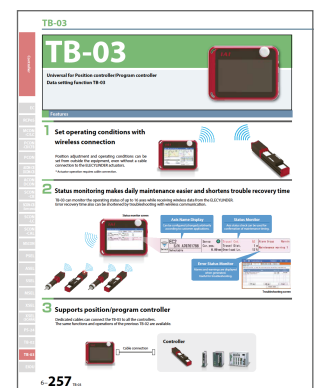
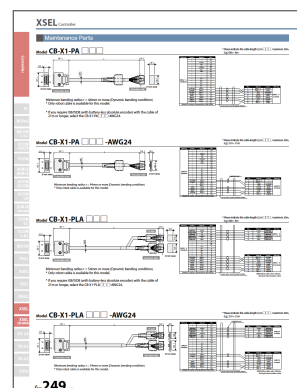
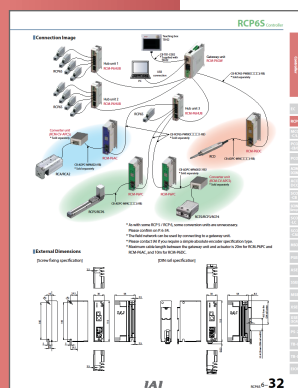
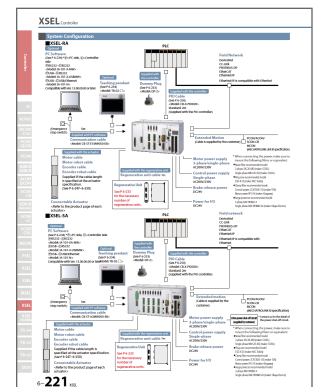
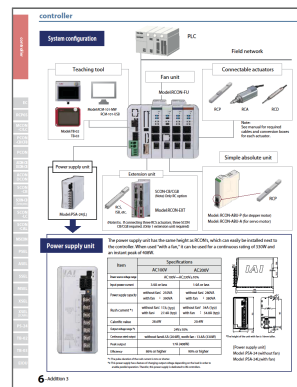


CONTROLLER

2020



controller

Controller

R-unit

RCP6S

RCON

MCON

PCON

ACON/DCON

SCON

MSCON

SSEL

MSEL

XSEL

PSA-24

TB-02

TB-03

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

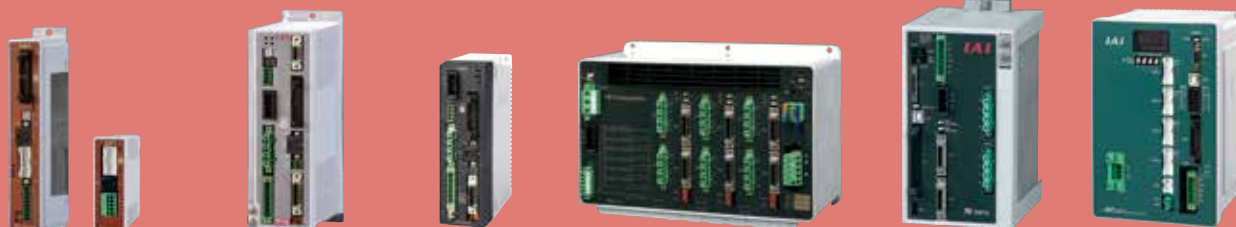


R-unit

MCON-C

PCON

ACON



DCON

SCON-CB

SCON-CAL

MSCON

SSEL

MSEL



XSEL

PSA-24

TB-02

TB-03

	Controller overview	7-11
	Positioner Type	7-13
	Program type	7-15
	Network	7-17
	Safety Category Compliant Types	7-21
R-unit	RCON/ RSEL/REC	7-23
RCP6S	RCP6S/RCM-P6□C	7-103
MCON	MCON-C/CG	7-117
PCON	PCON-CB/CGB/CFB/CGFB/CYB/PLB/POB	7-137
ACON/DCON	ACON-CB/CGB/CYB/PLB/POB DCON-CB/CGB/CYB/PLB/POB	7-163
SCON	SCON-CB/CGB/LC/CAL/CGAL	7-187
MSCON	MSCON-C	7-231
SSEL	SSEL-CS	7-243
MSEL	MSEL-PC/PG/PCX/PGX/PCF/PGF	7-257
XSEL	XSEL-RA/SA/P/PCT/Q/QCT	7-271
XSEL (For SCARA)	XSEL-RAX/RAXD/SAX/SAXD/PX/QX	7-289
PSA-24	PSA-24/24L	7-311
TB-02	TB-02	7-315
TB-03	TB-03	7-319

Controller

MEMO

- R-unit
- RCP6S
- MCON
-C
- PCON
-CB/CFB
- PCON
- ACON-CB
DCON-CB
- ACON
DCON
- SCON
-CB
- SCON-CB
(Servo press)
- SCON
-CAL
- MSCON
- SSEL
- MSEL
- XSEL
- XSEL
(SCARA)
- PSA-24
- TB-02
- TB-03

MEMO

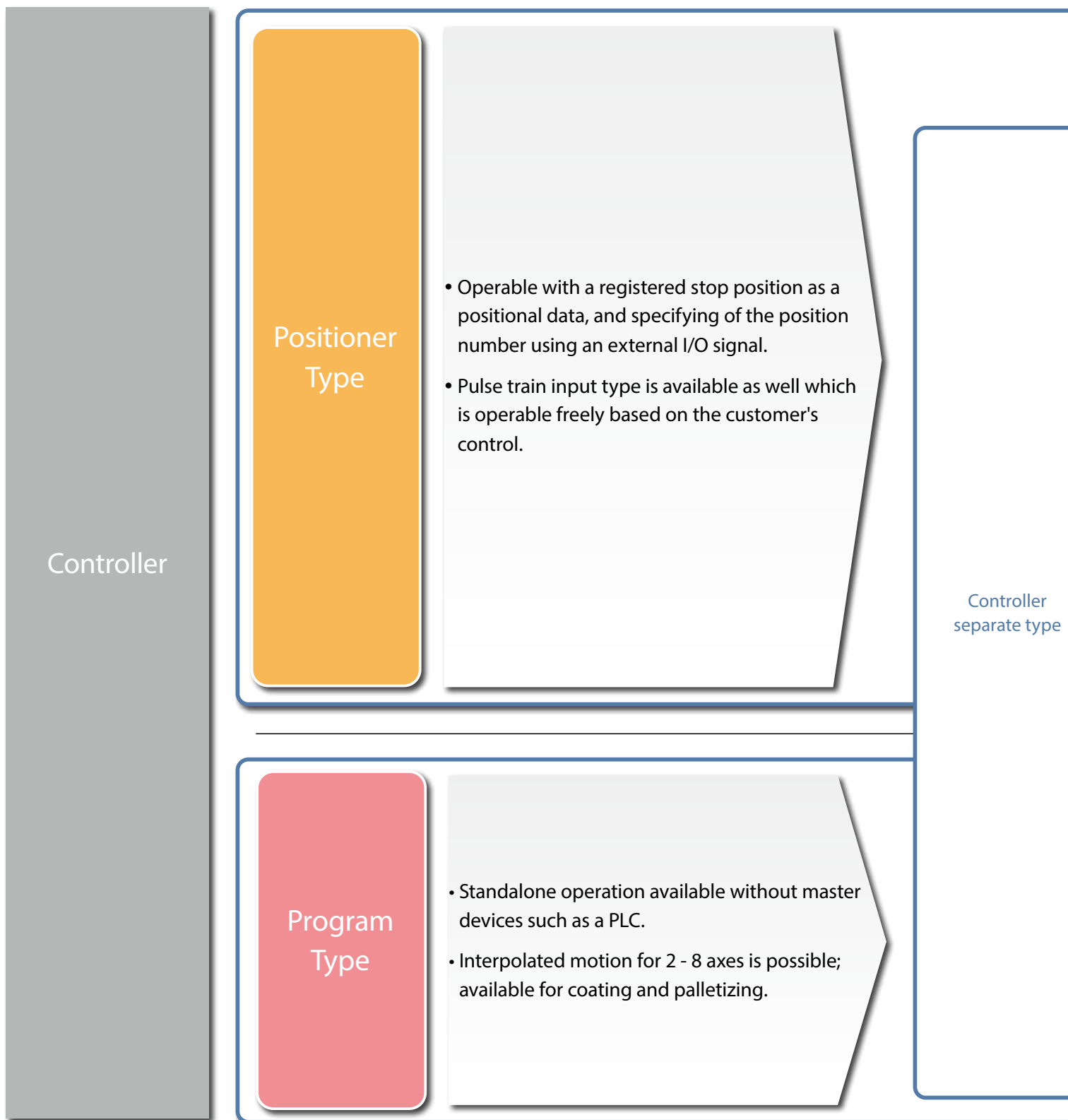
Handwriting practice area with horizontal dotted lines.

Controller
R-unit
RCP6S
MCON -C
PCON -CB/CFB
PCON
ACON-CB DCON-CB
ACON DCON
SCON -CB
SCON-CB (Servo press)
SCON -CAL
MSCON
SSEL
MSEL
XSEL
XSEL (SCARA)
PSA-24
TB-02
TB-03

Controller Overview

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

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



Controller integrated type



ELECYLINDER



See ELECYLINDER catalog.



Gateway for network connection

REC

See P7-53

Controller for single axis



Position controller
24VDC/AC100V/AC200V type

PCON/ACON/DCON/SCON



Position controller
24VDC type

MCON



Position controller
AC100V/AC200V type

MSCON

See P7-13

R-unit
Series



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

RCON

See P7-38

Controller for multi-axes



Program controller
AC100V/AC200V type

MSEL/SSEL/XSEL

See P7-15



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

RSEL

See P7-45

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

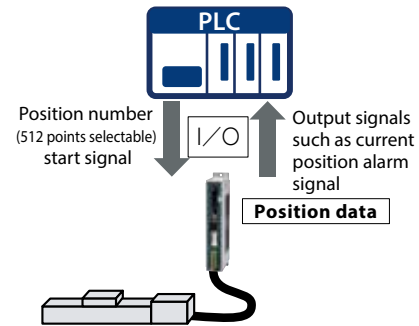
TB-03

Positioner Type

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

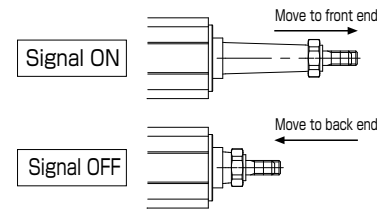
1 No programming needed

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



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

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



3 Reasonable price

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



4 Wide range of variations with full of functions

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

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

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

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

•The absolute type varies depending on the controller type. Please refer to the relevant controller page.



See
P7-137



See
P7-163



See
P7-187



See
P7-38



See
P7-117



See
P7-231

Program Type

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

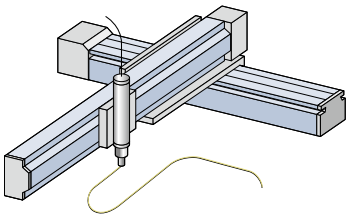
1 High-level control available using simple language

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

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

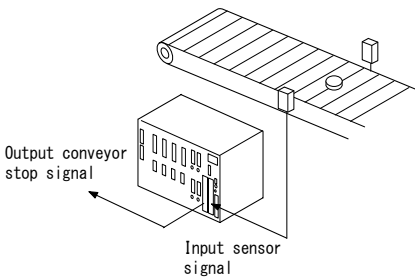
2 Interpolation possible up to 8 axes

Simultaneous 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

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



RSEL

See
P7-45

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.



SSEL

See
P7-243

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.



MSEL

See
P7-257

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.



XSEL

See
P7-271

Controller

R-unit

RCP6S

MCON
-CPCON
-CB/CFB

PCON

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

MCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Network Compatibility

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

1 Compatible with main field networks

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

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

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



Compatible network and functions

As of March 2020

Controller series		Ellipsis	position controller									program controller					
			PCON -CB	ACON -CB	SCON -CB	SCON -CAL	SCON-CB (servo press specification)	DCON -CB	MCON -C	MSCON	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 Field CIE	CIE	●	●	●	—	●	●	●	—	●	—	—	●	—	—	—
	SSCNET III/H	SSN	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—
	MECHATRO LINK I / II (*1)	ML	●	●	●	●	●	—	—	—	—	—	—	—	—	—	—
	MECHATRO LINK III (*1)	ML3	●	●	●	—	—	●	●	—	—	—	—	—	—	—	—
	PROFIBUS- DP	PR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PROFINET IO	PRT	●	●	●	●	●	●	●	—	●	—	—	●	●	—	—
	IA net	IA	—	—	—	—	—	—	—	—	—	●	●	—	●	—	—
Number of positioning points (*2)			768						256		128	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			P7-137	P7-1163	P7-187	P7-217	P7-203	P7-163	P7-117	P7-231	P7-38	P7-243	P7-615	P7-45	P7-257	P7-271	P7-289

(*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.

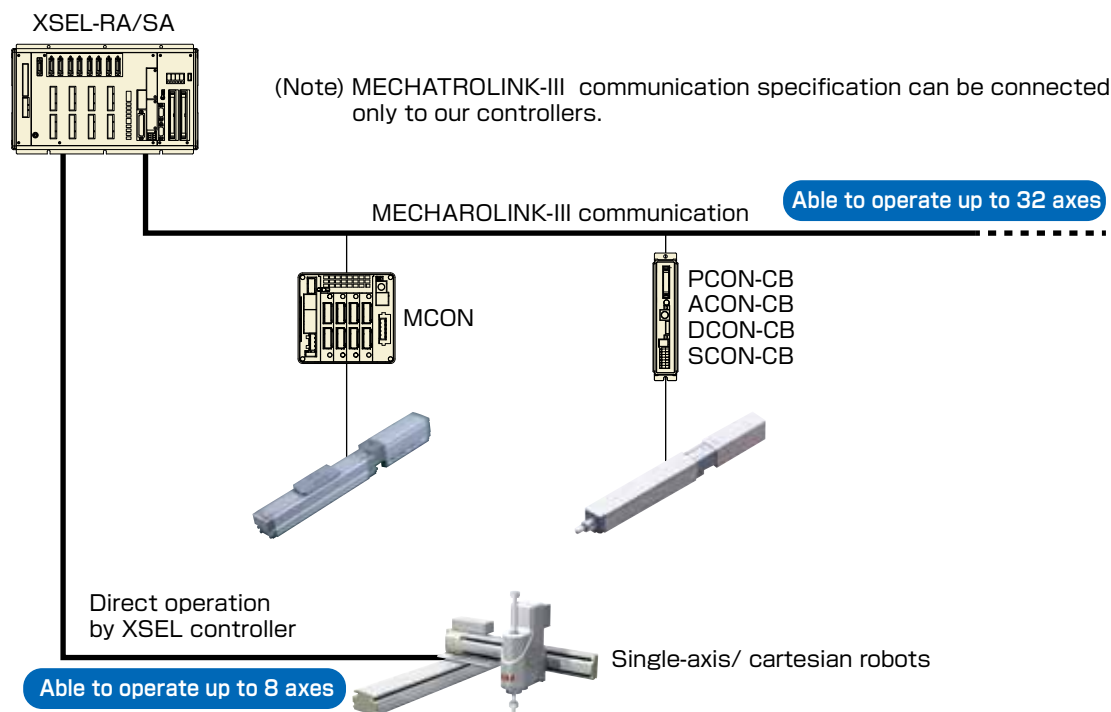
(*4) It corresponds to Ethernet (TCP/IP: message communication) only for standard Ethernet.

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

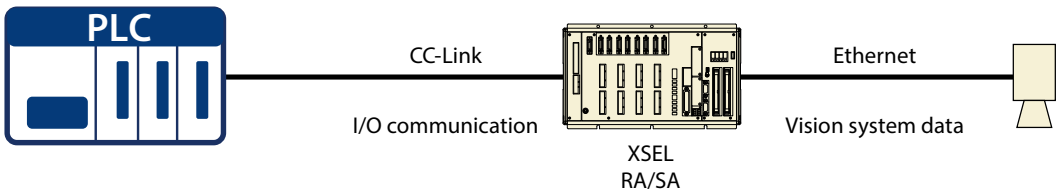
Coordinate values from the camera are stored as position data in the robot controller by dedicated instruction. Communication programs are not necessary.



(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 P1-323.

<SSCNET III/H>

- A homing operation is always necessary after switching the power supply on.
- When controlling rotary actuators, indexing operations are not possible.

Please make sure to read the "Caution on rotary selection" on P1-323.

R-unit

RCP6S

MCON
-CPCON
-CB/CFB

PCON

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

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Safety Category Compliant Types

<Compliance of controllers with the Safety category>

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

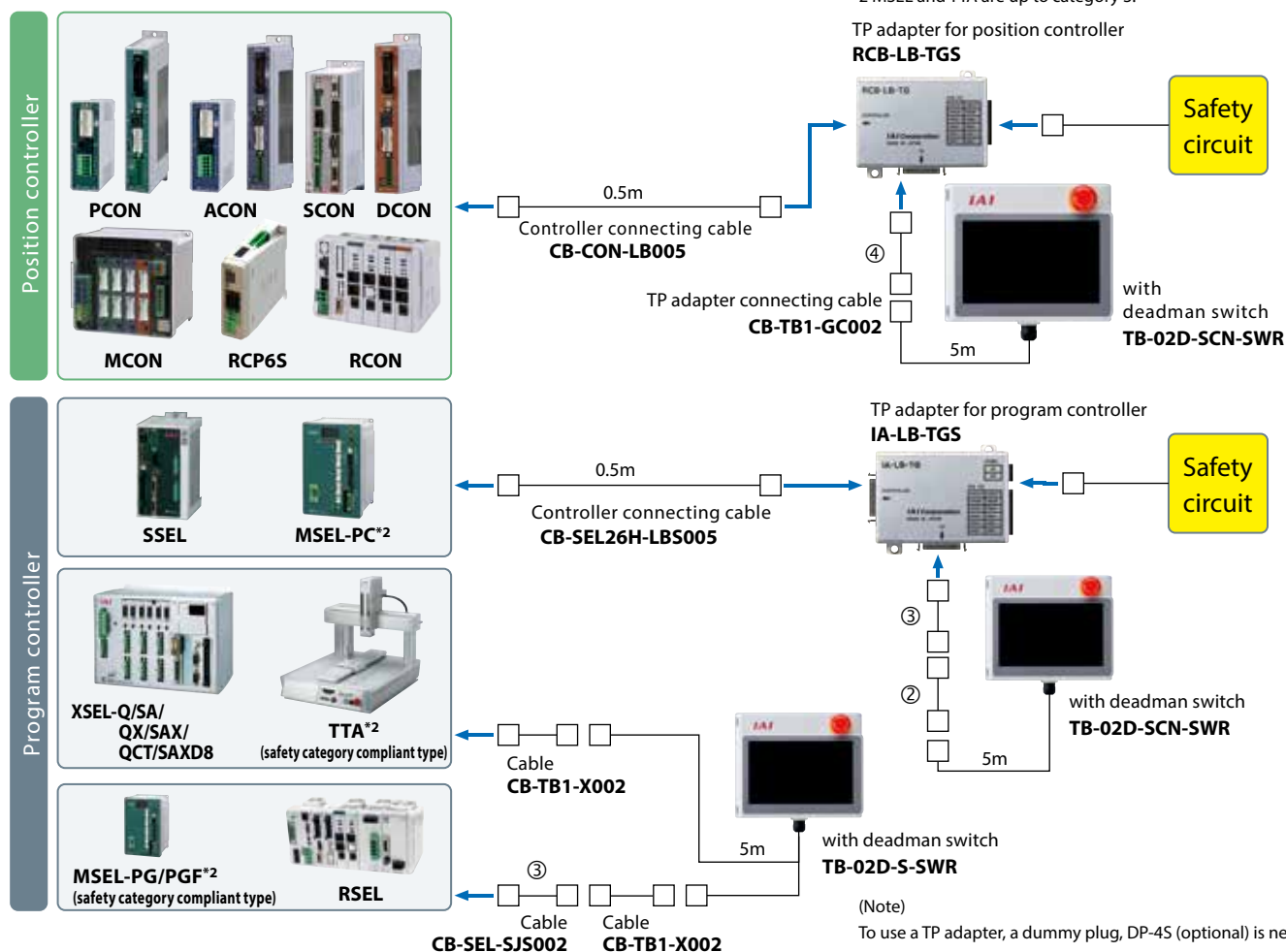
By changing the wiring of the system I/O connector, the safety category of up to B~4 (partially B~3) can be achieved.

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

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

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

*2 MSEL and TTA are up to category 3.



MEMO

Controller

R-unit

Unit-linkage type controller



(*1) Acquisitions depend on the model. See P7-64 to -66 for details.

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Positioner Type

RCON



R-unit



Program Type

RSEL



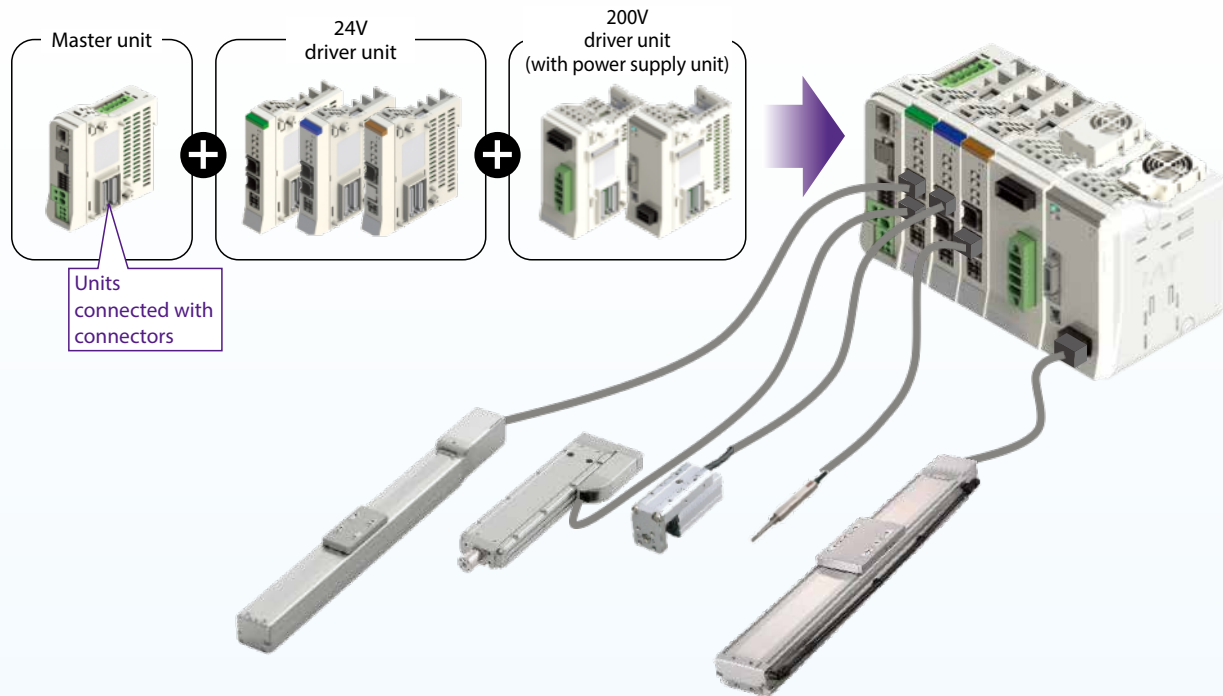
ELECYLINDER Drive Unit

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.

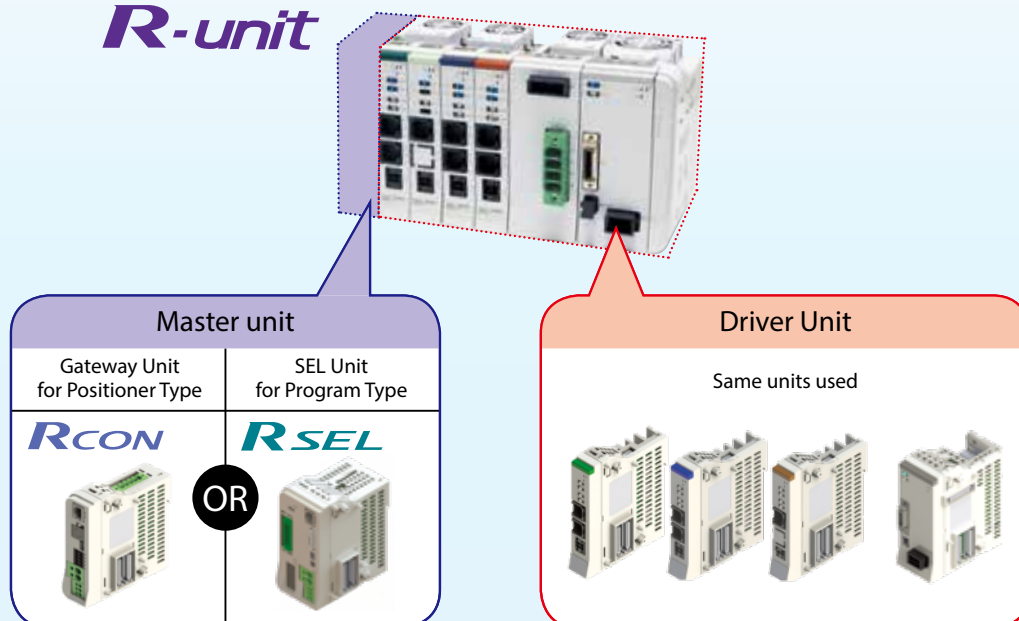
This allows for mixed control of an actuator with both a 24V motor and 200V motor.



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.

R-unit



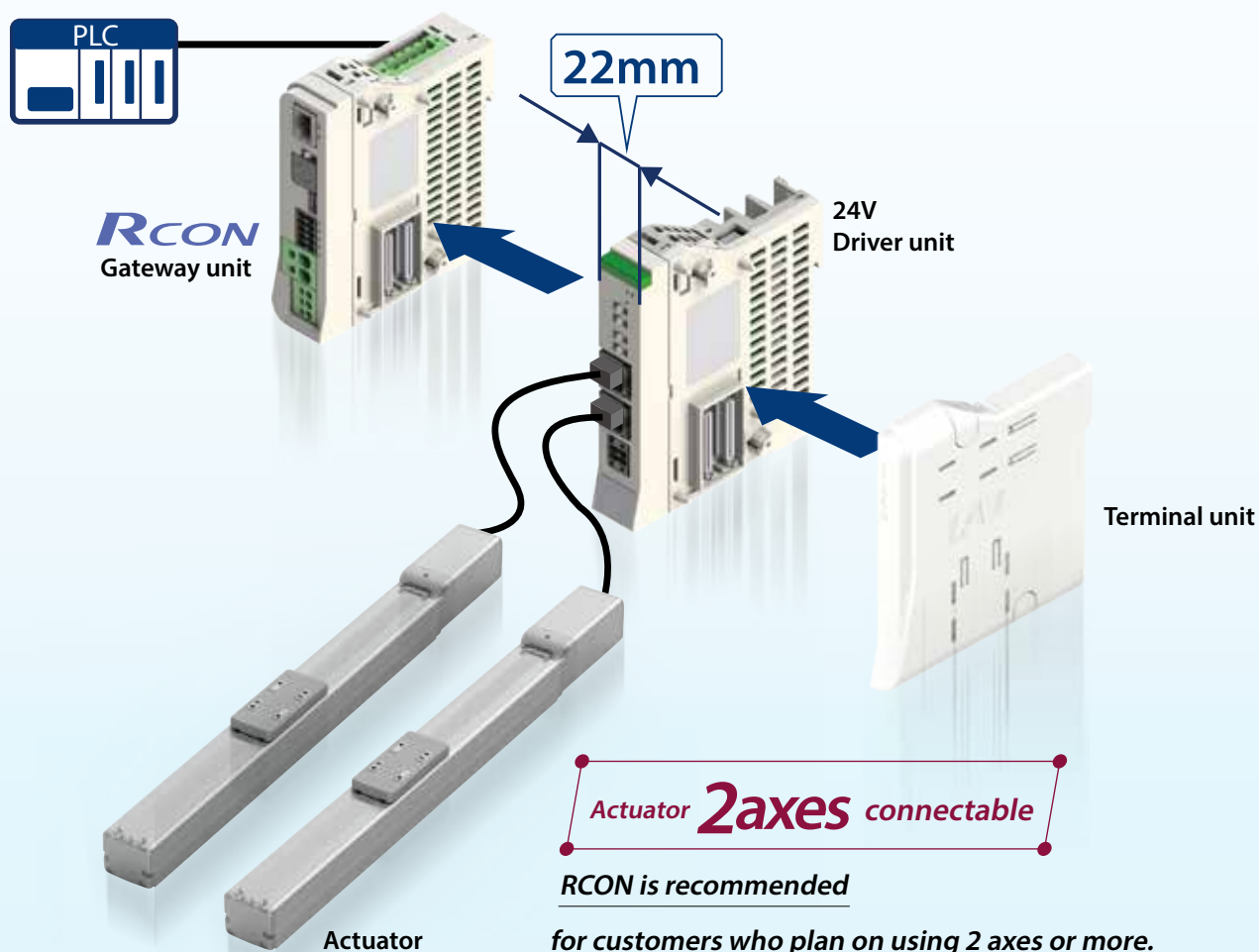
Saves space inside the control panel



RCON

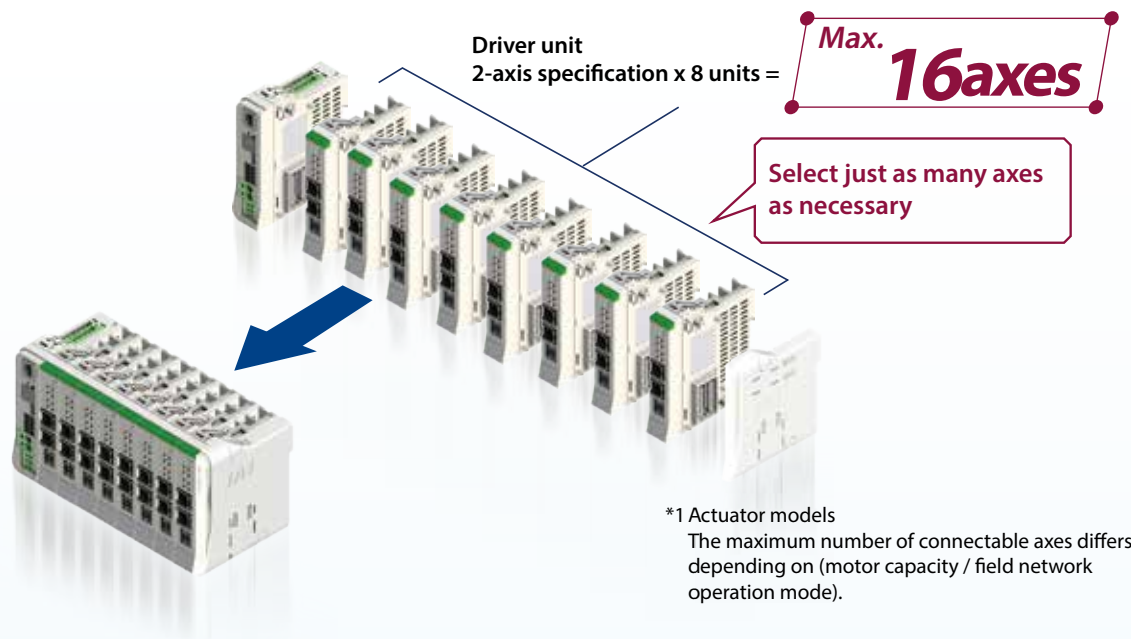
RCON is recommended for actuators with two axes or more.

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.



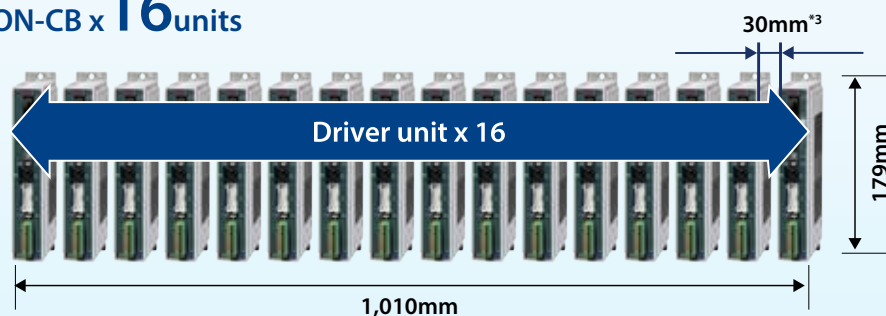
Saves up to 85%*² of control panel space and reduces costs by as much as 60%.

*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 16 units



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

PCON-CB
CC-Link specification x 16 units

60% cost reduction

RCON x 16-axis connection specification

85% Space saving



IAI

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.

Driver unit
2-axis specification
x 4 units =

Max. **8axes**

Select just as many
axes as necessary

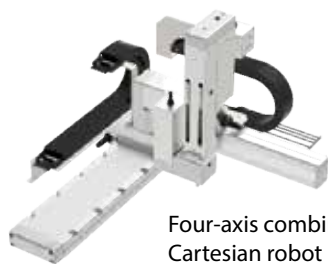
RSEL



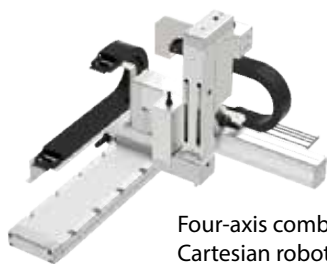
*1 The maximum number of connectable axes differs depending on the actuator model (motor capacity).

Group 1

Group 2



Four-axis combined
Cartesian robot



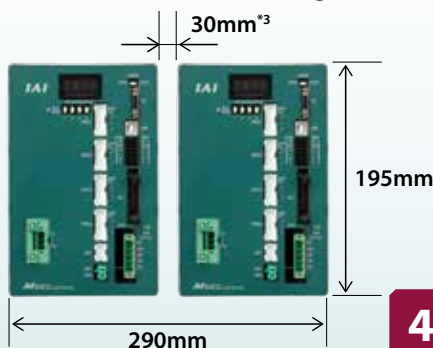
Four-axis combined
Cartesian robot

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 x2 units (8-axis connection)



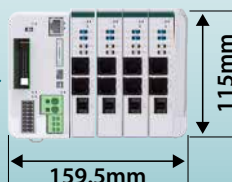
MSEL
CC-Link specification
8 axes (4 axes x 2 units)

44% cost reduction

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

RSEL x8-axis connection specification

67%
Space saving



RSEL
CC-Link specification
stepper motor 8 axes

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

High function 1 *Compatibility: No.1 in the industry with seven field network types supported*

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



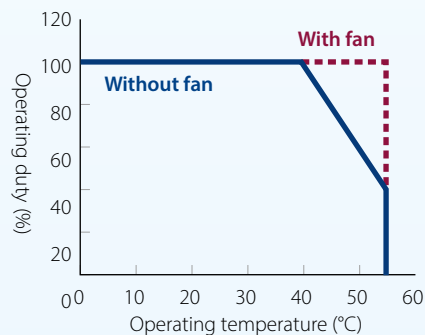
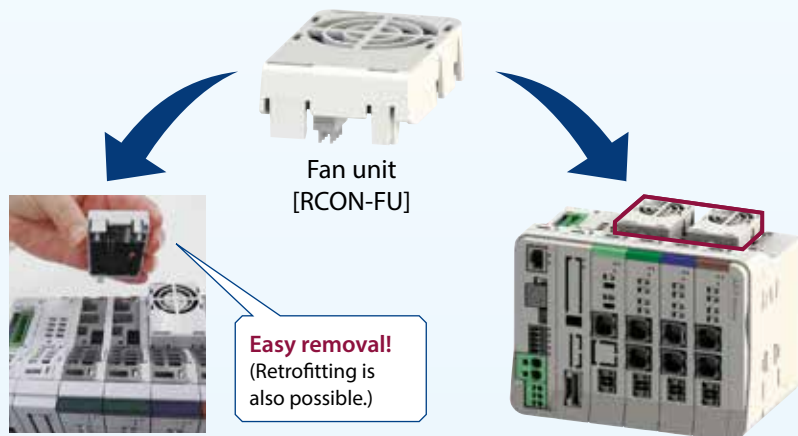
- * IAI controllers with field network option only support I/O messaging. Ex. EtherNet/IP option cannot be connected to a PLC for explicit messaging.
- * CC-link IE Basic is not supported.

High function 2 *Supports controller installation environment temperatures of 0 ~ 55°C*

Install the optional fan unit to enable use in environments of 0~55°C without lowering actuator operating duty. (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.

