable is CB-RCAPC-MPA□□□. Refer to P8-123 for details of the cable.

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 track.

CN1 DF62E-13S-2.2C(Hirose)

Color		Signal	Pin No.
Standard cable	Robot cable		
Gray(AWG22/18)	Gray(AWG22/18)	CP	1
Blue(AWG22/18)	Blue(AWG22/18)	MP	8
Orange(AWG22/18)	Orange(AWG22/18)	MP	9
Green(AWG22/18)	Green(AWG22/18)	GND	10
Brown(AWG22/18)	Brown(AWG22/18)	GND	11
Orange(AWG26)	Orange(AWG26)	AM_SD+	6
Light blue(AWG26)	Light blue(AWG26)	AM_SD-	2
Red(AWG26)	Red(AWG26)	CT_SD+	7
Gray(AWG26)	Gray(AWG26)	CT_SD-	3
Green(AWG26)	Green(AWG26)	BK	4
Brown(AWG26)	Brown(AWG26)	EMGS	5
—	—	NC	13
Black(AWG26)	Green(AWG26)	FG	12

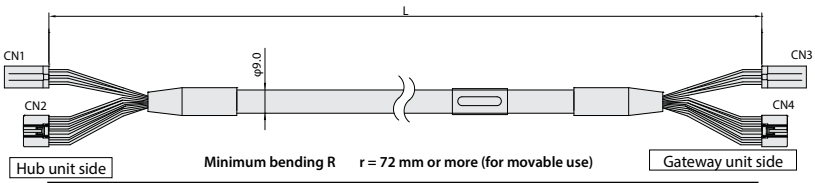
Center Inter position

CN2 DF62E-13S-2.2C(Hirose)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	CP	Gray(AWG22/18)	Gray(AWG22/18)
8	MP	Blue(AWG22/18)	Blue(AWG22/18)
9	MP	Orange(AWG22/18)	Orange(AWG22/18)
10	GND	Green(AWG22/18)	Green(AWG22/18)
11	GND	Brown(AWG22/18)	Brown(AWG22/18)
6	AM_SD+	Orange(AWG26)	Orange(AWG26)
2	AM_SD-	Light blue(AWG26)	Light blue(AWG26)
7	CT_SD+	Red(AWG26)	Red(AWG26)
3	CT_SD-	Gray(AWG26)	Gray(AWG26)
4	BK	Green(AWG26)	Green(AWG26)
5	EMGS	Brown(AWG26)	Brown(AWG26)
13	NC	—	—
12	FG	Black(AWG26)	Green(AWG26)

Model CB-RCP6S-RLY□□□/CB-RCP6S-RLY□□□-RB

* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 030 = 3m



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

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

CN1 J11DF-06V-KX(J.S.T.MFG.CO.,LTD.)

Color	Signal	Pin No.
Brown(AWG18)	MP	B1
Gray(AWG18)	MP	B2
Red(AWG18)	MP	B3
Blue(AWG18)	GND	A1
Orange(AWG18)	GND	A2
Green(AWG18)	GND	A3

CN3 J11DF-06-KX(J.S.T.MFG.CO.,LTD.)

Pin No.	Signal	Color
B1	MP	Brown(AWG18)
B2	MP	Gray(AWG18)
B3	MP	Red(AWG18)
A1	GND	Blue(AWG18)
A2	GND	Orange(AWG18)
A3	GND	Green(AWG18)

CN2 DF62E-13S-2.2C(Hirose)

Color		Signal	Pin No.
Standard cable	Robot cable		
Blue(AWG22)	Blue(AWG22)	CP	1
—	—	NC	8
—	—	NC	9
Orange(AWG22)	Orange(AWG22)	GND	10
Green(AWG22)	Green(AWG22)	GND	11
Brown(AWG26)	Brown(AWG26)	AM_SD+	6
Green(AWG26)	Green(AWG26)	AM_SD-	2
Red(AWG26)	Red(AWG26)	CT_SD+	7
Gray(AWG26)	Gray(AWG26)	CT_SD-	3
Light blue(AWG26)	Light blue(AWG26)	NC	4
Orange(AWG26)	Orange(AWG26)	EMGS	5
—	—	NC	13
Black(AWG26)	Green(AWG26)	FG	12

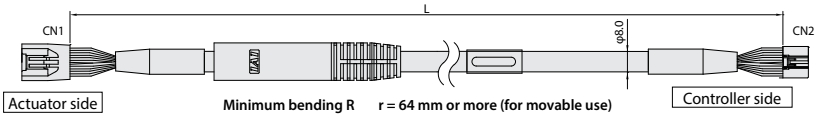
Center Inter position

CN4 DF62E-13S-2.2C(Hirose)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	CP	Blue(AWG22)	Blue(AWG22)
8	NC	—	—
9	NC	—	—
10	GND	Orange(AWG22)	Orange(AWG22)
11	GND	Green(AWG22)	Green(AWG22)
6	AM_SD+	Brown(AWG26)	Brown(AWG26)
2	AM_SD-	Green(AWG26)	Green(AWG26)
7	CT_SD+	Red(AWG26)	Red(AWG26)
3	CT_SD-	Gray(AWG26)	Gray(AWG26)
4	NC	Light blue(AWG26)	Light blue(AWG26)
5	EMGS	Orange(AWG26)	Orange(AWG26)
13	NC	—	—
12	FG	Black(AWG26)	Green(AWG26)

Model CB-RCP6S-PWBIO□□□-JY1/CB-RCP6S-PWBIO□□□-JY1-RB

* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 030 = 3m



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

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

CN1 DF62B-13EP-2.2C(Hirose)

Color		Signal	Pin No.
Standard cable	Robot cable		
Gray(AWG18)	Gray(AWG18)	CP	1
Blue(AWG18)	Blue(AWG18)	MP	8
Orange(AWG18)	Orange(AWG18)	MP	9
Green(AWG18)	Green(AWG18)	GND	10
Brown(AWG18)	Brown(AWG18)	GND	11
Orange(AWG26)	Orange(AWG26)	AM_SD+	6
Light blue(AWG26)	Light blue(AWG26)	AM_SD-	2
Red(AWG26)	Red(AWG26)	CT_SD+	7
Gray(AWG26)	Gray(AWG26)	CT_SD-	3
Green(AWG26)	Green(AWG26)	BK	4
Brown(AWG26)	Brown(AWG26)	EMGS	5
—	—	NC	13
Black(AWG26)	Green(AWG26)	FG	12

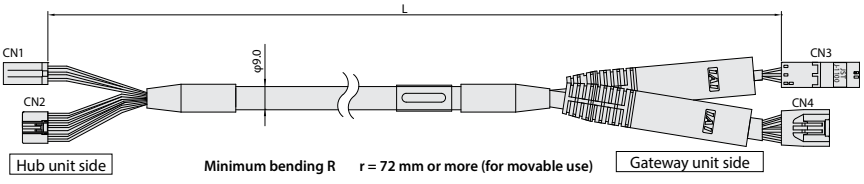
Center Inter position

CN2 DF62E-13S-2.2C(Hirose)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	CP	Gray(AWG18)	Gray(AWG18)
8	MP	Blue(AWG18)	Blue(AWG18)
9	MP	Orange(AWG18)	Orange(AWG18)
10	GND	Green(AWG18)	Green(AWG18)
11	GND	Brown(AWG18)	Brown(AWG18)
6	AM_SD+	Orange(AWG26)	Orange(AWG26)
2	AM_SD-	Light blue(AWG26)	Light blue(AWG26)
7	CT_SD+	Red(AWG26)	Red(AWG26)
3	CT_SD-	Gray(AWG26)	Gray(AWG26)
4	BK	Green(AWG26)	Green(AWG26)
5	EMGS	Brown(AWG26)	Brown(AWG26)
13	NC	—	—
12	FG	Black(AWG26)	Green(AWG26)

Model CB-RCP6S-RLY□□□-JY1/CB-RCP6S-RLY□□□-JY1-RB

* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 030 = 3m



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

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

CN1 J11DF-06V-KX(J.S.T.MFG.CO.,LTD.)

Color	Signal	Pin No.
Brown(AWG18)	MP	B1
Gray(AWG18)	MP	B2
Red(AWG18)	MP	B3
Blue(AWG18)	GND	A1
Orange(AWG18)	GND	A2
Green(AWG18)	GND	A3

CN3 J11DFM-06-KX(J.S.T.MFG.CO.,LTD.)

Pin No.	Signal	Color
B1	MP	Brown(AWG18)
B2	MP	Gray(AWG18)
B3	MP	Red(AWG18)
A1	GND	Blue(AWG18)
A2	GND	Orange(AWG18)
A3	GND	Green(AWG18)

CN2 DF62E-13S-2.2C(Hirose)

Color		Signal	Pin No.
Standard cable	Robot cable		
Blue(AWG22)	Blue(AWG22)	CP	1
—	—	NC	8
—	—	NC	9
Orange(AWG22)	Orange(AWG22)	GND	10
Green(AWG22)	Green(AWG22)	GND	11
Brown(AWG26)	Brown(AWG26)	AM_SD+	6
Green(AWG26)	Green(AWG26)	AM_SD-	2
Red(AWG26)	Red(AWG26)	CT_SD+	7
Gray(AWG26)	Gray(AWG26)	CT_SD-	3
Light blue(AWG26)	Light blue(AWG26)	NC	4
Orange(AWG26)	Orange(AWG26)	EMGS	5
—	—	NC	13
Black(AWG26)	Green(AWG26)	FG	12

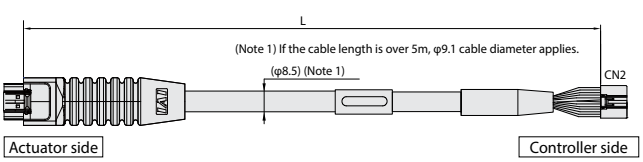
Center Inter position

CN4 DF62B-13EP-2.2C(Hirose)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	CP	Blue(AWG22)	Blue(AWG22)
8	NC	—	—
9	NC	—	—
10	GND	Orange(AWG22)	Orange(AWG22)
11	GND	Green(AWG22)	Green(AWG22)
6	AM_SD+	Brown(AWG26)	Brown(AWG26)
2	AM_SD-	Green(AWG26)	Green(AWG26)
7	CT_SD+	Red(AWG26)	Red(AWG26)
3	CT_SD-	Gray(AWG26)	Gray(AWG26)
4	NC	Light blue(AWG26)	Light blue(AWG26)
5	EMGS	Orange(AWG26)	Orange(AWG26)
13	NC	—	—
12	FG	Black(AWG26)	Green(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 = 63 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 track.

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

CN1 DF62DL-24S-2.2C (HIROSE ELECTRIC CO., LTD.)

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

Purple (AWG26)

CN2 DF62DL-24S-2.2C (HIROSE ELECTRIC CO., LTD.)

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

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

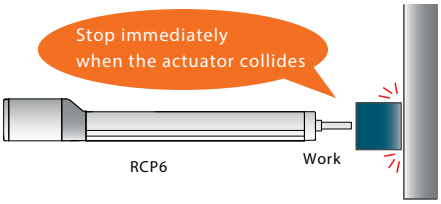
The RCP6 equipped with a high-resolution battery-less absolute encoder is supported. Since no battery is needed to retain position data, less space is required in the control panel, which in turn leads to lower cost of your equipment. The resolution is increased from 800 pulses /rev to 8,192 pulses/rev.

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.



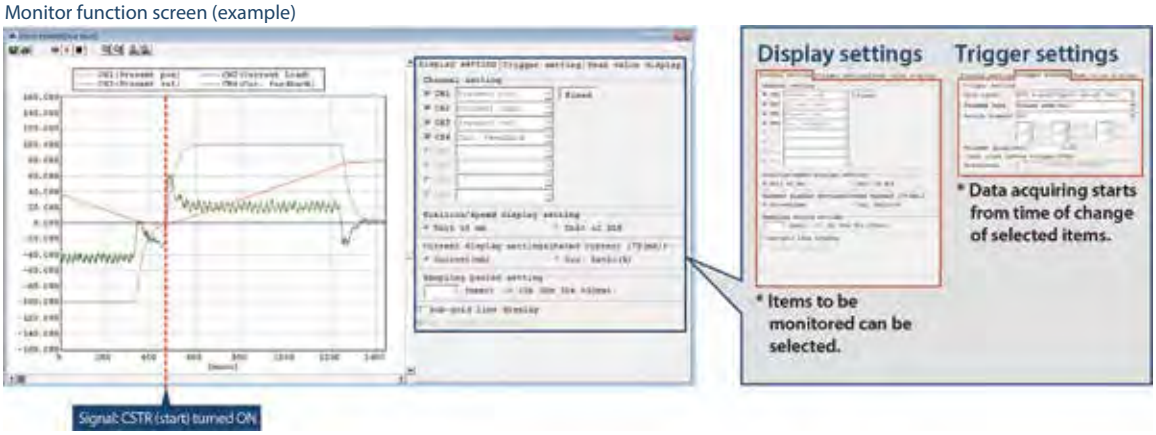
4 Enhanced Monitor Functions

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)



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	PROFIBUSDP	CompoNet	MECHATRO-LINK I,II*1	MECHATRO-LINK 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 Incremental specification		○	○	○	○	○	○	○	○	○	○	○	○
	Simple absolute spec.	With absolute battery	○	○	○	○	○	○	○	○	○	○	○	○
		With absolute battery unit	○	○	○	○	○	○	○	○	○	○	○	○
		Without absolute battery	○	○	○	○	○	○	○	○	○	○	○	○
PCON-CFB/CGFB	Battery-less absolute specification Incremental specification		○	○	○	○	○	○	○	○	○	○	○	○

*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 — Series — Type — Motor Type — Encoder Type — I/O Type — I/O Cable Length — 0 — Power Supply Voltage — Simple Absolute Specification — Controller Mounting Specification

Type

CB	Standard
CGB	Safety category compliant type
CFB	56SP/60P/86P motor-compliant type
CGFB	Safety category compliant 56SP/60P/86P motor-compliant type

Motor 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

Encoder Type

WAI	Battery-less absolute specification Incremental specification
SA	Simple absolute spec.

I/O Type

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 P8-20 for the caution when selecting.

I/O Cable Length

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

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

Power Supply Voltage

0	24VDC

Simple Absolute Specification

(Blank)	Battery-less absolute specification Incremental 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.

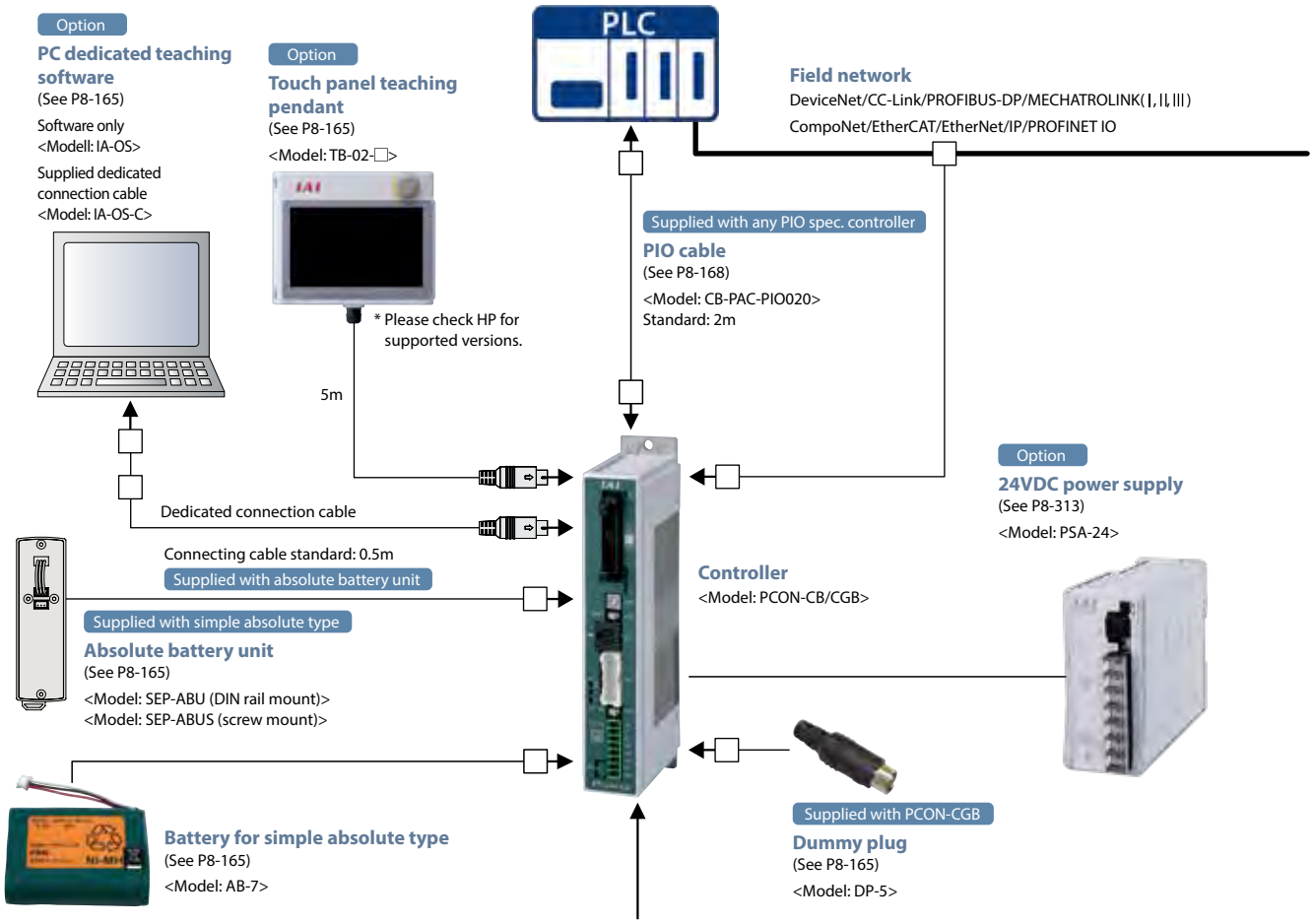
Controller Mounting Specification

(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.

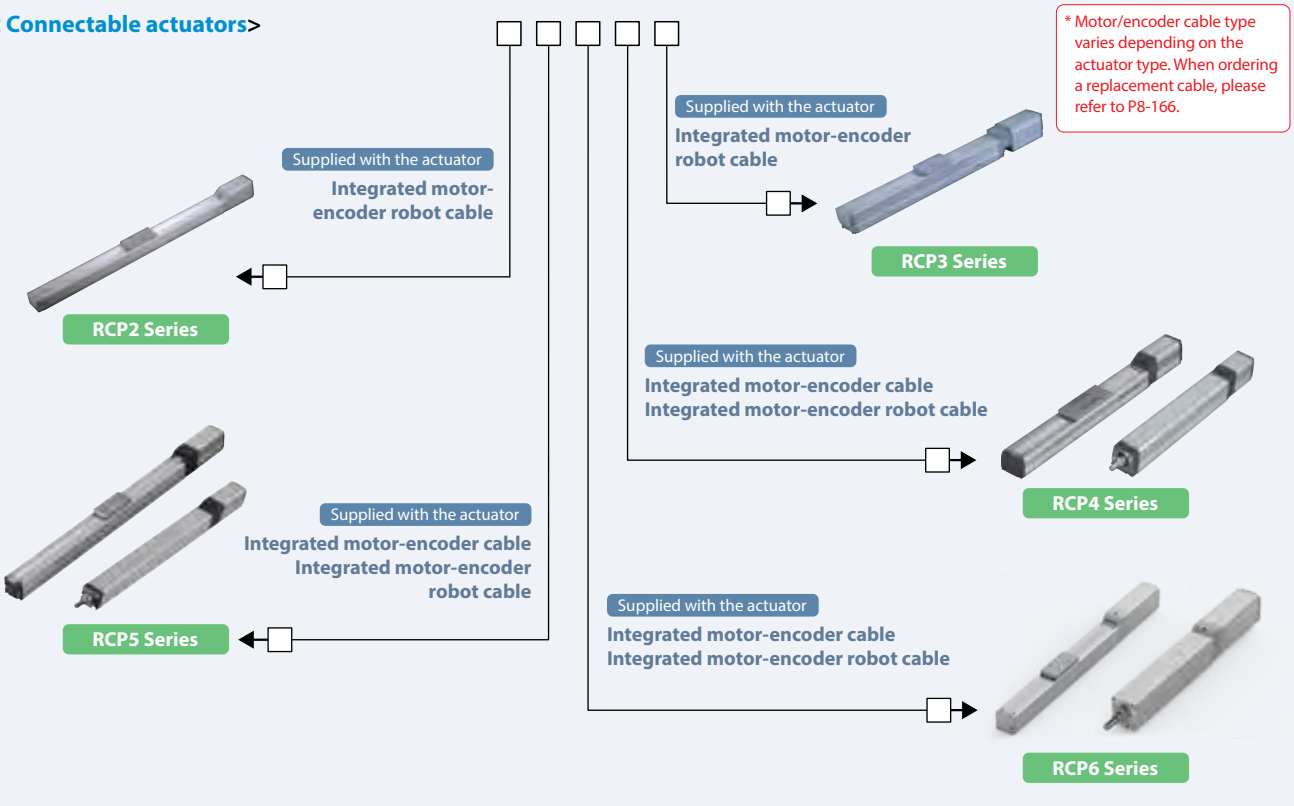
System configuration

<PCON-CB·CGB>



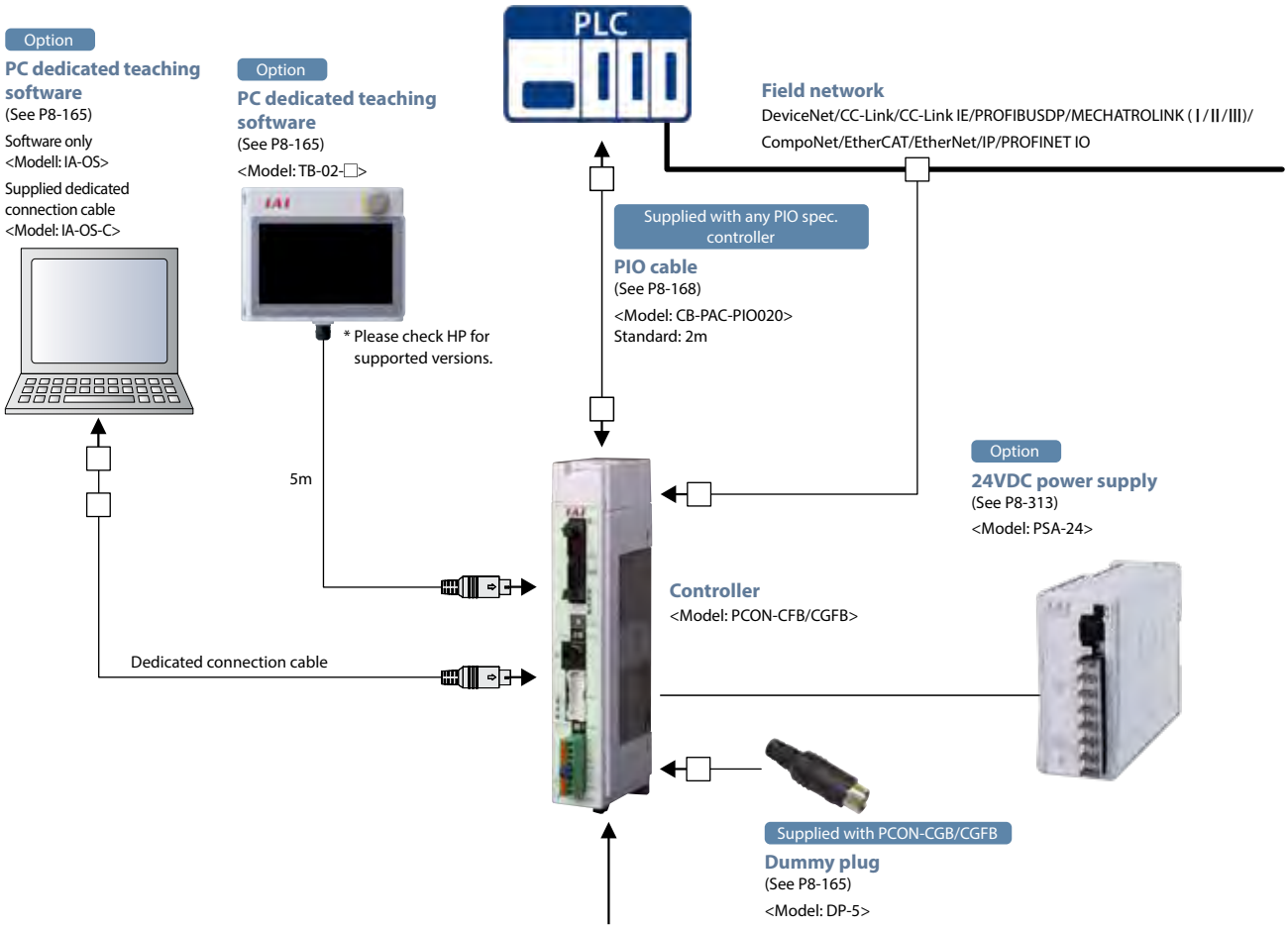
< Connectable actuators>

* Motor/encoder cable type varies depending on the actuator type. When ordering a replacement cable, please refer to P8-166.



System configuration

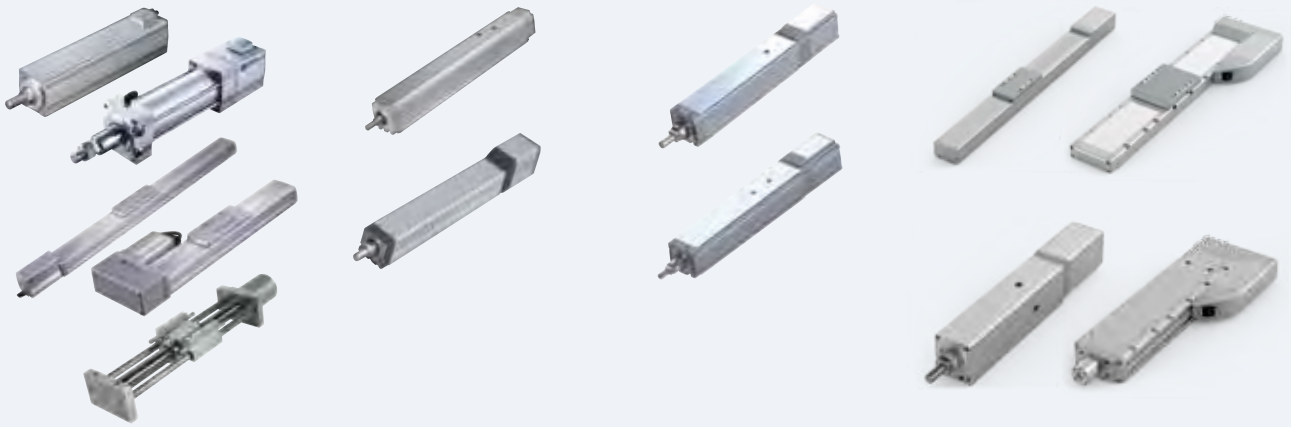
<PCON-CFB·CGFB>



< Connectable actuators>

* Motor/encoder cable type varies depending on the actuator type. When ordering a replacement cable, please refer to P8-166.

RCP2 Series	RCP4 Series	RCP5 Series	RCP6 Series
Supplied with the actuator	Supplied with the actuator	Supplied with the actuator	Supplied with the actuator
Integrated motor-encoder cable Integrated motor-encoder robot cable	Integrated motor-encoder cable Integrated motor-encoder robot cable	Integrated motor-encoder cable Integrated motor-encoder robot cable	Integrated motor-encoder cable Integrated motor-encoder robot cable



PIO I/O interface

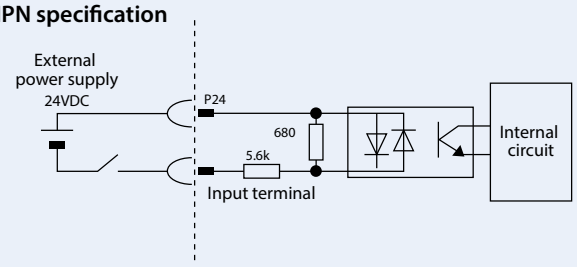
■Input part External input specification

Item	Specification
Input voltage	24VDC ±10%
Input current	5mA, 1 circuit
ON/OFF voltage	ON voltage Min. DC 18V OFF voltage Max. DC 6V

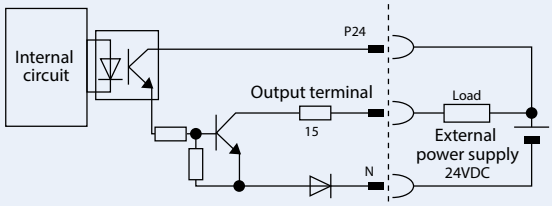
■Output part External output specification

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

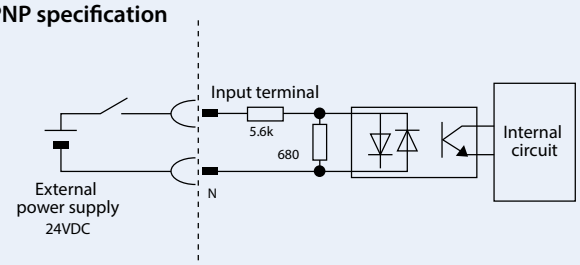
NPN specification



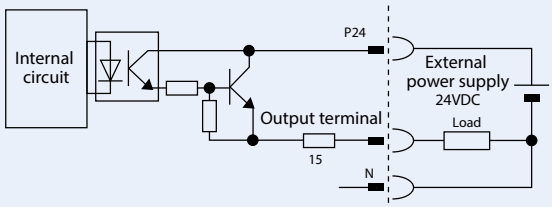
NPN specification



PNP specification



PNP specification



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)	• Number of positioning points: 64 points • Position number command: Binary Coded Decimal (BCD) • Zone signal output*1 : 1 point • Position zone signal output*2 : 1 point
PIO Pattern 1	1	Teaching mode (Teaching type)	• Number of positioning points: 64 points • Position number command: Binary Coded Decimal (BCD) • Zone signal output*2 : 1 point • Jog (inching) operation using PIO signals is supported. • Current position data can be written to the position table using PIO signals.
PIO Pattern 2	2	256-point mode (256 positioning points)	• 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)	• 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)	• Number of positioning points: 7 points • Position number command: Individual number signal ON • Zone signal output*1 : 1 point • Zone signal output*2 : 1 point
PIO Pattern 5	5	Solenoid valve mode 2 (3-point type)	• Number of positioning points: 3 points • Position number command: Individual number signal ON • Completion signal: A signal equivalent to a LS (limit switch) signal can be output. • Zone signal output*1 : 1 point • Zone signal output*2 : 1 point
PIO Pattern 6 (Note 1)	6	Pulse-train control mode for incremental	• Differential pulse input (200 kpps max.) • Home return function • Zone signal output*1 : 2 point • No feedback pulse output
PIO Pattern 7 (Note 1)	7	Pulse-train control mode for absolute	• Reference point setting (1 point) • Home return function • Differential pulse input (200 kpps max.) • No feedback pulse output • Zone signal output*1 : 2 point

*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)	×	○	×	×	×	×
		Brake release	○	×	○	○	○	○
	Output	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.

Explanation of I/O signal functions of PCON-CB/CFB

Usable signals differ depending ono the controller setting. Referring to the signal table, confirm available functions.

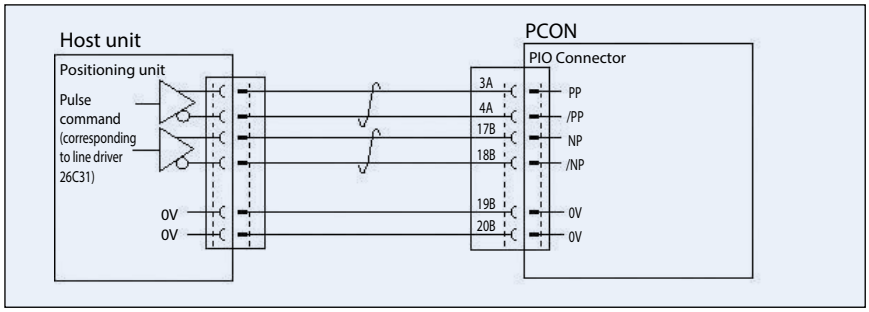
Category	Signal code	Signal name	Description of function
	CSTR	PTP strobe (start signal)	Start moving to the designated position of the command value.
Input	PC1~PC256	Command position No.	To enter the position No. (binary) of the desired position.
	BKRL	Forced brake release	Releases the brake forcedly
	RMOD	Switching operation mode	Enables the operation mode to be switched when the controller MODE switch is AUTO. (AUTO for signal OFF, MANU for signal ON)
	*STP	Temporary pause	Slows down to stop when this signal is OFF while moving. It resumes operation when the signal is ON while stopping with the resto of motions suspended.
	RES	Reset	Reses the alarm by an ON signal. Cancels the rest of motions by ON while temporarily stopping (*STP is OFF).
	SON	Servo ON	Servo is ON while the signal is ON, Servo is OFF while the signal is OFF.
	HOME	Home return	Performs Home return by an ON signal.
	MODE	Teach mode	Moves to the teach mode by an ON signal.The mode will not be switched over unless all of CSTR, JOG+ and JOG- are OFF and actuator is stopping.
	JISL	Jog/Inching switch	Performs jog motions by JOG+ and JOG- while this signal is OFF. Performs inching motions of JOG+ and JOG- when the signal is ON.
	JOG+ JOG−	Jog	Performs jog motions in the + (plus) direction for JOG+ signal ON edge detection and JOG- signal in the - (minus) direction when JISL is OFF. Slows down to stop when the OFF edge is detected while operating. It becomes an inching motion when the JISL signal is ON.
	PWRT	Writing of current position	In the teaching mode, the current position is written in the designated position when this signal is ON for more than 26ms with the writing position being designated.
	ST0~ST6	Start signal	Moves to the designated position when this signal is ON at the solenoid valve mode.
Output	PEND/INP	Positioning complete	This signal is ON when the positioning width range is reached after moving. PEND will not become OFF, even when the positioning width is exceeded. INP becomes OFF. PEND and INP can be changed by parameters.
	PM1~PM256	Complete position No.	Outputs the position number (binary output) that has reached after positioning is completed.
	HEND	Home return complete	This signal is ON when the home return is completed. This signal is kept ON unless the home position is not lost.
	ZONE1 ZONE2	Zone	This signal becomes ON when actuator current position is within the designated range of the parameter.
	PZONE	Position zone	This signal becomes ON while moving positions when the actuator current position is within the designated range specified by the position data. It can be used together with ZONE1. However, PZONE is enabled during operations with the selected position number only.
	RMDS	Output of operation mode	Outputs the status of operation mode. Turns ON when the controller is in the manual mode.
	*ALM	Alarm	Turns ON when the controller is in a normal condition. Turns OFF when the alarm is activated.
	ALM1~ALM8	Alarm code	Outputs the alarm details in a binary code when an alarm is activated because the operation cancellation level is reached.
	MOVE	In motion	Turned ON when the actuator is in motion (including home return and push motion).
	SV	Servo ON	Turns ON when the servo is ON.
	*EMGS	Emergency stop output	Turns ON when the controller is in an emergency stop release condition, and turns OFF in the emergency stop condition. (regardless of the alarm)
	MODES	Teach mode output	Turns ON at the teach mode by a MODE signal input. Turns OFF in the normal mode.
	WEND	Writing complete	This signal turns OFF in the teach mode, and turns ON when writing is completed by the PWRT signal. When PWR signal turns OFF, this signal also turns OFF.
	PE0~PE6	Current position No.	Turns ON when travel to the target position is completed in the solenoid valve mode.
	LS0~LS2	Limit switch output	Turns ON when the actuator's current position is within the positioning width range (±) of the target position. In the Home return complete condition, this signal will be output even before the travel command or in a servo OFF status.
	*ALML	Minor failure output	This signal is output when the alarm is activated in the message level.
	LOAD (Note 1)	Load output judgement status	This signal turns ON when the push current value exceeds the "threshold" set for the position data for a certain period of time within the push motion range and position data ranges of "ZONE+" and "ZONE-." It is used to judge whether or not press-fitting is performed normally. The signal also turns ON when a collision is detected (judgement) by the collision detection function.
	TRQS (Note 1)	Torque level status	This signal turns ON when the push current value exceeds the "threshold" set for the position data for a certain period of time (Note 3) within the push motion range. The signal turns OFF when the current value becomes below the "threshold." This is used to judge where or not press-fitting is performed normally. In the solenoid valve mode 2, when a motion is performed in the + direction by JOG+ before a home return, the motion becomes impossible due to an obstacle or the stroke end. In this case, the signal becomes ON when the motor current value exceeds the limit for home return current value.

* symbol accompanying each code indicates a negative logic signal. A negative logic signal is the signal that is processed when the input signal is turned OFF and the output signal is usually ON when the power is supplied and OFF when the signal is output.

Note 1: This is a signal dedicated to high thrust actuators (CFB type).It should be used as a guide output for other types of actuators.

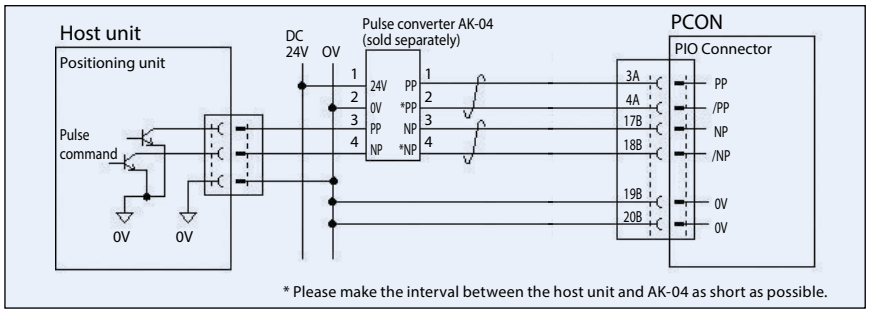
Pulse-train control circuit

■Host Unit = Differential Type



■Host Unit = Open Collector Type

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



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

Command pulse input patterns

	Command pulse-train pattern	Input terminal	Forward	Reverse
Negative logic	Forward pulse-train	PP・/PP		
	Reverse pulse-train	NP・/NP		
	A forward pulse-train indicates the amount of motor rotation in the forward direction, while a reverse pulse-train indicates the amount of motor rotation in the reverse direction.			
	Pulse-train	PP・/PP		
	Sign	NP・/NP	Low	High
	The command pulses indicate the amount of motor rotation, while the sign indicates the rotating direction.			
	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.			
Positive logic	Forward pulse-train	PP・/PP		
	Reverse pulse-train	NP・/NP		
	Pulse-train	PP・/PP		
	Sign	NP・/NP	High	Low
	Phase A/B pulse-train	PP・/PP		
		NP・/NP		

I/O Signals in pulse-train pontrol 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 (except for MECHATROLINK-III)

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

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

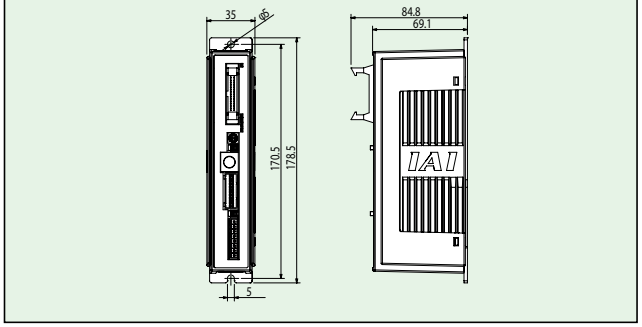
* ○ indicates that the operation is supported, and X indicates that it is not supported.
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

External dimensions

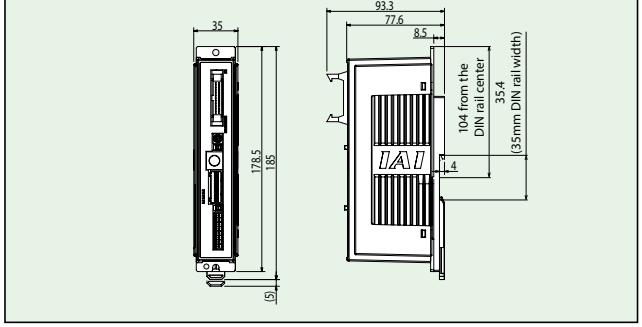
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

<PCON-CB・CGB>

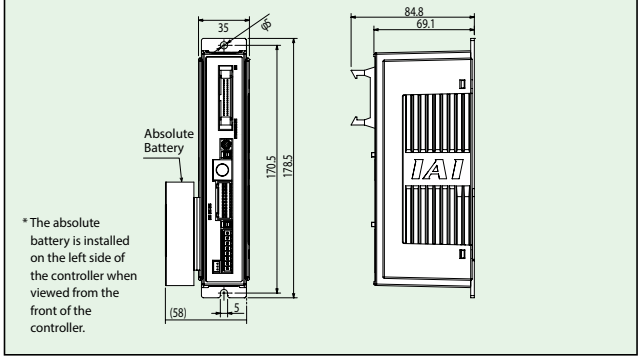
Battery-less Absolute/Incremental Specifications | Screw Mounting Spec.



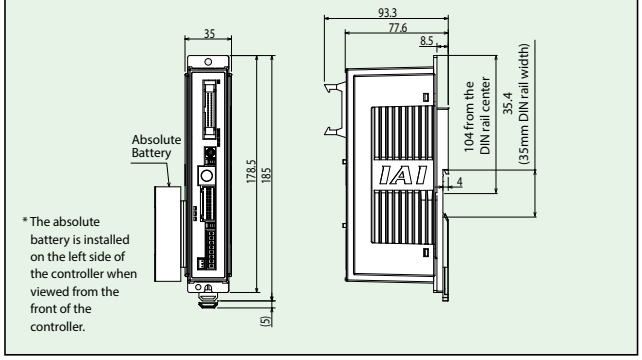
Battery-less Absolute/Incremental Specifications | DIN Rail Mounting Spec.



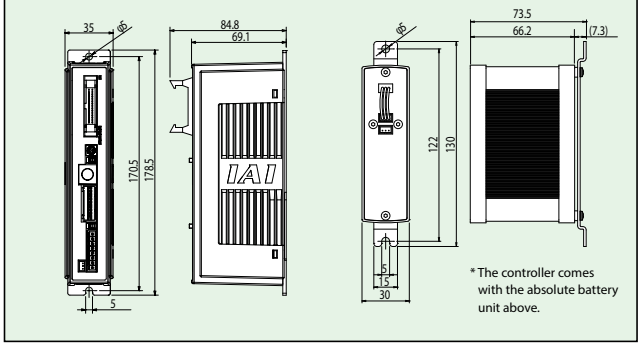
Simple Absolute Specification w/ Absolute Battery | Screw Mounting Spec.



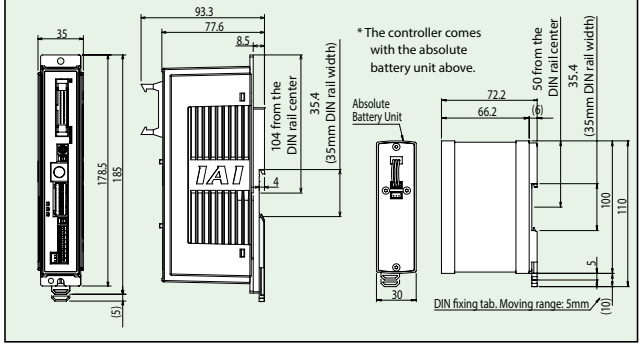
Simple Absolute Specification w/ Absolute Battery | DIN Rail Mounting Spec.



Simple Absolute Specification w/ Absolute Battery Unit | Screw Mounting Spec.



Simple Absolute Specification w/ Absolute Battery Unit | DIN Rail Mounting Spec.



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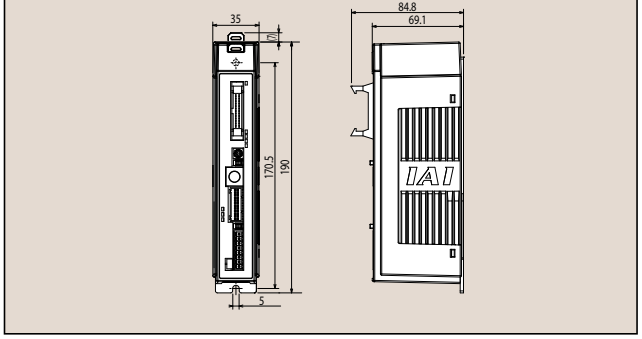
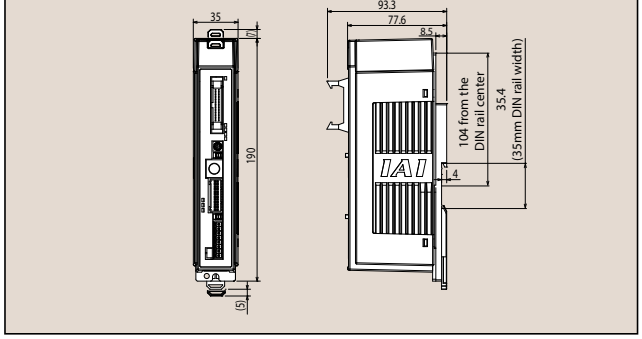
Battery-less Absolute/Incremental Specifications | Screw Mounting Spec.



Battery-less Absolute/Incremental Specifications | DIN Rail Mounting Spec.



Specification list

Item				Details	
				PCON-CB・CGB	PCON-CFB・CGFB
Number of controlled axes				1 axis	
Power supply voltage				24VDC±10%	
Load current (including controlside 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.	
				High-output setting enabled: 3.5A rated/4.2A max.	
			56SP, 60P, 86P		6A max.
	RCP6	Motor type	28P, 35P, 42P, 56P	High-output setting disabled: 2.2A max.	
				High-output setting enabled: 3.5A rated/4.2A max.	
			56SP, 60P		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℃	
	Ambient operating humidity			5%RH - 85%RH (non-condensing, no frost)	
	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.

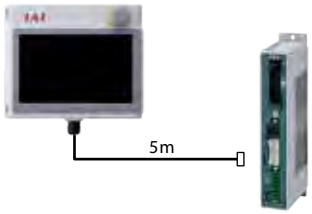
Option

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	5%RH - 85%RH (non-condensing, no frost))
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

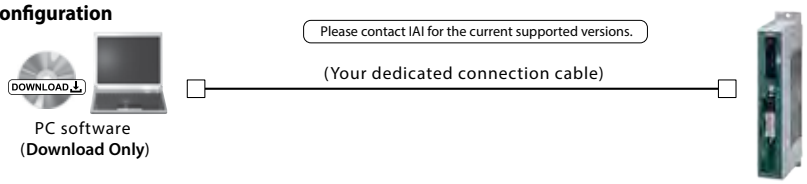
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

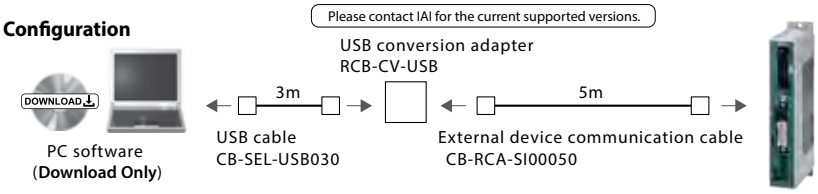
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



Supported Windows versions: 7/10

Absolute battery unit

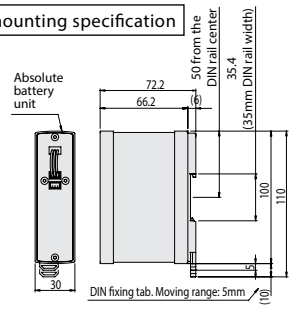
Overview A battery unit, supplied as an accessory for the simple absolute specification,which serves to back up the current position of the controller.

Model **SEP-ABU** (DIN rail mounting specification)
SEP-ABUS (Screw mounting specification)

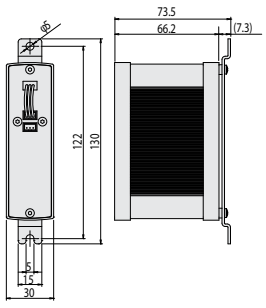
Specification

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

DIN rail mounting specification



Screw mounting specification



Replacement battery

Overview Replacement battery used with the absolute battery box.

Model **AB-7**

Dummy plug

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

Model **DP-5**

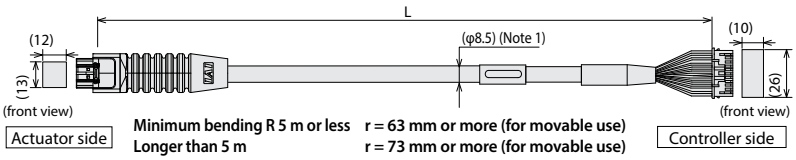
■ Table of Applicable Cables

	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/RRA8 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)	CB-CFA2-MPA □□□	CB-CFA2-MPA □□□ -RB
⑥	RCP4W	RA7C (High-thrust specification)		
⑦	RCP3		–	CB-APSEP-MPA □□□
⑧	RCP2 RCP2CR RCP2W	GRSS/GRLS/GRST/GRHM/GRHB/SRA4R/ SRGS4R/SRGD4R		
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



Minimum bending R 5 m or less r = 63 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

DF62DL-24S-2.2(Hirose)

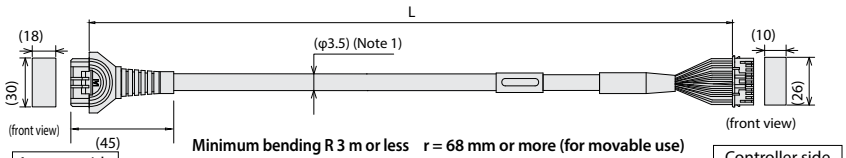
Color	Signal	Pin No.
Blue(AWG22/19)	φA	3
Orange(AWG22/19)	VMM	5
Brown(AWG22/19)	φB	10
Gray(AWG22/19)	VMM	9
Green(AWG22/19)	φ_A	4
Red(AWG22/19)	φ_B	15
Light Blue(AWG26)	SA [mABS]	12
Orange(AWG26)	SB [mABS]	17
Green(AWG26)	A+	1
Brown(AWG26)	A-	6
Gray(AWG26)	B+	11
Red(AWG26)	B-	16
Black(AWG26)	VPS	18
Yellow(AWG26)	LS+	8
Light Blue(AWG26)	BK+	20
Orange(AWG26)	BK-	2
Gray(AWG26)	VCC	21
Red(AWG26)	GND	7
Brown(AWG26)	LS-	14
Green(AWG26)	LS_GND	13
—	—	19
Pink(AWG26)	CF_VCC	22
—	—	23
Black(AWG26)	FG	24

PADP-24V-1-S(JST)

Pin No.	Signal	Color
1	φA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
3	φB	Brown(AWG22/19)
4	VMM	Gray(AWG22/19)
5	φ_A	Green(AWG22/19)
6	φ_B	Red(AWG22/19)
11	SA [mABS]	Light Blue(AWG26)
12	SB [mABS]	Orange(AWG26)
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Gray(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light Blue(AWG26)
10	BK-	Orange(AWG26)
17	VCC	Gray(AWG26)
19	GND	Red(AWG26)
8	LS-	Brown(AWG26)
20	LS_GND	Green(AWG26)
22	—	—
21	CF_VCC	Pink(AWG26)
23	—	—
24	FG	Black(AWG26)

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



Minimum bending R 3 m or less r = 68 mm or more (for movable use)
Longer than 3 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 track.

(Note 1) If the cable length is over 3m, φ9.1 cable diameter applies.

1-1827863-1(AMP)

Color		Signal	Pin No.
Standard cable	Robot cable		
Light Blue(AWG22/19)	Light Blue(AWG22/19)	φA	A1
Orange(AWG22/19)	Orange(AWG22/19)	VMM	B1
Green(AWG22/19)	Green(AWG22/19)	φ_A	A2
Brown(AWG22/19)	Brown(AWG22/19)	φB	B2
Gray(AWG22/19)	Gray(AWG22/19)	VMM	A3
Red(AWG22/19)	Red(AWG22/19)	φ_B	B3
Light Blue(AWG26)	Light Blue(AWG26)	SA [mABS]	A6
Orange(AWG26)	Orange(AWG26)	SB [mABS]	B6
Green(AWG26)	Green(AWG26)	A+	A7
Brown(AWG26)	Brown(AWG26)	A-	B7
Gray(AWG26)	Gray(AWG26)	B+	A8
Red(AWG26)	Red(AWG26)	B-	B8
Black(AWG26)	Black(AWG26)	VPS	B9
Yellow(AWG26)	Yellow(AWG26)	LS+	A4
Light Blue(AWG26)	Light Blue(AWG26)	BK+	A5
Orange(AWG26)	Orange(AWG26)	BK-	B5
Green(AWG26)	Green(AWG26)	LS_GND	A9
Brown(AWG26)	Brown(AWG26)	LS-	B4
Gray(AWG26)	Gray(AWG26)	VCC	A10
Red(AWG26)	Red(AWG26)	GND	B10
—	—	—	A11
Black	Green	FG	B11

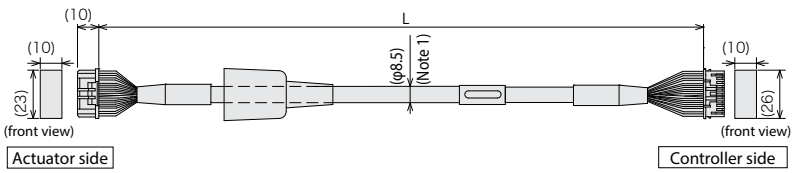
PADP-24V-1-S(JST)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	φA	Light Blue(AWG22/19)	Light Blue(AWG22/19)
2	VMM	Orange(AWG22/19)	Orange(AWG22/19)
5	φ_A	Green(AWG22/19)	Green(AWG22/19)
3	φB	Brown(AWG22/19)	Brown(AWG22/19)
4	VMM	Gray(AWG22/19)	Gray(AWG22/19)
6	φ_B	Red(AWG22/19)	Red(AWG22/19)
11	SA [mABS]	Light Blue(AWG26)	Light Blue(AWG26)
12	SB [mABS]	Orange(AWG26)	Orange(AWG26)
13	A+	Green(AWG26)	Green(AWG26)
14	A-	Brown(AWG26)	Brown(AWG26)
15	B+	Gray(AWG26)	Gray(AWG26)
16	B-	Red(AWG26)	Red(AWG26)
18	VPS	Black(AWG26)	Black(AWG26)
7	LS+	Yellow(AWG26)	Yellow(AWG26)
9	BK+	Light Blue(AWG26)	Light Blue(AWG26)
10	BK-	Orange(AWG26)	Orange(AWG26)
20	LS_GND	Green(AWG26)	Green(AWG26)
8	LS-	Brown(AWG26)	Brown(AWG26)
21	VCC	Gray(AWG26)	Gray(AWG26)
19	GND	Red(AWG26)	Red(AWG26)
17	—	—	—
22	—	—	—
23	—	—	—
24	FG	Black	Green

Maintenance parts

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

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



Minimum bending radius r = 80mm or more (dynamic bending condition)

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

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

1-1827863-1(AMP)

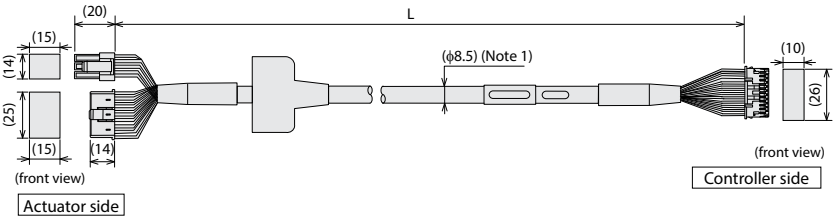
Color	Signal	PIN No.
Blue(AWG22/19)	φA	A1
Orange(AWG22/19)	VMM	B1
Green(AWG22/19)	φ_A	A2
Brown(AWG22/19)	φB	B2
Gray(AWG22/19)	VMM	A3
Red(AWG22/19)	φ_B	B3
Light Blue(AWG26)	—	A6
Orange(AWG26)	—	B6
Green(AWG26)	A+	A7
Brown(AWG26)	A-	B7
Gray(AWG26)	B+	A8
Red(AWG26)	B-	B8
Black(AWG26)	VPS	B9
Yellow(AWG26)	LS+	A4
Light Blue(AWG26)	BK+	A5
Orange(AWG26)	BK-	B5
Green(AWG26)	LS_GND	A9
Brown(AWG26)	LS-	B4
Gray(AWG26)	VCC	A10
Red(AWG26)	GND	B10
—	—	A11
Black	FG	B11

PADP-24V-1-S(JST)

PIN No.	Signal	Color
1	φA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
5	φ_A	Green(AWG22/19)
3	φB	Brown(AWG22/19)
4	VMM	Gray(AWG22/19)
6	φ_B	Red(AWG22/19)
11	—	Light Blue(AWG26)
12	—	Orange(AWG26)
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Gray(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light Blue(AWG26)
10	BK-	Orange(AWG26)
20	LS_GND	Green(AWG26)
8	LS-	Brown(AWG26)
17	VCC	Gray(AWG26)
19	GND	Red(AWG26)
21	—	—
22	—	—
23	—	—
24	FG	Black

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

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



Minimum bending radius r = 80mm or more (dynamic bending condition)

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

(Note 1) If the cable length is over 3m, φ9.1 cable diameter applies.

SLP-06V (JST)

Color		Signal	Pin No.
Standard cable	Robot cable		
Blue(AWG22/19)	Blue(AWG22/19)	φA	1
Orange (AWG22/19)	Orange (AWG22/19)	VMM	2
Brown (AWG22/19)	Brown (AWG22/19)	φB	4
Gray (AWG22/19)	Gray (AWG22/19)	VMM	5
Green (AWG22/19)	Green (AWG22/19)	φ/A	3
Red (AWG22/19)	Red (AWG22/19)	φ/B	6

XMP-18V (JST)

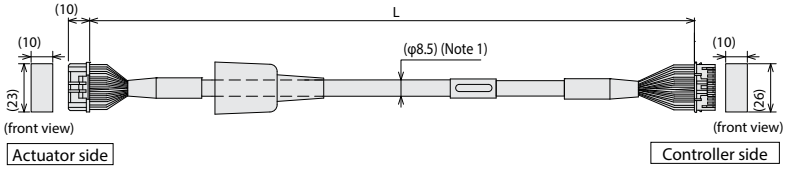
Light Blue (AWG26)	-	NC	5
(Orange (AWG26))	-	NC	6
Green (AWG26)	Green (AWG26)	LS+	1
Brown (AWG26)	Brown (AWG26)	LS-	2
Gray (AWG26)	Gray (AWG26)	A+	3
Red (AWG26)	Red (AWG26)	A-	4
Black (AWG26)	Black (AWG26)	B+	11
Yellow (AWG26)	Yellow (AWG26)	B-	13
Light Blue (AWG26)	Light Blue (AWG26)	BK+	16
Orange (AWG26)	Orange (AWG26)	BK-	17
(Green (AWG26))	(Green (AWG26))	(LS_GND)	10
Brown (AWG26)	Brown (AWG26)	LS-	14
Gray (AWG26)	Gray (AWG26)	VCC	12
Red (AWG26)	Red (AWG26)	GND	9
Black	Shield	FG	18
-	-	NC	15
-	-	NC	7
-	-	NC	8

PADP-24V-1-S (JST)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	φA	Blue (AWG22/19)	Blue (AWG22/19)
2	VMM	Orange (AWG22/19)	Orange (AWG22/19)
3	φB	Brown (AWG22/19)	Brown (AWG22/19)
4	VMM	Gray (AWG22/19)	Gray (AWG22/19)
5	φ/A	Green (AWG22/19)	Green (AWG22/19)
6	φ/B	Red (AWG22/19)	Red (AWG22/19)
11	NC	(Light Blue (AWG26))	-
12	NC	(Orange (AWG26))	-
13	LS+	Green (AWG26)	Green (AWG26)
14	LS-	Brown (AWG26)	Brown (AWG26)
15	A+	Gray (AWG26)	Gray (AWG26)
16	A-	Red (AWG26)	Red (AWG26)
18	B+	Black (AWG26)	Black (AWG26)
7	B-	Yellow (AWG26)	Yellow (AWG26)
9	BK+	Light Blue (AWG26)	Light Blue (AWG26)
10	BK-	Orange (AWG26)	Orange (AWG26)
20	(LS_GND)	(Green (AWG26))	(Green (AWG26))
8	LS-	Brown (AWG26)	Brown (AWG26)
21	VCC	Gray (AWG26)	Gray (AWG26)
19	GND	Red (AWG26)	Red (AWG26)
24	FG	Black	Shield
17	NC	-	-
22	NC	-	-
23	NC	-	-

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

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



Minimum bending radius r = 68mm or more (dynamic bending condition)

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

(Note 1) If the cable length is over 3m, φ9.1 cable diameter applies.

1-1827863-1(AMP)

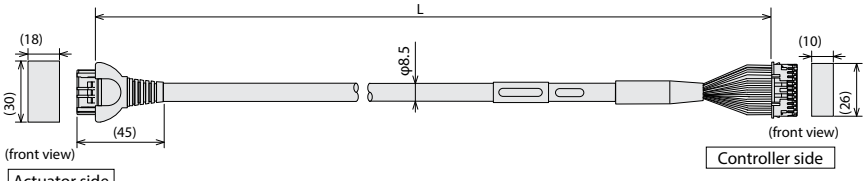
Color	Signal	PIN No.
Blue(AWG22/19)	φA	A1
Orange(AWG22/19)	VMM	B1
Green(AWG22/19)	φ_A	A2
Brown(AWG22/19)	φB	B2
Gray(AWG22/19)	VMM	A3
Red(AWG22/19)	φ_B	B3
(Light Blue(AWG26))	—	A6
(Orange(AWG26))	—	B6
Green(AWG26)	A+	A7
Brown(AWG26)	A-	B7
Gray(AWG26)	B+	A8
Red(AWG26)	B-	B8
Black(AWG26)	VPS	B9
Yellow(AWG26)	LS+	A4
Light Blue(AWG26)	BK+	A5
Orange(AWG26)	BK-	B5
Green(AWG26)	LS_GND	A9
Brown(AWG26)	LS-	B4
Gray(AWG26)	VCC	A10
Red(AWG26)	GND	B10
—	—	A11
Black	FG	B11

PADP-24V-1-S(JST)

PIN No.	Signal	Color
1	φA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
5	φ_A	Green(AWG22/19)
3	φB	Brown(AWG22/19)
4	VMM	Gray(AWG22/19)
6	φ_B	Red(AWG22/19)
11	—	(Light Blue(AWG26))
12	—	(Orange(AWG26))
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Gray(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light Blue(AWG26)
10	BK-	Orange(AWG26)
20	LS_GND	Green(AWG26)
8	LS-	Brown(AWG26)
21	VCC	Gray(AWG26)
19	GND	Red(AWG26)
17	—	—
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 = 68mm or more (dynamic bending condition)

1-1827863-1(AMP)

Color	Signal	PIN No.
Black(AWG22)	φA	A1
White(AWG22)	VMM	B1
Brown(AWG22)	φ_A	A2
Green(AWG22)	φB	B2
Yellow(AWG22)	VMM	A3
Red(AWG22)	φ_B	B3
Orange(AWG25)	LS+	A4
Gray(AWG25)	LS-	B4
White(AWG25)	—	A6
Yellow(AWG25)	—	B6
Red(AWG25)	A+	A7
Green(AWG25)	A-	B7
Black(AWG25)	B+	A8
Brown(AWG25)	B-	B8
Black(AWG25)	BK+	A5
Brown(AWG25)	BK-	B5
Green(AWG25)	GNDLS	A9
Red(AWG25)	VPS	B9
White(AWG25)	VCC	A10
Yellow(AWG25)	GND	B10
—	—	A11
—	Shield,FG	B11

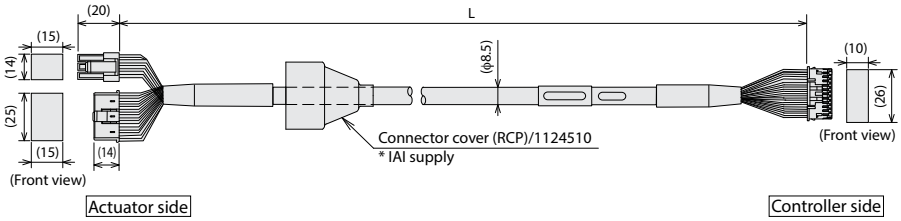
PADP-24V-1-S(JST)

PIN No.	Signal	Color
1	φA	Black(AWG22)
2	VMM	White(AWG22)
5	φ_A	Brown(AWG22)
3	φB	Green(AWG22)
4	VMM	Yellow(AWG22)
6	φ_B	Red(AWG22)
7	LS+	Orange(AWG25)
8	LS-	Gray(AWG25)
11	—	White(AWG25)
12	—	Yellow(AWG25)
13	A+	Red(AWG25)
14	A-	Green(AWG25)
15	B+	Black(AWG25)
16	B-	Brown(AWG25)
9	BK+	Black(AWG25)
10	BK-	Brown(AWG25)
20	GNDLS	Green(AWG25)
18	VPS	Red(AWG25)
17	VCC	White(AWG25)
19	GND	Yellow(AWG25)
21	—	—
24	Shield,FG	—
22	—	—
23	—	—

Maintenance parts

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



Minimum bending radius r = 68mm or more (dynamic bending condition)

SLP-06V (JST)

Color	Signal	Pin No.
Black(AWG22)	ϕA	1
White(AWG22)	VMM	2
Brown(AWG22)	ϕ/A	3
Red(AWG22)	ϕB	4
Green (AWG22)	VMM	5
Yellow (AWG22)	ϕ/B	6

XMP-18V (JST)

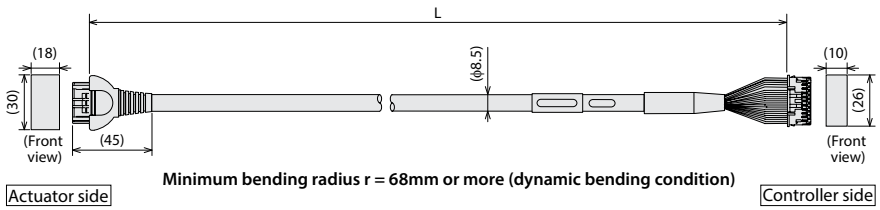
Color	Signal	Pin No.
White (AWG25)	A+	1
Yellow (AWG25)	A-	2
Red(AWG25)	B+	3
Green (AWG25)	B-	4
	N.C.	5
	N.C.	6
	N.C.	7
	N.C.	8
Red (AWG25)	GND	9
White (AWG25)	VCC	10
Yellow (AWG25)	VPS	11
Green (AWG25)	(reserve)	12
Black (AWG25)	LS+	13
Brown (AWG25)	LS-	14
	N.C.	15
Orange (AWG25)	BK+	16
Gray (AWG25)	BK-	17
Shield (AWG25)	F.G	18

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	ϕA	Black (AWG22)
2	VMM	White (AWG22)
3	ϕB	Red (AWG22)
4	VMM	Green (AWG22)
5	ϕ/A	Brown (AWG22)
6	ϕ/B	Yellow (AWG22)
7	LS+	Black (AWG25)
8	LS-	Brown (AWG25)
9	BK+	Orange (AWG25)
10	BK-	Gray (AWG25)
11	N.C.	
12	N.C.	
13	A+	White (AWG25)
14	A-	Yellow (AWG25)
15	B+	Red (AWG25)
16	B-	Green (AWG25)
17	VCC	White (AWG25)
18	VPS	Yellow (AWG25)
19	GND	Red (AWG25)
20	(reserve)	Green (AWG25)
21	N.C.	
22	N.C.	
23	N.C.	
24	FG	Shield (AWG25)

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



Minimum bending radius r = 68mm or more (dynamic bending condition)

1-1827863-1 (AMP)

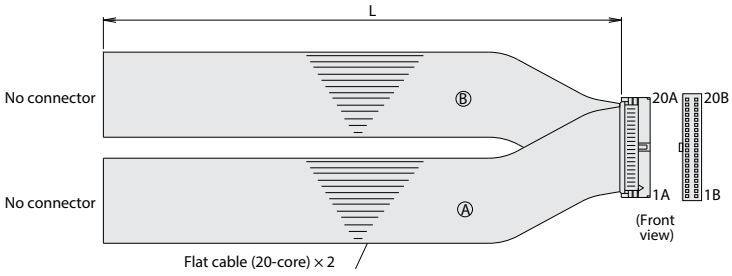
Color	Signal	Pin No.
Black (AWG22)	ϕA	A1
White (AWG22)	VMM	B1
Brown (AWG22)	ϕ_A	A2
Green (AWG22)	ϕB	B2
Yellow(AWG22)	VMM	A3
Red (AWG22)	ϕ_B	B3
Orange (AWG26)	LS+	A6
Gray (AWG26)	LS-	B6
Red (AWG26)	A+	A7
Green (AWG26)	A-	B7
Black (AWG26)	B+	A8
Brown (AWG26)	B-	B8
-	-	B4
-	-	A11
Black (AWG26)	BK+	A5
Brown (AWG26)	BK-	B5
Green (AWG26)	LS_GND	A9
Red (AWG26)	VPS	B9
White (AWG26)	VCC	A10
Yellow (AWG26)	GND	B10
-	-	A4
Shield	FG	B11

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	ϕA	Blue (AWG22)
2	VMM	Orange (AWG22)
5	ϕ_A	Green (AWG22)
3	ϕB	Brown (AWG22)
4	VMM	Gray (AWG22)
6	ϕ_B	Red (AWG22)
7	LS+	Light Blue (AWG26)
8	LS-	Orange (AWG26)
13	A+	Green (AWG26)
14	A-	Brown (AWG26)
15	B+	Gray (AWG26)
16	B-	Red (AWG26)
11	-	Black (AWG26)
12	-	Yellow (AWG26)
9	BK+	Light Blue (AWG26)
10	BK-	Orange (AWG26)
20	LS_GND	Green (AWG26)
18	VPS	Brown (AWG26)
17	VCC	Gray (AWG26)
19	GND	Red (AWG26)
21	-	-
22	-	-
23	-	-
24	FG	Shield

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(Hirose)

No.	Signal name	Cable color	Wiring
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded)
2A	24V	Red-1	
3A	-	Orange-1	
4A	-	Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	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	Flat cable Ⓑ (pressure-welded) AWG28
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Gray-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B	OUT15	Blue-4	
17B	-	Purple-4	
18B		Gray-4	
19B	0V	White-4	
20B	0V	Black-4	

PCON-CBP

Special controller for pulse press

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

Features

1 Supporting high-resolution battery-less absolute encoders

The pulse press specification actuator is equipped with a high-resolution battery-less absolute encoder. Because a battery is not needed to retain position data, space-saving of the controller is possible, contributing to cost reduction of the equipment.

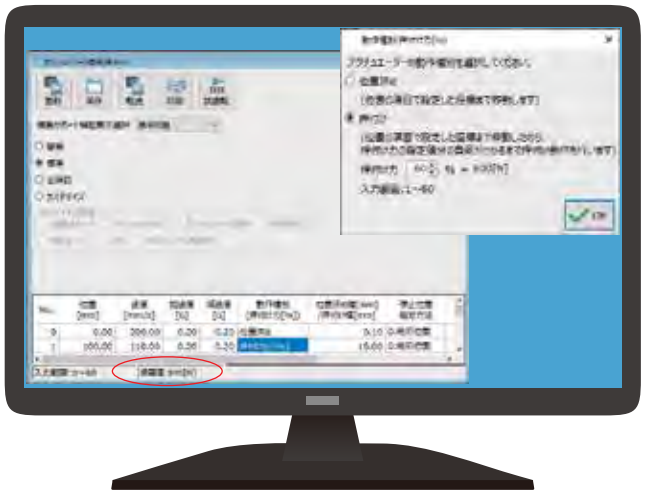
2 Supporting force control using a load cell

Present load value from the load cell can be monitored.
It supports both press-fitting and tensile directions, which can be switched over by specifying the position data easily.

3 Supporting display of target load in N units

It displays "Target Load (N)" after converted from the "Push Force (%)" of the position data. When the collision detecting function is disabled, "Threshold (%)" is also displayed in converted "N" value.

[PC compatible teaching software]



IA-OS: Position edit screen

[Teaching pendant]

TB-02: Position edit screen

Table of models

Model	PCON-CBP/CGBP									
External view										
I/O type	Positioner type	Field network type								
		DeviceNet	CC-Link	CC-Link IE Field	PROFIBUS-DP	CompoNet	MECHATROLINK-I/II*1	EtherCAT	EtherNet/IP	PROFINET IO
IO type code	NP/PN	DV	CC	CIE	PR	CN	ML	EC	EP	PRT
PCON-CBP/CGBP	–	–	–	–	–	–	–	–	–	–

*1: MECHATROLINK-I/II is treated as Intelligent I/O and supports only asynchronous communication commands.

Model specification item

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

Series	Type	Motor type	Encoder type	I/O type	I/O cable length	Power source voltage	Mounting specification

Type

CBP	CBP Pulse press standard type
CGBP	CGBP Pulse press safety category type

Motor type

35P	35□
42P	42□
56P	56□

Encoder type

WAI	Battery-less absolute

I/O type

NP	NP PIO(NPN)
PN	PN PIO(PNP)
DV	DeviceNet
CC	CC-Link
CIE	CC-Link IE Field
PR	PROFIBUS-DP
CN	CompoNet
ML	MECHATROLINK-I/II
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

I/O cable length

0	Without cable
2	2m (Standard)
3	3m
5	5m

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

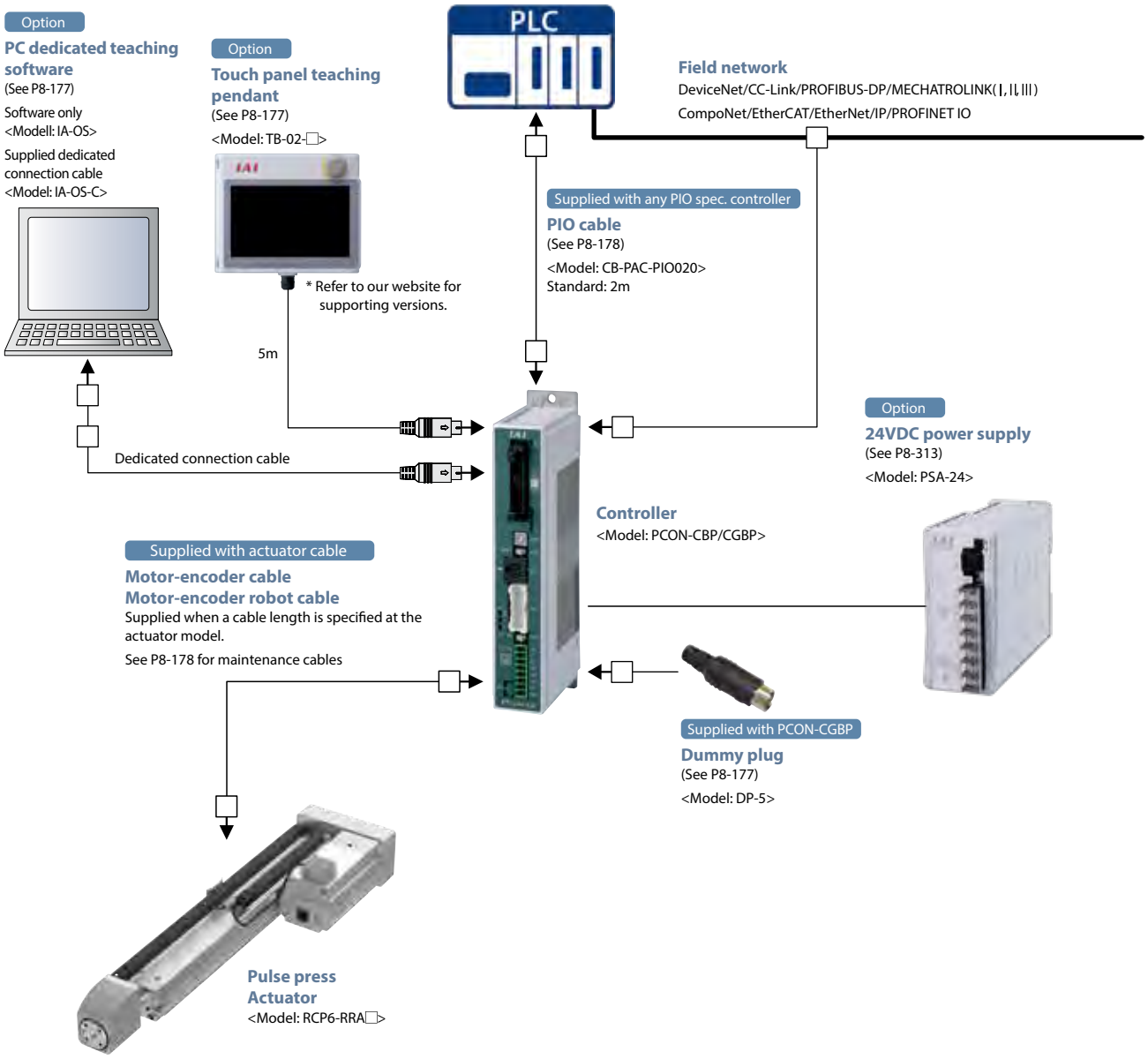
Power source voltage

0	DC24V

Mounting specification

Not specified	Screw mounting specification
DN	DN DIN rail mount specification

System configuration



PIO I/O Interface

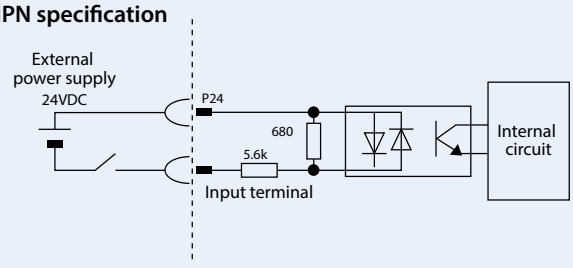
■Input part External input specification

Item	Specification
Input voltage	24VDC ±10%
Input current	5mA, 1 circuit
ON/OFF voltage	ON voltage Min. DC 18V OFF voltage Max. DC 6V

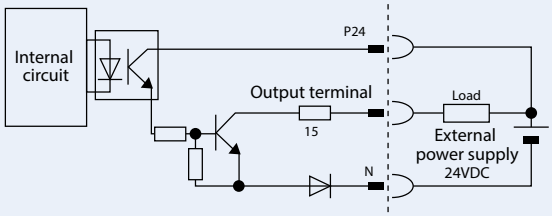
■Output part External output specification

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

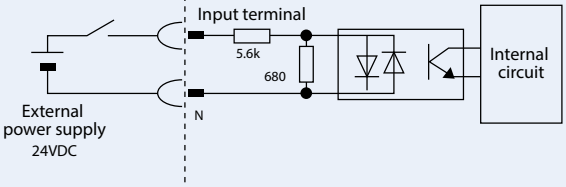
NPN specification



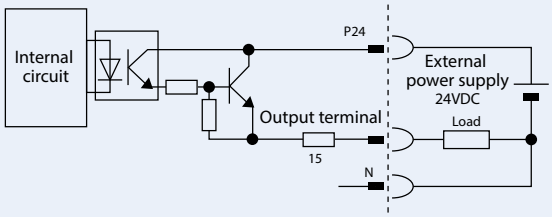
NPN specification



PNP specification



PNP specification



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)	• Number of positioning points: 64 points • Position No. command: binary code • Zone signal output*1 : 1 point • Position zone signal output*2 : 1 point
PIO Pattern 1	1	Teaching mode (Teaching type)	• Number of positioning points: 64 points • Position No. command: binary code • Zone signal output*2 : 1 point •Jog motion using PIO signals is supported • Current position data can be written to the position table using PIO signals.
PIO Pattern 2	2	256-point mode (256 positioning points)	• Number of positioning points: 256 points • Position No. command: binary code • Position zone signal output*2 : 1 point
PIO Pattern 3	3	512-point mode (512 positioning points)	• Number of positioning points: 512 points • Position number. command: binary code • No zone signal output
PIO Pattern 4	4	Solenoid valve mode 1 (7-point type)	• Number of positioning points: 7 points • Position No. command: individual No. signal ON • Zone signal output*1 : 1 point • Position zone signal output *2: 1 point
PIO Pattern 5	5	Solenoid valve mode 2 (3-point type)	• Number of positioning points: 3 points • Position number command: Individual number signal ON • Completion signal: LS (limit switch) or equivalent signals output is possible • Zone signal output*1 : 1 point • Zone signal output*2 : 1 point
PIO Pattern 6	6	Force control mode 1	• Number of positions: 32 points • Position No. command: binary code • Position zone signal output *2: 1 point • Load cell calibration command
PIO Pattern 7	7	Force control mode 2	• Number of positions: 5 points • Position No. command: individual No. signal ON • Position zone signal output *2: 1 point • Load cell calibration command

*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.

PIO patters and signal assignments

The table below lists the signal assignments for the I/O at 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	6	7
			Positioning mode	Teach mode	256 mode	512 mode	Solenoid valve mode 1	Solenoid valve mode 2	Force control mode 1	Force control mode 2
	Input	Number of positions	64 points	64 points	256 points	512 points	7 points	3 points	32 points	5 points
		Home return signal	○	○	○	○	○	×	○	○
		Jog signal	×	○	×	×	×	×	×	×
		Teaching signal (writing current positions)	×	○	×	×	×	×	×	×
		Brake release	○	×	○	○	○	○	○	○
	Output	Moving signal	○	○	×	×	×	×	×	×
		Zone signal	○	△ (Note 1)	△ (Note 1)	×	○	○	△ (Note 1)	△ (Note 1)
		Position zone signal	○	○	○	×	○	○	○	○
1A	24V		P24							
2A	24V		P24							
3A	—		—							
4A			—							
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0	PC1	ST0
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)	PC2	ST1
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (no function)	PC4	ST2
8A		IN3	PC8	PC8	PC8	PC8	ST3	—	PC8	ST3
9A		IN4	PC16	PC16	PC16	PC16	ST4	—	PC16	ST4
10A		IN5	PC32	PC32	PC32	PC32	ST5	—	—	—
11A		IN6	—	MODE	PC64	PC64	ST6	—	—	—
12A		IN7	—	JISL	PC128	PC128	—	—	—	—
13A		IN8	—	JOG+	—	PC256	—	—	CLBR	CLBR
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 (ALM1)	PM1 (ALM1)	PM1 (ALM1)	PM1 (ALM1)	PE0	LSO	PM1	PE0
2B		OUT1	PM2 (ALM2)	PM2 (ALM2)	PM2 (ALM2)	PM2 (ALM2)	PE1	LS1 (TRQS)	PM2	PE1
3B		OUT2	PM4 (ALM4)	PM4 (ALM4)	PM4 (ALM4)	PM4 (ALM4)	PE2	LS2 (Note 2)	PM4	PE2
4B		OUT3	PM8 (ALM8)	PM8 (ALM8)	PM8 (ALM8)	PM8 (ALM8)	PE3	—	PM8	PE3
5B		OUT4	PM16	PM16	PM16	PM16	PE4	—	PM16	PE4
6B		OUT5	PM32	PM32	PM32	PM32	PE5	—	TRQS	TRQS
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	—	LOAD	LOAD
8B		OUT7	ZONE1	MODES	PM128	PM128	ZONE1	ZONE1	CEND	CEND
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—	PEND	PEND
13B		OUT12	SV	SV	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B		OUT15	LOAD/TRQS *ALML	*ALML	LOAD/TRQS *ALML	LOAD/TRQS *ALML	LOAD/TRQS *ALML	*ALML	*ALML	*ALML
17B	—		—							
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.

Field network specifications: 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.

■Model 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.
5	Position/simple direct value mode 2	This mode has a force control function in place of the above position/simple mode and zone function.
6	Half direct value mode 2	In place of reading the command current in the above half direct value mode, this mode can read load cell data.
7	Remote I/O mode 3	This mode has a function to read the current position and load cell data in addition to the above remote I/O mode.

■Required Data Size for Each Network

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

(Note 1) Beware that MECHATROLINK does not support the full direct value mode.

■List of Functions by Operation Mode

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 mode 2	Remote I/O mode 3
Number of positioning points	512	768	Unlimited	Unlimited	512	768	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	○	○	×	×	○	○	×	○
Forced control	△ (Note 2)	×	×	○	△ (Note 2)	○	○	△ (Note 2)
Current load data read	×	×	×	○	×	○	○	○

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.
(Note 2) Available when PIO pattern is set to 6 or 7.

Specification list

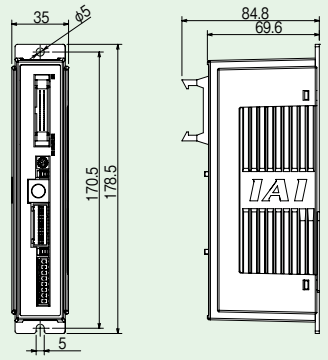
Item		Details
		PCON-CBP/CGBP
Number of controlled axes		1 axis
Power supply voltage		DC24V±10%
Load current (including control side current consumption) (Note 1)		High-output setting disabled: 2.2A max. High-output setting enabled: 3.5A rated/4.2A max.
Electromagnetic brake power (for actuator with brake)		24VDC ±10%　0.15A (max.)
Inrush current (Note 2)		8.3A
Momentary power failure resistance		MAX.500μs
Compatible encoder		High-resolution battery-less absolute encoder: Resolution 8,192 pulses/rev
Actuator cable length		Max. 20m
External interface	PIO specification	DC24V dedicated signal input/output (NPN/PNP selectable) Input up to 16 points, Output up to 16 points, Cable length max. 10m
	Field network specification	DeviceNet,CC-Link,CC-Link IE,PROFIBUS-DP,CompoNet, MECHATROLINK-Ⅰ/Ⅱ,EtherCAT,EtherNet/IP,PROFINET IO
Data setting, input method		PC compatible teaching software, Touch panel teaching pendant
Data retention memory		Position data and parameters are saved in non-volatile memory. (No limit in writing)
Operating mode		Positioner mode
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.
Insulation resistance		DC500V, 10MΩ or higher
Electric shock protection mechanism		Class 1, basic insulation
Mass (Note 3)		Screw mounting type: Less than 250g, DIN rail mounting type: Less than 285g
Cooling method		Natural air cooling
Environment	Ambient operating temperature	0~40°C
	Ambient operating humidity	85%RH (non-condensing)
	Operating ambient	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 switched on (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.

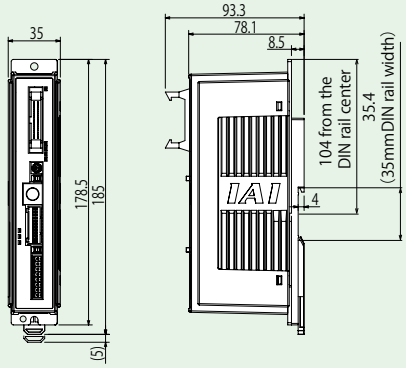
External dimensions

<PCON-CBP/CGBP>

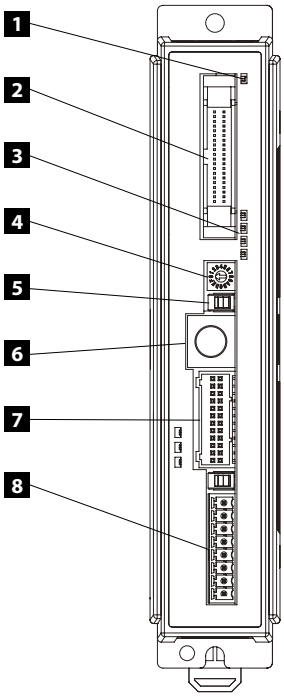
Screw mounting type specification



DIN rail mounting specification



Part names



1 Controller indication LED

indicates the controller condition

○ : Light ON, ×: Light OFF, ☆ : Flashing

LED		Operating condition
SV (Green)	ALM (Red)	
×	×	Control power OFF
		Servo OFF
×	○	Alarm (over operation release level)
		Motor driving power OFF
		Stopping for emergency
○	×	Servo ON
☆	×	Auto Servo OFF
○(Orange)		Initialization after power ON

2 Connector for PIO connector/field network connection

A cable connector for connecting peripheral devices such as PLC via parallel communication.

3 LED for monitoring current/alarm

usually indicates the command current ratio. When alarm is activated, it indicates the alarm code.

LED	Operating condition
STS3 (Green)	Status indication * While servo is ON, it indicates present command current ratio (to the rated value).
STS2 (Green)	
STS1 (Green)	
STS0 (Green)	

STATUS 3	STATUS 2	STATUS 1	STATUS 0	Command current value ratio
ALM8	ALM4	ALM2	ALM1	Simple alarm code
×	×	×	×	0.00% to 6.24%
×	×	×	○	6.25% to 24.99%
×	×	○	○	25.00% to 49,99%
×	○	○	○	50.00% to 74.99%
○	○	○	○	75.00% to 100.00% or higher

* While alarm is activated: it indicates the simple alarm code.

4 Switch for setting the axis number

This switch is to identify each controller when multiple controllers are linked.

5 Operation mode setting switch

Switch for interlock

Name	Description
MANU	Not able to accept commands from PIO
AUTO	Able to accept commands from PIO

* The emergency stop switch on the touch panel teaching pendant is enabled at the time of connection regardless of AUTO/MANU. Make sure to turn OFF the power when disconnecting the touch panel teaching pendant and the SIO communication cable.

6 SIO connector

A connector for touch panel teaching pendant or PC communications.

7 Motor-encoder connector

A connector for connecting actuator motors and encoder cables.

8 Power supply connector

A connector for supplying each power source and emergency stop status signal.

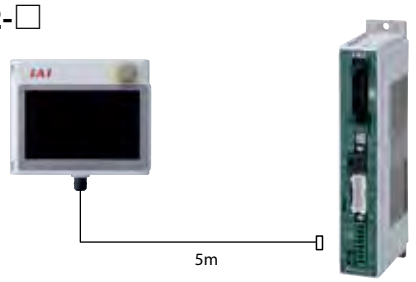
Options

Touch panel teaching pending

Features A teaching device 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	5%RH - 85%RH (non-condensing, no frost))
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

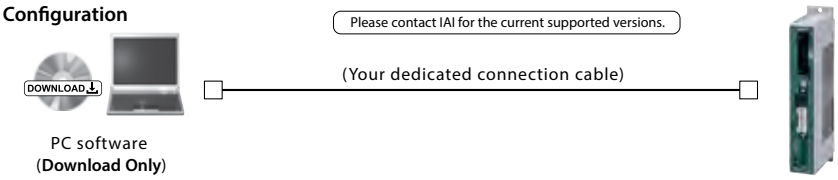
PC compatible teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

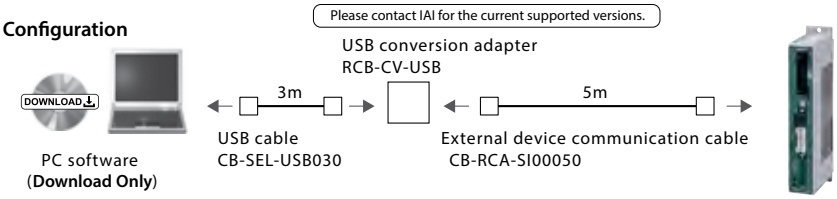
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



Supported Windows versions: 7/10

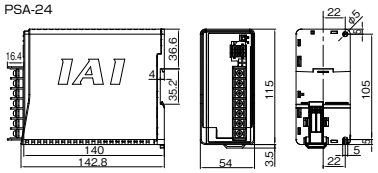
24V power source

Overview A power source for supplying DC24V.
It is possible to confirm the necessary power capacity by using the "Calculator" software.

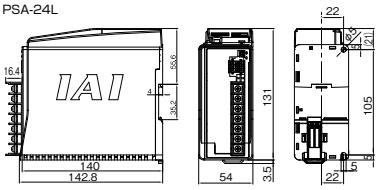
Model **PSA-24 (without fan)**

Model **PSA-24L (with fan)**

PSA-24



PSA-24L



Item	Specification	
	AC100V input	AC200V input
Power source input voltage range	AC100V~AC230V±10%	
Input power source current	3.9A or less	1.9A or less
Power capacity	Without fan: 250VA With fan: 390VA	Without fan: 280VA With fan: 380VA
Inrush current *1	Without fan: 17A (typ) With fan: 27.4A (typ)	Without fan: 34A (typ) With fan: 54.8A (typ)
Heat quantity	28.6W	20.4W
Output voltage range *2	24V±10%	
Rated continuous output	Without fan: 8.5A (204W), with fan: 13.8A (330W)	
Peak output	17A(408W)	
Efficiency	86% or higher	90% or higher
Parallel connection *3	Up to 5 units	

*1 Inrush current flows for approx. 5ms.
*2 To enable parallel operations, this power source features variable output voltage according to the load. Therefore, this power source is for IAI controllers only.
*3 Parallel connections are not possible under the following conditions.
* Parallel connection of PSA-24 (without fan) and PSA-24L (with fan)
* Parallel connection with another power unit other than this power unit
* Parallel connection with PS-24

Dummy plug

Features Safety category compliant specifications
It is necessary when using the (PCON-CGBP).

Model **DP-5**

Maintenance parts (cables)

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

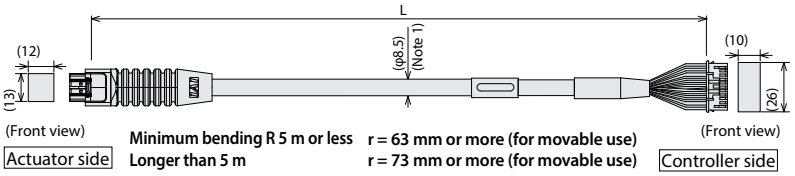
■ **Table of corresponding cables**

Mode code	Motor-encoder cable	Motor-encoder robot cable
RCP6-RRA ☐ R-LCT	CB-CAN-MPA ☐☐☐	CB-CAN-MPA ☐☐☐ -RB

Mode code	PIO flat cable
PCON-CBP/CGBP	CB-PAC-PIO ☐☐☐

Model CB-CAN-MPA☐☐☐/CB-CAN-MPA☐☐☐-RB

*Please indicate the cable length (L) in ☐☐☐. Up to 20m
e.g.) 080=8m



Minimum bending R 5 m or less r = 63 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

Actuator side
DF62DL-24S-2.2(Hirose)

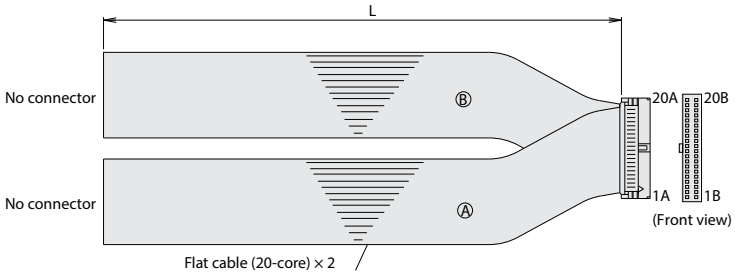
Color		Signal	Pin No.
Standard cable	Robot cable		
Blue(AWG22/19)	Blue(AWG22/19)	φA	3
Orange(AWG22/19)	Orange(AWG22/19)	VMM	5
Brown(AWG22/19)	Brown(AWG22/19)	φB	10
Gray(AWG22/19)	Gray(AWG22/19)	VMM	9
Green(AWG22/19)	Green(AWG22/19)	φ_A	4
Red(AWG22/19)	Red(AWG22/19)	φ_B	15
Light blue(AWG26)	Light blue(AWG26)	SA[mABS]	12
Orange(AWG26)	Orange(AWG26)	SB[mABS]	17
Green(AWG26)	Green(AWG26)	A+	1
Brown(AWG26)	Brown(AWG26)	A-	6
Gray(AWG26)	Gray(AWG26)	B+	11
Red(AWG26)	Red(AWG26)	B-	16
Black(AWG26)	Black(AWG26)	VPS	18
Yellow(AWG26)	Yellow(AWG26)	LDC_VCC	8
Light blue(AWG26)	Light blue(AWG26)	BK+	20
Orange(AWG26)	Orange(AWG26)	BK-	2
Gray(AWG26)	Gray(AWG26)	VCC	21
Red(AWG26)	Red(AWG26)	GND/LDC_GND	7
Brown(AWG26)	Brown(AWG26)	LDC_SD+	14
Green(AWG26)	Green(AWG26)	LDC_SD-	13
—	—	—	19
Pink(AWG26)	Pink(AWG26)	CF_VCC	22
—	—	—	23
Black(AWG26)	Green(AWG26)	FG	24

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

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	φA	Blue(AWG22/19)	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)	Orange(AWG22/19)
3	φB	Brown(AWG22/19)	Brown(AWG22/19)
4	VMM	Gray(AWG22/19)	Gray(AWG22/19)
5	φ_A	Green(AWG22/19)	Green(AWG22/19)
6	φ_B	Red(AWG22/19)	Red(AWG22/19)
11	SA[mABS]	Light blue(AWG26)	Light blue(AWG26)
12	SB[mABS]	Orange(AWG26)	Orange(AWG26)
13	A+	Green(AWG26)	Green(AWG26)
14	A-	Brown(AWG26)	Brown(AWG26)
15	B+	Gray(AWG26)	Gray(AWG26)
16	B-	Red(AWG26)	Red(AWG26)
18	VPS	Black(AWG26)	Black(AWG26)
7	LDC_VCC	Yellow(AWG26)	Yellow(AWG26)
9	BK+	Light blue(AWG26)	Light blue(AWG26)
10	BK-	Orange(AWG26)	Orange(AWG26)
17	VCC	Gray(AWG26)	Gray(AWG26)
19	GND/LDC_GND	Red(AWG26)	Red(AWG26)
8	LDC_SD+	Brown(AWG26)	Brown(AWG26)
20	LDC_SD-	Green(AWG26)	Green(AWG26)
22	—	—	—
21	CF_VCC	Pink(AWG26)	Pink(AWG26)
23	—	—	—
24	FG	Black(AWG26)	Green(AWG26)

Model CB-PAC-PIO☐☐☐

*Please indicate the cable length (L) in ☐☐☐. Up to 20m
e.g.) 080=8m

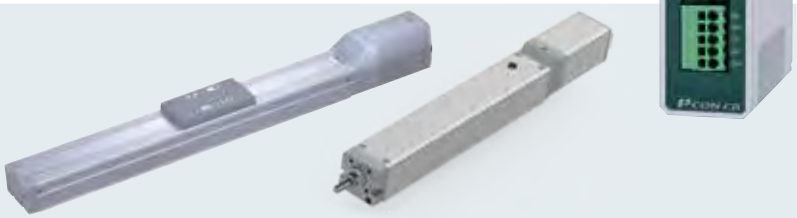


HIF6-40D-1. 27R(Hirose)

No.	Signal	Color	Wiring	No.	Signal	Color	Wiring
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded)	1B	OUT0	Brown-3	Flat cable Ⓑ (pressure-welded) AWG28
2A	24V	Red-1		2B	OUT1	Red-3	
3A	-	Orange-1		3B	OUT2	Orange-3	
4A		Yellow-1		4B	OUT3	Yellow-3	
5A	IN0	Green-1		5B	OUT4	Green-3	
6A	IN1	Blue-1		6B	OUT5	Blue-3	
7A	IN2	Purple-1		7B	OUT6	Purple-3	
8A	IN3	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	

PCON-CYB/PLB/POB

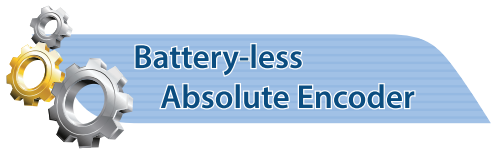
Position Controller
for RoboCylinder



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.

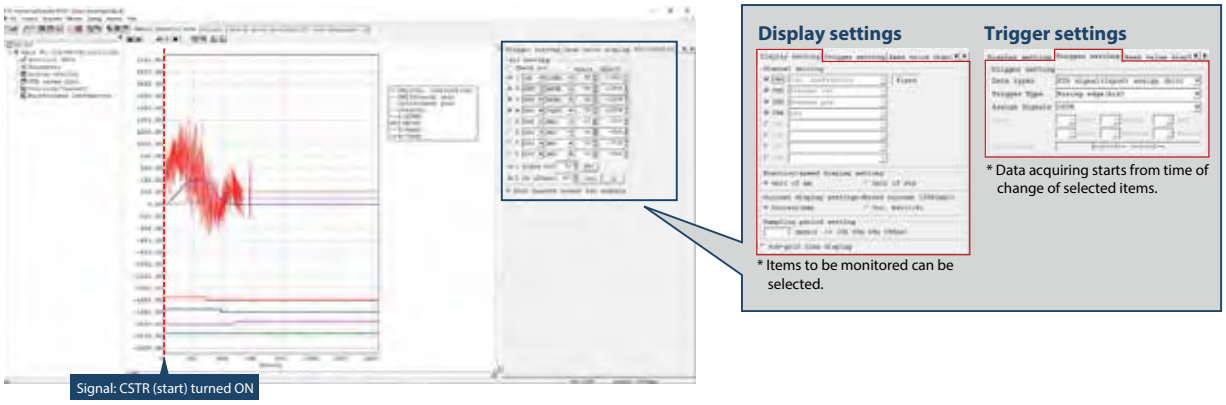
3 Equipped with Smart tuning function

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)



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

PCON – [Type] – [Motor Type] WAI – [I/O Type] – [I/O Cable Length] – 0 – [Actuator Mounting Specification]

Series

Type	
CYB	Positioner / Solenoid valve type
PLB	Pulse-train control type (Differential receiver type)
POB	Pulse train control type (Open collector type)

Motor Type

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

(Example) 20P: 20 □ Pulse motor compatible

Encoder Type

WAI	Battery-less absolute /Incremental

I/O Type

NP	PIO (NPN) specification
PN	PIO (PNP) specification

I/O Cable Length

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

* The POB type has a maximum cable length of 2m.

Power Supply Voltage

0	24VDC

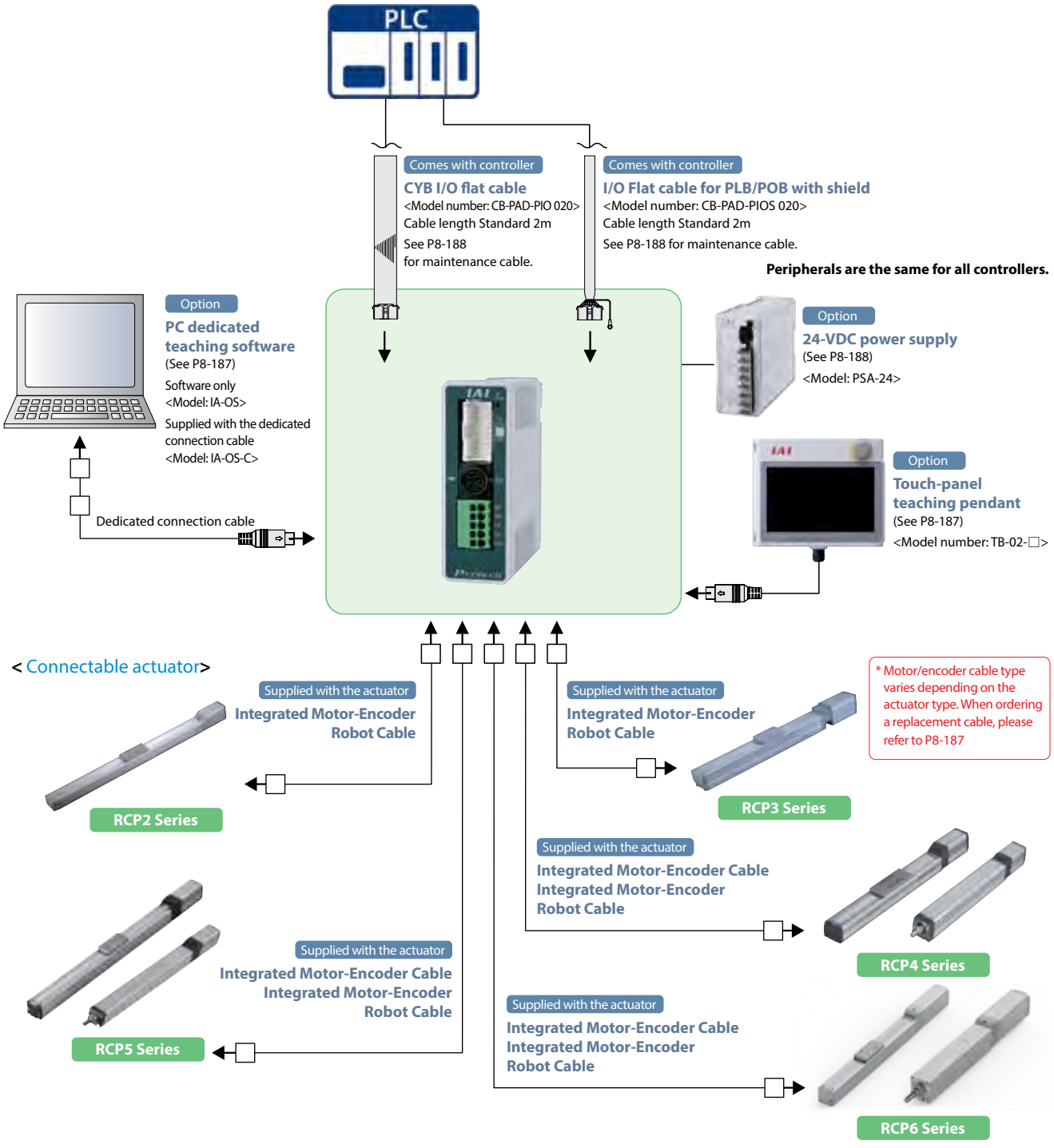
Actuator Mounting Specification

(Blank)	Screw Mounting specification
DN	DIN rail mounting specification

Note

Basically, the type of motor is the same as the type of motor of the actuator to be connected, however, there are models that some of the controllers and the motors of the actuators do not match.
The applicable models are listed below, so please note when selecting.
<28 SP target actuator>
● Controller Motor type "28SP" ... RCP2 - RA3C

System configuration



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

Pin number	Category		Parameter (PIO pattern) selection						
			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
		Number of positioning points	16	7	3	2	2	One of 4,8,16,32,64 points (selection)	768
		Zone signal	△(Note 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	Serial communication (Modbus) Refer to operation manual
		Position zone signal	△(Note 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	
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+)(Note 2)	-	ST1(-)(Note 2)		
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(Note 2)	LS0/PE0(Note 3)	Any signal other than the completed position No.,PEND can be selected in the output.	
14		OUT1	PM2(ALM2)	PE1	LS1(TRQS)(Note 2)	LS1/PE1(Note 2)	LS1/PE1(Note 3)		
15		OUT2	PM4(ALM4)	PE2	LS2(-)(Note 2)	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) In the table above, an 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 1, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.
(Note 2) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)
(Note 3) Pin number 13 and 14 of PIO pattern 3 or 4 , can select PE * and LS * by 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.
	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.
Output	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

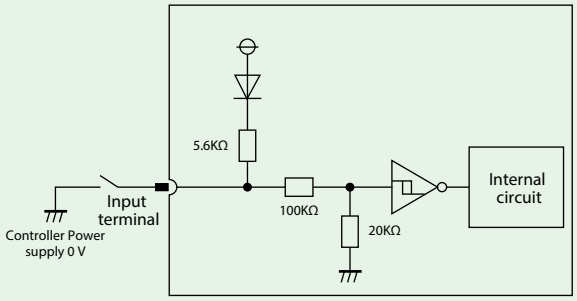
Model	CYB	PLB / POB	Summary
Name	Positioner / Solenoid valve type	Pulse-train control type	
Positioner mode	○	×	It is the basic operation mode that operates by specifying the position number and inputting the start signal.
Solenoid valve mode	○	×	It is possible to move just by turning ON/OFF the position 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)

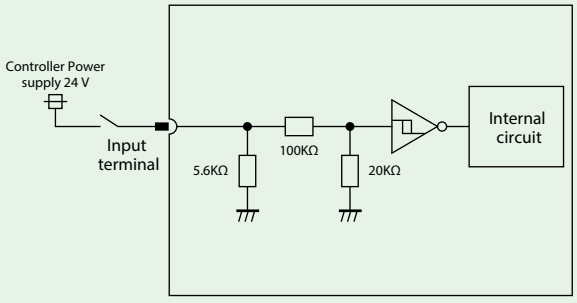
■ Input Part External Input Specifications

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

NPN Specification



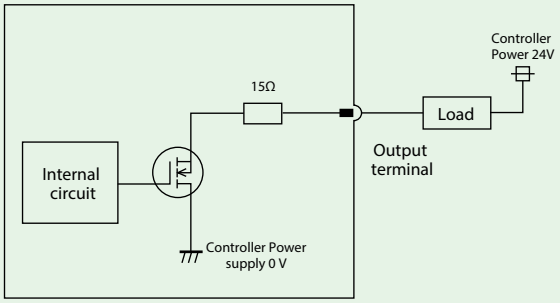
PNP Specification



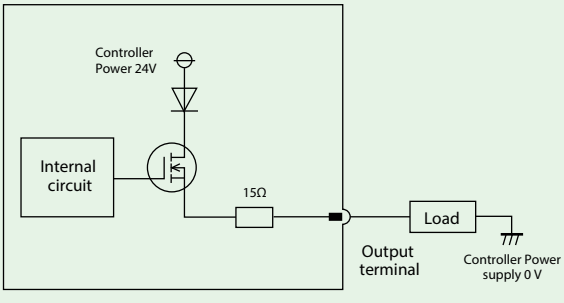
■ Output Part External Output Specifications

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

NPN Specification



PNP Specification

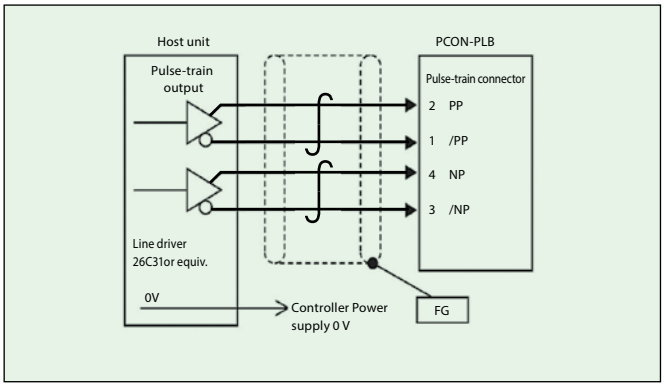


Pulse-train input circuit

■ Differential line driver

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

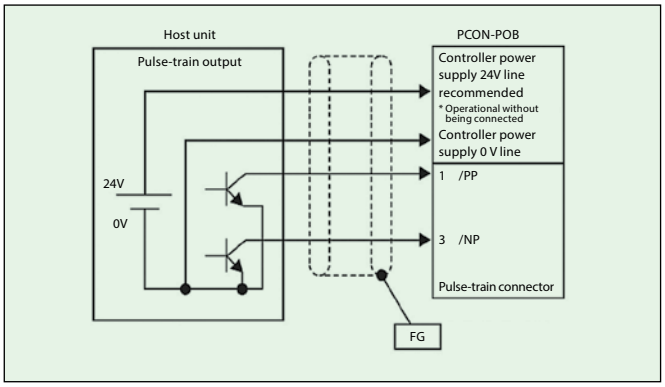
* The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



■ 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.			
	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.			
Reverse logic	**Forward pulse-train**	**PP · /PP**		
	Reverse pulse-train	**NP · /NP**		
	Pulse-train	**PP · /PP**		
	Sign	**NP · /NP**	High	Low
	Phase A/B pulse-train	**PP · /PP**		
		NP · /NP		

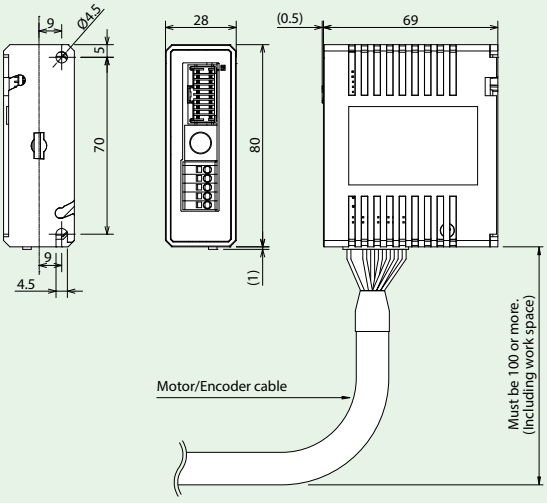
Note) The number of encoder pulses that can be operated with PCON is are followings.
RCP5・RCP4・RCP3・RCP2 ... 800 pulse
RCP6 ... 8192 pulse

Specification table

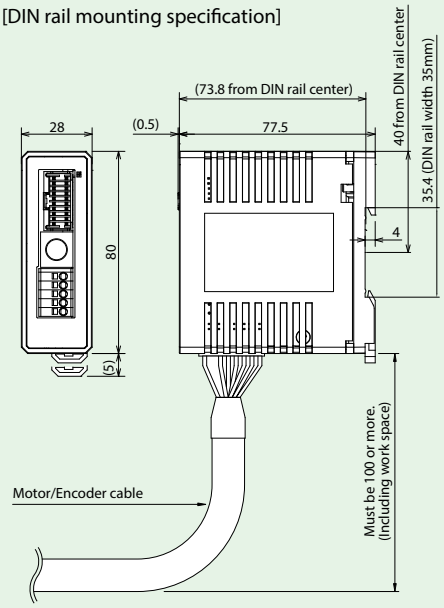
Item	Specification		
Controller type	CYB	PLB	POB
Number of controlled axes	1 axis		
Operation method	Positioner/Solenoid valve type	Pulse-train control type	
Number of positioning points	Up to 64 points	—	
Back up memory	FRAM		
I/O connector (PIO connecter)	20 pin connector		
Number of I/Os	8 input points/8 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	5%RH - 85%RH (non-condensing, no frost)		
Operating ambience	Not exposed to corrosive gases		
Degree of protection	IP20		
Mass	250g (DIN rail mounting specification 285g)		

External dimensions

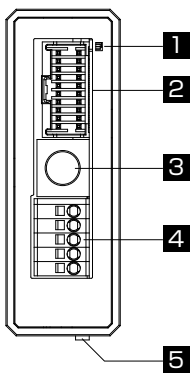
[Screw mounting specification]



[DIN rail mounting specification]



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.

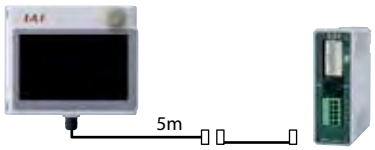
Option

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	5%RH - 85%RH (non-condensing, no frost)
Degree of protection	IP20
Weight	470g (TB-02 only)

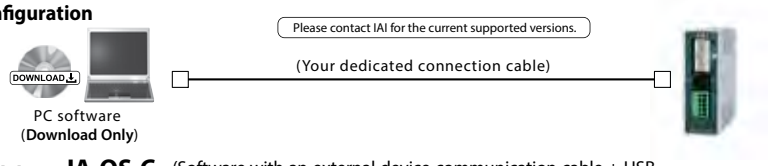
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

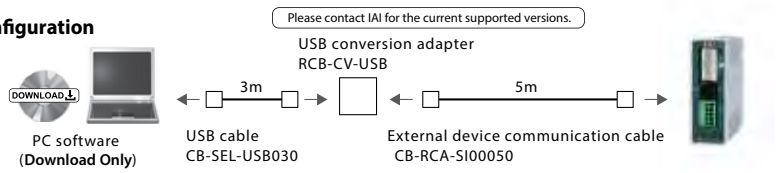
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



Supported Windows versions: 7/10

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/ SRGS4R/SRGD4R		
⑥		RTBS/RTBSL RTCS/RTCSL	–	CB-RPSEP-MPA □□□
⑦	RCP2CR RCP2W	GRS/GRM GR3SS/GR3SM	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
⑧		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

Minimum bending R 5 m or less r = 63 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

DF62DL-24S-2.2C(Hirose)

Color	Signal	Pin No.
Blue(AWG22/19)	φA	3
Orange(AWG22/19)	VMM	5
Brown(AWG22/19)	φB	10
Gray(AWG22/19)	VMM	9
Green(AWG22/19)	φ_A	4
Red(AWG22/19)	φ_B	15
Light Blue(AWG26)	SA [mABS]	12
Orange(AWG26)	SB [mABS]	17
Green(AWG26)	A+	1
Brown(AWG26)	A-	6
Gray(AWG26)	B+	11
Red(AWG26)	B-	16
Black(AWG26)	VPS	18
Yellow(AWG26)	LS+	8
Light Blue(AWG26)	BK+	20
Orange(AWG26)	BK-	2
Gray(AWG26)	VCC	21
Red(AWG26)	GND	7
Brown(AWG26)	LS-	14
Green(AWG26)	LS_GND	13
—	—	19
Pink(AWG26)	CF_VCC	22
—	—	23
Black(AWG26)	FG	24

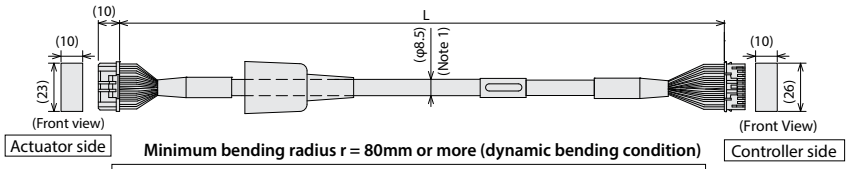
Purple(AWG26)

PADP-24V-1-S(JST)

Pin No.	Signal	Color
1	φA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
3	φB	Brown(AWG22/19)
4	VMM	Gray(AWG22/19)
5	φ_A	Green(AWG22/19)
6	φ_B	Red(AWG22/19)
11	SA [mABS]	Light Blue(AWG26)
12	SB [mABS]	Orange(AWG26)
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Gray(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light Blue(AWG26)
10	BK-	Orange(AWG26)
17	VCC	Gray(AWG26)
19	GND	Red(AWG26)
8	LS-	Brown(AWG26)
20	LS_GND	Green(AWG26)
22	—	—
21	CF_VCC	Pink(AWG26)
23	—	—
24	FG	Black(AWG26)

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

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



Minimum bending radius r = 80mm or more (dynamic bending condition)

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

(Note 1) ϕ9.1 when the cable length is longer than 5m.

1-1827863-1 (AMP)

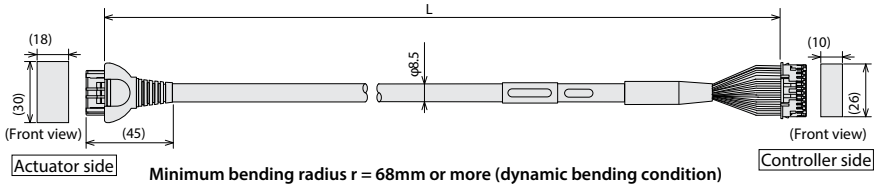
Color	Signal	Pin No.
Blue(AWG22/19)	φA	A1
Orange(AWG22/19)	VMM	B1
Green(AWG22/19	φ_A	A2
Brown(AWG22/19	φB	B2
Gray(AWG22/19)	VMM	A3
Red(AWG22/19)	φ_B	B3
Light blue(AWG26)	—	A6
Orange(AWG26)	—	B6
Green(AWG26)	A+	A7
Brown(AWG26)	A-	B7
Gray(AWG26)	B+	A8
Red(AWG26)	B-	B8
Black(AWG26)	VPS	B9
Yellow(AWG26)	LS+	A4
Light blue(AWG26)	BK+	A5
Orange(AWG26)	BK-	B5
Green(AWG26)	LS_GND	A9
Brown(AWG26)	LS-	B4
Gray(AWG26)	VCC	A10
Red(AWG26)	GND	B10
—	—	A11
Black	FG	B11

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	φA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
5	φ_A	Green(AWG22/19
3	φB	Brown(AWG22/19
4	VMM	Gray(AWG22/19)
6	φ_B	Red(AWG22/19)
11	—	Light blue(AWG26)
12	—	Orange(AWG26)
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Gray(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light blue(AWG26)
10	BK-	Orange(AWG26)
20	LS_GND	Green(AWG26)
8	LS-	Brown(AWG26)
17	VCC	Gray(AWG26)
19	GND	Red(AWG26)
21	—	—
22	—	—
23	—	—
24	FG	Black

Model CB-APSEP-MPA □□□ *The default specification of this cable is 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)

1-1827863-1 (AMP)

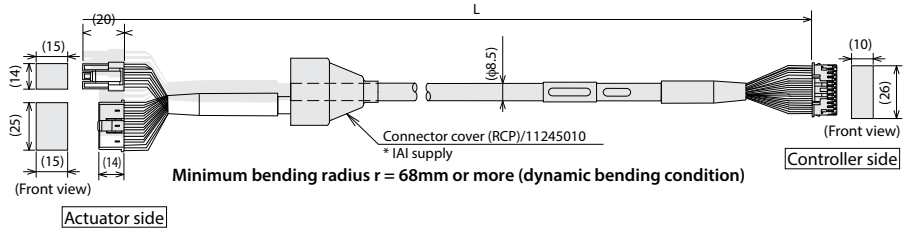
Color	Signal	PIN No.
Black(AWG22)	φA	A1
White(AWG22)	VMM	B1
Brown(AWG22)	φ_A	A2
Green(AWG22)	φB	B2
Yellow(AWG22)	VMM	A3
Red(AWG22)	φ_B	B3
Orange(AWG25)	LS+	A4
Gray(AWG25)	LS-	B4
White(AWG25)	—	A6
Yellow(AWG25)	—	B6
Red(AWG25)	A+	A7
Green(AWG25)	A-	B7
Black(AWG25)	B+	A8
Brown(AWG25)	B-	B8
Black(AWG25)	BK+	A5
Brown(AWG25)	BK-	B5
Green(AWG25)	GND LS	A9
Red(AWG25)	VPS	B9
White(AWG25)	VCC	A10
Yellow(AWG25)	GND	B10
—	—	A11
—	Shield、FG	B11

PADP-24V-1-S (JST)

PIN No.	Signal	Color
1	φA	Black(AWG22)
2	VMM	White(AWG22)
5	φ_A	Brown(AWG22)
3	φB	Green(AWG22)
4	VMM	Yellow(AWG22)
6	φ_B	Red(AWG22)
7	LS+	Orange(AWG25)
8	LS-	Gray(AWG25)
11	—	White(AWG25)
12	—	Yellow(AWG25)
13	A+	Red(AWG25)
14	A-	Green(AWG25)
15	B+	Black(AWG25)
16	B-	Brown(AWG25)
9	BK+	Black(AWG25)
10	BK-	Brown(AWG25)
20	GND LS	Green(AWG25)
18	VPS	Red(AWG25)
17	VCC	White(AWG25)
19	GND	Yellow(AWG25)
21	—	—
24	Shield、FG	—
22	—	—
23	—	—

Model CB-PSEP-MPA □□□ *The default specification of this cable is 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)

SLP-06V (JST)

Color	Signal	Pin No.
Black(AWG22)	φA	1
White(AWG22)	VMM	2
Brown (AWG22)	φ/A	3
Red (AWG22)	φB	4
Green (AWG22)	VMM	5
Yellow (AWG22)	φ/B	6

XMP-18V (JST)

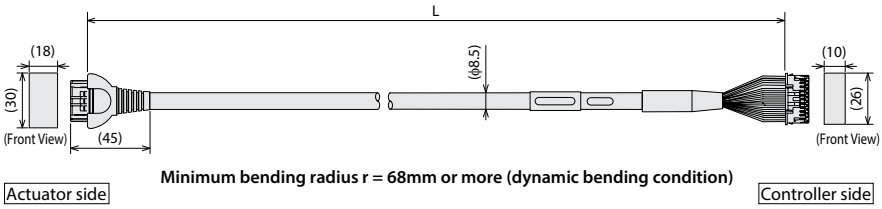
Color	Signal	Pin No.
White (AWG25)	A+	1
Yellow (AWG25)	A-	2
Red (AWG25)	B+	3
Green (AWG25)	B-	4
	N.C.	5
	N.C.	6
	N.C.	7
	N.C.	8
Red (AWG25)	GND	9
White (AWG25)	VCC	10
Yellow (AWG25	VPS	11
Green (AWG25)	(reserve)	12
Black (AWG25)	LS+	13
Brown (AWG25)	LS-	14
	N.C	15
Orange (AWG25)	BK+	16
Gray (AWG25)	BK-	17
Shield (AWG25)	F.G	18

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	φA	Black (AWG22)
2	VMM	White (AWG22)
3	φB	Red (AWG22)
4	VMM	Green (AWG22)
5	φ/A	Brown (AWG22)
6	φ/B	Yellow (AWG22)
7	LS+	Black (AWG25)
8	LS-	Brown (AWG25)
9	BK+	Orange (AWG25)
10	BK-	Gray (AWG25)
11	N.C	
12	N.C.	
13	A+	White (AWG25)
14	A-	Yellow (AWG25)
15	B+	Red (AWG25)
16	B-	Green (AWG25)
17	VCC	White (AWG25)
18	VPS	Yellow (AWG25)
19	GND	Red (AWG25)
20	(reserve)	Green (AWG25)
21	N.C.	
22	N.C.	
23	N.C.	
24	FG	Shield (AWG25)

Model CB-RPSEP-MPA □□□ *The default specification of this cable is 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)

1-1827863-1 (AMP)

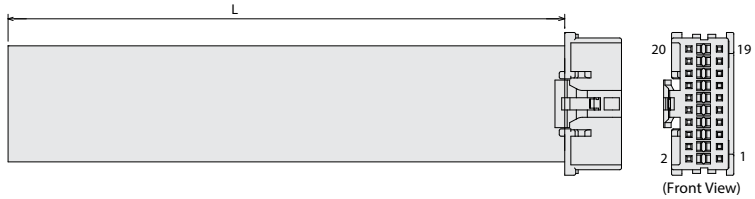
Color	Signal	Pin No.
Black (AWG22)	φA	A1
White (AWG22)	VMM	B1
Brown (AWG22)	φ_A	A2
Green (AWG22)	φB	B2
Yellow(AWG22)	VMM	A3
Red (AWG22)	φ_B	B3
Orange (AWG26)	LS+	A6
Gray (AWG26)	LS-	B6
Red (AWG26)	A+	A7
Green (AWG26)	A-	B7
Black (AWG26)	B+	A8
Brown (AWG26)	B-	B8
-	-	B4
-	-	A11
Black (AWG26)	BK+	A5
Brown (AWG26)	BK-	B5
Green (AWG26)	LS_GND	A9
Red (AWG26)	VPS	B9
White (AWG26)	VCC	A10
Yellow (AWG26)	GND	B10
-	-	A4
Shield	FG	B11

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	φA	Blue (AWG22)
2	VMM	Orange (AWG22)
5	φ_A	Green (AWG22)
3	φB	Brown (AWG22)
4	VMM	Gray (AWG22)
6	φ_B	Red (AWG22)
7	LS+	Light blue (AWG26)
8	LS-	Orange (AWG26)
13	A+	Green (AWG26)
14	A-	Brown (AWG26)
15	B+	Gray (AWG26)
16	B-	Red (AWG26)
11	-	Black (AWG26)
12	-	Yellow (AWG26)
9	BK+	Light blue (AWG26)
10	BK-	Orange (AWG26)
20	LS_GND	Green (AWG26)
18	VPS	Brown (AWG26)
17	VCC	Gray (AWG26)
19	GND	Red (AWG26)
21	-	-
22	-	-
23	-	-
24	FG	Shield

Model CB-PAD-PIO □□□

* Please indicate the cable length (L) in □□□, maximum 10m, e.g.) 080 = 8m

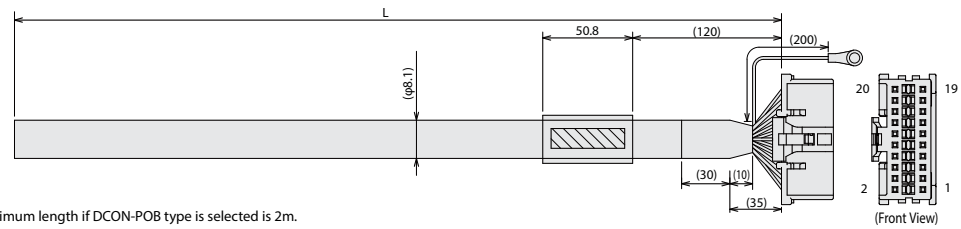


51353-2000(MOLEX)

No.	Signal	Cable color	Wiring
1	—	Brown-1	Flat cable AWG28
2	—	Red-1	
3	—	Orange-1	
4	—	Yellow-1	
5	IN0	Green-1	
6	IN1	Blue-1	
7	IN2	Purple-1	
8	IN3	Gray-1	
9	IN4	White-1	
10	IN5	Black-1	
11	IN6	Brown-2	Flat cable AWG28
12	IN7	Red-2	
13	OUT0	Orange-2	
14	OUT1	Yellow-2	
15	OUT2	Green-2	
16	OUT3	Blue-2	
17	OUT4	Purple-2	
18	OUT5	Gray-2	
19	OUT6	White-2	
20	OUT7	Black-2	

Model CB-PAD-PIOS □□□

* Please indicate the cable length (L) in □□□, maximum 10m, e.g.) 080 = 8m



* Maximum length if DCON-POB type is selected is 2m.

51353-2000(MOLEX)

No.	Signal name	Cable color	Wiring
1	PG	Orange/Red	0.2sq
2	PP	Orange/Black	
3	NG	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)

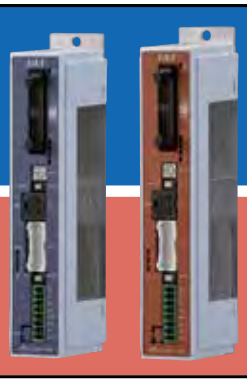
FG	Green	AWG22

ACON-CB

Position Controller
for RCA/RCA2

DCON-CB

Position Controller
for RCD



(*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

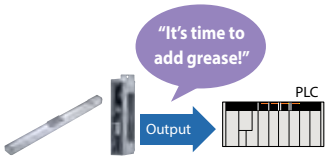
Compatible with DeviceNet, CC-Link, CC-Link IE Filed, PROFIBS-DP, PROFINET IO, CompoNet, MECHATROLINK, EtherCAT and EtherNet/IP.
Field network connection allows for less-wiring, direct numerical commands, position number commands, current position reading, and more.