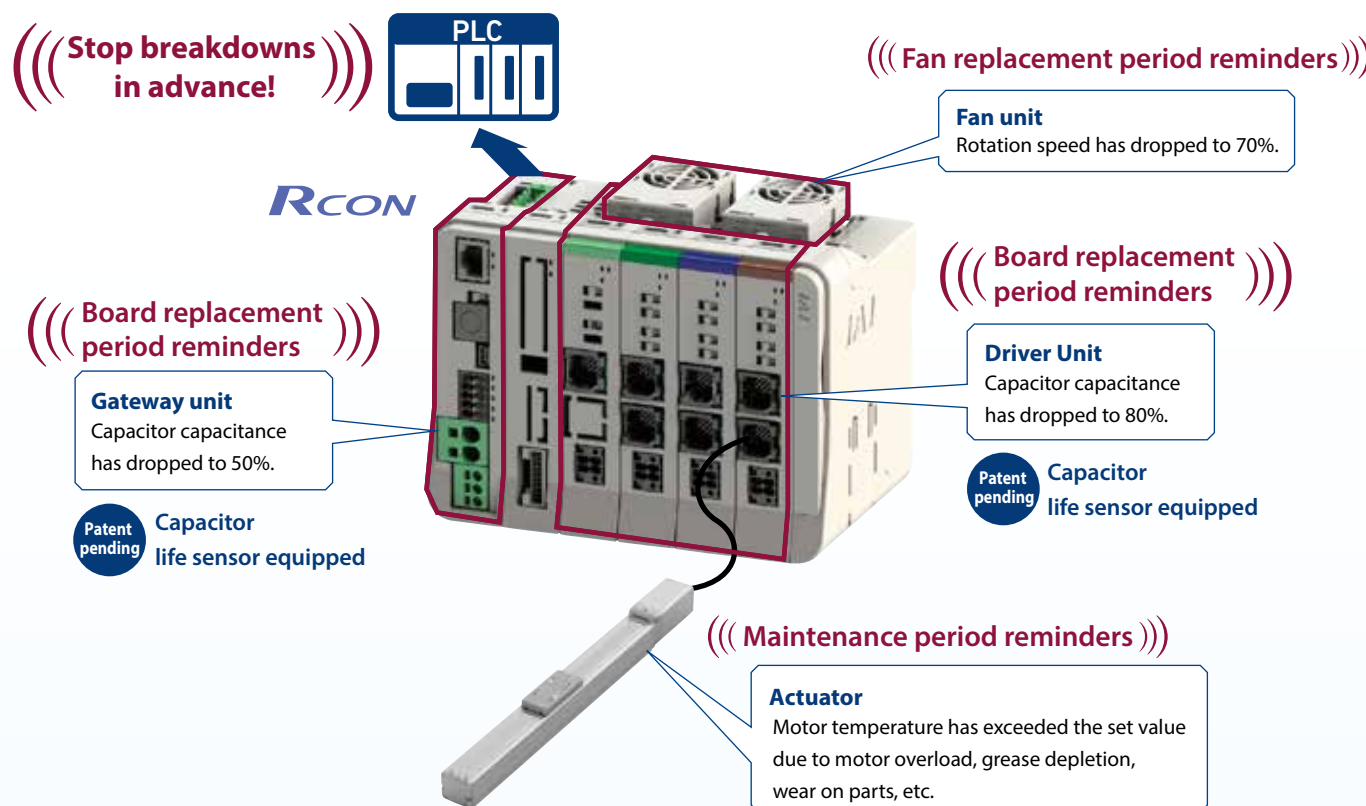
* Simple absolute units support 0~40°C.

REC supports 55°C without a fan.



High function3 Predictive maintenance/preventative maintenance function

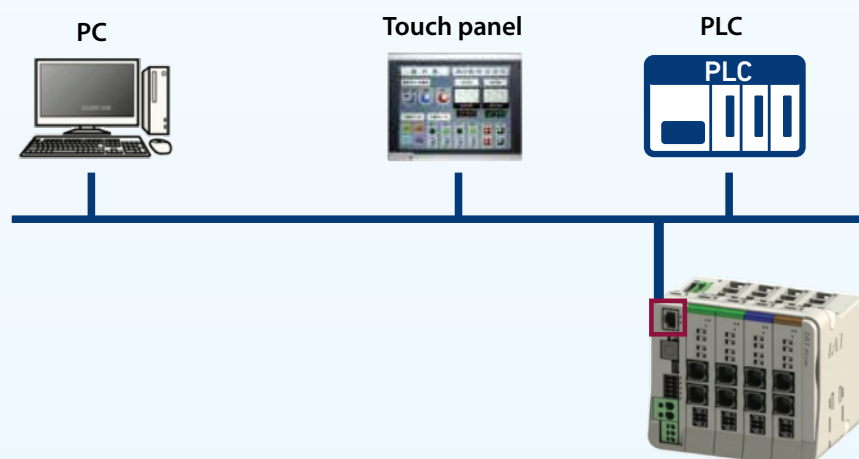
R-units have a preventative maintenance function for the capacitor and a predictive maintenance function for the fan unit and actuator.



High function4 Ethernet-equipped

Supports Ethernet connections. (Excluding REC.)

*Supported as option for RCON.



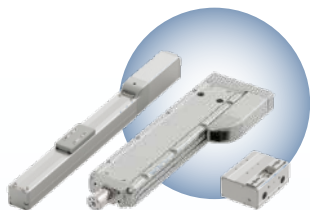
High function5 Highest number of connection actuators in the industry! Can be connected with 947 IAI actuators*

* See P. 42 for connectable actuators.
(As of February 2020.)

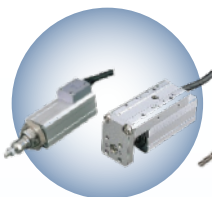
● Models with 24V motors

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

RCP Series



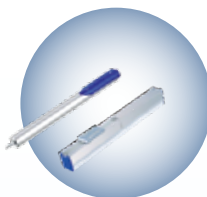
RCA Series



RCD Series



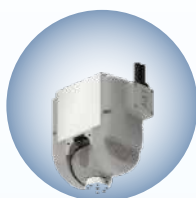
RCL Series



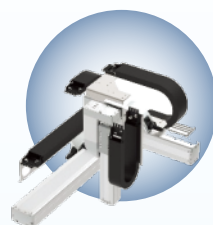
24V driver unit



WU Series



IK Series



EC Series



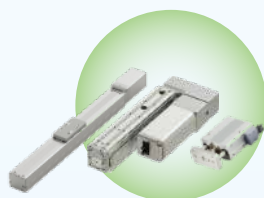
EC connection unit



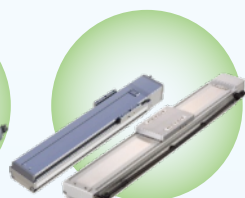
● Models with 200V motors

These products are capable of driving actuators equipped with 200V high capacity motors. They are compatible with all encoders.

RCS Series



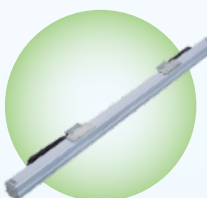
IS(D)B Series



SSPA Series



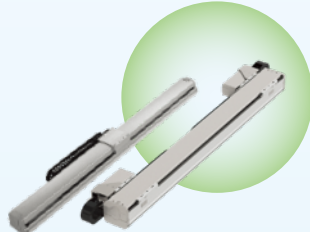
LSA Series



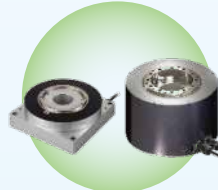
200V driver unit
+ power supply unit



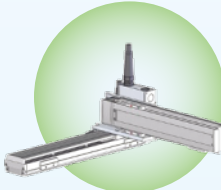
NS(A) Series



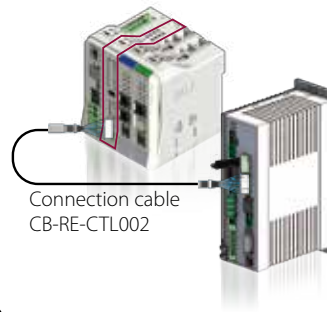
DD(A) Series



ICSB Series



Expansion unit
+ SCON connection



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.

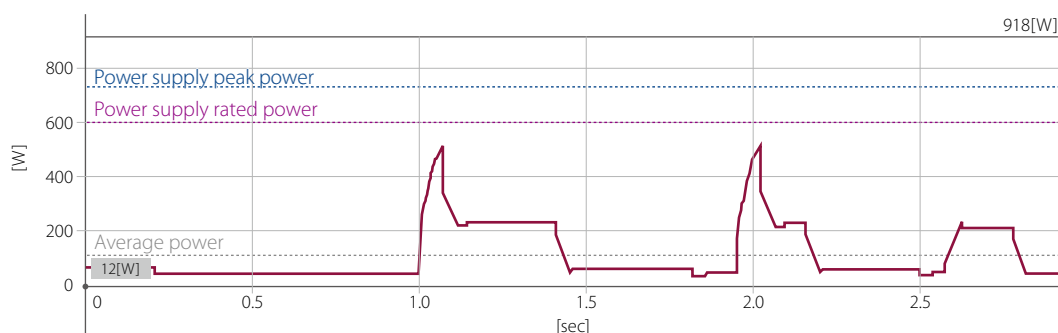


High function7 Helps visualize equipment with 24V power monitor

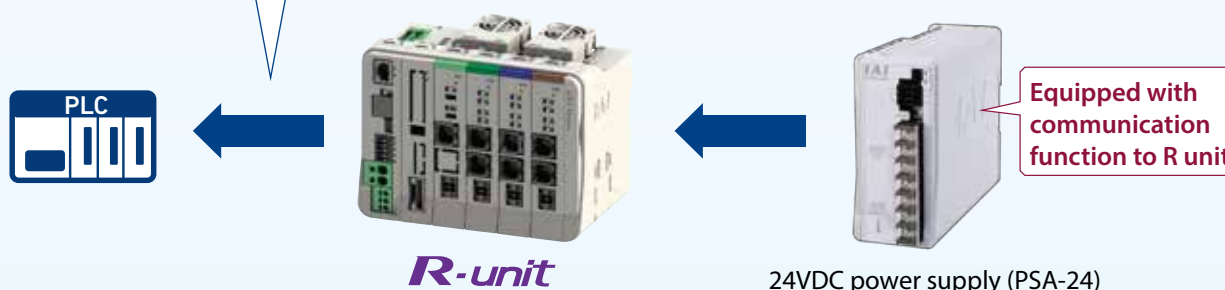
Helps visualize equipment.

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.

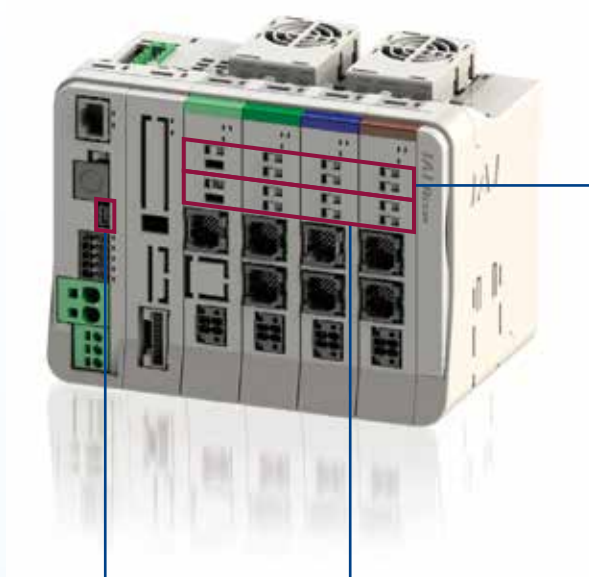


MEMO

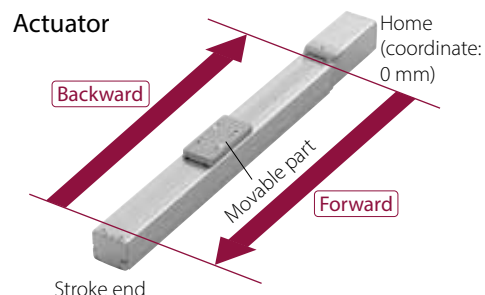
R-unit

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.



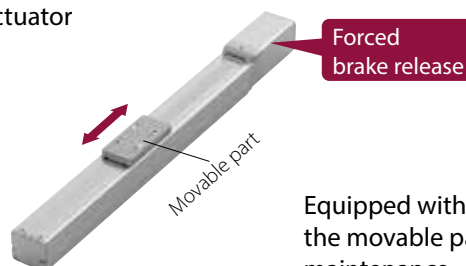
Each axis JOG (+/-) switch



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

Each axis brake release switch

Actuator



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).

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

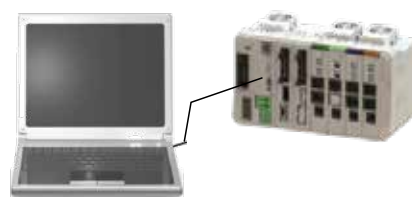
MEMO

Handwriting practice area with horizontal dotted lines.

RSEL

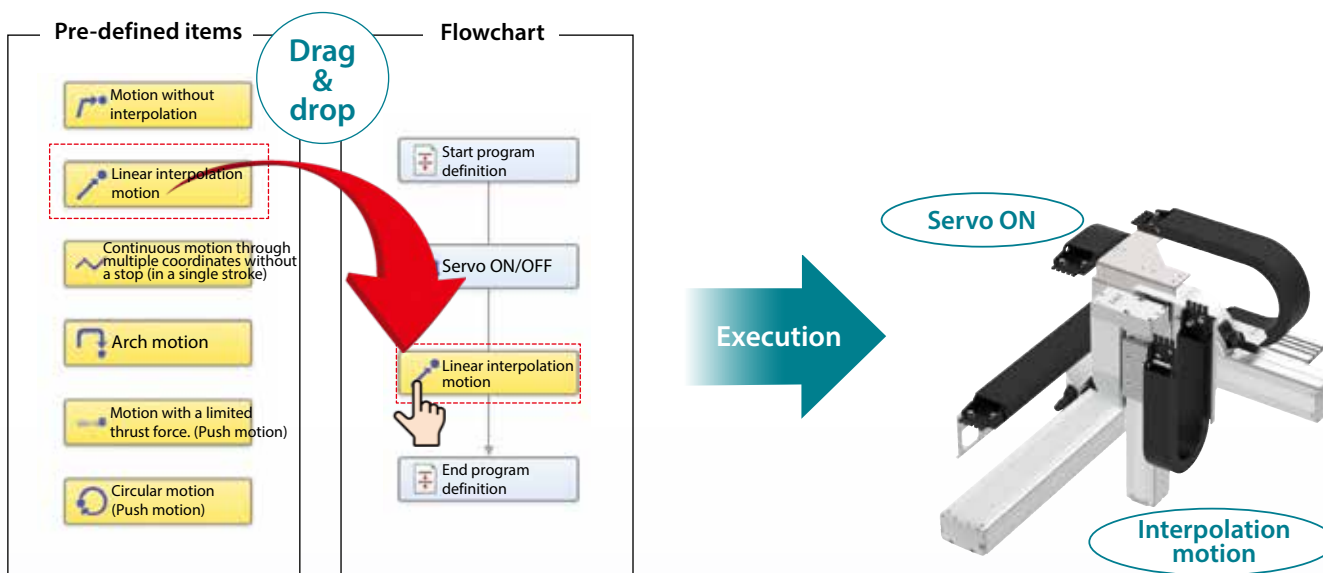
Easy programming even for beginners!

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



The "SEL Programming Support Tool" enables customers to program by placing pre-defined items for operations without knowing the SEL language.

The supported versions of the PC-dedicated teaching software for RSEL is 14.00.00.00 or later.



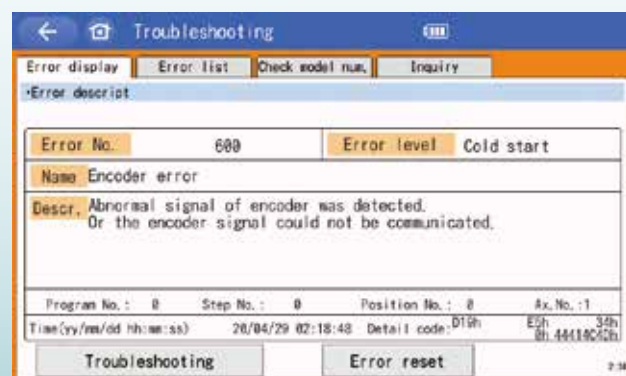
Troubleshooting using the teaching pendant

The program controller teaching pendant (TB-02/03) now offers troubleshooting functionality.

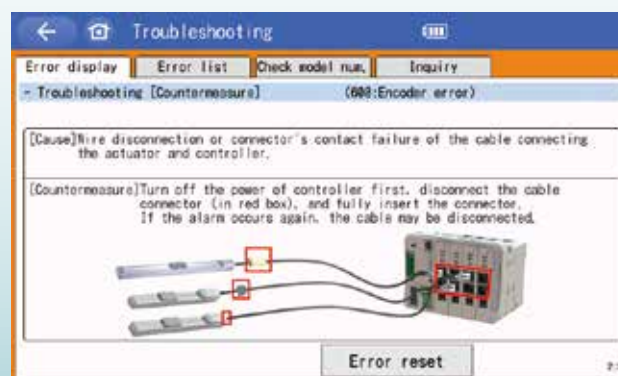
It suggests solutions to problems using a series of YES/NO questions. (Supported by Ver. 2.70 or later.)



<Error details>



<Solution>



Model Selection

Select from three types of R-units, 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. 7-38

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. 7-45

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. 7-53

RCON Selection Method

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

<Selection example>



Step 2 Gateway unit selection

Select the gateway unit model from the network type.

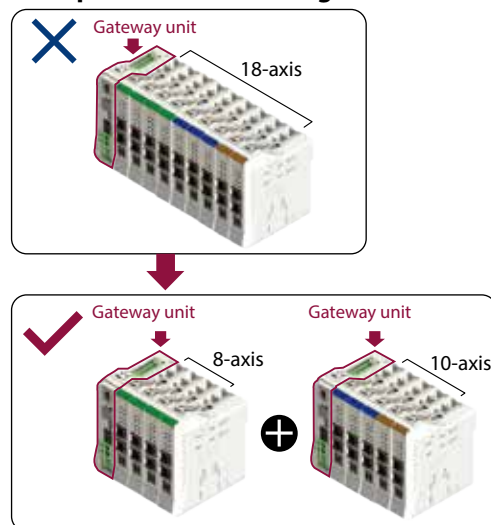
Network type	Gateway unit model
	RCON-GW/GWG-CC
	RCON-GW/GWG-CIE
	RCON-GW/GWG-DV
	RCON-GW/GWG-EC
	RCON-GW/GWG-EP
	RCON-GW/GWG-PR
	RCON-GW/GWG-PRT

<Selection example>

Selection 1

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



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












Step 3 Classify actuator types into three categories.

*See P. 66 for actuators that cannot be connected.

Actuator type	Selected actuator
Models with 24V motors	<p><Selection example></p> <p>RCD RCP2 RCA2 RCP6</p>
Models with 200V motors	<p><Selection example></p> <p>RCS4 ISB DDA</p>
ELECYLINDER (model with 24V motor)	<p><Selection example></p> <p>EC with ACR option</p>

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		2-axis specification	RCON-PC-2	 	1
			1-axis specification	RCON-PC-1		1
	High thrust motor 565P, 60P 86P		1-axis specification	RCON-PCF-1		1
RCA RCA2 RCL	2 5 10 20, 20S 30		2-axis specification	RCON-AC-2	 	1
			1-axis specification	RCON-AC-1	-	-
RCD	3D		2-axis specification	RCON-DC-2	-	-
			1-axis specification	RCON-DC-1		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).

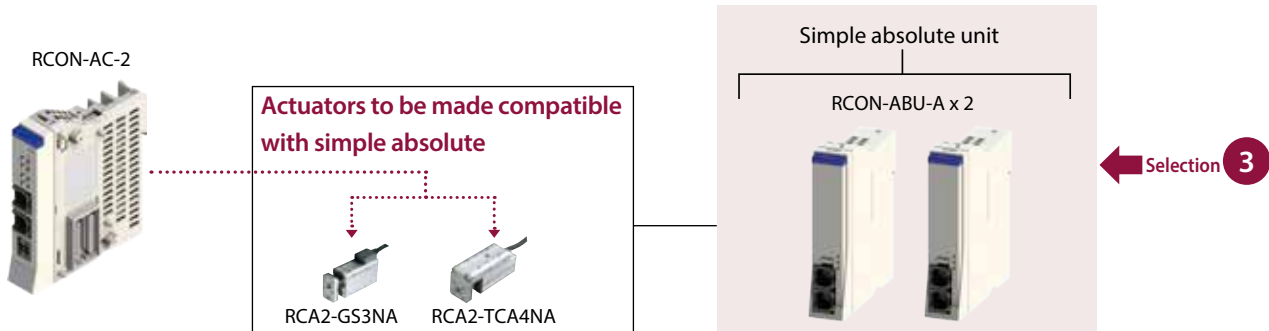
The cable is supplied with the simple absolute unit.

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





<Selection example>

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






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		1





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	 RC54-RA6C-WA-100  ISB-LXM-WA-200
Expansion unit	Specification other than above	 DDA-LT18CS-AM-200 <p>* This is because the absolute multi-rotation specification cannot be connected using a 200V driver unit.</p>



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
200V driver unit		1-axis specification	RCON-SC-1	 RC54  ISB	2



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

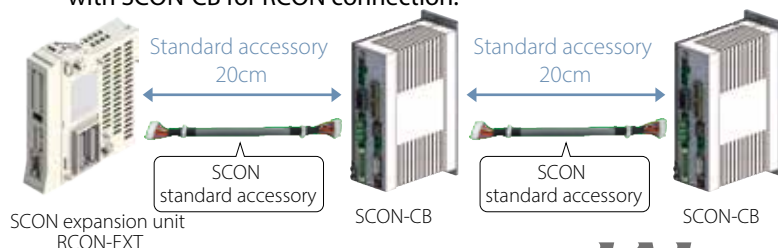
(2) Select a number of controllers (SCON-CB) to connect through the expansion unit according to the number of connected actuators.

*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

● 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. 77

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 connected to RCON is as follows.

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

How to check

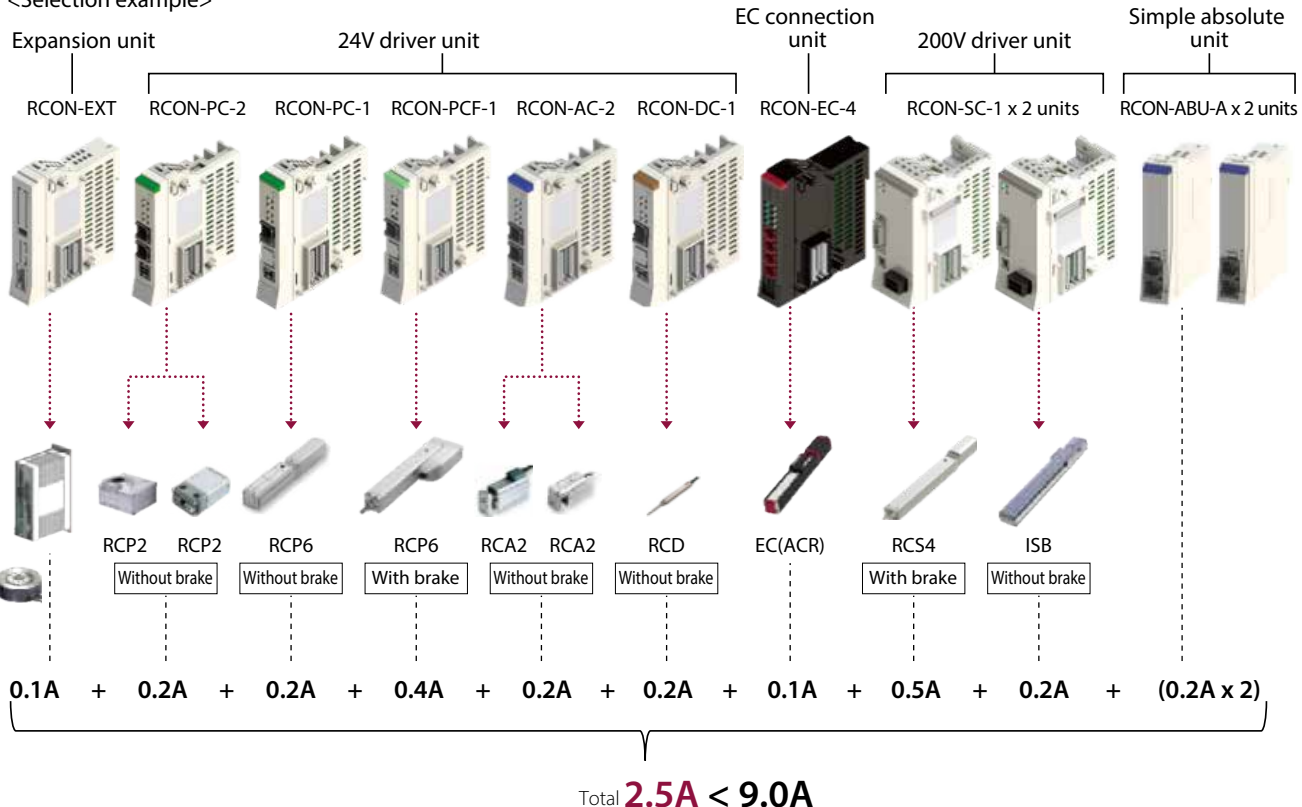
Add up while checking the "Control power capacity list" below.

Control power capacity list

Item	Unit		Power capacity	<Selection example>
Control power capacity (per unit)	Master unit (including terminal unit)	Gateway unit Without Ethernet	0.8A	
		Gateway unit 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 (including 200V power supply 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		0.1A	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 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	20P/20SP/28P	Without PowerCON	0.8A	-	-	x 2 axes
		RCP3	28P/35P/42P/56P		1.9A	-	-	
		RCP4	28P/35P/42P/42SP/56P	Without PowerCON	1.9A	-	-	x 1 axis
		RCP5		With PowerCON	2.3A	-	3.9A	
	Stepper motor /RCON-PCF	RCP2	56SP/60P/86P	Without PowerCON	5.7A	-	-	x 1 axis
		RCP4						
		RCP5						
		RCP6						
	AC servo motor /RCON-AC	RCA	5W	Standard / Hi-accel./decel.	1.0A	-	3.3A	x 1 axis
				Standard / Hi-accel./decel. / Energy-saving	1.3A	2.5A	4.4A	
					1.3A	2.5A	4.4A	x 1 axis
					1.7A	3.4A	5.1A	
		RCL	2W	Standard / Hi-accel./decel.	1.3A	2.2A	4.0A	x 1 axis
					0.8A	-	4.6A	
					1.0A	-	6.4A	
					1.3A	-	6.4A	
	DC brush-less motor /RCON-DC	RCD	3W	Standard	0.7A	-	1.5A	x 1 axis

* Applicable models: RCP2-RA3, RCP2-RGD3

● EC connection unit

Item	Actuator/EC connection unit				Rated current	Max. current		
		Series	Motor type	Type		When energy-saving is set		
Motor power capacity (per 1-axis actuator)	Stepper motor /RCON-EC	EC	35P/42P/56P	Other than the below	2.3A	2.2A	3.9A	x 1 axis
			28P	S3□/RR3□	-	2.2A	-	
				Mini	-	2.0A	-	

<Selection example>

24V driver unit EC connection unit

RCON-PC-2 RCON-PC-1 RCON-PCF-1 RCON-AC-2 RCON-DC-1 RCON-EC-4

Actuator								
Series	RCP2	RCP2	RCP6	RCP6	RCA2	RCA2	RCD	EC
Motor type	28P	20P	35P	60P	10W	20W	3W	42P

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

It is possible to calculate the control power and motor power capacity as in steps 10/11 (calculation when all axes are simultaneously used at maximum load).

Step 12 200V motor power limiting

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

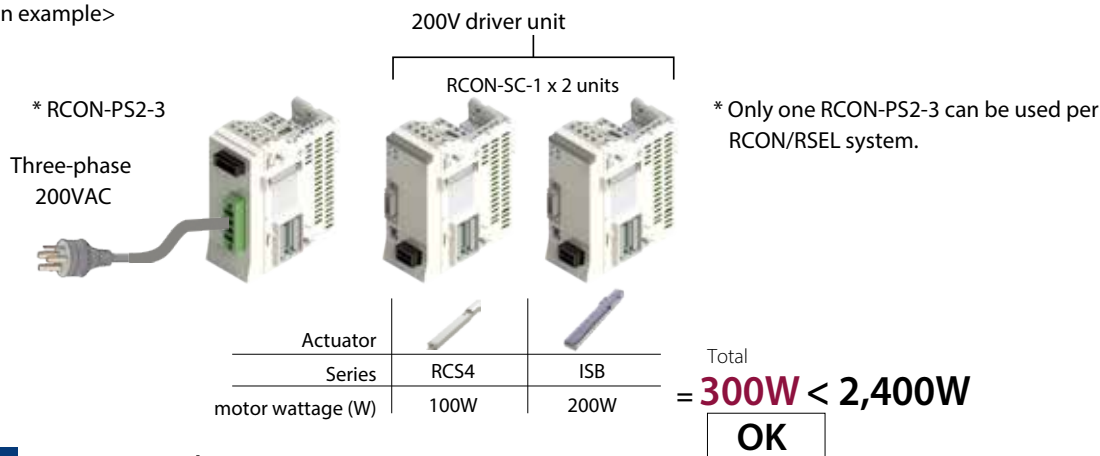
*Some limitations apply. See "Actuators that cannot connect to R-units" (P. 7-66) for details.

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>



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

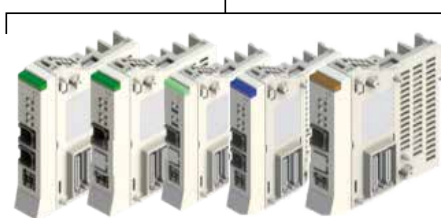
The number of fan units is the total number of driver units divided by 2.

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>

24V driver units (5 units + 1) ÷ 2 = 3 units



Fan unit [RCON-FU] x 3 units



Selection **8**

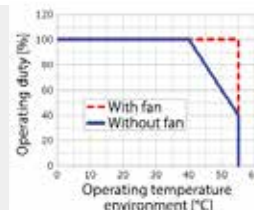
Note: The ambient operating temperature of the simple absolute unit is within the range of 0~40°C even when a fan unit is installed.

*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

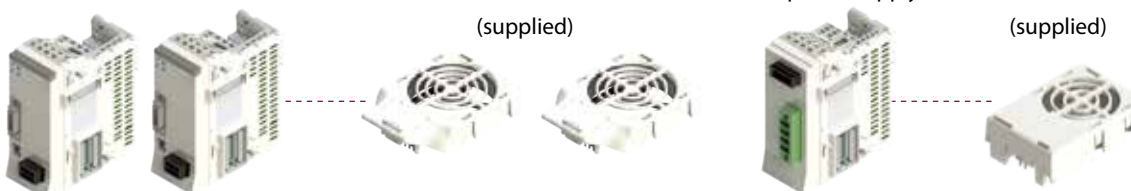
A single fan unit is always included with each installation unit. (There is no need to specify the model.)

<Selection example>

200V driver units x 2 units

RCON-FUH x 2 units
(supplied)

200V power supply unit RCON-FU x 1 unit
(supplied)

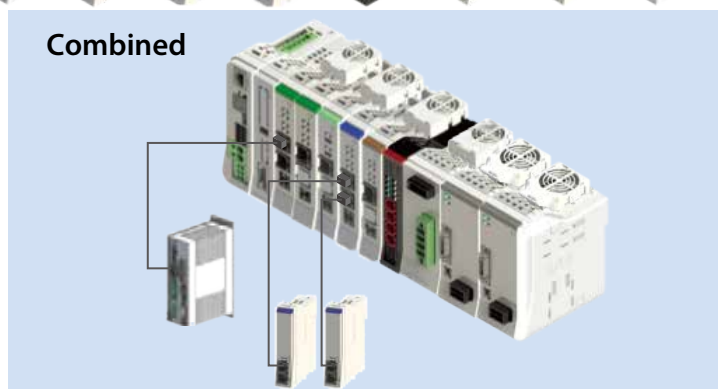
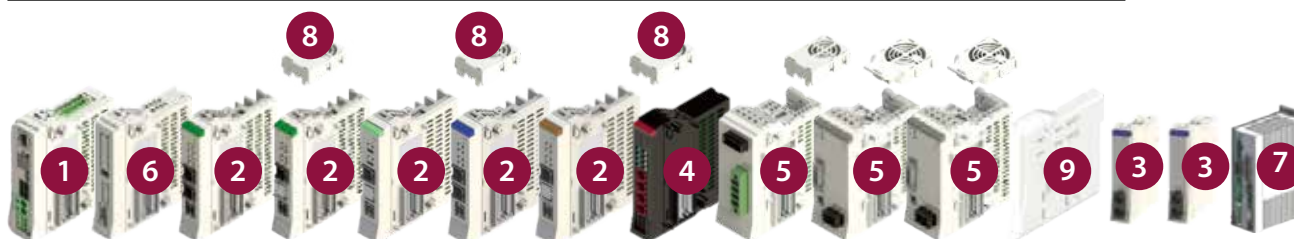


Select the terminal unit to connect based on the unit connected to the left of the terminal unit.
(Units are designed to prevent incorrect connections. Confirm the model first before installing a unit.)

← Selection 9

<Selection example>

Number	Count
1	8
6	1
2	2
2	2
2	2
2	2
3	1
4	1
5	2
5	1
7	1



RSEL Selection Method

Controller

Step 1 Select the actuator to connect. (Up to 8 axes.)

<Selection example>



RCS2 Series



RCA2 Series



RCP6 Series



WU Series



RCS4 Series



IS(P)B Series

Step 2 SEL unit selection

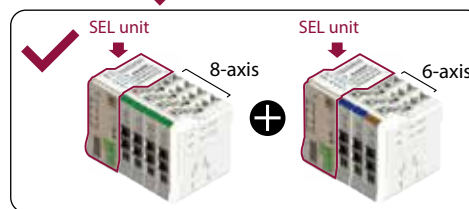
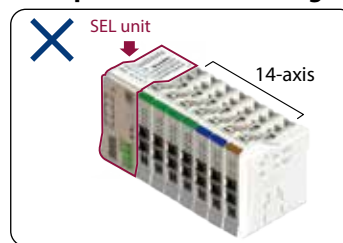
Select the SEL unit model from the following I/O types.

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

Caution

Only one SEL unit can be connected per system. Split this among two or more units to connect 9 or more axes or if the power capacity is exceeded.

Example: When connecting 14 axes



Selection 1




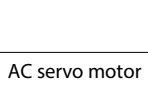



Step 3 Classify actuator types into two categories.

*See P. 7-66 for actuators that cannot be connected (TTA/SCARA/Servo press/EC/etc).

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
			1-axis specification	RCON-PC-1	RCP6-RTFML 	1
	High thrust motor 565P, 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
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.

<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

RCON-ABU-A

RCON-ABU-P

Simple absolute battery




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	Specification other than above	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
200V driver unit		1-axis specification	RCON-SC-1		3

Selection 4

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		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.)

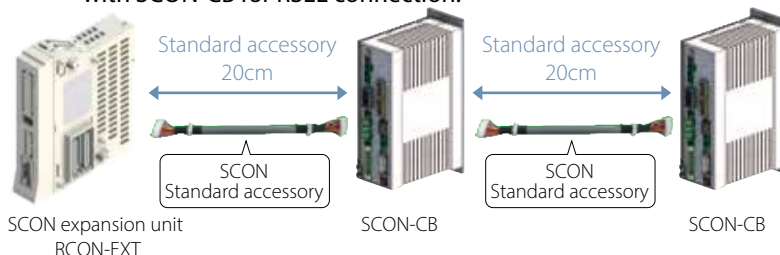
Controller	External view	Number of axes connected to actuator	I/O type	<Selection example>	
				Classification	Required units
SCON-CB/CGB		1-axis specification	SCON-**-RC-*		1

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.

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



Model: CB-RE-CTL□□□
See P. 7-101

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.

$$24 \text{ input points} \div 16 = 1.5$$

2 units



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

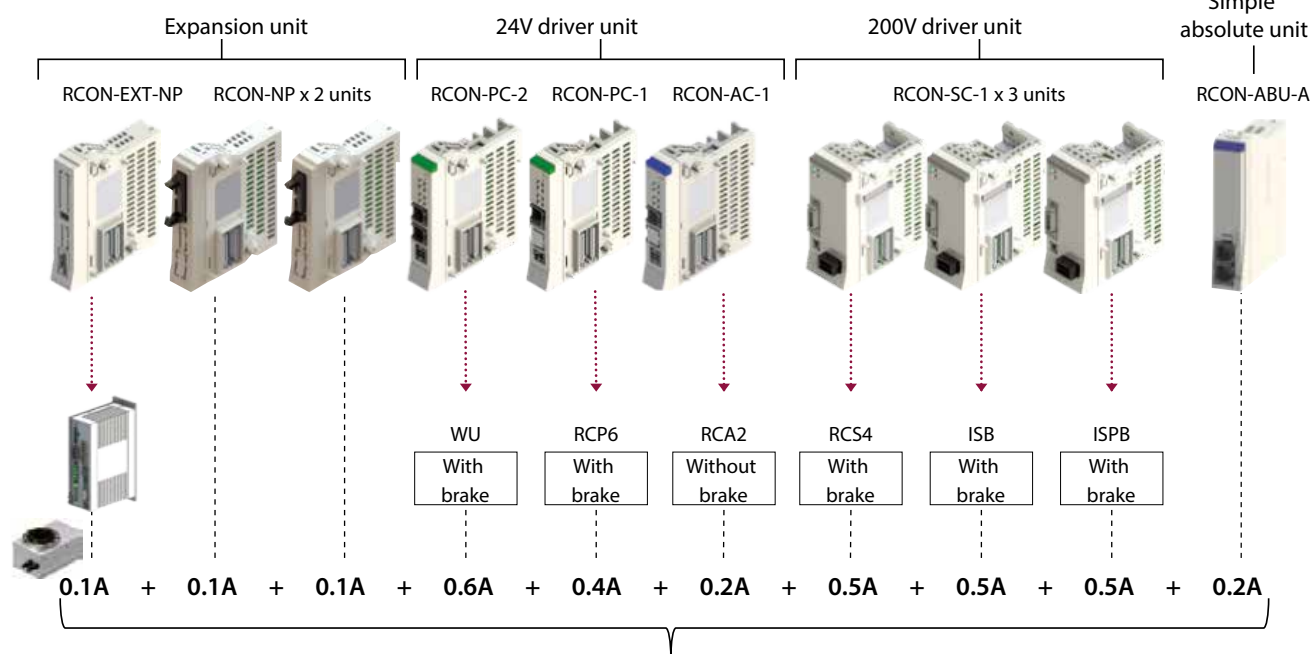
Add up while checking the "Control power capacity list" below.