DeviceNet, PROFIBUS, EtherCAT, CompoNet, PROFINET, MECHATROLINK, EtherNet/IP, CC-Link, CC-Link IE Field

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 optical 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								
				DeviceNet	CC-Link	CC-Link IE Field connection specification	PROFIBUSDP	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
ACON-CB -CGB	Battery-less absolute specification Incremental specification	○	○	○	○	○	○	○	○	○	○	○	○
	Simple absolute spec. With absolute battery	○	–	○	○	○	○	○	○	○	○	○	○
	Simple absolute spec. With absolute battery unit	○	–	○	○	○	○	○	○	○	○	○	○
	Simple absolute spec. Without absolute battery	○	–	○	○	○	○	○	○	○	○	○	○
	Absolute specification	○	–	○	○	○	○	○	○	○	○	○	○
DCON-CB -CGB	Incremental specification	○	○	○	○	○	○	○	○	○	○	○	○

Model specification items

ACON — Series — Type — Motor Type — Encoder Type — Option — I/O Type — I/O Cable Length — **0** Power Supply Voltage — Simple Absolute Specification — Controller Mounting Specification

CB	Standard
CGB	Safety category compliant type

2	2W	10	10W
5	5W	20	20W
5S	5W	20S	20W
		30	30W

(E.g.) 2: 2W 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.

<5S/20 S target actuator>
●Controller Motor type "5S"
…RCA2-RA2A□, RCA2-SA2A□
●Controller Motor type "20S"
…RCA2-SA4□, RCA2-TA5□, RCA-RA3□, RCA-RG□3□, RCAW-RA3□

WAI	Battery-less absolute
A	Incremental

HA	Hi-accel./decel. specification
LA	Energy saver specification

NP	PIO (NPN)
PN	PIO (PNP)
PLN	Pulse train (NPN)
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

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

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

(Note 1) Please be sure to check P8-20 for the caution when selecting.

0	24VDC

(Blank)	Battery-less absolute specification Incremental specification Absolute Specification
AB	Simple Absolute Specification (With absolute battery)
ABU	Simple Absolute Specification (With absolute battery unit)
ABUN	Simple Absolute Specification (Without absolute battery)

* Simple absolute spec. can be chosen when the actuator's encoder type is incremental type.

(Blank)	Screw Mounting specification
DN	DIN rail mounting specification

DCON — Series — Type — **3** Motor Type — **I** Encoder Type — I/O Type — I/O Cable Length — **0** Power Supply Voltage — Controller Mounting Specification

CB	Standard
CGB	Safety category compliant type

3	3W

I	Incremental

NP	PIO (NPN)
PN	PIO (PNP)
PLN	Pulse-train (NPN)
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 (Note1)
ML3	MECHATROLINK III (Note1)
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

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

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

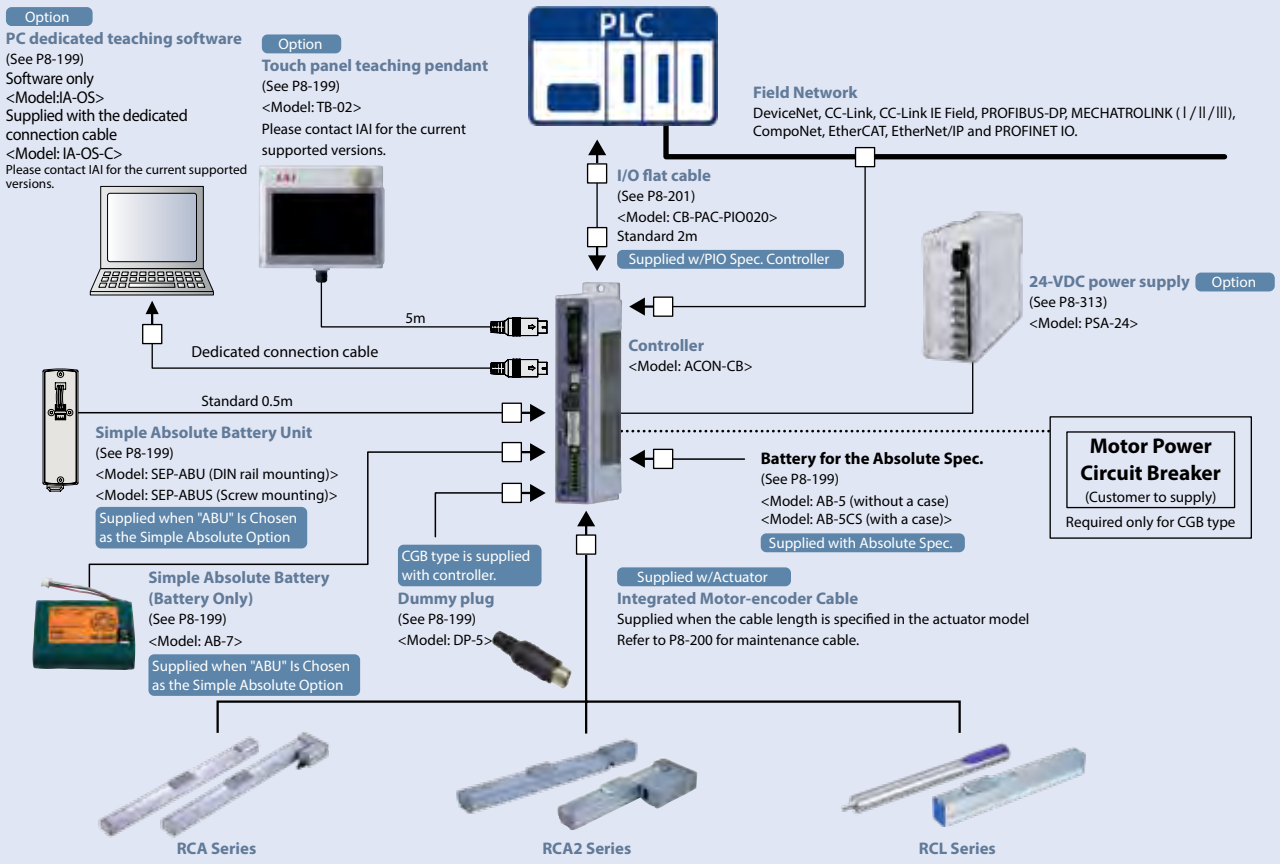
0	24VDC

(Blank)	Screw Mounting specification
DN	DIN rail mounting specification

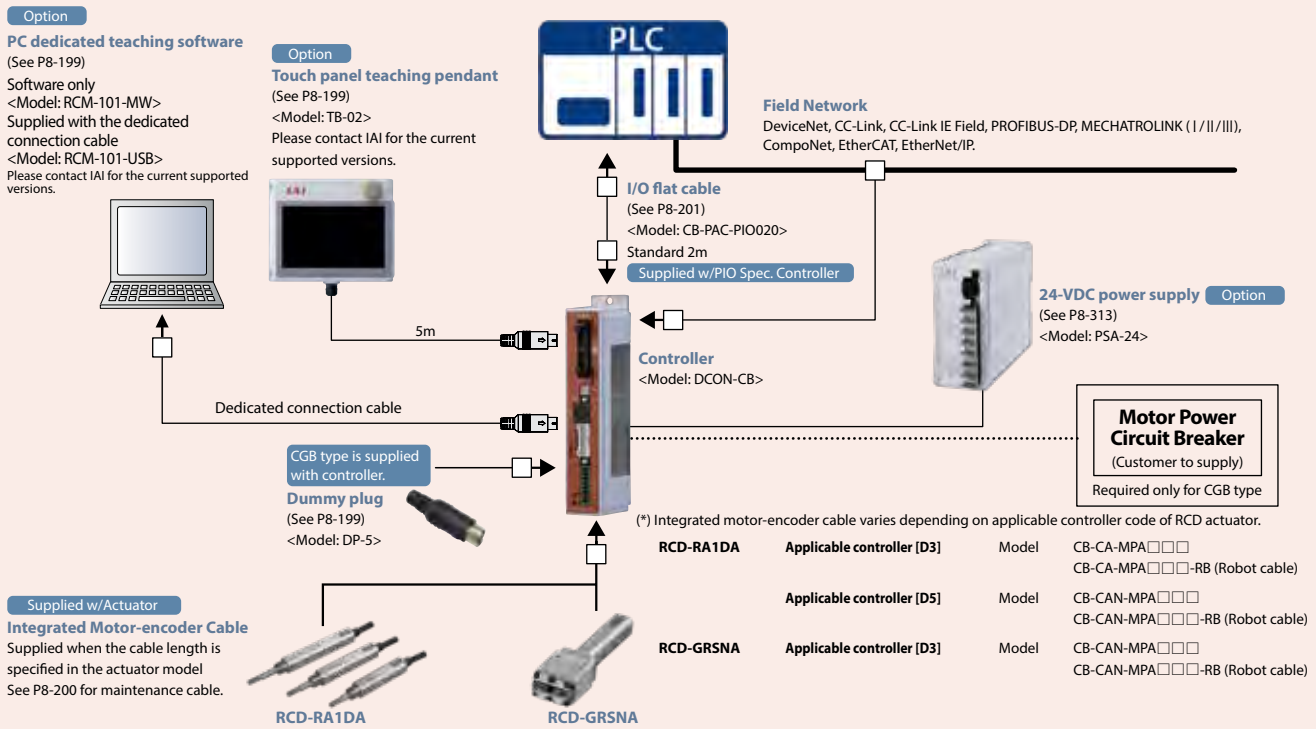
(Note 1) Please be sure to check P8-20 for the caution when selecting.

System configuration

<ACON-CB/CGB>



<DCON-CB/CGB>



(*) Integrated motor-encoder cable varies depending on applicable controller code of RCD actuator.

RCD-RA1DA	Applicable controller [D3]	Model	CB-CA-MPA□□□ CB-CA-MPA□□□-RB (Robot cable)
	Applicable controller [D5]	Model	CB-CAN-MPA□□□ CB-CAN-MPA□□□-RB (Robot cable)
RCD-GRSNA	Applicable controller [D3]	Model	CB-CAN-MPA□□□ CB-CAN-MPA□□□-RB (Robot cable)

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

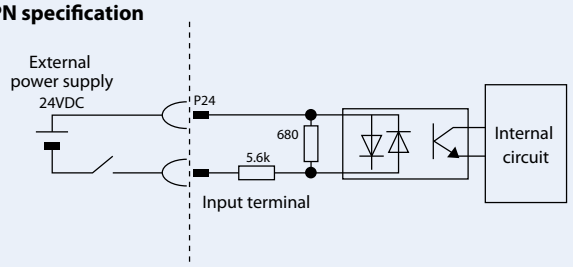
■Input part External input specification

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

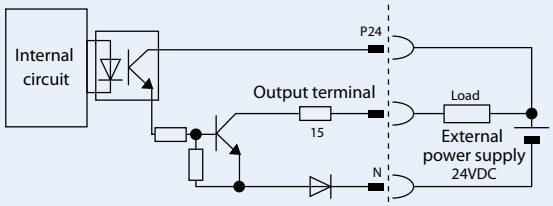
■Output part External output specification

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

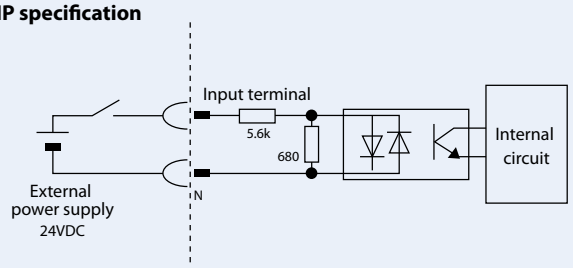
NPN specification



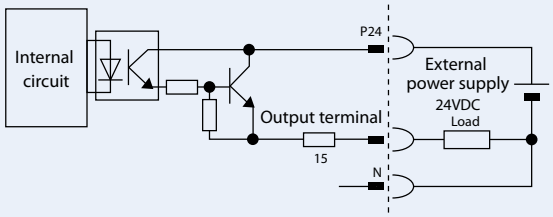
NPN specification



PNP specification



PNP specification



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)	•Number of positioning points: 64 points •Position number command: Binary Coded Decimal (BCD) •Zone signal output*1: 1 point •Position zone signal output*2: 1 point
PIO Pattern 1	1	Teaching mode (Teaching type)	•Number of positioning points: 64 points •Position number command: Binary Coded Decimal (BCD) •Position zone signal output*2: 1 point •Jog (inching) operation using PIO signals is supported. •Current position data can be written to the position table using PIO signals.
PIO Pattern 2	2	256-point mode (256 positioning points)	•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)	•Number of positioning points: 512points •Position number command: Binary Coded Decimal (BCD) •No zone signal output
PIO Pattern 4	4	Solenoid valve mode 1 (7-point type)	•Number of positioning points: 7 points •Position number command: Individual number signal ON •Zone signal output*1: 1 point •Position zone signal output*2: 1 point
PIO Pattern 5	5	Solenoid valve mode 2 (3-point type)	•Number of positioning points: 3 points •Position number command: Individual number signal ON •Completion signal: A signal equivalent to a LS (limit switch) signal can be output. •Zone signal output*1: 1 point •Position zone signal output*2: 1 point
PIO Pattern 6 (Note 1)	6	Pulse-train control mode for incremental	•Differential pulse input (200 kpps max.) •Home return function •Zone signal output*1: 2 point •No feedback pulse output
PIO Pattern 7 (Note 1)	7	Pulse-train control mode for incremental	•Reference point setting (1 point) •Differential pulse input (200 kpps max.) •Home return function •Zone signal output*1: 2 point •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.

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)	×	○	×	×	×	×
		Brake release	○	×	○	○	○	○
	Output	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	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 (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.

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.

Explanation of I/O signal functions of ACON-CB

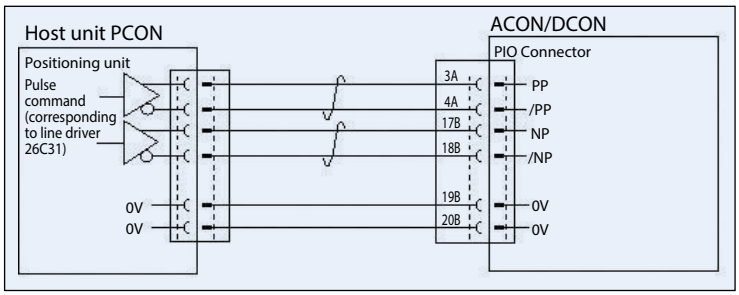
Available signals differ depending on the controller setting
Refer to the table of signals for available functions.

Category	Signal code	Signal name	Description of function
Input	CSTR	PTP strobe (start signal)	Start moving to the position set in the command position.
	PC1~PC256	Command position No.	To enter the position No. (binary) of the desired position.
	BKRL	Forced brake release	Releases the brake forcedly.
	RMOD	Switching operation mode	Enables to switch over the operation mode when the controller MODE switch is AUTO. (AUTO for signal OFF, MANU for signal ON)
	*STP	Temporary pause	Slows down to stop when this signal is OFF while moving. While the operation is paused with the rest of motions suspended, it resumes the operation when this signal is ON.
	RES	Reset	Reses the alarm by an ON signal. Cancels the rest of motions by ON while temporarily stopping (*STP is OFF).
	SON	Servo ON	Servo is ON while the signal is ON, Servo is OFF while the signal is OFF.
	HOME	Home return	Performs a home return by an ON signal.
	MODE	Teach mode	Switches to the teach mode by an ON signal. The mode will not be switched unless all of CSTR, JOG+ and JOG- are OFF and the actuator is stopping.
	JISL	Jog/Inching switch	Performs jog motions by JOG+ and JOG- while this signal is OFF. Performs inching motion by JOG+ and JOG- while this signal is ON.
	JOG+ JOG－	Jog	Performs jog motions in the + (plus) direction for JOG+ signal ON edge detection and JOG- signal in the - (minus) direction when JISL is OFF. Slows down to stop when the OFF edge is detected while operating. It becomes an inching motion when the JISL signal is ON.
	PWRT	Writing of current position	In the teaching mode, the current position is written in the designated position when this signal is ON for more than 26ms with the writing position being designated.
	ST0~ST6	Start signal	Moves to the designated position when this signal is ON in the solenoid valve mode.
Output	PEND/INP	Positioning complete	This signal is ON when the positioning width range is reached after moving. PEND will not become OFF, even when the positioning width is exceeded. INP becomes Off. PEND and INP can be switched over by parameter.
	PM1~PM256	Complete position No.	Outputs the position No. (binary output) reached after positioning is complete.
	HEND	Home return complete	This signal is ON when the home return is completed. This signal remains ON unless the home position is lost.
	ZONE1 ZONE2	Zone	This signal becomes ON when actuator current position is within the designated zone of the parameter.
	PZONE	Position zone	This signal turns ON while moving positions when actuator current position is within the designated zone specified by the position data. It can be used together with ZONE1. However, PZONE is enabled during operations with the selected position No.
	RMDS	Output of operation mode	Outputs the status of operation mode. Turns ON when the controller is in the manual mode.
	*ALM	Alarm	Turns ON when the controller is in a normal condition. Turns OFF when the alarm is activated.
	ALM1～ALM8	Alarm code	Outputs the alarm details in a binary code when an alarm is activated because the operation cancellation level is reached.
	MOVE	In motion	Turns ON when the actuator is in motion (including home return and push motion).
	SV	Servo ON	Turns ON when the servo is ON.
	*EMGS	Emergency stop output	Turns ON when the controller is in an emergency stop release condition, and turns OFF in the emergency stop condition. (regardless of the alarm)
	MODES	Teach mode output	Turns ON in the teach mode by a MODE signal input.Turns OFF in a normal mode.
	WEND	Writing complete	This signal turns OFF in the teach mode, and turns ON when writing is completed by the PWRT signal. The signal turns OFF when PWRT signal is OFF.
	PE0~PE6	Current position No.	Turns ON when travel to the target position is completed in the solenoid valve mode.
	LS0~LS2	Limit switch output	Turns ON when the actuator's current position is within the positioning width range (±) of the target position. In the Home return complete condition, this signal will be output even before the travel command or in a servo OFF status.
	*ALML	Minor failure output	This signal is output when the message level alarm occurs. (Parameter setting is needed)
	*BALM	Warning for low absolute battery voltage	This signal is ON when the voltage of the battery of the serial absolute actuator is in the normal range. For incremental actuators, this signal is always ON. It is also possible to turn OFF by setting parameter No. 151 when the message level alarm has occurred.
	TRQS	Torque level status	In the solenoid valve mode 2, when a motion is performed in the + direction by JOG+ before a Home return, the motion becomes impossible due to an obstacle or the stroke end. In this case, the signal becomes ON when the motor current value exceeds the limit for home return current value.

An asterisk (*) shows a negative logic signal. 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.

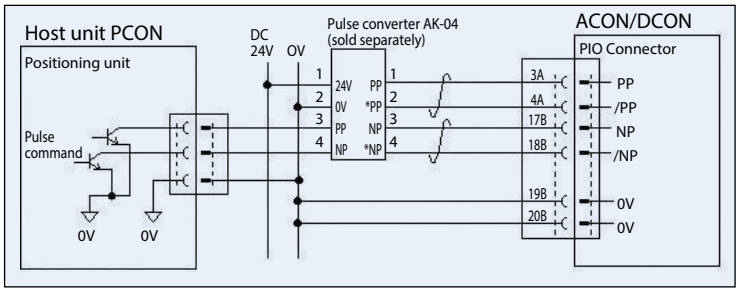
Pulse-train control circuit (Common to ACON-CB/DCON-CB)

■Host Unit = Differential Type



■Host Unit = Open Collector Type

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

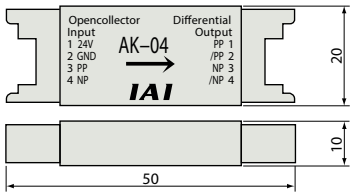


Pulse Converter: AK-04

Open-collector command pulses are pulses.
Use this converter if the host controller outputs open-collector pulses.

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	37104-3122-000L (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.			
	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.			
Positive logic	Forward pulse-train	PP・/PP		
	Reverse pulse-train	NP・/NP		
	Pulse-train	PP・/PP		
	Sign	NP・/NP	High	Low
	Phase A/B pulse-train	PP・/PP		
		NP・/NP		

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	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 (Common to ACON-CB/DCON-CB)* Except for MECHATROLINK-III

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

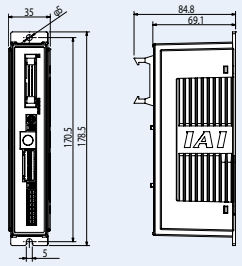
	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2
Number of positioning points	512	768	Unlimited	Unlimited	512
Operation by direct position data input	×	○	○	○	×
Direct speed/acceleration input	×	×	○	○	×
Push-motion operation	○	○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

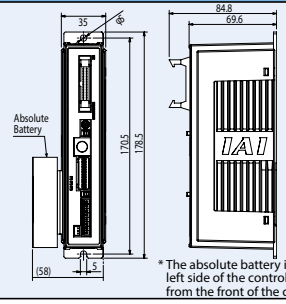
External dimensions (Common to ACON-CB/DCON-CB) * DCON-CB is only available Incremental specification.

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

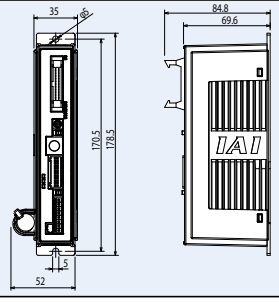
Battery-less Absolute/Incremental Specifications (Screw Mounting Type)



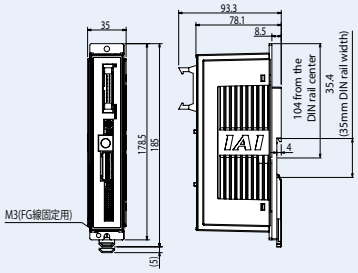
Simple Absolute Specification (Screw Mounting Type)



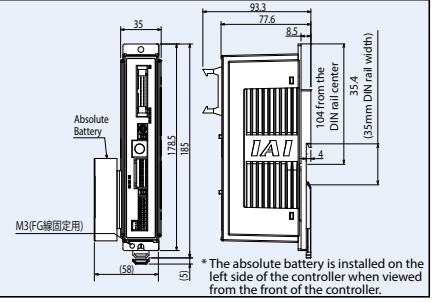
Absolute Specification (Screw Mounting Type)



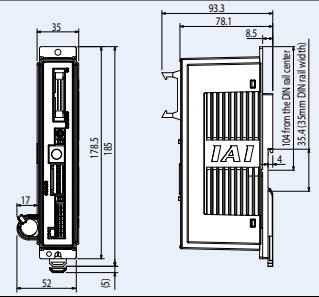
Battery-less Absolute/Incremental Specifications (DIN Rail Mounting)



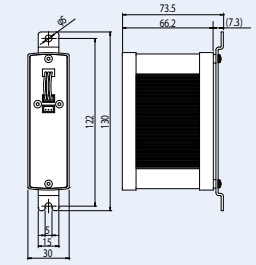
Simple Absolute Specification (DIN Rail Mounting)



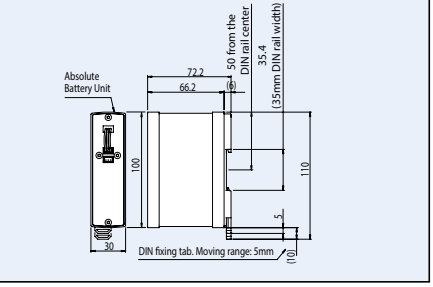
Absolute Specification (DIN Rail Mounting)



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 (di erntial 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	5%RH - 85%RH (non-condensing, no frost)	
Protection degree	IP20	
Mass	Battery-less absolute/Incremental spec.: 230g, simple absolute spec.: 240g (incl. battery: 430g)	Incremental specification: 230g
	Absolute spec.: 240g (incl. battery: 260g)	—

■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
	RCL	2W	0.8	4.6	—	—
		5W	1	6.4	—	—
DCON-CB	RCD	10W	1.3	6.4	—	—
		3W	0.7	1.5	—	—

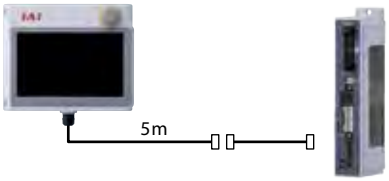
Option (Common to ACON-CB/DCON-CB)

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	5%RH - 85%RH (non-condensing)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

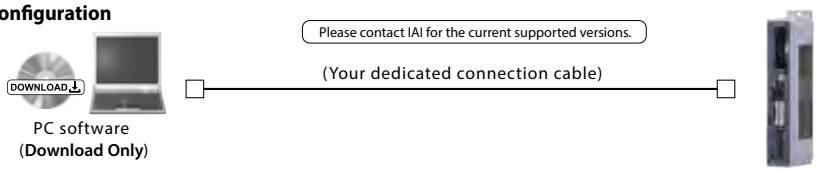
Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Supported Windows versions: 7/10

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

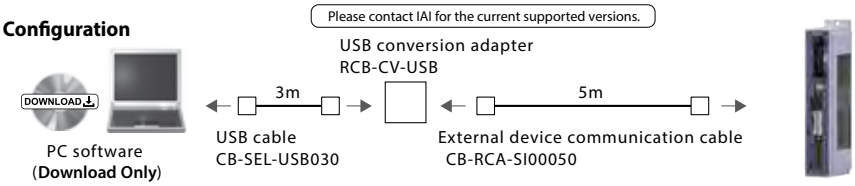
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



Dummy plug

Features This plug is required when the safety category specification (ACON/DCON-CGB) is used.

Model **DP-5**

Option (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)
Weight	Battery box: 140 g or less, Battery: 140 g or less

Replacement battery (Simple absolute specification)

Overview Replacement battery used with the absolute battery box.

Model **AB-7**

Replacement battery (Absolute specification)

Overview Replacement battery used with the absolute battery box.

Model **AB-5** (Battery)
AB-5-CS (Battery with case)

Maintenance part list

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

■ 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 □□□	CB-CAN-MPA □□□ -RB
②		GRSNA		

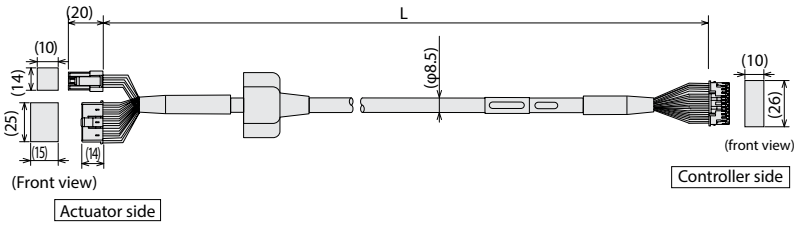
* When the applicable controller of the RCD - RA1DA model uses "D3", the cable model is CB - CA - MPA □□□ / CB - CA - MPA □□□ - RB.

● Common to ACON-CB/DCON-CB

	Model Number	PIO Flat Cable
⑤	ACON-CB/DCON-CB	CB-PAC-PIO □□□

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)

SLP-03V (JST)

Color	Signal	Pin No.
Red (AWG22)	U	1
Yellow (AWG22)	V	2
Black (AWG22)	W	3

MP-18V (JST)

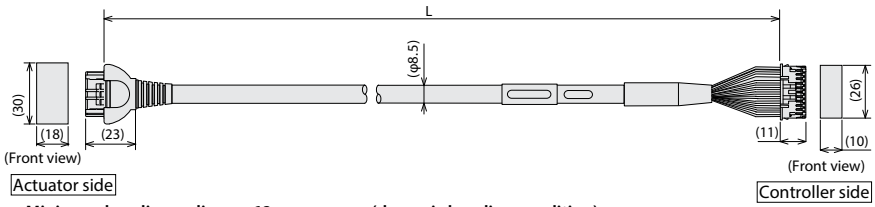
Color	Signal	Pin No.
White (AWG25)	A+	1
Yellow (AWG25)	A-	2
Red (AWG25)	B+	3
Green (AWG25)	B-	4
—	N.C.	5
Green (AWG25)	(reserve)	6
Black (AWG25)	LS+	7
—	N.C.	8
Shield (AWG25)	F.G	9
Black (AWG25)	Z+/SD+	10
Brown (AWG25)	Z-/SD-	11
White (AWG22)	BAT+	12
Red (AWG25)	VPS/BAT-	13
White (AWG25)	VCC	14
Yellow (AWG25)	GND	15
Brown (AWG25)	LS-	16
Gray (AWG25)	BK-	17
Orange (AWG25)	BK+	18

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	U	Red (AWG22)
2	V	Yellow (AWG22)
3	N.C.	
4	N.C.	
5	W	Black (AWG22)
6	N.C.	
7	BK+	Orange (AWG25)
8	BK-	Gray (AWG25)
9	LS+	Black (AWG25)
10	LS-	Brown (AWG25)
11	A+	White (AWG25)
12	A-	Yellow (AWG25)
13	B+	Red (AWG25)
14	B-	Green (AWG25)
15	Z+/SD+	Black (AWG25)
16	Z-/SD-	Brown (AWG25)
17	VCC	White (AWG25)
18	VPS/BAT-	Red (AWG25)
19	GND	Yellow (AWG25)
20	(reserve)	Green (AWG25)
21	BAT+	White (AWG22)
22	N.C.	
23	N.C.	
24	F.G	Shield (AWG25)

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)

1-1827863-1 (AMP)

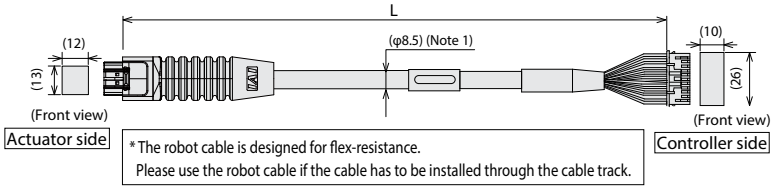
Color	Signal	PIN No.
Black(AWG22)	U	A1
White(AWG22)	V	B1
Brown(AWG22)	W	A2
Green(AWG22)	—	B2
Yellow(AWG22)	—	A3
Red(AWG22)	—	B3
Orange(AWG26)	BK+	A4
Gray(AWG26)	BK-	B4
White(AWG26)	A+	A6
Yellow(AWG26)	A-	B6
Red(AWG26)	B+	A7
Green(AWG26)	B-	B7
Black(AWG26)	Z+	A8
Brown(AWG26)	Z-	B8
Black(AWG26)	LS+	A5
Brown(AWG26)	LS-	B5
Green(AWG26)	LS_GND	A9
Red(AWG26)	VPS	B9
White(AWG26)	VCC	A10
Yellow(AWG26)	GND	B10
—	—	A11
Shield	FG	B11

PADP-24V-1-S (JST)

PIN No.	Signal	Color
1	U	Blue(AWG22)
2	V	Orange(AWG22)
5	W	Green(AWG22)
3	—	Brown(AWG22)
4	—	Gray(AWG22)
6	—	Red(AWG22)
7	BK+	Light Blue(AWG26)
8	BK-	Orange(AWG26)
11	A+	Green(AWG26)
12	A-	Brown(AWG26)
13	B+	Gray(AWG26)
14	B-	Red(AWG26)
15	Z+	Black(AWG26)
16	Z-	Yellow(AWG26)
9	LS+	Light Blue(AWG26)
10	LS-	Orange(AWG26)
20	LS_GND	Green(AWG26)
18	VPS	Brown(AWG26)
17	VCC	Gray(AWG26)
19	GND	Red(AWG26)
21	—	—
22	—	—
23	—	—
24	—	Shield

Model number 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)



* 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.

DF62DL-24S-2.2(Hirose)

Color	Signal		Pin No.
	ACON	DCON	
Blue(AWG22/19)	U	U	3
Orange(AWG22/19)	V	V	5
Brown(AWG22/19)	—	—	10
Gray(AWG22/19)	—	—	9
Green(AWG22/19)	W	W	4
Red(AWG22/19)	—	—	15
Light Blue(AWG26)	A+	A+	12
Orange(AWG26)	A-	A-	17
Green(AWG26)	B+	B+	1
Brown(AWG26)	B-	B-	6
Gray(AWG26)	Z+/SA[mABS]	HS1_IN	11
Red(AWG26)	Z-/SB[mABS]	HS2_IN	16
Black(AWG26)	VPS/BAT-	—	18
Yellow(AWG26)	BK+	—	8
Light Blue(AWG26)	LS+	—	20
Orange(AWG26)	LS-	—	2
Gray(AWG26)	VCC	VCC	21
Red(AWG26)	GND	GND	7
Brown(AWG26)	BK-		14
Green(AWG26)	LS_GND	HS3_IN	13
—	—	—	19
Pink(AWG26)	BAT+	—	22
—	—	—	23
Black(AWG26)	FG	FG	24

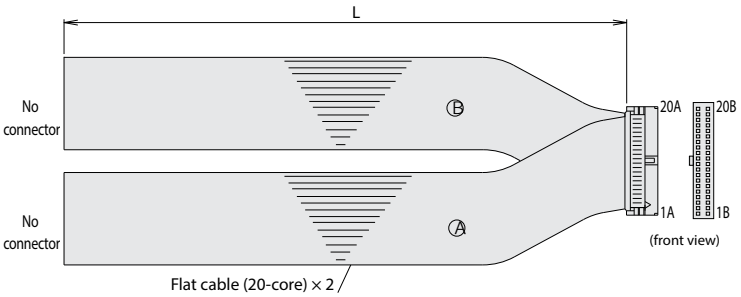
PADP-24V-1-S(JST)

Pin No.	Signal		Color
	ACON	DCON	
1	U	U	Blue(AWG22/19)
2	V	V	Orange(AWG22/19)
3	—	—	Brown(AWG22/19)
4	—	—	Gray(AWG22/19)
5	W	W	Green(AWG22/19)
6	—	—	Red(AWG22/19)
11	A+	A+	Light Blue(AWG26)
12	A-	A-	Orange(AWG26)
13	B+	B+	Green(AWG26)
14	B-	B-	Brown(AWG26)
15	Z+/SA[mABS]	HS1_IN	Gray(AWG26)
16	Z-/SB[mABS]	HS2_IN	Red(AWG26)
18	VPS/BAT-	—	Black(AWG26)
7	BK+	—	Yellow(AWG26)
9	LS+	—	Light Blue(AWG26)
10	LS-	—	Orange(AWG26)
17	VCC	VCC	Gray(AWG26)
19	GND	GND	Red(AWG26)
8	BK-		Brown(AWG26)
20	LS_GND	HS3_IN	Green(AWG26)
22	—	—	—
21	BAT+	—	Pink(AWG26)
23	—	—	—
24	FG	FG	Black(AWG26)

Purple(AWG26)

Model number CB-PAC-PIO □□□

* Please indicate the cable length (L) in □□□, maximum 10m, e.g.) 080 = 8m



HIF6-40D-1.27R(Hirose)

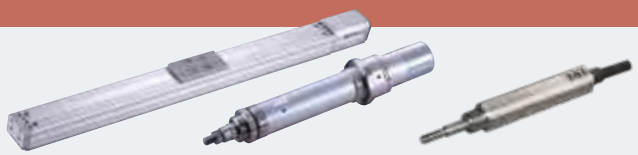
No.	Signal name	Cable color	Wiring
1A	24V	Brown-1	Flat cable A (pressure-welded)
2A	24V	Red-1	
3A	Pulse input	Orange-1	
4A		Yellow-1	
5A	IN0	Green-1	
6A	IN1	Blue-1	
7A	IN2	Purple-1	
8A	IN3	Gray-1	
9A	IN4	White-1	
10A	IN5	Black-1	
11A	IN6	Brown-2	
12A	IN7	Red-2	
13A	IN8	Orange-2	
14A	IN9	Yellow-2	
15A	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	Flat cable B (pressure-welded) AWG28
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	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	Pulse input	Purple-4	
18B		Gray-4	
19B	0V	White-4	
20B	0V	Black-4	

MEMO

ACON-CYB/PLB/POB
DCON-CYB/PLB/POB

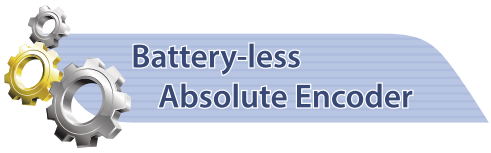
Position Controller for RoboCylinder



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 output, or when the device is restarted after failure.
Down time can be shortened, and manufacturing costs can be reduced.

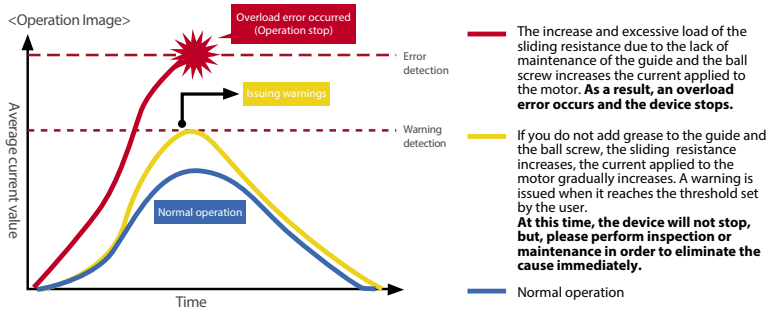


2 Equipped with Smart tuning function (ACON only)

Supports the smart tuning function, allowing optimal setting of the speed and acceleration/deceleration values based on the payload.

3 Preventative maintenance

Warning is issued before an overload error is generated from a change in the average current value.



The increase and excessive load of the sliding resistance due to the lack of maintenance of the guide and the ball screw increases the current applied to the motor. **As a result, an overload error occurs and the device stops.**

If you do not add grease to the guide and the ball screw, the sliding resistance increases, the current applied to the motor gradually increases. A warning is issued when it reaches the threshold set by the user.
At this time, the device will not stop, but, please perform inspection or maintenance in order to eliminate the cause immediately.

Normal operation

●By using predictive maintenance function, it enables you to prevent urgent stops in your system.

●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

Positioner Controller that can operate RCP6/RCP5/RCP4/RCP3/RCP2. 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

Type	
CYB	Positioner / Solenoid valve type
PLB	Pulse-train control type (Differential receiver type)
POB	Pulse-train control type (Open collector type)

Motor Type			
2	2W	20	20W
5	5W	20S	20W
5S	5W	30	30W
10	10W		

(Example) 2: 2W Servo motor compatible

Encoder Type	
WAI	Battery-less absolute/ Incremental

* Absolute specification of RCA actuator can not be operated. Please use ACON-CB or ASEL to operate the Absolute specification.

Option	
HA	Hi-accel./decel. supported
LA	Energy saver

I/O Type	
NP	PIO(NPN) specification
PN	PIO(PNP) specification

I/O Cable Length	
0	No cable
2	2m
3	3m
5	5m

* The POB type has a maximum cable length of 2m.

Power Supply Voltage	
0	24VDC

Controller Mounting Specification	
(Blank)	Screw Mounting specification
DN	DIN rail mounting specification

Note

Basically, the type of motor is the same as the type of motor of the actuator to be connected, however, there are models that some of the controllers and the motors of the actuators 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□

DCON – [ ] – 3 I – [ ] – [ ] – 0 – [ ]

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

Type	
CYB	Positioner / Solenoid valve type
PLB	Pulse-train control type (Differential receiver type)
POB	Pulse-train control type (Open collector type)

Motor Type	
3	3W

* DC Blushless motor compatible

Encoder Type	
I	Incremental

I/O Type	
NP	PIO(NPN) specification
PN	PIO(PNP) specification

I/O Cable Length	
0	No cable
2	2m
3	3m
5	5m

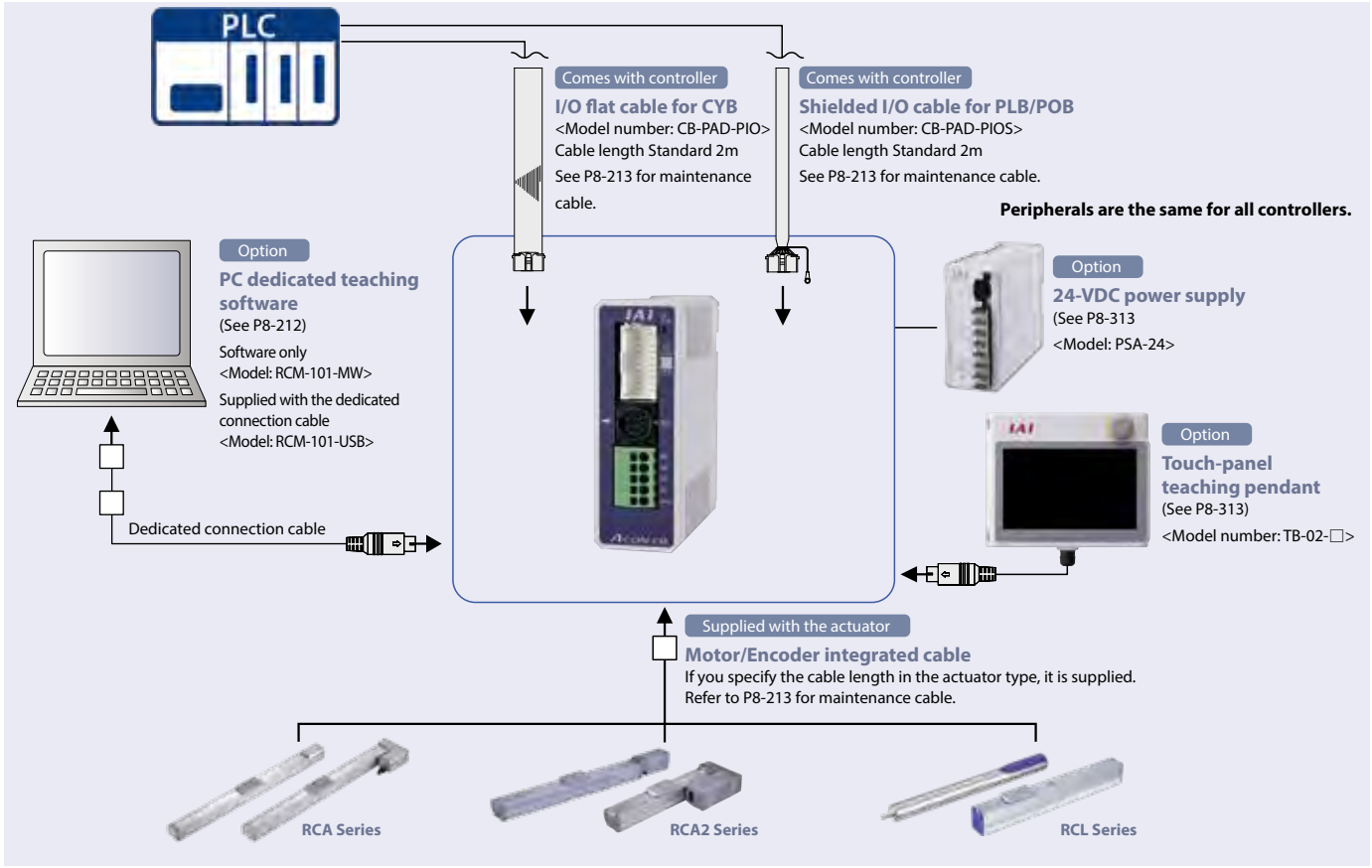
* The POB type has a maximum cable length of 2m.

Power Supply Voltage	
0	24VDC

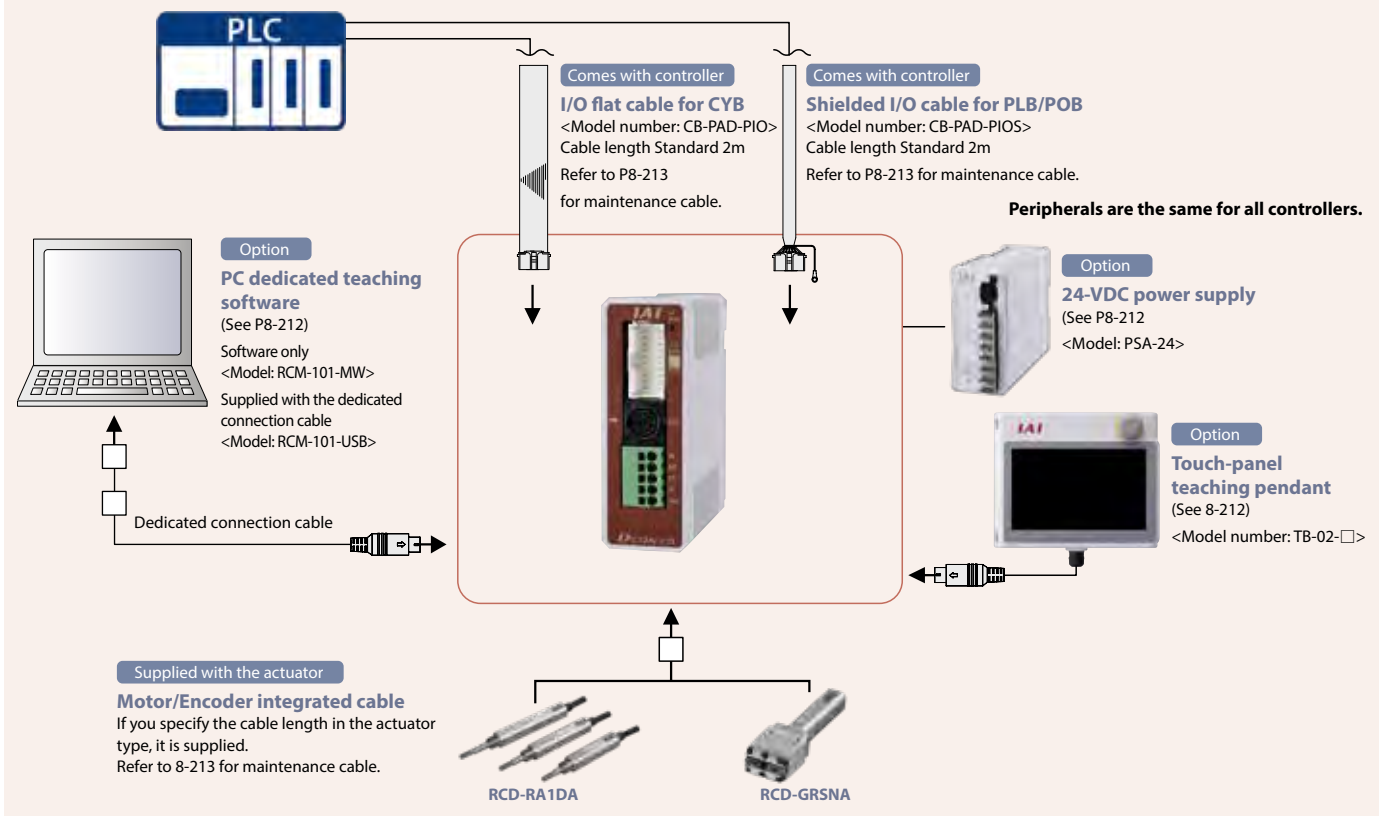
Controller Mounting Specification	
(Blank)	Screw Mounting specification
DN	DIN rail mounting specification

System configuration

<ACON-CYB/PLB/POB>



<DCON-CYB/PLB/POB>



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

Pin number	Category		Parameter (PIO pattern) selection						
			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
		Number of positioning points	16	7	3	2	2	One of 4, 8, 16, 32, 64 points (Selection)	768
		Zone signal	△(Note 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	Serial communication (Modbus) Refer to operation manual
		Position zone signal	△(Note 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	
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+)(Note 2)	-	ST1 (-)(Note 2)		
7		IN2	PC4	ST2	ST2 (-)(Note 2)	-	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(Note 3)	LS0/PE0(Note 3)	Any signal other than the completed position No.,PEND can be selected in the output.	
14		OUT1	PM2(ALM2)	PE1	LS1(TRQS)(Note 2)	LS1/PE1(Note 3)	LS1/PE1(Note 3)		
15		OUT2	PM4(ALM4)	PE2	LS2 (-)(Note 2)	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) In the table above, an 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 1, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.
(Note 2) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)
(Note 3) Pin number 13 and 14 of PIO pattern 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/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.
	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.
Output	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	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 (ACON-PLB/POB DCON-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 (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.
	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

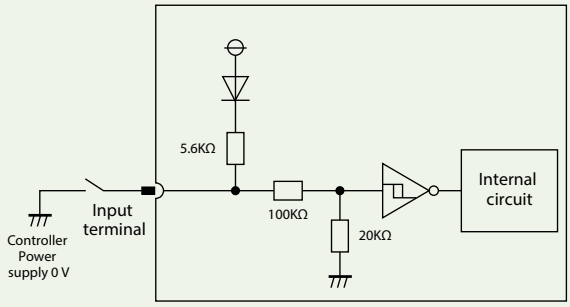
Model	CYB	PLB / POB	Summary
Name	Positioner / Solenoid valve type	Pulse-train control type	
Positioner mode	○	×	It is the basic operation mode that operates by specifying the position number and inputting the start signal.
Solenoid valve mode	○	×	It is possible to move just by turning ON/OFF the position 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)

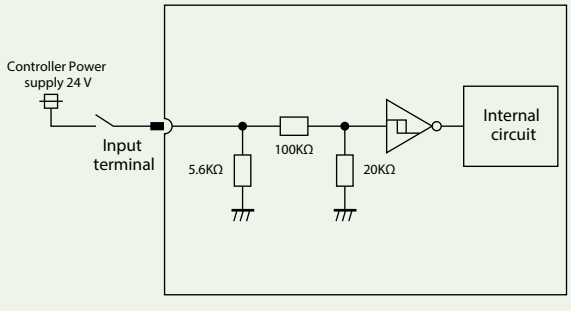
■ Input Part External Input Specifications

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

NPN Specification



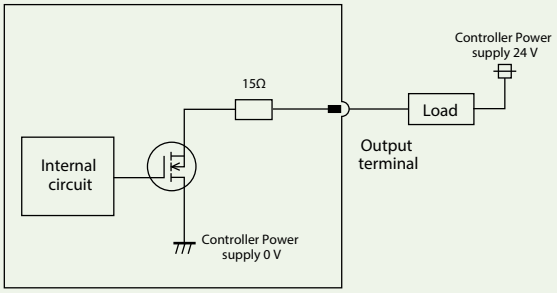
PNP Specification



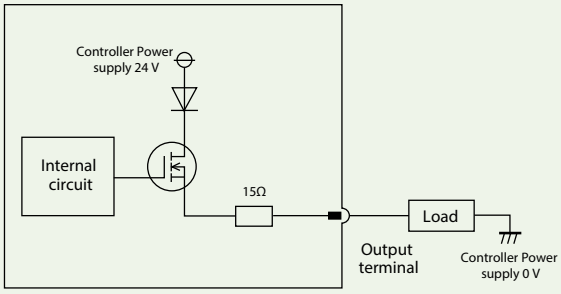
■ Output Part External Output Specifications

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

NPN Specification



PNP Specification

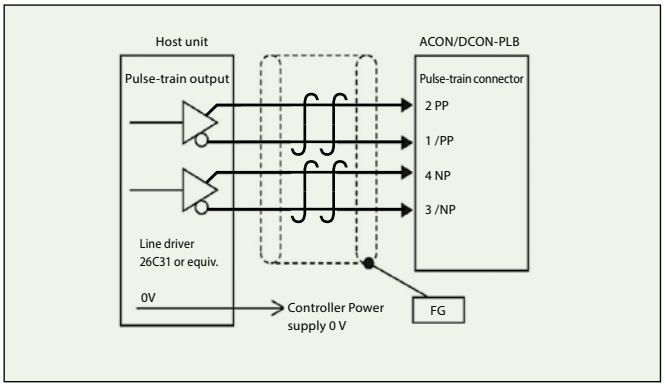


Pulse-train input circuit

■ Differential line driver

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

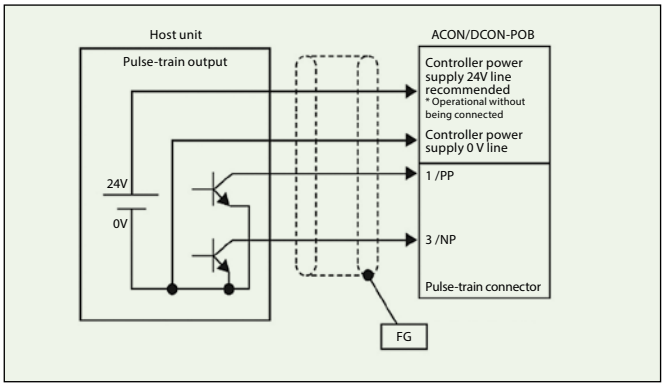
* The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



■ 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.			
	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.			
Positive logic	Forward pulse-train	PP・/PP		
	Reverse pulse-train	NP・/NP		
	Pulse-train	PP・/PP		
	Sign	NP・/NP	High	Low
	Phase A/B pulse-train	PP・/PP		
		NP・/NP		

Specification Table

Item	Specification		
Controller type	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 connecter)	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 ~ 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	5%RH - 85%RH (non-condensing, no frost)		
Operating ambience	Not exposed to corrosive gases		
Degree of protection	IP20		
Mass	230g (DIN rail mounting specification 265g)		

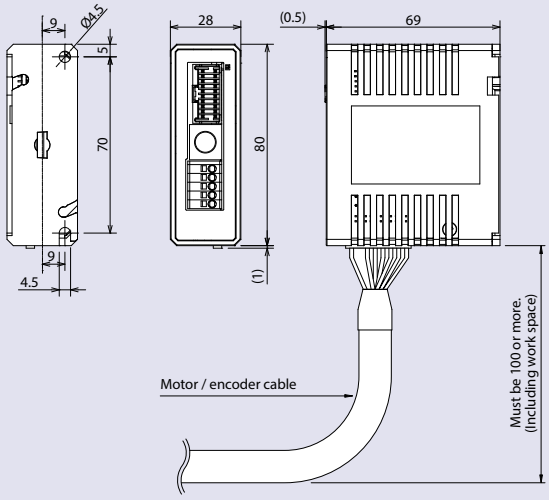
■ Motor power capacity

		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	—	—

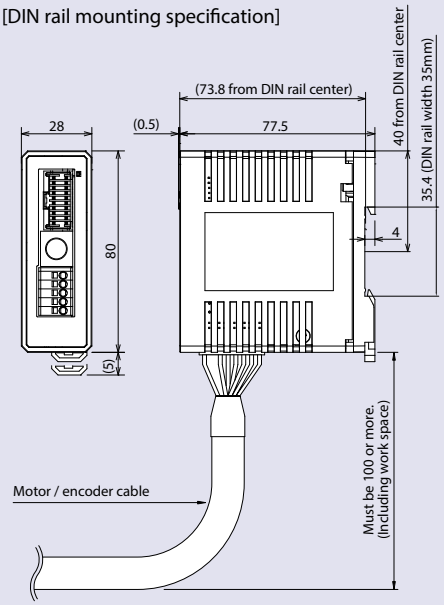
External Dimensions

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

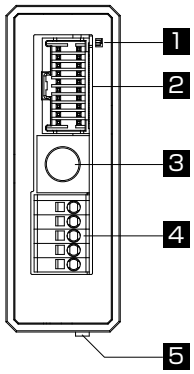
[Screw fastening specification]



[DIN rail mounting specification]



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.

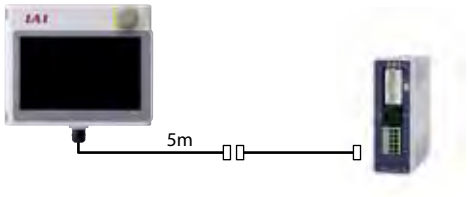
Option

Touch panel teaching box

Features Teaching device for positioning input, test operation, and monitoring.

Model **TB-02-□**

Configuration



Specification

Rated voltage	24V DC
Power consumption	3.6 W or less (150 mA or less)
Ambient operating temperature	0 ~ 40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Degree of protection	IP20
Weight	470g (TB-02 only)

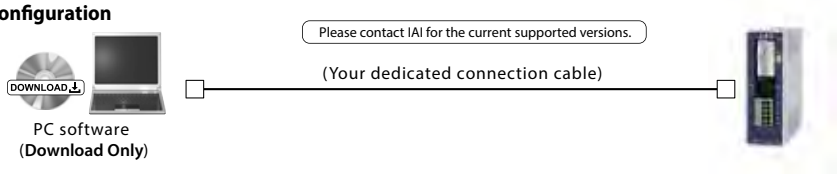
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

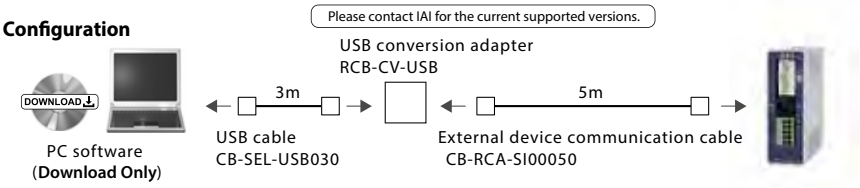
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



Supported Windows versions: 7/10

Maintenance parts

When placing an order for the 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 □□□	CB-CAN-MPA □□□ -RB
②		GRSNA		

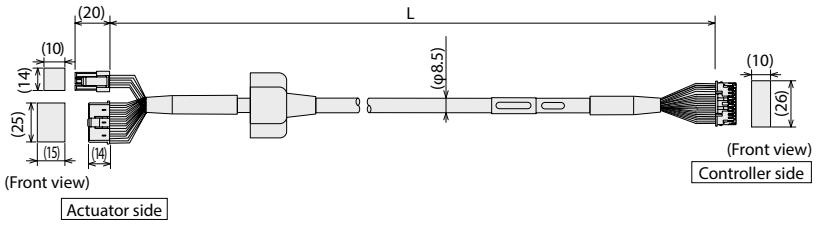
* When the applicable controller of the RCD - RA1DA model uses "D3", the cable model is CB - CA - MPA □□□ / CB - CA - MPA □□□ - RB.

● Common to ACON/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



Minimum bending radius r= 68mm or more (Dynamic bending condition)

SLP-03V (JST)

Color	Signal	Pin No.
Red (AWG22)	U	1
Yellow (AWG22)	V	2
Black (AWG22)	W	3

MP-18V (JST)

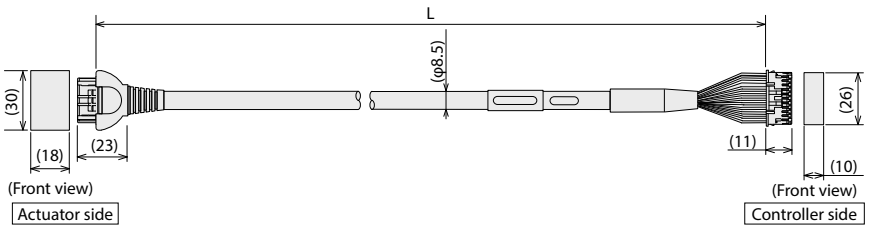
Color	Signal	Pin No.
White (AWG25)	A+	1
Yellow (AWG25)	A-	2
Red (AWG25)	B+	3
Green (AWG25)	B-	4
	N.C.	5
Green (AWG25)	(reserve)	6
Black (AWG25)	LS+	7
	N.C.	8
Shield (AWG25)	F.G	9
Black (AWG25)	Z+/SD+	10
Brown (AWG25)	Z-/SD-	11
White (AWG22)	BAT+	12
Red (AWG25)	VPS/BAT-	13
White (AWG25)	VCC	14
Yellow (AWG25)	GND	15
Brown (AWG25)	LS-	16
Gray (AWG25)	BK-	17
Orange (AWG25)	BK+	18

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	U	Red (AWG22)
2	V	Yellow (AWG22)
3	N.C.	
4	N.C.	
5	W	Black (AWG22)
6	N.C.	
7	BK+	Orange (AWG25)
8	BK-	Gray (AWG25)
9	LS+	Black (AWG25)
10	LS-	Brown (AWG25)
11	A+	White (AWG25)
12	A-	Yellow (AWG25)
13	B+	Red (AWG25)
14	B-	Green (AWG25)
15	Z+/SD+	Black (AWG25)
16	Z-/SD-	Brown (AWG25)
17	VCC	White (AWG25)
18	VPS/BAT-	Red (AWG25)
19	GND	Yellow (AWG25)
20	(reserve)	Green (AWG25)
21	BAT+	White (AWG22)
22	N.C.	
23	N.C.	
24	F.G	Shield (AWG25)

Model 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)

1-1827863-1 (AMP)

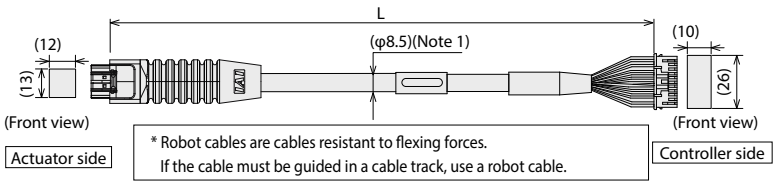
Color	Signal	PIN No.
Black(AWG22)	U	A1
White(AWG22)	V	B1
Brown(AWG22)	W	A2
Green(AWG22)	—	B2
Yellow(AWG22)	—	A3
Red(AWG22)	—	B3
Orange(AWG25)	BK+	A4
Gray(AWG25)	BK-	B4
White(AWG25)	A+	A6
Yellow(AWG25)	A-	B6
Red(AWG25)	B+	A7
Green(AWG25)	B-	B7
Black(AWG25)	Z+	A8
Brown(AWG25)	Z-	B8
Black(AWG25)	LS+	A5
Brown(AWG25)	LS-	B5
Green(AWG25)	LS_GND	A9
Red(AWG25)	VPS	B9
White(AWG25)	VCC	A10
Yellow(AWG25)	GND	B10
—	—	A11
Shield	FG	B11

PADP-24V-1-S (JST)

PIN No.	Signal	Color
1	U	Blue(AWG22)
2	V	Orange(AWG22)
5	W	Green(AWG22)
3	—	Brown(AWG22)
4	—	Gray(AWG22)
6	—	Red(AWG22)
7	BK+	Light Blue(AWG25)
8	BK-	Orange(AWG25)
11	A+	Green(AWG25)
12	A-	Brown(AWG25)
13	B+	Gray(AWG25)
14	B-	Red(AWG25)
15	Z+	Black(AWG25)
16	Z-	Yellow(AWG25)
9	LS+	Light Blue(AWG25)
10	LS-	Orange(AWG25)
20	LS_GND	Green(AWG25)
18	VPS	Brown(AWG25)
17	VCC	Gray(AWG25)
19	GND	Red(AWG25)
21	—	—
22	—	—
23	—	—
24	—	Shield

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)



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

Minimum bending radius r= 68mm or more (Dynamic bending condition)

(Note 1) If the cable length is 5 m or more, the diameter of the non-robot cable becomes ø9.1, while that of the robot cable becomes ø10.

(Note 2) When connecting to RCD, maximum 10m.

DF62DL-24S-2.2C(Hirose)

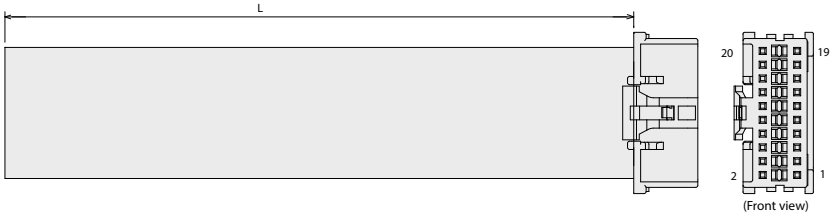
Color	Signal ACON	Signal DCON	Pin No.
Blue(AWG22/19)	U	U	3
Orange(AWG22/19)	V	V	5
Brown(AWG22/19)	—	—	10
Gray(AWG22/19)	—	—	9
Green(AWG22/19)	W	W	4
Red(AWG22/19)	—	—	15
Light Blue(AWG26)	A+	A+	12
Orange(AWG26)	A-	A-	17
Green(AWG26)	B+	B+	1
Brown(AWG26)	B-	B-	6
Gray(AWG26)	Z+/SA[mABS]	HS1_IN	11
Red(AWG26)	Z-/SB[mABS]	HS2_IN	16
Black(AWG26)	VPS/BAT-	—	18
Yellow(AWG26)	BK+	—	8
Light Blue(AWG26)	LS+	—	20
Orange(AWG26)	LS-	—	2
Gray(AWG26)	VCC	VCC	21
Red(AWG26)	GND	GND	7
Brown(AWG26)	BK-		14
Green(AWG26)	LS_GND	HS3_IN	13
—	—	—	19
Pink(AWG26)	BAT+	—	22
—	—	—	23
Black(AWG26)	FG	FG	24
			Purple(AWG26)

PADP-24V-1-S(JST)

Pin No.	Signal ACON	Signal DCON	Color
1	U	U	Blue(AWG22/19)
2	V	V	Orange(AWG22/19)
3	—	—	Brown(AWG22/19)
4	—	—	Gray(AWG22/19)
5	W	W	Green(AWG22/19)
6	—	—	Red(AWG22/19)
11	A+	A+	Light Blue(AWG26)
12	A-	A-	Orange(AWG26)
13	B+	B+	Green(AWG26)
14	B-	B-	Brown(AWG26)
15	Z+/SA[mABS]	HS1_IN	Gray(AWG26)
16	Z-/SB[mABS]	HS2_IN	Red(AWG26)
18	VPS/BAT-	—	Black(AWG26)
7	BK+	—	Yellow(AWG26)
9	LS+	—	Light Blue(AWG26)
10	LS-	—	Orange(AWG26)
17	VCC	VCC	Gray(AWG26)
19	GND	GND	Red(AWG26)
8	BK-		Brown(AWG26)
20	LS_GND	HS3_IN	Green(AWG26)
22	—	—	—
21	BAT+	—	Pink(AWG26)
23	—	—	—
24	FG	FG	Black(AWG26)

Model CB-PAD-PIO □□□

* Please indicate the cable length (L) in □□□,maximum 10m, e.g.) 080 = 8m



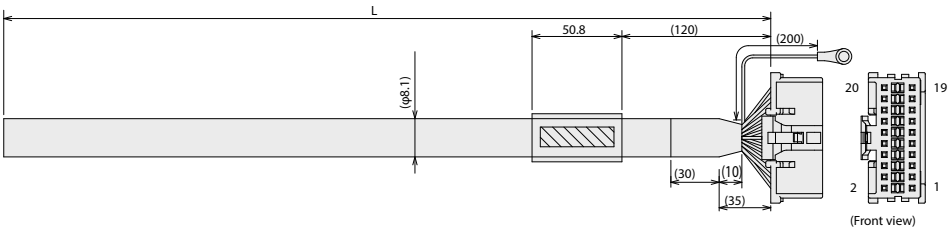
51353-2000(MOLEX)

No.	Signal name	Cable color	Wiring
1	—	Brown-1	Flat cable AWG28
2	—	Red-1	
3	—	Orange-1	
4	—	Yellow-1	
5	IN0	Green-1	
6	IN1	Blue-1	
7	IN2	Purple-1	
8	IN3	Gray-1	
9	IN4	White-1	
10	IN5	Black-1	

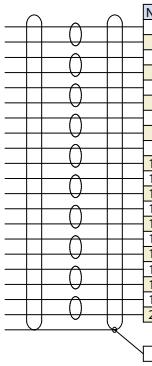
No.	Signal name	Cable color	Wiring
11	IN6	Brown-2	Flat cable AWG28
12	IN7	Red-2	
13	OUT0	Orange-2	
14	OUT1	Yellow-2	
15	OUT2	Green-2	
16	OUT3	Blue-2	
17	OUT4	Purple-2	
18	OUT5	Gray-2	
19	OUT6	White-2	
20	OUT7	Black-2	

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	0.2sq
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)

	FG	Green	AWG22

SCON-CB

Position Controller for Single-axis robot / Cartesian robot / Linear servo / ROBO Cylinder RCS2/RCS3/RCS4

CE (*1) RoHS 10 cULus (*2)

(*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, ISDB and NSA 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.

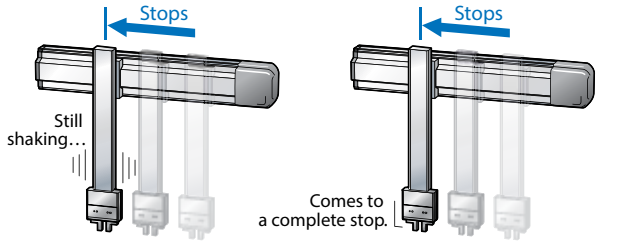
2 Supporting Major Field Networks <Optional Function>

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.

DeviceNet
PROFIBUS
CompoNet
CC-Link
EtherNet/IP
CC-Link IE Field
MECHATROLINK
EtherCAT
PROFINET

3 Vibration Control Function <Optional Function>

A vibration control function is equipped that suppresses vibration of the work part installed on the slider when the actuator's slider moves.
This function shortens the time the actuator waits for vibration to settle, and consequently shortens the cycle time.



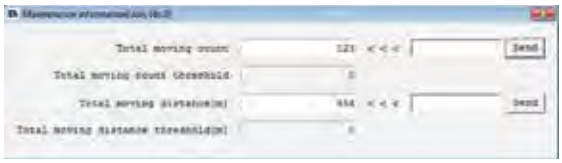
Without vibration control
The work part vibrates after stopping.

With vibration control
The work part generates virtually no vibration after stopping.

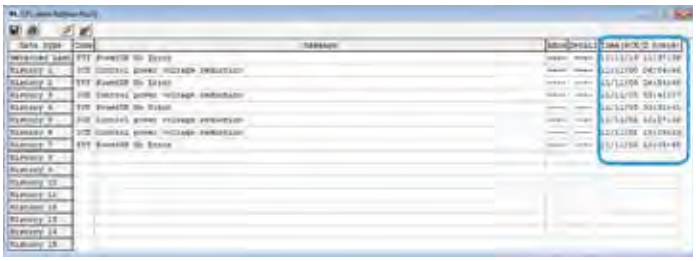
4 Capable of Predictive Maintenance <Optional Function>

- 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 o -board tuning, it is possible to adjust the acceleration/deceleration and gain depending on the payload.
- Using the counter function, the exact number of actuator movements and total distance traveled are calculated.
  This function can be used to output a signal when maintenance is required.
- The calendar function enables to retain the history of alarm occurrence.

<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 specification. 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 function is compliant with the following safety standards:
- ISO/EN ISO 13849-1 category 3 PLe
- 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.

List of models

Model		SCON-CB/CGB											
External view													
I / O type		Standard specification	Field network type (*1)										
		PIO connection specification	DeviceNet	CC-Link	CC-Link IE Field	PROFIBUS-DP	CompoNet	MECHATROLINK-I/ II	MECHATROLINK- III	EtherCAT	EtherCAT Motion	EtherNet/IP	PROFINET IO	RCON
I/O type code		NP/PN	DV	CC	CIE	PR	CN	ML	ML3	EC	ECM	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) The index absolute type can not be used in the pulse-train control, MECHATROLINK-III and EtherCAT Motion control. (See P1-320)
(*1) Note that communication with PIO and pulse-train cannot be performed in the network type.

Model

SCON – [Series] – [Type] – [Motor Type] [Encoder Type] [Option] – [I/O Type] – [I/O Cable Length] – [Power Supply Voltage] – [Safety type]

Type

CB	High-function type
CGB	Safety category compliant type

* For RCS 3 - RA 15 R / 20 R, only CGB can be chosen.

Motor Type

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

Encoder Type

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.

Option

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 actuator>
RCS2-SA4C/SA5C/SA6C/SA7C/RA4C/RA5C/RGS4C/RGS5C/RGD4C/RGD5C

I/O Type

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

(Note 1) Please be sure to check P8-20 for the caution when selecting.

Power Supply Voltage

1	Single phase AC100V
2	Single phase AC 200V
3	Three phase 200VAC

* Please check the power supply voltage that can be selected on the page of the actuator.

Safety type

Not specified	Standard type
STO	STO type
SS	SS1-t type

* Only the standard type is selectable for RCS3-RA15R/20R.

I/O Cable Length

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 the type of motor of the actuator to be connected, however, there are models that some of the controllers and the motors of the actuators do not match.
The applicable models are listed below, so please note when selecting.
<30D・30R・200S applicable actuator>

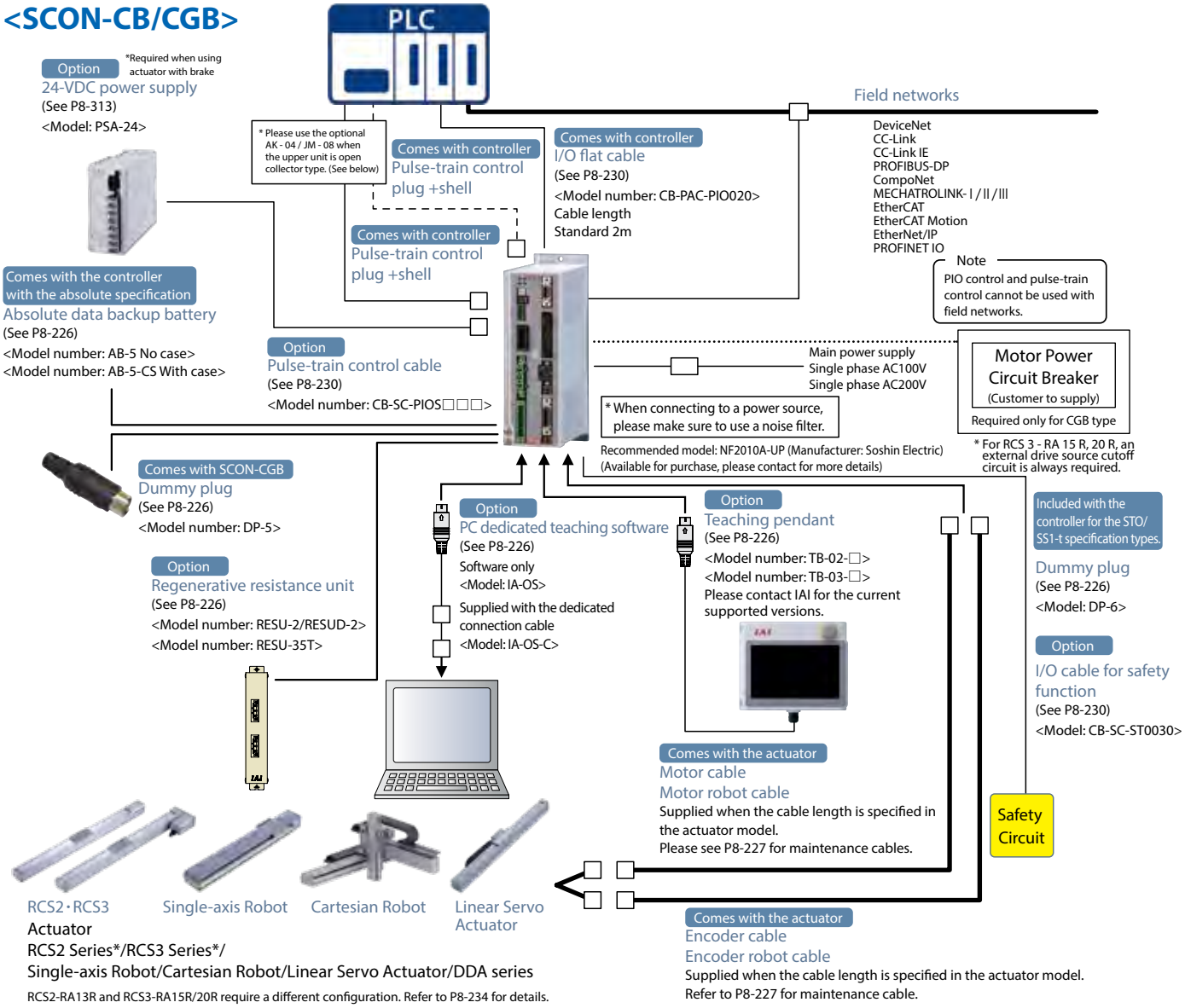
● Controller Motor type "30D"
30W actuator other than RS

● Controller Motor type "30R"
RS

● Controller Motor type "200S"
DD-LT18□ DDCR-LT18□
DDA-LT18C DDACR-LT18C
* For 200S, the housing of the controller will be 400W. Please check the 400w specifications for the price.

System configuration

<SCON-CB/CGB>

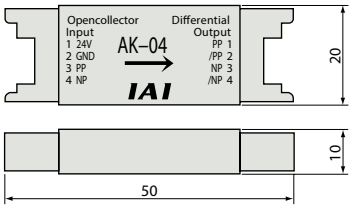


Pulse Converter: Model number AK-04

Open-collector command pulses are converted to differential command pulses. Use this converter if the host controller outputs open-collector pulses.

Specification

Item	Specification
Input power supply	24VDC±10% (Max.50mA)
Input pulse	Open-collector (Collector current: 12mA max.)
Input frequency	200kHz or less
Output pulse	Differential output (10mA max.) (26C31 or equivalent)
Mass	10g or less (excluding cable connectors)
Accessories	3M's 37104-3122-000FL (e-CON connector), 2 pieces Suitable wire: AWG No.24~26

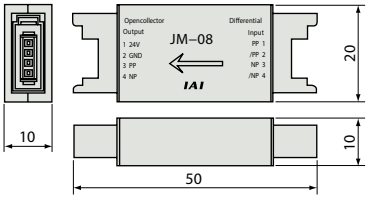


Pulse Converter: Model number JM-08

Converts differential pulses to the open-collector specification. Please use this converter if the host controller uses open-controller specification for pulse input.

Specification

Item	Specification
Input power supply	24VDC±10% (Max.50mA)
Input pulse	Differential input (10mA max.) (conforming to RS422)
Input frequency	500kHz or less
Output pulse	24-VDC open-collector (Collector current: 25mA max.)
Mass	10g or less (excluding cable connectors)
Accessories	37104-3122-000FL (e-CON connector)(by 3M) × 2 Suitable wire: AWG No.24~26



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 the 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 the 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 3000 W / 3300 W can not be used.

I/O Signal table

* You can select one of nine types of I/O signal assignments.

Pin No	Category		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
		Positioning point	64	64	256	512	7	3	32	5	—
1A	24V		P24								P24
2A	24V		P24								P24
3A	—		NC								NC
4A	—		NC								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	PWR
2B		OUT1	PM2	PM2	PM2	PM2	PE1	LS1 (TRQS)	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 can not be used.
Note 2: It is available to use only in Pulse-Train Control Mode PIO Pattern 1.

Field network specification operation mode description (Except for MECHATROLINK-Ⅲ and EtherCAT Motion)

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 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.
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 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	CC-LinkIE Field	MECHATROLINK Ⅰ,Ⅱ	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 bytes	2 bytes	1 channel	4 words	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes
1	Position/simple direct value mode	8 bytes	8 bytes	1 channel	4 words	8 bytes	8 bytes	8 bytes	8 bytes	8 bytes
2	Half direct value mode	16 bytes	16 bytes	2 channel	8 words	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes
3	Full direct value mode	32 bytes	32 bytes	4 channel	16 words	× (Note 1)	32 bytes	32 bytes	32 bytes	32 bytes
4	Remote I/O mode 2	12 bytes	12 bytes	1 channel	4 words	12 bytes	12 bytes	12 bytes	12 bytes	12 bytes
5	Position/simple direct value mode 2	8 bytes	8 bytes	1 channel	4 words	8 bytes	8 bytes	8 bytes	8 bytes	8 bytes
6	Half direct value mode 2	16 bytes	16 bytes	2 channel	8 words	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes
7	Remote I/O mode 3	12 bytes	12 bytes	1 channel	4 words	12 bytes	12 bytes	12 bytes	12 bytes	12 bytes
8	Half direct value mode 3	16 bytes	16 bytes	2 channel	8 words	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	○	○	○	○	○	○	×	○	○

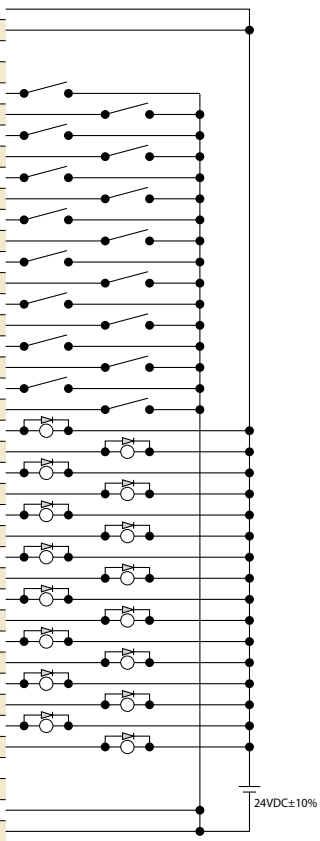
* ○ indicates that the operation is supported, and X indicates that it is not supported.
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.
(Note 2): It can be used when the PIO pattern is set to 6 or 7.

I/O Wiring diagrams

Positioning Mode/Teaching Mode/Solenoid Valve Mode

PIO connector (NPN specification)

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

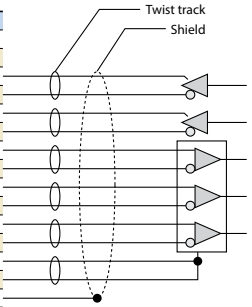


* Connect Pins 1A and 2A to 24 V, and Pins 19B and 20B to 0 V.

Pulse-train Mode (Differential Output)

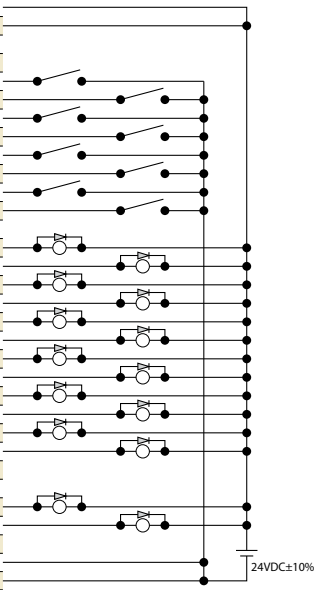
Pulse connector

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



PIO connector (NPN specification)

Pin No.	Category	Signal name
1A	Power supply	24V
2A		24V
3A		Not used
4A		Not used
5A	Input	SON
6A		RES
7A		HOME
8A		TL
9A		CSTP
10A		DCLR
11A		BKRL
12A		RMOD
13A～20A	—	Not used
1B	Output	PWR
2B		SV
3B		INP
4B		HEND
5B		TLR
6B		*ALM
7B		*EMGS
8B		RMDS
9B		ALM1
10B		ALM2
11B		ALM4
12B		ALM8
13B		See (*1)
14B		—
15B		ZONE1
16B		ZONE2
17B～18B	—	Not used
19B	Power supply	0V
20B		0V



* 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

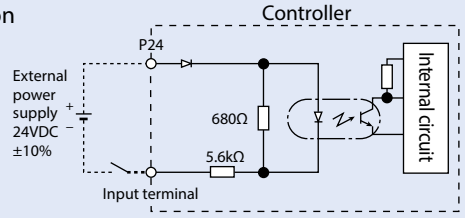
Input Part External Input Specifications

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

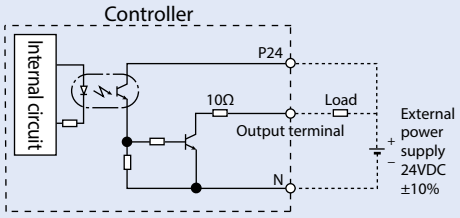
Output Part External Output Specifications

Item	Specification
Load voltage	24VDC
Max. load current	50mA/1 point
Leak current	Max. 0.1mA/1 point
Isolation method	Photocoupler

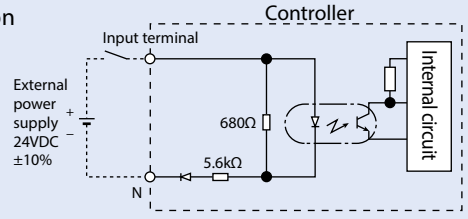
NPN specification



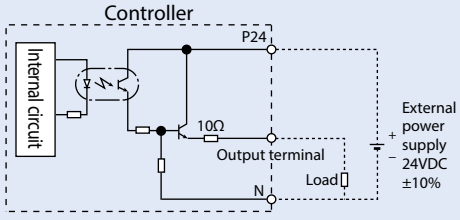
NPN specification



PNP specification



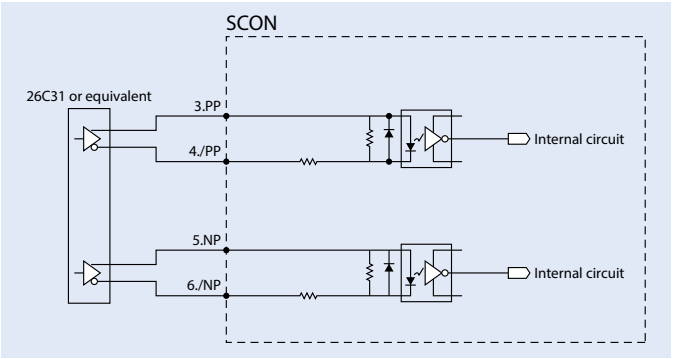
PNP specification



Pulse-train type I/O specification (differential line driver specification) * Except for the field network specification.

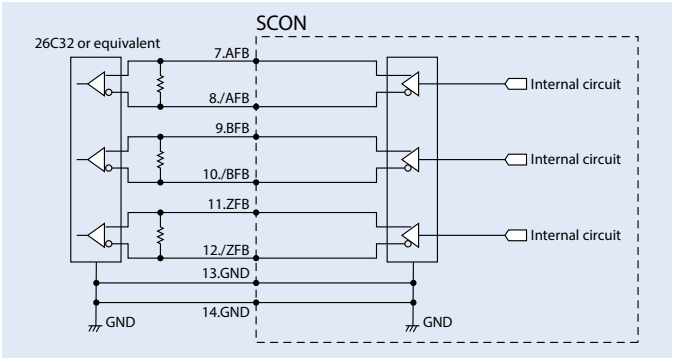
Input Part

Maximum number of input pulses	: Line driver interface 2.5Mppss
Isolation method	: Photocoupler isolation



Output Part

Maximum number of output pulses	: Line driver interface 2.5Mpps
Isolation/non-isolation	: Non-isolation

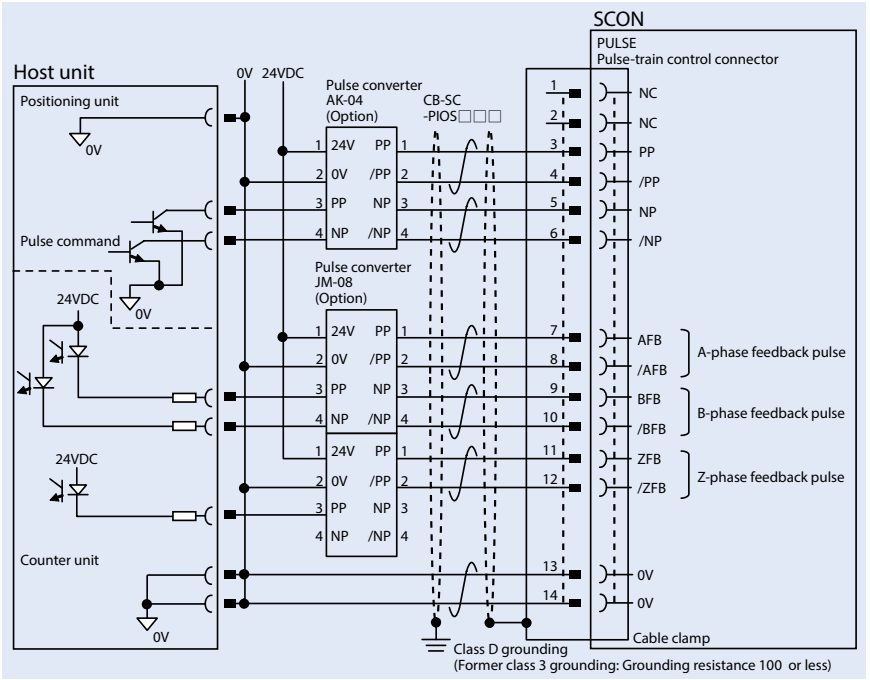


Pulse-train type I/O specification (open-collector specification)

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		
	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 pulse is used for the amount of motor rotation, while the sign indicates the rotating direction.			
	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.			
Positive logic	Forward pulse-train	PP•/PP		
	Reverse pulse-train	NP•/NP		
	Pulse-train	PP•/PP		
	Sign	NP•/NP	High	Low
	Phase A/B pulse-train	PP•/PP		
		NP•/NP		

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 monitor 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		RS48 2ch
Command pulse-train input method (Note 1)		Differential line driver output supported		–
Maximum input pulse frequency (Note 1)		Differential line driver method: 2.5Mpps max./ Open-collector method (pulse converter used): 200kpps max.		–
Feedback pulse (Note 2) (Except for field network specification)		Differential line driver method: Max. 2.5Mpps		–
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		Unavailable
Forced electromagnetic brake release		Brake release switch ON/OFF		
Input power supply		Single-phase AC100~115V±10% Single-phase AC200~230V±10%	Single-phase AC200~230V±10%	Three-phase AC200V~230V±10%
Power-supply capacity (Note 3)		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(continuous), 0.075mm(continuous) 58~150Hz 4.9m/s²(continuous), 9.8m/s²(continuous)		X,Y, and Z directions 10~57Hz single-side width 0.035mm(continuous), 0.075mm(intermittent) 58~150Hz 4.9m/s²(continuous), 9.8m/s²(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℃		
Ambient operating humidity		5%RH - 85%RH (non-condensing, no frost)		
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)

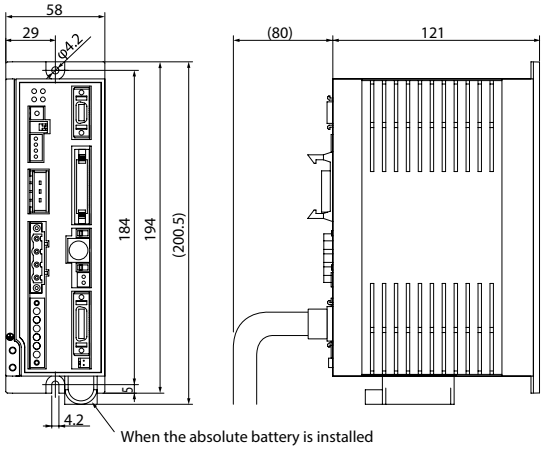
(Note 1) When the master unit is of the open-collector method, covert the pulse to the pulse differential method by AK-04 (see P8-218). The maximum input pulse frequency of AK-04 is 200kpps.
(Note 2) When the master unit is of the open-collector method, covert the pulse to the pulse differential method by JM-08 (see P8-218). The maximum input pulse frequency of JM-08 is 500kpps.
(Note 3) Controllers operating any of the actuator models denoted by (*) shall conform to the external dimensions of controllers for 400W or more, even when the output is less than 400W.

* The number of encoder pulses for the actuators operable with SCON-CB is 1600 pulses for RCS2-SRA7BD/SRGS7BD, 1600 pulses for RCS2-□□5N (incremental), 1048576 pulses for DD(A)-□18P: 20bit, 131072 pulses for DD(A)-□18S: 17bit, 2400 pulses for NS-S□M□ (incremental, 131072 pulses for ISB (battery-less absolute) and 16384 pulses for all the rest.

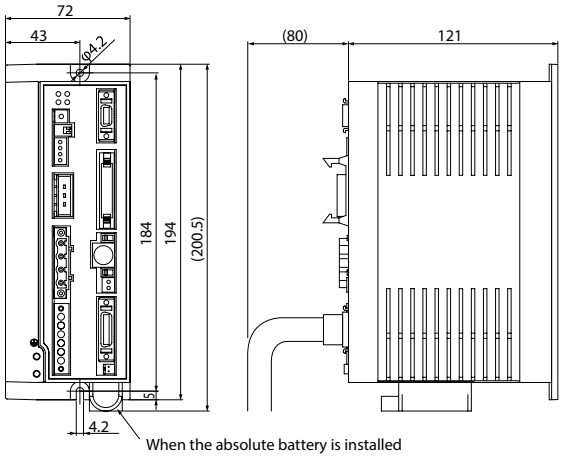
External dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

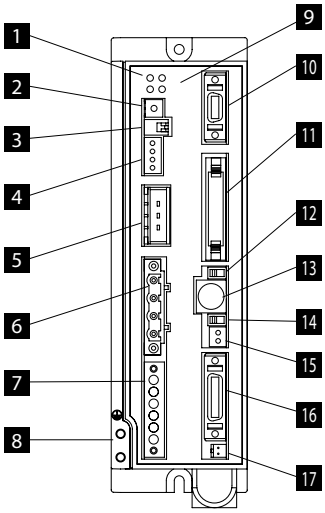
Less than 400W

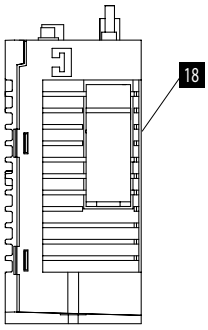


400~750W



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/SS1-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. Also, turn the power off before disconnecting the touch panel teaching pendant and 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 24V DC 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).

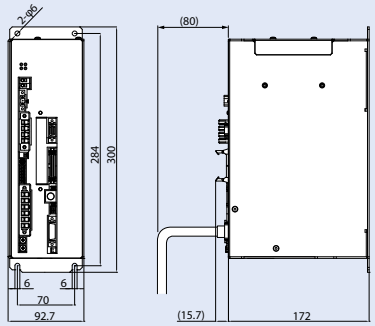
18 Absolute battery holder

It is a battery holder in order to mount the absolute data backup battery.

External dimensions

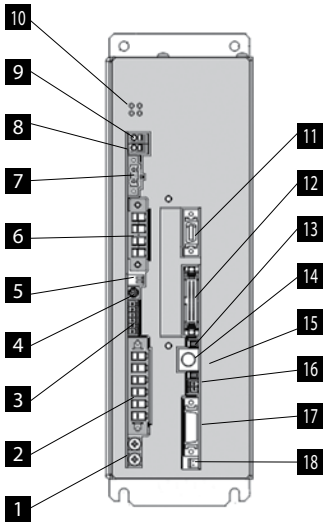
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

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 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 effective 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

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 communication cable connection connector such as a teaching tool and a gateway unit such as PC-compatible software.

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.

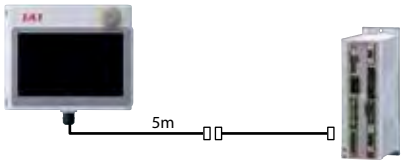
Options

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	5%RH - 85%RH (non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

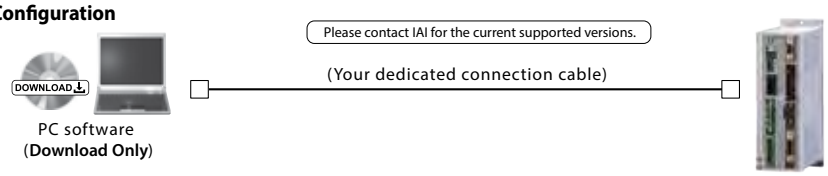
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

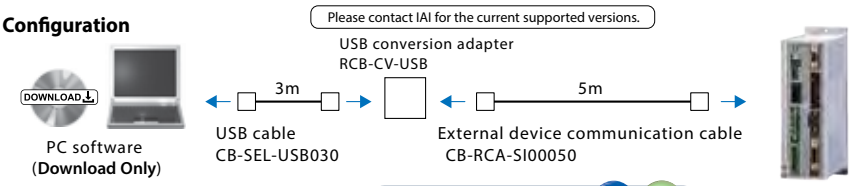
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



Supported Windows versions: 7/10

Regenerative Resistance Unit

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

Features This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the tables below to con rm 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 P8-304).

<For ~750W>

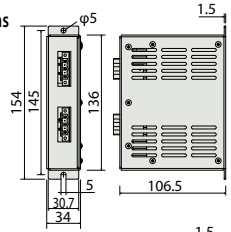
Model **RESU-2** (Standard specification)/ **RESUD-2** (DIN rail mounting specification)

Specification

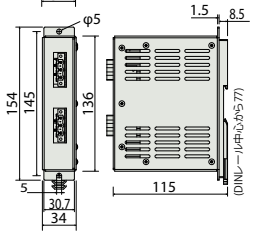
Model number	RESU-2	RESUD-2
Mass	Approximately 0.4kg	
Internal regen. resistance value	235Ω 80W	
Mounting method	Screw mounting	DIN rail mounting
Included cable	CB-SC-REU010	

External dimensions

<RESU-2>



<RESUD-2>



Necessary Amount Guideline

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

* The required regenerative resistance may be more than as specified above depending on the operating conditions.
* The guide of the linear servo actuator is same as the above table. However, one LSA / LSAS-N10S type is required.

Necessary Amount 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.

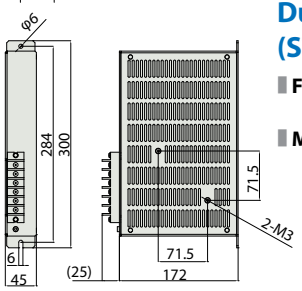
Necessary Amount Guideline(DD)

Series	Type	Required Quantity
DD DDA	LT18□ LH18□	1 2

<For 3000W・3300W>

Model **RESU-35T**

<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

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

Features This plug is required when the safety category specification (SCON-CGB) is used.

Model **DP-5**

Dummy plug (STO/SS1-t specification)

Features Feature: Necessary when STO/SS1-t function is not used.

Model **DP-6**

Maintenance parts

When placing an order for the 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-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS2	RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③		RA13R (Standard)			CB-RCS2-PLA□□□	CB-X2-PLA□□□
④		RA13R (With brake)			CB-RCS2-PLA□□□ * Between controller and brake CB-RCS2-PLA□□□	CB-X2-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		With LS	–		–	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□□□	–	CB-X3-PA□□□ * 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 21m or longer) *
⑲	Models with LS other than ① - ⑰		–		–	CB-X1-PLA□□□ (In case of 20 m or shorter) *
						CB-X1-PLA□□□-AWG24 (in case of 21m or longer) *

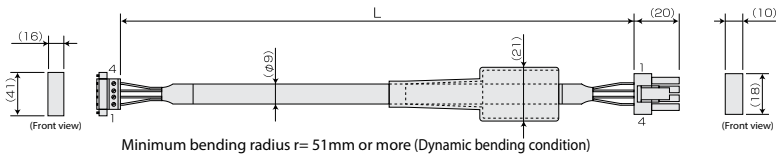
* Model that is not battery-less absolute specification will be CB-X1-PA □□□ / CB-X1-PLA □□□ even when it is 20 m or more.

Model Number	PIO flat cable	Pulse-train control cable	I/O cable for safety function
⑳ SCON-CB	CB-PAC-PIO□□□	CB-SC-PIOS□□□	CB-SC-STO030

* Please refer to P<?>-214~ for the cable of load cell specification of RCS2-RA13R.

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

* Please indicate the cable length (L) in □□□ , maximum 30m, e.g.) 080 = 8m



* Only robot cable is available for this model.

GIC2.5/4-STF-7.62 (Phoenix)

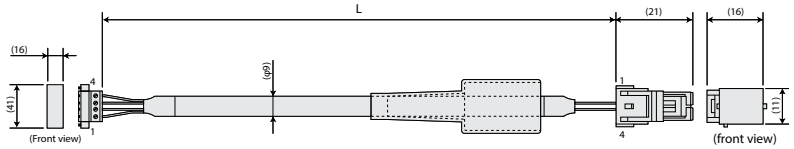
Wiring	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

SLP-04V (JST)

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

Model Number CB–XMC–MA□□□

* Please indicate the cable length (L) in □□□ , e.g.) 080 = 8m maximum SCON/SSEL:20m, XSEL:30m



* Only robot cable is available for this model.

GIC2.5/4-STF-7.62 (Phoenix)

Wiring	Color	Signal	No.
1.25sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

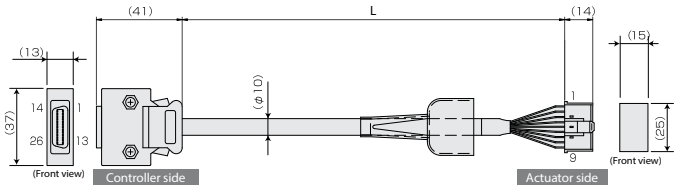
YLP-04V (JST)

No.	Signal	Color	Wiring
1	U	Red	1.25sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

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= 58mm or more (Dynamic bending condition)

*** Please use the robot cable if the cable has to be installed through the cable track.**

10126-3000PE(Sumitomo 3M)

Wiring	Color (RCS2)	Color (X3)	Signal	No.
AWG26 (soldered)	-	-	—	10
	-	-	—	11
	-	-	E24V	12
	Gray/White	White/Green	OV	13
	Brown/White	White/Orange	LS	26
	-	-	CREEP	25
	-	-	OT	24
	-	-	RSV	23
	-	-	—	9
	-	-	—	18
	-	-	—	19
	Pink	White/Blue	A+	1
	Purple	White/Yellow	A—	2
	White	White/Red	B+	3
	Blue/Red	White/Black	B—	4
	Orange/White	White/Purple	Z+	5
	Green/White	White/Gray	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

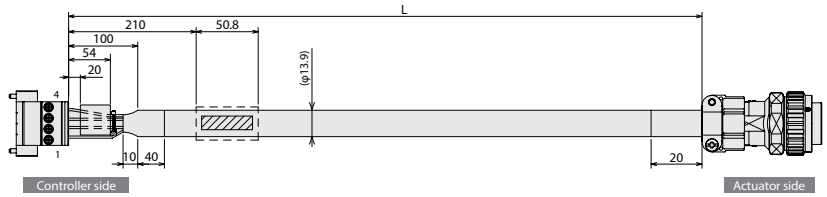
The shield is clamped to the hood.

YLP-04V (JST)

No.	Signal	Color (RCS2)	Color (X3)	Wiring
1	A	Pink	White/Blue	AWG26 (crimped)
2	Ā	Purple	White/Yellow	
3	B	White	White/Red	
4	B̄	Blue/Red	White/Black	
5	Z	Orange/White	White/Purple	
6	Z̄	Green/White	White/Gray	
7	LS+	Brown/White	White/Orange	
8	—	-	-	
9	FG	Ground	Ground	
10	SD	Blue	Orange	
11	SD	Orange	Green	
12	BAT+	Black	Purple	
13	BAT—	Yellow	Gray	
14	VCC	Green	Red	
15	GND	Brown	Black	
16	LS—	Gray/White	White/Green	
17	BK—	Gray	Blue	
18	BK+	Red	Yellow	

Model Number 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)

GIC2.5/4-STF-7.62(Phoenix)

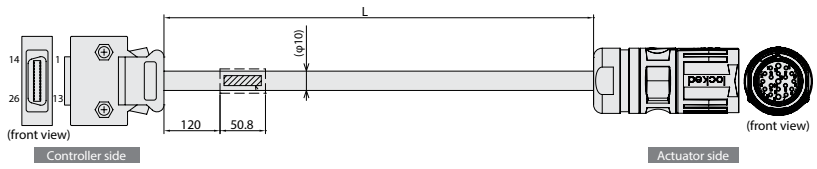
Wiring	Color	Signal	No.
AWG12	Green/Yellow	PE	1
	Black1	U	2
	Black2	V	3
	Black3	W	4

JL10-6A18-10SE-EB(JAE)

No.	Signal	Color	Wiring
A	U	Black1	AWG12 (soldered)
B	V	Black2	
C	W	Black3	
D	PE	Green/Yellow	

Model Number 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)

10126-3000PE(Sumitomo 3M)

Wiring	Color	Signal	No.
AWG26 (soldered)	—	—	11
	White/Orange	E24V	12
	White/Green	E24G	13
	Brown/Blue	LS	26
	Brown/Yellow	CLEEP	25
	Brown/Red	OT	24
	Brown/Black	RSV	23
	White/Blue	LC_SRD+	9
	White/Yellow	LC_SRD-	10
	White/Red	LC_VCC	18
	White/Black	LC_GND	19
	—	—	1
	—	—	2
	—	—	3
	—	—	4
	—	—	5
	—	—	6
	Orange	SRD+	7
	Green	SRD-	8
	Purple	BAT+	14
	Gray	BAT-	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR-	20
	Yellow	BKR+	21
	—	—	22

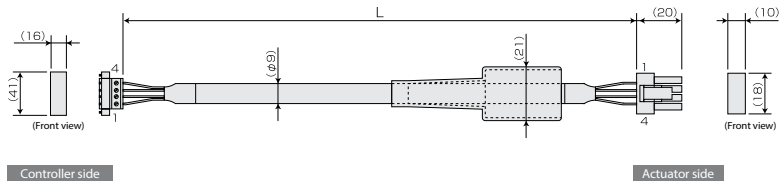
The shield is clamped to the hood.

CA-19S1N1280DNS(Phoenix)

No.	Signal	Color	Wiring
1	LS	Brown/Blue	AWG26 (soldered)
2	CLEEP	Brown/Yellow	
3	OT	Brown/Red	
4	RSV	Brown/Black	
5	BAT+	Purple	
6	VCC	Red	
7	LC_SRD+	White/Blue	
8	LC_SRD-	White/Yellow	
9	LC_VCC	White/Red	
10	BKR+	Yellow	
11	BKR-	Blue	
12	FG	Ground	
13	E24V	White/Orange	
14	BAT-	Gray	
15	SRD+	Orange	
16	SRD-	Green	
17	LC_GND	White/Black	
18	E24G	White/Green	
19	GND	Black	

Model Number CB-X-MA□□□

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m



Minimum bending radius r= 51mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

GIC2.5/4-STF-7.62 (Phoenix)

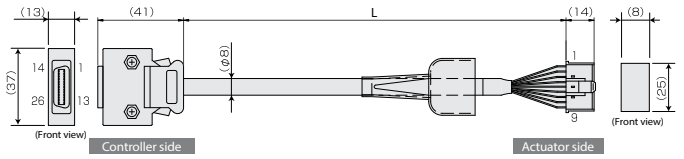
Wiring	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

SLP-04V (JST)

No.	Signal	Color	Wiring
1	U	Red	0.75sq (crimped)
2	V	White	
3	W	Black	
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= 44mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

*** 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.**

10126-3000PE(Sumitomo 3M)

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

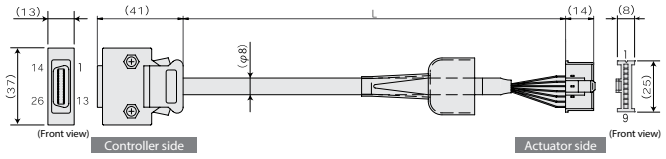
The shield is clamped to the hood.

XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	Purple	AWG26 (crimped)
2	BAT–	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK–	Blue	
9	BK+	Yellow	

Model Number CB-X1-PA□□□-AWG24

* Please indicate the cable length (L) in □□□ , maximum 30m, e.g.) 210 = 21m



Minimum bending radius r= 44mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

10126-3000PE(Sumitomo 3M)

Wiring	Color	Signal	No.
	–	–	10
	–	–	11
	–	E24V	12
	–	0V	13
	–	LS	26
	–	CREEP	25
	–	OT	24
	–	RSV	23
	–	–	9
	–	–	18
	–	–	19
	–	A+	1
AWG24 (soldered)	–	A–	2
	–	B+	3
	–	B–	4
	–	Z+	5
	–	Z–	6
	Orange	SRD+	7
	Green	SRD–	8
	–	BAT+	14
	–	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

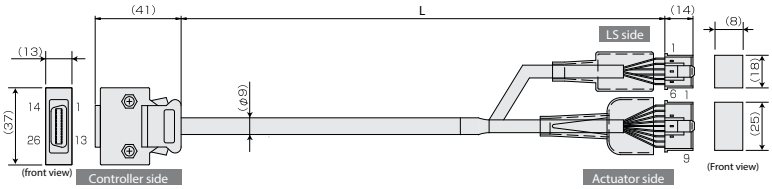
The shield is clamped to the hood.

XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	–	AWG24 (crimped)
2	BAT–		
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK–	Blue	
9	BK+	Yellow	

Model Number CB-X1-PLA□□□

* Please indicate the cable length (L) in □□□ , maximum 30m, e.g.) 080 = 8m



Minimum bending radius r= 54mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

*** 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.**

10126-3000PE(Sumitomo 3M)

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

The shield is connected to cable clamp.

XMP-06V (JST)

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

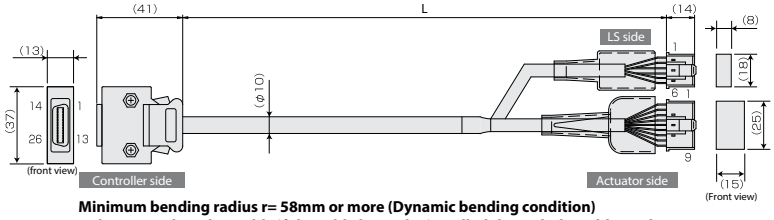
XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	Purple	AWG26 (crimped)
2	BAT–	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK–	Blue	
9	BK+	Yellow	

(The wire color "White/Blue" indicates the colors

Model Number CB-RCS2-PLA□□□(For RCS2 rotary)/CB-X2-PLA□□□(NS LS Specification /for RCS2 rotary)

* 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.**

10126-3000PE(Sumitomo 3M)

Wiring	Color (RCS2)	Color (X2)	Signal	No.
	–	–	–	10
	–	–	–	11
Brown/White	White/Orange		E24V	12
Gray/White	White/Green		0V	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
–	–		–	9
–	–		–	18
–	–		–	19
Pink	White/Blue		A+	1
Purple	White/Yellow		A–	2
White	White/Red		B+	3
Blue/Red	White/Black		B–	4
Orange/White	White/Purple		Z+	5
Green/White	White/Gray		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

AWG26 (soldered)

The shield is connected to cable clamp.

(The wire color "White/Blue" indicates the colors of the band and insulation)

XMP-06V (JST)

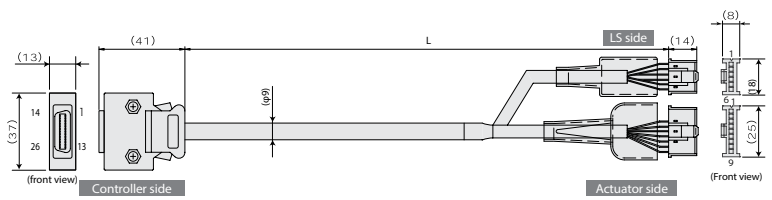
No.	Signal	Color (RCS2)	Color (X2)	Wiring
1	E24V	Brown/White	White/Orange	AWG26 (crimped)
2	0V	Gray/White	White/Green	
3	LS	Red/White	Brown/Blue	
4	CREEP	Black/White	Brown/Yellow	
5	OT	Yellow/Black	Brown/Red	
6	RSV	Pink/Black	Brown/Blac	

XMP-18V (JST)

No.	Signal	Color (RCS2)	Color (X2)	Wiring
1	A+	Pink	White/Blue	AWG26 (crimped)
2	A–	Purple	White/Yellow	
3	B+	White	White/Red	
4	B–	Blue/Red	White/Black	
5	Z+	Orange/White	White/Purple	
6	Z–	Green/White	White/Gray	
7	–	–	–	
8	–	–	–	
9	FG	Ground	Ground	
10	SD	Blue	Orange	
11	SD	Orange	Green	
12	BAT+	Black	Purple	
13	BAT–	Yellow	Gray	
14	VCC	Green	Red	
15	GND	Brown	Black	
16	–	–	–	
17	BK–	Gray	Blue	
18	BK+	Red	Yellow	

Model Number CB-X1-PLA□□□-AWG24

* Please indicate the cable length (L) in □□□ , maximum 30m, e.g.) 210 = 21m



Minimum bending radius r= 54mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

10126-3000PE(Sumitomo 3M)

Wiring	Color	Signal	No.
	–	–	10
	–	–	11
White/Blue	E24V		12
White/Yellow	0V		13
White/Red	LS		26
White/Black	CREEP		25
White/Purple	OT		24
White/Gray	RSV		23
	–	–	9
	–	–	18
	–	–	19
	–	A+	1
AWG24 (soldered)	–	A–	2
	–	B+	3
	–	B–	4
	–	Z+	5
	–	Z–	6
Orange	SRD+		7
Green	SRD–		8
–	BAT+		14
–	BAT–		15
Red	VCC		16
Black	GND		17
Blue	BKR–		20
Yellow	BKR+		21
–	–		22

The shield is connected to cable clamp.

XMP-06V (JST)

No.	Signal	Color	Wiring
1	E24V	White/Blue	AWG24 (crimped)
2	0V	White/Yellow	
3	LS	White/Red	
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	

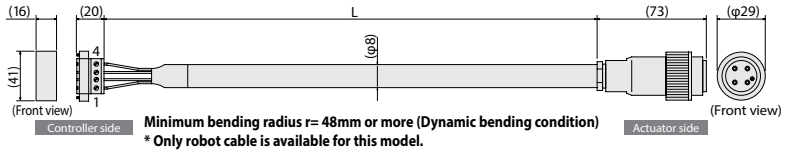
XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	–	AWG24 (crimped)
2	BAT–		
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK–	blue	
9	BK+	Yellow	

(The wire color "White/Blue" indicates the colors of the band and insulation)

Model Number CB-XEU-MA□□□

* Please indicate the cable length (L) in □□□ , maximum 30m, e.g.) 080 = 8m



Minimum bending radius r= 48mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

Plug
GIC2.5/4-STF-7.62 (Phoenix)

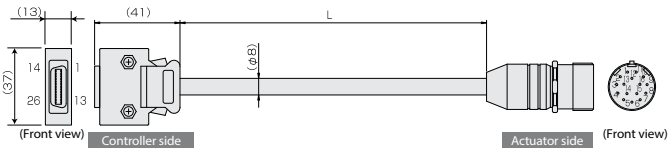
Wiring	Color	Signal	No.
0.75sq	Green/Yellow	PE	1
	White letter "1" on black	U	2
	White letter "2" on black	V	3
	White letter "3" on black	W	4

Plug connector
99-4222-00-04(BINDER)

No.	Signal	Color	Wiring
⊕	PE	Green/Yellow	0.75sq (crimped)
1	U	White letter "1" on black	
2	V	White letter "2" on black	
3	W	White letter "3" on black	

Model Number CB-X1-PA□□□-WC

* Please indicate the cable length (L) in □□□ , maximum 30m, e.g.) 080 = 8m



Minimum bending radius r= 44mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

10126-3000PE(Sumitomo 3M)

Wiring	Color	Signal	No.
AWG26 (soldered)	—	—	10
	—	—	11
	—	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
	Green	SRD−	8
	Purple	BAT+	14
	Gray	BAT−	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR−	20
	Yellow	BKR+	21
	—	—	22

The shield is connected to cable clamp.

(The wire color "White/Blue" indicates the colors of the band and insulation)

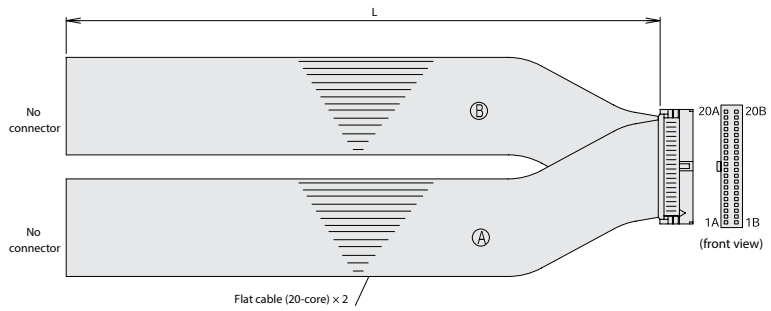
99-4630-00-16(BINDER)

No.	Signal	Color	Wiring
1	SD	Orange	AWG26 (soldered)
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 metal sleeve.

Model Number CB-PAC-PIO□□□

* Please indicate the cable length (L) in □□□ , maximum 10m, e.g.) 080 = 8m

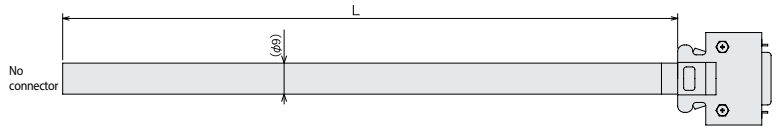


HIF6-40D-1.27R(Hirose)

No.	Signal name	Cable Color	Wiring	No.	Signal name	Cable Color	Wiring
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded)	1B	OUT0	Brown-3	Flat cable Ⓑ (pressure-welded) AWG28
2A	24V	Red-1		2B	OUT1	Red-3	
3A	—	Orange-1		3B	OUT2	Orange-3	
4A	—	Yellow-1		4B	OUT3	Yellow-3	
5A	IN0	Green-1		5B	OUT4	Green-3	
6A	IN1	Blue-1		6B	OUT5	Blue-3	
7A	IN2	Purple-1		7B	OUT6	Purple-3	
8A	IN3	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 Number CB-SC-PIOS□□□

* Please indicate the cable length (L) in □□□ , maximum 10m, e.g.) 080 = 8m



10114-3000PE(Sumitomo 3M)

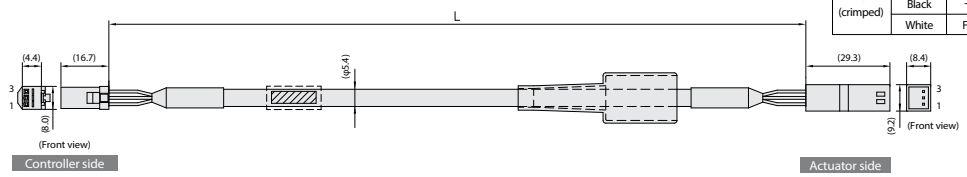
Wiring	Color	Signal	No.
0.2sq (soldered)	Black	No use	1
	White/Black	No use	2
	Red	PP	3
	White/Red	/PP	4
	Green	NP	5
	White/Green	/NP	6
	Yellow	APB	7
	White/Yellow	/APB	8
	Brown	BPB	9
	White/Brown	/BPB	10
	Blue	ZPB	11
	White/Blue	/ZPB	12
	Gray	GND	13
	White/Gray	GND	14

The shield is connected to cable clamp.

Black
White/Black
Red
White/Red
Green
White/Green
Yellow
White/Yellow
Brown
White/Brown
Blue
White/Blue
Gray
White/Gray
Shield

Model Number CB-DDB-BK□□□

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



J11SF-03V-KX(JST)

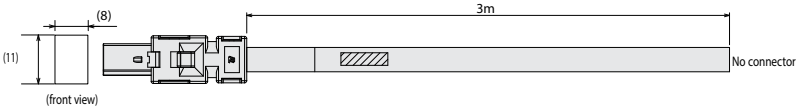
Wiring	Color	Signal	No.
AWG20 (crimped)	Red	+	3
	Black	−	2
	White	FG	1

J11SFM-03V-KX(JST)

No.	Signal	Color	Wiring
3	+	Red	AWG20 (crimped)
2	−	Black	
1	FG	White	

Model Number CB-SC-STO 030

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



2013595-1(TE)

Wiring	Color	Signal	No.
AWG26	—	—	1
	—	—	2
	Black	/SRI1−	3
	Black/White	/SRI1+	4
	Red	/SRI2−	5
	Red/White	/SRI2+	6
	Green	EDM−	7
	Green/White	EDM+	8

Shield is connected to the cable clamp.

Black
Black/white
Red
Red/white
Green
Green/white
Shield

* Wire color: (ex.) Black/White represents white lines on the black insulator.

SCON-CB <Sero press specification>

Servo Press dedicated controller (SCON-CB F)

CE (*1) RoHS 10 c UL us (*2)

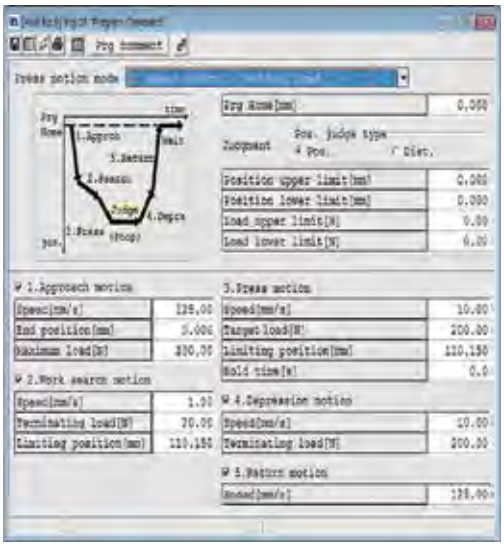
(*1) MECHATROLINK-I/II connection specification is not compliant with CE Marking.
(*2) 3000 and 3300W types are not compliant with UL standard.

Features

1 Equipped Dedicated Press Program

There are 9 types of press-operation modes to choose from

Speed control After arriving at the target position, stops while maintaining the position at the time of arrival.	Position stop
	Distance stop
	Load stop
	Incremental load stop
Force control After arriving at the target position, stops while maintaining the force at the time of arrival.	Position stop/Position stop2
	Distance stop
	Load stop
	Incremental load stop



Simple program input

Simply operate the program by inputting the values into the screen for each press-operation mode that you are using.
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 more microscopic 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 speci•ed range.

2 Assignment of I/O Signals Specialized for the Servo Press Functions

The assignment of servo press dedicated I/O signals is completely different than the former PIO pattern.

3 Predictive Maintenance Functions

- A function that issues a warning when a motor overload is detected has been included
  Monitoring changes in the temperature of the motor makes it possible to detect abnormalities before the occurrence of a breakdown or a malfunction.
- Improvement of monitoring functions
  Similar to the trigger function of an oscilloscope, it is now possible to acquire the waveforms of the current position, current speed, etc. from the instant the state of the selected signal changes. Also, it is possible to acquire the signal states of positioning completion, alarms, etc.
- A function that integrates the number of cycles with the distance covered makes it possible to check maintenance timing.
- The calendar function makes it possible to keep a timetable of the alarms that have been generated.

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 specification are available; STO and SS1-t specification.
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 Ple
- 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	CC-Link	CC-Link IE Field	PROFIBUS-DP	CompoNet	MECHATROLINK	EtherCAT	EtherNet/IP	PROFINET
			DeviceNet connection specification	CC-Link connection specification	CC-Link IE Field connection specification	PROFIBUS-DP connection specification	CompoNet connection specification	MECHATROLINK-I/II connection specification	EtherCAT connection specification	EtherNet/IP connection specification	PROFINET IO connection specification
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 or pulse-train is not available.

Model

SCON – [Series] – [Type] – [Motor Type] [Encoder Type] F – [I/O Type] – [I/O Cable Length] – [Power Supply Voltage] – [Safety type]

Type

CB	Standard
CGB	Safety category compliant type

* Only CGB can be selected for RCS3-RA15R/20R.

Motor Type

30D	30W	400	400W
60	60W	750S	750W
100	100W	3000	3000W
200	200W	3300	3300W

(Example) 60: 60 W servo motor compatible

Encoder Type

WAI	PROFINET IO

F

F	For servo press only (Note 1)

(Note 1) If you do not use the press program, it will be blank. (Excluding 3000 W, 3300 W)

I / O Type

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

(Note 1) Please be sure to check P8-20 for the caution when selecting.

I/O Cable Length

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

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

Power Supply Voltage

1	Single phase AC100V
2	Single phase AC200V
3	Three phase AC200V

* Please check the power supply voltage that can be selected on the page of the actuator.

Safety type

Not specified	Standard type
STO	STO type
SS	SS1-t type

* Only the standard type is selectable for RCS3-RA15R/20R.

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.

<30 D · 750 S Applicable actuator>

●Controller Motor type "30D"
RCS3-RA4R

●Controller Motor type "750S"
RCS 2 - RA 13 R When option LCT is selected

System configuration

Option
* Required when using actuator option with brake

24-VDC power supply
(See P8-313
<Model: PSA-24>

Supplied with SCON-CGB

Dummy plug
(See P8-241)
<Model number: DP-5>

Supplied with the controller when the absolute spec. is selected.

Absolute data backup battery
(See P8-241)
<Model number: AB-5>

Option

Regenerative resistance unit
(See P8-241)
<Model number: RESU-2/RESUD-2>
<Model number: RESU-35T>

* Please use the optional JM-08 converter if the host controller uses open-collector specification. (See P8-235)

Supplied with controller

I/O flat cable
(See P8-242)
<Model number: CB-PAC-PIO020>
Standard cable length: 2m

Field network

DeviceNet
CC-Link
CC-Link IE
PROFIBUS-DP
CompoNet
MECHATROLINK- I / II
EtherCAT
EtherNet/IP
PROFINET IO

Caution
PIO control and field network cannot be combined.

Supplied with controller

Plug and shell for multi-function connector

SCON-CB

Motor Power Circuit Breaker
(Customer to supply)
Required only for CGB type

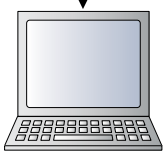
Main power supply
Single phase AC100V
Single phase AC200V
Three phase AC200V

*** When connecting to a power source, please make sure to use a noise filter.**
Recommended model NF2010A-UP (manufacturer: Soshin Electric Co., Ltd.)
(Available for purchase, please contact for the details)

* In the case of RA15R, 20R, drive source interruption circuit is required externally.

Option

PC dedicated teaching software
(See P8-241)
Software only
<Model: RCM-101-MW>
Supplied with the dedicated connection cable
<Model: RCM-101-USB>



Option

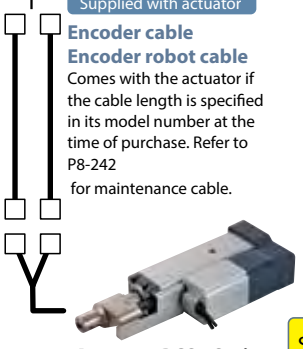
Touch panel teaching pendant
(See P8-241)
<Model number: TB-02-□>
Please contact IAI for the current supported versions.

Supplied with actuator

Motor cable
Motor robot cable
Comes with the actuator if the cable length is specified in its model number at the time of purchase. Refer to P8-242 for maintenance cable.

Supplied with actuator

Encoder cable
Encoder robot cable
Comes with the actuator if the cable length is specified in its model number at the time of purchase. Refer to P8-242 for maintenance cable.



Actuator RCS3 Series

* The wiring of the RCS2-RA13R is shown below.

Included with the controller for the STO/SS1-t specification types.

Dummy plug
(See P8-241)
<Model number: DP-6>

Option

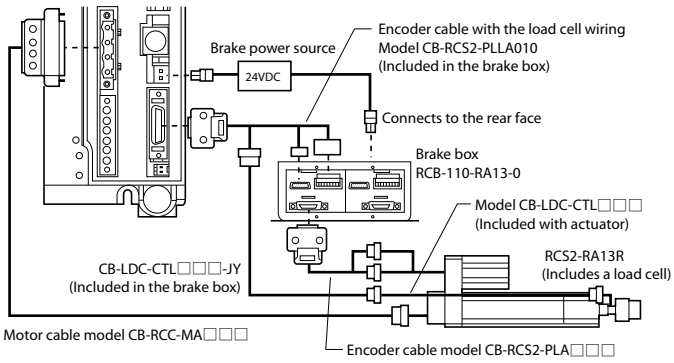
I/O cable for safety function
(See P 8-244)
<Model number: CB-SC-ST0030>

Safety Circuit

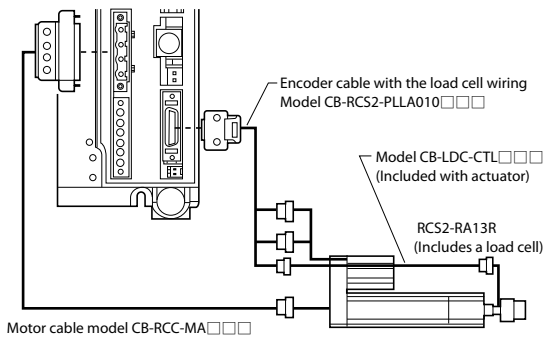
RCS2-RA13R wiring

RCS2-RA13R option: If the brake (No brake box) "BN" is selected and used as the second axis of the brake box, "Cb-ldc-ctl □ □ □-JY", CB-RCS2-PLLA010 should be purchased separately.

With a Brake



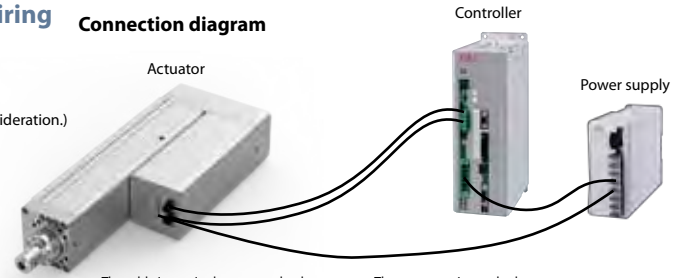
Without a Brake



RCS 3 - RA 15 R / 20 R (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.)
24v DC Supply is required for both actuators and controllers.

Connection diagram



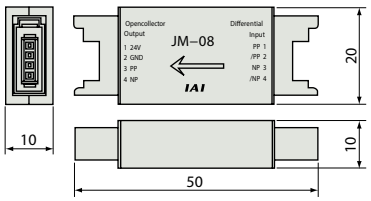
The cable is required to prepare by the customer. The connector is attached.
* Please check the instruction manual for details.

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 power line 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	Forcibly release brake
17A		IN12	RMOD	Operation mode switching
18A		IN13	HOME	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	ALM Alarm (Negative logic)
16B		OUT15	*ALML	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 direct value mode	In addition to servo press functions such as start of press program and determination result reading, it supports all functions such as direct numerical movement and current load data reading.
2	Press direct value mode	This is an operation mode that designates the "press stage" of a press program by direct value. Press direct value motions and positioning direct value motions are possible.

■Required Data Size for Each Network

	Mode	DeviceNet	CompoNet	CC-Link	CC-Link IE Field	MECHATROLINK Ⅰ, Ⅱ	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 byte	2 byte	1 station	4 words	2 byte	2 byte	2 byte	2 byte	2 byte
1	Full direct value mode	32 byte	32 byte	4 stations	16 words	× (Note 1)	32 byte	32 byte	32 byte	32 byte
2	Press direct value mode	32 byte	32 byte	4 stations	16 words	× (Note 1)	32 byte	32 byte	32 byte	32 byte

(Note 1) Please not that the MECHATROLINK specification does not support the full direct value mode.

■List of Functions by Operation Mode

	Remote I/O mode	Full direct value mode (Note 1)	Press direct value mode (Note 1)
Operation by position data input	×	○	○
Direct speed/acceleration input	×	○	○
Press load direct command	×	×	○
Current position reading	×	○	○
Current speed reading	×	○	○
Operation by program No. input	○	○	○
Judgment result reading	○	○	○
Current speed read	×	○	○
Overload level monitor	×	○	○
Servo gain switching	○ (*1)	○ (*1)	○

(*1) One servo gain can be registered in one press program.
(Note 1) MECHATROLINK does not support the full function mode and press direct value 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.