Control power capacity list

Item	Unit	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
		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 all types)		0.1A
	Simple absolute unit (common to all types)		0.2A

*Power capacity of master unit not included in calculation.

<Selection example>



Total **3.2A** < 9.0A

OK

(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.

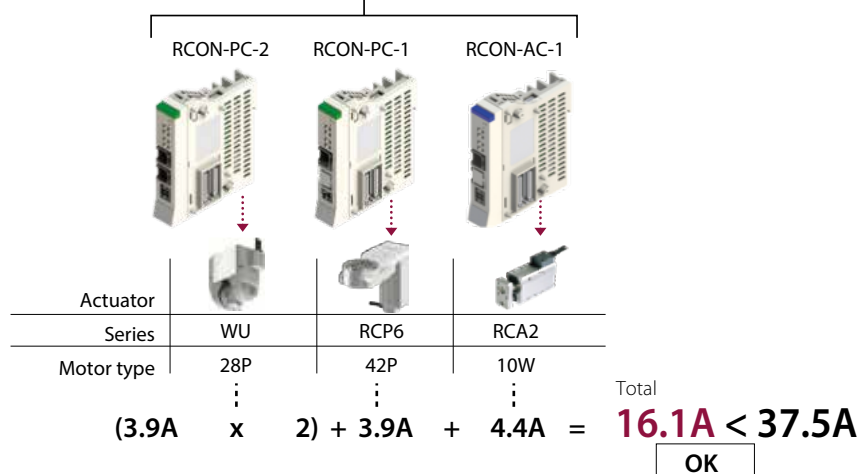
● 24V driver unit

Item	Actuator/driver unit				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	20P/20SP/28P		0.8A	-	-	x 3 axes		
		RCP3	28P* /35P/42P/56P		1.9A	-	-			
		RCP4	28P/35P/42P/ 42SP/56P	Without PowerCON	1.9A	-	-			
		RCP5		With PowerCON	2.3A	-	3.9A			
		RCP6								
		WU								
	Stepper motor /RCON-PCF	RCP2	56SP/60P/86P	Without PowerCON	5.7A	-	-			
		RCP4								
		RCP5								
		RCP6								
	AC servo motor /RCON-AC	RCA RCA2		5W	Standard / Hi-accel./decel.	1.0A	-	3.3A	x 1 axis	
				10W		1.3A	2.5A	4.4A		
				20W	Standard / High accel/decel / Energy saving	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>

24V driver unit



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

It is possible to calculate the control power and motor power capacity as in steps 9/10 (calculation when all axes are simultaneously used at maximum load).

Step 11 200V motor power limiting

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

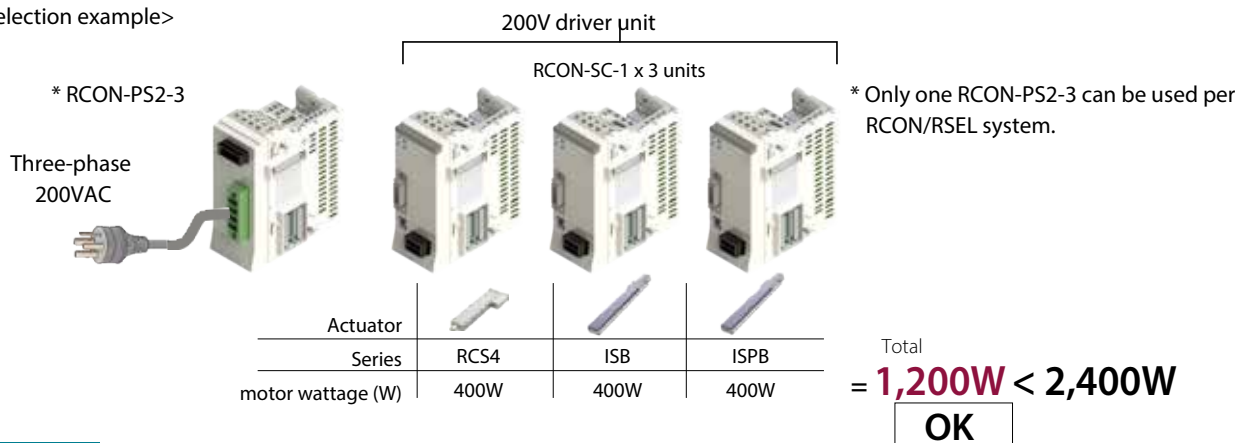
*Some limitations apply. See "Actuators that cannot connect to R-units" (P. 42) for details.

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>



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

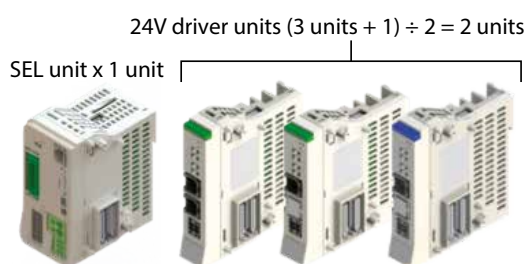
A single fan unit can be installed to a SEL unit.

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>



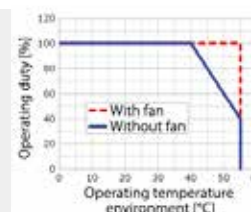
Fan unit [RCON-FU] x 3 units



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 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>



IAI

RSEL Selection Method R-unit 7-50

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).
Other than RCON-SC	RCON-GW-TR	Supplied with SEL unit.

Selection 9

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)
RCON-EXT-NP	PIO/SIO/SCON expansion unit
RCON-NP x 2 units	PIO unit
RCON-PC-2	24V driver unit (RCP Series connection, 2-axis specification)
RCON-PC-1	24V driver unit (RCP Series connection, 1-axis specification)
RCON-AC-1	24V driver unit (RCA Series connection, 1-axis specification)
RCON-ABU-A	Simple absolute unit (for RCA Series connection)
RCON-PS2-3	200V power supply unit
RCON-SC-1 x 3 units	200V driver unit
SCON-***-RC	RCON connection specification SCON controller *Select the model to order based on the actuator to connect.

1 8

5

7

2

2

2

3

4

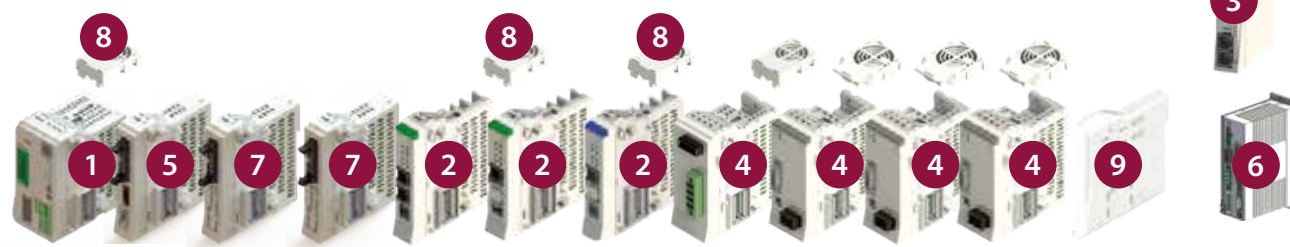
4

6

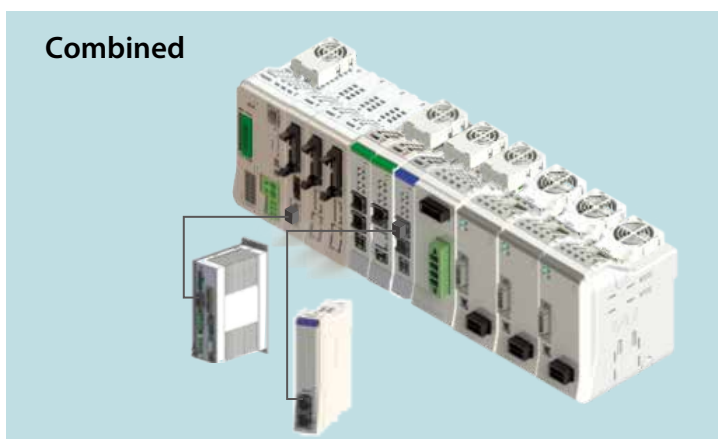
9

3

6



Combined



MEMO

Controller

R-unit

REC Selection Method

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

<Selection example>



* only EC with ACR option can be connected to RCON-EC unit.

Step 2 EC gateway unit selection

Select the EC gateway unit model from the network type.

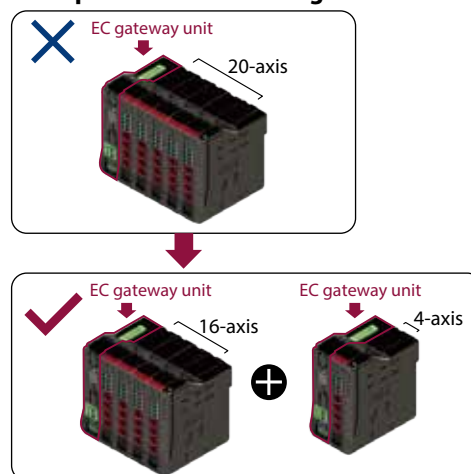
Network type	Gateway unit model
	REC-GW-CC
	REC-GW-CIE
	REC-GW-DV
	REC-GW-EC
	REC-GW-EP
	REC-GW-PR
	REC-GW-PRT

<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	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		2

Selection 2

Step 4 Calculation of EC connection unit motor power capacities (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

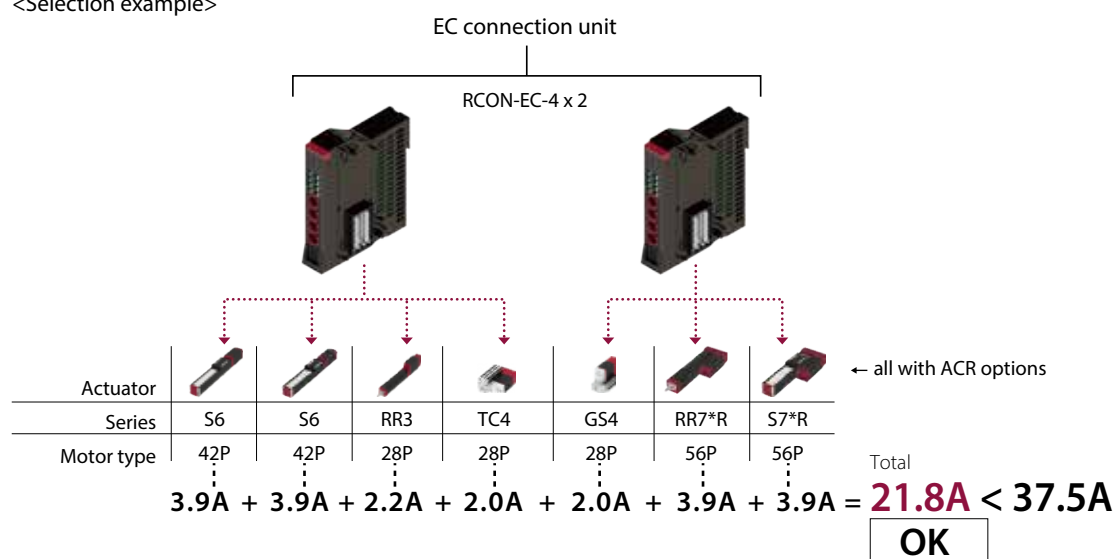
How to check

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/EC connection unit				Rated current	Max. current		<Selection example>
		Series	Motor type	Type		When energy-saving is set		
Motor power capacity (per 1-axis actuator)	Stepper motor/ RCON-EC	EC (ACR)	35P/42P/56P	Other than the below	2.3A	2.2A	3.9A	x 4 axes
			28P	S3□/RR3□	-	2.2A	-	x 1 axis
				Mini	-	2.0A	-	x 2 axes

<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.)

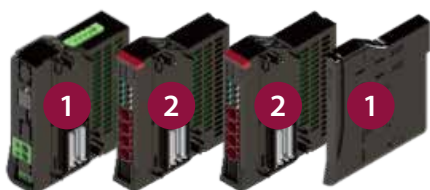
It is possible to calculate the motor power capacity as in step 4 (calculation when all axes are simultaneously used at maximum load).

Step 5 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

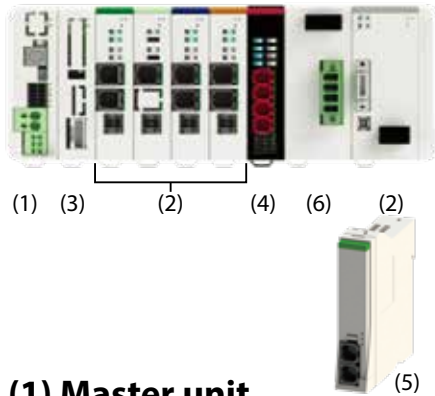


Combined

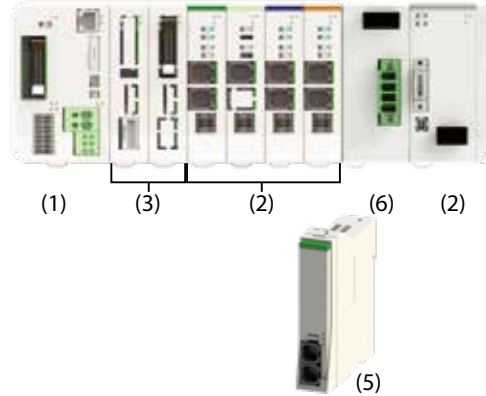


Model Specification Items

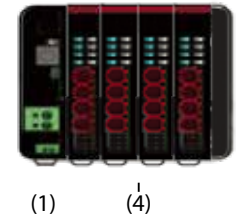
RCON



RSEL



REC



(1) Master unit

RCON – – –

Series Type I/O type Options

GW	Standard type
GWG	Safety category spec 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

ET	Ethernet-equipped
FU <input type="checkbox"/>	Fan unit mounting (<input type="checkbox"/> : 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, connect the terminal unit supplied with the 200V power supply unit.

RSEL – **G** – – –

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

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

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)".

FU <input type="checkbox"/>	Fan unit mounting (<input type="checkbox"/> : 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, connect the terminal unit supplied with the 200V power supply unit.

REC – **GW** – –

Series Type I/O type Options

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

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

24V specification

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

Type: AC 2-30W motor 1 axis 2 axes	2 5 10 20 20S 30	2W servo motor 5W servo motor 10W servo motor 20W servo motor 20W servo motor (For RCA2-SA4/RCA-RA3) 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	60 100 100S 150 200 200S 300S 400 600 750	60W servo motor 100W servo motor 100W servo motor (for LSA) 150W servo motor 200W servo motor 200W servo motor (for LSA, DD) 300W servo motor (for LSA) 400W servo motor 600W servo motor 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








Contact IAI for model selection items








IAI

Unit Lineup

(1) Master unit

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

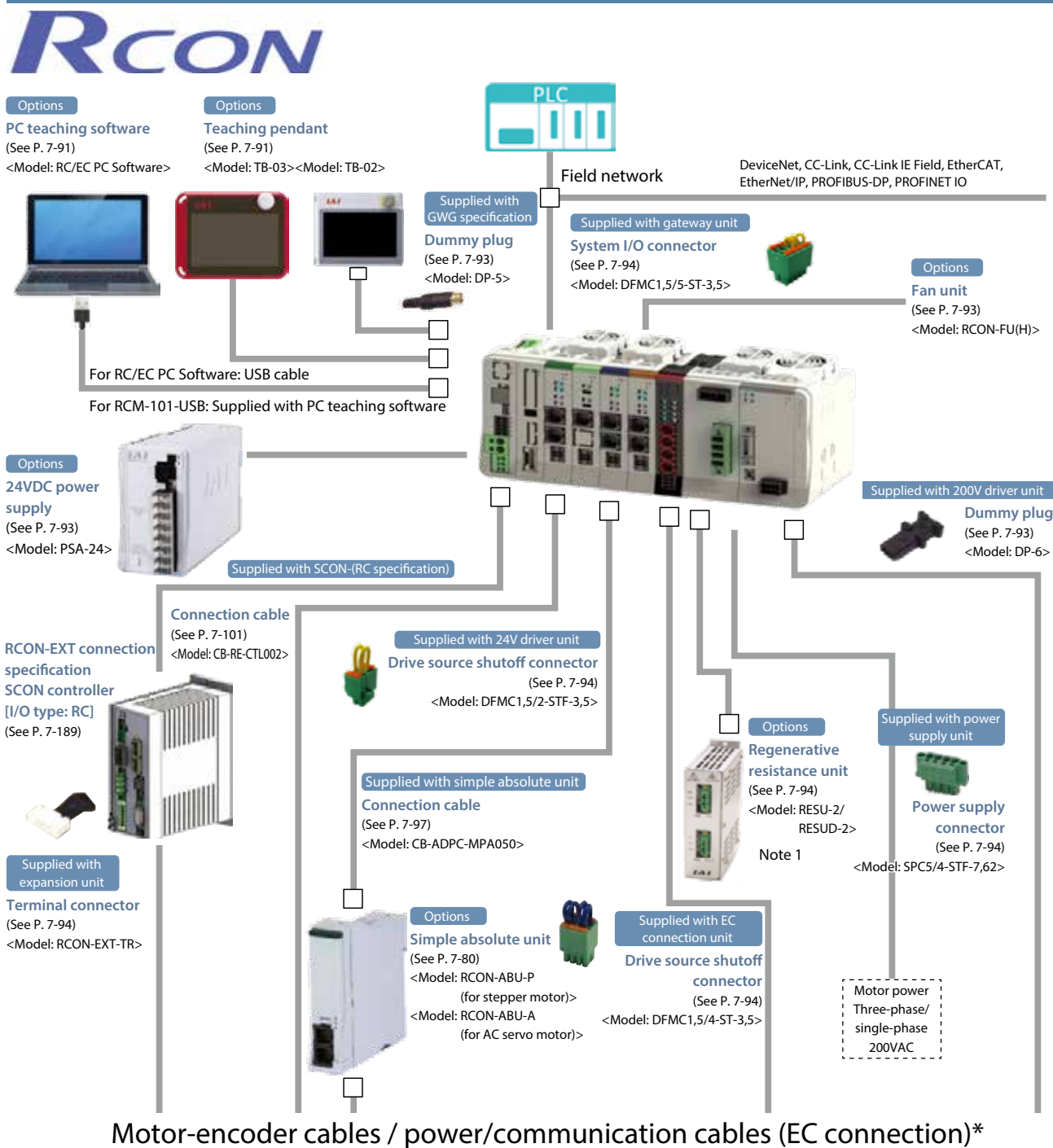
(6) 200V power supply unit

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

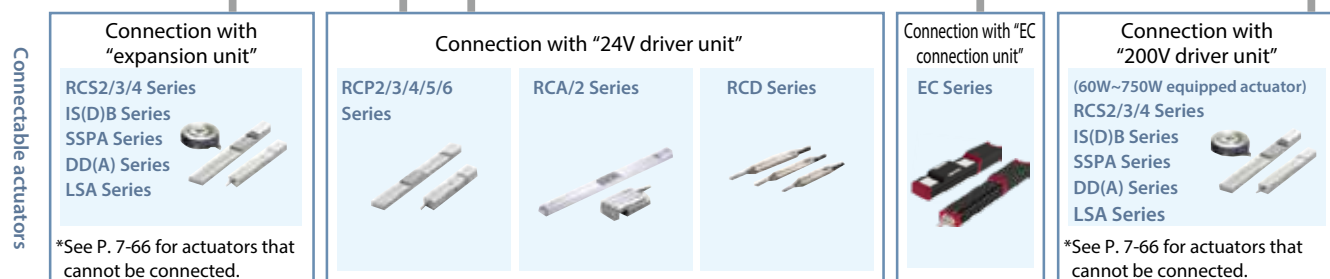
(7) SCON controller (RCON-EXT connection specification)

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	○	○

System Configuration



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



*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.
See P. 7-95 for information on ordering single cables.

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".

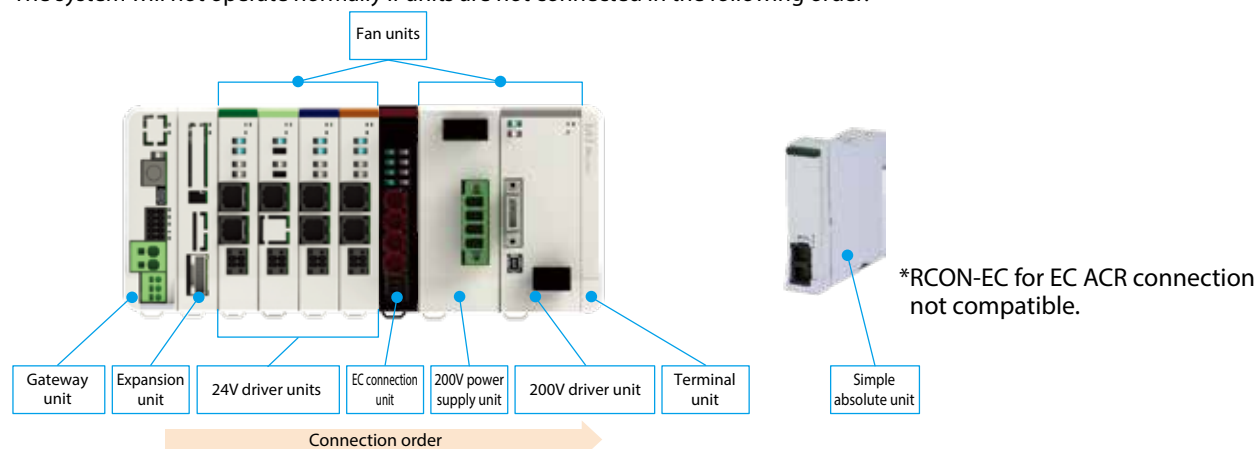
Unit Configuration

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.



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)

*. Ensure that there are 16 or less total axes to connect.

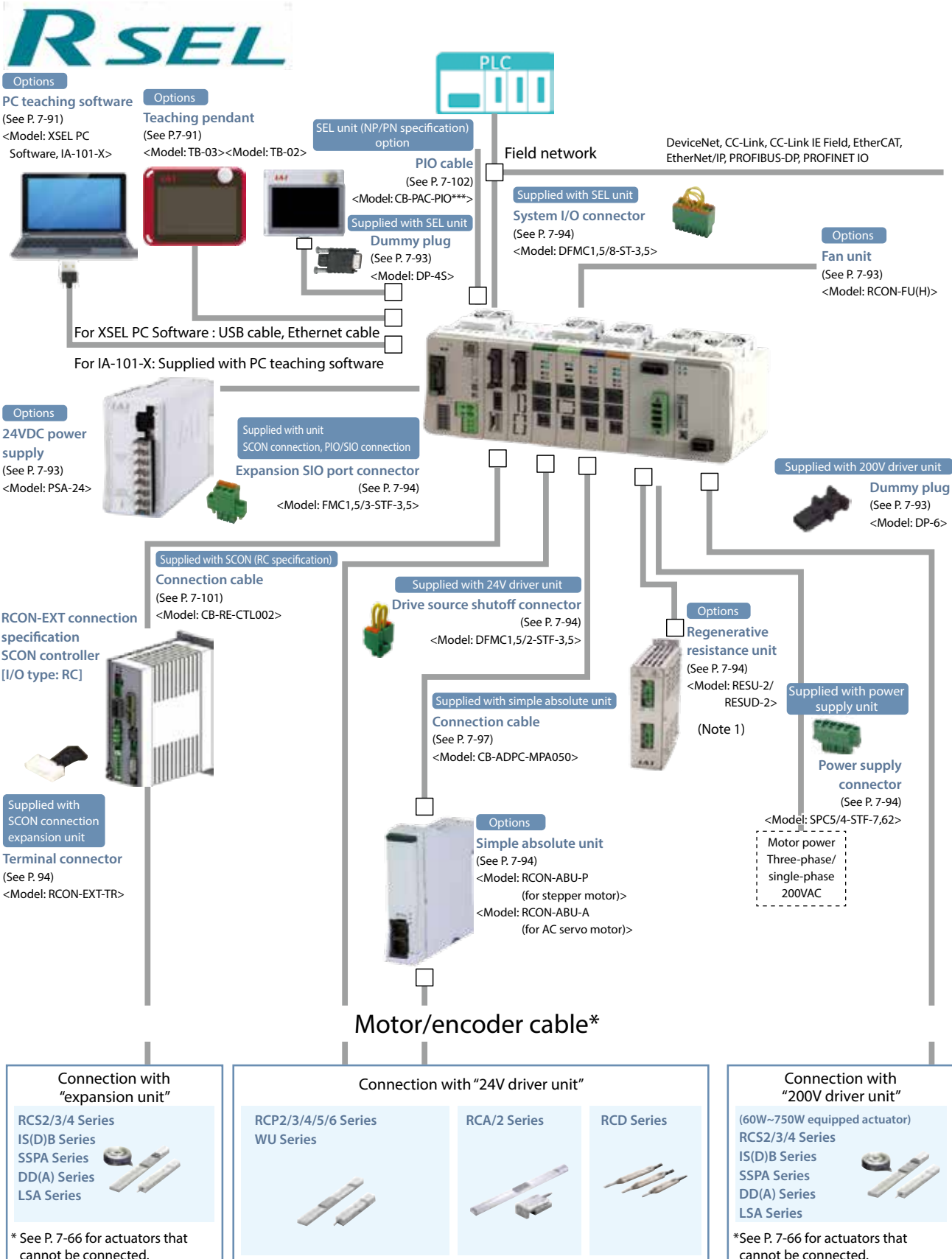
· The maximum number of connectable axes varies depending on the operation mode.

See "Maximum number of connectable axes (P. 7-83)".

■ Unit name and single product model number list

Product name		Model	Reference page
Master unit/gateway unit	CC-Link connection specification	RCON-GW/GWG-CC	P7-69
	CC-Link IE Field connection specification	RCON-GW/GWG-CIE	P7-70
	DeviceNet connection specification	RCON-GW/GWG-DV	P7-71
	EtherCAT connection specification	RCON-GW/GWG-EC	P7-72
	EtherNet/IP connection specification	RCON-GW/GWG-EP	P7-73
	PROFIBUS-DP connection specification	RCON-GW/GWG-PR	P7-74
	PROFINET IO connection specification	RCON-GW/GWG-PRT	P7-75
Expansion unit	SCON expansion	RCON-EXT	P7-79
24V driver unit	Stepper motor 1-axis specification	RCON-PC-1	P7-77
	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	P7-80
200V power supply unit	200VAC input power supply	RCON-PS2-3	P7-78
200V driver unit	AC200V motor 1-axis specification	RCON-SC-1	P7-78
Terminal unit	For 24V	RCON-GW-TR	P7-81
	For 200V	RCON-GW-TRS	
Simple absolute unit	For RCON-PC	RCON-ABU-P	P7-80
	For RCON-AC	RCON-ABU-A	
Fan unit	Other than the below	RCON-FU	P7-93
	For 200V driver	RCON-FUH	

System Configuration

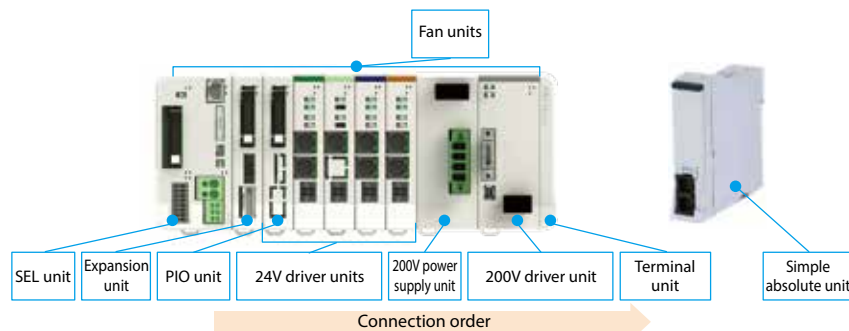


Unit Configuration

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.



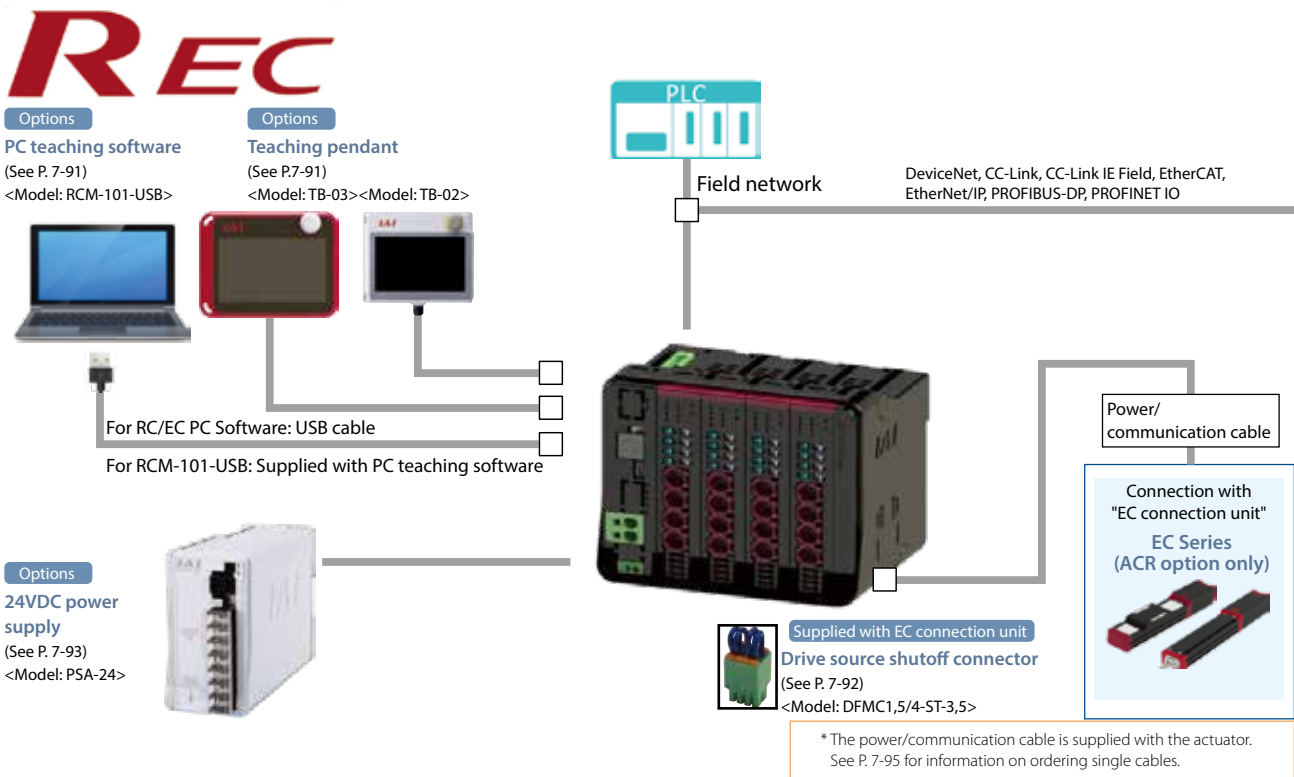
Unit name	Number of connected units	Additional information
SEL unit	1	Placed at far left
Expansion unit (SCON connection specification)	1*	Select either type
Expansion unit (PIO unit)	(Max.) 8	If connecting a PIO/SIO/SCON expansion unit, the maximum will be 7
24V driver unit	(Max.) 8*	Can be rearranged 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	P7-76
	PIO (NPN) connection specification	RSEL-G-NP	
	PIO (PNP) connection specification	RSEL-G-PN	
	CC-Link connection specification	RSEL-G-CC	P7-69
	CC-Link connection specification (bifurcated connector supplied)	RSEL-G-CC2	
	CC-Link IE Field connection specification	RSEL-G-CIE	
	DeviceNet connection specification	RSEL-G-DV	P7-71
	DeviceNet connection specification (bifurcated connector supplied)	RSEL-G-DV2	
	EtherCAT connection specification	RSEL-G-EC	
	EtherNet/IP connection specification	RSEL-G-EP	P7-73
	PROFIBUS-DP connection specification	RSEL-G-PR	P7-74
	PROFINET IO connection specification	RSEL-G-PRT	P7-75
Expansion unit	SCON expansion	RCON-EXT	P7-79
	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	P7-77
	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	P7-78
200V driver unit	AC200V motor 1-axis specification	RCON-SC-1	P7-78
Terminal unit	For 24V	RCON-GW-TR	P7-81
	For 200V	RCON-GW-TRS	
Simple absolute unit	For RCON-PC	RCON-ABU-P	P7-80
	For RCON-AC	RCON-ABU-A	
Fan unit	Other than the below	RCON-FU	P7-93
	For 200V driver	RCON-FUH	

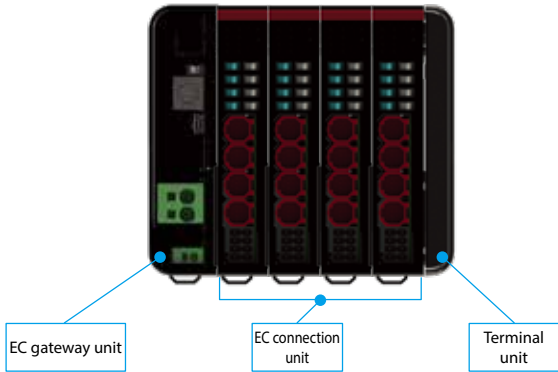
System Configuration



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	CC-Link connection specification	REC-GW-CC	P7-69
	CC-Link IE Field connection specification	REC-GW-CIE	P7-70
	DeviceNet connection specification	REC-GW-DV	P7-71
	EtherCAT connection specification	REC-GW-EC	P7-72
	EtherNet/IP connection specification	REC-GW-EP	P7-73
	PROFIBUS-DP connection specification	REC-GW-PR	P7-74
	PROFINET IO connection specification	REC-GW-PRT	P7-75
EC connection unit	EC connection unit 4-axis specification	RCON-EC-4	P7-80
Terminal unit	For REC	RCON-GW-TRE	P7-81

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 *For maximum axes, see "Maximum number of connectable axes" (P. 7-83)						
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		Gateway unit, driver unit, 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						
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		85% RH or less, non-condensing						
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	○	○	- (to be acquired)	- (to be acquired)	○	○	- (to be acquired)
	UL	○	○	- (to be acquired)	- (to be acquired)	○	○	- (to be acquired)

(Note: ○= Yes)

■ 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		1~8-axis							
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, expansion unit, power supply 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						
		Communication speed	12Mbps full speed						
	Ethernet		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 I/O		(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		85% RH or less, non-condensing							
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	○	○	- (to be acquired)	- (to be acquired)	○	○	- (to be acquired)	- (to be acquired)
	UL	- (to be acquired)	○	- (to be acquired)	- (to be acquired)	○	○	- (to be acquired)	- (to be acquired)

(Note: ○= Yes)

*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		B (the safety category specification supports up to 4 external circuits)	
Ambient operating temperature		0~55°C	
Ambient operating humidity		85% RH or less, non-condensing	
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	- (to be acquired)	- (to be acquired)
	UL	- (to be acquired)	- (to be acquired)

Actuators that cannot be connected to R-units

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/ PIO/SIO/SCON expansion unit (RCON-EXT)	
Master unit	Actuator	24V stepper motor/ 24V AC servo motor/ DC brush-less motor- equipped actuator	200V AC servo motor- equipped actuator		ELECYLINDER (Only w/ACR option)
		Wrist unit: WU Tabletop: TT(A) SCARA robot: IXP	Servo press: RCS2/RCS3 Linear servo: LSA-W21H LSA-W21S (single-phase power) SCARA robot: IX/IXA High-speed Cartesian robot: CT4 Single axis robot: ZR Rotary: DD/DDA (single-phase power) (Actuators corresponding to following specifications) · Actuators equipped with motors below 60W or above 750W · Actuators equipped with absolute encoders or absolute multi-rotation		Cannot be connected
RCON					-
RSEL		Tabletop: TT(A) SCARA robot: IXP			Cannot be connected
REC		Cannot be connected	Cannot be connected		-

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	<input type="checkbox"/> <input type="checkbox"/> 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	<input type="checkbox"/> <input type="checkbox"/> 5N	Incremental	1600
			SR <input type="checkbox"/> 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	<input type="checkbox"/>	Incremental	2400
			Models other than the above		16384
		LSA/LSAS		Incremental	Resolution 0.001mm
		DD/DDA	<input type="checkbox"/> 18S	Index absolute	131072
			<input type="checkbox"/> 18P	Index absolute	1048576
EC connection unit	Stepper motor	EC		Battery-less Absolute Incremental	800

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-units, 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.

*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
	Three-phase 200VAC
	1,600W
	2,400W

Power supply capacity by unit

<Control power>

Item	unit	Power capacity
Control power capacity (per unit)	Master unit (including terminal unit)	Gateway unit Without Ethernet
		With Ethernet
		SEL unit
		EC gateway unit
	24V driver unit (common for all types)	Without brake
		With brake (1-axis specification)
		With brake (2-axis specification)
		200V driver unit (including 200V power supply unit)
		Without brake
		With brake
	Expansion unit (common for each unit)	
	Simple absolute unit (common to all types)	
	EC connection unit	

<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	20P/20SP/28P	Without PowerCON	0.8A	-
		RCP3	28P/35P/42P/56P	Without PowerCON	1.9A	-
		RCP4	28P/35P/42P/42SP/56P	Without PowerCON	1.9A	-
		RCP5		With PowerCON	2.3A	-
		RCP6		With PowerCON	2.3A	3.9A
		RCP6		With PowerCON	2.3A	3.9A
	Stepper motor /RCON-PCF	RCP2	56SP/60P/86P	Without PowerCON	5.7A	-
		RCP4		Without PowerCON	5.7A	-
		RCP5		Without PowerCON	5.7A	-
		RCP6		Without PowerCON	5.7A	-
		RCP6		Without PowerCON	5.7A	-
		RCP6		Without PowerCON	5.7A	-
	AC servo motor /RCON-AC	RCA	5W	Standard / Hi-accel./decel.	1.0A	3.3A
			10W	Standard / Hi-accel./decel.	1.3A	4.4A
			20W	Standard / High accel./decel.	1.3A	2.5A
			20W (20S)	Energy saving	1.7A	3.4A
			30W	Energy saving	1.3A	2.2A
		RCL	2W	Standard / Hi-accel./decel.	0.8A	4.6A
			5W	Standard / Hi-accel./decel.	1.0A	6.4A
			10W	Standard / Hi-accel./decel.	1.3A	6.4A
				Standard	0.7A	-
				Standard	0.7A	1.5A
	DC brush-less motor /RCON-DC	RCD	3W	Standard	0.7A	-
				Standard	0.7A	1.5A

* Applicable models: RCP2-RA3, RCP2-RGD3

● EC connection unit

Item		Actuator/connection unit			Rated current	Max. current	
		Series	Motor type	Type		When energy-saving is set	
Motor power capacity (per 1-axis actuator)	EC stepper motor/ RCON-EC	EC	35P/42P/56P	Other than the below	2.3A	2.2A	3.9A
			28P	S3□/RR3□	-	2.2A	-
				Mini	-	2.0A	-



Caution

For operation patterns where acceleration/deceleration operation is performed simultaneously on all axes, and where operating duty is 100% Motor power must be calculated at the maximum current value. (If the maximum current is not listed, calculate with the rated current.)

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.)

DeviceNet connection specification

RCON

RSEL

REC



■ Model: **RCON-GW/GWG-DV**

■ Model: **RSEL-G-DV/DV2**

■ Model: **REC-GW-DV**

Specifications

	RCON	RSEL	REC
Operation type	Positioner Type	Program Type	Positioner Type
Power supply input voltage	24VDC \pm 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing		
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
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)

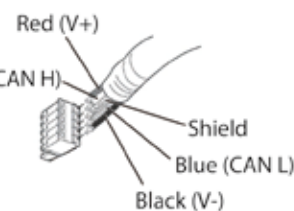
Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	MSTB2,5/5-STF-5,08 AUM	Standard accessories
		TMSTBP2,5/5-STF-5,08 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 \pm 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing		
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
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)

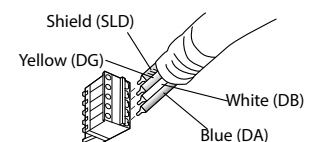
Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
		(RSEL) DFMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DFMC1,5/4-ST-3,5	Standard accessories
Network	Cable side	MSTB2,5/5-STF-5,08 AU With 110Ω/130Ω terminal resistor	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#, 85% RH or less, non-condensing		
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
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		

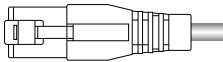
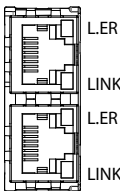
* A fan unit must be attached during use in environments exceeding 40°C (excluding REC)
CC-link IE Basic is not supported.

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 \pm 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing		
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
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		

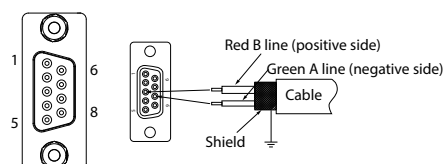
* A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

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 connection specification

RCON



■ Model: **RCON-GW/GWG-EC**

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 \pm 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing		
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
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		

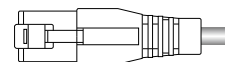
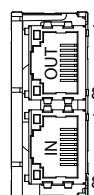
* A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DFMC1,5/5-ST-3,5	Standard accessories
	Controller side	(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 \pm 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing		
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
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		

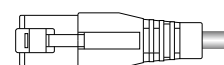
* A fan unit must be attached during use in environments exceeding 40°C (excluding REC)
Explicit messaging is not supported. (Implicit messaging only).

Connector area		Cable connector model	Remarks
System IO	Cable side	(RCON) DPMC1,5/5-ST-3,5	Standard accessories
	Controller side	(RSEL) DPMC1,5/8-ST-3,5	Standard accessories
Drive-source cutoff	Cable side	(REC) DPMC1,5/4-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 \pm 10%		
Power supply current	0.8A (with Ethernet: 1.0A)	1.2A	0.8A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing		
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
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		

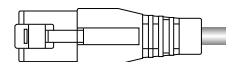
* A fan unit must be attached during use in environments exceeding 40°C (excluding REC)

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



No I/O connection specification

RSELModel: **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

RSELModel: **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□□□)

Specifications

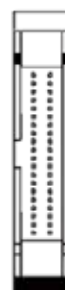
	RSEL
Operation type	Program Type
Power supply input voltage	24VDC \pm 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C#, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	4 compatible
Degree of protection	IP20
Mass	270g
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)

Specifications

	RSEL
Operation type	Program Type
Power supply input voltage	24VDC \pm 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
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)



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, 85% RH or less, non-condensing
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, 85% RH or less, non-condensing
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, 85% RH or less, non-condensing
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.

RCON
RSEL



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

Specifications

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

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

200V power supply unit

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

RCON
RSEL



Model
RCON-PS2-3

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

Specifications

Motor power input voltage	Single-phase/three-phase 200VAC~230VAC $\pm 10\%$
Maximum power capacity	1,600W (1-phase 200VAC) 2,400W (3-phase 200VAC)
Ambient operating temperature & humidity	(With fan) 0~55°C, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	393g
External dimensions	W45.2mm×H115mm×D95mm
Accessories	Power supply connector SPC5/4-STF-7,62
Compatible Type	RCON/RSEL

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

Configuration Unit Description

Other Units

SCON expansion unit

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



Model	
RCON-EXT	
Specifications	
Power	24VDC \pm 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	99g
External dimensions	W22.6mm \times H115mm \times 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.



Model	
RCON-EXT-NP (NPN specification)	
RCON-EXT-PN (PNP specification)	
Specifications	
Power	24VDC \pm 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	110g
External dimensions	W22.6mm \times H115mm \times D95mm
Accessories	Expansion SIO port connector FMC1,5/3-STF-3,5 Terminal connector RCON-EXT-TR PIO cable (when a cable length other than "0" is specified for the model)
Compatible Type	RSEL

PIO unit

This unit is for PIO expansion.



Model	
RCON-NP (NPN specification)	
RCON-PN (PNP specification)	
Specifications	
Power	24VDC \pm 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	105g
External dimensions	W22.6mm \times H115mm \times D95mm
Accessories	PIO cable (when a cable length other than "0" is specified for the model)
Compatible Type	RSEL

EC connection unit

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

**RCON
REC**



Model	
RCON-EC	

Specifications

Power	24VDC \pm 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 85% RH or less, non-condensing
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 \pm 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, 85% RH or less, non-condensing
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 serial communication and input/output signals. (Supplied with purchase of gateway unit.)

RCON
RSEL



Model
RCON-GW-TR

Specifications

Power	24VDC \pm 10%
Ambient operating temperature & humidity	0~55°C, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	48g
External dimensions	W12.6mm \times H115mm \times 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.)

RCON
RSEL



Model
RCON-GW-TRS

Specifications

Power	24VDC \pm 10%
Ambient operating temperature & humidity	0~55°C, 85% RH or less, non-condensing
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	40g
External dimensions	W12.6mm \times H115mm \times 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.)

REC



Model
RCON-GW-TRE

Specifications

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

PIO Signal Chart

Standard PIO connector, expansion PIO connector pin layout

Pin No.	Category	Assignment	Pin No.	Category	Assignment
1A	24V	P24	1B		OUT0
2A	24V	P24	2B		OUT1
3A	-	-	3B		OUT2
4A	-	-	4B		OUT3
5A	Input	IN0	5B	Output	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

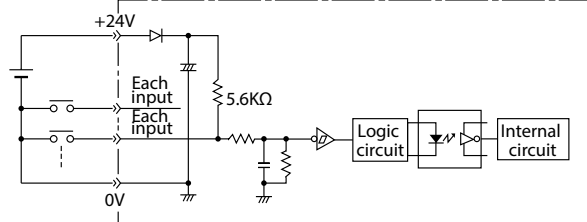
*The same assignment will be applied to each unit even for an expansion unit (PIO specification).

I/O internal circuit

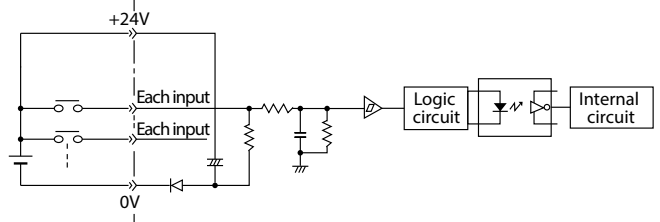
[Input]

Item	Specifications
Number of input	16 points
Input voltage	24VDC \pm 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]



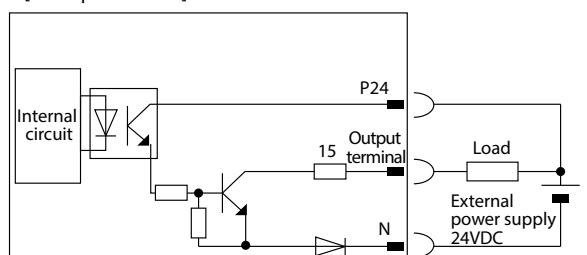
[PNP specification]



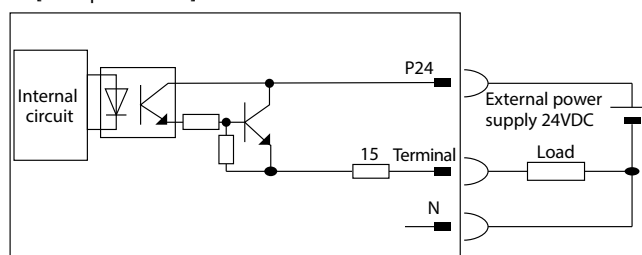
[Output]

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

[NPN specification]



[PNP specification]



Field Network Operation Mode

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.

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.	

RCON-GW maximum number of connectable axes

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

* I/O messaging only.

** CC-link IE Basic is not supported.

*** Implicit messaging only. (No explicit messaging type).

List of Functions by Operation Mode

	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	○	△ (Note 1)	△	△	△	△
Different acceleration and deceleration settings	×	△	△	△	△	△
Pitch feed (incremental)	○	△	△	△	×	△
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).

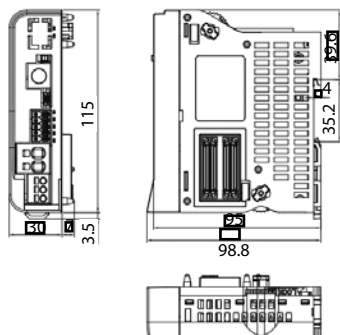
Note 5: The maximum output value in positioner 5 mode is 3,276.7mm (327.67 degrees for DD motor).

To control the actuator in an operation range exceeding the maximum value, select a different operation mode.

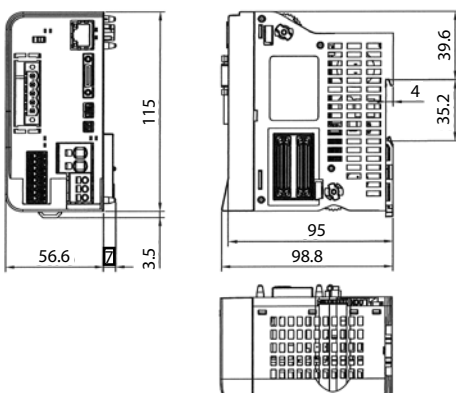
External dimensions

Master unit

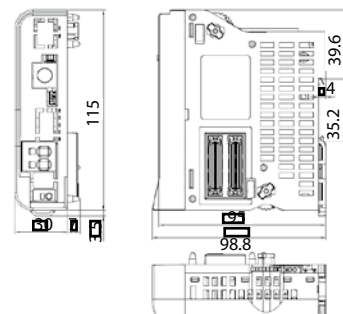
RCON



RSEL

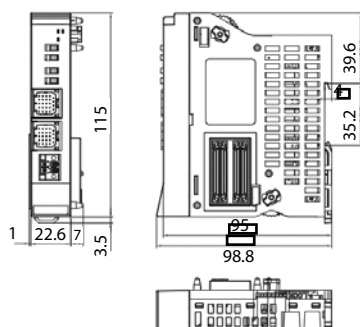


REC

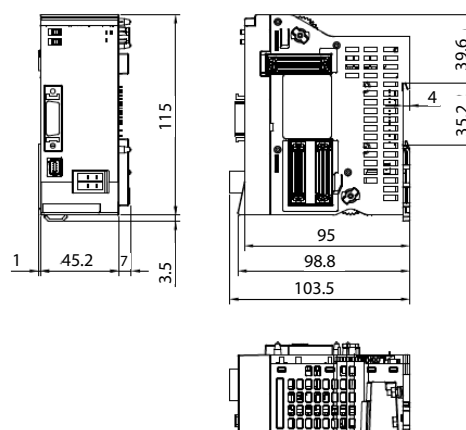


Driver Unit

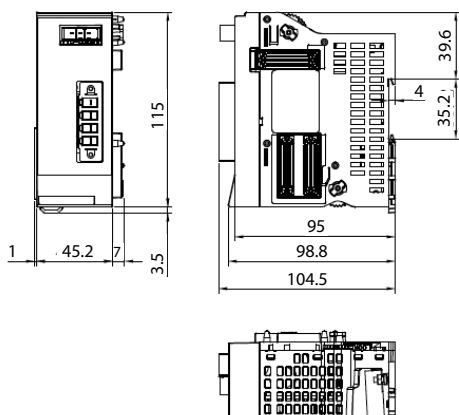
24V



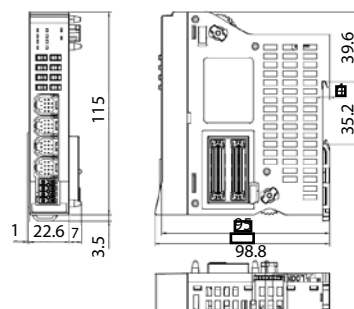
200V



200V power supply unit



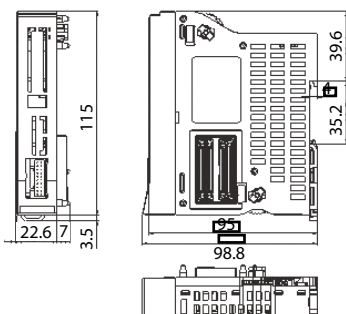
EC connection unit



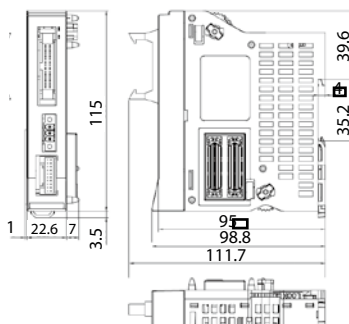
External dimensions

Expansion unit

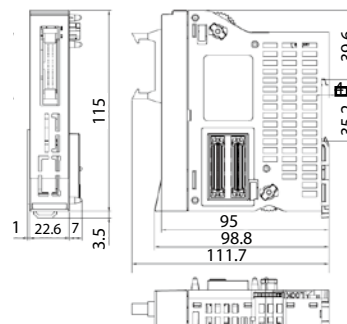
SCON expansion



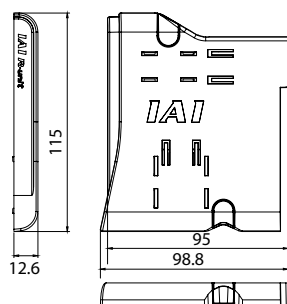
PIO/SIO/SCON expansion



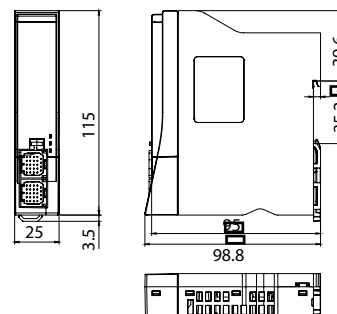
PIO



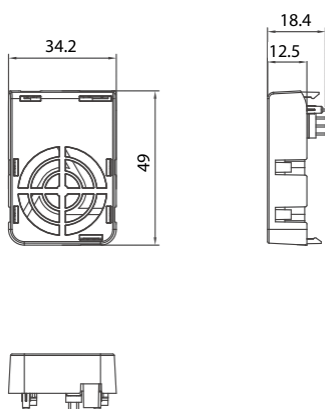
Terminal unit



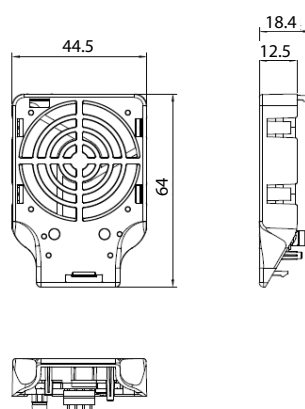
Simple absolute unit



Fan unit



For 200V driver



Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

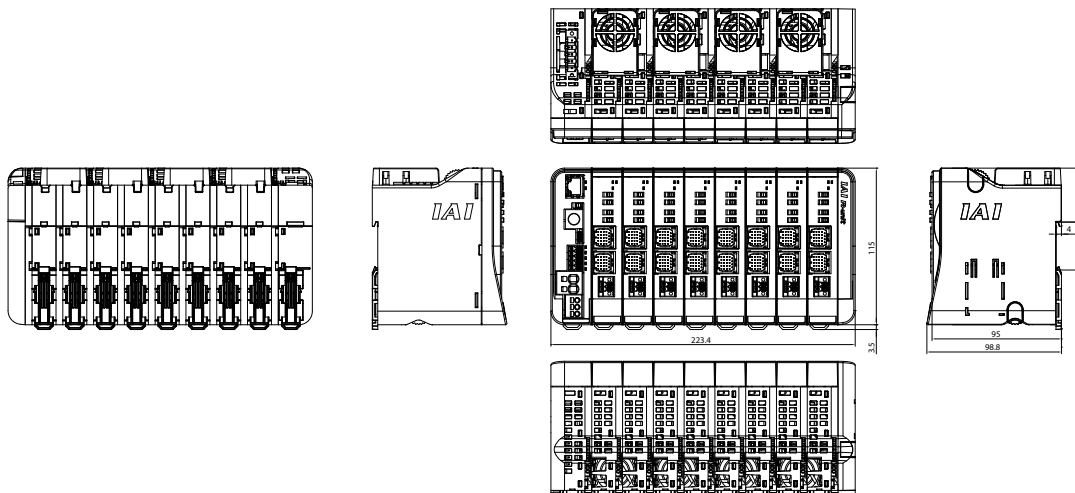
TB-03

Unit combination examples

RCON

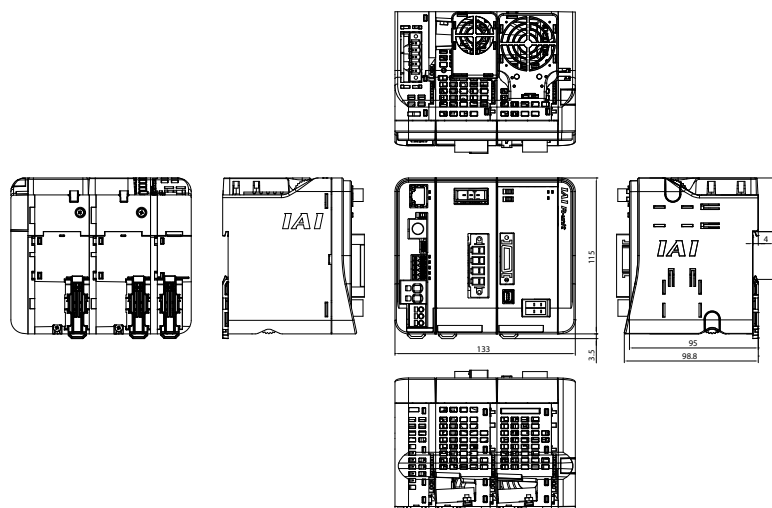
8 24V driver units (16 axes)

With fan



RCON

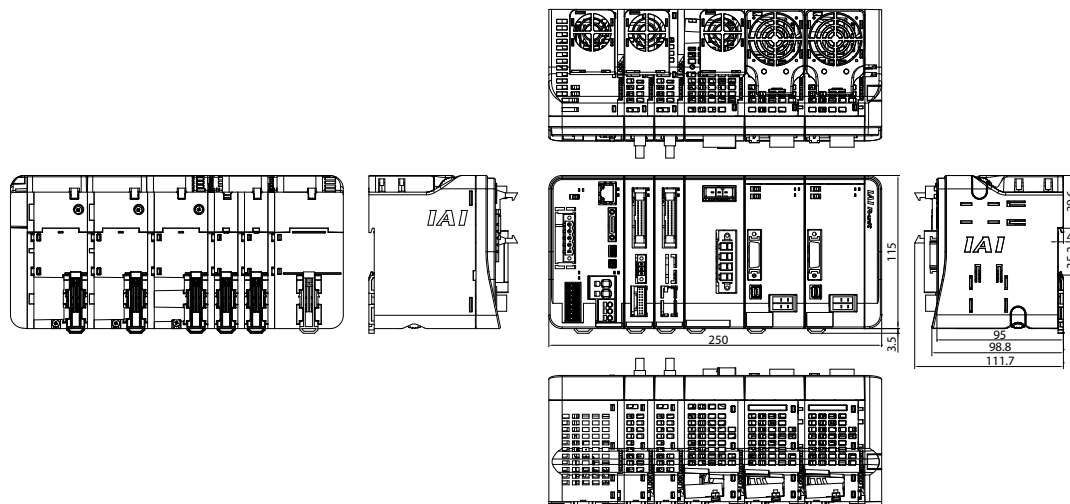
1 200V driver unit (1 axis)



Unit combination examples

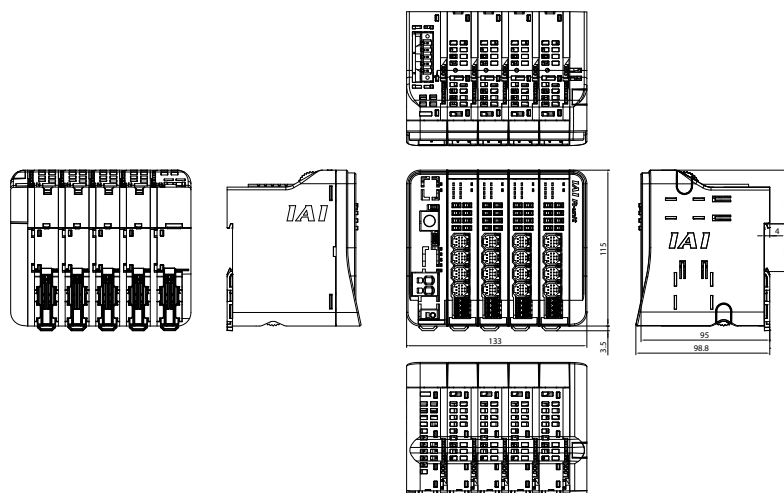
RSEL

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



REC

For 4 EC connection units (16 axes)



Controller

R-unit

RCP6S

MCON

-C

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-CAL

MSCON

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

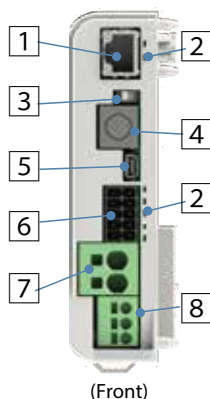
TB-02

TB-03

Name of Each Component

Master unit

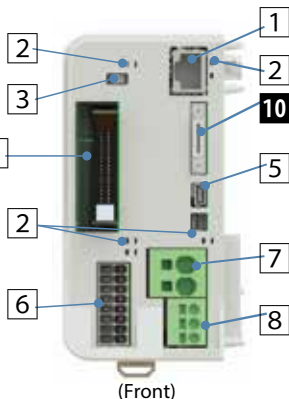
RCON-GW/GWG



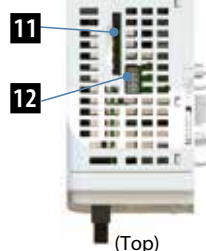
(Front)

(Top)

RSEL-G

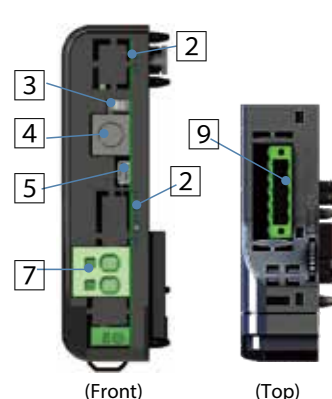


(Front)



(Top)

REC-GW



(Front)

(Top)

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.

11 Memory card slot

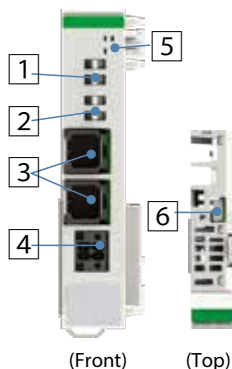
Insert an SD/SDHC card to perform updates.

12 Fan connector

A connector to attach the fan unit.

Driver Unit

24V series



(Front)

(Top)

200V series



(Front)

(Top)

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.

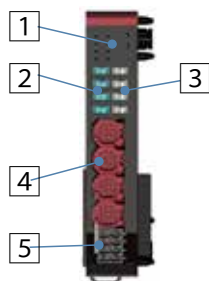
8 Motor connector

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.)

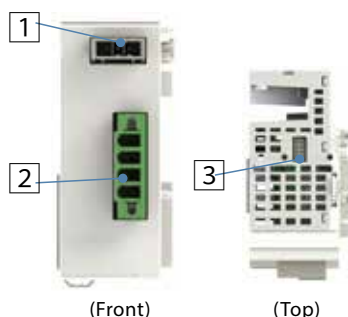
4 EC connector

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



1 External regenerative resistance connector

A connector to connect to an external regenerative resistance unit.

2 200VAC input connector

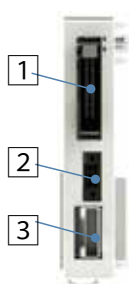
A connector for three-phase/single-phase 200VAC.

3 Fan connector

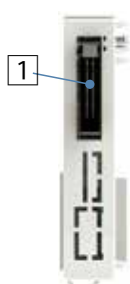
A connector to connect the fan unit.

Expansion unit

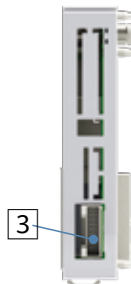
RCON-EXT-NP/PN



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).

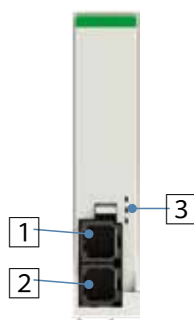
2 SIO cable connector

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

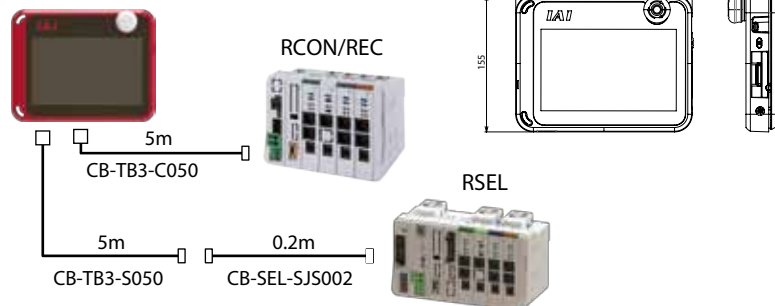
- **Features** A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

■ Model **TB-03-**

See P. 7-319

Please contact IAI for the current supported versions.

■ Configuration



■ External dimensions

■ Specifications

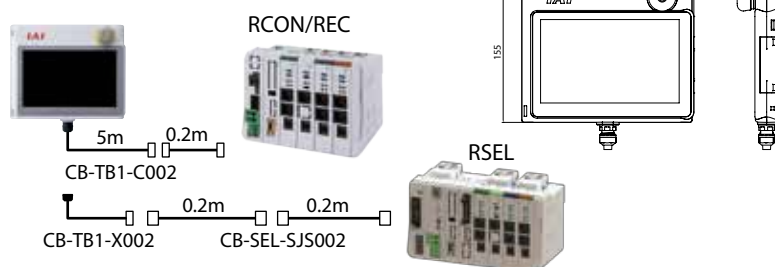
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~85% RH (non-condensing)
Environmental resistance	IPX0
Mass	670g (TB-03 unit only)
Charging method	Wired connection with dedicated AC adapter/ controller
Wireless connection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

■ Model **TB-02(D)-**

See P. 7-315

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	20~85% RH (non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

PC Teaching Software (Windows only)

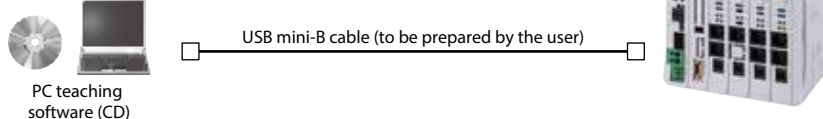
- **Features** Start-up support software which comes equipped with functions such as position/program teaching, trial operation, and monitoring.

For RCON/REC

■ RC/EC PC Software

Please contact IAI for the current supported versions.

■ Configuration



Supported Windows versions: 7/10



or PC Software downloaded link

Supported Windows versions: 7/8/8.1/10

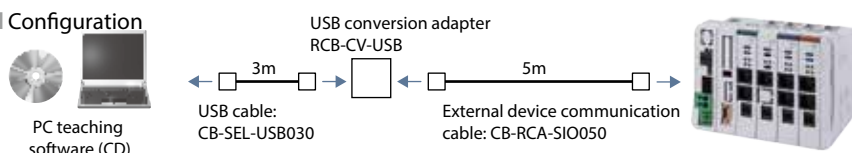


■ Model **RCM-101-USB**

Please contact IAI for the current supported versions.

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

■ Configuration



For RSEL

Model XSEL PC Software

Features PC teaching software (DVD) only.

If you want to connect both the controller and PC side with a 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.

Configuration Please contact IAI for the current supported versions.

Notes

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

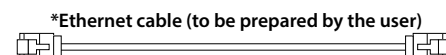
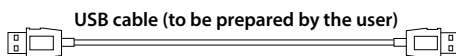
If an emergency switch is not available, use the emergency stop-equipped model "IA-101-X-USBMW".

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

Supported Windows versions:
7/8/8.1/10



PC teaching software (DVD)



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



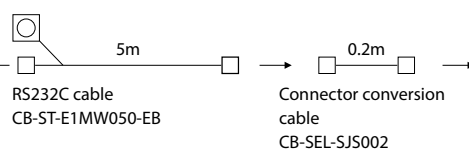
or PC Software downloaded link

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

Configuration Please contact IAI for the current supported versions.



PC teaching software (DVD)



Supported Windows versions:
7/8/8.1/10



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.)

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)**



Specifications Table

Item	Specification	
	100VAC input	200VAC input
Power input voltage range	100VAC~230VAC $\pm 10\%$	
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 $\pm 10\%$	
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	

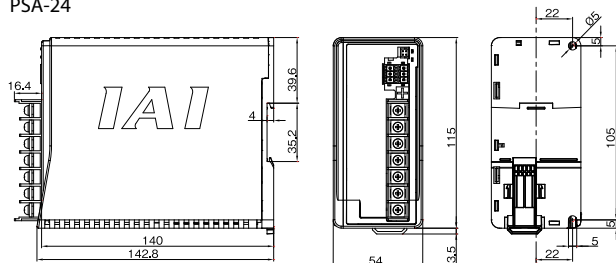
*1 The pulse width of flowing inrush current is less than 5ms.

*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.

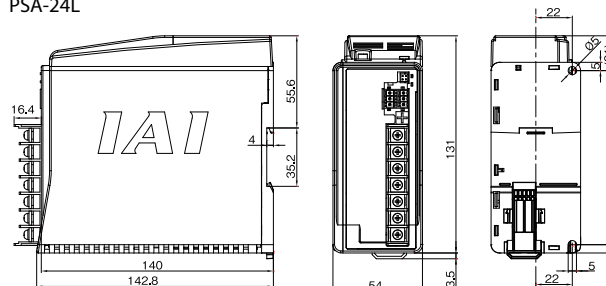
*3 Parallel connection cannot be used under the following conditions.
 · Parallel connection of PSA-24 (specification without fan) and PSA-24L (specification with fan)
 · Parallel connection with a power supply unit other than this power supply
 · Parallel connection with PS-24

External dimensions

PSA-24



PSA-24L



Maintenance Parts

Fan unit

■ **Overview** An option for forced cooling of the driver unit.

■ **Model RCON-FU**



For 200V driver

■ **Model RCON-FUH**



Dummy plug

For RCON-GWG

■ **Model DP-5**



For RSEL

■ **Model DP-4S**



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-SJ, IA-101-X-MW-JS accessory.)

■ **Model CB-SEL-SJS002**



For 200V driver

■ **Model DP-6**



System I/O connector

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

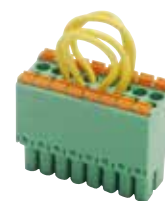
For RCON-GW(G)

■ 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 Unit that converts the regenerative current generated during motor deceleration to heat. A regenerative resistor is built-in to the 200V driver unit and 200V power supply unit. However, external regenerative resistance will be required if the timing at which energy is generated due to deceleration is the same.

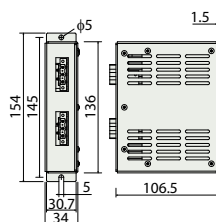
■ Model **RESU-2(Standard specification)/RESUD-2(DIN rail mounting specification)**

Specifications

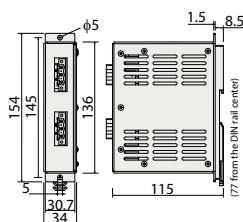
Model	RESU-2	RESUD-2
Unit weight	About 0.4kg	
Built-in regenerative resistance value	235Ω 80W	
Unit mounting method	Screw mount	DIN rail mount
Attached cable	CB-SC-REU010	

External Dimensions

<RESU-2>



<RESUD-2>



*When two regenerative units are required, please use one RESU-2(See P.7-287) and one RESU-1 (please contact IAI for the details).