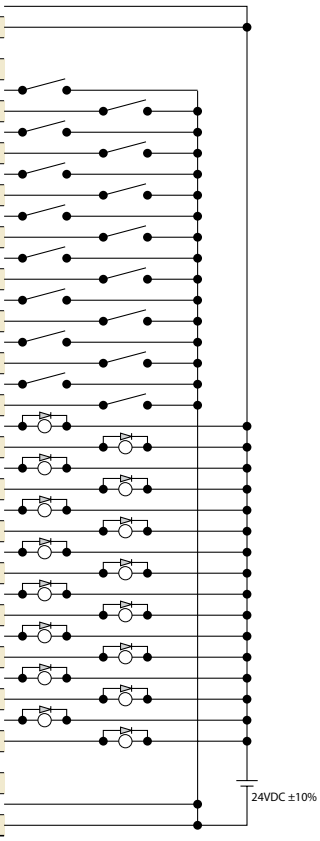
■Signals of I/O connector for safety function

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 the safety function is functioning without failure.
8	EDM+		

I/O Wiring diagram

PIO connector (NPN specification)

Pin number	Classification	Signal name
1A	Power supply	24V
2A		24V
3A	—	Unused
4A	—	Unused
5A	Input	IN0
6A		IN1
7A		IN2
8A		IN3
9A		IN4
10A		IN5
11A		IN6
12A		IN7
13A		IN8
14A		IN9
15A		IN10
16A		IN11
17A		IN12
18A		IN13
19A		IN14
20A		IN15
1B	Output	OUT0
2B		OUT1
3B		OUT2
4B		OUT3
5B		OUT4
6B		OUT5
7B		OUT6
8B		OUT7
9B		OUT8
10B		OUT9
11B		OUT10
12B		OUT11
13B		OUT12
14B		OUT13
15B		OUT14
16B		OUT15
17B	—	Unused
18B	—	Unused
19B	Power supply	0V
20B		0V



* Connect pin numbers 1A and 2A to 24V, and connect pin numbers 19B and 20B to 0V.

PIO Input/Output interface

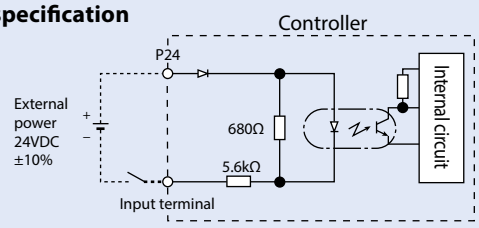
Input part External Input Specification

Item	Specification
Input voltage	24VDC ±10%
Input current	4mA, 1 circuit
ON/OFF voltage	ON voltage, 18VDC min. OFF voltage, 60VDC max.
Isolation method	Photo-coupler

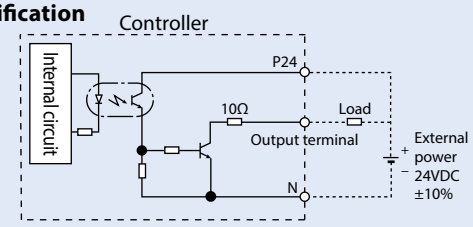
Output part Part External Output Specifications

Item	Specification
Load voltage	24VDC
Maximum load current	50mA, 1 circuit
Leakage current	0.1 mA or less / 1point
Isolation method	Photo-coupler

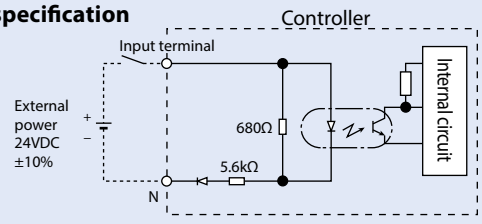
NPN specification



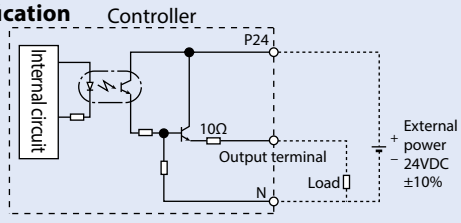
NPN specification



PNP specification

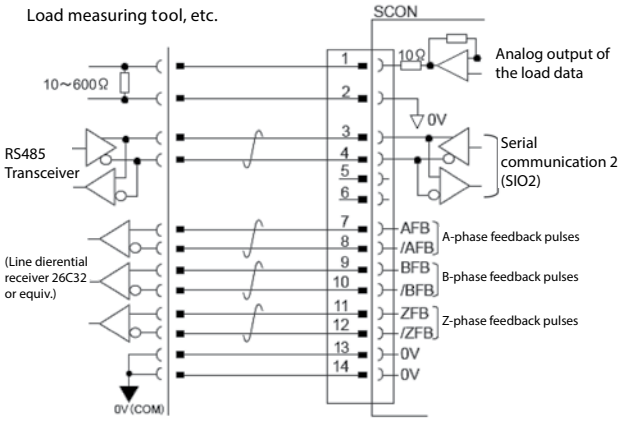


PNP specification

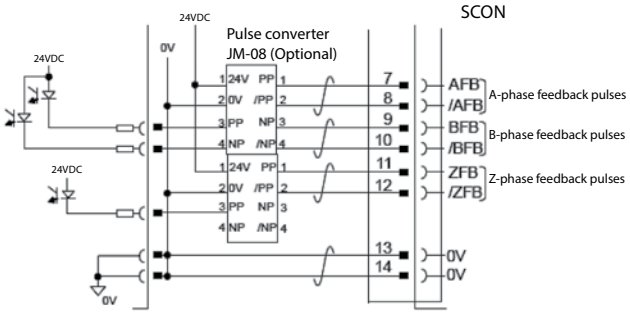


Multi-function connector (interface)

①When the host controller inputs feedback pulses with a line differential receiver.



②A pulse converter (JM - 08: option) is required when the host controller inputs feedback pulses with an open collector.



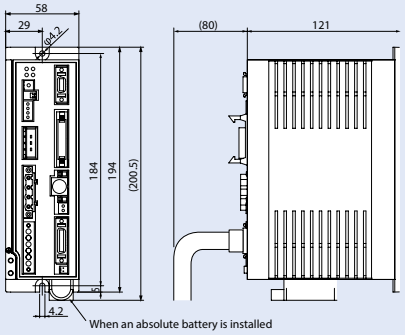
Specifications

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 Actuatoe.
Serial communication			RS485 2ch		
Position detection methods			Incremental encoder / Absolute encoder		
Driving power shut-o function			CB: Available (built-in relay) CGB: Unavailable		
Electromagnetic brake force release			Brake release switch ON/OFF		
Input power			Single phase AC100~115V ±10% Single phase AC200~230V ±10%	Single phase AC200~230V ±10%	Three phase AC200~230V ±10%
Power supply capacity			30W/94VA 60W/186VA 100W/282VA 200W/469VA	400W/968VA 750W/1569VA	3000W/5705VA 3300W/6062VA
SCONCB/ CGB	External interface	PIO specification	Dedicated 24VDC signal inputs/outputs (NPN/PNP selectable) --- Max. of 16 input/16 output points		
		Field bus specification	DDeviceNet, 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/s² (continuous), 9.8m/s² (intermittent)		
Calendar/ clock function	Retention time		Approximately 10 days		
	Charging time		Approximately 100 hours		
Protection functions			Excess current, temperature abnormalities, monitoring of fan speed drops, encoder disconnection, etc.		
Internal regenerative resisitance value			2000Ω 10W		34Ω 160W
Ambient operating temperature			0~40°C		
Ambient operating humidity			5%RH - 85%RH (non-condensing, no frost)		
Ambient operating atmosphere			Free from corrosive gases		
Protection class			IP20		
Mass			Approx. 900g (an absolute specification is 25g heavier)	Approx. 1.2kg (an absolute specification is 25g heavier)	Approx. 2.8kg (an absolute specification is 25g heavier)
External dimensions			58mm(W)×194mm(H)×121mm(D)	72mm(W)×194mm(H)×121mm(D)	92.7mm(W)×300mm(H)×172mm(D)

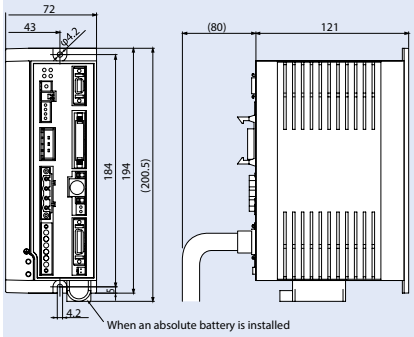
External dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

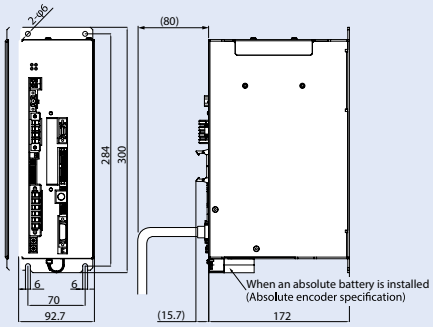
Less than 400W



400W~750W

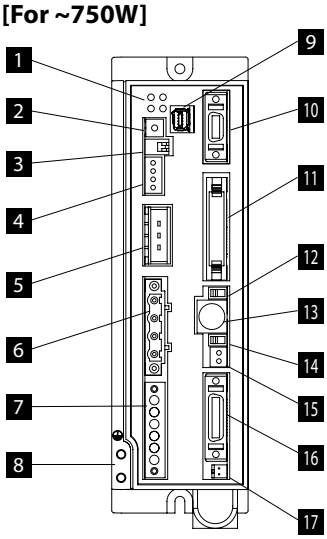


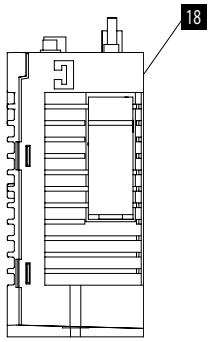
For 3000W, 3300W



Names of the parts

[For ~750W]





1 LED display(PWR, SV, ALM, EMG)

Indicates the status of the controller.

Name	Color	
PWR	Green	Turned ON when the system is ready (after power input and while CPU is normally functioning).
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 Rotary 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 Grounding 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)

This connector is to output the feedback pulses, analog load data of the load cell, and to use the SIO communication function (SIO2).

11 PIO connector

Used to connect communication cable between 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 teaching pendant is enabled when the connection is made, regardless of the states, AUTO or MANU. Turn the power OFF before removing the teaching pendant and SIO communication cable.

13 SIO connector(SIO)

Used to connect the 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 used to connect lines to brake power supply (24VDC) (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

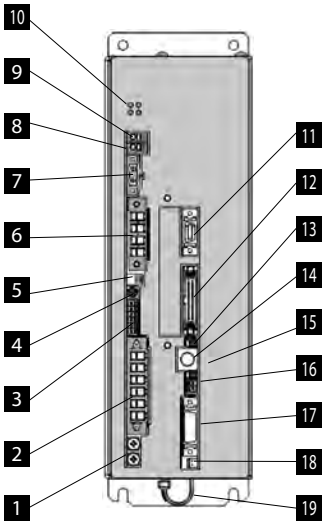
Connector used to connect the absolute data backup battery (only when the actuator with an absolute encoder is selected).

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~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 effective 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 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)

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 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.

19 Absobattery Holder (comes with absolute specifications)

Absobattery storage holder.

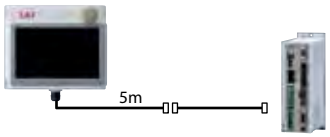
Options

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	5%RH - 85%RH (non-condensing, no frost)
Protection class	IP20
Mass	470g (TB-02 main unit only)

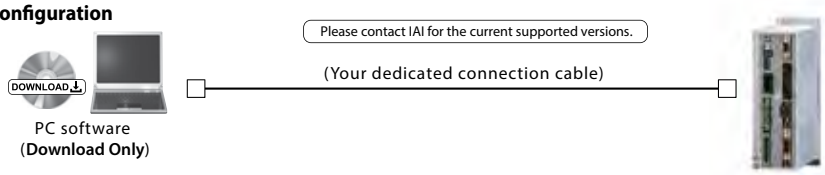
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring.
It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

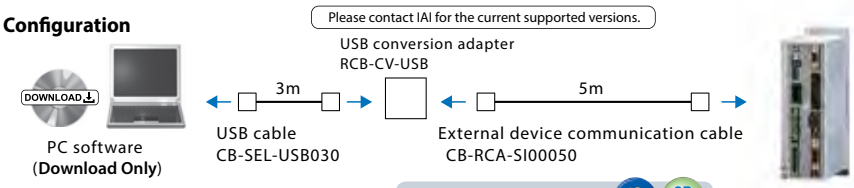
Configuration



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Configuration



Regenerative Resistance Unit

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

Features This unit converts the regenerative current, which is generated when the motor decelerates, into heat.
Please refer to the tables below to con rm 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 P8-304).

<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	

Necessary Amount Guideline

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

* Depending on the operating conditions, a regeneration resistance higher than that mentioned above may be necessary.

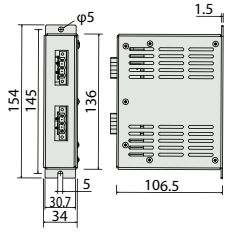
Necessary Amount Guideline (RCS2-RA13R)

	Lead 2.5	Lead 1.25
Horizontal	1	0
Vertical	1	1

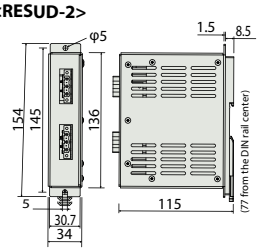
* Depending on the operating conditions, a regeneration resistance higher than that mentioned above may be necessary.

External dimensions

<RESU-2>



<RESUD-2>



<For 3000W・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 Amount Guideline

●**For 3000W**

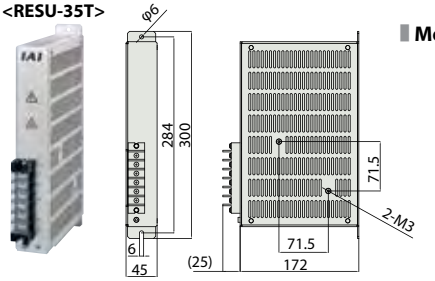
Cycle time	Number of connected units
12sec or more	No need
6~12sec	1
3.5~6sec	2
3.5sec or less	(Note)

●**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.

<RESU-35T>



Supported Windows versions: 7/10

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)
AB-5-CS3(with a case)

Dummy plug

Features This plug is required when the safety category specification (SCON-CGB) is used.

Model **DP-5**

Dummy plug (STO/SS1-t specification)

Features Feature: Necessary when STO/SS1-t function is not used.

Model **DP-6**

Maintenance parts

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

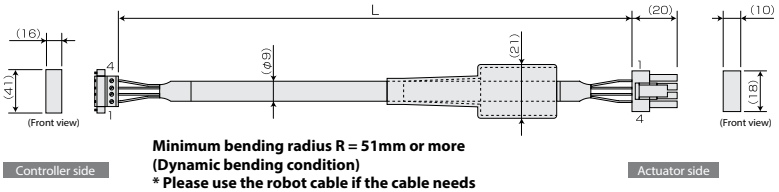
■Table of Applicable Cables

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	–	CB-RCS3-MA□□□-RB	–	CB-RCS3-PLA□□□-RB
	RA20R				
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 flatcable
SCON-CB	CB-PAC-PIO□□□

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.**

GIC2.5/4-STF-7.62(Phoenix)

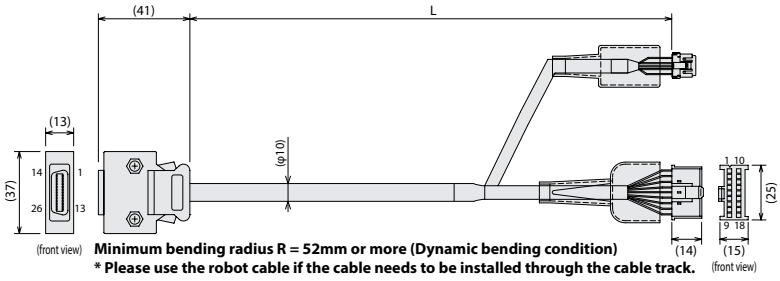
Wiring	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

SLP-04V (JST)

No.	Signal	Color	Wiring
1	U	Red	0.75sq (pressure-welded)
2	V	White	
3	W	Black	
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.**

10126-3000PE(Sumitomo 3M)

Wiring	Color (Standard cable)	Color (Robot cable)	Signal	No.
	–	–	–	
	–	–	E24V	12
	Gray/ White	White/ Green	0V	13
	Brown/White	White/Orange	LS	26
	–	–	CLEEP	25
	–	–	OT	24
	–	–	RS V	23
	Yellow/ Black	Brown/ Blue	LC SRD +	9
	Pink/ Black	Brown/ Green	LC SRD -	10
	Red/White	Brown/ Red	LC VCC	18
	Black/ White	Brown/ Black	LC GND	19
AWG26 (Soldered)	Pink	White/ Blue	A+	1
	Purple	White/Yellow	A-	2
	White	White/ Red	B+	3
	Blue/Red	White/Black	B-	4
	Orange/White	White/Purple	Z+	5
	Green/ White	White/Gray	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 shield is clamped to the hood.

CB01A6-05B0-01 (Sumiko-Tec)

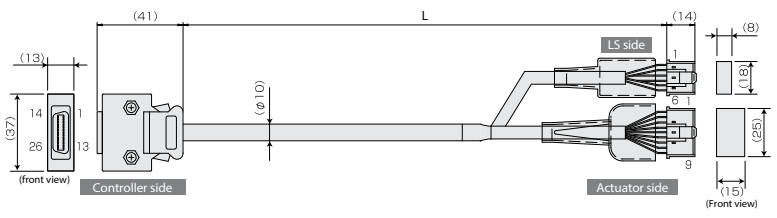
No.	Signal	Color (Standard cable)	Color (Robot cable)	Wiring
1	SGA	Yellow/ Black	Brown/ Blue	AWG26 (crimped)
2	SGB	Pink/ Black	Brown/Yellow	
3	VIN	Red/White	Brown/ Red	
4	GND	Black/ White	Brown/Black	
5	FG	Black	Black	

XMP-18V (JST)

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

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.**

10126-3000PE(Sumitomo 3M)

Wiring	Color (RCS2)	Color (X2)	Signal	No.
	–	–	–	10
	–	–	–	11
	Brown/White	White/Orange	E24V	12
	Gray/White	White/Green	0V	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
	–	–	–	9
	–	–	–	18
	–	–	–	19
	Pink	White/Blue	A+	1
AWG26 (soldered)	Purple	White/Yellow	A–	2
	White	White/Red	B+	3
	Blue/Red	White/Black	B–	4
	Orange/White	White/Purple	Z+	5
	Green/White	White/Gray	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 shield is connected to cable clamp

(The wire color "White/Blue" indicates the colors of the band and insulation)

XMP-06V (JST)

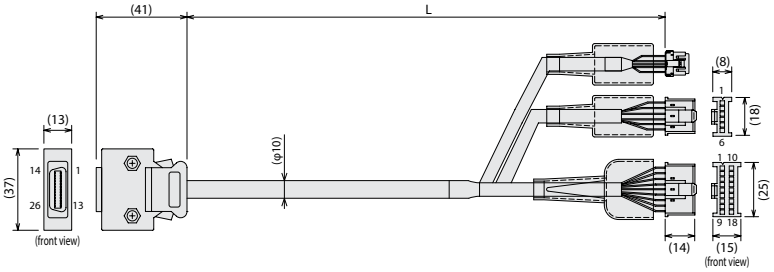
No.	Signal	Color (RCS2)	Color (X2)	Wiring
1	E24V	Brown/White	White/Orange	AWG26 (crimped)
2	0V	Gray/White	White/Green	
3	LS	Red/White	Brown/Blue	
4	CREEP	Black/White	Brown/Yellow	
5	OT	Yellow/Black	Brown/Red	
6	RSV	Pink/Black	Brown/Blac	

XMP-18V (JST)

No.	Signal	Color (RCS2)	Color (X2)	Wiring
1	A+	Pink	White/Blue	AWG26 (crimped)
2	A–	Purple	White/Yellow	
3	B+	White	White/Red	
4	B–	Blue/Red	White/Black	
5	Z+	Orange/White	White/Purple	
6	Z–	Green/White	White/Gray	
7	–	–	–	
8	–	–	–	
9	FG	Ground	Ground	
10	SD	Blue	Orange	
11	SD	Orange	Green	
12	BAT+	Black	Purple	
13	BAT–	Yellow	Gray	
14	VCC	Green	Red	
15	GND	Brown	Black	
16	–	–	–	
17	BK–	Gray	Blue	
18	BK+	Red	Yellow	

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.**

10126-3000PE(Sumitomo 3M)

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

AWG26 (soldered)

Shield is clamp-connected to the hood

CB01A6-05B0-01 (Sumiko-Tec)

No.	Signal	Color (Standard cable)	Color (Robot cable)	Wiring
1	SGA	Purple/White	Purple/Black	AWG26 (crimped)
2	SGB	White/Blue	White/Blue	
3	VIN	Blue/Red2	Blue/Red	
4	GND	Orange/White2	Orange/White	
5	FG	Black	Black	

XMP-06V (JST)

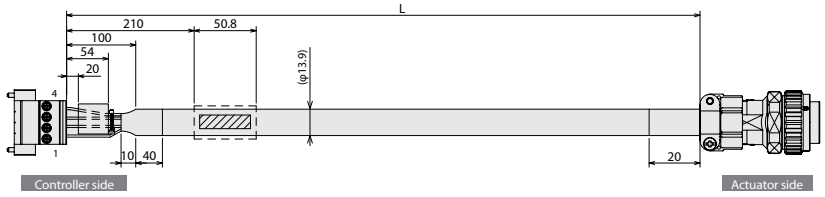
No.	Signal	Color (Standard cable)	Color (Robot cable)	Wiring
1	E24V	Brown/White	Brown/Black	AWG26 (crimped)
2	0V	Gray/ White	Gray/Black	
3	LS	Red/ White	Red/ Black	
4	CLEEP	Black/White	Black/White	
5	OT	Yellow/Black	Yellow/Blue	
6	RSV	Pink/Black	Pink/Black	

XMP-18V (JST)

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

Model CB-RCS3-MA□□□-RB

* Please indicate the cable length (L) in □□□ , maximum 30m, e.g.) 080 = 8m



IPC5/4-STF-7.62(Phoenix)

Wiring	Color	Signal	No.
AWG12	Green/Yellow	PE	1
	Black1	U	2
	Black2	V	3
	Black3	W	4

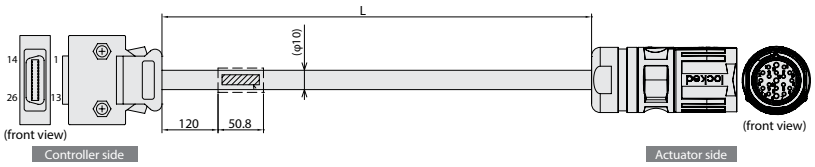
JL10-6A18-10SE-EB(JAE)

No.	Signal	Color	Wiring
A	U	Black1	AWG12 (soldered)
B	V	Black2	
C	W	Black3	
D	PE	Green/Yellow	

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



10126-3000PE(Sumitomo 3M)

Wiring	Color	Signal	No.
	—	—	11
White/Orange	E24V		12
White/Green	E24G		13
Brown/Blue	LS		26
Brown/Yellow	CLEEP		25
Brown/Red	OT		24
Brown/Black	RSV		23
White/Blue	LC SRD+		9
White/Yellow	LC SRD-		10
White/Red	LC VCC		18
White/Black	LC GND		19
—	—		1
—	—		2
—	—		3
—	—		4
—	—		5
—	—		6
Orange	SRD+		7
Green	SRD-		8
Purple	BAT+		14
Gray	BAT-		15
Red	VCC		16
Black	GND		17
Blue	BKR-		20
Yellow	BKR+		21
—	—		22

AWG26 (soldered)

The shield is clamped to the hood.

CA-19S1N1280DNS(Phoenix)

No.	Signal	Color	Wiring
1	LS	Brown/Blue	AWG26 (soldered)
2	CLEEP	Brown/Yellow	
3	OT	Brown/Red	
4	RSV	Brown/Black	
5	BAT+	Purple	
6	VCC	Red	
7	LC SRD+	White/Blue	
8	LC SRD-	White/Yellow	
9	LC VCC	White/Red	
10	BKR+	Yellow	
11	BKR-	Blue	
12	FG	Ground	
13	E24V	White/Orange	
14	BAT-	Gray	
15	SRD+	Orange	
16	SRD-	Green	
17	LC GND	White/Black	
18	E24G	White/Green	
19	GND	Black	

Model CB-LDC-CTL□□□-JY

Minimum bending radius r=28mm or greater (Dynamic bending condition)

CB01A6-05B0-01

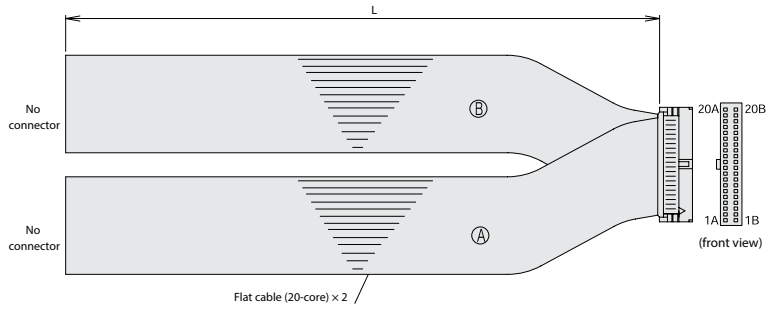
No.	Signal	Color
1	SGA	Red
2	SGB	Grey
3	VIN	Green
4	GND	Brown
5	FG	Shield/black

CB01A5-05B0-01

No.	Signal	Color
1	SGA	Red
2	SGB	Grey
3	VIN	Green
4	GND	Brown
5	FG	Shield/black

Model CB-PAC-PIO□□□

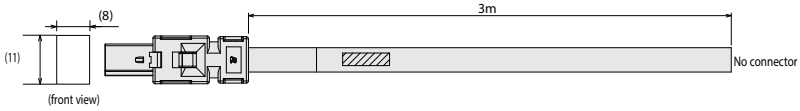
* Please indicate the cable length (L) in □□□ , maximum 10m,
e.g.) 080 = 8m



HIF6-40D-1.27R(Hirose)

No.	Signal name	Cable Color	Wiring	No.	Signal name	Cable Color	Wiring
1A	24V	Brown-1	Flat cable Ⓐ (pressure-welded)	1B	OUT0	Brown-3	Flat cable Ⓑ (pressure-welded) AWG28
2A	24V	Red-1		2B	OUT1	Red-3	
3A	—	Orange-1		3B	OUT2	Orange-3	
4A	—	Yellow-1		4B	OUT3	Yellow-3	
5A	IN0	Green-1		5B	OUT4	Green-3	
6A	IN1	Blue-1		6B	OUT5	Blue-3	
7A	IN2	Purple-1		7B	OUT6	Purple-3	
8A	IN3	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



2013595-1(TE)

Wiring	Color	Signal	No.
AWG26	—	—	1
	—	—	2
	Black	/SRI1−	3
	Black/White	/SRI1+	4
	Red	/SRI2−	5
	Red/White	/SRI2+	6
	Green	EDM−	7
	Green/White	EDM+	8
Shield is connected to the cable clamp.			

Black
Black/white
Red
Red/white
Green
Green/white
Shield

* Wire color: (ex.) Black/White represents white lines on the black insulator.

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) Motor | Encoder | Option | (Specs for 2nd axis) Motor | Encoder | Option | I/O type | I/O cable length | Power voltage

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 motor has the same alphanumeric code as the connecting actuator motor, though some controllers and actuator motors have different codes.
When ordering, please pay attention to such types listed below:
<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

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

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

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.

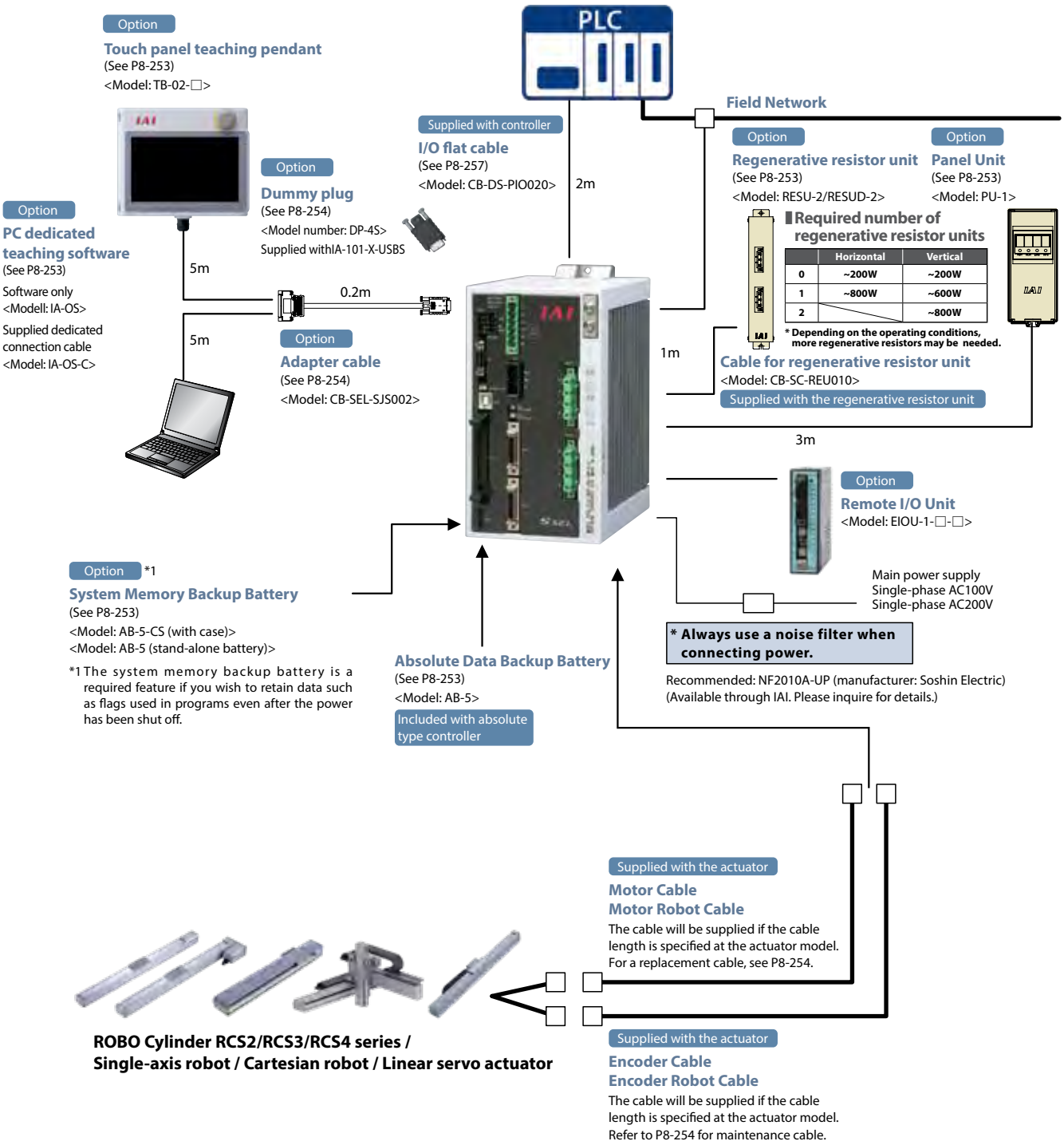
1	Single-phase AC100V
2	Single-phase AC200V

* 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.

System configuration



I/O Specifications

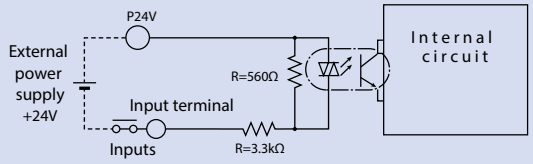
■ Input Section External input specifications

Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage (min.) OFF voltage (max.)
Isolation method	Photocoupler

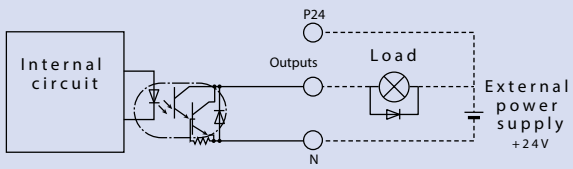
■ Output Section

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point, 400mA / 8 points total
Leakage current (max.)	Max. 0.1mA / point
Isolation method	Photocoupler

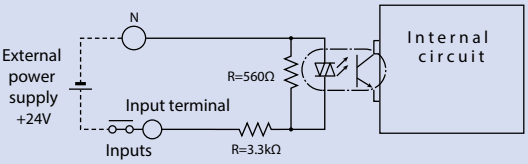
NPN Specifications



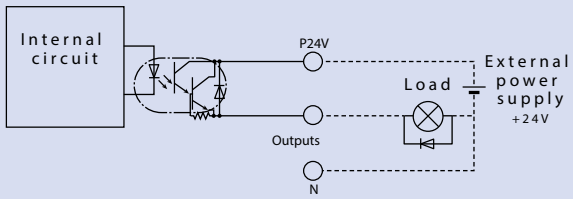
NPN Specifications



PNP 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

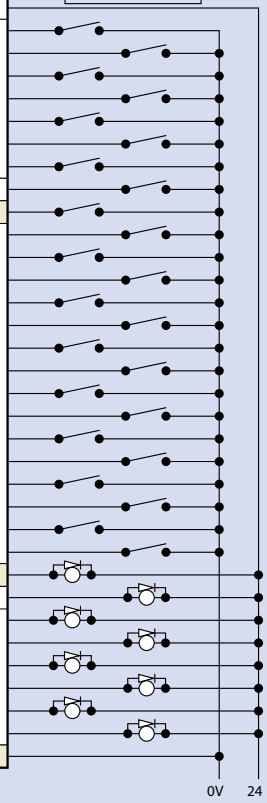
Operation mode		Features
Program mode		Various operations including linear/arc interpolation operation, ideal path operation for coating processes, etc., arch-motion operation and palletizing operation can be performed using the Super SEL language that lets you program complex control actions using simple commands.
Positioner mode	Standard mode	This is the basic mode from which operations can be conducted by designating position numbers and inputting the start signal. Push-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 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
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	
11B		012	General-purpose input	
12A		013	General-purpose input	
12B		014	General-purpose input	
13A		015	General-purpose input	
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	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.

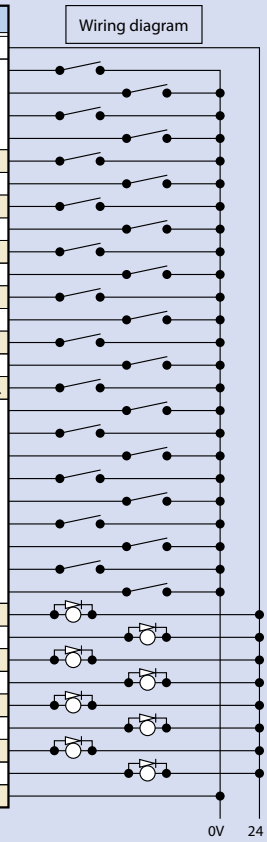
Wiring diagram



Positioner standard mode

Pin No.	Category	Port No.	Positioner Standard Mode	Functions
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 he position numbers to move to, using ports 007 to 019. The number an 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	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

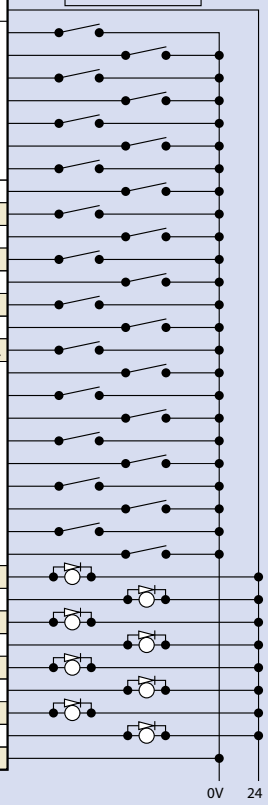


Explanation of I/O signal functions

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 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.
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.

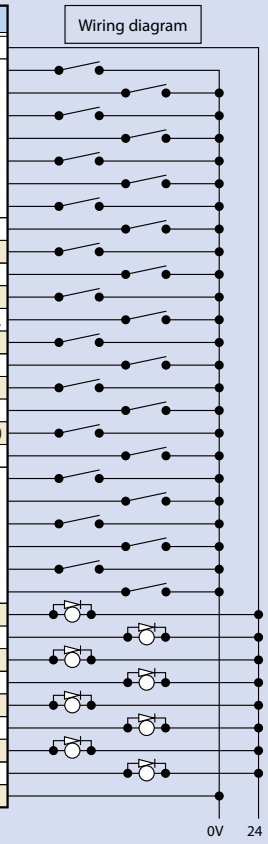
Wiring diagram



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 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 selected position on the firs 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 No. 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

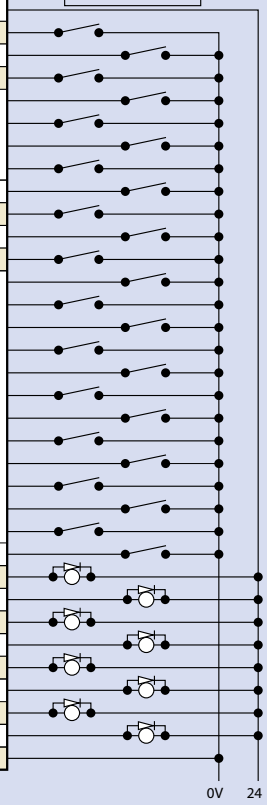


Explanation of I/O signal functions

Positioner, Teaching Mode

Pin No.	Category	Port No.	Program 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. (Total of the values specified for 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	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	-	—
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.

Wiring diagram



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	(Same as Port No. 004 - 015)
2A		017	Position No. 2000	—
2B		018	Position No. 4000	—
3A		019	Position No. 8000	—
3B		020	Position No. 10000	—
4A		021	Position No. 20000	—
4B		022	NC (+1)	—
5A		023	CPU reset	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	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 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 1	Turns on when moving to the specified position is completed on 1st axis.
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.

Wiring diagram

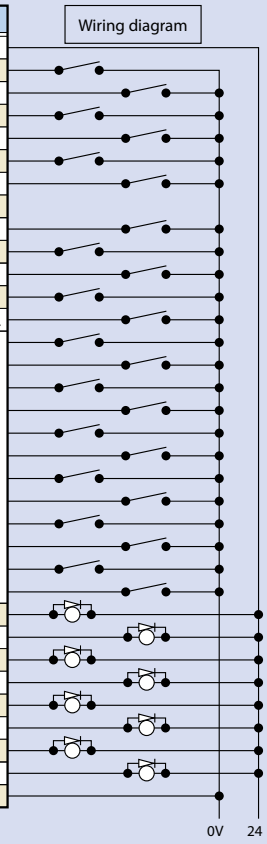


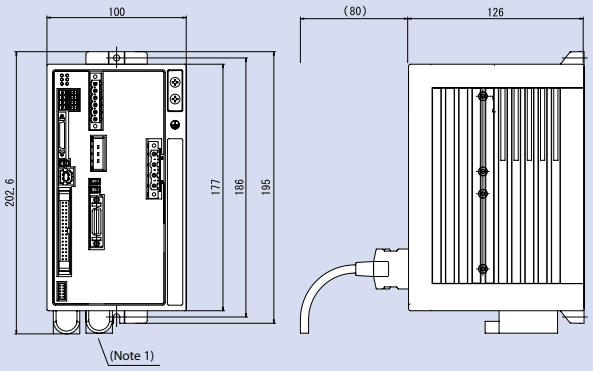
Table of specifications

	Item	Specifications	
Basic specifications	Connected actuator	RCS2 / RCS3 /RCS4 series / Single-axis robot / Cartesian robot / Linear servo actuator	
	Input voltage	Single-phase AC100 to AC115V ±10%	Single-phase AC200 to AC230V ±10%
	Power supply capacity	Maximum 1660VA (for 400W, 2-axis operation)	
	Dielectric strength voltage	DC500V 10MΩ or higher	
	Withstand voltage	AC500V 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/s² (continuous), 9.8m/s² (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.	
	Operating method	Program operation / Positioner operation (switchable)	
Program	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)	
	Data input method	Touch panel teaching pendant or PC dedicated teaching software	
Communication	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	
	Field network	Device Net, CC-Link, PROFIBUS, EtherNet/IP, IA net	
General specifications	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%RH - 95%RH (non-condensing, no frost)	
	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

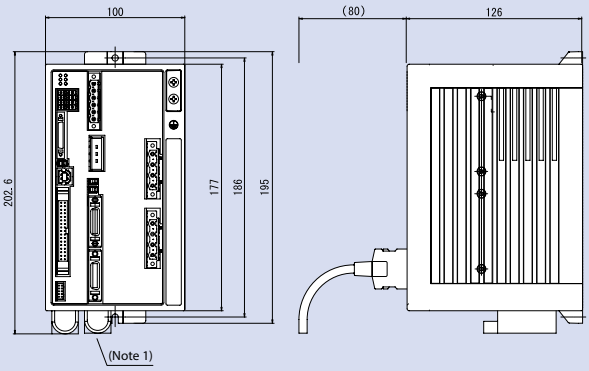
CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

SSEL 1-axis controller



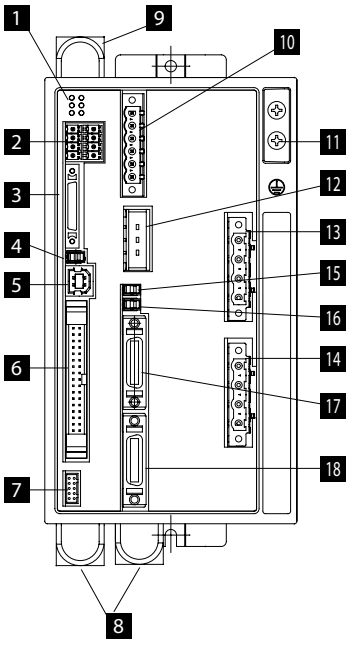
(Note 1) Absolute data back-up battery.
Not installed with incremental specification.

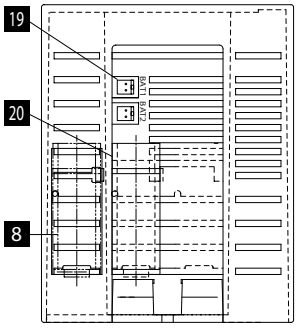
SSEL 2-axis controller

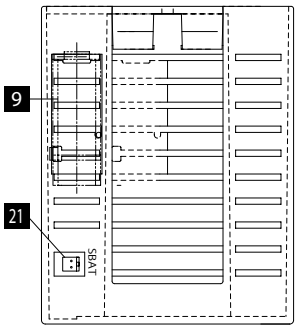


(Note 1) Absolute data back-up battery.
Not installed with incremental specification.

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 running mode is MANU. A special conversion cable is needed to connect a conventional D-sub, 25-pin connector.

4 Mode switch

This switch is used to specify the running mode of the controller. The left position indicates the MANU (manual operation) mode, while the right position indicates the AUTO (automatic operation) mode. Teaching can only be performed 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 resistor that must be connected when the built-in regenerative resistor alone does not offer sufficient capacity in high-acceleration/ high-load operation, etc.

Whether or not an external regenerative resistor is necessary depends on the conditions of your specific application such as the axis configuration.

13 Motor connector for axis 1

Connects the motor cable of the axis 1 actuator.

14 Motor connector for axis 2

Connects the 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.

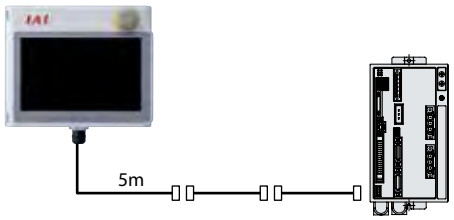
Options

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℃
Ambient operational humidity	5%RH - 85%RH (non-condensing, no frost)
Protection class	IP20
Weight	470g (TB-02 only)

PC dedicated teaching software (Windows only)

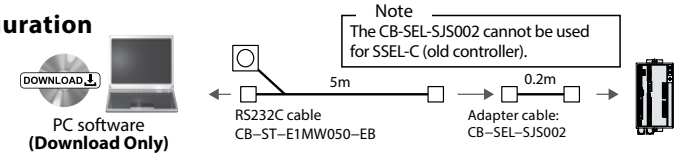
Features A startup support software for entering programs/positions, performing test runs, and monitoring. More functions have been added for debugging, and improvements have been made to shorten the start-up time.

* Please purchase through your distributor and a download link will be sent to your valid email address.

Compatible with Windows ver.: 7/10

Model **IA–101–X–MW–JS** (including RS232C cable + adapter cable)

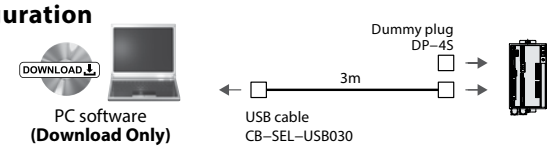
Configuration



Note
The CB-SEL-SJS002 cannot be used for SSEL-C (old controller).

Model **IA–101–X–USBS** (including USB cable + Dummy plug)

Configuration



Note
Dummy plug DP-4S cannot be used for SSEL-C (old controller).

Note
Only versions 7.0.0.0 and later can be used with the SSEL controller.

Regenerative Resistor Unit

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

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 resistor 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	

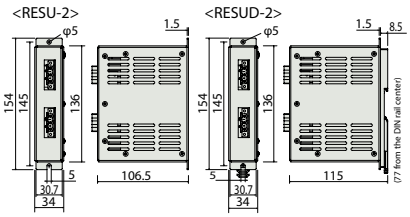
Required number of units

	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. (See Page 8-304)

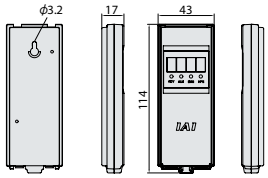
External dimensions



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.

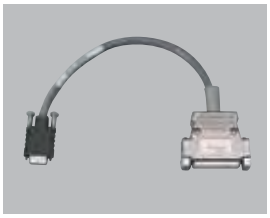
Model **CB-SEL-USB030** (cable length: 3m)

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.



Spare parts

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below.

■ 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-RCC-MA □□□	CB-RCC-MA □□□ -RB	CB-RCS2-PA □□□	CB-X3-PA □□□
②	RCS2	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 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	–	CB-X1-PA □□□
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)

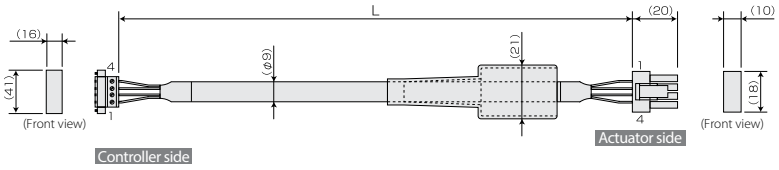
* Cables for other than the battery-less absolute specification are CB-X1-PA□□□/CB-X1-PLA□□□, even when the length is 20m or longer.

Product model		PIO flat cable
⑭	SSEL-CS	CB-DS-PIO□□□

Spare parts

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

* Enter the cable length (L) into □□□ .
Compatible to a maximum of 30m. Ex.: 080=8m



GIC2.5/4-STF-7.62 (Phoenix)

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

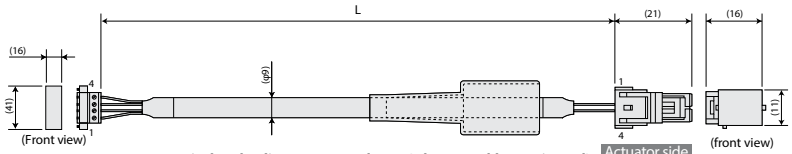
SLP-04V (JST)

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



GIC2.5/4-STF-7.62 (Phoenix)

Wire	Color	Signal	No.
1.25sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

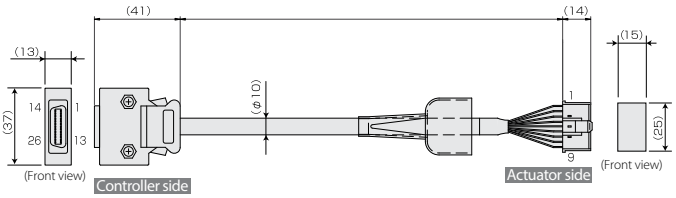
YLP-04V (JST)

No.	Signal	Color	Wire
1	U	Red	1.25sq (crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Min. bend radius r=55 mm or larger (when movable type is used)
***The robot cable is the standard.**

Model CB-RCS2-PA □□□ (for RCS2/RCS3/RCS4)/CB-X3-PA □□□ (for RCS2/RCS3/RCS4)

* Enter the cable length (L) into □□□ .
Compatible to a maximum of 30m. Ex.: 080=8m



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.**

GIC2.5/4-STF-7.62 (Phoenix)

10126-3000PE(Sumitomo 3M)

Wire	Color (RCS2)	Color (X3)	Signal	No.
AWG26 (soldered)	–	–	–	10
	–	–	–	11
	–	–	E24V	12
	Gray/White	White/Green	OV	13
	Brown/White	White/Orange	LS	26
	–	–	CREEP	25
	–	–	OT	24
	–	–	RSV	23
	–	–	–	9
	–	–	–	18
	–	–	–	19
	Pink	White/Blue	A+	1
	Purple	White/Yellow	A−	2
	White	White/Red	B+	3
	Blue/Red	White/Black	B−	4
	Orange/White	White/Purple	Z+	5
	Green/White	White/Gray	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

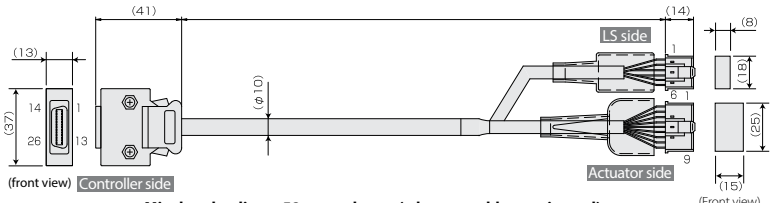
The shield is connected to the hood by a clamp.

XMP-18V (JST)

No.	Signal	Color (RCS2)	Color (X3)	Wire
1	A	Pink	White/Blue	AWG26 (crimped)
2	Ā	Purple	White/Yellow	
3	B	White	White/Red	
4	B̄	Blue/Red	White/Black	
5	Z	Orange/White	White/Purple	
6	Z̄	Green/White	White/Gray	
7	LS+	Brown/White	White/Orange	
8	–	–	–	
9	FG	Ground	Ground	
10	SD	Blue	Orange	
11	SD	Orange	Green	
12	BAT+	Black	Purple	
13	BAT−	Yellow	Gray	
14	VCC	Green	Red	
15	GND	Brown	Black	
16	LS−	Gray/White	White/Green	
17	BK−	Gray	Blue	
18	BK+	Red	Yellow	

Model CB-RCS2-PLA □□□ /CB-X2-PLA □□□

* Enter the cable length (L) into □□□ .
Compatible to a maximum of 30m. Ex.: 080=8m



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.**

10126-3000PE(Sumitomo 3M)

Wire	Color (RCS2)	Color (X2)	Signal	No.
AWG26 (soldered)	–	–	–	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
	–	–	–	9
	–	–	–	18
	–	–	–	19
	Pink	White/Blue	A+	1
	Purple	White/Yellow	A−	2
	White	White/Red	B+	3
	Blue/Red	White/Black	B−	4
	Orange/White	White/Purple	Z+	5
	Green/White	White/Gray	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

Shield is clamp-connected to the hood

XMP-6V (JST)

No.	Signal	Color (RCS2)	Color (X2)	Wire
1	E24V	Brown/White	White/Orange	AWG26 (crimped)
2	OV	Gray/White	White/Green	
3	LS	Red/White	Brown/Blue	
4	CREEP	Black/White	Brown/Yellow	
5	OT	Yellow/Black	Brown/Red	
6	RSV	Pink/Black	Brown/Black	

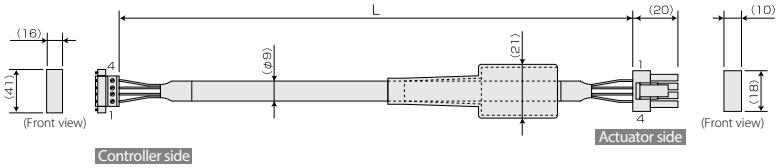
XMP-18V (JST)

No.	Signal	Color (RCS2)	Color (X2)	Wire
1	A	Pink	White/Blue	AWG26 (crimped)
2	Ā	Purple	White/Yellow	
3	B	White	White/Red	
4	B̄	Blue/Red	White/Black	
5	Z	Orange/White	White/Purple	
6	Z̄	Green/White	White/Gray	
7	–	–	–	
8	–	–	–	
9	FG	Drain	Drain	
10	SD	Blue	Orange	
11	SD	Orange	Green	
12	BAT+	Black	Purple	
13	BAT−	Yellow	Gray	
14	VCC	Green	Red	
15	GND	Brown	Black	
16	–	–	–	
17	BK−	Gray	Blue	
18	BK+	Red	Yellow	

(Wire color White/Blue shows Band color/Insulator color)

Model CB-X-MA □□□

* Enter the cable length (L) into □□□ .
Compatible to a maximum of 30m. Ex.: 080=8m



GIC2.5/4-STF-7.62 (Phoenix)

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

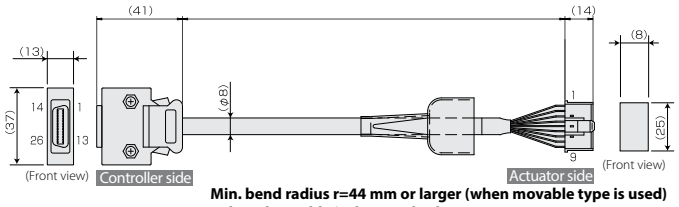
SLP-04V (JST)

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

Min. bend radius r=51 mm or larger (when movable type is used)
*** The robot cable is the standard.**

Model CB-X1-PA □□□

* Enter the cable length (L) into □□□ .
Compatible to a maximum of 30m. Ex.: 080=8m



Min. bend radius r=44 mm or larger (when movable type is used)
*** The robot cable is the standard.**
*** If you require a cable of 21m or longer for ISB, ISDB, or ISDBCR (battery-less absolute encoders), select CB-X1-PA□□□-AWG24.**
*** 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.**

10126-3000PE(Sumitomo 3M)

Wire	Color	Signal	No.
AWG26 (soldered)	—	—	10
	—	—	11
	—	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
Orange	SRD+		7
Green	SRD−		8
Purple	BAT+		14
Gray	BAT−		15
Red	VCC		16
Black	GND		17
Blue	BKR−		20
Yellow	BKR+		21
—	—		22

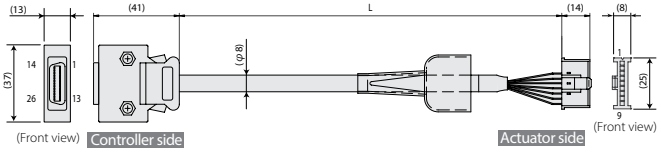
The shield is connected to the hood by a clamp.

XMP-09V (JST)

No.	Signal	Color	Wire
1	BAT+	Purple	AWG26 (crimped)
2	BAT−	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK−	Blue	
9	BK+	Yellow	

Model CB-X1-PA□□□-AWG24

* Specify the cable length in □□□ .
Maximum length is 30m. Ex.: 210=21m



Minimum bending radius r= 44mm or more (Dynamic bending condition).
*** Robot cable is the standard.**

10126-3000PE(Sumitomo 3M)

Wire	Color	Signal	No.
AWG24 (soldered)	—	—	10
	—	—	11
	—	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
Orange	SRD+		7
Green	SRD−		8
Purple	BAT+		14
Gray	BAT−		15
Red	VCC		16
Black	GND		17
Blue	BKR−		20
Yellow	BKR+		21
—	—		22

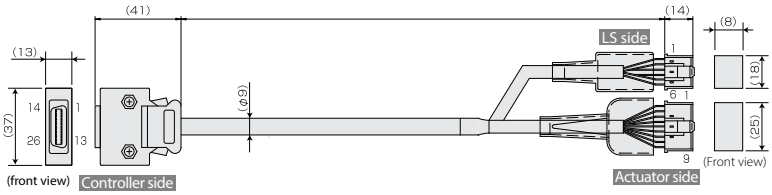
Shield is clamp-connected to the hood

XMP-09V (JST)

No.	Signal	Color	Wire
1	BAT+	Purple	AWG24 (crimped)
2	BAT−	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK−	Blue	
9	BK+	Yellow	

Model CB-X1-PLA □□□

* Enter the cable length (L) into □□□ .
Compatible to a maximum of 30m. Ex.: 080=8m



Min. bend radius r=51 mm or larger
(when movable type is used)
*** The robot cable is the standard.**
*** If you require a cable of 21m or longer for ISB, ISDB, or ISDBCR (battery-less absolute encoders), select CB-X1-PLA□□□-AWG24.**

10126-3000PE(Sumitomo 3M)

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

The shield is connected to the hood by a clamp.

XMP-06V (JST)

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

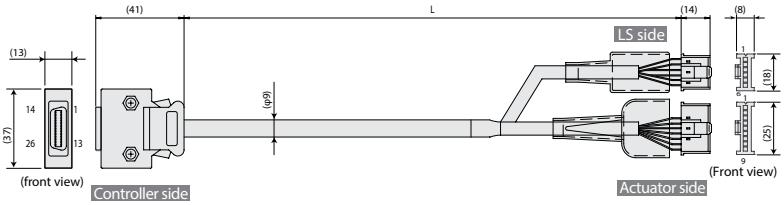
XMP-09V (JST)

No.	Signal	Color	Wire
1	BAT+	Purple	AWG26 (crimped)
2	BAT−	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Ground	
8	BK−	Blue	
9	BK+	Yellow	

(Wire color of White/Blue shows band color/isolation color.)

Model CB-X1-PLA□□□-AWG24

* Specify the cable length in □□□ .
Maximum length is 30m. Ex.: 210=21m



Minimum bending radius r= 54mm or more (Dynamic bending condition).
*** Robot cable is the standard.**

10126-3000PE(Sumitomo 3M)

Wire	Color	Signal	No.
AWG24 (soldered)	—	—	10
	—	—	11
White/Blue	E24V		12
White/Yellow	0V		13
White/Red	LS		26
White/Black	CREEP		25
White/Purple	OT		24
White/Gray	RSV		23
—	—		9
—	—		18
—	—		19
—	A+		1
—	A−		2
—	B+		3
—	B−		4
—	Z+		5
—	Z−		6
Orange	SRD+		7
Green	SRD−		8
Purple	BAT+		14
Gray	BAT−		15
Red	VCC		16
Black	GND		17
Blue	BKR−		20
Yellow	BKR+		21
—	—		22

Shield is clamp-connected to the hood

XMP-06V (JST)

No.	Signal	Color	Wire
1	E24V	White/Blue	AWG24 (crimped)
2	0V	White/Yellow	
3	LS	White/Red	
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	

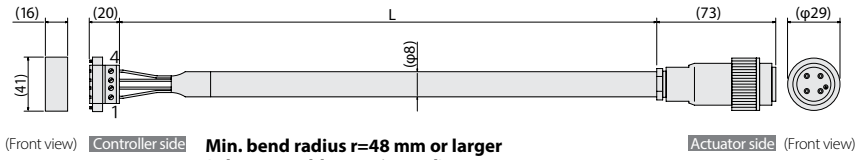
XMP-09V (JST)

No.	Signal	Color	Wire
1	BAT+	Purple	AWG24 (crimped)
2	BAT−	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK−	Blue	
9	BK+	Yellow	

(Wire color White/Blue shows Band color/Insulator color)

Model CB-XEU-MA □□□

* Enter the cable length (L) into □□□ .
Compatible to a maximum of 30m. Ex.: 080=8m



Min. bend radius r=48 mm or larger
(when movable type is used)
*** The robot cable is the standard.**

Plug
GIC2.5/4-STF-7.62 (Phoenix)

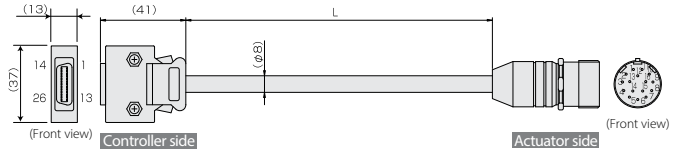
Wire	Color	Signal	No.
0.75sq	Green/Yellow	PE	1
	White letter "1" on black	U	2
	White letter "2" on black	V	3
	White letter "3" on black	W	4

Plug connector
99-4222-00-04(BINDER)

No.	Signal	Color	Wire
⊕	PE	Green/Yellow	0.75sq (crimped)
1	U	White letter "1" on black	
2	V	White letter "2" on black	
3	W	White letter "3" on black	

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 the standard.**

10126-3000PE(Sumitomo 3M)

Wire	Color	Signal	No.
AWG26 (soldered)	—	—	10
	—	—	11
	—	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
	Orange	SRD+	7
	Green	SRD−	8
	Purple	BAT+	14
	Gray	BAT−	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR−	20
	Yellow	BKR+	21
	—	—	22

The shield is connected to the hood by a clamp.

99-4630-00-16(BINDER)

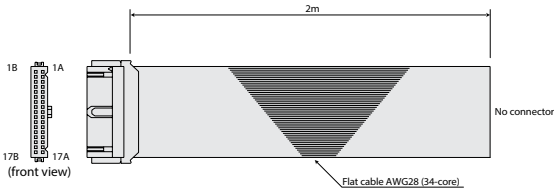
No.	Signal	Color	Wire
1	SD	Orange	AWG26 (soldered)
2	SD	Green	
3	—	—	
4	—	—	
5	—	—	
6	—	—	
7	—	—	
8	—	—	
9	—	—	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT−	Gray	
14	—	—	
15	BK−	Blue	
16	BK+	Yellow	

The shield is connected to the hood by a clamp.

(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



HIF3BA-34D-2.54R(Hirose)

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	

MEMO

MSEL

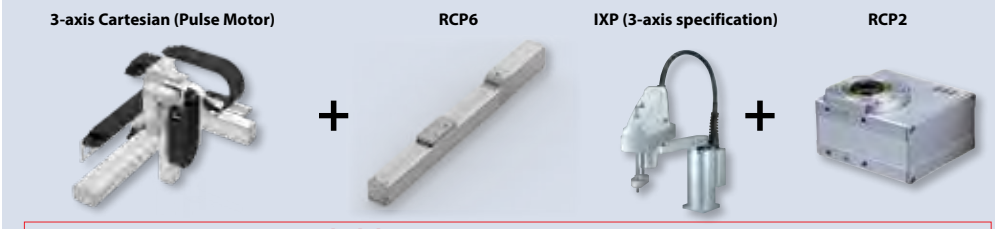
Program Controller
for RCP6/RCP5/RCP4/RCP3/RCP2/IXP
Wrist Unit WU

Features

1 Control Maximum of 4 Axes Available with Pulse Motor Mounted ROBO Cylinder

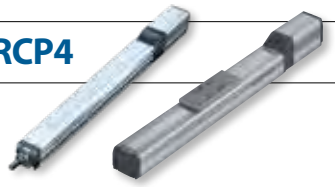
Actuators with pulse motor in the past were able to control only up to two axes with one program controller. By using MSEL, four axes will be available for control. It is also available for interpolation operations, which enhances the ways of use.

Examples of Combinations



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.

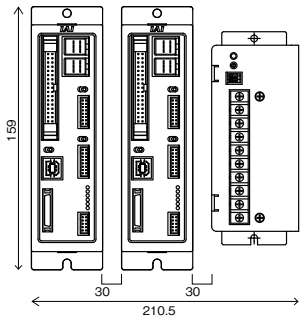


3 Cable Reduction and Space-saving

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

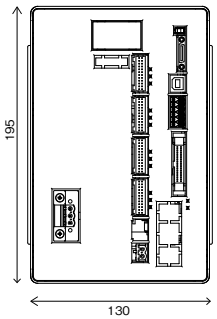
Conventional product **PSEL 2units + PS241 (24V power supply)**



Cable Reduction
Applicable for AC100 to 230V built-in power source.

Cost Reduction
Approx. 36% reduced

New **MSEL one unit**



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. The expansion I/O is available to select from PIO (IN 16 points / OUT 16 points) or various field networks.

Table of models

Program controller for operations of RCP6/RCP5/RCP4/RCP3/RCP2 Series actuators. It is applicable to various types of controls with one unit.

Type		PC	PG
Name		Standard type	Safety category compliant type
External view			
Maximum controllable axes		4	
Number of positions		30,000 points	
Power supply		Single-phase AC100~230V	
Safety category		B	3*1
Battery-less absolute Incremental	1-axis	○	
	2-axis	○	
	3-axis	○	
	4-axis	○	
Simple absolute specification	1-axis	○	
	2-axis	○	
	3-axis	○	
	4-axis	○	

*1: Compliance with the Safety Category requires the customer to install a safety circuit externally to the controller.

Model

MSEL — [ ] Series — [ ] Type — [ ] Number of axes — [ ] [ ] [ ] (Specs for 1st axis) Motor / Encoder / Option — [ ] [ ] [ ] (Specs for axis 2 to 4) Motor / Encoder / Option — [ ] Standard I/O — [ ] Expansion I/O — [ ] I/O cable length — 4 Power voltage — [ ] Simple absolute unit — [ ] Mounting specification

Type

PC	Standard type
PG	Safety category compliant type

Number of axes

1	1-axis
2	2-axis
3	3-axis
4	4-axis

Motor / Encoder / Option (Specs for 1st axis)

20P	20□
20SP	20□
28P	28□
28SP	28□
35P	35□
42P	42□
42SP	42□
56P	56□
WUS	WU-S用
WUM	WU-M用

(Ex) 20P: 20□Pulse motor compatible
* WUS and WUM use 2 axes.
No need to specify encoder and options.

WAI	Battery-less absolute Incremental
SA	Simple absolute specification

* Battery-less absolute and incremental cannot be used together with simple absolute. When using simple absolute, all the axes need to be used in simple absolute.

B	Brake

Motor / Encoder / Option (Specs for axis 2 to 4)

20P	20□
20SP	20□
28P	28□
28SP	28□
35P	35□
42P	42□
42SP	42□
56P	56□
WUS	WU-S用
WUM	WU-M用

(Ex) 20P: 20□Pulse motor compatible
* WUS and WUM use 2 axes.
No need to specify encoder and options.

WAI	Battery-less absolute Incremental
SA	Simple absolute specification

* Battery-less absolute and incremental cannot be used together with simple absolute. When using simple absolute, all the axes need to be used in simple absolute.

B	Brake

Standard I/O

NP	NPN
PN	PNP

Expansion I/O

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
EC	EtherCAT communication
PRT	PROFINET IO
SE1	RS232C
SE2	RS485
IA	IA Net

* 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.

I/O cable length

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

Power voltage

4	AC100~230

Simple absolute unit

ABB	With absolute battery box
ABBN	Without absolute battery box
Blank	Battery-less or Incremental

* Make sure to select ABB / ABBN when simple absolute type "SA" is selected.

Mounting specification

Blank	Screw fixation
DN	DIN rail mount

NOTE

Basically, the motor has the same alphanumeric sign as the connecting actuator motor, though some controllers and actuator motors have different signs.
1. When ordering, pay attention to such types listed below:
(Actuators for 28SP)
●Controller motor "28SP"
... RCP2-RA3C
2. One WU can be connected to one MSEL.

For Connecting to Actuators with 56SP, 60P and 86P motors.

List of models

Type	PCF	PGF
Name	56SP/60P/86P Motor Type	Safety Category 56SP/60P/86P Motor Type
External view		
Number of maximum controllable axes	4	
Number of positions	30,000 points	
Power supply	Single phase AC100-230V	
Safety category	B	3*1

*1: Compliance with the Safety Category requires the customer to install a safety circuit externally to the controller.

Model

MSEL – [ ] – [ ] – [ ] WAI [ ] – [ ] [ ] [ ] – [ ] [ ] [ ] – [ ] – [ ] – [ ] – 4 – [ ] – [ ]

Series / Type / Number of axes / (Specs for 1st axis) / (Specs for axis 2s) / (Specs for axis 3 and 4) / Standard I/O / Expansion I/O / I/O cable length / Power voltage / Simple absolute unit / Mounting specification

Type

PCF	56SP/60P/86P motor type
PGF	Safety category compliant 56SP/60P/86P motor type

Number of axes

1	1-axis
2	2-axis
3	3-axis
4	4-axis

(Specs for 1st axis) Motor

56SP	56□
60P	60□
86P	86□

(Ex) 20P: 20□ pulse motor compatible

NOTE
One WU can be connected to one MSEL.

(Specs for 1st axis) Option

B	Brake

(Specs for axis 2s) Motor

20P	20□
20SP	20□
28P	28□
28SP	28□
35P	35□
42P	42□
42SP	42□
56P	56□
56SP	56□
60P	60□
86P	86□
WUS	WU-S用
WUM	WU-M用

(Ex) 20P: 20□Pulse motor compatible
* WUS and WUM use 2 axes.
No need to specify encoder and options.

(Specs for axis 2s) Encoder

WAI	Battery-less absolute Incremental
SA	Simple absolute specification

* The simple absolute cannot be selected when connecting 56SP, 60P and 86P actuators.

(Specs for axis 2s) Option

B	Brake

(Specs for axis 3 and 4) Motor

20P	20□
20SP	20□
28P	28□
28SP	28□
35P	35□
42P	42□
42SP	42□
56P	56□
WUS	WU-S用
WUM	WU-M用

(Ex) 20P: 20□Pulse motor compatible
* WUS and WUM use 2 axes.
No need to specify encoder and options.

(Specs for axis 3 and 4) Encoder

WAI	Battery-less absolute Incremental
SA	Simple absolute specification

* Battery-less absolute and incremental cannot be used together with simple absolute. When using simple absolute, all the axes need to be used in simple absolute.

(Specs for axis 3 and 4) Option

B	Brake

Standard I/O

NP	NPN
PN	PNP

Expansion I/O

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 communication
PRT	PROFINET IO
SE1	RS232C
SE2	RS485
IA	IA Net

* 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.

I/O cable length

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

Power voltage

4	AC100~230

Simple absolute unit

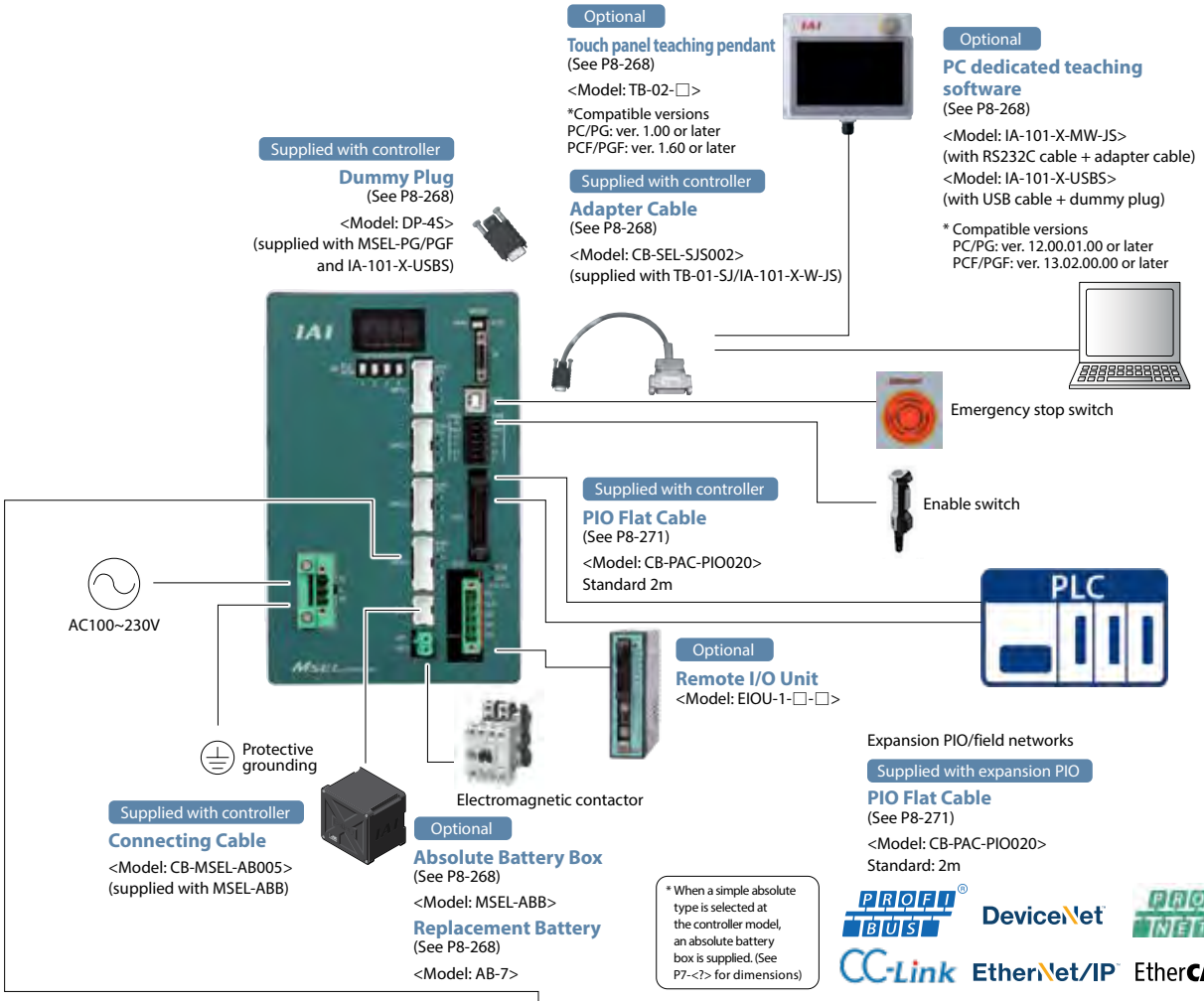
ABB	With absolute battery box
ABBN	Without absolute battery box
Blank	Battery-less or Incremental

* Make sure to select ABB / ABBN when simple absolute type "SA" is selected.

Mounting specification

Blank	Screw fixation
DN	DIN rail mount

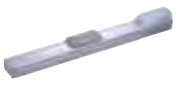
System configuration



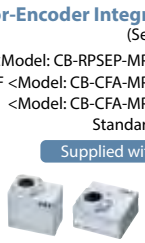
<Connectable Actuators>

* Wire the emergency stop switch, enable switch, electromagnetic contactor, etc., as necessary.
The same applies to the factory settings (shorting).

Motor-Encoder Integrated Cable
(See P8-270)
<Model: CB-PSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with actuator
Actuator RCP2 Series



Motor-Encoder Integrated Cable
(See P8-270,271)
for PC/PG <Model: CB-RPSEP-MPA□□□>
for PCF/PGF <Model: CB-CFA-MPA□□□>/
<Model: CB-CFA-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with actuator
Actuator RCP2 Small Rotary



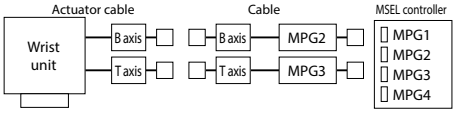
Motor-Encoder Integrated Cable
(See P8-270)
<Model: CB-APSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with actuator
Actuator RCP3 Series

Motor-Encoder Integrated Cable
(See P8-271)
for PC/PG <Model: CB-CA-MPA□□□>/<Model: CB-CA-MPA□□□-RB>
for PCF/PGF <Model: CB-CFA2-MPA□□□>/<Model: CB-CFA2-MPA□□□-RB
Standard: 1m/3m/5m
Supplied with actuator
Actuator RCP4 Series

Motor-Encoder Integrated Cable
(See P8-269,271)
for PC/PG <Model: CB-CAN-MPA□□□>/<Model: CB-CAN-MPA□□□-RB>
for PCF/PGF <Model: CB-CFA3-MPA□□□>/<Model: CB-CFA3-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with actuator
Actuator RCP5 Series

Motor-Encoder Integrated Cable
(See P8-269,271)
for PC/PG <Model: CB-CAN-MPA□□□>/
<Model: CB-CAN-MPA□□□-RB>
for PCF/PGF <Model: CB-CFA3-MPA□□□>/
<Model: CB-CFA3-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with actuator
Actuator RCP6 Series/ WU Series

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.



For IXP (PowerCON SCARA)

List of models

Name	Controller for PowerCON SCARA			
External view				
Type	PCX3	PGX3	PCX4	PGX4
Classification	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 AC100 to 230V			

Model

Specs of SCARA / Specs of additional axes

* 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).

MSEL – [Controller type] – [SCARA type] WAI [Encoder] [Option] – [Motor] WAI [Encoder] [Option] – [Standard I/O] – [Expansion I/O] – [PIO Cable] – 4 – [Power voltage] [Mounting specification]

Controller type

PCX3	3-axis standard
PGX3	3-axis safety category compliant
PCX4	4-axixs standard
PGX4	4-axis safety category compliant

SCARA type

3N1808	IXP-3N1808用
4N1808	IXP-4N1808用
3N2508	IXP-3N2508用
4N2508	IXP-4N2508用
3N2508GM	IXP-3N2508GM用
3□3515	IXP-3□3515用
4□3515	IXP-4□3515用
3N3515GM	IXP-3N3515GM用
3N3510GL	IXP-3N3510GL用
3□4515	IXP-3□4515用
4□4515	IXP-4□4515用
3N4515GM	IXP-3N4515GM用
3N4510GL	IXP-3N4510GL用
3□5520	IXP-3□5520用
4□5520	IXP-4□5520用
3N5515GL	IXP-3N5515GL用
3N5515GW	IXP-3N5515GW用
3□6520	IXP-3□6520用
4□6520	IXP-4□6520用
3N6515GL	IXP-3N6515GL
3N6515GW	IXP-3N6515GW用

* The signs below are specified in the □:
N: Standard specification
C: Clean specification
W: Dust- & splash-proof

Encoder

B	Brake

* An arm length of 550 and 650 can only be selected. Make sure to select it when the workpiece is 4 kg or larger.

Motor

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

(EX) 20P : 20□ pulse motor compatible

Note

Basically, the motor has the same alphanumeric sign as the connecting actuator motor, though some controllers and actuator motors have different signs. When ordering, please pay attention to such types listed below: (Actuators for 28SP)

●Controller motor type "28SP"
…RCP2-RA3C

Option

Blank	No option
B	Brake

Standard I/O

NP	NPN
PN	PNP

Expansion I/O

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 communication board

* 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.

PIO Cable

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

Power voltage

4	AC100~230V

Mounting specification

Blank	Screw fixation
DN	DIN rail mount

System configuration

Supplied with the SCARA robot

Motor-Encoder Integrated Cable
(See P8-269)
<Model: CB-CAN-MPA□□□>
Standard: 1m/3m/5m
*The SCARA robot can be connected to PCX/PGX only.

Supplied with the controller/Option

Dummy Plug
(See P8-268)
<Model: DP-4S>
(Supplied with MSEL-PGX and IA-101-X-USBS)

Optional

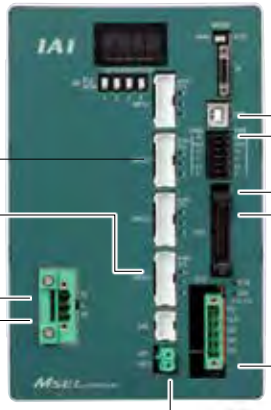
Touch panel teaching pendant
(See P8-268)
<Model: TB-02-□>
* compatible versions
PC/PG: ver. 1.00 or later
PCX/PGX: ver. 1.02 or later

Supplied with the controller/Option

Adapter Cable
(See P8-268)
<Model: CB-SEL-SJS002>
(supplied with TB-01-SJ/IA-101-X-W-JS)

Optional

PC dedicated teaching software
(See P8-268)
<Model: IA-101-X-MW-JS>
(with RS232C cable + adapter cable)
<Model: IA-101-X-USBS>
(with USB cable + dummy plug)
* Compatible versions
PCX/PGX: ver. 11.00.00.00 or later



Emergency stop switch

Enable switch

Supplied with controller

PIO Flat Cable
(See P8-271)
<Model: CB-PAC-PIO020>
Standard: 2m

AC100~230V

Expansion PIO/field networks

Optional

Remote I/O Unit
<Model: EIOU-1-□-□>

Protective grounding

Electromagnetic contactor

Supplied with expansion PIO specification

PIO Flat Cable
(See P8-271)
<Model: CB-PAC-PIO020>
Standard: 2m

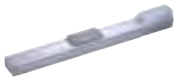
PROFIBUS DeviceNet PROFINET
CC-Link EtherNet/IP EtherCAT

* Wire the emergency stop switch, enable switch, electromagnetic contactor, etc., as necessary.
The same applies to the factory settings (shorting).

<Compatible Actuators>

* MSEL-PCX/PGX can be connected to IXP with 3-axis specification.

Motor-Encoder Integrated Cable
(See P8-270)
<Model: CB-PSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with actuator

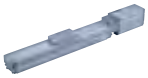


Actuator RCP2 Series

Motor-Encoder Integrated Cable
(See P8-270)
<Model: CB-RPSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with actuator

Actuator RCP2 Small Rotary

Motor-Encoder Integrated Cable
(See P8-270)
<Model: CB-APSEP-MPA□□□>
Standard: 1m/3m/5m
Supplied with actuator



Actuator RCP3 Series

Motor-Encoder Integrated Cable
(See P8-270)
<Model: CB-CA-MPA□□□>
<Model: CB-CA-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with actuator

Actuator RCP4 Series

Motor-Encoder Integrated Cable
(See P8-269)
<Model: CB-CAN-MPA□□□>
<Model: CB-CAN-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with actuator

Actuator RCP5 Series

Motor-Encoder Integrated Cable
(See P8-269)
<Model: CB-CAN-MPA□□□>
<Model: CB-CAN-MPA□□□-RB>
Standard: 1m/3m/5m
Supplied with actuator

Actuator RCP6 Series

Basic controller specifications

Specification item			Description
ower input voltage			Single phase AC100~230V±10%
Power supply current			2.9Atyp.(AC100V), 1.4Atyp.(AC200V), 1.2Atyp.(AC230V)
Power supply frequency range			50/60Hz±5%
Motor type			Pulse 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		○
	Program		○
SIO interface	Communication method		RS232C (asynchronous communications)
	Communication speed		9.6, 19.2, 38.4, 57.6, 76.8, 115.2kbps
	Hot swapping	TP port	×
		USB	○
Standard PIO interface	Input specification	Number of input points	16 points
		Input voltage	24VDC ±10%
		Input current	7mA / circuit
		ON voltage	Min.DC16V
		OFF voltage	Max.DC5V
		Leak current	Allowable leak current: Max. 1mA
		Isolation method	Photocoupler insulation
	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			5%RH - 85%RH (non-condensing, no frost)
Installation	Installation direction		Vertical installation (exhaust side up)
	Installation method		Screw fixation or DIN rail mount
Rush current			15Atyp.(AC100V), 30Atyp.(AC200V): 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

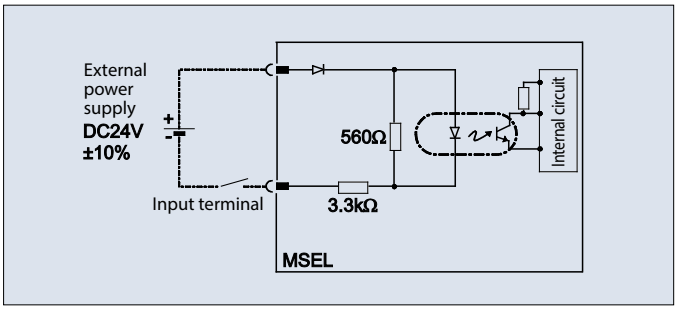
Pin No.	Category	Assignment	Pin No.	Category	Assignment
1A	24V	P24	1B	Output	OUT0
2A	24V	P24	2B		OUT1
3A	—	—	3B		OUT2
4A	—	—	4B		OUT3
5A	Input	IN0	5B		OUT4
6A		IN1	6B		OUT5
7A		IN2	7B		OUT6
8A		IN3	8B		OUT7
9A		IN4	9B		OUT8
10A		IN5	10B		OUT9
11A		IN6	11B		OUT10
12A		IN7	12B		OUT11
13A		IN8	13B		OUT12
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 ±10%
Input current	7mA / circuit
On/Off voltage	On voltage... Min. DC 16.0V Off voltage... max. DC 5.0V
Insulation method	Photocoupler insulation

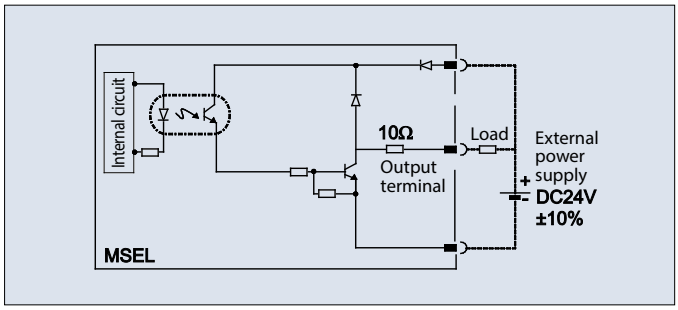
* The port numbers in the circuit diagram below represent the factory-set port numbers.
* When the input is off, the allowable leak current is 1mA max.



[Output Section] External output specifications (NPN specifications)

Item	Specifications	
Load voltage	24VDC ±10%	Use 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.)

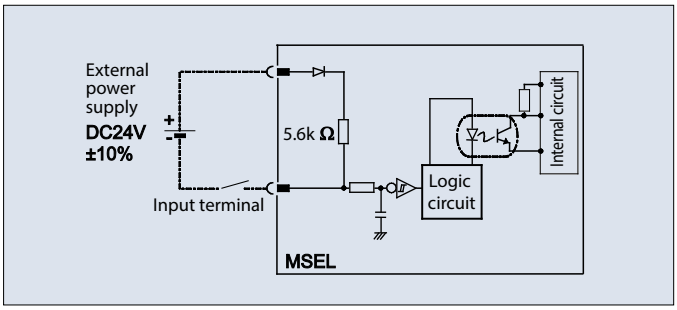


* For the standard IO (PNP specifications), refer to the operation manual.

Internal circuits for standard I/Os (NPN specifications)

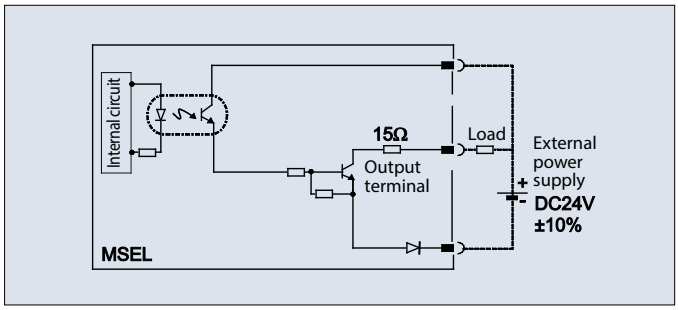
[Input Section] External input specifications

Item	Specifications
Number of input points	16 points
Input voltage	24VDC ±10%
Input current	4mA / circuit
On/Off voltage	On voltage... Min. DC 18V (3.5mA) Off voltage... Max. DC 6V (1mA)
Insulation method	Photocoupler insulation

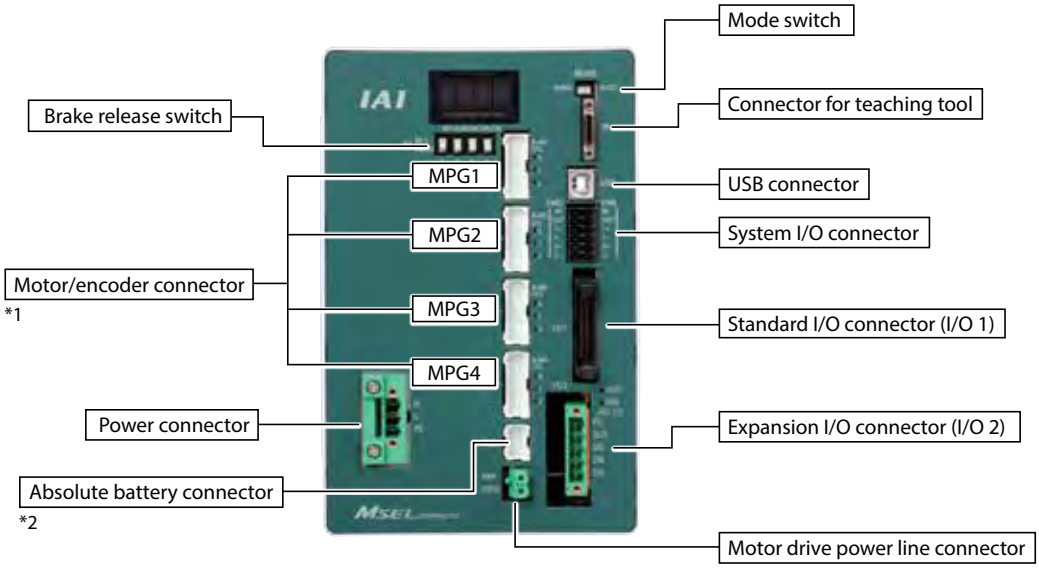


[Output Section] External output specifications

Item	Specifications
Number of output points	16 points
Rated load current	24VDC ±10%
Maximum current	50mA / circuit
Insulation method	Photocoupler insulation



Name of each part



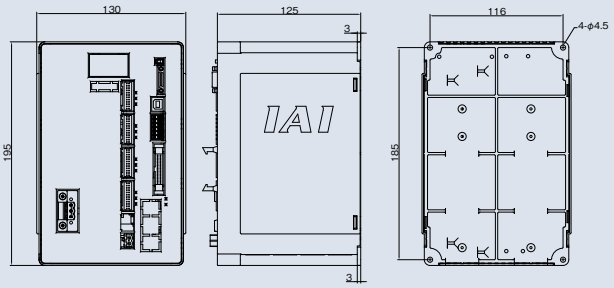
*1: Do not connect a wrong motor to the MPG1, MPG2, MPG3 or MPG4 connectors. It may cause malfunction or failure.
*2: Not available for MSEL-PCX/PGX.

External dimensions

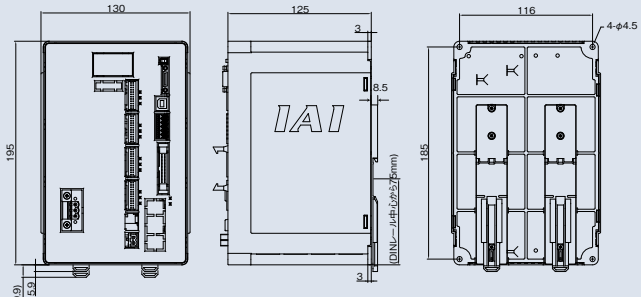
Controller

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

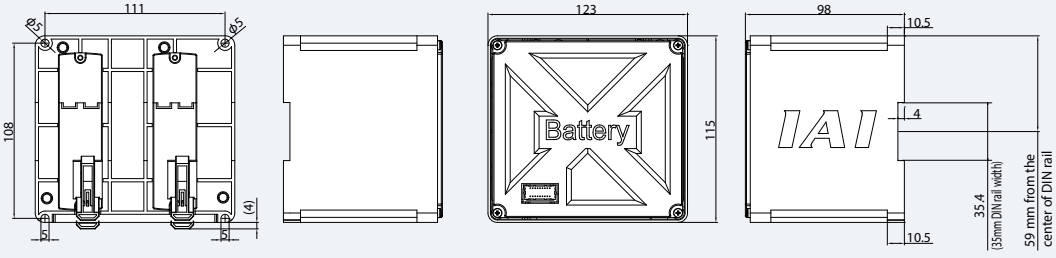
Screw fixing specification



DIN rail mounting specification



Absolute Battery Box



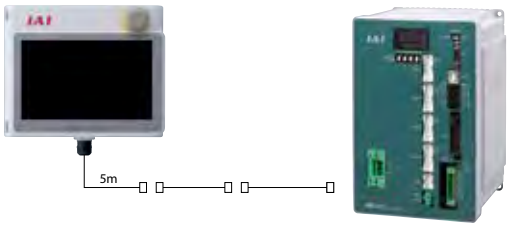
Options

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℃
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Protective structure	IP20
Weight	470g (TB-02 unit only)

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**

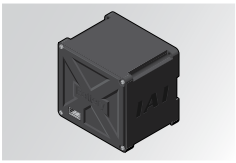
Absolute Battery Box

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 P8-267**

* 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.



Replacement Battery

Features The replacement battery for the absolute battery box.

Model **AB-7**

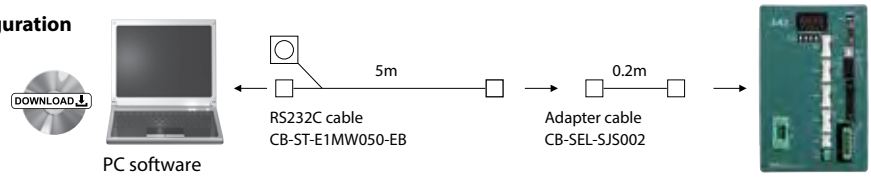
* Same quantity of absolute battery units is required as the number of axes.

PC dedicated teaching software (Windows only)

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.
* Please purchase through your distributor and a download link will be sent to your valid email address.

Model number **IA-101-X-MW-JS** (including RS232C cable + Connector adapter cable)

Configuration

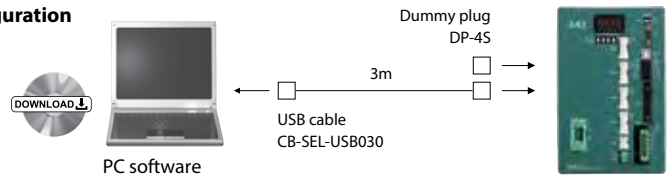


PC software
(Download Only)

Compatible Windows: 7/10

Model number **IA-101-X-USBS** (including USB cable + dummy plug)

Configuration



PC software
(Download Only)

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.)

Spare parts

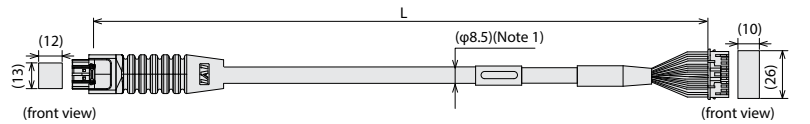
When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below.

■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□□□(for MSEL-PC/PG) CB-CFA2-MPA□□□(for MSEL-PCF/PGF)	CB-CA-MPA□□□-RB(for MSEL-PC/PG) CB-CFA2-MPA□□□-RB(for MSEL-PCF/PGF)
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	RCP2 RCP2CR RCP2W	GRSS/GRLS/GRST GRHM/GRHB SRA4R/SRGS4R SRGD4R	–	CB-APSEP-MPA□□□
⑪		HS8C/HS8R SA16C RA8C/RA8R RA10C	CB-CFA-MPA□□□	CB-CFA-MPA□□□-RB
⑫		Models other than the above	–	CB-PSEP-MPA□□□
⑬	WU		CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

DF62DL-24S-2.2C(Hirose)

Color	Signal	Pin No.
Blue(AWG22/19)	ϕA	3
Orange(AWG22/19)	VMM	5
Brown(AWG22/19)	ϕB	10
Gray(AWG22/19)	VMM	9
Green(AWG22/19)	ϕ A	4
Red(AWG22/19)	ϕ B	15
Light blue(AWG26)	SA[mABS]	12
Orange(AWG26)	SB[mABS]	17
Green(AWG26)	A+	1
Brown(AWG26)	A-	6
Gray(AWG26)	B+	11
Red(AWG26)	B-	16
Black(AWG26)	VPS	18
Yellow(AWG26)	LS+	8
Light blue(AWG26)	BK+	20
Orange(AWG26)	BK-	2
Gray(AWG26)	VCC	21
Red(AWG26)	GND	7
Brown(AWG26)	LS-	14
Green(AWG26)	LS_GND	13
—	—	19
Pink(AWG26)	CF_VCC	22
—	—	23
Black(AWG26)	FG	24

Purple(AWG26)

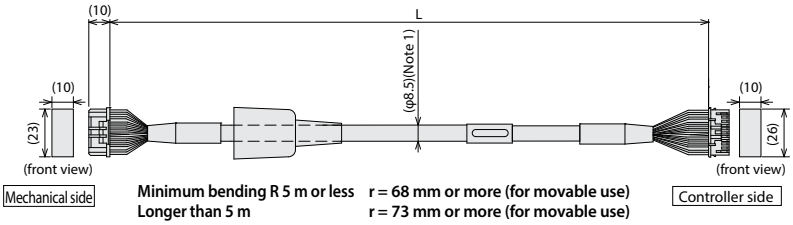
PADP-24V-1-S(JST)

Pin No.	Signal	Color
1	ϕA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
3	ϕB	Brown(AWG22/19)
4	VMM	Gray(AWG22/19)
5	ϕ A	Green(AWG22/19)
6	ϕ B	Red(AWG22/19)
11	SA[mABS]	Light blue(AWG26)
12	SB[mABS]	Orange(AWG26)
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Gray(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light blue(AWG26)
10	BK-	Orange(AWG26)
17	VCC	Gray(AWG26)
19	GND	Red(AWG26)
8	LS-	Brown(AWG26)
20	LS_GND	Green(AWG26)
22	—	—
21	CF_VCC	Pink(AWG26)
23	—	—
24	FG	Black(AWG26)

Spare parts

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

1-1827863-1 (AMP)

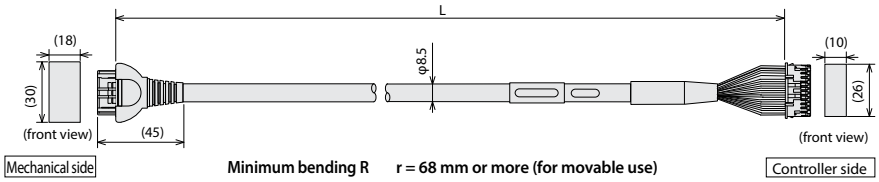
Color	Signal	Pin No.
Blue(AWG22/19)	ϕA	A1
Orange(AWG22/19)	VMM	B1
Green(AWG22/19)	ϕ_A	A2
Brown(AWG22/19)	ϕB	B2
Grey(AWG22/19)	VMM	A3
Red(AWG22/19)	ϕ_B	B3
Light blue(AWG26)	—	A6
Orange(AWG26)	—	B6
Green(AWG26)	A+	A7
Brown(AWG26)	A-	B7
Grey(AWG26)	B+	A8
Red(AWG26)	B-	B8
Black(AWG26)	VPS	B9
Yellow(AWG26)	LS+	A4
Light blue(AWG26)	BK+	A5
Orange(AWG26)	BK-	B5
Green(AWG26)	LS_GND	A9
Brown(AWG26)	LS-	B4
Grey(AWG26)	VCC	A10
Red(AWG26)	GND	B10
—	—	A11
Black	FG	B11

PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	ϕA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
5	ϕ_A	Green(AWG22/19)
3	ϕB	Brown(AWG22/19)
4	VMM	Grey(AWG22/19)
6	ϕ_B	Red(AWG22/19)
11	—	Light blue(AWG26)
12	—	Orange(AWG26)
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Grey(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light blue(AWG26)
10	BK-	Orange(AWG26)
20	LS_GND	Green(AWG26)
8	LS-	Brown(AWG26)
17	VCC	Grey(AWG26)
19	GND	Red(AWG26)
21	—	—
22	—	—
23	—	—
24	FG	Black

Model CB-APSEP-MPA □□□

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m



Minimum bending R r = 68 mm or more (for movable use)

1-1827863-1(AMP)

Color	Signal	Pin No.
Black(AWG22)	ϕA	A1
White(AWG22)	VMM	B1
Brown(AWG22)	ϕ_A	A2
Green(AWG22)	ϕB	B2
Yellow(AWG22)	VMM	A3
Red(AWG22)	ϕ_B	B3
Orange(AWG25)	LS+	A4
Grey(AWG25)	LS-	B4
White(AWG25)	—	A6
Yellow(AWG25)	—	B6
Red(AWG25)	A+	A7
Green(AWG25)	A-	B7
Black(AWG25)	B+	A8
Brown(AWG25)	B-	B8
Black(AWG25)	BK+	A5
Brown(AWG25)	BK-	B5
Green(AWG25)	GND※	A9
Red(AWG25)	VPS	B9
White(AWG25)	VCC	A10
Yellow(AWG25)	GND	B10
	—	A11
—	Shield,FG	B11

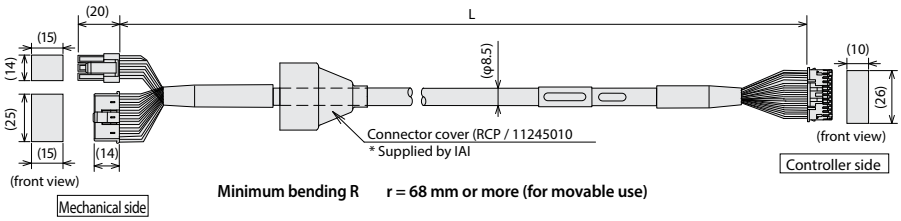
PADP-24V-1-S(JST)

Pin No.	Signal	Color
1	ϕA	Black(AWG22)
2	VMM	White(AWG22)
5	ϕ_A	Brown(AWG22)
3	ϕB	Green(AWG22)
4	VMM	Yellow(AWG22)
6	ϕ_B	Red(AWG22)
7	LS+	Orange(AWG25)
8	LS-	Grey(AWG25)
11	—	White(AWG25)
12	—	Yellow(AWG25)
13	A+	Red(AWG25)
14	A-	Green(AWG25)
15	B+	Black(AWG25)
16	B-	Brown(AWG25)
9	BK+	Black(AWG25)
10	BK-	Brown(AWG25)
20	GND※	Green(AWG25)
18	VPS	Red(AWG25)
17	VCC	White(AWG25)
19	GND	Yellow(AWG25)
21	—	—
24	Shield,FG	—
22	—	—
23	—	—

Model CB-PSEP-MPA □□□

*** The robot cable is standard.**

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m



Minimum bending R r = 68 mm or more (for movable use)

SLP-06V(JST)

Color	Signal	Pin No.
Black(AWG22)	ϕA	1
White(AWG22)	VMM	2
Brown(AWG22)	ϕ/A	3
Red(AWG22)	ϕB	4
Green(AWG22)	VMM	5
Yellow(AWG22)	ϕ/B	6

XMP-18V(JST)

Color	Signal	Pin No.
White(AWG25)	A+	1
Yellow(AWG25)	A-	2
Red(AWG25)	B+	3
Green(AWG25)	B-	4
	N.C.	5
	N.C.	6
	N.C.	7
	N.C.	8
Red(AWG25)	GND	9
White(AWG25)	VCC	10
Yellow(AWG25)	VPS	11
Green(AWG25)	(Preserve)	12
Black(AWG25)	LS+	13
Brown(AWG25)	LS-	14
	N.C.	15
Orange(AWG25)	BK+	16
Grey(AWG25)	BK-	17
Shield(AWG25)	F.G	18

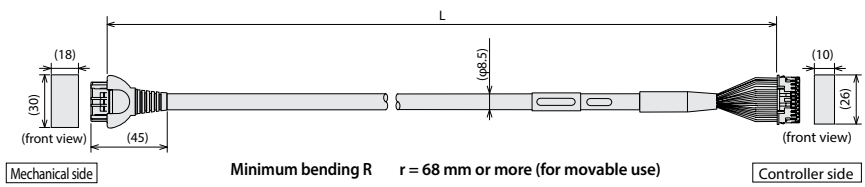
PADP-24V-1-S(JST)

Pin No.	Signal	Color
1	ΦA	Black(AWG22)
2	VMM	White(AWG22)
3	ΦB	Red(AWG22)
4	VMM	Green(AWG22)
5	Φ/A	Brown(AWG22)
6	Φ/B	Yellow(AWG22)
7	LS+	Black(AWG25)
8	LS-	Brown(AWG25)
9	BK+	Orange(AWG25)
10	BK-	Grey(AWG25)
11	N.C.	
12	N.C.	
13	A+	White(AWG25)
14	A-	Yellow(AWG25)
15	B+	Red(AWG25)
16	B-	Green(AWG25)
17	VCC	White(AWG25)
18	VPS	Yellow(AWG25)
19	GND	Red(AWG25)
20	(Preserve)	Green(AWG25)
21	N.C.	
22	N.C.	
23	N.C.	
24	FG	Shield(AWG25)

Model CB-RPSEP-MPA □□□

*** The robot cable is standard.**

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m



Minimum bending R r = 68 mm or more (for movable use)

1-1827863-1(AMP)

Color	Signal	Pin No.
Black(AWG22)	ϕA	A1
White(AWG22)	VMM	B1
Brown(AWG22)	ϕ_A	A2
Green(AWG22)	ϕB	B2
Yellow(AWG22)	VMM	A3
Red(AWG22)	ϕ_B	B3
Orange(AWG26)	LS+	A6
Grey(AWG26)	LS-	B6
Red(AWG26)	A+	A7
Green(AWG26)	A-	B7
Black(AWG26)	B+	A8
Brown(AWG26)	B-	B8
—	—	B4
—	—	A11
Black(AWG26)	BK+	A5
Brown(AWG26)	BK-	B5
Green(AWG26)	LS_GND	A9
Red(AWG26)	VPS	B9
White(AWG26)	VCC	A10
Yellow(AWG26)	GND	B10
—	—	A4
Shield	FG	B11

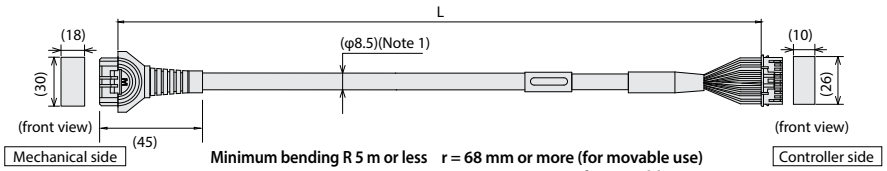
PADP-24V-1-S (JST)

Pin No.	Signal	Color
1	ϕA	Blue(AWG22)
2	VMM	Orange(AWG22)
5	ϕ_A	Green(AWG22)
3	ϕB	Brown(AWG22)
4	VMM	Grey(AWG22)
6	ϕ_B	Red(AWG22)
7	LS+	Light blue(AWG26)
8	LS-	Orange(AWG26)
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Grey(AWG26)
16	B-	Red(AWG26)
11	—	Black(AWG26)
12	—	Yellow(AWG26)
9	BK+	Light blue(AWG26)
10	BK-	Orange(AWG26)
20	LS_GND	Green(AWG26)
18	VPS	Brown(AWG26)
17	VCC	Grey(AWG26)
19	GND	Red(AWG26)
21	—	—
22	—	—
23	—	—
24	FG	Shield

Spare parts

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

1-1827863-1(AMP)

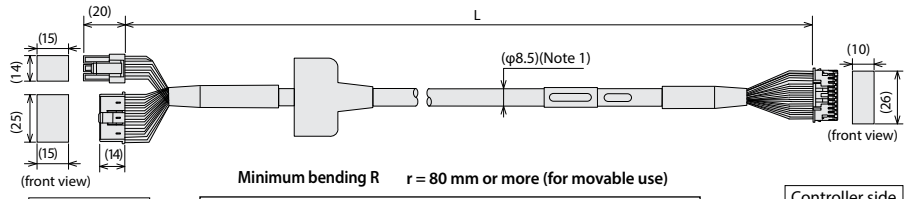
Color		Signal	Pin No.
Standard cable	Robot cable		
Light blue(AWG22/19)	Light blue(AWG22/19)	ϕA	A1
Orange(AWG22/19)	Orange(AWG22/19)	VMM	B1
Green(AWG22/19)	Green(AWG22/19)	ϕ_A	A2
Brown(AWG22/19)	Brown(AWG22/19)	ϕB	B2
Grey(AWG22/19)	Grey(AWG22/19)	VMM	A3
Red(AWG22/19)	Red(AWG22/19)	ϕ_B	B3
Light blue(AWG26)	Light blue(AWG26	SA(mABS)	A6
Orange(AWG26)	Orange(AWG26)	SB(mABS)	B6
Green(AWG26)	Green(AWG26)	A+	A7
Brown(AWG26)	Brown(AWG26)	A-	B7
Grey(AWG26)	Grey(AWG26)	B+	A8
Red(AWG26)	Red(AWG26)	B-	B8
Black(AWG26)	Black(AWG26)	VPS	B9
Yellow(AWG26)	Yellow(AWG26)	LS+	A4
Light blue(AWG26)	Light blue(AWG26)	BK+	A5
Orange(AWG26)	Orange(AWG26)	BK-	B5
Green(AWG26)	Green(AWG26)	LS_GND	A9
Brown(AWG26)	Brown(AWG26)	LS-	B4
Grey(AWG26)	Grey(AWG26)	VCC	A10
Red(AWG26)	Red(AWG26)	GND	B10
—	—	—	A11
Black	Green	FG	B11

PADP-24V-1-S(JST)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	ϕA	Light blue(AWG22/19)	Light blue(AWG22/19)
2	VMM	Orange(AWG22/19)	Orange(AWG22/19)
5	ϕ_A	Green(AWG22/19)	Green(AWG22/19)
3	ϕB	Brown(AWG22/19)	Brown(AWG22/19)
4	VMM	Grey(AWG22/19)	Grey(AWG22/19)
6	ϕ_B	Red(AWG22/19)	Red(AWG22/19)
11	SA(mABS)	Light blue(AWG26)	Light blue(AWG26
12	SB(mABS)	Orange(AWG26)	Orange(AWG26)
13	A+	Green(AWG26)	Green(AWG26)
14	A-	Brown(AWG26)	Brown(AWG26)
15	B+	Grey(AWG26)	Grey(AWG26)
16	B-	Red(AWG26)	Red(AWG26)
18	VPS	Black(AWG26)	Black(AWG26)
7	LS+	Yellow(AWG26)	Yellow(AWG26)
9	BK+	Light blue(AWG26)	Light blue(AWG26)
10	BK-	Orange(AWG26)	Orange(AWG26)
20	LS_GND	Green(AWG26)	Green(AWG26)
8	LS-	Brown(AWG26)	Brown(AWG26)
21	VCC	Grey(AWG26)	Grey(AWG26)
19	GND	Red(AWG26)	Red(AWG26)
17	—	—	—
22	—	—	—
23	—	—	—
24	FG	Black	Green

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m



Minimum bending R r = 80 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

SLP-06V(JST)

Color		Signal	Pin No.
Standard cable	Robot cable		
Blue(AWG22/19)	Blue(AWG22/19)	ϕA	1
Orange(AWG22/19)	Orange(AWG22/19)	VMM	2
Brown(AWG22/19)	Brown(AWG22/19)	ϕB	4
Grey(AWG22/19)	Grey(AWG22/19)	VMM	5
Green(AWG22/19)	Green(AWG22/19)	ϕ/A	3
Red(AWG22/19)	Red(AWG22/19)	ϕ/B	6

XMP-18V(JST)

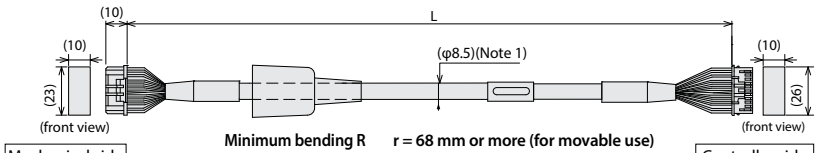
(Light blue(AWG26))	—	NC	5
(Orange(AWG26))	—	NC	6
Green(AWG26)	Green(AWG26)	LS+	1
Brown(AWG26)	Brown(AWG26)	LS-	2
Grey(AWG26)	Grey(AWG26)	A+	3
Red(AWG26)	Red(AWG26)	A-	4
Black(AWG26)	Black(AWG26)	B+	11
Yellow(AWG26)	Yellow(AWG26)	B-	13
Light blue(AWG26)	Light blue(AWG26)	BK+	16
Orange(AWG26)	Orange(AWG26)	BK-	17
(Green(AWG26))	(Green(AWG26))	LS_GND	10
Brown(AWG26)	Brown(AWG26)	LS-	14
Grey(AWG26)	Grey(AWG26)	VCC	12
Red(AWG26)	Red(AWG26)	GND	9
Black	Shield	FG	18
—	—	NC	15
—	—	NC	7
—	—	NC	8

PADP-24V-1-S(JST)

Pin No.	Signal	Color	
		Standard cable	Robot cable
1	ϕA	Blue(AWG22/19)	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)	Orange(AWG22/19)
3	ϕB	Brown(AWG22/19)	Brown(AWG22/19)
4	VMM	Grey(AWG22/19)	Grey(AWG22/19)
5	ϕ/A	Green(AWG22/19)	Green(AWG22/19)
6	ϕ/B	Red(AWG22/19)	Red(AWG22/19)
11	NC	(Light blue(AWG26))	—
12	NC	(Orange(AWG26))	—
13	LS+	Green(AWG26)	Green(AWG26)
14	LS-	Brown(AWG26)	Brown(AWG26)
15	A+	Grey(AWG26)	Grey(AWG26)
16	A-	Red(AWG26)	Red(AWG26)
18	B+	Black(AWG26)	Black(AWG26)
7	B-	Yellow(AWG26)	Yellow(AWG26)
9	BK+	Light blue(AWG26)	Light blue(AWG26)
10	BK-	Orange(AWG26)	Orange(AWG26)
20	LS_GND	(Green(AWG26))	(Green(AWG26))
8	LS-	Brown(AWG26)	Brown(AWG26)
21	VCC	Grey(AWG26)	Grey(AWG26)
19	GND	Red(AWG26)	Red(AWG26)
24	FG	Black	Shield
17	NC		
22	NC	—	—
23	NC	—	—

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m



Minimum bending R r = 68 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 track.

(Note 1) If the cable length is over 5m, φ9.1 cable diameter applies.

1-1827863-1(AMP)

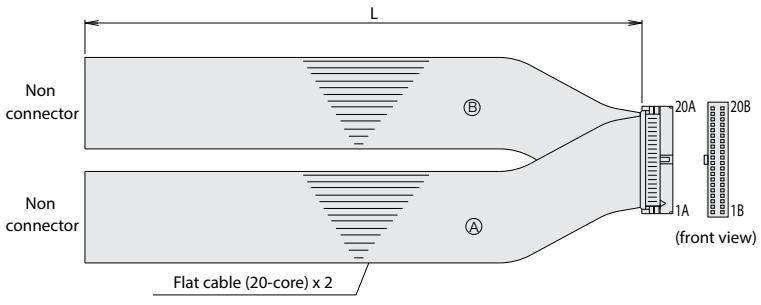
Color	Signal	Pin No.
Blue(AWG22/19)	ϕA	A1
Orange(AWG22/19)	VMM	B1
Green(AWG22/19)	ϕ_A	A2
Brown(AWG22/19)	ϕB	B2
Grey(AWG22/19)	VMM	A3
Red(AWG22/19)	ϕ_B	B3
(Light blue(AWG26))	—	A6
(Orange(AWG26))	—	B6
Green(AWG26)	A+	A7
Brown(AWG26)	A-	B7
Grey(AWG26)	B+	A8
Red(AWG26)	B-	B8
Black(AWG26)	VPS	B9
Yellow(AWG26)	LS+	A4
Light blue(AWG26)	BK+	A5
Orange(AWG26)	BK-	B5
Green(AWG26)	LS_GND	A9
Brown(AWG26)	LS-	B4
Grey(AWG26)	VCC	A10
Red(AWG26)	GND	B10
—	—	A11
Black	FG	B11

PADP-24V-1-S(JST)

Pin No.	Signal	Color
1	ϕA	Blue(AWG22/19)
2	VMM	Orange(AWG22/19)
5	ϕ_A	Green(AWG22/19)
3	ϕB	Brown(AWG22/19)
4	VMM	Grey(AWG22/19)
6	ϕ_B	Red(AWG22/19)
11	—	(Light blue(AWG26))
12	—	(Orange(AWG26))
13	A+	Green(AWG26)
14	A-	Brown(AWG26)
15	B+	Grey(AWG26)
16	B-	Red(AWG26)
18	VPS	Black(AWG26)
7	LS+	Yellow(AWG26)
9	BK+	Light blue(AWG26)
10	BK-	Orange(AWG26)
20	LS_GND	Green(AWG26)
8	LS-	Brown(AWG26)
21	VCC	Grey(AWG26)
19	GND	Red(AWG26)
17	—	—
22	—	—
23	—	—
24	FG	Black

Model CB-PAC-PIO □□□

* Enter the cable length (L) into □□□. Compatible to a maximum of 10m.
Ex.: 080=8m



HIF6-40D-1.27R(Hirose)

No.	Signal	Cable color	Wiring
A1	24V	Brown-1	Flat cable (A) (Crimped) AWG28
A2	24V	Red-1	
A3	—	Orange-1	
A4		Yellow-1	
A5	IN0	Green-1	
A6	IN1	Blue-1	
A7	IN2	Purple-1	
A8	IN3	Gray-1	
A9	IN4	White-1	
A10	IN5	Black-1	
A11	IN6	Brown-2	
A12	IN7	Red-2	
A13	IN8	Orange-2	
A14	IN9	Yellow-2	
A15	IN10	Green-2	
A16	IN11	Blue-2	
A17	IN12	Purple-2	
A18	IN13	Gray-2	
A19	IN14	White-2	
A20	IN15	Black-2	

No.	Signal	Cable color	Wiring
B1	OUT0	Brown-3	Flat cable (B) (Crimped) AWG28
B2	OUT1	Red-3	
B3	OUT2	Orange-3	
B4	OUT3	Yellow-3	
B5	OUT4	Green-3	
B6	OUT5	Blue-3	
B7	OUT6	Purple-3	
B8	OUT7	Gray-3	
B9	OUT8	White-3	
B10	OUT9	Black-3	
B11	OUT10	Brown-4	
B12	OUT11	Red-4	
B13	OUT12	Orange-4	
B14	OUT13	Yellow-4	
B15	OUT14	Green-4	
B16	OUT15	Blue-4	
B17	—	Purple-4	
B18		Gray-4	
B19	0V	White-4	
B20	0V	Black-4	

MEMO

X-SEL

Program Controller
for Single-axis robot / Cartesian robot / Linear servo /
RCS4/RCS3/RCS2 series.

(*) Only SA, Q types are compliant with UL.

List of models

Multi-axial program controller for operating servo motor actuators. Up to 8 axes can be simultaneously controlled.

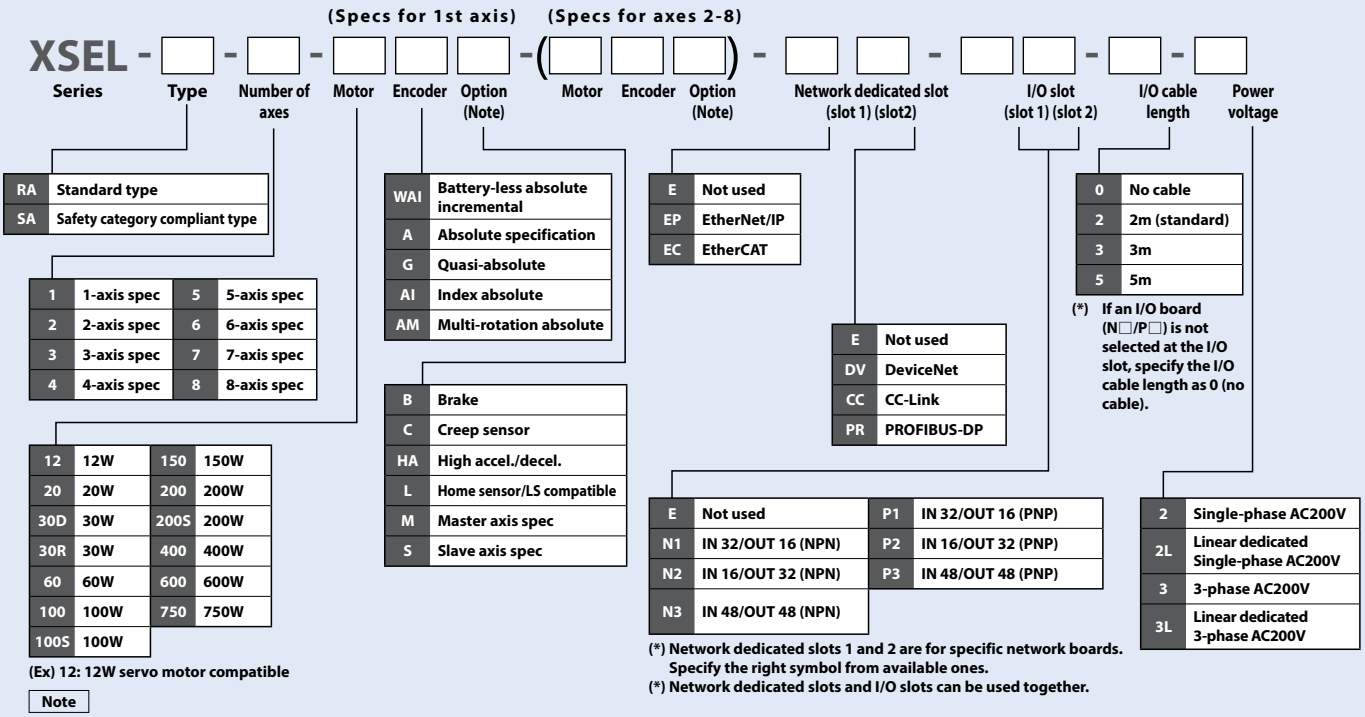
Type		RA	SA	P	Q
External view					
Description		Standard specification	Safety category compliant	Standard specification	Safety category compliant
Maximum number of control axes		8 axes		6 axes	
Number of positions		Maximum 55000 positions (It varies depending on the number of axes. See specification table on P8-280.)		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 AC200V/230V ±10% 3-hpase AC200V/230V ±10%		Single-phase AC200V/230V ±10% 3-hpase AC200V/230V ±10%	
Control power voltage		Single-phase AC200V/230V ±10%		Single-phase AC200V/230V ±10%	
Safety category (*1)		B	4-axis	B	4-axis
Overseas standard		CE		CE	
Expanded motion control function		Up to 32 axes can be controlled. (Only for the IAI controllers that are compatible with MECHATROLINK III)		Up to 16 axes can be controlled. (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) 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)



(*) 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).

(Ex) 12: 12W servo motor compatible

(*) 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.

Note

Basically, the motor has the same alphanumeric sign as the connecting actuator motor, though some controllers and actuator motors have different signs.

When ordering, pay attention to such types listed below:

(30D/30R/200S compatible actuators)

- **Controller motor type "30D"...30W actuator other than RS**
- **Controller motor type "30R"... RS**
- **Controller motor type "200S" ..... some models of LSA/LSAS**

* Note: When selecting a single-axis or Carrtesian 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 ① 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
* Refer to the Operation Manual for items not specified in this catalog.

② Actuators of the high-speed types (RCS3-CT8C and RCS3-CTZ5C) can be connected only with three-phase power source. The maximum number of connectable axes is 3 when only RCS3-CT8C is connected.

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 P8-277.

[XSEL-RA/SAType]

XSEL - RA - 4 - 200A - 100A - 60A - 30A - EPDV - N1E - 2 - 3

Series / Type / Number of axes / Connected actuator motor wattage, encoder / 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 / Network dedicated slots 1 / Slot 1 / Slot 2/3/4 * / I/O cable length / Power voltage

I/O slot description

Model

[XSEL-P/Q]

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

Specifying axis 2-6 depends on the number of axes used.

XSEL-□-□-□-□-□-(□-□-□)-□-□-□-□-□-□-□

Series: XSEL

Type

P	Standard type
Q	Safety category compliant

Number of connected axes

1	1-axis spec	4	4-axis spec
2	2-axis spec	5	5-axis spec
3	3-axis spec	6	6-axis spec

(specs for 1st axis) Motor

12	12W	100	100W	300S	300W
20	20W	100S	100W	400	400W
30D	30W	150	150W	600	600W
30R	30W	200	200W	750	750W
60	60W	200S	200W	1000	1000W

(Ex) 12: 12W servo motor compatible

Encoder

WAI	Battery-less absolute incremental
A	Absolute specification
G	Quasi-absolute
AI	Index absolute
AM	Multi-rotation absolute

(Note) Option

B	Brake
C	Creep sensor
HA	High accel./decel.
L	Home sensor/LS compatible
M	Master axis spec
S	Slave axis spec

(Specs for axis 2-6) Motor

12	12W	100	100W	300S	300W
20	20W	100S	100W	400	400W
30D	30W	150	150W	600	600W
30R	30W	200	200W	750	750W
60	60W	200S	200W	1000	1000W

(Ex) 12: 12W servo motor compatible

Encoder

WAI	Battery-less absolute incremental
A	Absolute specification
G	Quasi-absolute
AI	Index absolute
AM	Multi-rotation absolute

(Note) Option

B	Brake
C	Creep sensor
HA	High accel./decel.
L	Home sensor/LS compatible
M	Master axis spec
S	Slave axis spec

Network dedicated slot

Blank	Not used
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS
EP	EtherNet/IP

* The EtherNet/IP specification is compatible with the EtherNet.

(Slot 1) Standard I/O

* If the standard I/O board or expansion I/O (N□/P□) is not selected, specify the I/O cable length as 0 (no cable).

(Slot 2) (Slot 3) (Slot 4) Expansion I/O

E	Not used
N1	IN 32/OUT 16 (NPN)
N2	IN 16/OUT 32 (NPN)
N3	IN 48/OUT 48 (NPN)
P1	IN 32/OUT 16 (PNP)
P2	IN 16/OUT 32 (PNP)
P3	IN 48/OUT 48 (PNP)
MC	Pulse I/O board (*)
S	Expansion I/O with base

* Can be mounted up to 2 for one expansion I/O.
* When an expansion I/O is not installed but only an expansion I/O base, specifications are as shown in the right.

* If an expansion I/O is not used, specify an "E" (not used) in slots 2 to 4.
If an expansion I/O is used, specify an expansion I/O symbol from the left table in the slot position to be mounted.
When an expansion I/O is specified, the controller enclosure becomes "with expansion I/O base".
(See P8-592and 593)

S S S
(Slot 2) (Slot 3) (Slot 4)
Expansion I/O

I/O cable length

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

Power supply voltage

2	Single-phase AC200V
3	3-phase AC200V
2L	Linear dedicated single-phase AC200V
3L	Linear dedicated 3-phase AC200V

* When operating a linear servo actuator, specify 2L or 3L. Otherwise specify 2 or 3.