Maintenance Parts (Cables)

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

Table of compatible cables

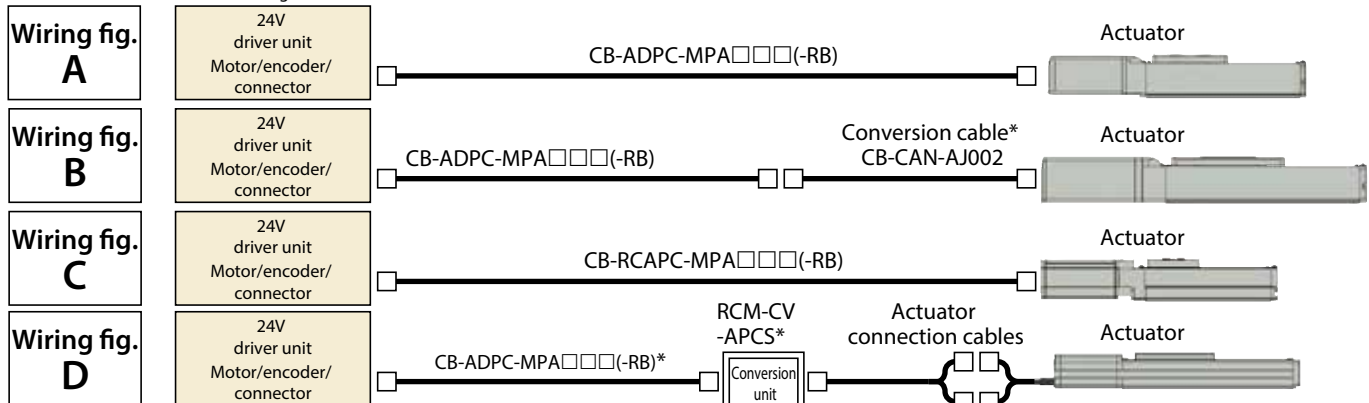
Motor encoder cable for 24V driver connection

No.	Actuator		Applicable controller symbol	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	CB-ADPC-MPA□□□(-RB)	-	A
(2)		High thrust type ^(Note 1)	P6	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (conversion cable)	-	B
(3)		Gripper (GR*), ST4525E, SA3/RA3	P5	CB-ADPC-MPA□□□(-RB)	-	A
(4)	RCP4 RCP4CR RCP4W	High thrust type ^(Note 1)	P6	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (conversion cable)	-	B
(5)		Other than (3), (4)	P5	CB-ADPC-MPA□□□(-RB) CB-CAN-AJ002 (conversion cable)	-	B
(6)	RCP3		P5	CB-RCAPC-MPA□□□(-RB)	-	C
(7)		RCP2 (standard type) rotary compact type RCP2-RTBS/RTBSL/RTCS/RTCSL	P5	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	CB-ADPC-MPA□□□(-RB)	-	A
(9)	RCP2 RCP2CR RCP2W	GRSS/GRLS/GRST/GRHM/GRHB of all types (standard / clean room / dust-proof/splash-proof) Short type (RCP2 only) RCP2-SRA4R/SRGS4R/SRGD4R	P5	CB-RCAPC-MPA□□□(-RB)	-	C
(10)		High thrust type ^(Note 1)	P6	CB-ADPC-MPA□□□(-RB) [CB-CFA-MPA□□□(-RB)]	Required	D
(11)		Other than (7)~(10)	P5	CB-ADPC-MPA□□□(-RB) [CB-PSEP-MPA□□□]	Required	D
(12)		RCA2/RCA2CR/RCA2W, RCL	A6	CB-RCAPC-MPA□□□(-RB)	-	C
(13)		RCA2/RCA2CR/RCA2W (CNS option)	A6	CB-ADPC-MPA□□□(-RB)	-	A
(14)	RCA RCACR RCAW	Short type (RCA only) RCA-SRA4R/SRGS4R/SRGD4R	A6	CB-RCAPC-MPA□□□(-RB)	-	C
(15)		Other than (14)	A6	CB-ADPC-MPA□□□(-RB) [CB-ASEP2-MPA□□□]	Required	D
(16)	RCD	RCD-RA1DA, RCD-GRSNA	D6	CB-ADPC-MPA□□□(-RB)	-	A
(17)	WU		PM2	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

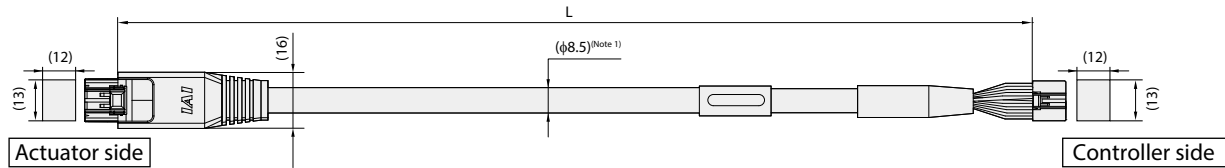
No.	Actuator		Applicable controller code	Connection cable (Note 3)			
	Series	Type		Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
(1)	RCS4 RCS4CR		T4	CB-RCC1-MA□□□	CB-X2-MA□□□	-	CB-X1-PA□□□
(2)	RCS3(P) RCS3(P)CR	CTZ5C CT8C	T4	CB-RCC1-MA□□□	CB-X2-MA□□□	-	CB-X1-PA□□□
(3)		Other than (2)	T4	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-RCS2-PA□□□	CB-X3-PA□□□
(4)	RCS2 RCS2CR	RTC□L RT6	T4	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-RCS2-PLA□□□	CB-X2-PLA□□□
(5)	RCS2W	Other than (4)	T4	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-RCS2-PA□□□	CB-X3-PA□□□
(6)	RCS2	RA13R	T4	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	-	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	-	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	Other than (12)	T4	-	CB-X2-MA□□□	-	CB-X1-PA□□□
(12)	SSPDACR IF FS RS	(Option: When limit switch was selected)	T4	-	CB-X2-MA□□□	-	CB-X1-PLA□□□
(13)	NSA		T4	-	CB-X2-MA□□□	-	CB-X1-PA□□□
(14)	NS	Other than (15)	T4	-	CB-X2-MA□□□	-	CB-X3-PA□□□
(15)		(Option: When limit switch was selected)	T4	-	CB-X2-MA□□□	-	CB-X2-PLA□□□
(16)	DD DDCR DDW	T18□ LT18□	T4	-	CB-X2-MA□□□	-	CB-X3-PA□□□
(17)	DDA DDACR	H18□ LH18□	T4	-	CB-XMC1-MA□□□	-	CB-X3-PA□□□
(18)	LSA	W□□□	T4	-	CB-XMC1-MA□□□	-	CB-X2-PLA□□□
(19)		Other than (18)	T4	-	CB-X2-MA□□□	-	CB-X3-PA□□□
(20)	LSAS		T4	-	CB-X2-MA□□□	-	CB-X1-PA□□□
(21)	ISWA ISPWA		T4	-	CB-XEU1-MA□□□	-	CB-X1-PA□□□-WC

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

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)

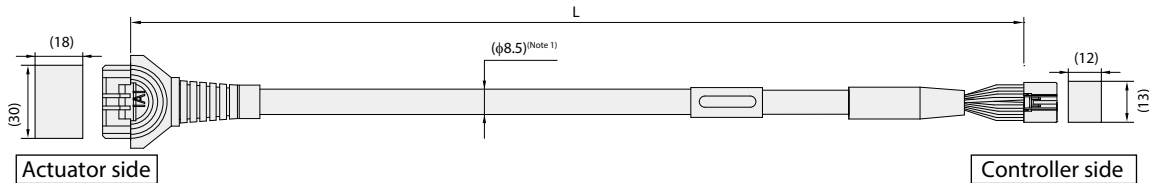
* The robot cable is designed for flex-resistance: Please use the robot cable if the cable needs to be installed through the cable track.

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

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

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

*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)

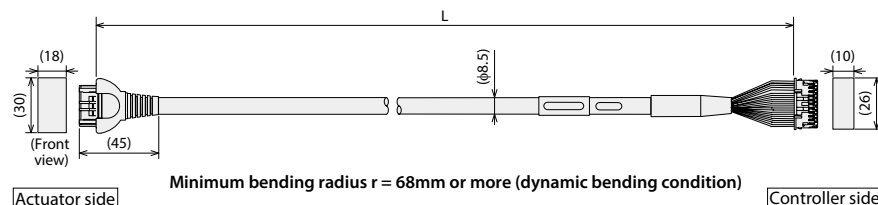
* The robot cable is designed for flex-resistance: Please use the robot cable if the cable needs to be installed through the cable track.

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

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

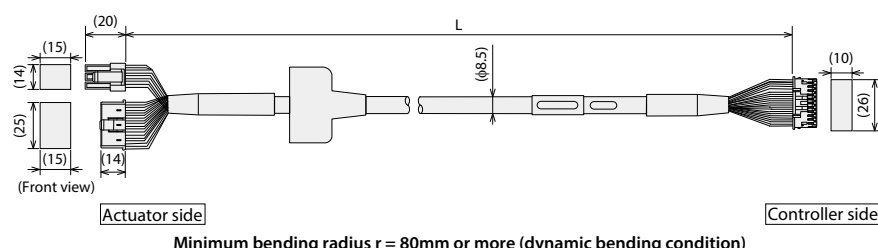


Actuator side D-1100D 1-1827863-1 (AMP)		Controller side PADP-24V-1-S (J.S.T. Mfg. Co., Ltd.)	
Terminal number		Terminal number	
A1	Black (φA)	1	φA
B1	White (VMM)	2	φA
A2	Brown (φA)	3	φB
B2	Green (φB)	4	VMM
A3	Yellow (VMM)	5	φA
B3	Red (φB)	6	φB
A6	Orange (LS+)	7	NC
B6	Gray (LS-)	8	NC
A7	Red (A+)	9	NC
B7	Green (A-)	10	NC
A8	Black (B+)	11	NC
B8	Brown (B-)	12	NC
A4	NC	13	NC
B4	NC	14	NC
A5	Black (identification tape) (BK-)	15	NC
B5	Brown (identification tape) (BK-)	16	NC
A9	Green (identification tape) (GNDL)	17	NC
B9	Red (identification tape) (VPS)	18	NC
A10	White (identification tape) (VCC)	19	NC
B10	Yellow (identification tape) (GND)	20	NC
A11	NC	21	NC
B11	Shield (FG) (FG)	22	NC
	NC	23	NC
	NC	24	NC

■ Model **CB-CFA-MPA**□□□/□□□-RB

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

If the cable length is over 3m, φ9.1 cable diameter applies for a non-robot cable and φ10 for a robot cable.

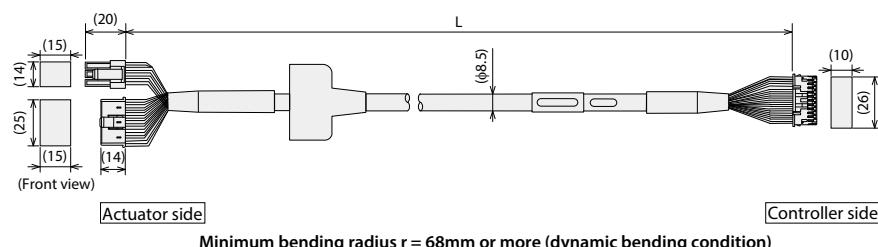


* The robot cable is designed for flex-resistance:
Please use the robot cable if the cable needs to be installed through the cable track.

Actuator side SLP-06V (J.S.T. Mfg. Co., Ltd.) XMP-18V (J.S.T. Mfg. Co., Ltd.)		Controller side PADP-24V-1-S (J.S.T. Mfg. Co., Ltd.)	
Pin No.	Signal name	Pin No.	Signal name
1	φA	1	φA
2	VMM	2	VMM
4	φB	3	φB
5	VMM	4	VMM
3	φA	5	φA
6	φB	6	φB
5	NC	11	NC
6	NC	12	NC
13	LS+	7	LS+
14	LS-	8	LS-
1	A+	13	A+
2	A-	14	A-
3	B+	15	B+
4	B-	16	B-
16	BK+	9	BK+
17	VCC	10	BK-
12	VCC	21	VCC
9	GND	19	GND
11	VPS	18	VPS
10	NC	20	NC
18	FG	24	FG
15	NC	17	NC
7	NC	22	NC
8	NC	23	NC

■ Model **CB-PSEP-MPA**□□□ * Only the robot cable is available for this model.

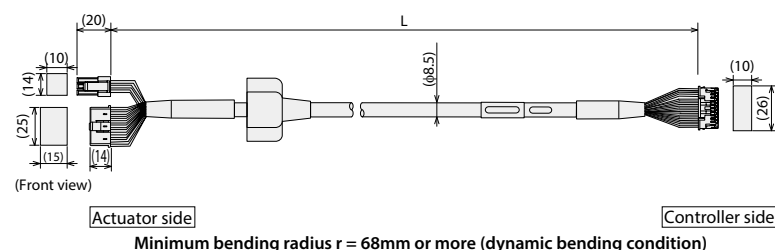
* Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 20m



Actuator side SLP-06V (J.S.T. Mfg. Co., Ltd.) XMP-18V (J.S.T. Mfg. Co., Ltd.)		Controller side PADP-24V-1-S (J.S.T. Mfg. Co., Ltd.)	
Terminal number		Terminal number	
1	Black (φA)	1	φA
2	White (VMM)	2	φA
4	Red (φB)	3	φB
5	Green (VMM)	4	VMM
3	Brown (φA)	5	φA
6	Yellow (φB)	6	φB
16	Orange (BK+)	9	NC
17	Gray (BK-)	10	NC
5	NC	11	NC
6	NC	12	NC
13	Black (LS+)	7	NC
14	Brown (LS-)	8	NC
1	White (A+)	13	NC
2	Yellow (A-)	14	NC
3	Red (B+)	15	NC
4	Green (B-)	16	NC
10	White (identification tape) (VCC)	17	NC
11	Yellow (identification tape) (VPS)	18	NC
9	Red (identification tape) (GND)	19	NC
12	Green (identification tape) (reserve)	20	NC
15	NC	21	NC
7	NC	22	NC
8	NC	23	NC
18	Shield (FG)	24	NC

■ Model **CB-ASEP2-MPA**□□□ * Only the robot cable is available for this model.

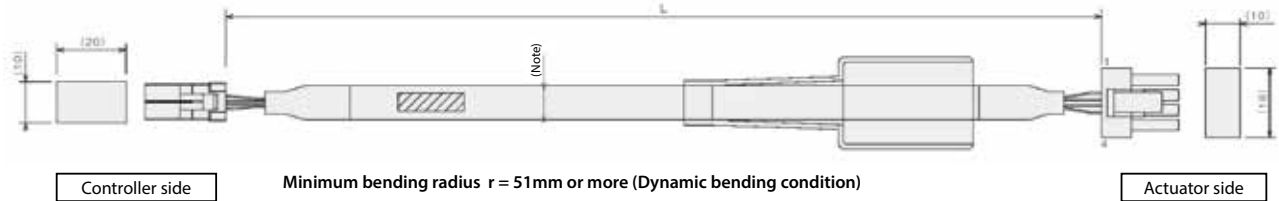
* Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 20m



Actuator side SLP-06V (J.S.T. Mfg. Co., Ltd.) XMP-18V (J.S.T. Mfg. Co., Ltd.)		Controller side PADP-24V-1-S (J.S.T. Mfg. Co., Ltd.)	
Terminal number		Terminal number	
1	Red (U)	1	φA
2	Yellow (V)	2	φA
	NC	3	φB
3	Black (W)	4	VMM
	NC	5	φA
18	Orange (BK+)	6	φB
17	Gray (BK-)	7	NC
7	Black (LS+)	8	NC
16	Brown (LS-)	9	NC
1	White (A+)	10	NC
2	Yellow (A-)	11	NC
3	Red (B+)	12	NC
4	Green (B-)	13	NC
10	Black (identification tape) (Z+)	14	NC
11	Brown (identification tape) (Z-)	15	NC
14	White (identification tape) (VCC)	16	NC
15	Yellow (identification tape) (GND)	17	NC
13	Red (identification tape) (VPS/BAT-)	18	NC
6	Green (identification tape) (reserve)	19	NC
12	White (BAT+)	20	NC
5	NC	21	NC
8	NC	22	NC
9	Shield (FG)	23	NC
		24	NC

Model CB-RCC1-MA□□□/CB-X2-MA□□□

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

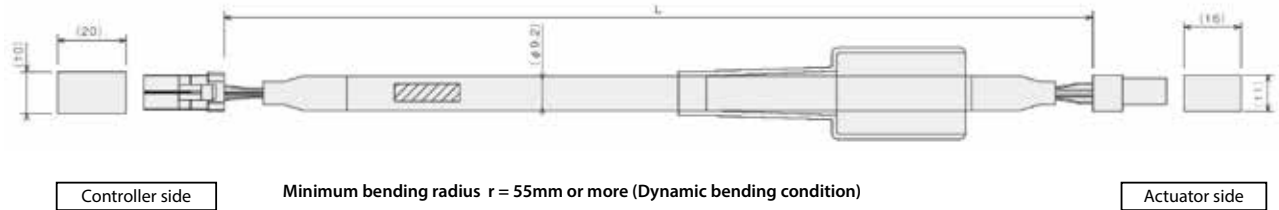


* Please use the robot cable if the cable needs to be installed through the cable track.

F35FDC-04V-K (J.S.T. Mfg. Co., Ltd.)				SLP-04V (J.S.T. Mfg. Co., Ltd.)			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
0.75sq (crimped)	Red	U	B1	1	U	Red	0.75sq (crimped)
	White	V	B2	2	V	White	
	Black	W	A1	3	W	Black	
	Green	PE	A2	4	PE	Green	

Model CB-XMC1-MA□□□

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

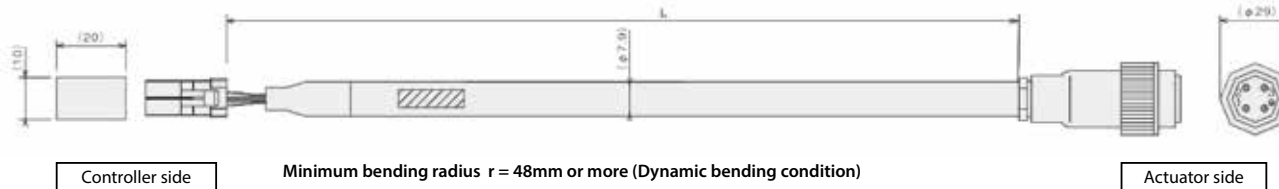


* Only the robot cable is available for this model.

F35FDC-04V-K (J.S.T. Mfg. Co., Ltd.)				SLP-04V			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
1.25sq (crimped)	Red	U	B1	1	U	Red	1.25sq (crimped)
	White	V	B2	2	V	White	
	Black	W	A1	3	W	Black	
	Green	PE	A2	4	PE	Green	

Model CB-XEU1-MA□□□

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

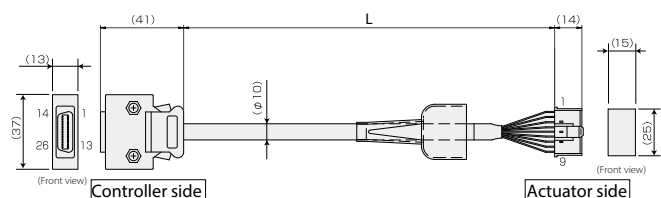


* Only the robot cable is available for this model.

F35FDC-04V-K (J.S.T. Mfg. Co., Ltd.)				99-4222-00-04(binder)			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
0.75sq (crimped)	1 with white character in black	U	B1	1	U	1 with white character in black	0.75sq (crimped)
	2 with white character in black	V	B2	2	V	2 with white character in black	
	3 with white character in black	W	A1	3	W	3 with white character in black	
	Green/yellow	PE	A2	⓪	PE	Green/yellow	

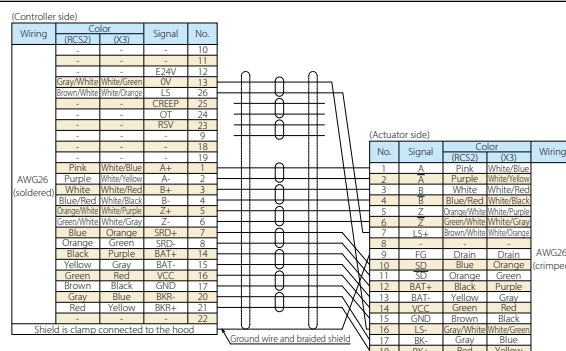
Model CB-RCS2-PA□□□□

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



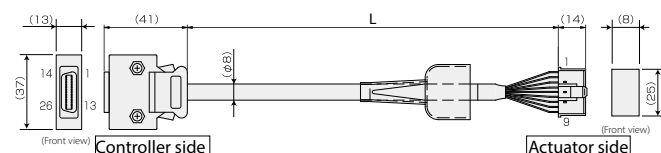
Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)

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



Model CB-X1-PA□□□□

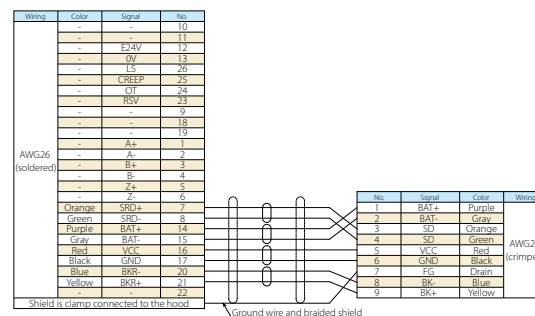
*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 20m



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)

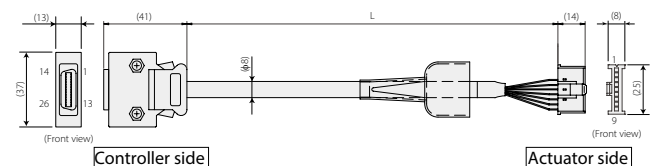
* Only the robot cable is available for this model.

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



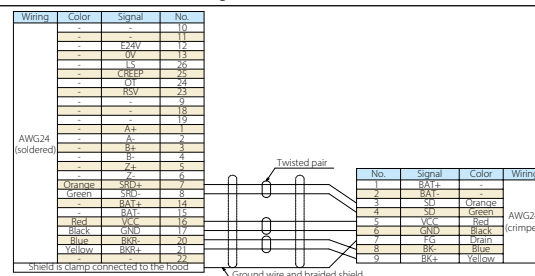
Model CB-X1-PA□□□□-AWG24

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



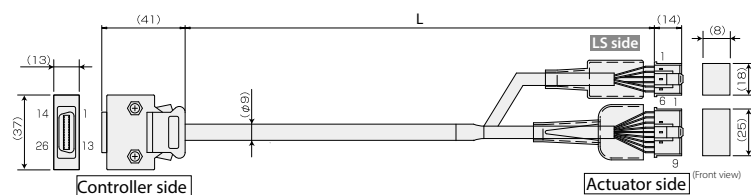
Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)

* Only the robot cable is available for this model.



Model CB-X1-PLA□□□□

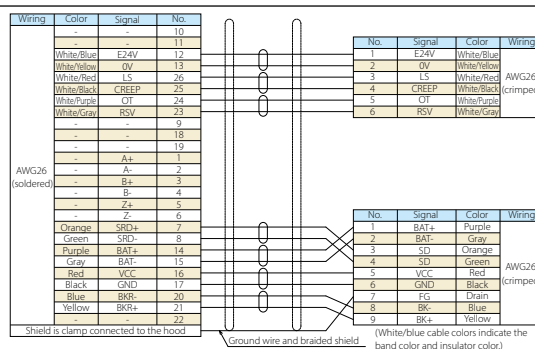
*Please indicate the cable length (L) in □□□, e.g.) 080 = 8m, maximum 30m



Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)

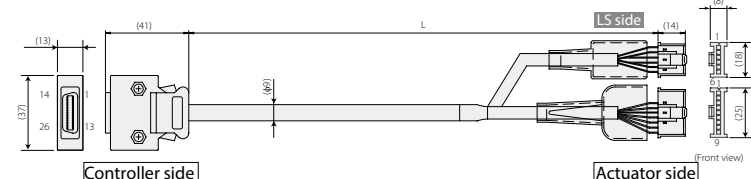
* Only the robot cable is available for this model.

*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.



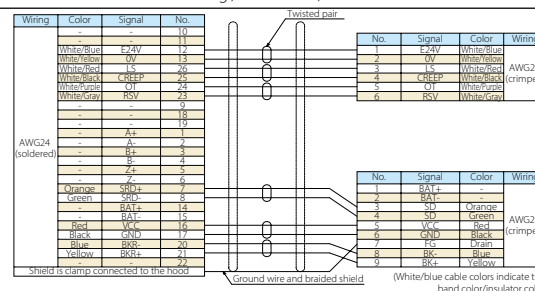
Model CB-X1-PLA□□□□-AWG24

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



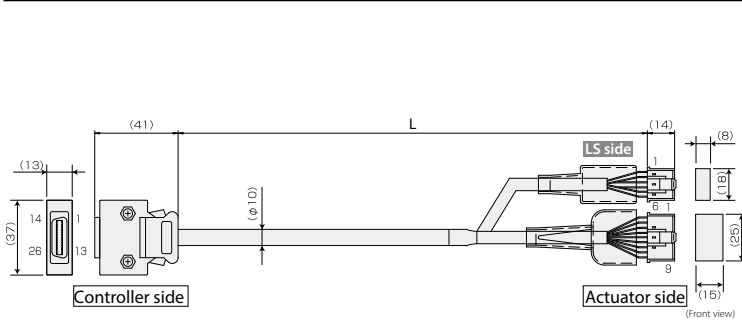
Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)

* 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

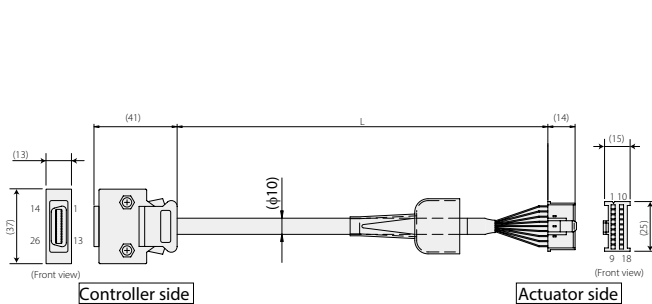


Minimum bending radius $r = 50\text{mm}$ or more (Dynamic bending condition)
*Please use the robot cable if the cable needs to be installed through the cable track.

(Controller side)				(Actuator side)			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
	(RC52)	(X2)			(RC52)	(X2)	
	-	-	10	1	A+	Pink	White/Blue
	-	-	11	2	A-	Purple	White/Yellow
	-	-	12	3	B+	White	White/Red
	-	-	13	4	B-	Blue/Red	White/Black
	-	-	14	5	Z+	Orange/White	White/Purple
	-	-	15	6	Z-	Green/White	White/Gray
	-	-	16	7	LS+	Brown/White	White/Orange
	-	-	17	8	LS-	Gray	White/Black
	-	-	18	9	FG	Drain	Drain
	-	-	19	10	SD	Blue	Orange
	-	-	20	11	SD	Orange	Green
	-	-	21	12	BAT+	Black	Purple
	-	-	22	13	BAT-	Yellow	Gray
	-	-	23	14	VCC	Green	Red
	-	-	24	15	GND	Brown	Black
	-	-	25	16	LS-	Gray	Blue
	-	-	26	17	BK+	Red	Yellow
	-	-	27	18	BK+	Red	Yellow

Model CB-X3-PA

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

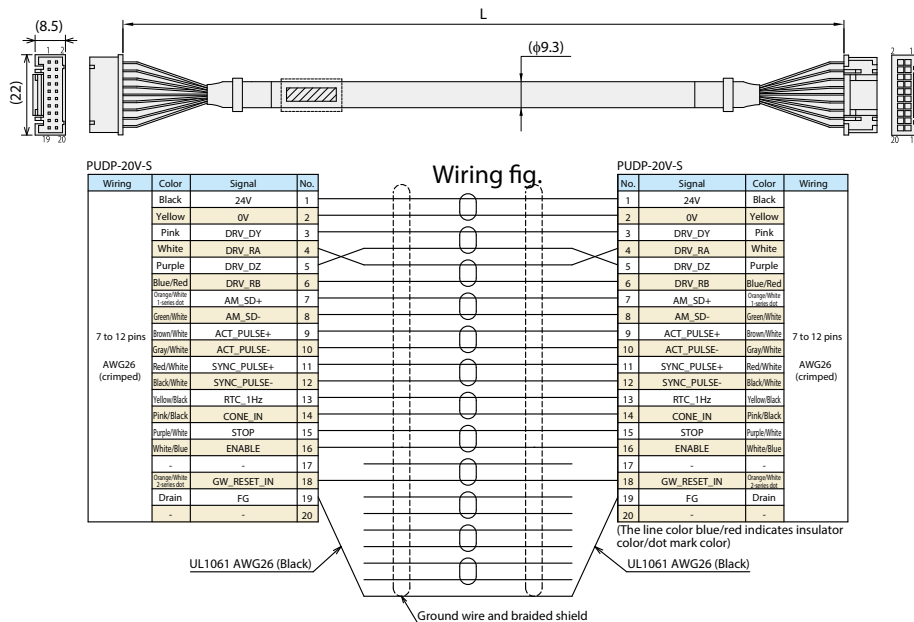


Minimum bending radius $r = 50\text{mm}$ or more (Dynamic bending condition)
* Please use the robot cable if the cable needs to be installed through the cable track.

(Controller side)				(Actuator side)			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
	(RC52)	(X3)			(RC52)	(X3)	
	-	-	10	1	A	Pink	White/Blue
	-	-	11	2	A	Purple	White/Yellow
	-	-	12	3	B	White	White/Red
	-	-	13	4	B	Blue/Red	White/Black
	-	-	14	5	Z	Orange/White	White/Purple
	-	-	15	6	Z	Green/White	White/Gray
	-	-	16	7	LS+	Brown/White	White/Orange
	-	-	17	8	LS-	Gray	White/Black
	-	-	18	9	FG	Drain	Drain
	-	-	19	10	SD	Blue	Orange
	-	-	20	11	SD	Orange	Green
	-	-	21	12	BAT+	Black	Purple
	-	-	22	13	BAT-	Yellow	Gray
	-	-	23	14	VCC	Green	Red
	-	-	24	15	GND	Brown	Black
	-	-	25	16	LS-	Gray	Blue
	-	-	26	17	BK+	Red	Yellow
	-	-	27	18	BK+	Red	Yellow

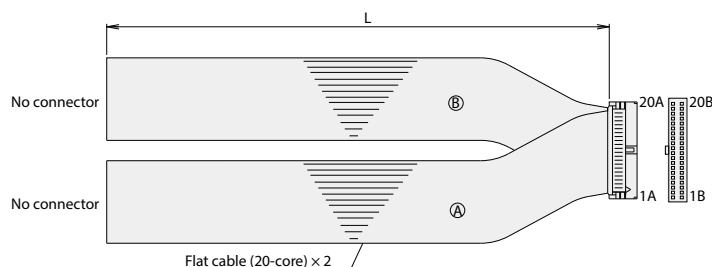
Model CB-RE-CTL

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



Model CB-PAC-PIO□□□

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

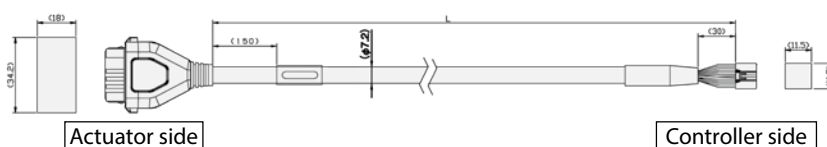


HIF6-40D-1.27R

No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
1A	24V	Brown-1		1B	OUT0	Brown-3	
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-REC-PWBIO□□□-RB

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

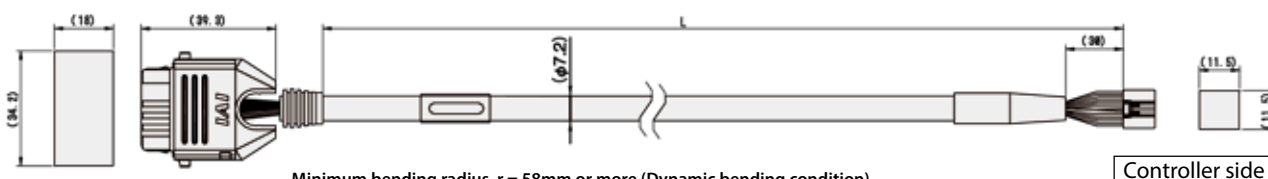


Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)
* Only the robot cable is available for this model.

Color	Signal name	Pin No.	Pin No.	Signal name	Color
Black (AWG18)	0V	A1	2	0V	Black (AWG18)
Red (AWG18)	24V(MP)	B1	1	24V(MP)	Red (AWG18)
Light blue (AWG22)	24V(CP)	A2	12	24V(CP)	Light blue (AWG22)
Orange (AWG26)	INO	B3	7	OUT0	Orange (AWG26)
Yellow (AWG26)	IN1	B4	8	OUT1	Yellow (AWG26)
Green (AWG26)	IN2	B5	9	OUT2	Green (AWG26)
Pink (AWG26)	SD+	B6	6	SD+	Pink (AWG26)
White (AWG26)	SD-	A6	10	SD-	White (AWG26)
Blue (AWG26)	OUT0	A3	3	INO	Blue (AWG26)
Purple (AWG26)	OUT1	A4	4	IN1	Purple (AWG26)
Gray (AWG26)	OUT2	A5	5	IN2	Gray (AWG26)
Brown (AWG26)	BKRLS	B2	11	BKRLS	Brown (AWG26)
			13	FG	Green (AWG26)

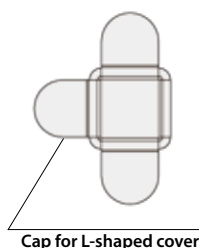
Model CB-REC2-PWBIO□□□-RB

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

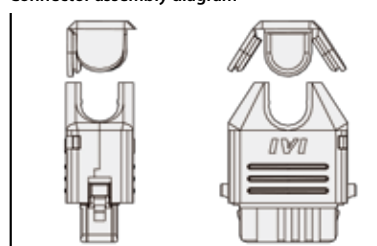


Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)
* Only the robot cable is available for this model.

Connector assembly diagram



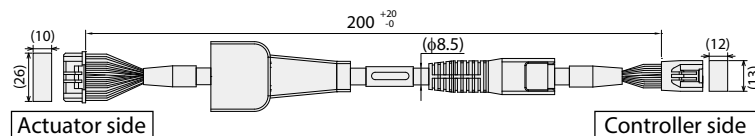
Cap for L-shaped cover



Color	Signal name	Pin No.	Pin No.	Signal name	Color
Black (AWG18)	0V	A1	2	0V	Black (AWG22)
Red (AWG18)	24V(MP)	B1	1	24V(MP)	Red (AWG22)
Light blue (AWG22)	24V(CP)	A2	12	24V(CP)	Light blue (AWG22)
Orange (AWG26)	INO	B3	7	OUT0	Orange (AWG26)
Yellow (AWG26)	IN1	B4	8	OUT1	Yellow (AWG26)
Green (AWG26)	IN2	B5	9	OUT2	Green (AWG26)
Yellow-Green (AWG26)	SD+	B6	6	SD+	Yellow-Green (AWG26)
Light gray (AWG26)	SD-	A6	10	SD-	Light gray (AWG26)
Blue (AWG26)	OUT0	A3	3	INO	Blue (AWG26)
Purple (AWG26)	OUT1	A4	4	IN1	Purple (AWG26)
Gray (AWG26)	OUT2	A5	5	IN2	Gray (AWG26)
Brown (AWG26)	BKRLS	B2	11	BKRLS	Brown (AWG26)
			13	FG	Green (AWG26)

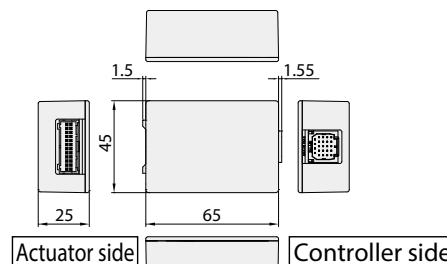
Model CB-CAN-AJ002

Model RCM-CV-APCS



Minimum bending radius $R \geq 3\text{m}$ or less $r = 68\text{mm}$ or more (Dynamic bending condition)

Pin No.	Signal name	Color	Pin No.	Signal name	Color
A1	PC	Blue (AWG22)	3	PC	Blue (AWG22)
B1	AC	Orange (AWG22)	5	AC	Orange (AWG22)
B2	DC	Brown (AWG22)	10	DC	Brown (AWG22)
A2	φA	Gray (AWG22)	9	φA	Gray (AWG22)
A3	φB	Gray (AWG22)	4	φA	Gray (AWG22)
B3	φB	Red (AWG22)	15	φB	Red (AWG22)
A6	SA(mABS)	Light blue (AWG26)	12	SA(mABS)	Light blue (AWG26)
B6	SB(mABS)	Orange (AWG26)	17	SB(mABS)	Orange (AWG26)
A7	A+	Green (AWG26)	1	A+	Green (AWG26)
B7	A-	Brown (AWG26)	6	A-	Brown (AWG26)
A8	B+	Gray (AWG26)	11	B+	Gray (AWG26)
B8	B-	Red (AWG26)	16	B-	Red (AWG26)
B9	VPS	Black (AWG26)	18	VPS	Black (AWG26)
A4	LS+	Yellow (AWG26)	8	LS+	Yellow (AWG26)
A5	BK+	Light blue (AWG26)	20	BK+	Light blue (AWG26)
B5	BK-	Orange (AWG26)	2	BK-	Orange (AWG26)
A10	VCC	Gray (AWG26)	21	VCC	Gray (AWG26)
B10	GND	Red (AWG26)	7	GND	Red (AWG26)
B4	LS-	Brown (AWG26)	14	LS-	Brown (AWG26)
A9	LS_GND	Green (AWG26)	13	LS_GND	Green (AWG26)
A11	-	-	19	-	-
B11	FG	Black (AWG26)	22	CF_VCC	Gray (AWG26)
			23	-	-
			24	FG	Black (AWG26)



RCP6S with Built-in Controller

Built-in controller for RCS6S



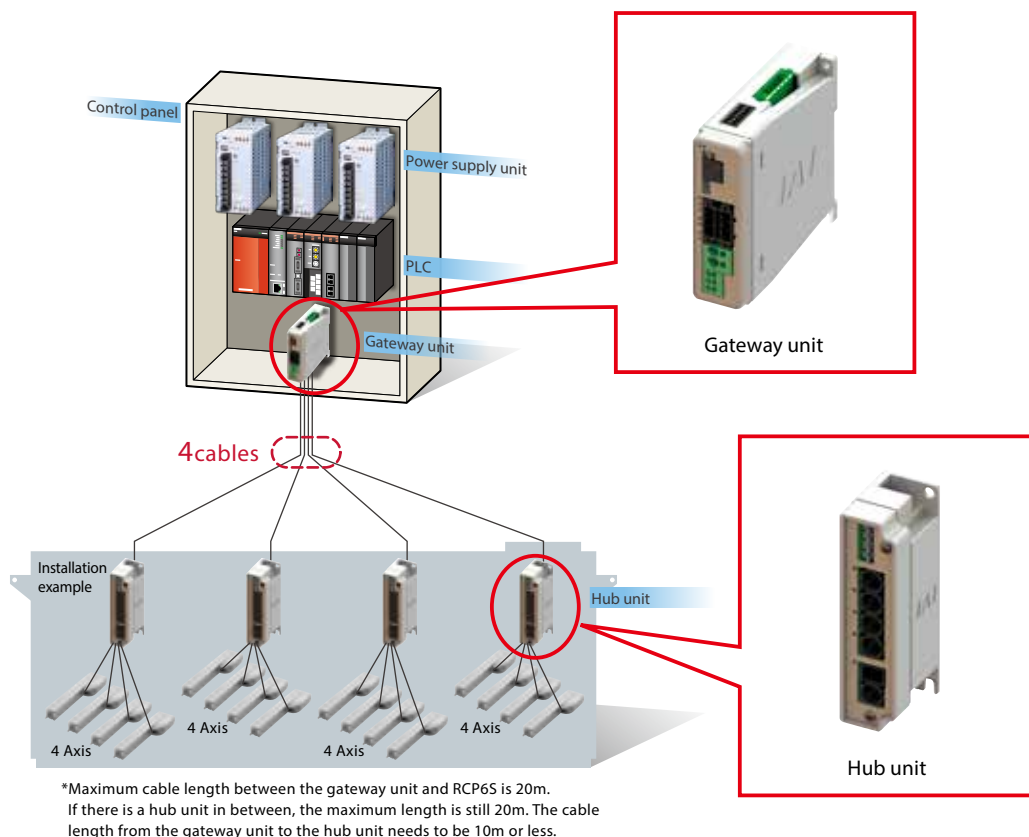
Features

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

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

*The number of connectable axes will vary depending on the type of field network and its mode. Please refer to P7-105 for details.

Control Panel for the RCP6S Built-in Controller Actuator



RCP 6S peripheral equipment

Gateway unit is required in order to operate RCP6S.

- Gateway unit: This unit is used in order to connect RCP6S to the field network. → See P7-105
- Hub unit: This unit can expand the number of axes connected to the gateway unit. → See P7-109
- PLC connection unit: This unit is used to connect RCP6S directly to the PLC using serial communication. → See P7-110
- Controller for RCP6S Gateway: Controllers for connection of actuators other than RCP6S to an RCP6S gateway within the system. → See P7-111

Basic Controller Specification List

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(5) Selection of power supply:

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

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

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

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

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

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

Option

Gateway Unit (RCM-P6GW)

Features:

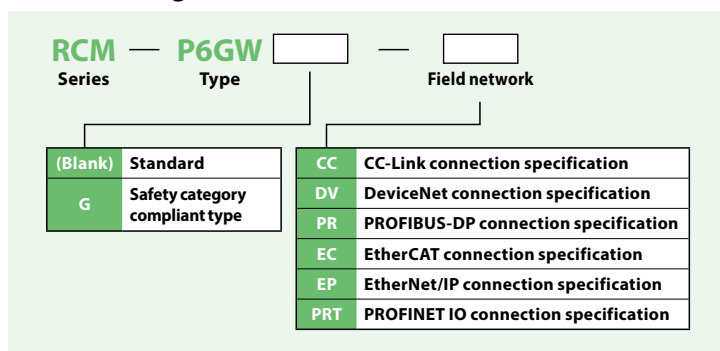
This unit is used in order to connect RCP6S to the field network.

Details:

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



Model Configuration

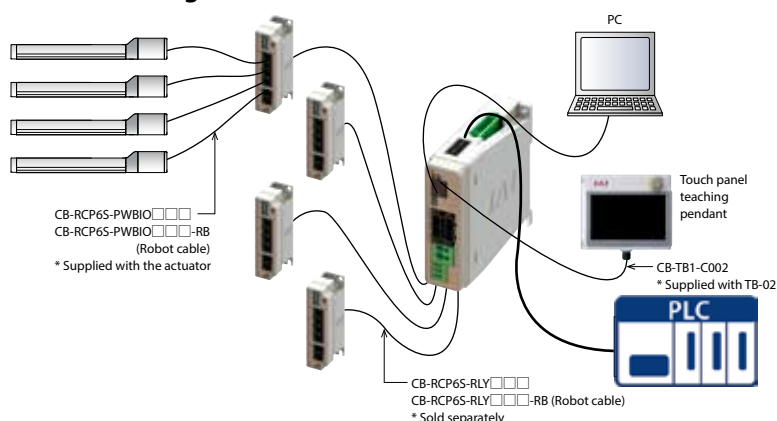


Standard price

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

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

Connection Image



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

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

(*2) Hub unit: See P7-109.

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.

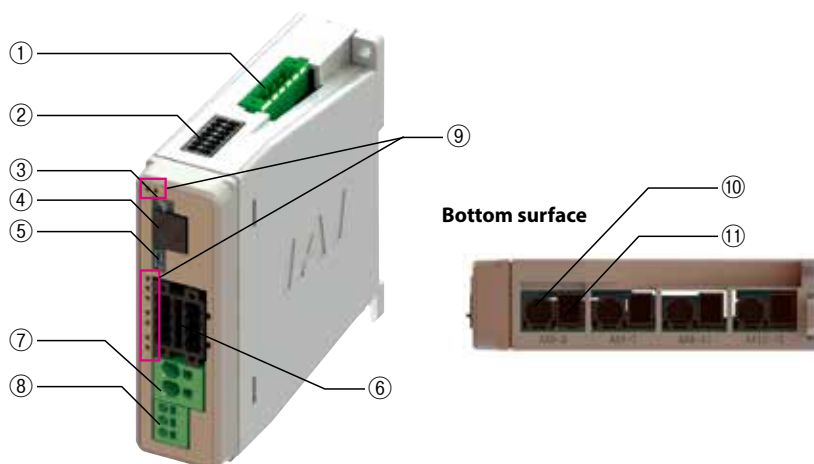
Operation mode	Description	Overview
Positioner 1/ Simple direct numerical value mode (Simple direct mode)	Positioner 1 mode can store up to 768 points of position data, and can move to the stored position. Both modes allow monitoring the current position numerically with 0.01mm increments. The simple 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.	<p>PLC</p> <p>Target position Target position number Control signal</p> <p>Current position Completed position number Status signal</p> <p>Communication via field network</p> <p>Gateway unit</p> <p>Hub unit</p> <p>+24V</p>
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.	<p>PLC</p> <p>Target position Positioning band Speed, acceleration/deceleration Pushing percentage Control signal</p> <p>Current position Motor current (command value) Current speed (command value) Alarm code Status signal</p> <p>Communication via field network</p> <p>Gateway unit</p> <p>Hub unit</p> <p>+24V</p>
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.	<p>PLC</p> <p>Target position number Control signal</p> <p>Completed position number Status signal</p> <p>Communication via field network</p> <p>Gateway unit</p> <p>Hub unit</p> <p>+24V</p>
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.	<p>PLC</p> <p>Target position number Control signal</p> <p>Completed position number Status signal</p> <p>Communication via field network</p> <p>Gateway unit</p> <p>Hub unit</p> <p>+24V</p>
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.	<p>PLC</p> <p>Target position number Control signal</p> <p>Current position Completed position number Status signal</p> <p>Communication via field network</p> <p>Gateway unit</p> <p>Hub unit</p> <p>+24V</p>

List of Functions by Operation Mode

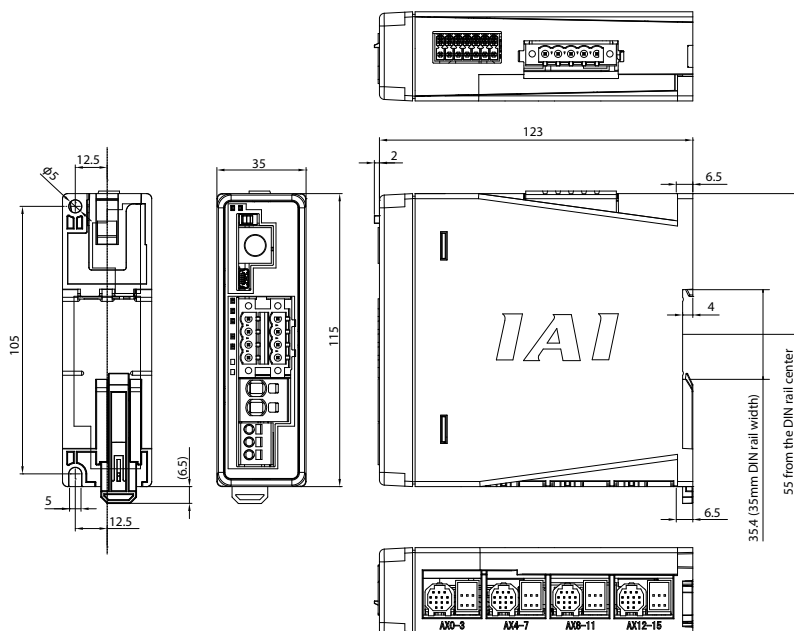
	Simple direct value mode	Positioner 1 mode	Direct numerical control mode (Direct indication/Full mode)	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Number of positioning points	768	768	Unlimited	768	256	16
Home return operation	○	○	○	○	○	○
Positioning operation	○	△	○	△	△	△
Speed, acceleration/deceleration 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



External Dimensions



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

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

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

Gateway Unit Basic Specifications

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

*1 See P. 7-105

Controller

R-unit

RCP6S

MCON
-CPCON
-CB/CFB

PCON

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

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Option

Hub Unit (RCM-P6HUB)

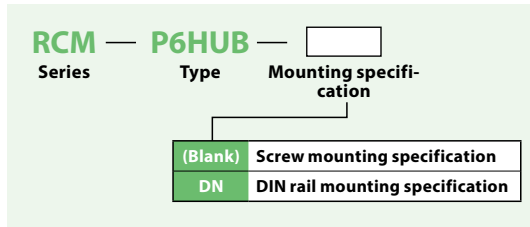
The hub unit cannot be used alone.
It must be used with a gateway unit.

Features:

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

* The number of connectable axes will vary depending on the type of field networks and its mode.
Please refer to P7-105 for details and confirm the "Number of connectable axes".

Model Configuration

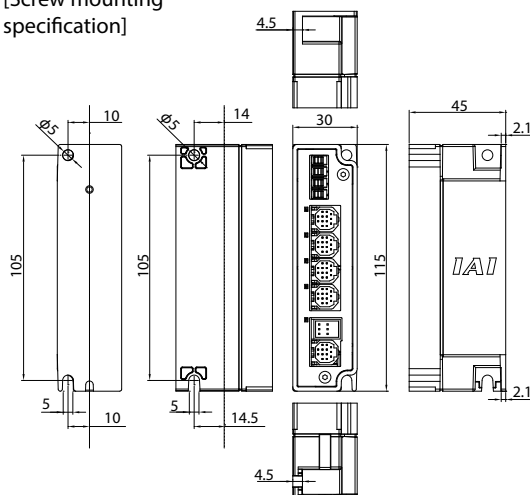


Specification

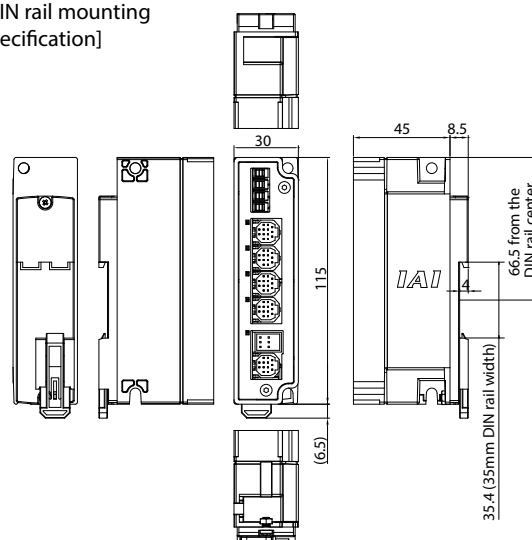
Specification	Description
Number of controlled axes	4 axes max.
Power supply voltage	24VDC±10%
Control power capacity	0.3A (single hub unit)
Motor power capacity	12.8A max. from connected axes
Emergency stop input	None
Enable input	None
LED display	SYS LED × 1 (RUN/ALM) AXIS LED × 4 (RUN/ALM)
Electromagnetic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

External Dimensions

[Screw mounting specification]



[DIN rail mounting specification]



CAD drawings can be downloaded from our website:
www.intelligentactuator.com



Option

PLC Connection Unit (RCB-P6PLC)

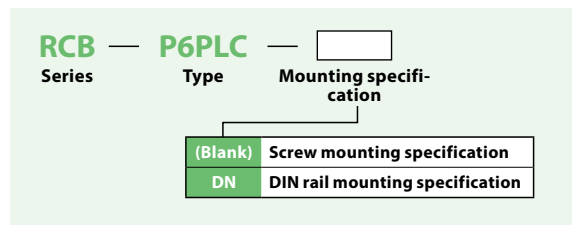
Features:

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

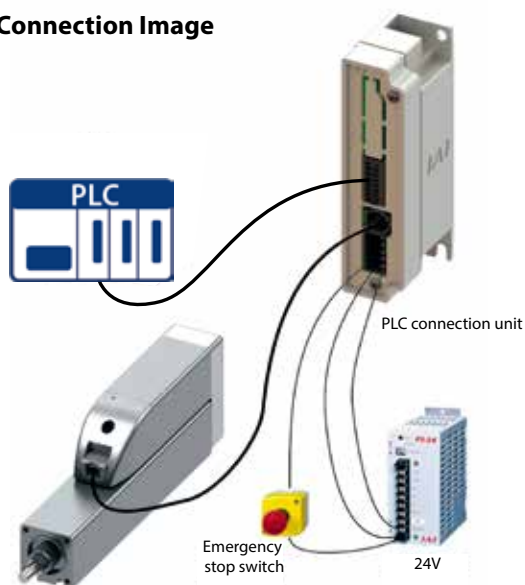
The RCP6S and the PLC connection unit can be easily connected with a cable.

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

Model Configuration



Connection Image

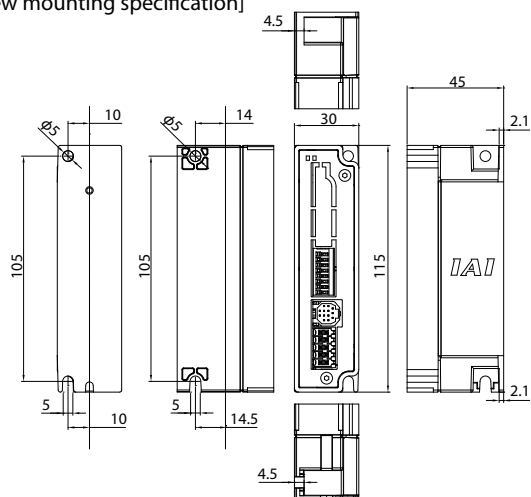


Specification

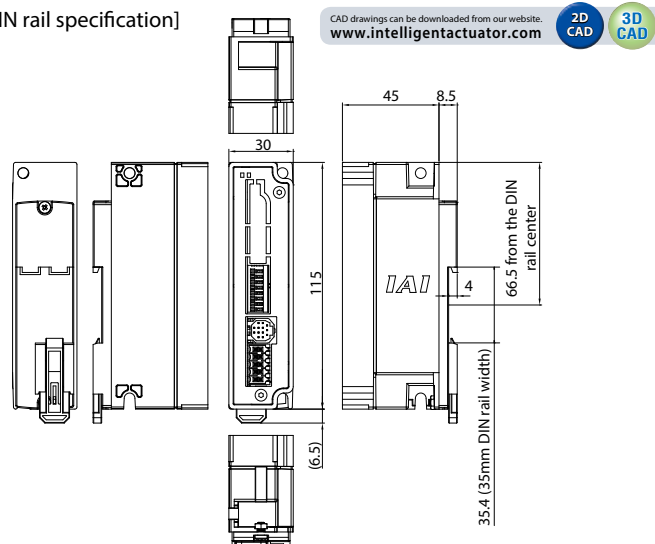
Specification	Description
Number of controlled axes	1-axis
Power supply voltage	24VDC \pm 10%
Control power capacity	0A for single PLC connection unit 0.3A for connected PLC units + RCP6S built-in driver • For brake types, 0.7A for 0.2 sec is required for releasing brake
Motor power capacity	Depending 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 10M Ω
Contamination	Contamination 2
Weight	65g
External dimensions	35W \times 115H \times 45D
Overseas Accreditations	CE, cUL (Both Acquired)

External Dimensions

[Screw mounting specification]



[DIN rail specification]



Option

RCP6S Gateway Controller <RCM-P6□C>

Features:

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

Details:

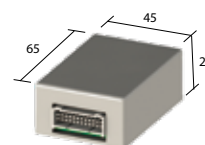
- RCP2~6, RCA, RCA2, RCD actuators can be connected.
* Some products may not be supported
- RCP2~4, RCA, and RCA2 connections require a converter unit.
- The same control as an RCP6S built-in controller is possible.
(Refer to P7-106 for details about control operation modes.)
- The actuator and controller information during operation can be displayed on a PC screen as a wave form through the use of PC dedicated software.
(Current position, current speed, servo motor, etc)



RCM-P6PC

RCM-P6DC

RCM-P6AC



RCM-CV-APCS
(Converter unit)

Model Configuration

RCM Series	Type	Motor Type	Encoder Type	Options	I/O Type	I/O Cable Length	Input Power	Mounting Specifications																																																						
P6PC	Stepper motor				SE SIO specifications		0 24VDC																																																							
P6AC	Servo motor			HA High acceleration/deceleration specifications *1 LA Energy saving compatible *1		0 No cable																																																								
P6DC	Brush-less DC motor type																																																													
<table border="1"> <thead> <tr> <th colspan="2">Stepper motor</th> <th colspan="2">Servo motor</th> <th colspan="2">Brush-less DC motor type</th> </tr> </thead> <tbody> <tr> <td>20P</td> <td>20□</td> <td>2</td> <td>2W</td> <td>3D</td> <td>3W</td> </tr> <tr> <td>20SP</td> <td>20□</td> <td>5</td> <td>5W</td> <td></td> <td></td> </tr> <tr> <td>28P</td> <td>28□</td> <td>5S</td> <td>5W</td> <td></td> <td></td> </tr> <tr> <td>28SP</td> <td>28□</td> <td>10</td> <td>10W</td> <td></td> <td></td> </tr> <tr> <td>35P</td> <td>35□</td> <td>20</td> <td>20W</td> <td></td> <td></td> </tr> <tr> <td>42P</td> <td>42□</td> <td>20S</td> <td>20W</td> <td></td> <td></td> </tr> <tr> <td>42SP</td> <td>42□</td> <td>30</td> <td>30W</td> <td></td> <td></td> </tr> <tr> <td>56P</td> <td>56□</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>									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□				
Stepper motor		Servo motor		Brush-less DC motor type																																																										
20P	20□	2	2W	3D	3W																																																									
20SP	20□	5	5W																																																											
28P	28□	5S	5W																																																											
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35P	35□	20	20W																																																											
42P	42□	20S	20W																																																											
42SP	42□	30	30W																																																											
56P	56□																																																													
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DN	DIN rail mounting specification																																																													

*1: RCA series dedicated

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

Notes

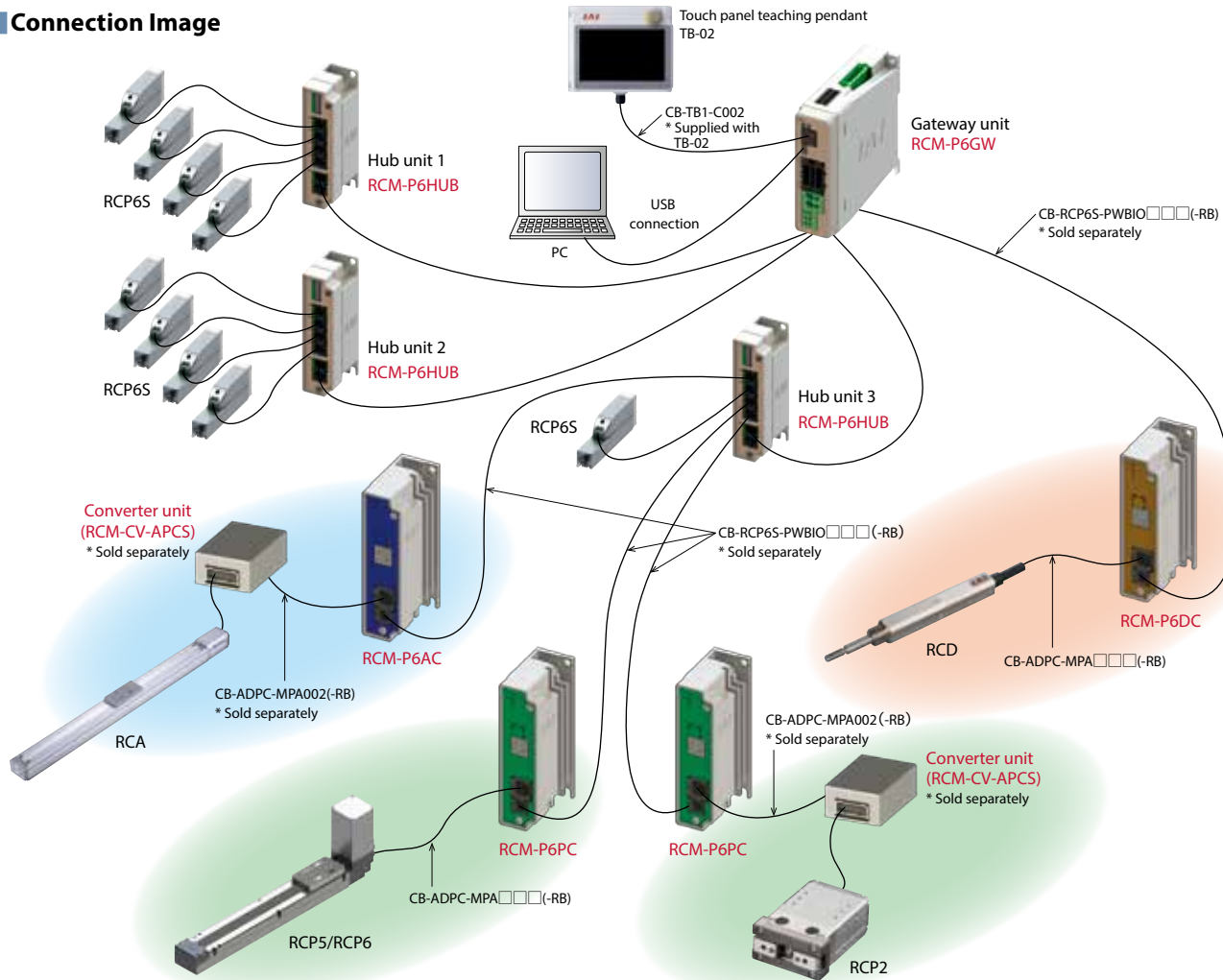
In principle, the same type of motor as the type of motor of the actuator to be connected should be entered, however, there are some models where the motor type of some controllers and actuators do not match. Be sure to check the corresponding models listed below during selection.

<20SP/28SP/42SP/55/20S Target Actuators>

- Motor Type [20SP]...RCP3-RA2AC RCP3-RA2BC
- Motor Type [28SP]...RCP2-RA3C
- Motor Type [42SP]...RCP4-RA5C
- Motor Type [55]...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 P7-114.

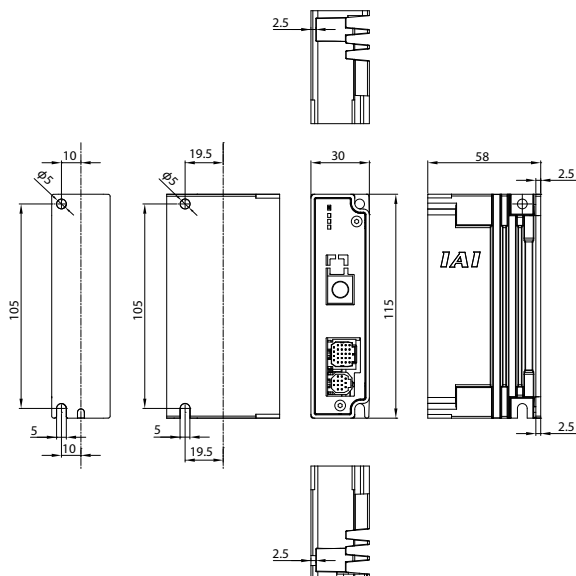
* The field network can be used by connecting to a gateway unit.

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

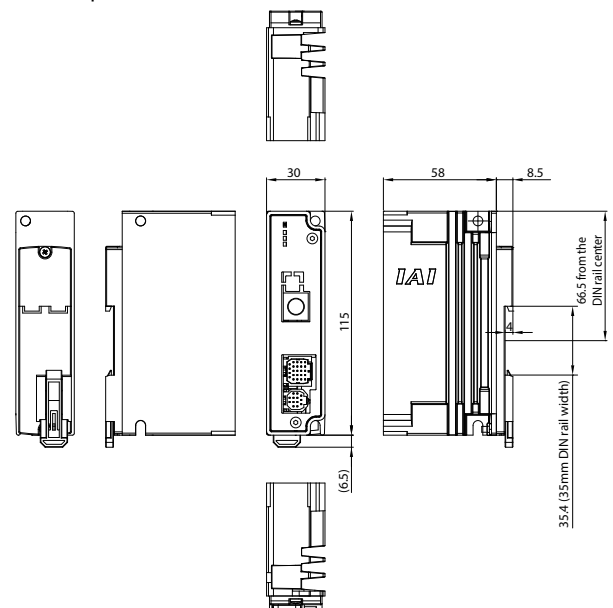
* Maximum cable length between the gateway unit and actuator is 20m for RCM-P6PC and RCM-P6AC, and 10m for RCM-P6DC.

External Dimensions

[Screw fixing specification]



[DIN rail specification]



Option

Specification

Specified Items	Specification Content				
Model number	RCM-P6PC		RCM-P6AC		RCM-P6DC
Number of controlled axes	1-axis				
Controller power	24VDC ± 10%				
Control power capacity	0.3A • For RCP6 types with brakes only, 0.7A for 0.2 sec is required for releasing brake		0.3A		
Motor power capacity	20P, 28P	High power setting Disabled: Maximum 1.0 A	10W, 20W	Rated 1.3 A / maximum 4.4 A (Maximum 2.5 A at power saving)	Rated 0.7 A Maximum 1.5 A
	35P, 42P, 56P	High power setting Disabled: Maximum 1.7 A	20W, (20S)	Rated 1.7 A / maximum 5.1 A (Maximum 3.4 A at power saving)	
		High power setting Enabled: Rated 3.2 A/ Maximum 4.2 A	30W	Rated 1.3 A / maximum 4.0 A (Maximum 2.2 A at power saving)	
Inrush current	8.3A		10A		
Emergency stop input	B contact input				
Enable input	None				
T.P. enable input	Yes				
Enable operation	Servo OFF				
Backup memory	FRAM (256kbit), No. of overwrites: Unlimited				
Calendar function	None (unless connected to a GW unit)				
Cooling method	Natural air cooling				
Supported encoders	• 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-***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-RAA4C	—
RCP6-RAA6C	—
RCP6-RAA7C	—
RCP6-RAA4R	—
RCP6-RAA6R	—
RCP6-RAA7R	—
RCP6-WRA10C	—
RCP6-WRA12C	—
RCP6-WRA14C	—
RCP6-WRA10R	—
RCP6-WRA12R	—
RCP6-WRA14R	—
RCP4-RA3C	—
RCP4-RA5C	—
RCP4-RA3R	—
RCP4-RA5R	—
RCP3-RA2AC	—
RCP3-RA2BC	—
RCP3-RA2AR	—
RCP3-RA2BR	—
RCP2-SRA4R	—
RCP2-SRG54R	—
RCP2-SRGD4R	—

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

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

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

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

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

- When using the actuator with "○" displayed, the conversion unit (RCM - CV - APCS) is required.
- Please contact IAI if you require a simple absolute encoder specification type.
- The connecting cable for the RCP4/RCP2CR/RCP2W series is CB-ADPCMPA□□□□ (-RB) + CB-CAN-AJ002.
(The cable CB-CAN-AJ002 is not necessary for the gripper (GR□□), ST4525E and SA3/RA3.)
- The connecting cable for the RCP3 series is CB-RCAPC-MPA□□□□ (-RB).

RCM-P6AC Compatible Actuators

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

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

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

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

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

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

RCM-P6DC Compatible Actuators

Rod Type	
Model	Conversion unit
RCD-RA1DA	—

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

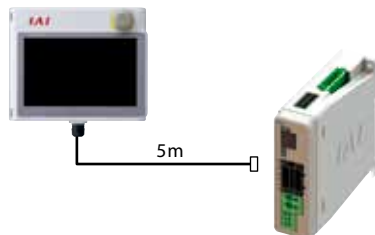
Option

Touch panel teaching pendant

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

Model **TB-02-**□

Configuration



Specification

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

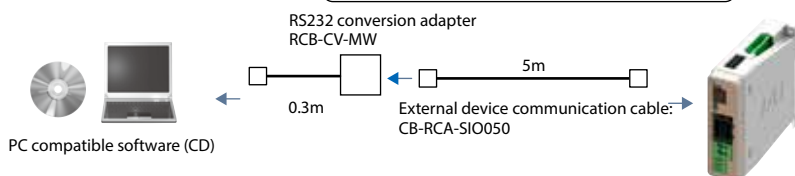
PC dedicated teaching software (Windows only)

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

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

Configuration

Please contract IAI for the current supported versions.



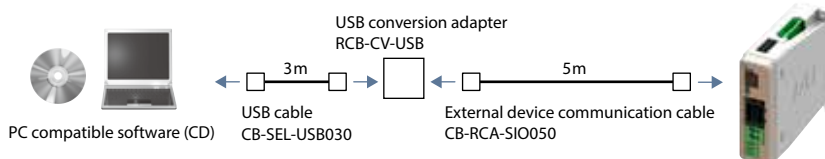
Supported Windows version 7/8/8.1/10



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

Configuration

Please contract IAI for the current supported versions.



Maintenance parts

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

* The total length of the cable is limited.
See the cautions on P7-103 and P7-112.

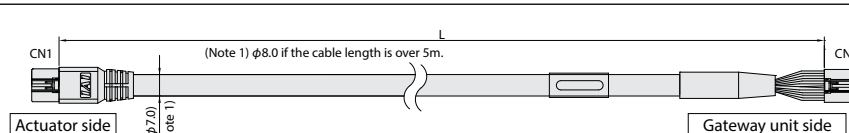
Table of compatible cables

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

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

Maintenance parts

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

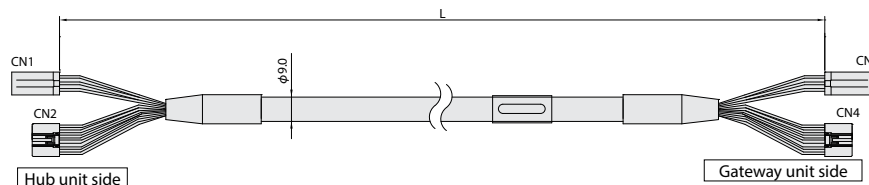


Minimum bending R 5 m or less $r = 56$ mm or more (for movable use)
Longer than 5 m $r = 64$ mm or more (for movable use)

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

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

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



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

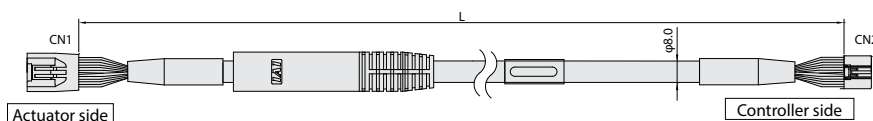
* The robot cable is a cable of the flex-resistant specification. Use a robot cable to pass through the cable track.

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

CN1				CN3			
Color	Signal	Pin No.		Pin No.	Signal	Color	
Brown(AWG18)	MP	B1		B1	MP	Brown(AWG18)	
Gray(AWG18)	MP	B2		B2	MP	Gray(AWG18)	
Red(AWG18)	MP	B3		B3	MP	Red(AWG18)	
Blue(AWG18)	GND	A1		A1	GND	Blue(AWG18)	
Orange(AWG18)	GND	A2		A2	GND	Orange(AWG18)	
Green(AWG18)	GND	A3		A3	GND	Green(AWG18)	

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

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



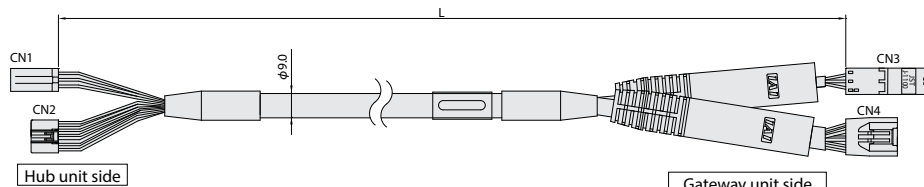
Minimum bending R $r = 64$ mm or more (for movable use)

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

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

CN1				CN2			
Color	Signal	Pin No.		Pin No.	Signal	Color	
Gray(AWG18)	CP	B1		1	CP	Gray(AWG18)	
Blue(AWG18)	MP	B2		8	MP	Blue(AWG18)	
Orange(AWG18)	MP	B3		9	MP	Orange(AWG18)	
Green(AWG18)	GND	A1		10	GND	Green(AWG18)	
Brown(AWG18)	GND	A2		11	GND	Brown(AWG18)	
Orange(AWG26)	AM SD+	6		6	AM SD+	Orange(AWG26)	
Light blue(AWG26)	AM SD-	2		2	AM SD-	Light blue(AWG26)	
Red(AWG26)	CT SD+	7		7	CT SD+	Red(AWG26)	
Gray(AWG26)	CT SD-	3		3	CT SD-	Gray(AWG26)	
Green(AWG26)	BK	4		4	BK	Green(AWG26)	
Brown(AWG26)	EMGS	5		5	EMGS	Brown(AWG26)	
NC	NC	13		13	NC	NC	
Black(AWG26)	FG	12		12	FG	Black(AWG26)	

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



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

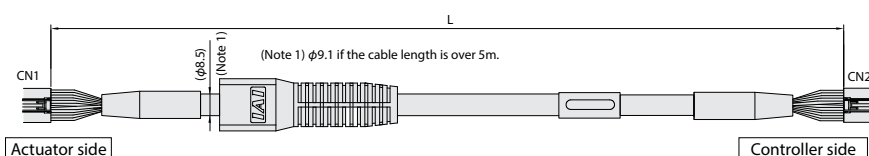
* The robot cable is a cable of the flex-resistant specification. Use a robot cable to pass through the cable track.

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

CN1				CN3			
Color	Signal	Pin No.		Pin No.	Signal	Color	
Brown(AWG18)	MP	B1		B1	MP	Brown(AWG18)	
Gray(AWG18)	MP	B2		B2	MP	Gray(AWG18)	
Red(AWG18)	MP	B3		B3	MP	Red(AWG18)	
Blue(AWG18)	GND	A1		A1	GND	Blue(AWG18)	
Orange(AWG18)	GND	A2		A2	GND	Orange(AWG18)	
Green(AWG18)	GND	A3		A3	GND	Green(AWG18)	

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

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



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

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

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

CN1				CN2			
Color	D	A	P	Pin No.	Signal	Color	
Blue(AWG22/19)	U	U	ΦA	3	ΦA	U	Blue(AWG22/19)
Orange(AWG22/19)	V	V	V	5	VMM	V	Orange(AWG22/19)
Brown(AWG22/19)	—	—	ΦB	10	ΦB	—	Brown(AWG22/19)
Gray(AWG22/19)	—	—	VMM	9	VMM	—	Gray(AWG22/19)
Green(AWG22/19)	W	W	ΦA	4	ΦA	W	Green(AWG22/19)
Red(AWG22/19)	—	—	ΦB	15	ΦB	—	Red(AWG22/19)
Black(AWG26)	BK	L5+	8	8	L5+	BK	Black(AWG26)
Yellow(AWG26)	BK	L5-	14	14	L5-	BK	Yellow(AWG26)
Blue(AWG26)	A+	A+	S(MB)	12	S(MB)	A+	Blue(AWG26)
Orange(AWG26)	A-	A-	S(MB)	17	S(MB)	A-	Orange(AWG26)
Green(AWG26)	B+	B+	A+	1	A+	B+	Green(AWG26)
Brown(AWG26)	B-	B-	A-	6	A-	B-	Brown(AWG26)
Gray(AWG26)	H51	IN	S(MB)	11	H51	IN	Gray(AWG26)
Red(AWG26)	H52	IN	S(MB)	16	H52	IN	Red(AWG26)
Blue(AWG26)	—	LS+	BK+	20	BK+	LS+	Blue(AWG26)
Orange(AWG26)	—	LS-	BK-	2	BK-	LS-	Orange(AWG26)
Gray(AWG26)	VCC	VCC	VCC	21	VCC	VCC	Gray(AWG26)
Red(AWG26)	GND	GND	GND	7	GND	GND	Red(AWG26)
Brown(AWG26)	—	VPS	VPS	18	VPS	VPS	Brown(AWG26)
Green(AWG26)	H53	IN	LS	13	H53	IN	Green(AWG26)
—	—	—	—	19	—	—	—
Pink(AWG26)	—	BAT+	CF	22	CF	BAT+	Pink(AWG26)
—	—	—	—	23	—	—	—
Black(AWG26)	FG	FG	FG	24	FG	FG	Black(AWG26)

MCON-C/CG

Multi-axis CON Series
Position Controller



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

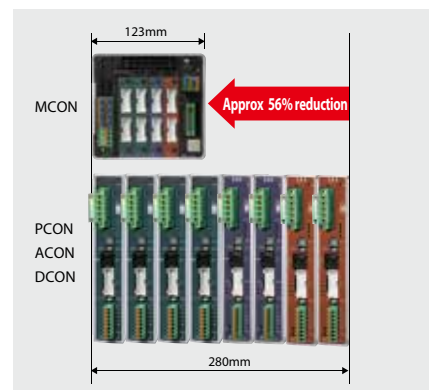
Features

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

1 Saves space and reduces cost

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

* Mcon-c/CG



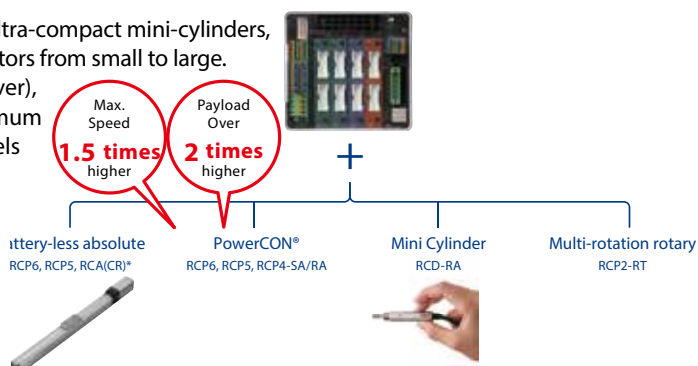
2 Accommodates a wide range of actuators

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

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

Allows the installation of 7 types of driver boards

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



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

3 Many useful functions

Function of servo monitoring in the AUTO mode.

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

The calendar function

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

Smart tuning function

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

Off-board tuning function (for AC servo motor)

- The optimum gain is set according to the payload.

Vibration control function (for AC servo motor)

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

Acceleration/deceleration mode specification

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

Axis name display function

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

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

MCON



(*1) See P7-119.