Note

Basically, the motor has the same alphanumeric sign as the connecting actuator motor, though some controllers and actuator motors have different signs.
When ordering, pay attention to such types listed below:
(30D/30R/200S compatible actuators)
●Controller motor type "30D"…30W actuator other than RS
●Controller motor type "30R"... RS

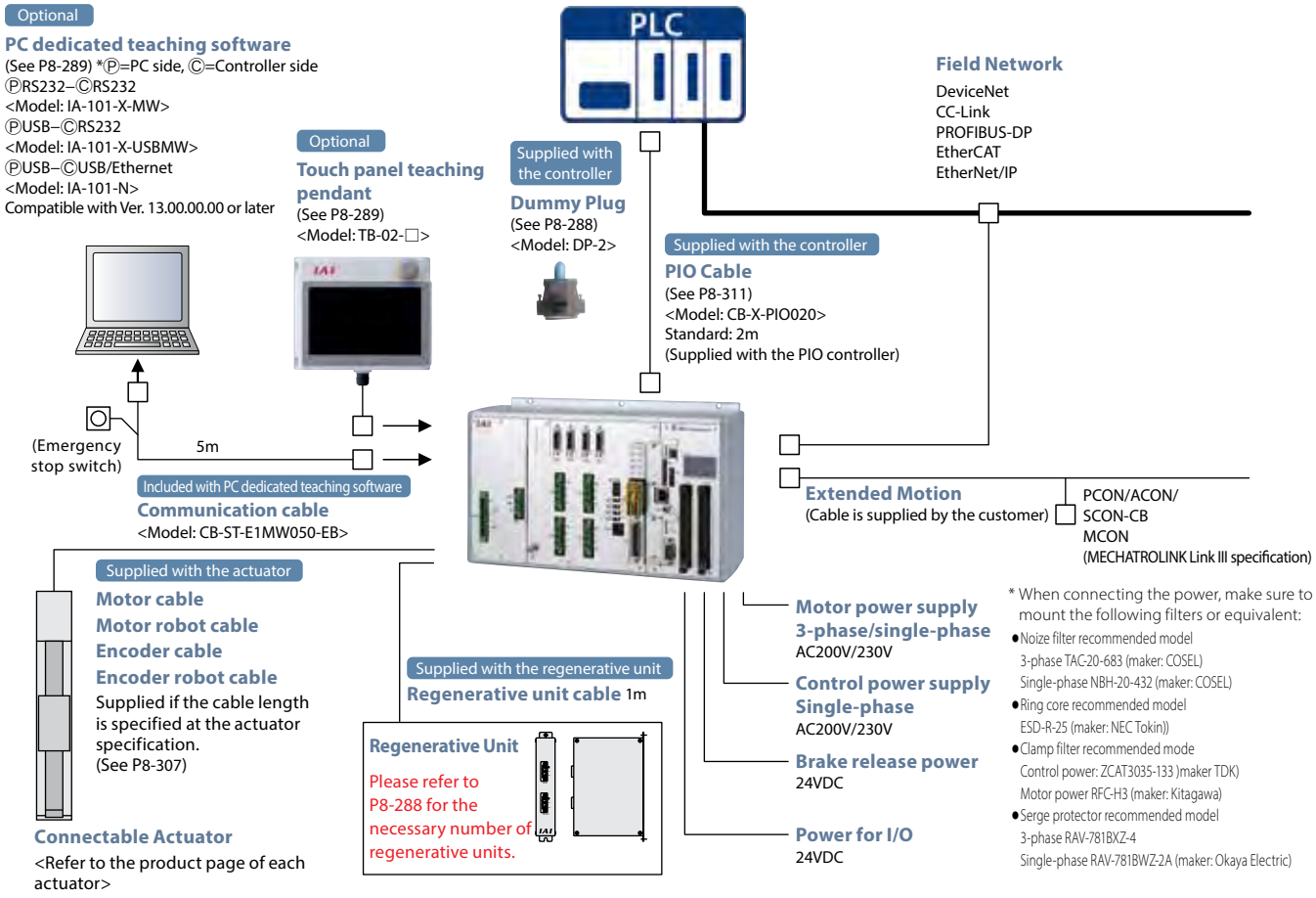
NOTE

The 5th and 6th axes of the XSEL-P/Q cannot connect to the following models:

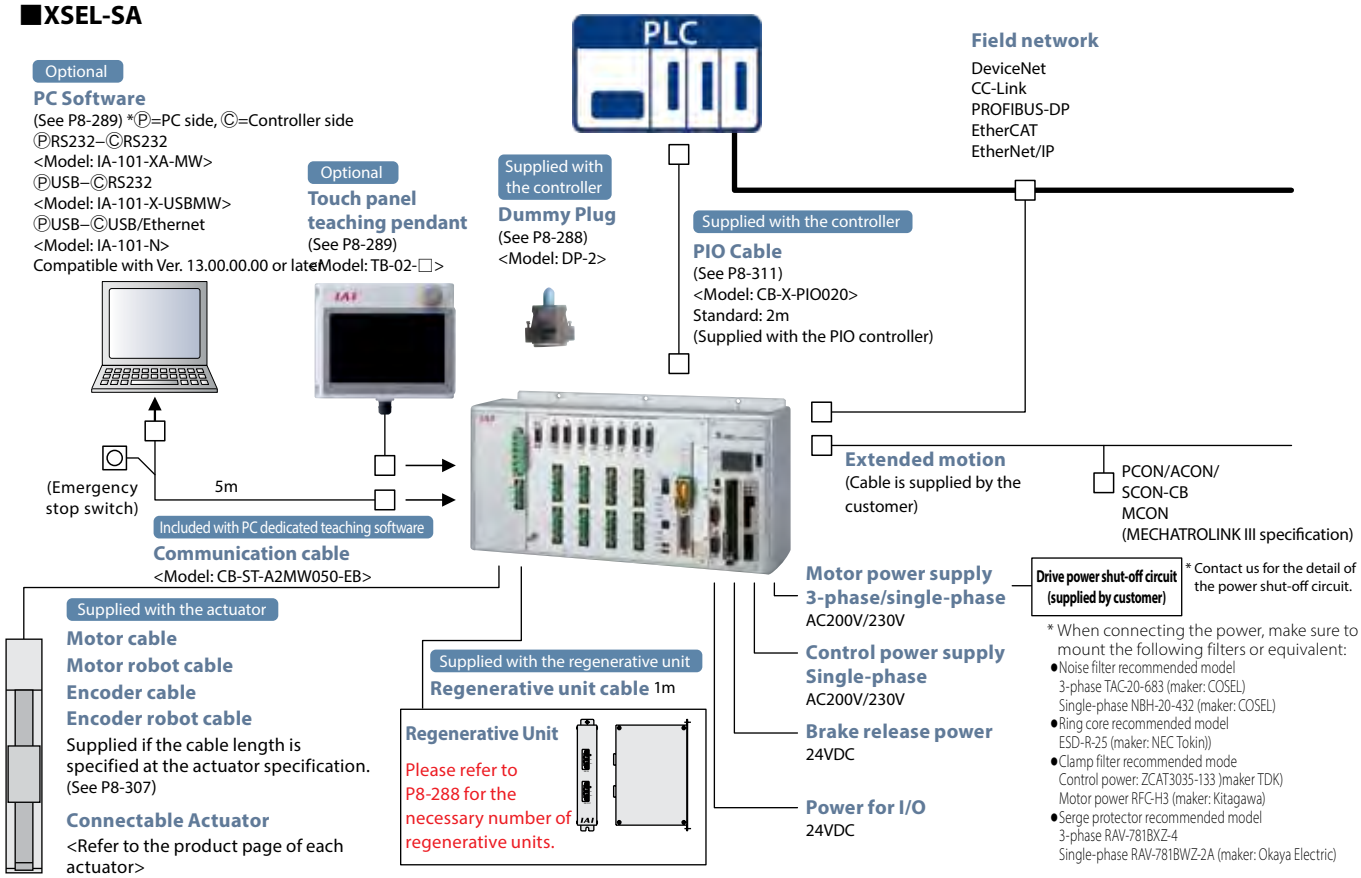
●LSA Series
●RCS2-SRA7/SRGS7/SRGD7
●RCS2-□□5N (incremental)
●NS-SXM□/SZM□ (incremental)
●Servo press

System configuration

■XSEL-RA



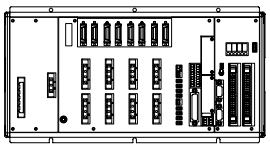
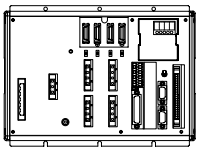
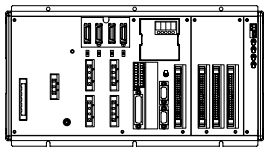
■XSEL-SA



Connectable I/O models by controller Type

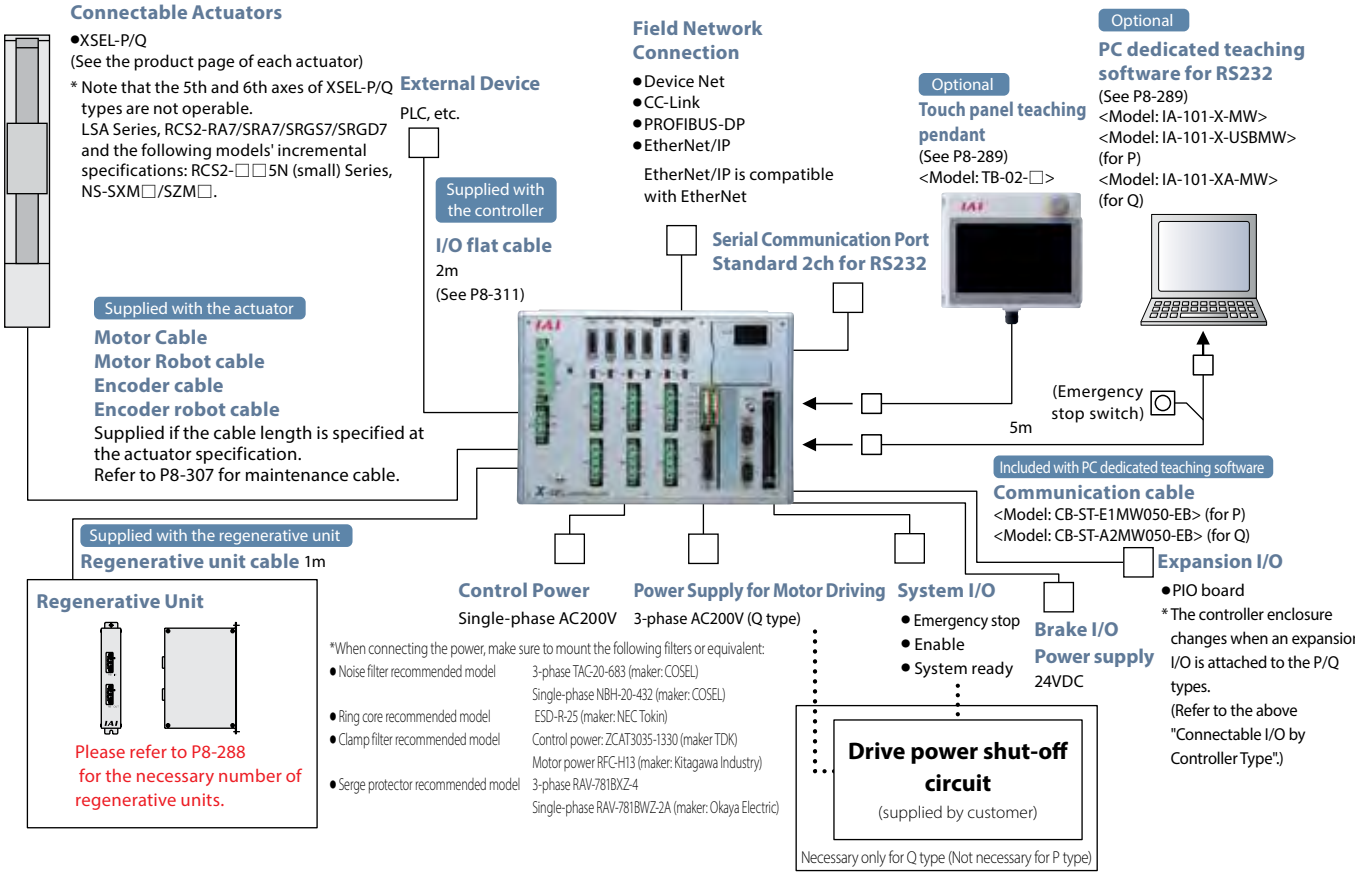
Specifications of the connectable I/O (input/output) vary according to the XSEL controller type.

* Refer to each controller model regarding the symbols specified in the slot in the table below.

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	Standard specification		(not applicable) DV CC PR EP ET	(not applicable)	E N1 N2 N3 P1 P2 P3	(not applicable)	(not applicable)	(not applicable)
	with expansion slot specification			(not applicable)		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

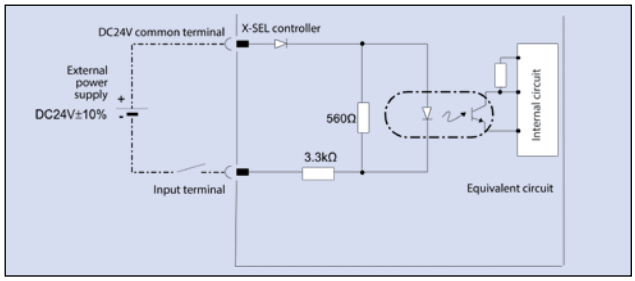
■XSEL-P/Q



I/O Wiring diagram

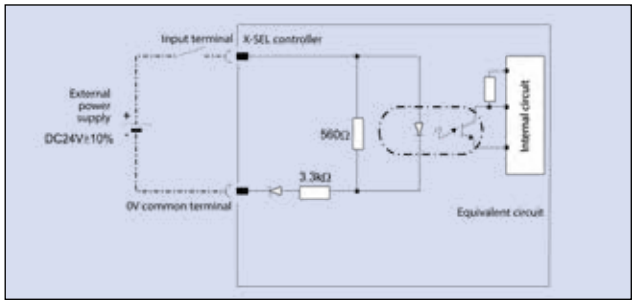
Input Section External input specification (NPN specification)

Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage....min. DC 16.0V / OFF voltage ... max. DC5.0V
Isolation method	Photocoupler



Input Section External input specification (PNP specification)

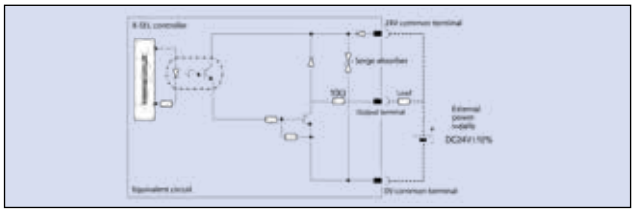
Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage....min. DC 8V / OFF voltage ... max. DC19V
Isolation method	Photocoupler



Output Section External input specification (NPN specification)

Item	Specifications	
Load voltage	24VDC	TD62084 (or equivalent)
Max. load current	100mA / point 400mA / 8 ports (note)	
Leak current	Max. 0.1 mA / point	
Isolation method	Photocoupler	

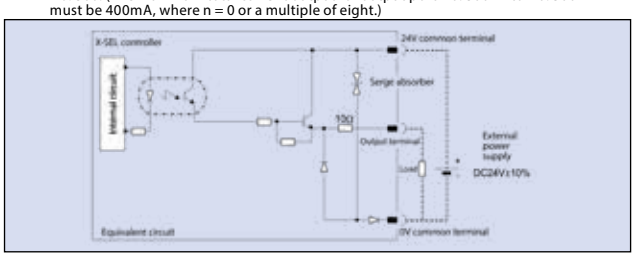
(Note) The maximum total load current for each set of the eight ports from output port No. 300 is 400mA. (The maximum total current output for output port No. 300+n to No. 300+n+7 must be 400mA, where n = 0 or a multiple of eight.)



Output Section External input specification (PNP specification)

	Specifications	
Item	24VDC	TD62784 (or equivalent)
Load voltage Max. load current	100mA / point 400mA / 8 ports *	
Leak current	Max. 0.1 mA / point	
Isolation method	Photocoupler	

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



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 inpu t
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 (24VDC) 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 (24VDC) 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			General-purpose input
26	–	–	External power supply (24VDC) Pin No. 27-50/76-99)
27	Input		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	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 (24VDC) 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 (24VDC) Pin No. 27-50/76-99)

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] AC200/230V ±10% [Single-phase specification[AC200/230V ±10%	
Control power input		Single phase AC200/230V ±10%	
Power supply frequency		50/60Hz	
Insulation resistance		10MΩ or more (between the power-supply terminal and I/O terminals, and between all external terminals and case, at 500VDC)	
Withstand voltage		AC1500V (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 (NPN/PNP), 96-point I/O PIO (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, battery error, etc.	
Weight	**No absolute battery unit**	[4-axis specification] approx. 4.4 kg [8-axis specification] approx. 5.3 kg	[4-axis, 3-phase specification] approx. 4.4 kg [4-axis single-phase specification] 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 specification] approx. 5.4 kg [8-axis single-phase specification] approx. 6.0 kg
Ambient operating temperature/humidity/atmosphere		5%RH - 85%RH (non-condensing, no frost). Free from corrosive gases. In particular, there shall be no significant dust.	

* Refer to the Operation Manual for the power source capacity.

Table of specifications

■ P/Q (Safety Category Compliant Type)

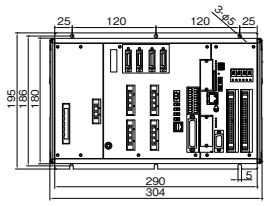
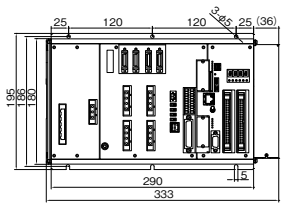
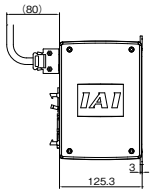
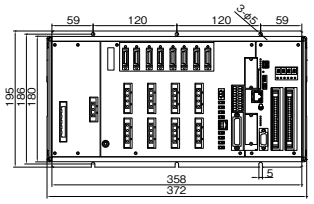
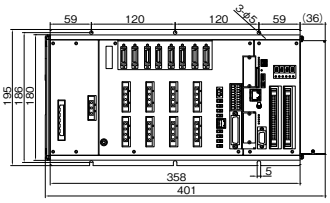
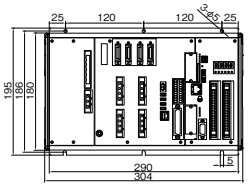
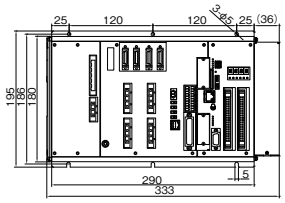
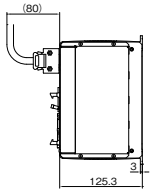
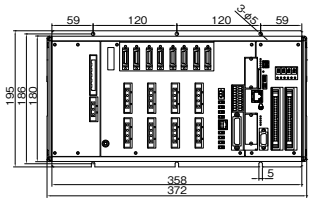
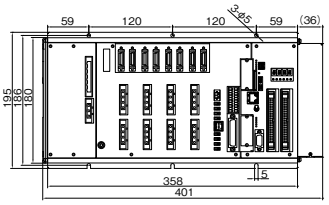
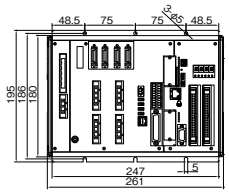
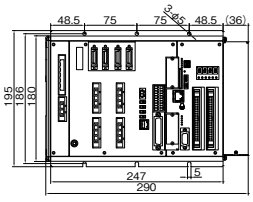
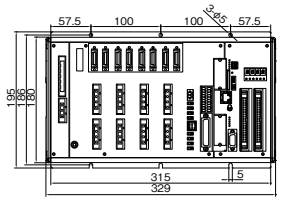
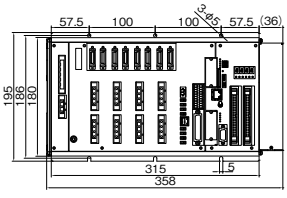
Item		Description											
Controller type		P						Q					
Connecting actuator		RCS3/RCS2/IS(P)B/IS(P)A/IS(P)DB/IS(P)DBCR/IS(P)DACR/IF/FS/RS/linear											
Compatible motor output (W)		20/30/60/100/150/200/300/400/600/750/1000											
Number of controlled axes		1-axis	2-axis	2-axis	4-axis	5-axis	6-axis	1-axis	2-axis	2-axis	4-axis	5-axis	6-axis
Maximum connected axes		Max2400W (single-phase AC200V specification is 1600W)											
Control power input		AC200/230 Single-phase ±10%						AC200/230 Single-phase ±10%					
Motor power input		AC200/230 Single-phase/3-phase ±10%						AC200/230 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 case, at 500VDC)											
Withstand voltage		AC1500V (one minute)						AC1500V (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
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 funcation		1ch RS485 port (9-pin D-sub) (serial communication (RS232C). This port or channel 2 can be used either.)											
Temperature/humidity/atmosphere		0 to 40°C, 10 to 95% (non-condensing). Free from corrosive gases. In particular, there shall be no significant dust.											
Weight (*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)

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

	Controller specifications		Front view: Battery-less absolute specification/Incremental specification/ Quasi-absolute specification/Index absolute specification	Front view: Absolute specification/Multi-rotation absolute specification	Side view
RA	Single-phase/ 3-phase specifications	1 to 4 axis specifications			 (Battery-less specification/ Incremental specification/ Quasi-absolute specification/ Index absolute specification)
		5 to 8 axis specifications			
SA	Single-phase specifications	1 to 4 axis specifications			 Absolute specification/ Multi-rotation absolute specification
		5 to 8 axis specifications			
	3-phase specifications	1 to 4 axis specifications			
		5 to 8 axis specifications			

* If the connected axes include even one axis of absolute specification, the external dimensions are of the absolute specification.

External dimensions

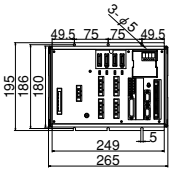
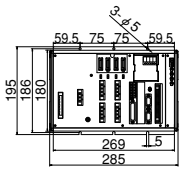
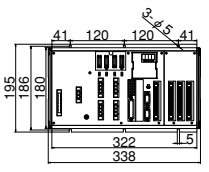
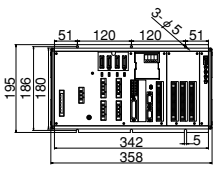
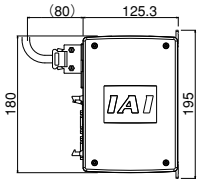
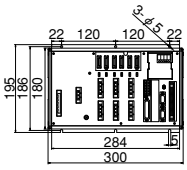
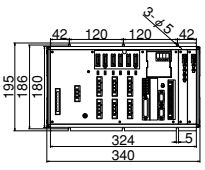
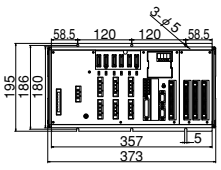
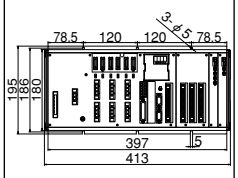
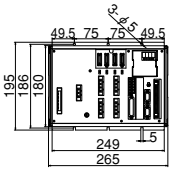
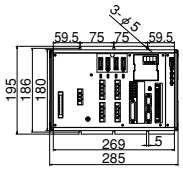
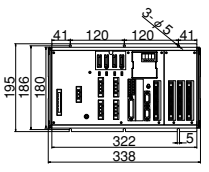
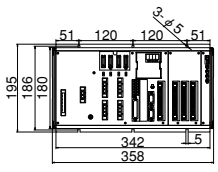
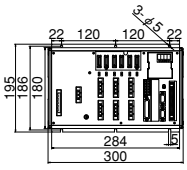
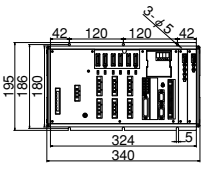
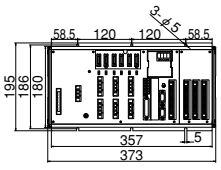
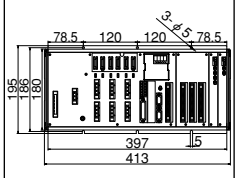
CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

■ XSEL-P

XSEL-P types vary their shapes and dimensions according to the controller specifications (encoder class, 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]

		Basic layout (incremental specification)	With brake/absolute unit	With I/O expansion base	With Brake, absolute unit + I/O expansion base	Side view
Controller specifications	Encoder	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					
	5 to 6 axis specifications					

External dimensions

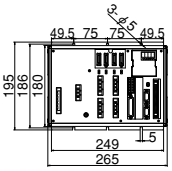
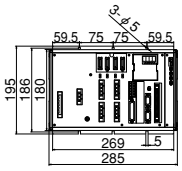
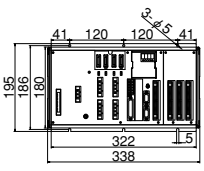
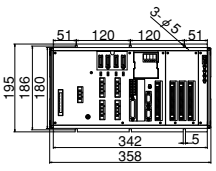
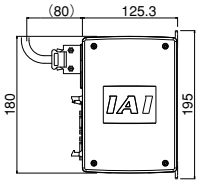
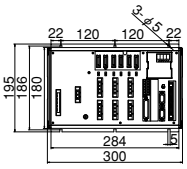
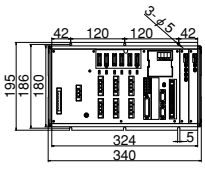
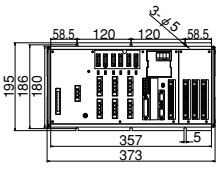
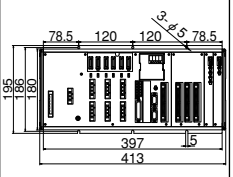
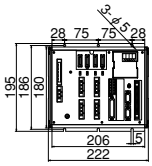
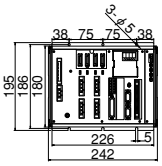
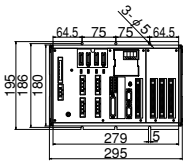
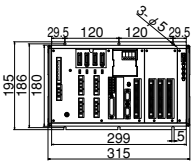
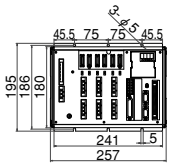
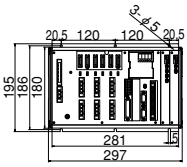
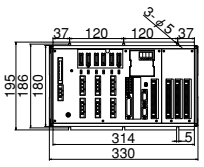
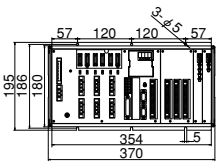
CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

■ XSEL-Q (Safety Category Compliant Type)

XSEL-Q types vary their shapes and dimensions according to the controller specifications (encoder class, brake, I/O expansion, power supply specifications). Confirm the dimensions to suit the desired type and number of axes.

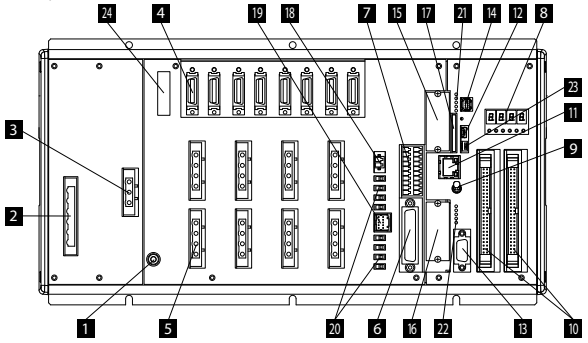
(Note)
The external dimensions of the Q type, single-phase 200V specification are different from that of the P type.

[XSEL-Q]

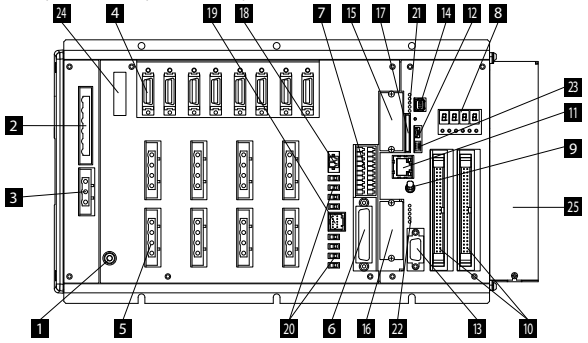
		Basic layout (incremental specification)	With brake/absolute unit	With I/O expansion base	With Brake, absolute unit + I/O expansion base	Side view
Controller specifications	Encoder	Battery-less absolute/ incremental	Absolute	Battery-less absolute/ incremental	Absolute	
	Brake	None	Yes	None	Yes	
	I/O	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					
	5 to 6 axis specifications					

Part names

■RA Type



■SA Type (Safety Category Compliant, with 3-phase absolute unit)



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

AC200V 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 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.

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 of 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 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.

8 Panel Window

This window has a 4-digit, 7-segment LED and 5 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 for a prevention of malfunctions. 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-point I/O or 96-point DIO board (optional) is installed.

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.

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. 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.

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 method if you wish 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. If you want to manually operate the actuator at the time of start up for teaching or abnormal condition, you can force to release the brake by pushing it to the RLS side. 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

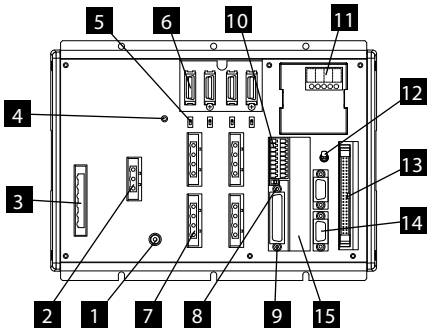
A connector to connect an encoder for conveyor tracking. It is included as standard for the controller for SCARA.

25 Absolute Battery Unit

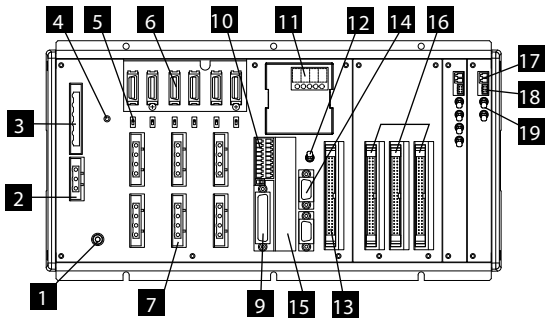
This unit comes with the absolute specification.

Part names

P (Standard 4 axes)



Q (Absolute brake unit + 6 axes with expansion base)



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 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

AC200V 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.

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 filedbus 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 sngle-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>=LSA/LSAS total wattage (Controller Wattage Calculation Output) + total wattage (motor W x 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)
S6SS	100	1	300
S6SM	100	2	600
S8SS	100	1	300
S8SM	100	2	600
S8HS	100	1	300
S8HM	100	2	600
N10SS	100	1	300
N10SM	100	2	600
S10SS	200	1	600
S10SM	200	2	1200
S10HS	200	1	600
S10HM	200	2	1200
H8SS/L15SS	200	1	600

Actuator Model	Driver output (W)	Number of sliders (pc)	Controller Wattage Calculation Output (W)
H8SM/L15SM	200	2	1200
H8HS	200	1	600
H8HM	200	2	1200
N15SS	200	1	600
N15SM	200	2	1200
N15HS	200	1	600
N15HM	200	2	1200
N19SS	300	1	600
N19SM	300	2	1200
W21SS	400	1	800
W21SM	400	2	1600
W21HS	1000	1	1500
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" in the 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

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

■ 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 weight	Approx. 0.4 kg	
Built-in regenerative resistor	235Ω 80W	
Unit mounting method	Screw fixing	DIN rail mount
Accessory	CB-ST-REU010	

Installation standard Determined by the total motor capacity of the connected axes.

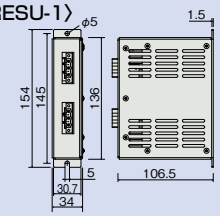
Horizontal use

Number of connecting units	P/Q/R/S Type
0	~100W
1	~600W
2	~1200W
3	~1800W
4	~2400W

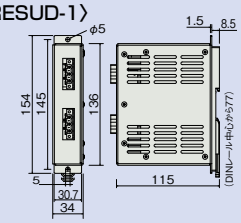
Vertical use

Number of connecting units	P/Q/R/S Type
0	~100W
1	~600W
2	~1000W
3	~1400W
4	~2000W
5	~2400W

〈RESU-1〉



〈RESUD-1〉



■ 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) 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 cope with the Ethernet (PCP/IP: message communications) by setting parameters.

■ Dummy Plug

Model

DP-2

Features

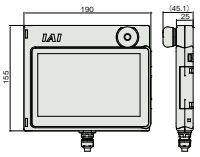
A dummy plug to be attached to the teaching connector when the touch panel teaching pendant is not connected.

Options

Touch panel teaching pendant

Features A teaching device having functions of position inputs, trial operations, monitoring, etc.

External dimensions



Model TB-02-□

Specifications

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Operating ambient temperature	0~40℃
Operating ambient humidity	5%RH - 85%RH (non-condensing, no frost)
Protective class	IP20
Weight	470g (TB-02 single unit only)

PC dedicated teaching software (Windows only)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Software and RS232C cable

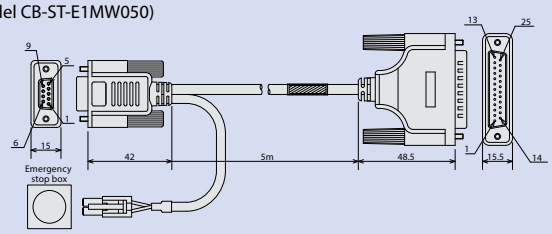
Model **IA-101-X-MW**

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 Download, Compatible Windows: 7/10
PC connecting cable 5m + emergency stop box (Model CB-ST-E1MW050-EB)

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.

PC connecting cable single unit (Model CB-ST-E1MW050)



9-pin D-sub socket		Wiring diagram		25-pin D-sub socket	
Connector hood FG				Connector hood FG	
BROWN	2		2	BROWN	
BROWN／BLACK	3		3	BROWN／BLACK	
ORANGE	5		7	ORANGE	
ORANGE／BLACK				ORANGE／BLACK	
	4		4		
	6		5		
	7		6		
	8		20		
			18		
			19		
ELP-02V			13	RED	
RED	1		12	RED／BLACK	
BLACK	2		1	Shield FG	

(Shield)

Safety category 4 compliant kit including software and RS232C cable (for XSEL-Q/QX/SA/SAX)

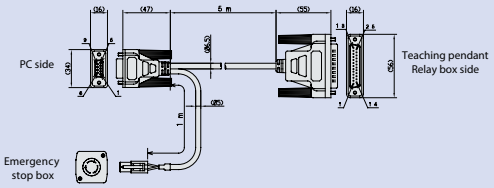
Model **IA-101-XA-MW** * Exclusive use for XSEL-Q/QX/S/SX. Cannot be used for other controllers.

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 (Accessories) Software Download, Compatible Windows: 7/10
PC connecting cable 5m + emergency stop box (Model: CB-ST-A2MW050-EB)

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.

Dimensions PC connecting cable (Model: CB-ST-A1MW050)



D sub 9P socket			D sub 25P socket		
Signal	Color	No.	No.	Signal	Color
RXD	Orange/Black dot	2	2	TXD	Orange/Black dot
TXD	Orange/Red dot	3	3	RXD	Orange/Red dot
SG	Grey/Black dot	5	7	SG	Grey/Black dot
	Grey/Red dot				Grey/Red dot
DTR	(Grounding)	4	4	RTS	(Grounding)
DSR		6	5	CTS	
RTS	(Grounding)	7	6	DSR	(Grounding)
CTS		8	20	DTR	
Connector hood FG			17	ENB1	(Grounding)
			19	ENB1	
			21	ENB2	(Grounding)
			22	ENB2	
Emergency switch box			12	EMG1	White/Black dot
Signal	Color	No.	13	EMG1	White/Red dot
EMG1	Orange	1	16	EMG2	Yellow/Black dot
EMG1	Grey	2	24	EMG2	Yellow/Red dot
EMG2	White	3	1	Shield FG	
EMG2	Yellow	4		Connector hood FG	

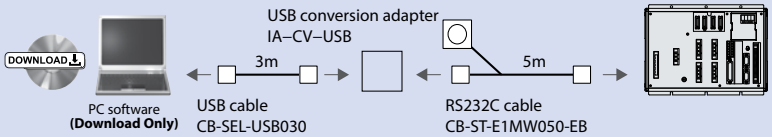
(Shield)

USB-compatible software kit

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 Download
Compatible Windows: 7/10
PC connecting cable 5m + emergency stop box + USB conversion adapter + USB cable 3m



Software only (for XSEL-RA/SA/RAX/SAX)

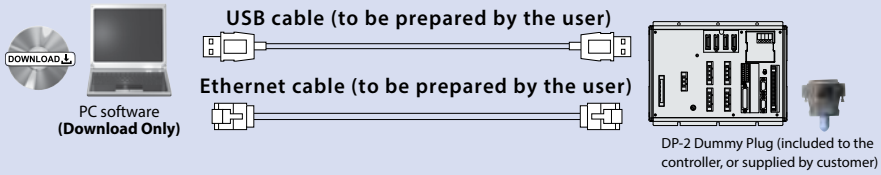
Model **IA-101-N**

Features Contains only the PC dedicated teaching software download.
Order only the software when connecting both the controller and PC sides by your USB cable or Ethernet cable. The cable that meets the following specifications is supplied by the customer.

Details Sofware Download, compatible Windows: 7/10

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



MEMO

X-SEL

SCARA Robot
Program Controller

CE (*1) RoHS 10 (*1)

(*1) Not compliant when connected to IX-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 (P8-299) 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 2400W/Three-phase 3600W (only IXA-800/1000)		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

Model

[XSEL-RAX/SAX Type]

(Additional axis content 5th~8th axes)

XSEL - [Type] - [SCARA Robot Main Body Type] -([Motor Type] [Encoder Type] [Options])- [Network (Slot 1)] [Dedicated Slot(s) (Slot 2)] - [I/O Slot(s) (Slot 1)] [(Slot 2)] - [I/O Cable Length] - [Power Supply Voltage]

Series

Type

RAX3	3-axis SCARA
RAX4	[3-axis SCARA+1-axis] or [4-axis SCARA]
RAX5	[3-axis SCARA+2-axis] or [4-axis SCARA+ 1-axis]
RAX6	[3-axis SCARA+3-axis] or [4-axis SCARA +2-axis]
RAX7	[3-axis SCARA+4-axis] or [4-axis SCARA +3-axis]
RAX8	4-axis SCARA+4-axis
SAX3	3-axis SCARA Safety category specification
SAX4	[3-axis SCARA+1-axis] or [4-axis SCARA] Safety category specification
SAX5	[3-axis SCARA+2-axis] or [4-axis SCARA+ 1-axis] Safety category specification
SAX6	[3-axis SCARA+3-axis] or [4-axis SCARA +2-axis] Safety category specification
SAX7	[3-axis SCARA+4-axis] or [4-axis SCARA +3-axis] Safety category specification
SAX8	4-axis SCARA+4-axis Safety category specification

* The case size varies depending on the type of SCARA robot to be connected and the additional axes connected. For details, refer to the external dimensions on each product page(p8-302).

SCARA Robot Main Body Type

3NNN1805	IXA-3N□N1805	3N□N6018	IXA-3N□N6018
4NNN1805	IXA-4N□N1805	3N□N6033	IXA-3N□N6033
3N□N3105	IXA-3N□N3105	4N□N6018	IXA-4N□N6018
3N□N3105	IXA-3N□N3105	4N□N6033	IXA-4N□N6033
4N□N4518	IXA-4N□N4518	4N□N8020	IXA-4N□N8020
4N□N4533	IXA-4N□N4533	4N□N8040	IXA-4N□N8040
3N□N4518	IXA-3N□N4518	4N□N10020	IXA-4N□N10020
4N□N4533	IXA-4N□N4533	4N□N10040	IXA-4N□N10040
		4NSW3515	IXA-4NSW3015
		4NSW4518	IXA-4NSW4518
		4NSW4533	IXA-4NSW4533
		4NSW6018	IXA-4NSW6018
		4NSW6033	IXA-4NSW6033

* □ is contains a symbol.
N: Standard type
S: High-speed type

Motor Type

12	12W servo motor	150	150W servo motor
20	20W servo motor	200	200W servo motor
30D	30W servo motor for DS	200S	For LSA-S10/N15
30R	30W servo motor for RS	300	300W servo motor
60	60W servo motor	400	400W servo motor
100	100W servo motor	600	600W servo motor
100S	For LSAS-N10	750	750W servo motor

(Example)12:12W Servo motor type

Note

Basically, the motor type is the same as the motor type of the actuator to be connected, but there are models that do not match the motor type of some controllers and actuators. Be sure to check the corresponding models listed below during selection.
<30D・30R・100S/200S Target Actuators>
●Controller motor type [30D]: 30W actuator other than RS
●Controller motor type [30R]: RS
●Controller motor type [100S/200S]: LSAS

Encoder Type

WAI	Battery-less absolute incremental
A	Absolute
G	Quasi absolute
AI	Index absolute
AM	Absolute multi-rotation

Options

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

Network (Slot 1)

E	Not used
EP	EtherNet/IP
EC	EtherCAT

Dedicated Slot(s) (Slot 2)

E	Not used
DV	DeviceNet
CC	CC-Link
PR	PROFIBUS-DP

I/O Slot(s) (Slot 1) (Slot 2)

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.

I/O Cable Length

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

Power Supply Voltage

3	3 Three-phase 200V

Non-connectable actuators (additional axes)

Linear servo actuator (other than LSAS series), RCS2-□□5N (incremental specification), RCS2-SRA7BD/SRGS7BD/ SRGD7BD, NS-SXM□/SZM□ (both incremental specification only), RCS3-CT□, RCS2-RA13R (with load cell), RCS3-RA□□, DD/DDA (High-resolution specification)

Limitations on additional axis connection

For SCARA controllers, there is a limit to the total motor wattage of the additional axis actuator motor that can be connected 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 robot model		Total wattage that can be connected to XSEL-RAX/SAX and the number of connectable axes .	
		Total wattage	Number of connectable axes
Standard type	IXA-3NNN1805	Total 1500W or less (Max. 750W for one axis)	Max. 4 axes (from 5 to 8th axes)
	IXA-3NNN3015		
	IXA-3NNN45□□	Total 600W or less (Max. 700W for one axis)	
	IXA-3NNN60□□		
	IXA-4NNN1815		
	IXA-4NNN3015	Total 600W or less (Max. 600W for one axis)	
	IXA-4NNN45□□		
	IXA-4NNN60□□		Max. 3 axes (from 6 to 8th axes)
	IXA-4NNN80□□	Not connectable	
	IXA-4NNN100□□		
High-speed type	IXA-3NSN3015/4NSN3015		
	IXA-3NSN45□□/4NSN45□□		
	IXA-3NSN60□□/4NSN60□□		
	IXA-4NSN80□□		
	IXA-4NSN100□□		
Dust- and splash-proof specification high-speed type	IXA-4NSW3015		
	IXA-4NSW45□□		
	IXA-4NSN60□□		

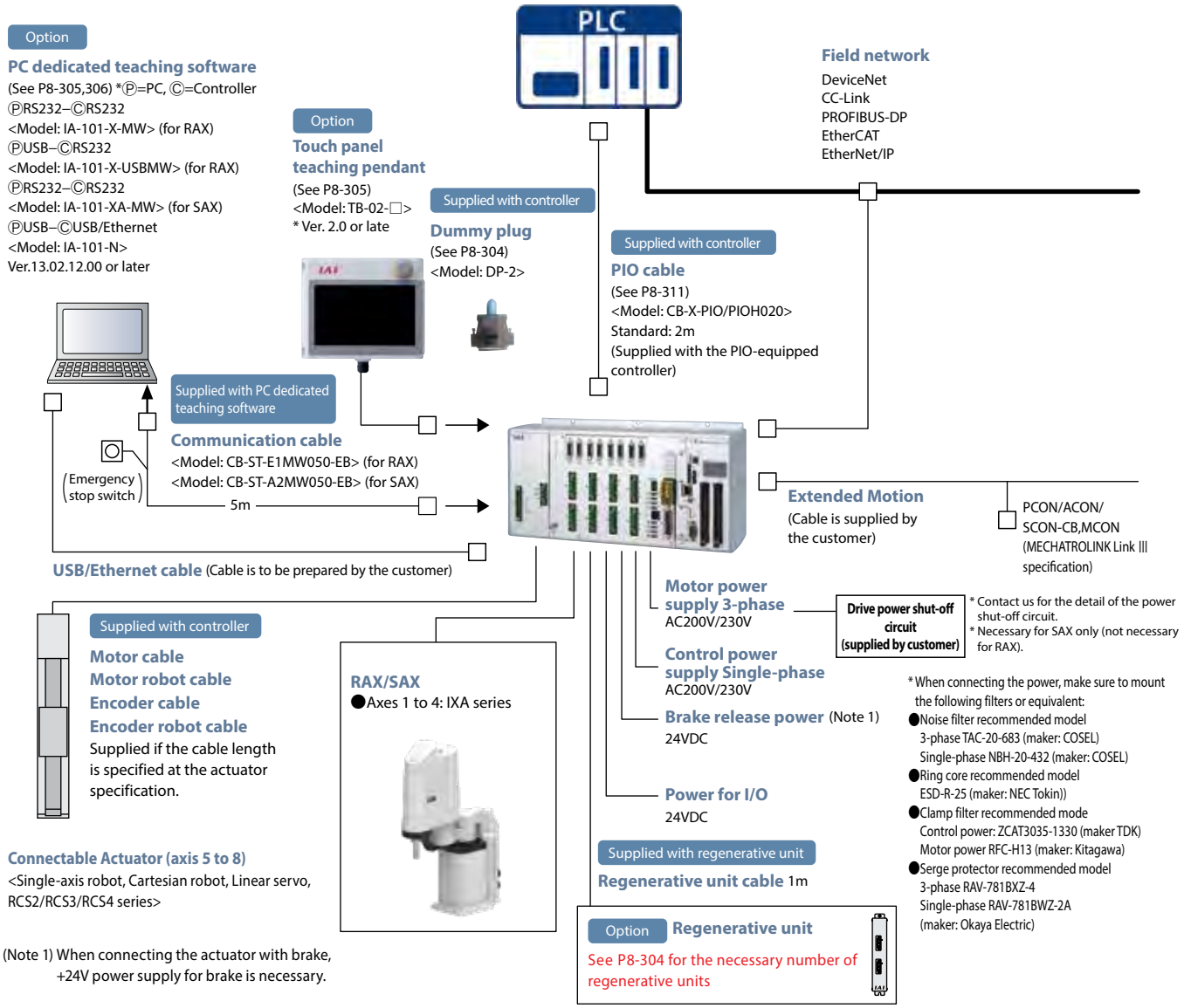
Note

●The high-speed type SCARA robot (including dust- and splash-proof spec.) cannot be connected with an additional axis.
●When using additional axes to the standard type, the controller will always be a cabinet for 8 axes. An additional axis cannot be added to the 3-axis SCARA robot (IXA-3NNN□□□) as the 4th axis. It can be connected to the XSEL controller as the 5th to 8th axes.

● For SCARA robot IXA

System configuration

■XSEL-RAX/SAX types



(Note 1) When connecting the actuator with brake, +24V power supply for brake is necessary.

● 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-axis
RAX7	SCARA +3-axis
RAX8	SCARA +4-axis
SAX4	SCARA 1-unit global spec.
SAX5	SCARA +1-axis global spec.
SAX6	SCARA +2-axis global spec.
SAX7	SCARA +3-axis global spec.
SAX8	SCARA +4-axis global spec.

* 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.

NNN1205~8040H NNN10040~12040	Standard type
NNN1205B~1805B	Standard ultra-compact type with brake
NSN5016H~6016H	High-speed type
NNC1205~8040H	Clean room type
NNC1205B~1805B	Clean room ultra-compact type with brake
NNW2515H~8040H	Splash-proof type
TNN3015H~3515H	Wall-mounting type
UNN3015H~3515H	Wall-mounting inverse type
HNN5020H~8040H	Ceiling-mounting type
INN5020H~8040H	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).

12	12W servo motor	150	150W servo motor
20	20W servo motor	200	200W servo motor
30D	30W servo motor for DS	200S	For LSA-S10/N15
30R	30W servo motor for RS	300	300W servo motor
60	60W servo motor	400	400W servo motor
100	100W servo motor	600	600W servo motor
100S	For LSAS-N10	750	750W servo motor

(Example)12:12W Servo motor type

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

3	3 Three-phase 200V

Note

In general, the motor specified in the controller model number should match the actuator's model number
Be sure to check the corresponding models listed below during 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□, DDCR-LT18□, DDCR-T18□

* Note for selecting single-axis robots
Conditions for connectable single-axis is change based on the SCARAR robot being operated.
For details, refer to the "unconnectable actuator" on P8-296.

[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 global specification

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

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 Three-phase 200V

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
There are limitations as to which SCARA robots can be connected together.
Please refer to "Non-connectable Actuators" on P8-296.

● For SCARA robot IX

Model

[XSEL-PX/QX Type]

XSEL -□-□-(□□□)-(□□□)-□-□-□-□-□-□-□

Series | Type | IX Main Body Type | (Additional axis content 5th axes) Motor Type | Encoder Type | Options | (Additional axis content 6th axes) Motor Type | Encoder Type | Options | Network Dedicated Slots | (Slot 1) Standard I/O | (Slot 2) (Slot 3) (Slot 4) Expansion I/O | I/O cable length | Power Supply Voltage

PX4	4-axis type
PX5	5-axis type
PX6	6-axis type
QX4	4-axis global specification type
QX5	5-axis global specification type
QX6	6-axis global specification type

NNN1205~8040H	Standard type
NNN1205B~1805B	Standard ultra-compact type with brake
NSN5016H~6016H	High-speed type
NNC1205~8040H	Clean room type
NNC1205B~1805B	Clean room ultra-compact type with brake
NNW2515H~8040H	Splash-proof type
TNN3015H~3515H	Wall-mounting type
UNN3015H~3515H	Wall-mounting inverse type
HNN5020H~8040H	Ceiling-mounting type
INN5020H~8040H	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).

WAI	Battery-less abs. Incremental
A	Absolute
G	Quasi absolute
AI	Index absolute
AM	Multi-rotation abs.

B	Brake equipped specification
C	Creep sensor specification
L	Home sensor/LS compatible
M	Master axis specified
S	Slave axis specified

WAI	Battery-less abs. Incremental
A	Absolute
G	Quasi absolute
AI	Index absolute
AM	Multi-rotation abs.

B	Brake equipped specification
C	Creep sensor specification
L	Home sensor/LS compatible
M	Master axis specified
S	Slave axis specified

E	Not used
N1	Input 32/Output 16 (NPN)
N2	Input 16/Output 32 (NPN)
N3	Input 48/Output 48 (NPN)
P1	Input 32/Output 16 (PNP)
P2	Input 16/Output 32 (PNP)
P3	Input 48/Output 48 (PNP)
S	Equipped Expansion I/O base

Blank	Not used
DV	DeviceNet board
CC	CC-Link board
PR	PROFIBUS-DP board
EP	EtherNet/IP board

* Ethernet/IP spcification can support Ethernet.

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

3	Three phase AC200V

* If you selected DV, CC, PR, or EP instead of a standard or expansion I/O, select 0 (no cable) for the I/O cable length.
* For details of standard I/O and expansion I/O, please refer to P 8-287.
* If expansion I/O will not be used, enter E (not used) for slots 2 to 4. If you are using expansion I/O, enter the expansion I/O code in the desired slot. If an expansion I/O is specified, the controller chassis will come with the expansion I/O base. (See P 8-303) If you will not be using the expansion I/O initially but will be adding it later, specify the chassis with I/O expansion board, but specify S for slots 2 to 4.

e.g. Expansion I/O on slot 2, remaining slots unused
XSEL-PX4-NNN1205-N1-N1EE-2-3
Expansion I/O base attached, but not the expansion I/O
XSEL-PX4-NNN1205-N1-SSS-2-3

12	12W	100	100W	400	400W
20	20W	100S	100W	600	600W
30D	30W	150	150W	750	750W
30R	30W	200	200W		
60	60W	200S	200W		

(Example)12:12W Servo motor type

12	12W	100	100W	400	400W
20	20W	100S	100W	600	600W
30D	30W	150	150W	750	750W
30R	30W	200	200W		
60	60W	200S	200W		

(Example)12:12W Servo motor compliant

Note

In general, the motor specified in the controller model number should match the actuator's model number, 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.
<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□, DDCR-LT18□, DDCR-T18□

* Details of the 5th and 6th axes are filled in for PX5/QX5/PX6/QX6.
* For arm length 700/800 and high-speed type, max. connectible axes is 4 (SCARA only).

● For SCARA robot IX

Non-connectable actuators

For XSEL-PX/QX (5, 6 axes)
LSA, LSAS Series, RCS2-□□5N (incremental spec.), RCS2-SRA7BD/SRGS7BD/
SPGD7BD, NS-SXM□/SZM□ (both incremental spec. only) and DDA Series.

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 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
Ultra-compact type	NN*1205 / NN*1505 / NN*1805	1500W 4 axes (max. 750W/axis)
Mini 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

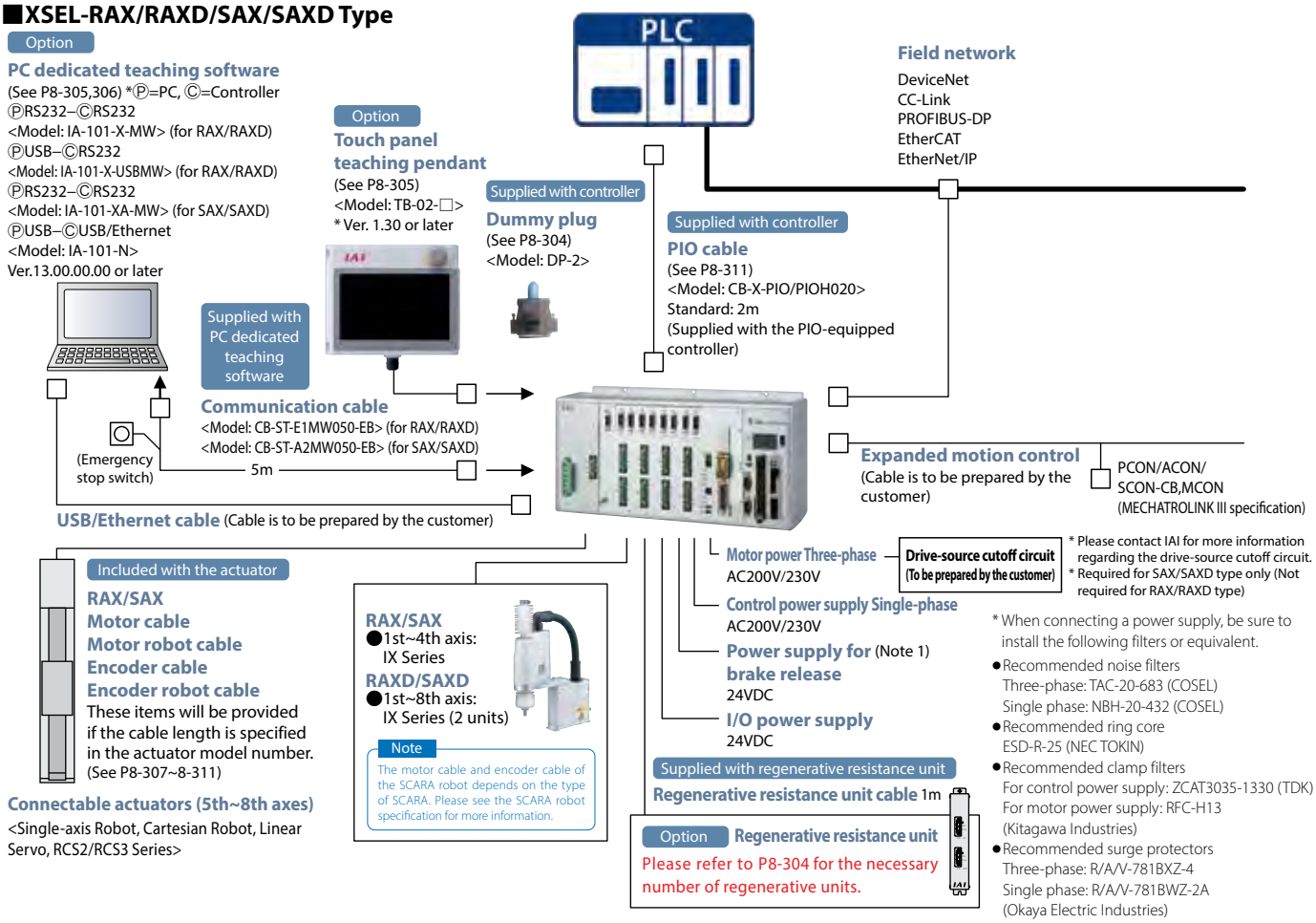
Controllers for SCARA can connect max. two SCARA robots, but there is a limitation for the combination. Please select a connectable combination.

SCARA robot model for 2 robot combinations				
1st robot		2nd robot		
Ultra-compact type	NN*1205 / NN*1505 / NN*1805	Ultra-compact type	Mini high-speed type	Medium high-speed type
Mini high-speed type	NN*2515H / NN*3515H TNN3015H / UNN3015H TNN3515H / UNN3515H			
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		

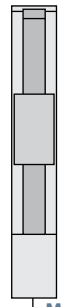
● For SCARA robot IX

System configuration

■XSEL-RAX/RAXD/SAX/SAXD Type



■XSEL-PX/QX Type



Connectable actuator(5 and 6 axis)
(See each actuator product page)
*Please note that axes 5 and 6 on the XSEL-PX/QX type cannot operate the following models.
LSA series, RCS2-RA7/SRA7/SRGS7/SRGD7
Incremental specification:
RCS2-□□5N (mini) series, NS-SXM□/SZM□

Included with the actuator

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 P8-307~8-311)

External equipment
PLC Others

Supplied with controller
I/O Flat cable
2m
(See P8-311)

Various Field Network Connections
- Device Net
- CC-Link
- PROFIBUS-DP
- EtherNet/IP

Ethernet/IP spcification can support Ethernet.

Serial Communications Port Standard 2ch for RS232

Option
Touch panel teaching pendant
(See P8-305)
<Model: TB-02-□>

Option
PC dedicated teaching software Connection via RS232
(See P8-305)
<Model: IA-101-X-MW> (For PX)
<Model: IA-101-X-USBMW> (For PX)
<Model: IA-101-XA-MW> (For QX)

(Emergency stop switch)
5m

Supplied with PC dedicated teaching software
Communication cable
<Model: CB-ST-E1MW050-EB> (for PX)
<Model: CB-ST-A2MW050-EB> (for QX)

Expansion I/O
- PIO Board

*If an expansion I/O is attached to type PX/QX, the controller's chassis must be changed.
(See P8-303)

Control power supply
Single-phase AC200V

Motor power supply
Three-phase AC200V(Q Type)

System I/O
- Emergency stop
- Enable
- System ready

Regenerative unit

Please refer to P8-304 for the necessary number of regenerative units.

Included with the Regenerative unit
Regenerative unit cable 1m

●1st~4th axis:
IX Series

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.

*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)

Drive-source cutoff circuit
(To be prepared by the customer)
Needed for QX type
(No need for PX)

Specifications table

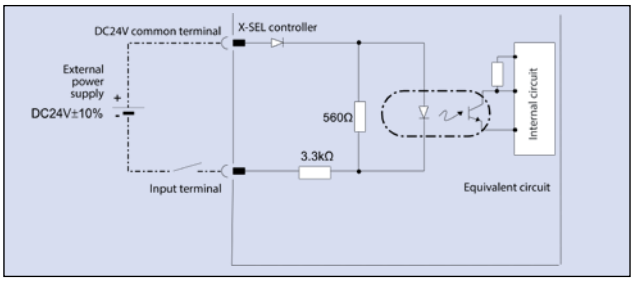
Controller type		RAX/RAXD type	SAX/SAXD type	PX type	QX type
Compatible motor output		12W~750W			
Number of controlled axes	connection with IXA	Axes 1-4: SCARA robot, Axes 5-8: Additional axes		–	
	connection with IX	Axes 1-4: SCARA robot, Axes 5-8: SCARA robot or additional axes		Axes 1-4: SCARA robot, Axes 5-6: additional axes	
Max. output of connected axes		Three-phase 2400W	Three-phase 2400W/Three-phase 3600W (only IXA-800/1000)	Three-phase 2400W	
Control power supply input		Single-phase AC200/230V ±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)		For 2400W: 5094VA/ for 3600W: 10688VA		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 3-axes: 41250, 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 type	
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		(1st-4th axes SCARA robot) Not used because of the battery-less absolute. (5th-8th additional axes) For absolute specification: AB-5			
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, 5%RH - 85%RH(non-condensing), avoid corrosive gas and excessive dust		0 - 40°C, 10%RH - 95%RH(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

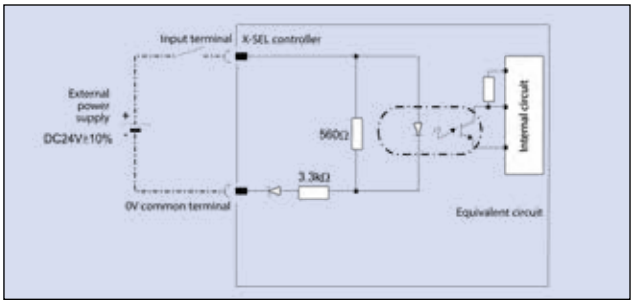
Input External input specification (NPN specification)

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)

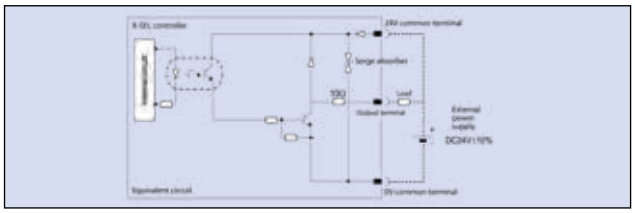
Item	Specification
Input voltage	24VDC ± 10%
Input current	7mA, 1 circuit
ON/OFF voltage	ON voltage: min. 8VDC; OFF voltage: max. 19VDC
Isolation method	Photocoupler isolation



Output External input specification (NPN specification)

Item	Specification	
Load voltage	24VDC	TD62084 (equivalent) used
Maximum load current	100mA/1 point 400mA/8 ports. (Note)	
Leakage current	Max. 0.1mA/1 contact	
Isolation method	Photocoupler isolation	

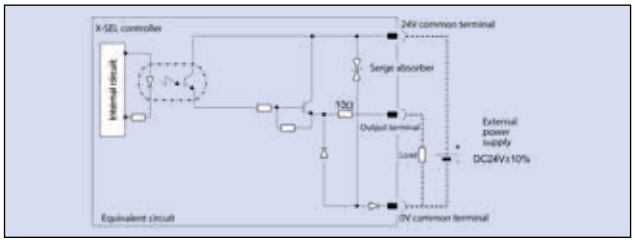
Note: The maximum load current will be 400mA per 8 ports from the output port No.300. (The maximum load current between the output port No.300 + n and No.300 + n + 7 is 400mA. n = 0 or multiple of 8.)



Output External input specification (PNP specification)

Item	Specification	
Load voltage	24VDC	TD62784 (equivalent) used
Maximum load current	100mA/1 point 400mA/8 ports. (Note)	
Leakage current	Max. 0.1mA/1 contact	
Isolation method	Photocoupler isolation	

Note: The maximum load current will be 400mA per 8 ports from the output port No.300. (The maximum load current between the output port No.300 + n and No.300 + n + 7 is 400mA. n = 0 or 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

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	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	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	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) for the 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) 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	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			General-purpose input
26	–	–	External power supply (24VDC) for the pin No. 27~50/76~99
27	Input		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	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) for the 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) for the pin No. 27~50, 76~99

External dimensions

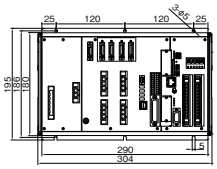
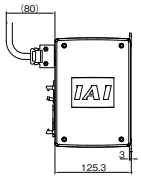
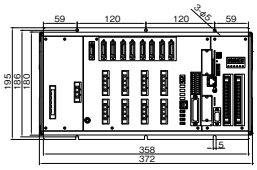
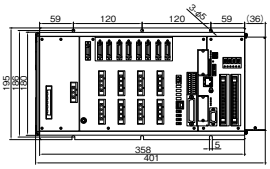
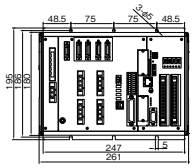
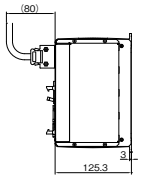
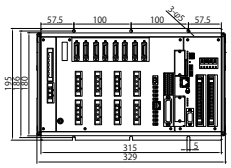
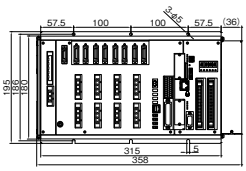
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

■ XSEL-RAX/RAXD/SAX/SAXD

Notes at the time of your order

The controller of the following IXA SCARA robots is that for an 8-axis specification enclosure.

- ●3-axis and 4-axis high-speed type (NSN)
- ●4-axis of the standard type IXA-4NNN60□□/4NNN80□□/4NN100□□
- ●3-axis and 4-axis of the standard types (NNN) with additional axes.
- ●Dust- and splash proof spec (NSW)

	Controller Specification		Front View		Side View
			Battery-less absolute/Incremental specification/Quasi absolute specification/Index absolute specification	Absolute specification/Multi-rotational absolute specification	
RAX RAXD	Three-phase specification	4-axis specification			 (Battery-less absolute/ Incremental specification/ Quasi absolute specification/ Index absolute specification)
		5~8-axis specification			
SAX SAXD	Three-phase specification	4-axis specification			 (Absolute specification/ Absolute multi-rotation specification)
		5~8-axis specification			

* When at least one absolute specification is included in the connecting single-axis actuators, the external view will be that of an absolute specification.
Controllers for the IX large types (arm length 700/800) and the high-speed types will be that for the 8-axis specification.

External dimensions

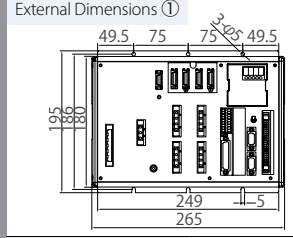
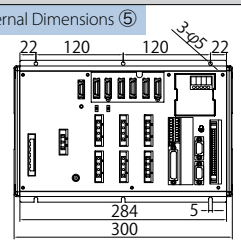
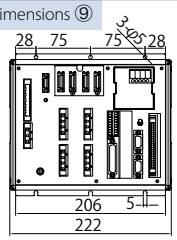
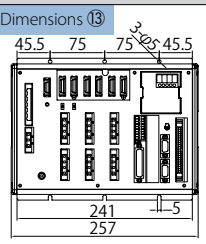
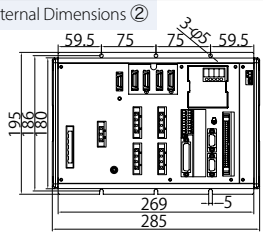
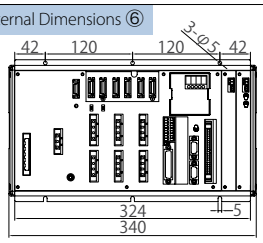
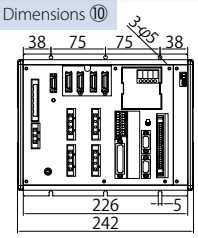
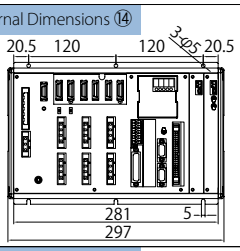
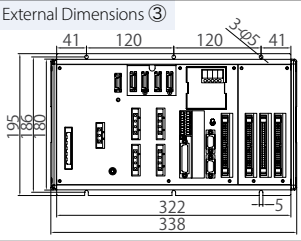
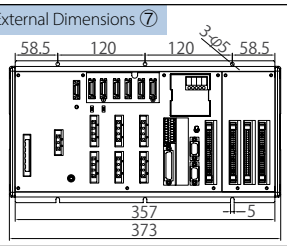
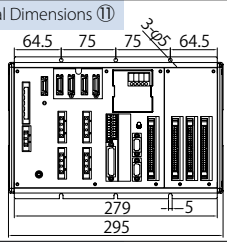
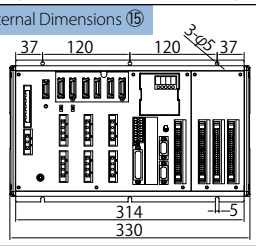
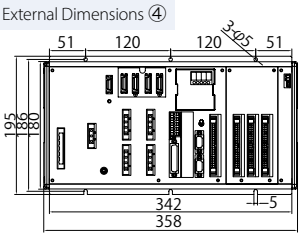
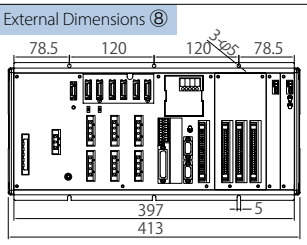
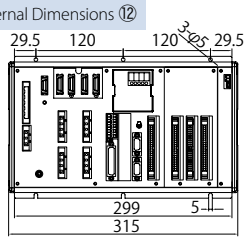
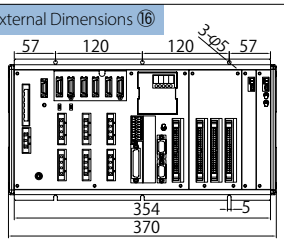
■ PX type/QX (safety category specification) type

CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

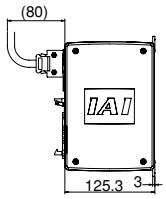
The X-SEL PX/QX types have different dimensions in accordance with type of connecting SCARA(arm length), number of axis ,with/without I/O expansion and type of linear motor axis. Please select the controller number from the table below and see the drawing of the same number.

SCARA main body		Controller							
Type	Arm length	Large capacity type (PX)				Large capacity safety category 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 Clean 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)
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								

(*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 abusolute encoder specification, please select external dimension ⑥ .
(*4) When linear motor axis is brake equipped specification or abusolute encoder specification, please select external dimension ⑧ .
(*5) When linear motor axis is brake equipped specification or abusolute encoder specification, please select external dimension ⑭ .
(*6) When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑯ .
(*7) Please select 6-axis specification for 4-axis specification because motor wattage of SCARA robot is high.