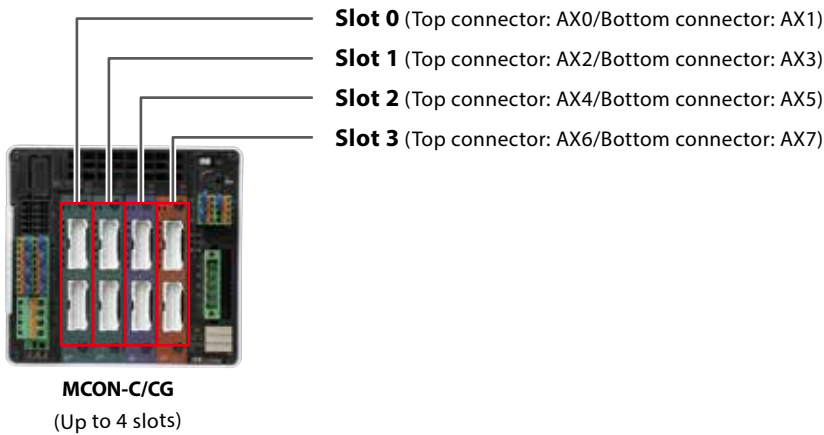
(Note 1) Please be sure to check P7-20 for the caution when selecting.

ABB	Absolute battery box included (Simple absolute specification)
ABBN	Absolute battery box not included (Simple absolute specification)
(Blank)	Battery-less absolute Incremental

* RCD series does not support the simple absolute specification.

Details of MCON Slots

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



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

Details of each slot

(1st axis: Top connector)			(2nd axis: Bottom connector)		
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Motor Type	Encoder Type	Option	Motor Type	Encoder Type	Option

- Slot 1 has a single board, and it is not possible to connect different motor types (Stepper/AC servo/DC Brush-less) or different encoder types (WAI/SA/I) to the same board.
- Depending on the actuator type, 2 axes or only one axis can be connected to Slot 1.

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

- If only 1 axis is connected to 1 slot, the model name of the second axis/bottom connector will be "N".
- When using RCP5/RCP4 with high-output setting enabled, please enter "T" in the option column.

Entry examples for each slot

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

Slot 0Slot 1Slot 2

35PWAIT-N-35PWAIT-N-35PWAIT-N

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

Slot 0Slot 1

20WAI-20WAI-3DI-N

Please refer to the next page(P 7-121) for the combination examples of each axis.

MEMO









Controller

MCON
-C

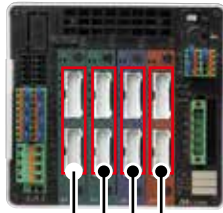
MCON Driver Board Combination Examples

Controller

The table below shows driver board combination examples of MCON.

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

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



Note: RCD series does not support the simple absolute specification.

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

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

標準価格表

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

① Base price by type

Select standard type (MCON-C) or safety category compliant type (MCON-CG).



② Slot model price

Add the price of the slot types specified in the 0~3 slots.



③ Quantity of simple absolute

Add the price of the number of axes to be operated by the simple absolute.

1	
Base price by type	
Description	Model
Standard	MCON-C
Safety category compliant type	MCON-CG



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



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

* ☐ indicates the motor size.

4 Quantity of batteries for simple absolute

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

5 I/O type

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

4		5	
Quantity of batteries for simple absolute		I/O type (Standard type is not NP, PLC function type can be selected only NP.)	Price
Number of axes		Type	number number
Axis 1	+	PIO specification (NPN specification)	NP
Axis 2	+	DeviceNet connection specification	DV
Axis 3	+	CC-Link connection specification	CC
Axis 4	+	CC-Link IE Field connection specification	CIE
Axis 5	+	PROFIBUS-DP connection specification	PR
Axis 6	+	CompoNet connection specification	CN
Axis 7	+	EtherNet/IP connection specification	EC
Axis 8	+	EtherCAT Motion specification	ECM
		EtherNet/IP connection specification	EP
		PROFINET IO connection specification	PRT
		SSCENT connection specification	SSN
		MeCHATRO LINK III connection specification	ML3
			Standard price by specification

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

R-unit

RCP6S

MCON-C

PCON-CB/CFB

PCON

ACON-CB
DCON-CBACON
DCON

SCON-CB

SCON-CB
(Servo press)

SCON-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

System Configuration

Controller

Option

PC dedicated teaching software

(See P7-133)

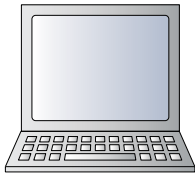
Software only

<Model: IRCM-101-MW>

Supplied with the dedicated connection cable

<Model: RCM-101-USB>

* MCON is supported by Ver.10.00.00.00 or later.



Option

Touch panel teaching box

(See P7-133)

<Model Number TB-02-□>



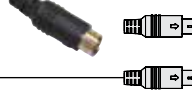
Included with MCON-CG

Dummy plug

(See P7-133)

<Model Number DP-5>

5m



Dedicated connection cable

The cable is supplied with the absolute battery box.

0.5m



Option

Absolute battery box

(See P7-133)

<Model Number MSEP-ABB>

Replacement battery

(See P7-133)

<Model Number AB-7>

* If the simple absolute specification is selected for a controller model, an absolute battery box will be included. (See P6-55 for the dimensions) del, an absolute battery box will be included. (See P7-132 for dimensions)



Fieldbus

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

* In order to connect to the fieldbus, communication setting of the controller is necessary. Please set with gateway parameter setting tool included with PC dedicated software or TB-02. If you do not have it, please purchase PC dedicated software. (See P7-133)

* Fieldbus connection cable should be prepared by customer.

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



MCON-C/CG

Option

24VDC power supply

(See P7-311)

<Model: PSA-24>



Integrated motor-encoder cable

(See P7-134)

<Model: CB-CAN-MPA □□□>

Integrated motor-encoder robot cable

(See P7-134)

<Model: CB-CAN-MPA □□□-RB>

Integrated motor-encoder cable

(See P7-134)

<Model: CB-CA-MPA □□□>

Integrated motor-encoder robot cable

(See P7-134)

<Model: CB-CA-MPA □□□-RB>

Integrated motor-encoder robot cable

(See P7-135)

<Model: CB-APSEP-MPA □□□>

* Only robot cable is available for this model.



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



RCP4 Series



RCP3/RCA2/RCL Series

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

System Configuration

Controller

Option

PC dedicated teaching software

(See P7-133)

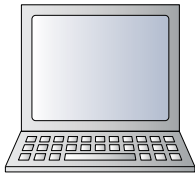
Software only

<Model: IRCM-101-MW>

Supplied with the dedicated connection cable

<Model: RCM-101-USB>

* MCON is supported by Ver.10.00.00.00 or later.



Option

Touch panel teaching box

(See P7-133)

<Model Number TB-02-□>



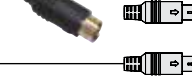
Included with MCON-CG

Dummy plug

(See P7-133)

<Model Number DP-5>

5m



Dedicated connection cable

The cable is supplied with the absolute battery box.

0.5m



Option

Absolute battery box

(See P7-133)

<Model Number MSEP-ABB>

Replacement battery

(See P7-133)

<Model Number AB-7>

* If the simple absolute specification is selected for a controller model, an absolute battery box will be included. (See P6-55 for the dimensions) del, an absolute battery box will be included. (See P7-132 for dimensions)



Fieldbus

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

* In order to connect to the fieldbus, communication setting of the controller is necessary. Please set with gateway parameter setting tool included with PC dedicated software or TB-02. If you do not have it, please purchase PC dedicated software. (See P7-133)

* Fieldbus connection cable should be prepared by customer.

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



MCON-C/CG



Option

24VDC power supply

(See P7-311)

<Model: PSA-24>

Integrated motor-encoder cable

(See P7-134)

<Model: CB-CAN-MPA □□□>

Integrated motor-encoder robot cable

(See P7-134)

<Model: CB-CAN-MPA □□□-RB>

Integrated motor-encoder cable

(See P7-134)

<Model: CB-CA-MPA □□□>

Integrated motor-encoder robot cable

(See P7-134)

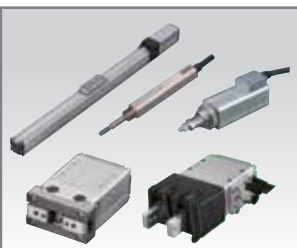
<Model: CB-CA-MPA □□□-RB>

Integrated motor-encoder robot cable

(See P7-135)

<Model: CB-APSEP-MPA □□□>

* Only robot cable is available for this model.



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



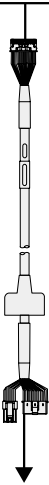
RCP4 Series



RCP3/RCA2/RCL Series

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

Controller
R-unit
RCP6S
MCON-C
PCON-CB/CFB
PCON
ACON-CB DCON-CB
ACON DCON
SCON-CB
SCON-CB (Servo press)
SCON-CAL
MSCON
SSEL
MSEL
XSEL
XSEL (SCARA)
PSA-24
TB-02
TB-03



Integrated motor-encoder robot cable
(See P7-135)
<Model: CB-PSEP-MPA□□□>
* Only robot cable is available for this model.

(See P7-135)
<Model: CB-APSEP-MPA□□□>
* Only robot cable is available for this model.



Integrated motor-encoder robot cable
(See P7-135)
<Model: CB-RPSEP-MPA□□□>
* Only robot cable is available for this model.



Integrated motor-encoder robot cable
(See P7-135)
<Model: CB-ASEP2-MPA□□□>
* Only robot cable is available for this model.

(See P7-135)
<Model: CB-APSEP-MPA□□□>
* Only robot cable is available for this model.



Control method by controller type

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

Control method

Since MCON-C / CG does not have a sequence function in the controller, it operates by receiving a command such as a moving position from the upper PLC.

Field bus control operation mode

■MCON-C/CG Case

The fieldbus control operation mode of the MCON-C/CG can be performed using a control mode selected from the table below. (*1)

To perform operations, the required data (target position, speed, acceleration, push current, etc.) is written on the specified address from the connected upper PLC.

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

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

*1 Except for MECHATROLINK III and SSCNET.

List of Functions by Operation Mode

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

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

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

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

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

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

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

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

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

I/O Signal Function Details

The following table shows functions assigned to the controller I/O.

Set to the remote I/O mode and select the PIO patterns from 0-5.

The controller can be operated by turning each port number ON/OFF via the network.

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

(Note 1) Can be switched by Parameter No. 149 "Zone output switching".

(Note 2) When the driver for stepper motor is selected, it can be switched by the Parameter No. 156 "Torque detection/Minor failure output".

Minor fault output is used for the AC servo motor driver / DC brushless motor driver.

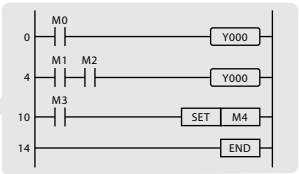
* In the table above, the # symbol accompanying each code indicates a negative logic signal.

* PIO pattern 3 is not available.

MCON-C / CG operation method

In case of Fieldbus specification

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



Ladder program

Positioning complete signal
Move complete position number
Current position

Specify movement position
(Position specification)
(Direct numerical designation)

No	Position [mm]	Speed [mm/s]	ACC [G]	DCL [G]
0	0.00	300.00	0.20	0.20H
1	50.00	300.00	0.20	0.20H
2	75.00	300.00	0.20	0.20H

Position data



Actuator



Tools required for setting

- 1 Touch panel teaching pendant (See P7-133)
- 2 PC dedicated teaching software (See P7-133)
- 3 Gateway parameter setting tool

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

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

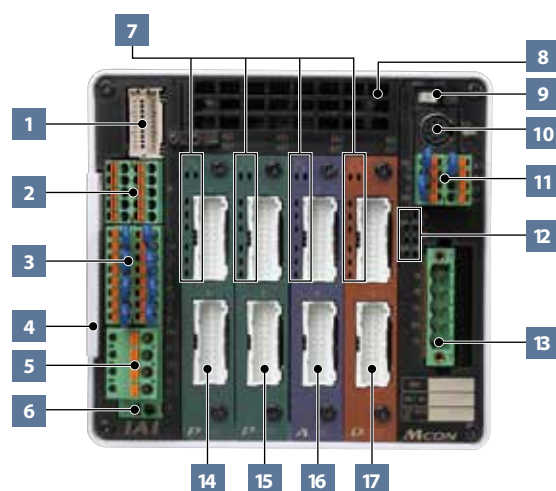
XSEL
(SCARA)

PSA-24

TB-02

TB-03

Name of each part of MCON controller



Descriptions of Each Component

1 Connector for the absolute data backup battery

This connects the absolute data backup battery box should the controller be the simple absolute type.

2 Connector for the external brake input

This signal input connector is used to release the actuator brake externally.

3 Motor power cut-off and emergency stop input connector

In/out terminals for external relay for motor power cut-off and connectors for emergency stop input, for each driver slot (2 axes).

4 Information card for configuration of the connecting axes

The information card contains information regarding the configuration of the controller axes which is removable to examine the contents.

5 +24V power supply input connector

This is the main power supply connector for the controller: The motor power can be shut-off while the control power remains turned ON at the time of an emergency stop. This is because the power supply terminals for the motor and the controller are separate.

6 FG terminal block

It is a terminal block for frame ground.

7 Status LEDs for drivers

The driver status and absolute status are displayed per slot (2 axes).

8 Fan unit

A fan unit that can be easily replaced. (Replacement fan unit Model: MSEP-FU)

9 AUTO/MANU switch

A switch for the automatic / manual operation.

10 SIO connector

A connector for connecting the touch panel teaching pendant and PC dedicated software cable.

11 System I/O connector

The connector for remote AUTO/MANU switch input and emergency stop input for the entire controller with functions including an external regeneration-resistance expansion terminal and an external SIO terminal.

12 Status LEDs for fieldbus

Status display LEDs for controller and fieldbus.

13 Fieldbus connector / Extended I / O

MCON-C / CG is equipped with various fieldbus connectors. MCON-LC / LCG can optionally install expansion I / O.

14 ~ 17 Motor-encoder connectors for actuator connections

Connect motor-encoder cables for actuators.

General specifications

Specification	Description						
Number of controlled axes	MAX. 8 axes						
Controller/Motor input power supply voltage	24VDC ±10%						
Brake release power consumption current	0.15A×Number of axes						
Control power consumption current	1.0A						
Control power inrush current (Note 1)	MAX 5A 30ms or less						
Motor consumption current	Actuator type				Rating	Maximum	
						Energy saver	Standard/Hi-accel./decel.
	Stepper motor (Note 2)	RCP2	20P~28P				2.0A
		RCP3	28SP~56P				2.0A
		RCP4	28P~56P	High-output disabled			2.0A
		RCP5 RCP6		High-output enabled (Note 3)	3.5A		4.2A
	AC servo motor (Note 2)	2W			0.8A		4.6A
		5W(RCA2)			1.0A		3.3A
		5W(RCL)			1.0A		6.4A
		10W(RCL)			1.3A		6.4A
		10W(RCA/RCA2)			1.3A	2.5A	4.4A
		20W			1.3A	2.5A	4.4A
		20W(20S type)			1.7A	3.4A	5.1A
		30W			1.3A	2.2A	4.0A
Brush-less DC motor	3W			0.7A		1.5A	
Motor power inrush current (Note 1)	Slot numbers × 10A max., 5ms or less						
Motor-encoder cable length	Max. 20 m (*) For simplified absolute specifications or when connecting with RCD, the maximum is 10 m.						
Serial communication (SIO port: teaching only)	RS485: 1ch (Modbus protocol) Speed: 9.6~230.4kbps						
External interface	DeviceNet, CC--Link, CC-Link IE, PROFIBUS-DP, CompoNet, EtherCAT, EtherCAT Motion, EtherNet/IP, PROFINET IO, SSCNET, MECHATROLINK III						
Data setting, input method	PC dedicated teaching software, touch panel teaching pendant, Gateway parameter setting tool						
Data retention memory	Position data and parameters are saved in non-volatile memory. (No limit to rewrite)						
Number of positioning points	256 points (Unlimited for simple numerical control and direct numerical control) (*) The number of positioning points vary depending on the motion mode selection set by the parameter.						
LED display (installed on the front panel)	Status LED for driver: 8 LEDs (for each driver board) Status LED for fieldbus: 7 LEDs						
Electromagnetic brake forced release	Enable to force-release by transmitting a deactivation signal to each axis (24VDC input).						
Protection function (Note 4)	Overcurrent protection (each slot has its own solid-state motor cut-off circuit built-in)						
Electric shock protection mechanism	Class 1, basic insulation						
Insulation resistance	DC500V 10MΩ						
Weight	620/ 690g when the simple absolute spec. is selected /Additional 1,950g						
Cooling method	Forced air cooling						
External dimensions	123W×115H×95D						
Ambient operating temp. & humidity	0~40°C, 85% RH or less (Non-condensing)						
Vibration resistance	Frequency: 10~57Hz/Amplitude: 0.075mm, Frequency: 57~150Hz/Acceleration: 9.8m/s² XYZ directions, Sweepage time: 10 minutes, Number of Sweepage time:10 times						
Impact resistance	Drop height: 800mm 1 corner, 3 edges, 6 faces						
Degree of protection	IP20						
PLC function (* MCON - LC / LCG)	Dedicated ladder (program capacity 12 K steps)						

(Note 1) Please note that the inrush current value varies depending on the impedance of the power line.

(Note 2) The current will be highest in the exciting phase detection performed in the first servo ON process after the power is turned on.

(Stepper motor: 100ms (normal)/AC servo motor: approx. 1 \sim 2 seconds (normal), up to 10 seconds)

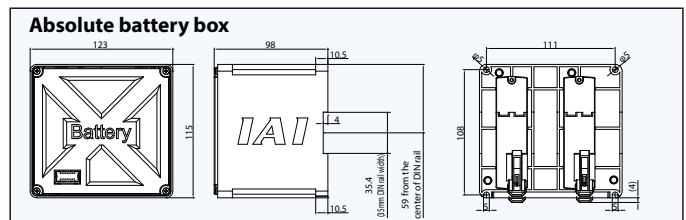
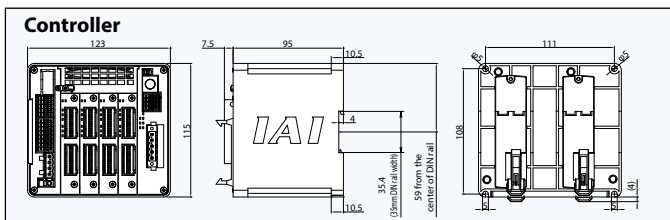
(Note 3) The driver board of high-output configuration specification can be used to control one axis per slot.

(Note 4) The AC servo motor will function if the load current reaches equal to or greater than 1.4 times the maximum value.

CAD drawings can be downloaded from our website.

www.intelligentactuator.com2D
CAD3D
CAD

External Dimensions



Maintenance parts

When placing an order for a replacement cable, please refer to the model below. (* Refer to P1-101 for the actuator to be connected.)

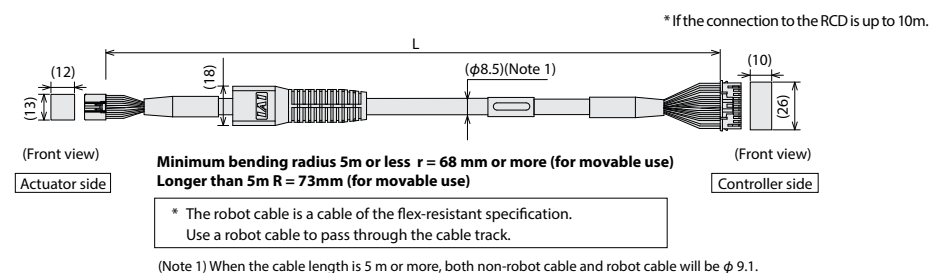
■ Table of compatible cables

Product model		Motor Encoder Integrated Cable Motor Encoder	Integrated Robot Cable
①	RCP6/RCP5 RCP6CR/RCP6W/RCP5CR/RCP5W	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
②	RCP4 RCP4CR		
③	RCP4 RCP4CR RCP4W (Models other than ②)	CB-CA-MPA □□□	CB-CA-MPA □□□ -RB
④	RCP3	—	CB-APSEP-MPA □□□
⑤	RCP2 RCP2CR RCP2W		
⑥	GRSS/GRSL/GRST/GRHM/GRHB/ SRA4R/SRGS4R/SRGD4R	—	CB-RPSEP-MPA □□□
⑦	RTBS/RTBSL RTCS/RTCSL		
⑧	GRS/GRM GR3SS/GR3SM	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
⑨	RTBS/RTBSL RTCS/RTCSL/RTB/RTBL/RTC/RTCL/ RTBB/RTBBL/RTCB/RTCBL		
⑩	RCP2/RCP2CR/RCP2W (models other than ⑤ ~ ⑧)	—	CB-PSEP-MPA □□□
⑪	RCA2/RCA2CR/RCA2W	—	CB-APSEP-MPA □□□
⑫	RCA2/RCA2CR/RCAW (when CNS is selected)	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
⑬	RCA RCA2CR RCAW	—	CB-APSEP-MPA □□□
⑭	SRA4R SRGS4R SRGD4R		
⑮	Models other than ⑬	—	CB-ASEP2-MPA □□□
⑯	RA1DA	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
⑰	GRSNA		
⑱	RCL	—	CB-APSEP-MPA □□□

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

Model CB-CAN-MPA□□□/CB-CAN-MPA□□□-RB

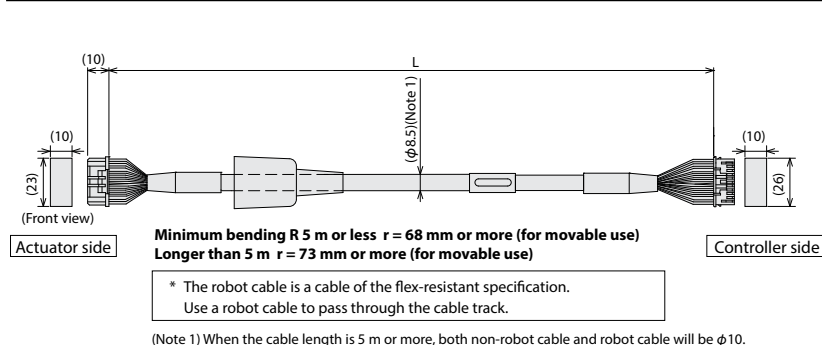
* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD). E.g.) 080 = 8m



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

Model CB-CA-MPA□□□/CB-CA-MPA□□□-RB

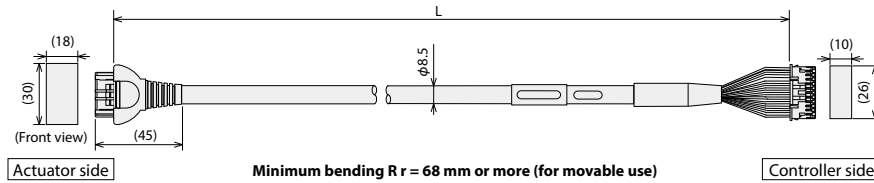
* Please indicate the cable length (L) in □□□, maximum 20m (10m when connecting to RCD). E.g.) 080 = 8m



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

Model CB-APSEP-MPA

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

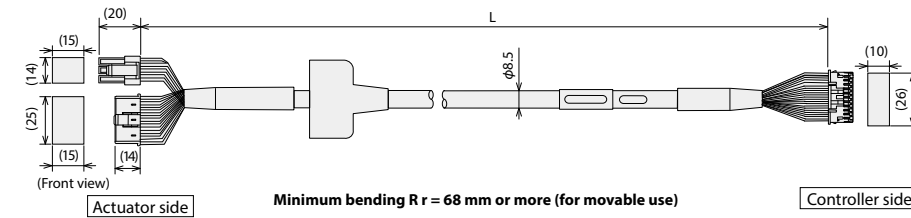


Actuator side 1-1827863-1 (AMP)			Controller side PADP-24V-1-S (JST)		
Pin No.	Signal name	Color	Pin No.	Signal name	Color
A1	ΦA	Black	1	ΦA	Black
B1	VMM	White	2	VMM	White
A2	ΦA	Brown	5	ΦA	Brown
B2	ΦB	Green	3	ΦB	Green
A3	VMM	Yellow	4	VMM	Yellow
B3	ΦB	Red	6	ΦB	Red
A4	LS+	Orange	7	LS+	Orange
B4	LS-	Grey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

Model CB-PSEP-MPA

* Only robot cable is available for this model.

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

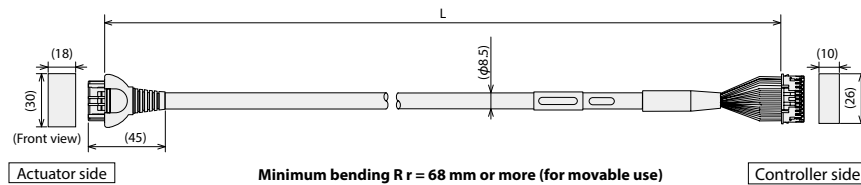


Actuator side Terminal number		Controller side Terminal number	
1	[ΦA]	1	
2	[VMM]	2	
4	[ΦB]	3	
5	[VMM]	4	
3	[ΦA]	5	
6	[ΦB]	6	
16	[BK+]	9	
17	[BK-]	10	
5	NC	11	
6	NC	12	
13	[LS+]	7	
14	[LS-]	8	
1	[A+]	13	
2	[A-]	14	
3	[B+]	15	
4	[B-]	16	
10	[VCC]	17	
11	[VPS]	18	
9	[GND]	19	
12	[reserve]	20	
15	NC	21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

Model CB-RPSEP-MPA

* Only robot cable is available for this model.

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

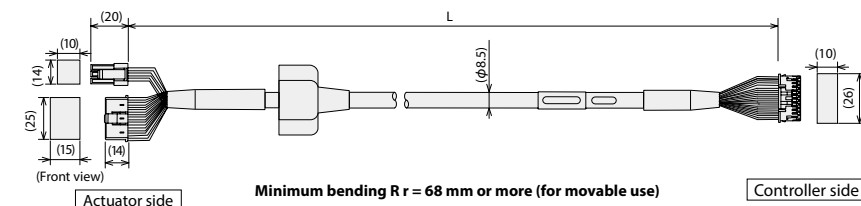


Actuator side Terminal number		Controller side Terminal number	
A1	[ΦA]	1	
B1	[VMM]	2	
A2	[ΦA]	3	
B2	[ΦB]	4	
A3	[VMM]	5	
B3	[ΦB]	6	
A6	[LS+]	7	
B6	[LS-]	8	
A7	[A+]	13	
B7	[A-]	14	
A8	[B+]	15	
B8	[B-]	16	
A4	NC	---	
B4	NC	---	
A5	[BK+]	9	
B5	[BK-]	10	
A9	[GNDLS]	20	
B9	[VPS]	18	
A10	[VCC]	17	
B10	[GND]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

Model CB-ASEP2-MPA

* Only robot cable is available for this model.

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



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

MEMO

Controller

MCON
-C

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.

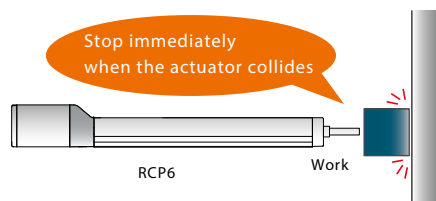


2 PowerCON® Equipped

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.



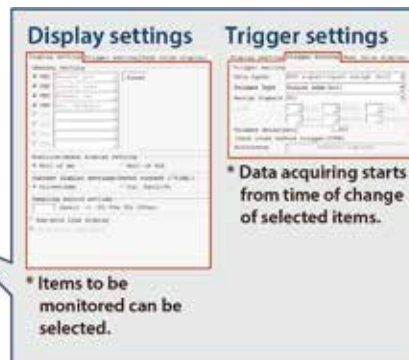
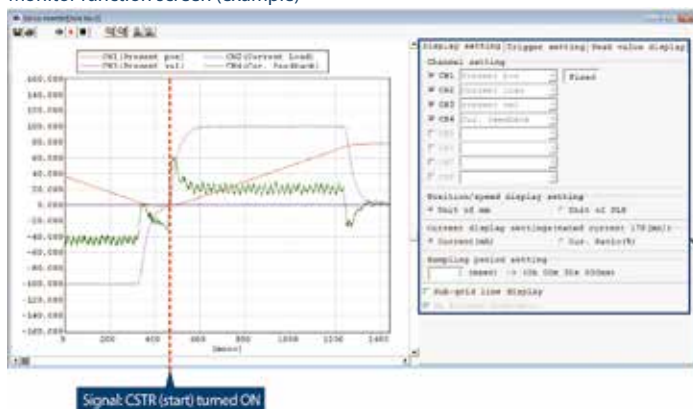
4 Enhanced Monitor Functions

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	MECHA-TROLINK I,II*1	MECHA-TROLINK III*1	EtherCAT	EtherNet/IP	PROFINET IO
I/O type model number			NP/PN	PLN/PLP	DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT
PCON-CB/CGB	Battery-less absolute specification		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Simple absolute spec.	With absolute battery	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		With absolute battery unit	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Without absolute battery	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PCON-CFB/CGFB	Battery-less absolute specification		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Incremental specification		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

Model Specification Items

PCON — — — — — — **0** — —

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

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

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

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

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

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

Please be sure to check P7-20 for the caution when selecting.

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

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

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

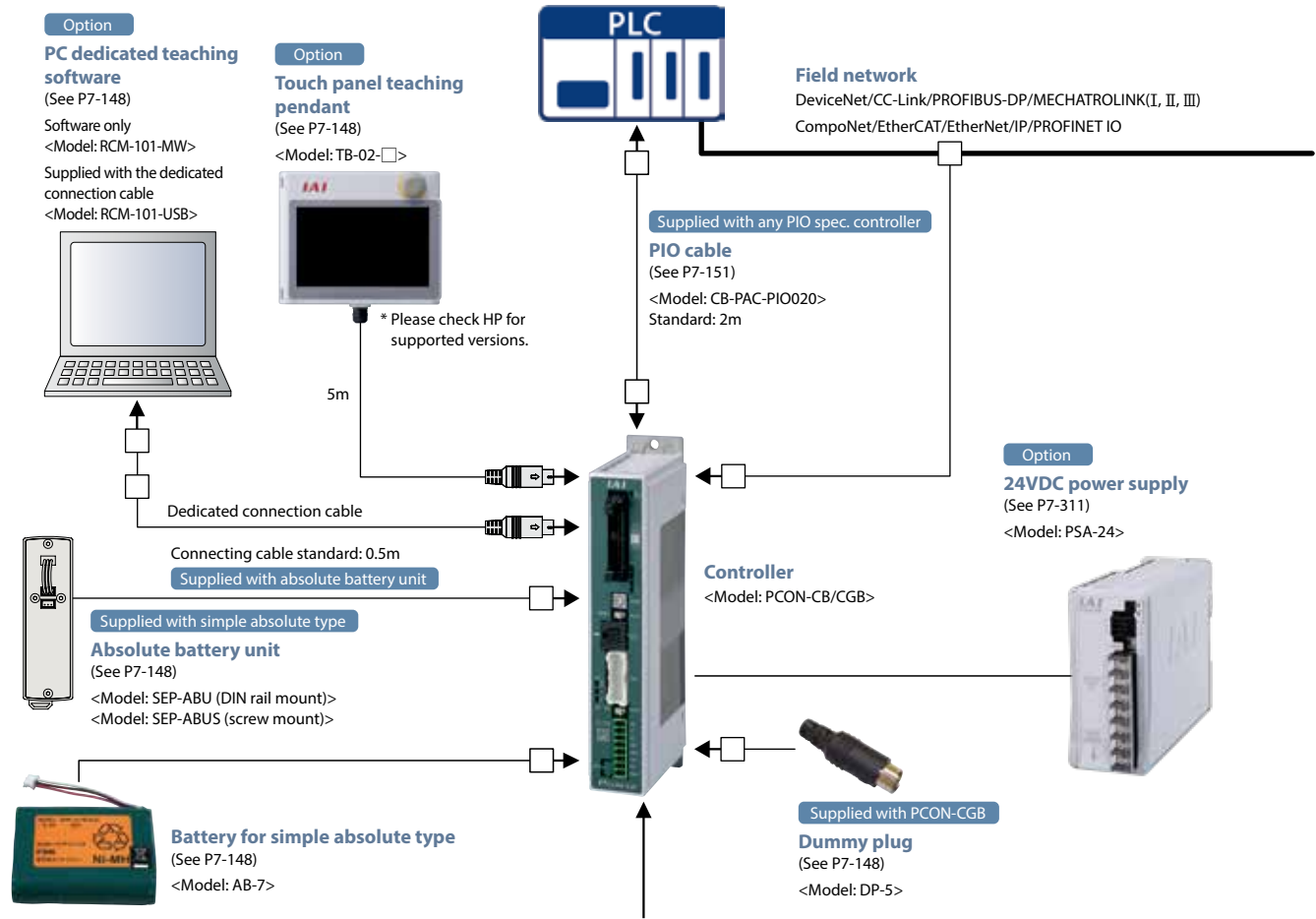
* PCON-CFB/CGFB does not support a simple absolute specification.

(Blank)	Screw mounting specification
DN	DIN rail mounting specification

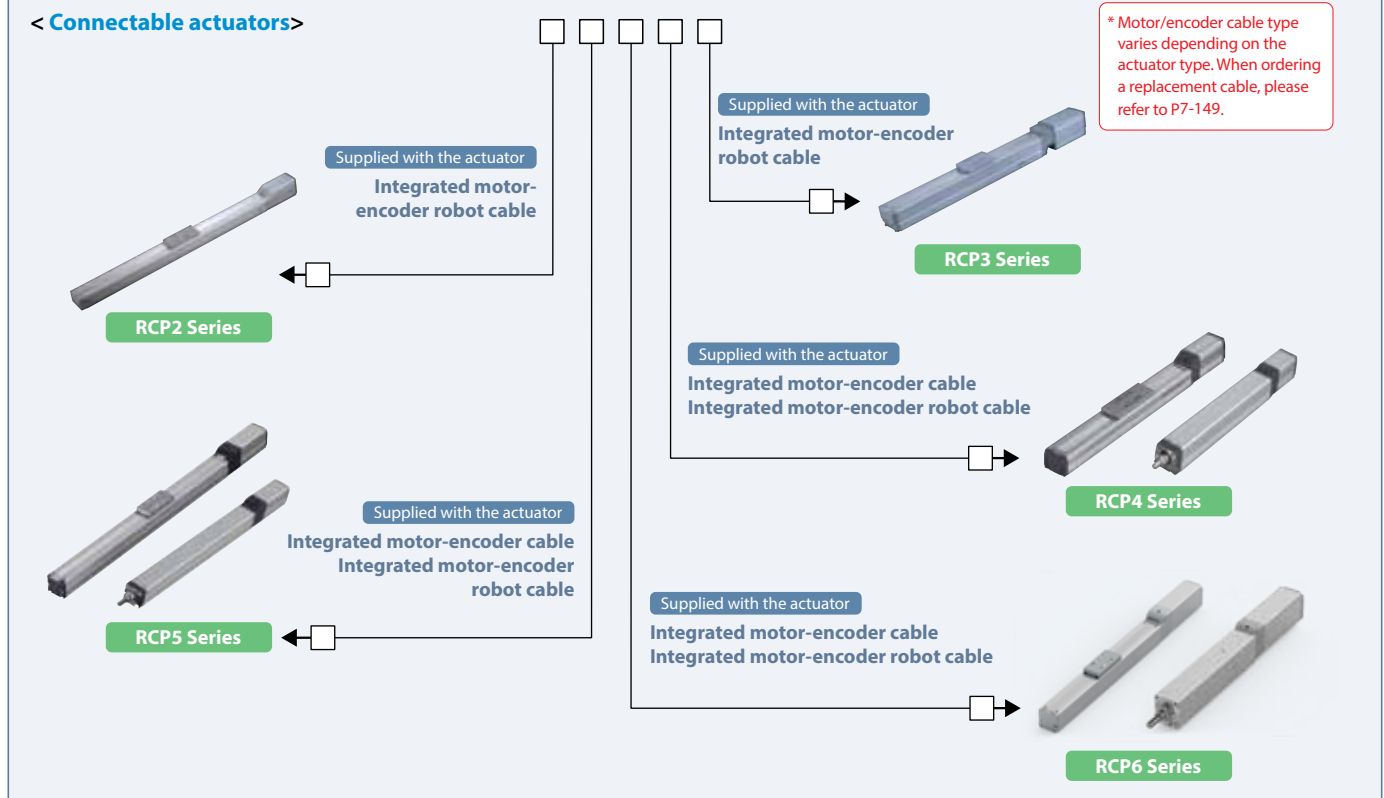
* The mounting type (screw or DIN rail) of the absolute battery unit and the controller must be the same.