	XSEL-PX		XSEL-QX	
	SCARA dedicated (PX4)	SCARA+ linear motor axis (PX5/PX6)	SCARA dedicated (QX4)	SCARA+ linear motor axis (QX5/QX6)
No expansion I/O	External Dimensions ① 	External Dimensions ⑤ 	External Dimensions ⑨ 	External Dimensions ⑬ 
	External Dimensions ② 	External Dimensions ⑥ 	External Dimensions ⑩ 	External Dimensions ⑭ 
With expansion I/O	External Dimensions ③ 	External Dimensions ⑦ 	External Dimensions ⑪ 	External Dimensions ⑮ 
	External Dimensions ④ 	External Dimensions ⑧ 	External Dimensions ⑫ 	External Dimensions ⑯ 

Side view (universal)



* 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.

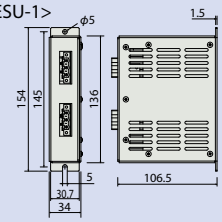
Horizontal specification

Total motor wattage	Required number of regenerative resistors
~100W	0
~600W	1
~1200W	2
~1800W	3
~2400W	4

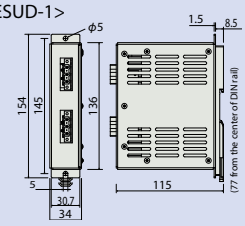
Vertical specification

Total motor wattage	Required number of regenerative resistors
~100W	0
~600W	1
~1000W	2
~1400W	3
~2000W	4
~2400W	5

<RESU-1>



<RESUD-1>



<When connecting a SCARA robot>

Installation criteria

Connection with IXA

Model		Number of necessary regenerative units
NNN	1805	0
	3015	2
	45 □□	
	60 □□	
	80 □□	6
	100 □□	7
NSN	3015	3
	45 □□	
	60 □□	4
	80 □□	7
	100 □□	
NSW	3015	3
	45 □□	
	60 □□	4

Connection with IX

Model number		Required number of regenerative resistors
NNN NNW TNN UNN HNN INN NNC	1205	0
	1505	
	1805	
	2515H	1
	3015H	
	3515H	
	50**H	3
	60**H	
	70**H	4
	80**H	
	10040	
	12040	
NSN	5016H	3
	6016H	

* 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 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 attached in the I/O slot.

<Network table>

	DeviceNet	CC-Link	PROFIBUS-DP	EtherNet/IP	EtherCAT
XSEL-PX/QX	●	●	●	● (Note1)	×
XSEL-RAX/SAX	●	●	●	●	●

Note1 EtherNet/IP specification can support EtherNet (TCP/IP:message communication) by setting parameter.

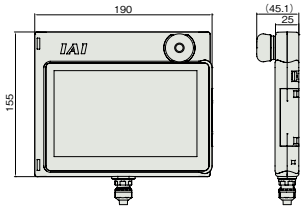
Option

Touch Panel Teaching Pendant

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

Model **TB-02-□**

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	5%RH - 85%RH (non-condensing)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (windows only)

* Please purchase through your distributor and a download link will be sent to your valid email address.

Software and RS232C cable (for XSEL-RA/RXA/RXAD/P/PX)

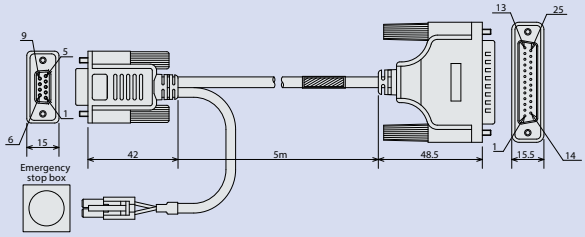
Model **IA-101-X-MW**

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 Download, supported Windows: 7/10

(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 set with an emergency stop box.



Wiring Diagram

D-sub 9 pin socket		D-sub 25 pin socket	
Connector hood FG		Connector hood FG	
BROWN	2	2	BROWN
BROWN/BLACK	3	3	BROWN/BLACK
ORANGE	5	7	ORANGE
ORANGE/BLACK			ORANG/BLACK
	4	4	
	6	5	
	7	6	
	8	20	
		18	
		19	
ELP−02V		13	RED
RED	1	12	RED/BLACK
BLACK	2	1	Sield FG

(shield)

Safety category 4 compliant kit including software and RS232C cable (for XSEL-SA/SAX/SAXD/Q/QX)

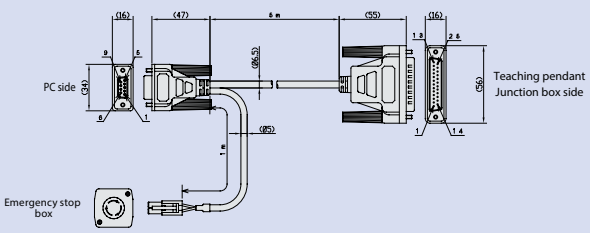
Model **IA-101-XA-MW** * Only for XSEL-SA/SAX/SAXD/Q/QX.

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 Download, supported Windows: 7/10

(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 set with an emergency stop box.
If you do not use a teaching tool, connect the dummy plug DP-2 that comes with the controller to the teaching connector.



D sub 9P socket		
Signal	Color	No.
RXD	Orange/Black dot	2
TXD	Orange/Red dot	3
SG	Grey/Black dot	5
	Grey/Red dot	
DTR	(Grounding)	4
DSR		6
RTS	(Grounding)	7
CTS		8
Connector hood FG		

Emergency switch box		
Signal	Color	No.
EMG1	Orange	1
EMG1	Grey	2
EMG2	White	3
EMG2	Yellow	4

D sub 25P socket		
No.	Signal	Color
2	TXD	Orange/Black dot
3	RXD	Orange/Red dot
7	SG	Grey/Black dot
		Grey/Red dot
4	RTS	(Grounding)
5	CTS	
6	DSR	(Grounding)
20	DTR	
17	ENB1	(Grounding)
19	ENB1	
21	ENB2	(Grounding)
22	ENB2	
12	EMG1	White/Black dot
13	EMG1	White/Red dot
16	EMG2	Yellow/Black dot
24	EMG2	Yellow/Red dot
1	Shield FG	
Connector hood FG		

(Shield)

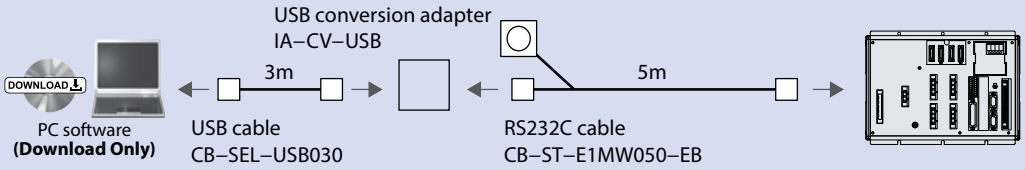
USB compatible Software kit (for XSEL-RA/RXA/RXAD/P/PX)

Model **IA-101-X-USBMW**

Features This type has a USB adapter mounted on the RS232C cable to allow the use on a PC's USB port.

Details Software Download, compatible Windows: 710

(Accessories) 5m PC connection cable + emergency stop box + USB adapter + USB cable 3m



Software only (for XSEL-RA/SA/RAX/SAX/P/PX/Q/QX)

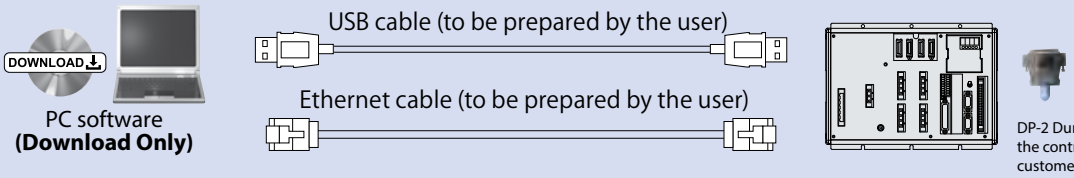
Model **IA-101-N**

Features It only comes with the PC compatible software (Download).
If you want to connect both the controller and PC side with your 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 Download, compatible Windows: 7/10

	Controller side connector	Maximum cable length
USB cable specification	USB Mini-B	5m
Ethernet cable specification	10/100/1000BASE-T(RJ-45)	5m



Maintenance parts

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

■Table of compatible cables

Model number			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W) RCS3(CR)	Models other than ②~④	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS2	RT			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)			CB-RCS2-PLA□□□ *Between the controller and brake CB-RCS2-PLA□□□	CB-X2-PLA□□□ *Between the controller and brake CB-X2-PLA□□□
⑤	RCS3	CTZ5C/CT8C			–	CB-X1-PA□□□
⑥	RCS4(CR)				–	CB-X1-PA□□□
⑦	NS	Without LS	–	CB-X-MA□□□	–	CB-X3-PA□□□
⑧		With LS	–		–	CB-X2-PLA□□□
⑨	LSAS	N	–		–	CB-X1-PA□□□
⑩	LSA	S/H/L/N	–		–	CB-X3-PA□□□
⑪		W	–	CB-XMC-MA□□□	–	CB-X2-PLA□□□
⑫	DDA DDACR DDW	LT18□	–	CB-X-MA□□□	–	CB-X3-PA□□□
⑬		LH18□	–	CB-XMC-MA□□□	–	
⑭	DDA DDACR (with brake)	LT18□	–	CB-X-MA□□□	–	CB-X3-PA□□□ *Between the controller and brake CB-DDB-BK□□□
⑮		LH18□	–	CB-XMC-MA□□□	–	
⑯	IS(P)WA	S/M/L	–	CB-XEU-MA□□□	–	CB-X1-PA□□□-WC
⑰	ZR		–	CB-X-MA□□□	–	Z-axis: CB-X1-PA□□□ R-axis: CB-X1-PLA□□□ *Between the controller and brake CB-RCS2-PLA□□□
⑱	Models other than with LS specification ①~⑪		–	CB-X-MA□□□	–	CB-X1-PA□□□ (For 20m or less)*
			–		–	CB-X1-PA□□□-AWG24 (For 21m or more)
⑲	Models other than ①~⑪		–		–	CB-X1-PLA□□□ (For 20m or less)*
			–		–	CB-X1-PLA□□□-AWG24 (For 21m or more)
⑳	IX (Joint cable specification)		–	CB-X-MA□□□	–	CB-X1-PA□□□

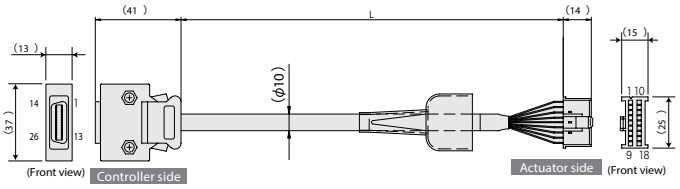
*Actuators without battery-less absolute encoders will still be CB-X1-PA□□□/CB-X1-PLA□□□ for over 20m.

Model number		PIO flat cable
㉑	XSEL- RA/SA/RAX/RAXD/SAX/SAXD	CB-X-PIO□□□
		Multipoint PIO flat cable
		CB-X-PIOH□□□

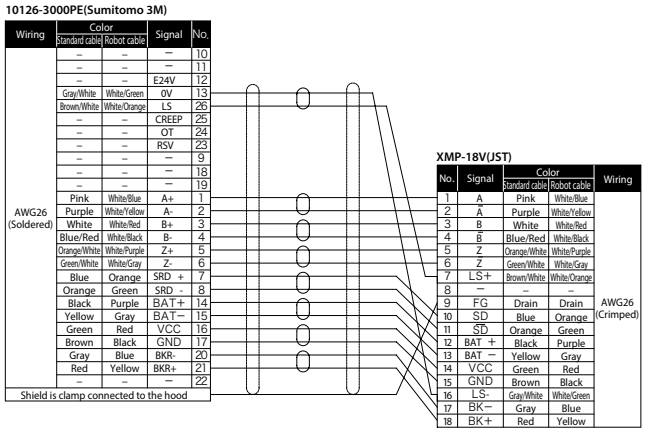
Model number		Brake cable for IXA		
㉒	XSEL- RAX/RAXD/SAX/SAXD	□NNN30/□NNN45	□NNN60	□NSN30/□NSN45/□NSN60
		CB-IXA-BK□□□-1	CB-IXA-BK□□□-2	CB-IXA-BK□□□-3

Model CB-RCS2-PA□□□ / CB-X3-PA□□□

* Please indicate the cable length (L) in □□□ , maximum 30m, E.g.) 080 = 8m

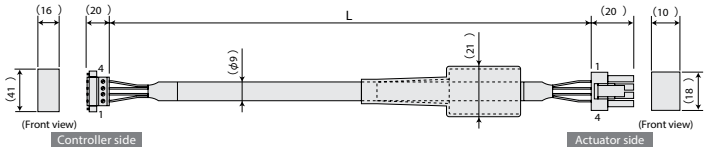


Minimum bending radius r = 50mm or more (Dynamic bending condition)
*** Please use the robot cable if the cable has to be installed through the cable track.**



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

* Please indicate the cable length (L) in □□□ , maximum 30m, E.g.) 080 = 8m



GIC2.5/4-STF-7.62 (Phoenix)

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

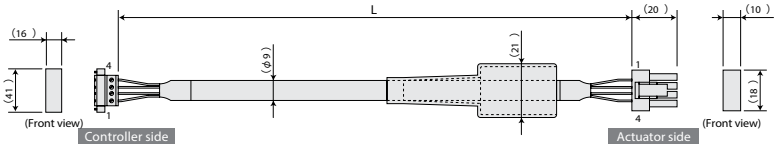
SLP-04V (JST)

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

Minimum bending radius r = 50mm 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



GIC2.5/4-STF-7.62 (Phoenix)

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

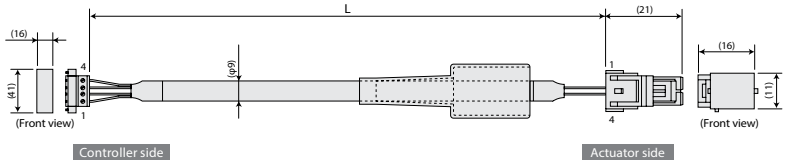
SLP-04V (JST)

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

Minimum bending radius r = 51mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

Model CB-XMC-MA □□□

* Please indicate the cable length (L) in □□□ , maximum 30m, E.g.) 080 = 8m



GIC2.5/4-STF-7.62 (Phoenix)

Wiring	Color	Signal	No.
1.25sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

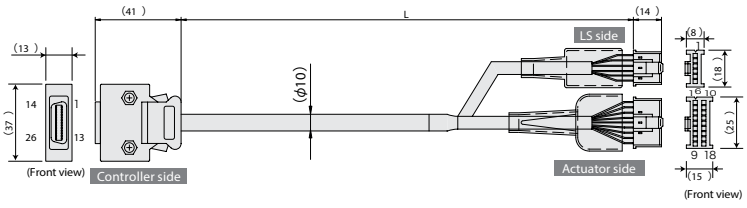
SLP-04V (JST)

No.	Signal	Color	Wiring
1	U	Red	1.25sq (Crimped)
2	V	White	
3	W	Black	
4	PE	Green	

Minimum bending radius r = 55mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

Model CB-RCS2-PLA □□□ / CB-X2-PLA □□□

* Please indicate the cable length (L) in □□□ , maximum 30m, E.g.) 080 = 8m



10126-3000PE (Sumitomo 3M)

Wiring	Color (RCS2)	Color (X2)	Signal	No.
	–	–	–	10
	–	–	–	11
	Brown/White	White/Orange	E24V	12
	Gray/White	White/Green	0V	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
	–	–	–	9
	–	–	–	18
	–	–	–	19
	Pink	White/Blue	A+	1
AWG26 (Soldered)	Purple	White/Yellow	A−	2
	White	White/Red	B+	3
	Blue/Red	White/Black	B−	4
	Orange/White	White/Purple	Z+	5
	Green/White	White/Gray	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

Shield is clamp connected to the hood

XMP-06V (JST)

No.	Signal	Color (RCS2)	Color (X2)	Wiring
1	E24V	Brown/White	White/Orange	AWG26 (Crimped)
2	0V	Gray/White	White/Green	
3	LS	Red/White	Brown/Blue	
4	CREEP	Black/White	Brown/Yellow	
5	OT	Yellow/Black	Brown/Red	
6	RSV	Pink/Black	Brown/Black	

XMP-18V (JST)

No.	Signal	Color (RCS2)	Color (X2)	Wiring
1	A	Pink	White/Blue	AWG26 (Crimped)
2	Ā	Purple	White/Yellow	
3	B	White	White/Red	
4	B̄	Blue/Red	White/Black	
5	Z	Orange/White	White/Purple	
6	Z̄	Green/White	White/Gray	
7	–	–	–	
8	–	–	–	
9	FG	Drain	Drain	
10	SD	Blue	Orange	
11	S̄D	Orange	Green	
12	BAT+	Black	Purple	
13	BAT−	Yellow	Gray	
14	VCC	Green	Red	
15	GND	Brown	Black	
16	–	–	–	
17	BK−	Gray	Blue	
18	BK+	Red	Yellow	

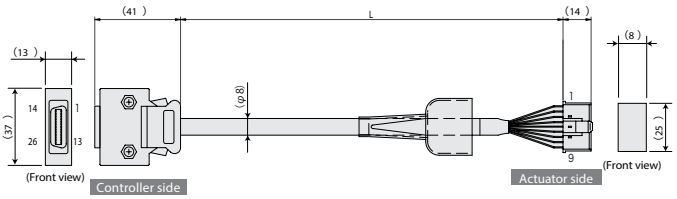
(Wire color White/Blue shows Band color/Insulator color)

Minimum bending radius r = 50mm or more (Dynamic bending condition)
*** Please use the robot cable if the cable has to be installed through the cable track.**

Maintenance parts

Model CB-X1-PA □□□

* Please indicate the cable length (L) in □□□, maximum 30m, E.g.) 080 = 8m



Minimum bending radius r = 44mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

*** 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.**

10126-3000PE (Sumitomo 3M)

Wiring	Color	Signal	No.
AWG2 6 (Soldered)	–	–	10
	–	–	11
	–	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
	Orange	SRD+	7
	Green	SRD–	8
	Purple	BAT+	14
	Gray	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

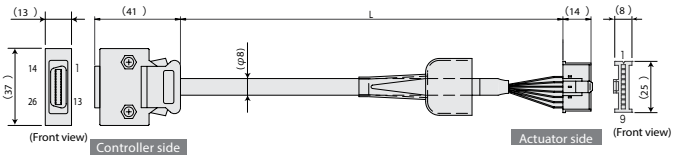
Shield is clamp connected to the hood

XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	Purple	AWG2 6 (Crimped)
2	BAT–	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK–	Blue	
9	BK+	Yello	

Model CB-X1-PA □□□ -AWG24

* Please indicate the cable length (L) in □□□, maximum 30m, E.g.) 210 = 21m



Minimum bending radius r = 44mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

10126-3000PE (Sumitomo 3M)

Wiring	Color	Signal	No.
AWG24 (Soldered)	–	–	10
	–	–	11
	–	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
	Orange	SRD+	7
	Green	SRD–	8
	Purple	BAT+	14
	Gray	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

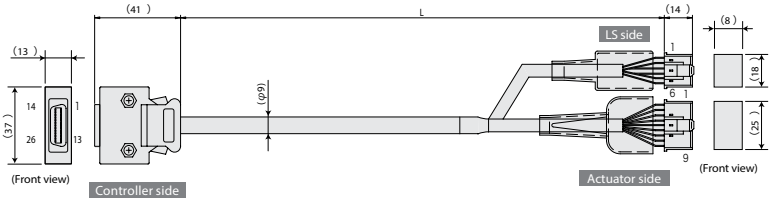
Shield is clamp connected to the hood

XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	Purple	AWG24 (Crimped)
2	BAT–	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK–	Blue	
9	BK+	Yellow	

Model CB-X1-PLA □□□

* Please indicate the cable length (L) in □□□, maximum 30m, E.g.) 080 = 8m



Minimum bending radius r = 54mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

*** If you require ISB/ISDB (with battery-less absolute encoder) with the cable of 21m or longer, select the CB-X1-PLA□□□-AWG24.**

10126-3000PE (Sumitomo 3M)

Wiring	Color	Signal	No.
AWG2 6 (Soldered)	–	–	10
	–	–	11
	White/Blue	E24V	12
	White/Yellow	0V	13
	White/Red	LS	26
	White/Black	CREEP	25
	White/Purple	OT	24
	White/Gray	RSV	23
	–	–	9
	–	–	18
	–	–	19
	–	A+	1
	–	A–	2
	–	B+	3
	–	B–	4
	–	Z+	5
	–	Z–	6
	Orange	SRD+	7
	Green	SRD–	8
	Purple	BAT+	14
	Gray	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

Shield is clamp connected to the hood

XMP-06V (JST)

No.	Signal	Color	Wiring
1	E24V	White/Blue	AWG2 6 (Crimped)
2	0V	White/Yellow	
3	LS	White/Red	
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	

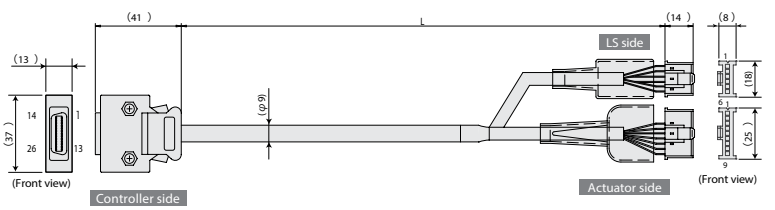
XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	Purple	AWG2 6 (Crimped)
2	BAT–	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK–	Blue	
9	BK+	Yellow	

(White/blue cable colors indicate the band color/insulator color)

Model CB-X1-PLA □□□ -AWG24

* Please indicate the cable length (L) in □□□, maximum 30m, E.g.) 210 = 21m



Minimum bending radius r = 54mm or more (Dynamic bending condition)
*** Only robot cable is available for this model.**

10126-3000PE (Sumitomo 3M)

Wiring	Color	Signal	No.
AWG24 (Soldered)	–	–	10
	–	–	11
	White/Blue	E24V	12
	White/Yellow	0V	13
	White/Red	LS	26
	White/Black	CREEP	25
	White/Purple	OT	24
	White/Gray	RSV	23
	–	–	9
	–	–	18
	–	–	19
	–	A+	1
	–	A–	2
	–	B+	3
	–	B–	4
	–	Z+	5
	–	Z–	6
	Orange	SRD+	7
	Green	SRD–	8
	Purple	BAT+	14
	Gray	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

Shield is clamp connected to the hood

XMP-06V (JST)

No.	Signal	Color	Wiring
1	E24V	White/Blue	AWG24 (Crimped)
2	0V	White/Yellow	
3	LS	White/Red	
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	

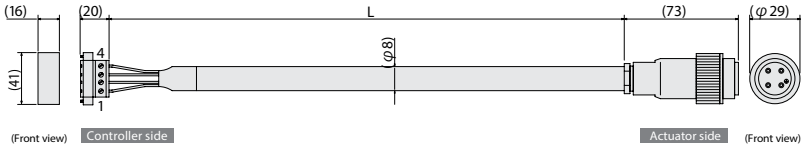
XMP-09V (JST)

No.	Signal	Color	Wiring
1	BAT+	Purple	AWG24 (Crimped)
2	BAT–	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK–	Blue	
9	BK+	Yellow	

(Wire color White/Blue shows Band color/Insulator color)

Model CB-XEU-MA □□□

* Please indicate the cable length (L) in □□□ , maximum 30m,
E.g.) 080 = 8m



Minimum bending radius r = 48mm or more (Dynamic bending condition)
* Only robot cable is available for this model.

Plug
GIC2.5/4-STF-7.62 (Phoenix)

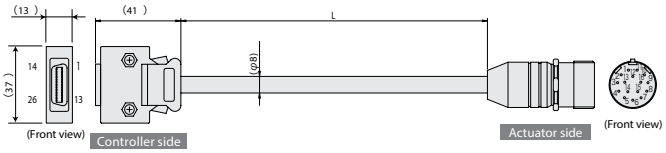
Wiring	Color	Signal	No.
0.75sq	Green/yellow	PE	1
	White letter "1" on black	U	2
	White letter "2" on black	V	3
	White letter "3" on black	W	4

Plug connector
99-4222-00-04 (BINDER)

No.	Signal	Color	Wiring
⊕	PE	Green/yellow	0.75sq (Crimped)
1	U	White letter "1" on black	
2	V	White letter "2" on black	
3	W	White letter "3" on black	

Model CB-X1-PA □□□ -WC

* Please indicate the cable length (L) in □□□ , maximum 30m,
E.g.) 080 = 8m



Minimum bending radius r = 38mm or more (Dynamic bending condition)
* Only robot cable is available for this model.

10126-3000PE (Sumitomo 3M)

Wiring	Color	Signal	No.
AWG2 6 (Soldered)	–	–	10
	–	–	11
	–	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
	Green	SRD–	8
	Purple	BAT+	14
	Gray	BAT–	15
	Red	VCC	16
	Black	GND	17
	Blue	BKR–	20
	Yellow	BKR+	21
	–	–	22

Shield is clamp connected to the hood

99-4630-00-16 (BINDER)

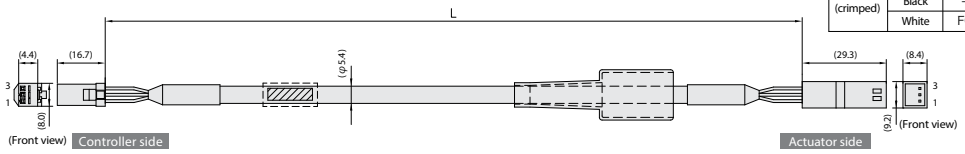
No.	Signal	Color	Wiring
1	SD	Orange	AWG2 6 (Soldered)
2	SD	Green	
3	–	–	
4	–	–	
5	–	–	
6	–	–	
7	–	–	
8	–	–	
9	–	–	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT–	Gray	
14	–	–	
15	BK–	Blue	
16	BK+	Yellow	

Shield is 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 (JST)

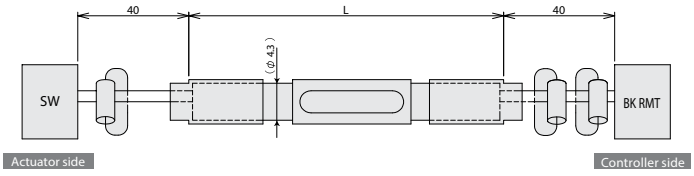
Wiring	Color	Signal	No.
AWG20 (crimped)	Red	+	3
	Black	–	2
	White	FG	1

J11SFM-03V-KX (JST)

No.	Signal	Color	Wiring
3	+	Red	AWG20 (crimped)
2	–	Black	
1	FG	White	

Model CB-IXA-BK □□□ -1

* Please indicate the cable length (L) in □□□ , maximum 15m,
E.g.) 050 = 5m



DF3-3S-2C (Hirose)

Connector	Color	Signal	Pin No.
SW	Red	BK3	1
	White	COM	2
	–	–	3

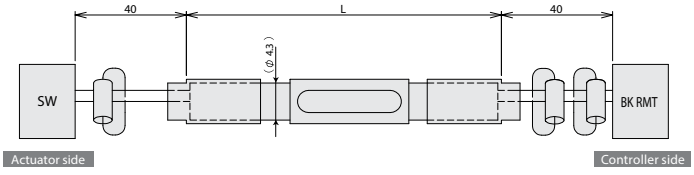
1-1827862-5(AMP)

Pin No.	Signal	Color	Connector
A2	BK3	Red	BK RMT
A3	COM	White	
Rest	–	–	

Sheath

Model CB-IXA-BK □□□ -2

* Please indicate the cable length (L) in □□□ , maximum 15m,
E.g.) 050 = 5m



DF3-3S-2C (Hirose)

Connector	Color	Signal	Pin No.
SW	Red	BK4	1
	White	COM	2
	–	–	3

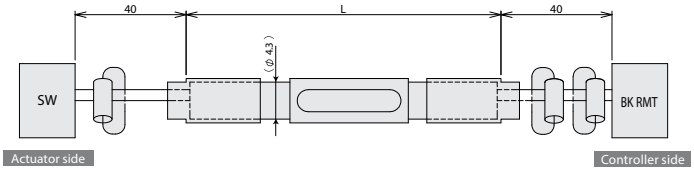
1-1827862-5(AMP)

Pin No.	Signal	Color	Connector
B2	BK4	Red	BK RMT
A3	COM	White	
Rest	–	–	

Sheath

Model CB-IXA-BK □□□ -3

* Please indicate the cable length (L) in □□□ , maximum 15m,
E.g.) 050 = 5m



DF3-3S-2C (Hirose)

Connector	Color	Signal	Pin No.
SW	Red	BK5	1
	White	COM	2
	–	–	3

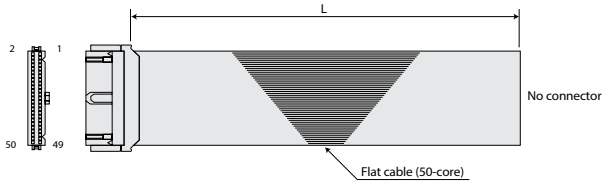
1-1827862-5(AMP)

Pin No.	Signal	Color	Connector
A4	BK5	Red	BK RMT
A3	COM	White	
Rest	–	–	

Sheath

Model CB-X-PIO □□□

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

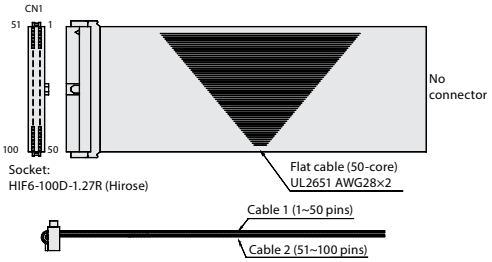


XG4M-5030-T (Omron)

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	Flat cable (crimped)	24	Yellow-3	Flat cable (crimped)	41	Brown-5	Flat cable (crimped)
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				

Model CB-X-PIOH □□□

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



HIF6-100D1.27R (Hirose)

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	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 output		76	Blue-3	324	General-purpose output
	2	Red-1	000	Program start		27	Purple-3	024	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	Output	62	Red-2	311	General-purpose output	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
Input	14	Yellow-2	012	Program No.(PRG No.20)	Input	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

MEMO

PSA-24

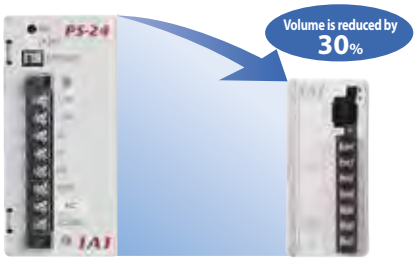
■ **Model PSA-24/PSA-24L**

24VDC Power supply

Features

Compact

Compared with the conventional 24V power supply, it has a compact size, allowing a smaller installation space.

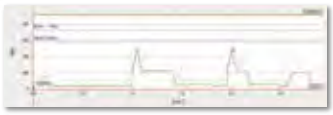


PS-24 NEW PSA-24

Output of internal data from the power supply

Possible to monitor the following data by connecting with R-unit:

- Output voltage
- Output currency
- Load factor
- Cumulative energizing time
- Internal temperature
- Alarm for low fan rotational speed



* an image graph

PSA-24 RCON RSEL PLC

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. 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.

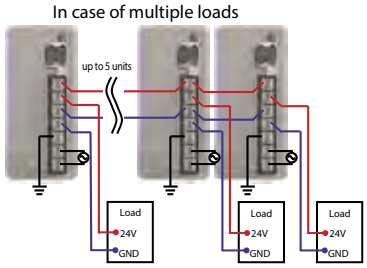
Calculation results are displayed.

Required number of power supply units

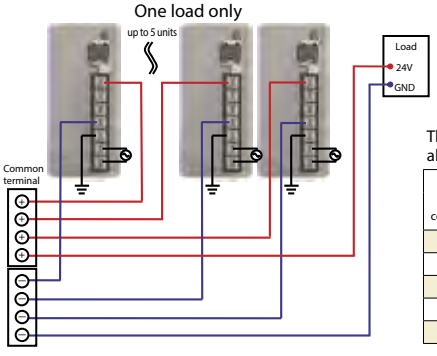
Current value graph

Parallel operation of up to 5 units is possible

In case of multiple loads



One load only



(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.

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)	PSA-24/PSA-24L
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

Specifications

tem		Specifictions		Conditions
		PSA-24 (without fan)	PSA-24L (with fan)	
Power source voltage range		AC100V ~ AC230V ±10%		
Power current	AC100V	2.5A or less	3.9A or less	Continuous rated output 204W
	AC200V	1.4A or less	1.9A or less	Continuous rated output 204W
Power frequency range		50/60 Hz± 5%		
Power supply capacity	AC100V	250VA	390VA	Continuous rated output 204W
	AC200V	280VA	380VA	Continuous rated output 204W
Inrush Current (Note 1)	AC100V	27.4A (typ)		When Cold-started (40°C)
	AC200V	54.8A (typ)		
Momentary power failure resistance	50Hz	20 ms		
	60Hz	16 ms		
Electric shock protection mechanism		Class Ⅰ		
Efficiency	AC100V	86% or more		Continuous rated output 204W
	AC200V	90% or more		
Output voltage range (Note 2)		17A (408W)		
Continuous rated output		8.5A (204W)	13.8A (330W)	
Peak output		17A (408W)		
Protective function		Protection agaist over current, over heat and over load.		
		Protection agaist over voltage, input low voltage and fan rotation		
Ambient operating temperature		0°C ~ +55°C (derating)		
Ambient operating humidity		5%RH - 85%RH		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/s2 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	AC100V	28.6W		Continuous rated output 204W
	AC200V	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		AC3000V, 1 minute
	AC input - FG	Leak current 10mA		AC2000V, 1 minute
	DE output - FG	Leak current 25mA		AC500V, 1 minute
Insulation resistance	AC input - DC output	DC500V 50MΩ or higher		
	AC input - FG	DC500V 50MΩ or higher		
	DE output - FG	DC500V 50MΩ or higher		
Leak current (Note 3)	AC100V	0.40mA typ		
	AC200V	0.75mA typ		
Safety standard		UL61010, EN61010-1		
		KC(EMC), EN55011		
Mass		805g	845g	

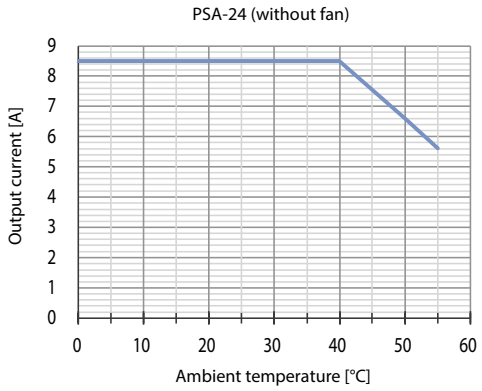
(Note 1) The pulse width of rush current is less than 5ms. During a parallel operation, the rush current will be multiplied by the number of units. Please carefully select taking the characteristics into account, so that the breaker is not activated due to rush current.
(Note 2) This power supply features changing output voltage according to load to make enable parallel operations possible. Therefore, this unit is for an exlusive use of IAI contollers. Please refer to the operation manual about output voltage by overload.
(Note 3) Represents leak current of the power supply unit.

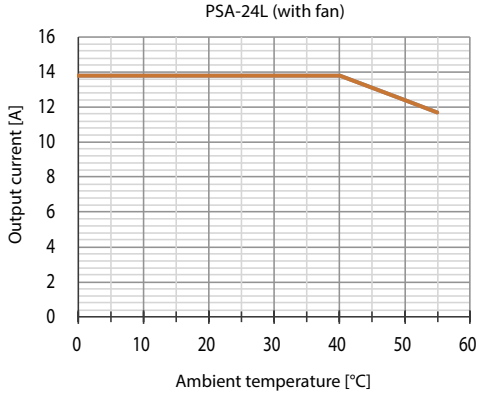
Caution

- **This power supply is not a constant voltage power supply. The output voltage changes with the load (voltage decreases according to the load percentage). 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.**
- **As a rule, when operating multiple units (without fan) in a row, allow at least 10mm space between each power supply. (No space is necessary for the units with fan.)**
- **This unit is a natural air-cooled power supply. Please give due consideration to natural convection so that heat does not build up around the power supply.**
- **The case of this product also has a heat radiating effect. Do not touch the case after installation as it may result in severe burns.**

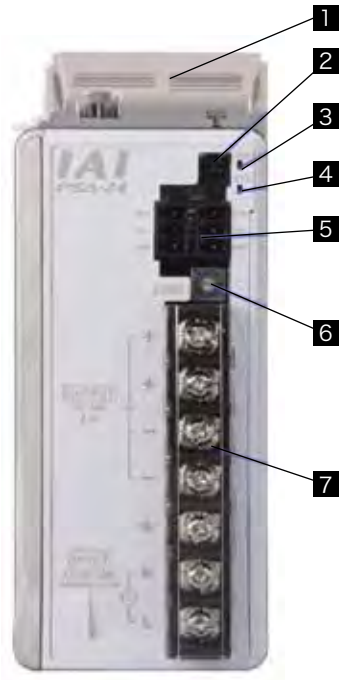
Derating against ambient temperature

When the ambient temperature is higher than 40°C, please lower the output power according to the derating curve shown below.





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.

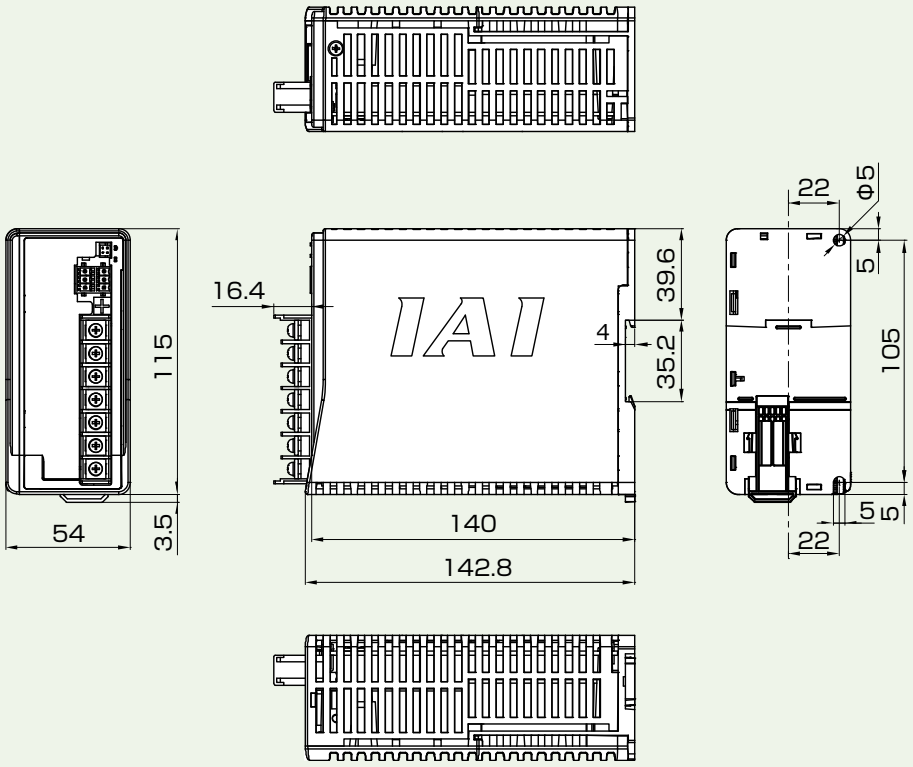
7 Terminals for power supply

To connect the wiring for the AC input, frame grounding and output voltage.

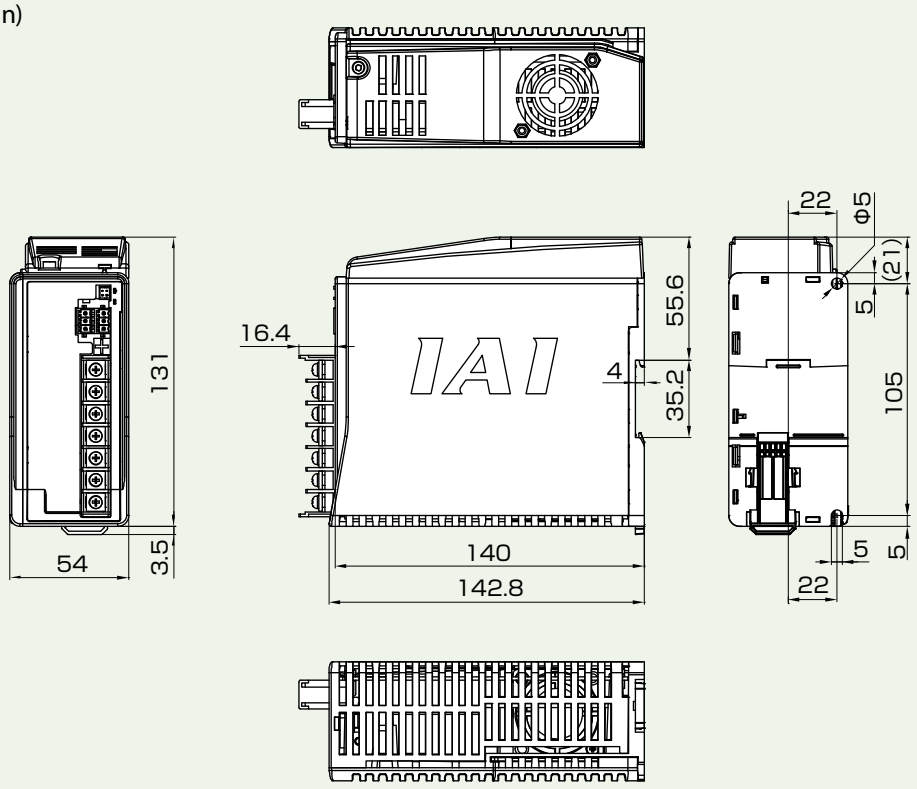
External dimensions

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

PSA-24 (without fan)



PSA-24L (with fan)



TB-03
TB-02

Commonly used for the position controller and program controller
Touch panel teaching pendant

CE RoHS 10

Features

Setting and trial runs can be done wirelessly even for actuators out of reach

Wireless connection (TB-03)

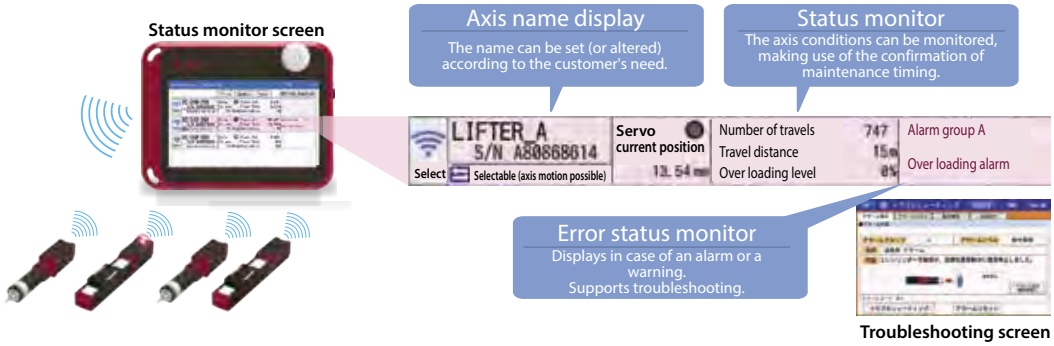
Operating conditions can be set wirelessly.
Without connecting with the ELECYLINDER main unit with a cable, positioning adjustments, setting of operating conditions and actuator motions are possible from out side of the equipment.

* The stop switch is enabled only for the "wired connection."
  Note that it is disabled for the "wireless connection.
  "The driving power source needs to be supplied by wire.

The functions of the ELECYLINDER that is operable with wireless connection differ depending on the specified item in the option.
"-WL" is for edit only, and "-WL2" is for edit and operation.

Connected axis status monitor (TB-03)

The operating conditions of up to 16 axes can be monitored by receiving wireless data that the ELECYLINDERs transmit all the time.
Furthermore, in case of abnormality, troubleshooting can be done wirelessly, making the recovery time from the trouble shortened.
* The driving power source is only for one axis.



One unit can set up all types of controllers

For ELECYLINDER/Position controller/Program controller

Connectable with all types of controllers* by using the dedicated cable.
* All the controllers shown in the General Catalog 2018 or later.

Graphical easy support functions

Main menu

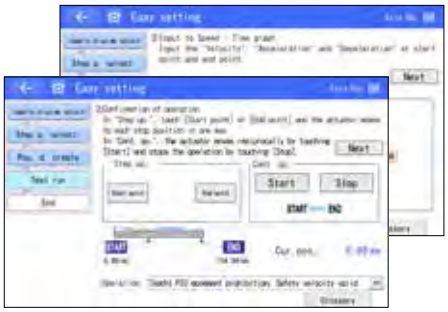
Use of icons for the menu makes selection much easier.

Easy data setting and program setting

A guide screen for position setting using pictures is provided for those who operate the actuator for the first time.

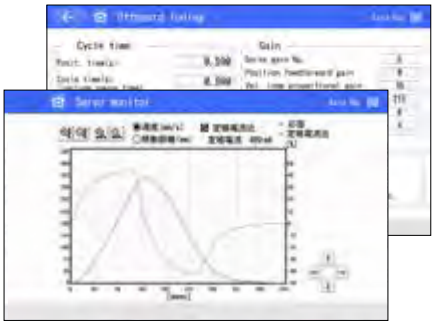
Easy data setting screen
(when connecting an ELECYLINDER)

Easy program setting screen
(when connecting a position controller)



Off-board tuning

Optimal gain calculations and setting as well as cycle time calculations are possible by inputting operation conditions.

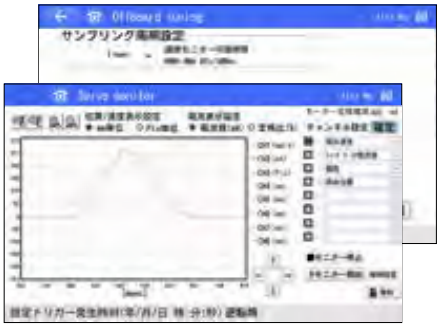


Position edit guide

Setting of position data is guided in an interactive method.

Servo monitor

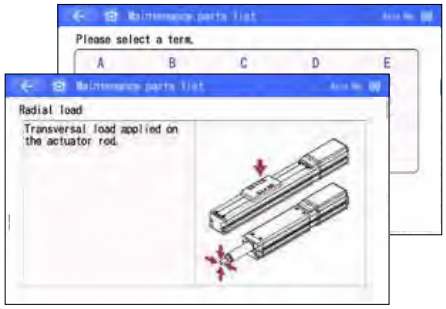
The current position, speed and current value deviation of the actuator are displayed in a graphical representation.



No problem even in case of a trouble! Full of functions for troubleshooting

Description of terms

Descriptions of terms used in the general catalog and operations of the position controller are provided on the screen.

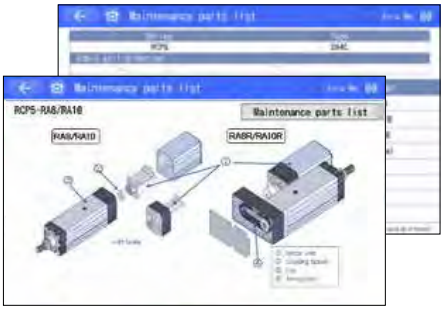


Troubleshooting

Shows troubleshooting by selecting only Yes/No about the trouble symptoms.

Maintenance part list

It is possible to confirm maintenance part list by entering the model.



There are many other functions!

List of functions of TB-03/TB-02

1	Wireless connection	Without connecting with the ELECYLINDER main unit with a cable, positioning adjustments, and operating condition setting are possible from out side of the equipment.
2	Monitoring of connected axis conditions	The operating conditions of up to 16 axes can be monitored by receiving wireless data that the ELECYLINDERs transmit all the time.
3	Main menu	Menu screen using icons that is easy for visual selections.
4	Easy data setting (EC) Easy program setting (position controller)	Operating method, positioning, speed, acceleration and deceleration can be set by an interactive method.
5	Troubleshooting	Function to display detailed information of the alarm and indicate troubleshooting in an interactive method in case of troubles.
6	Maintenance part list	Function to show list of maintenance parts for the periodical maintenance and failure.
7	Setting of initial screen	Function not to show the guide function with icons or select the initial screen at the time of start up.
8	Description of terms	Function to display descriptions of terms used in the general catalog and operations of the position controller on the screen.
9	Easy programing function	Function to program a repeated motion of positions and setting of pause time
10	Position edit guide	Function to guide setting method of the position data in an interactive method.
11	I/O control guide	Function to guide the I/O operation method of the position controller in an interactive method.
12	Off-board tuning	Function to set optimal control parameters (various gains) and enable cycle time calculation.
13	Gateway setting and monitoring	Function to set up and monitor the gateway system of RCP6S, RCON and REC.
14	Servo monitor	Function to monitor actual operating conditions in a wave form display.
15	Network data	Shows input/output data of the upper level controller when connecting a single-axis controller of the network specification.
16	Press program function	Press program function
17	Teaching update	Function to support software version upgrade by the customer.
18	Screen shot	Function to save screen shots in the bmp file format to the SD card by pressing the right bottom corner of the screen.
19	Large screen display	To support a large 7-inch full color touch panel to display large letters and buttons for high operability.
20	Multi-language	Supports Japanese, English and Chinese languages.

* 1 and 2 are functions for wireless connection between TB-03 and an ELECYLINDER.
4 to 9 are for ELECYLINDERs and position controllers.
10-16 are for position controllers.

Model number

One unit supports all controllers, although the cable must be selected in accordance with the controller to be connected.
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	① CB-TB3-C050	-
		N *2		
Program Controller	TB-03-S	(Blank)/C/E/K	-	② CB-TB3-S050 + ③ CB-SEL-SJS002
		N *2		
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

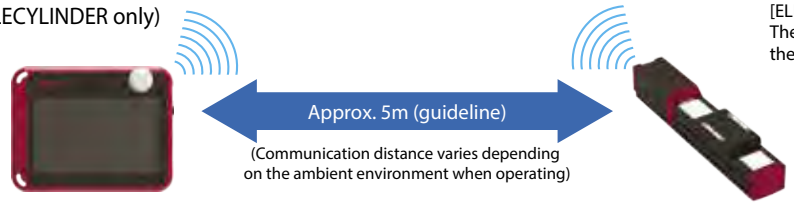
*3 Use with the ② cable when connecting to ASEL, PSEL, SSEL, or MSEL

● 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)

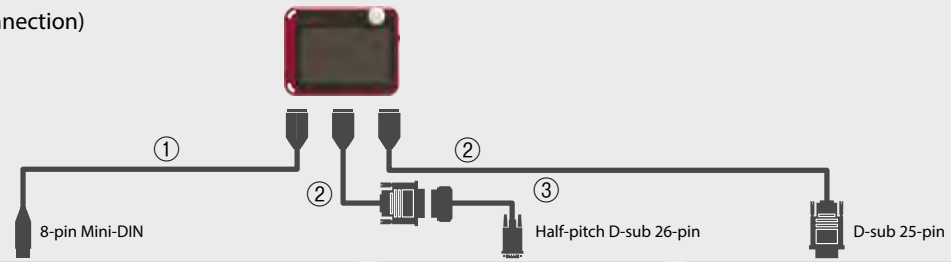


[ELECYLINDER model and wireless function]
The wireless function varies depending on the model option to be specified.

"-WL" = Edits by wirelessly
"-WL2" = Edits and Operation wirelessly.

Caution: Certification issues limit the countries in which wireless communication can be used. (See P8-322)

● Wired connection (cable connection)



[ELECYLINDER]
EC
[Position Controller]
PCON-CB/CFB/CGB/CGFB
ACON-CB/CGB
DCON-CB/CGB
SCON-CB/CGB
MCON-C/CG
RCP6S *1
PCON-CYB/PLB/POB
ACON-CYB/PLB/POB
DCON-CYB/PLB/POB
SCON-CAL/CGAL
MSCON
RCM-P6PC/P6AC/P6DC *1

[Program Controller]
MSEL-PC/PG/PCF/PGF/PCX/PGX
SSEL-CS
RSEL

[Program Controller]
XSEL-RA/SA/RAX/SAX/RAXD/SAXD
XSEL-P/Q/PCT/QCT/PX/QX
TTA

*1 To operate RCP6S and RCM-P6, a gateway unit or a PLC connecting unit is necessary.

TB-03

Body specifications

Power input Voltage range	24VDC ±10% [supplied from controller]
	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
Ingress 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

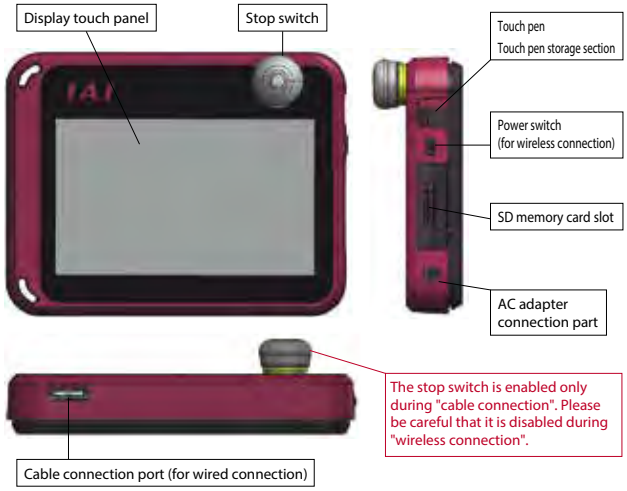
Wireless function (when connected to ELECYLINDER only)

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-axis
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

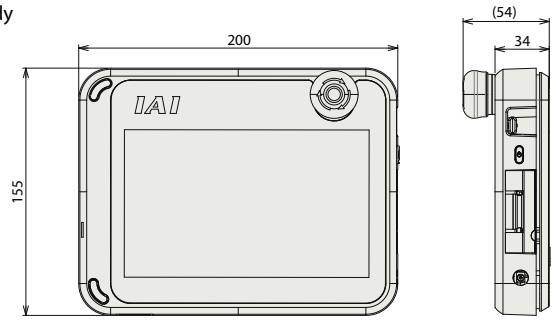
Name of each component



External dimensions

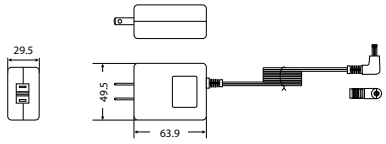
CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD

●Body

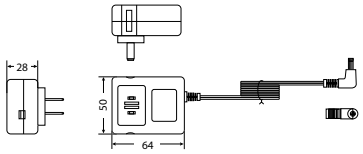


●AC adapter

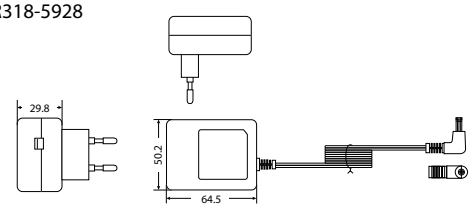
For Japan/North America/Thailand: UN318-5928



For China: UNZ318-5928



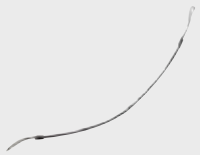
For Europe: UNE318-5928
For Korea: UNR318-5928



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 including 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 an 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.

●The use of this product is permitted in the following countries (regions) only.
In other countries (regions), it is necessary to acquire a certification in conformity with the concerned country (region).

Japan, USA, Canada, EU countries, China, South Korea, Thailand, Mexico

Models

The teaching pendant is compatible with every controller on P. 6, but please select the cable according to 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 universal for position 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)		

* You can specify the following at the end of the model number. Written in English when shipped: -ENG.

●Teaching Pendant Only (No Cable Included)

Type	Model Number	Specification
Models universal for position 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
Program controller connection cable	②CB-TB1-X002
	③CB-SEL-SJS002 (Adapter cable)*
TP adapter connection cable	④CB-TB1-GC002

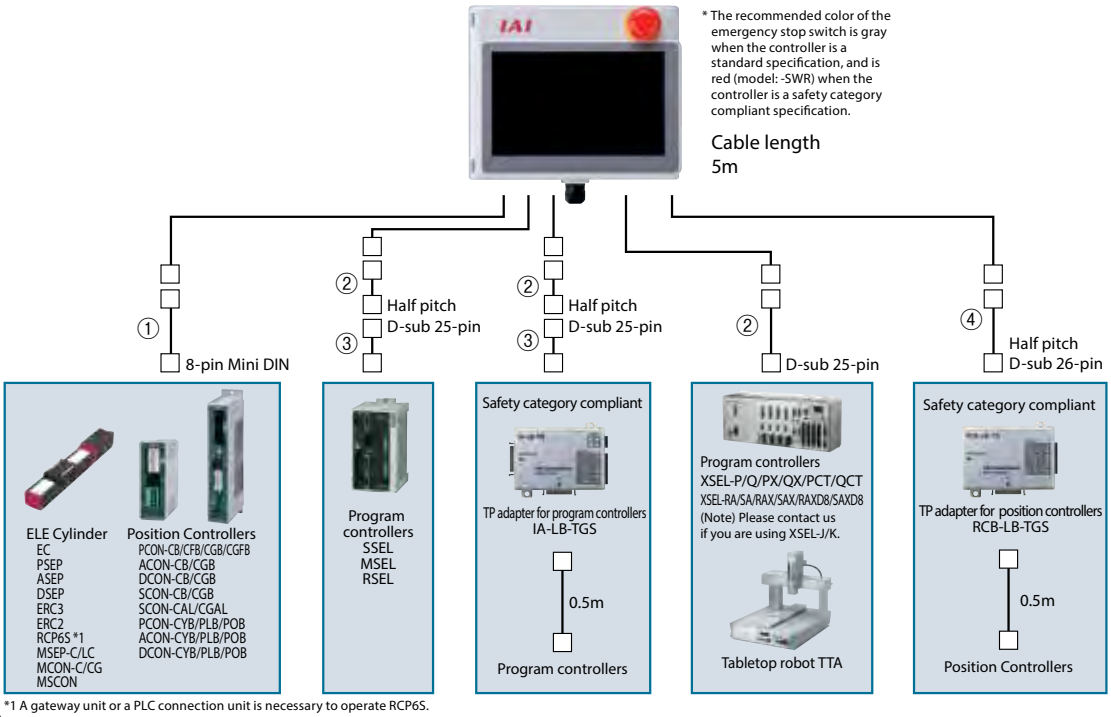
* Use with CB-TB1-X002 when connecting to ASEL, PSEL, SSEL, and MSEL.

●Options

Name	Model Number	Description
Strap	STR-1	Connected to the box.
Grip belt	GRP-1	Safety belt to hold the box by left hand.
Spiral cord	SIC-1	A cord which connects the box and the provided stylus.

(Note) Please contact us if you are using XSEL-J/K/JX/KX.

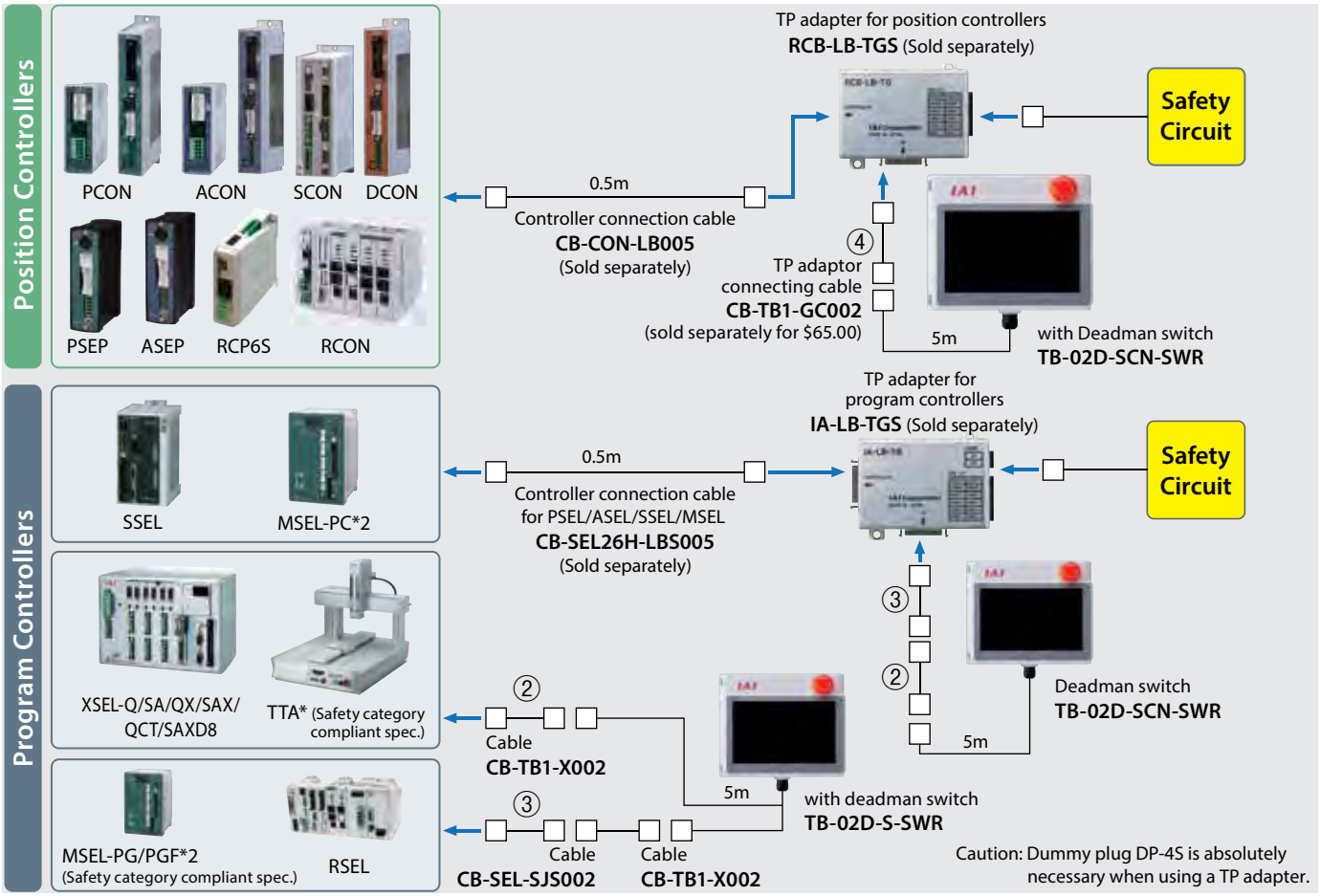
Applicable Controllers/Safety category compliant



*1 A gateway unit or a PLC connection unit is necessary to operate RCP6S.

*1 Compliant with category 4 when fitting the dummy plug.

■Compatibility with safety category will be constituted as below. Compliant with up to Safety Category B~4. *1 *2

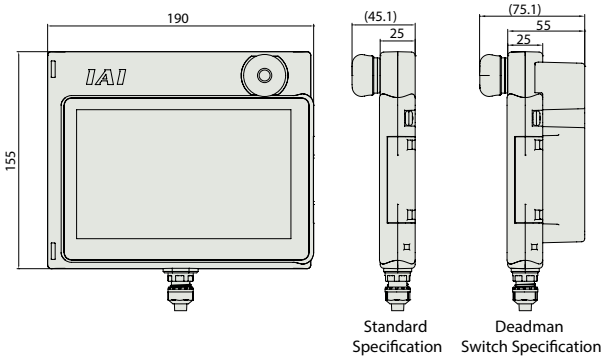


Specifications

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

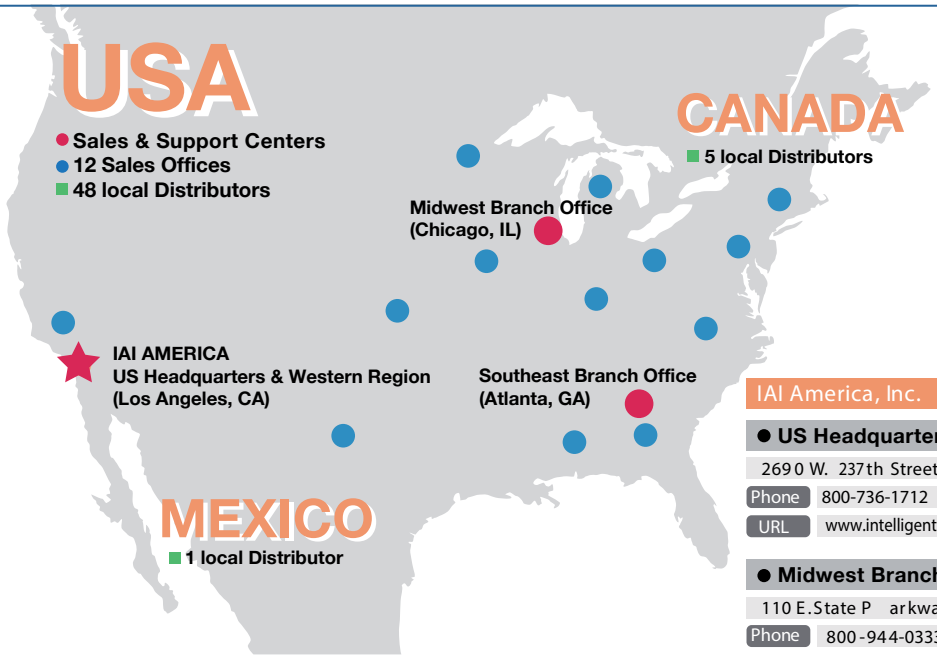
CAD drawings can be downloaded from our website. www.intelligentactuator.com 2D CAD 3D CAD



Catalog No. Genaral-Catalog-2021_Controller_CE9001-8-1.3A (2023JUL)

SUPPORT A network of authorized representatives in the US to serve you.

Support for phase of planning, product selection, quotation, problem solving, maintenance, training, etc.



www.intelligentactuator.com/inquiry/

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The information contained in this booklet may change without prior notice due to product improvement.

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