System Configuration

PowerCON150 <PCON-CB/CGB>

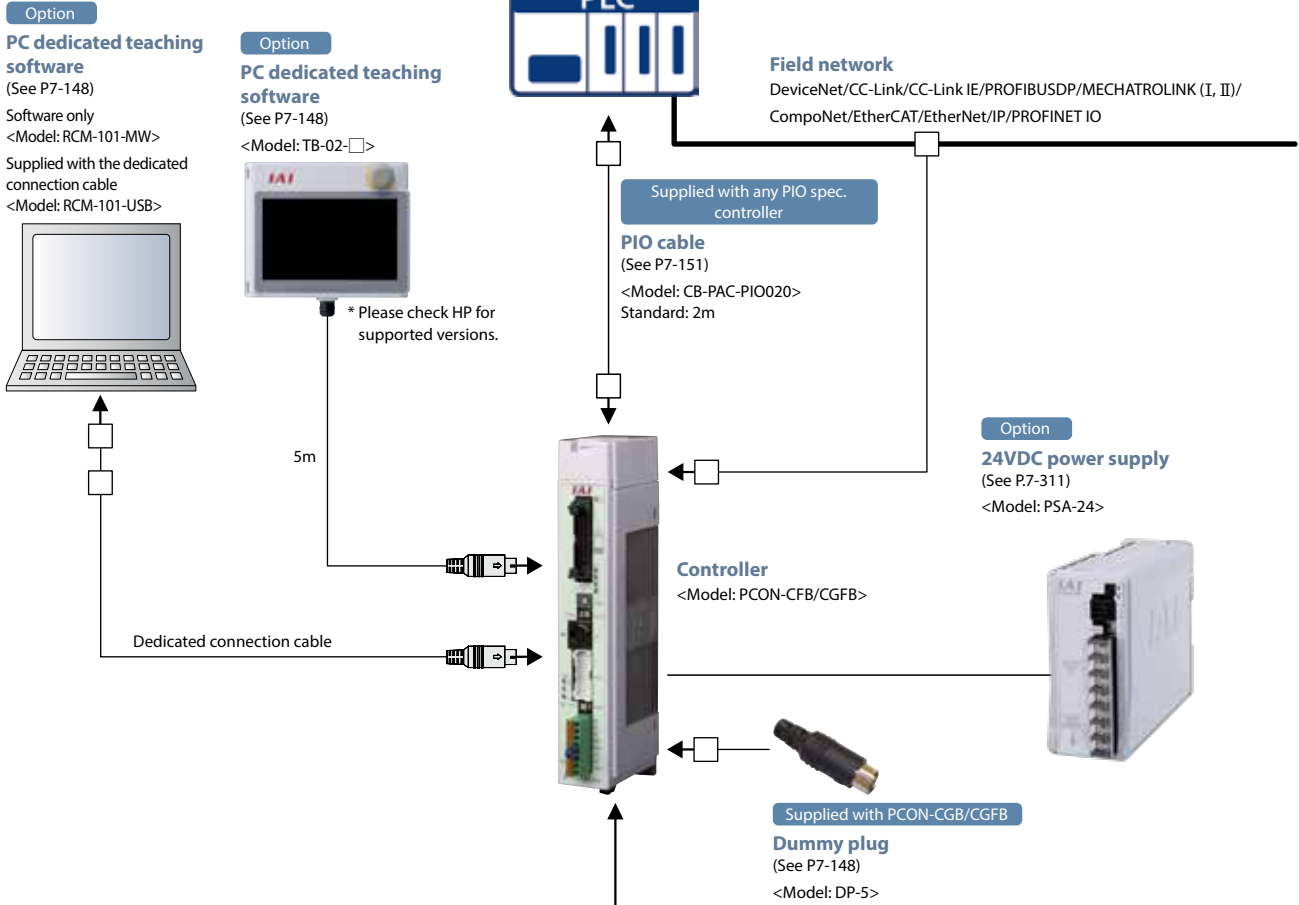


<Connectable actuators>

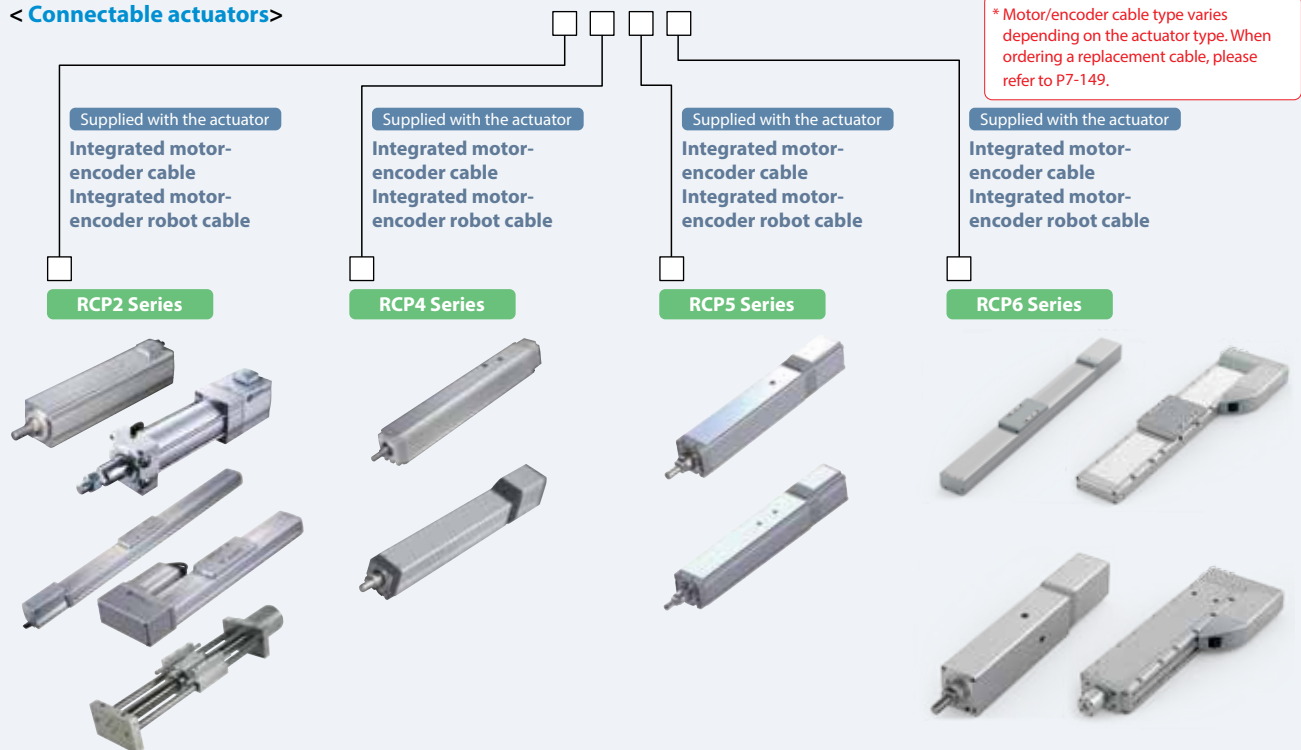


System Configuration

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



<Connectable actuators>

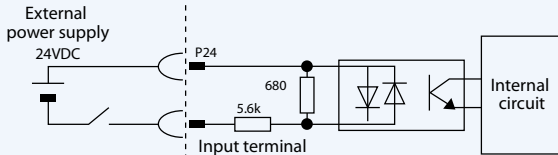


PIO I/O Interface

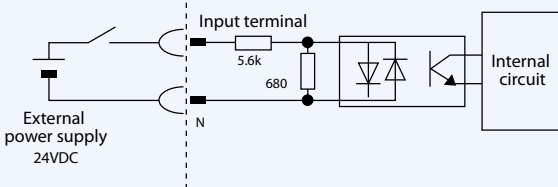
Input part External input specification

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

NPN specification



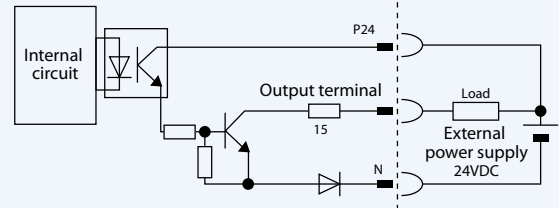
PNP specification



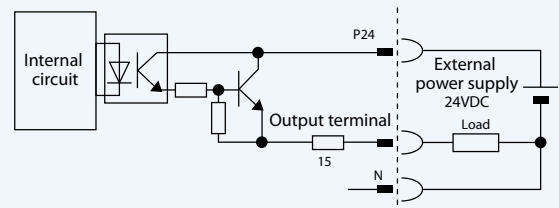
Output part External output specification

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

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

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

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

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

PIO Patterns and Signal Assignments

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

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

Pin No.	Category	PIO function	Parameter No.25, "PIO Pattern Selection"					
			0	1	2	3	4	5
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2
	Input	Number of positioning points	64-point	64-point	256-point	512-point	7-point	3-point
		Home return signal	○	○	○	○	○	×
		Jog signal	×	○	×	×	×	×
		Teaching signal (writing of current position)	×	○	×	×	×	×
		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		N						
20B		N						

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

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

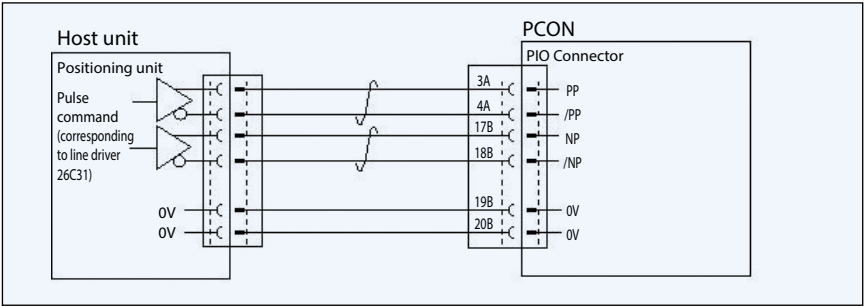
(Note 2) The setting will not become effective until the home return is completed.

Reference) Negative logic signal

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

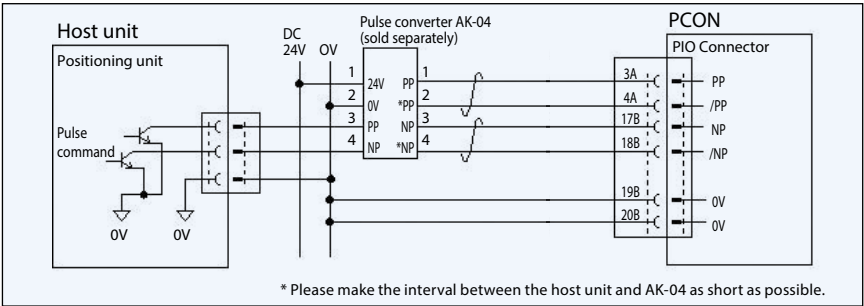
Pulse-train Control Circuit

■ Host Unit = Differential Type



■ Host Unit = Open Collector Type

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



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

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

Command Pulse Input Patterns

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

I/O Signals in Pulse-train Control Mode

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

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

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

Field Network Specification: Explanation of Operation Modes

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

Mode Description

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

Required Data Size for Each Network

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

* No required data size is set for MECHATROLINK I & II.

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

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

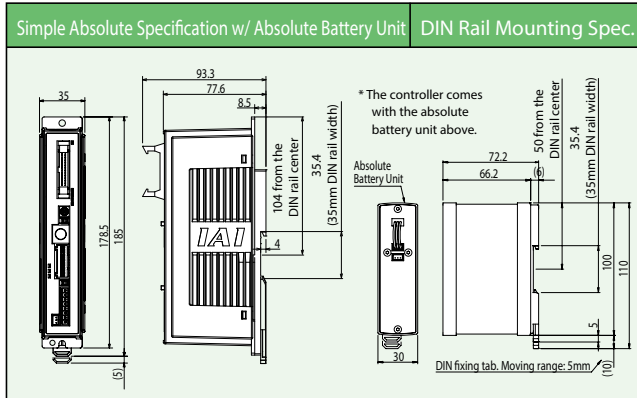
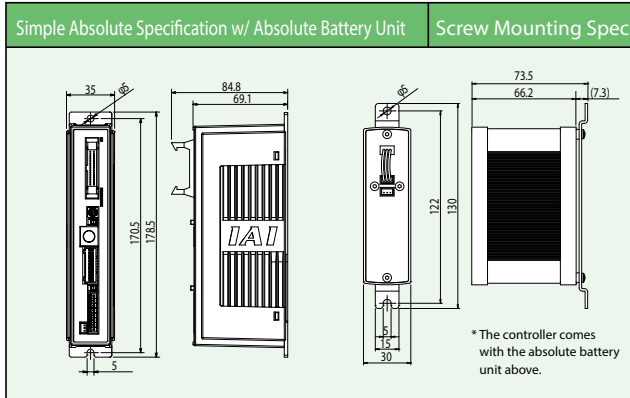
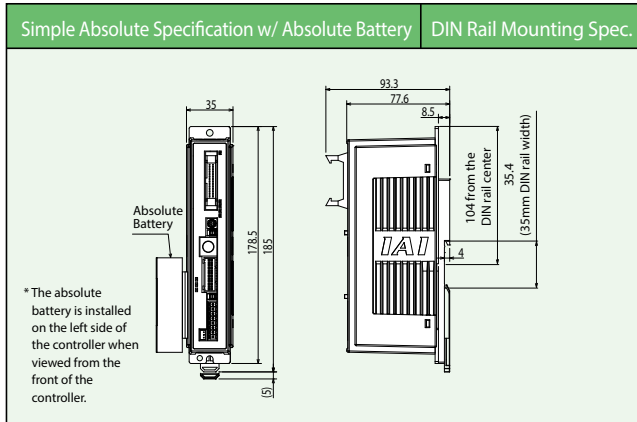
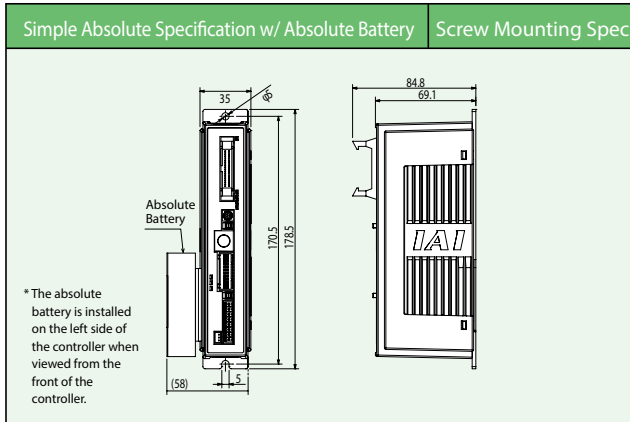
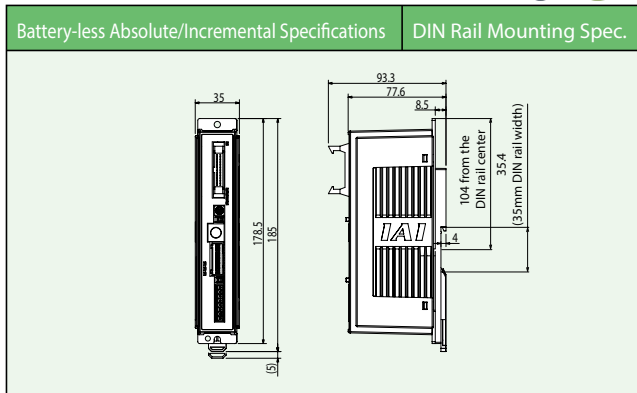
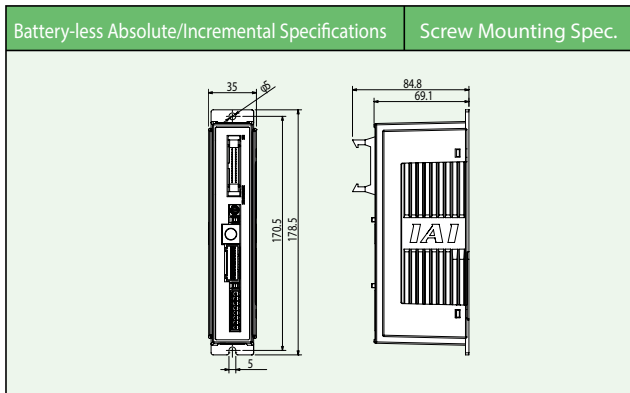
* ○ indicates that the operation is supported, and X indicates that it is not supported.

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

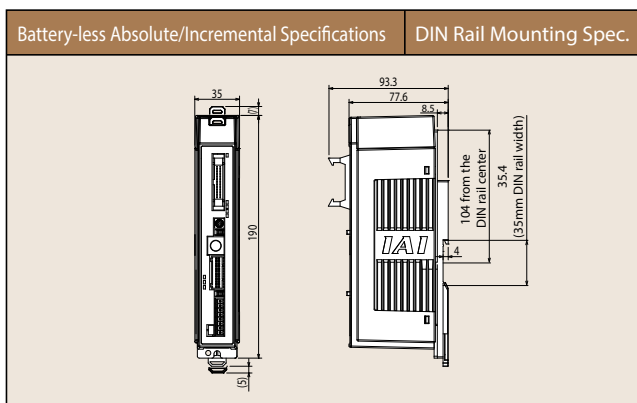
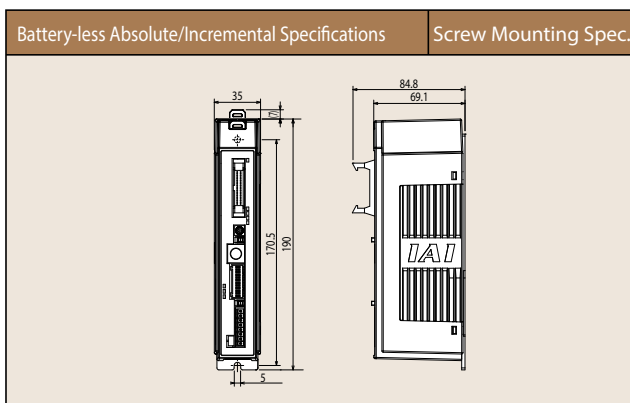
External Dimensions

<PCON-CB · CGB>

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



<PCON-CFB · CGFB>



Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

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
	56SP, 60P				6A max.
	Electromagnetic brake power (for actuator with brake)				24VDC ±10% 0.15A (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		Not more than 85% RH (non-condensing)		
	Operating ambience		Free from corrosive gases		
	Degree of protection		IP20		

Note 1) 0.3A higher for the field network specification.

Note 2) Inrush current flows for approx. 5msec after the power is input (at 40℃). Please note that the inrush current value varies depending on the impedance of the power line.

Note 3) 30g heavier for the field network specification.

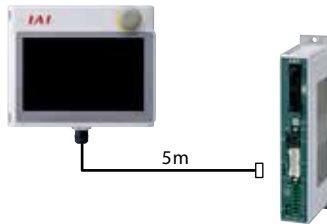
Option

Touch panel teaching pendant

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

Model TB-02-□

Configuration



Specification

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

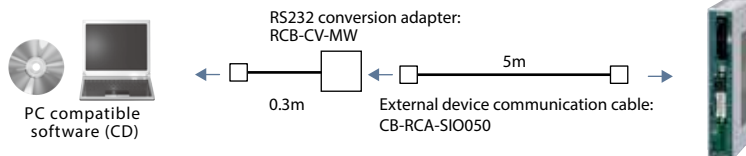
PC dedicated teaching software (Windows only)

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

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

Configuration

MCON is compatible with Ver.10.00.00.00 or later.



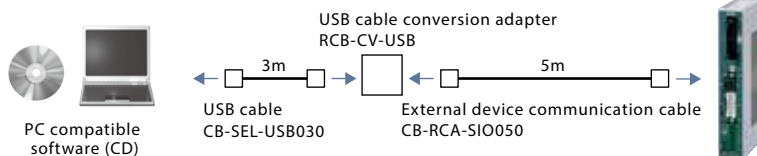
Supported Windows version 7/8/8.1/10



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

Configuration

MCON is compatible with Ver.10.00.00.00 or later.



Absolute battery unit

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

Model SEP-ABU (DIN rail mounting specification)

SEP-ABUS (Screw mounting specification)

Specification

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

Replacement battery

Overview Replacement battery used with the absolute battery box.

Model AB-7



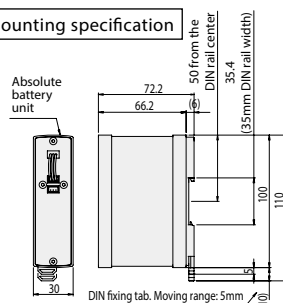
Dummy plug

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

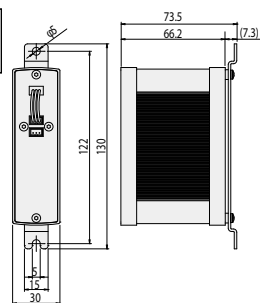
Model DP-5



DIN rail mounting specification



Screw mounting specification



Maintenance Parts

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

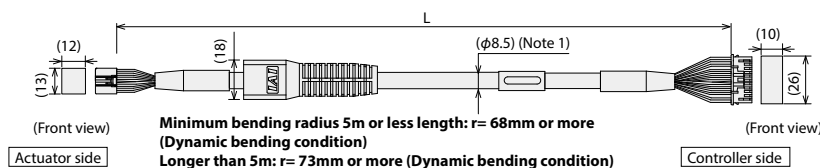
Table of Applicable Cables

Model Number		Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCP6/RCP6CR/RCP6W/RCP5/RCP5CR/RCP5W (Models other than ③)	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
②	RCP4 SA3/RA3/GR/ST		
③	RCP6/RCP6CR RCP6W/RCP5 RCP5W	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		
⑨	RCP2	—	CB-RPSEP-MPA □□□
⑩	RCP2CR RCP2W	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
⑪	GRSS/GRSL/GRST/GRHM/GRHB/SRA4R/ SRGS4R/SRGD4R		
⑫	RCP2 RCP2CR RCP2W	CB-CFA-MPA □□□	CB-CFA-MPA □□□ -RB
⑬	RTBS/RTBSL RTCS/RTCSL		
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

* () is the amount of the robot cable.



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

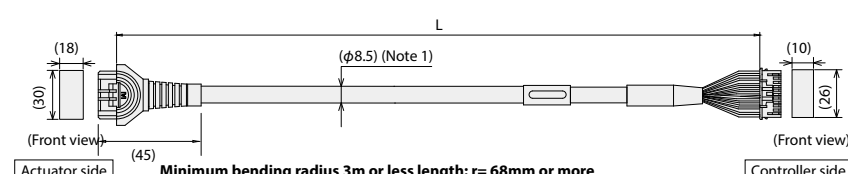
(Note 1) If the cable length is 5m or more, $\phi 9.1$ cable diameter applies for both non-robot cables and robot cables.

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

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

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

* () is the amount of the robot cable.



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

(Note 1) If the cable length is 5m or more, $\phi 9.1$ cable diameter applies for both non-robot cables and robot cables.

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

Pin No	Signal name	Pin No	Signal name
A1	ϕA	1	ϕA
B1	VMM	2	VMM
A2	ϕA	5	ϕA
B2	ϕB	3	ϕB
A3	VMM	4	VMM
B3	ϕB	6	ϕB
A4	LS+	7	LS+
B4	LS-	8	LS-
A6	SA(mABS)	11	SA(mABS)
B6	SB(mABS)	12	SB(mABS)
A7	A+	13	A+
B7	A-	14	A-
A8	B+	15	B+
B8	B-	16	B-
A5	BK+	9	BK+
B5	BK-	10	BK-
A9	LS_GND	20	LS_GND
B9	VPS	18	VPS
A10	VCC	21	VCC
B10	GND	19	GND
A11	—	17	—
B11	FG	22	—
		23	—
		24	FG

Maintenance Parts

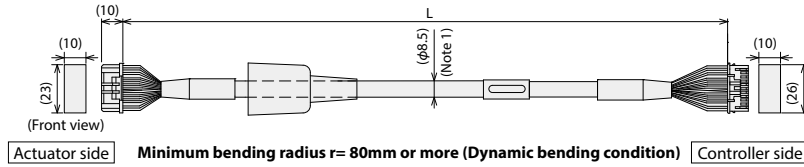
When placing an order for the replacement cable, please use the model number shown below.

Model **CB-CA-MPA**□□□/□□□**-RB**

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

* () is the amount of the robot cable.

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



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

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

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

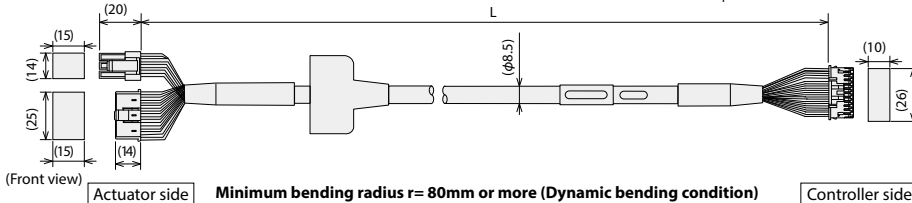
* () indicates the color of the robot cable.

Model **CB-CFA-MPA**□□□/□□□**-RB**

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

* () is the amount of the robot cable.

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



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

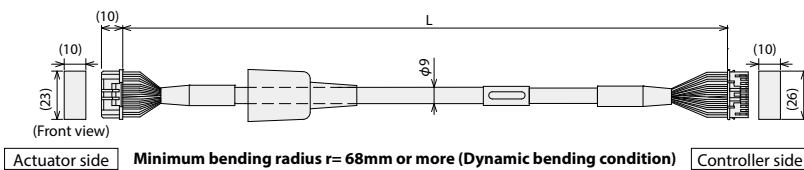
* The robot cable is designed for ex-resistance:
Please use the robot cable if the cable has to be installed through the cable track.

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

Model **CB-CFA2-MPA**□□□/□□□**-RB**

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

* () is the amount of the robot cable.



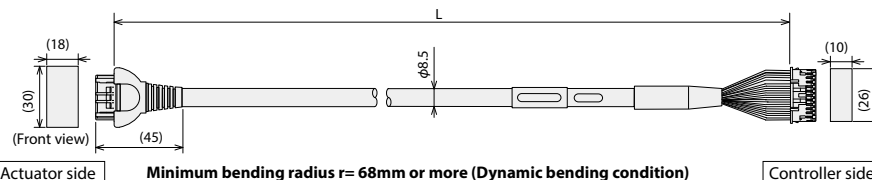
Minimum bending radius $r=68\text{mm}$ or more (Dynamic bending condition)

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

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

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

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



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

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

Maintenance Parts

Controller

R-unit

RCP6S

MCON

-C

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-CAL

MSCON

SSEL

MSEL

XSEL

XSEL

(SCARA)

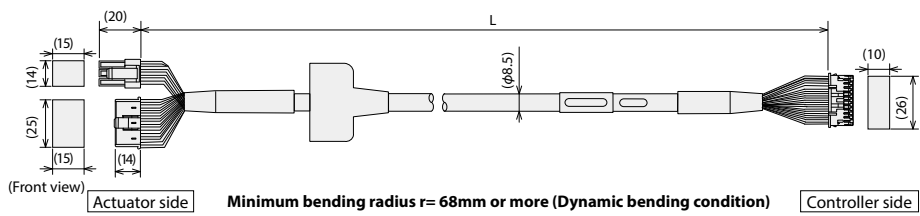
PSA-24

TB-02

TB-03

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

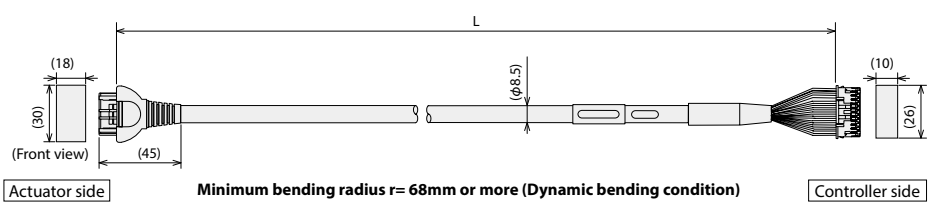
* Please indicate the cable length (L) in , maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m



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

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

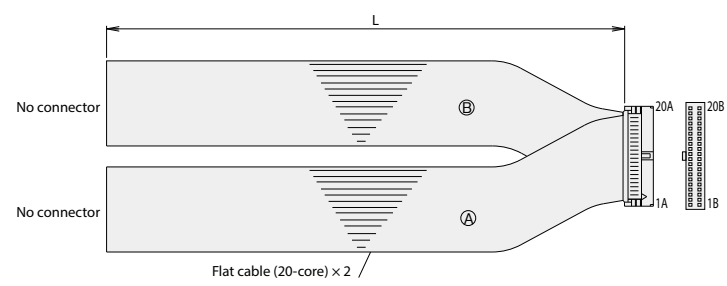
* Please indicate the cable length (L) in , maximum 20m (10m when connecting to RCD) E.g.) 080 = 8m



Actuator side Terminal number		Controller side Terminal number
A1	Black(Φ A)	1
B1	White(VMM)	2
A2	Brown(Φ A)	5
B2	Green(Φ B)	3
A3	Yellow(VMM)	4
B3	Red(Φ B)	6
A6	Orange(LS+)	8
B6	Gray(LS-)	7
A7	Red(A+)	13
B7	Green(A-)	14
A8	Black(B+)	15
B8	Brown(B-)	16
A4	NC	—
B4	NC	—
A5	Black(Identification tape)(BK+)	9
B5	Brown(Identification tape)(BK-)	10
A9	Green(Identification tape)(GNDL)	20
B9	Red(Identification tape)(VPS)	18
A10	White(Identification tape)(VCC)	17
B10	Yellow(Identification tape)(GND)	19
A11	NC	21
B11	Shield(FG)(FG)	24
	NC	22
	NC	23

Model **CB-PAC-PIO**

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



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

MEMO

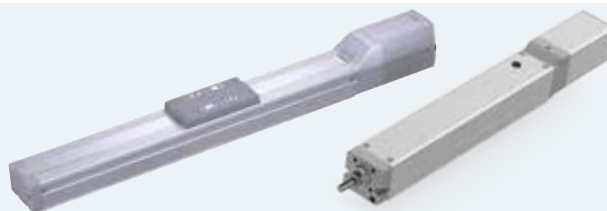
Controller

PCON
-CB/CFB

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.



Battery-less Absolute Encoder
No Battery, No Maintenance,
No Homing, and No Price Increase.
No Going Back to Incremental.

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.

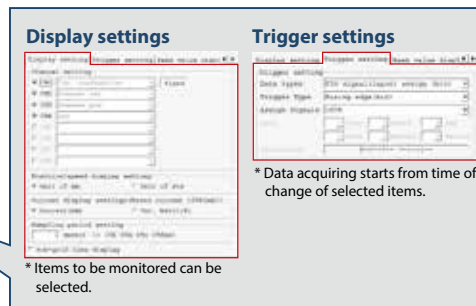
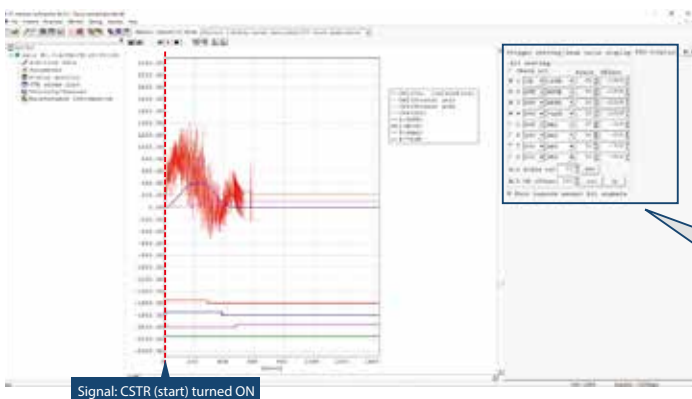
4 Enhanced Monitor Functions

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.

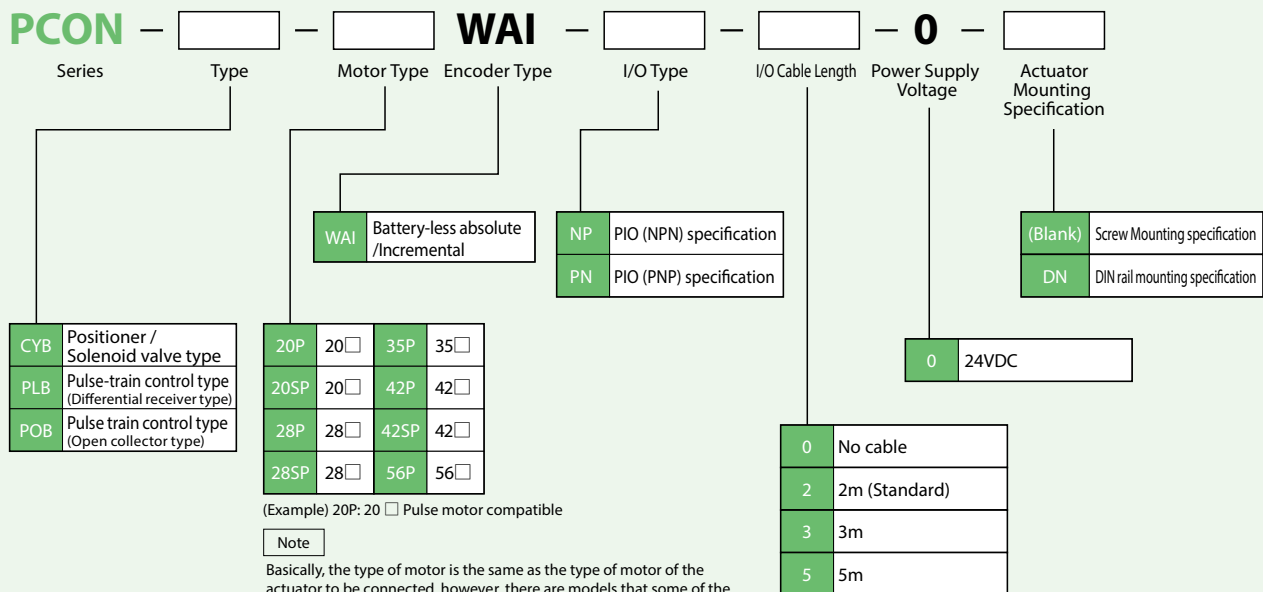
Product model		PowerCon (High output driver)	High resolution battery-less absolute	Simple absolute	Calendar function	Maintenance function	I/O point	Positioning point	Field network
PCON	CYB/PLB/POB	○	○	×	×	○	Non insulated 8IN/8OUT	Standard 16 points Max. 64 points	×
	CB	○	○	○	○	○	Insulated 16IN/16OUT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



* The POB type has a maximum cable length of 2m.

System configuration

Controller

R-unit

RCP6S

MCON

-C

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-CAL

MSCON

SSEL

MSEL

XSEL

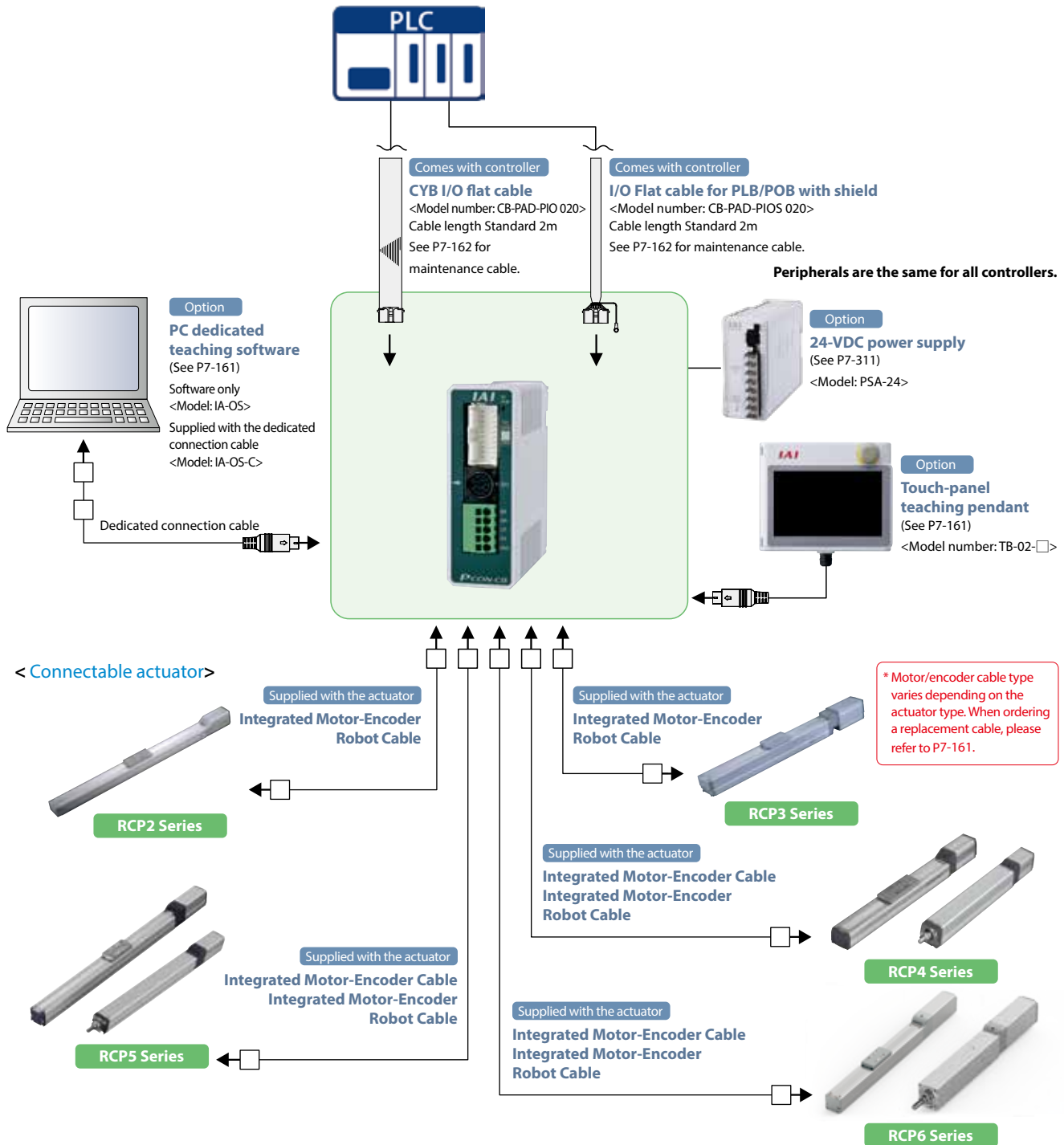
XSEL

(SCARA)

PSA-24

TB-02

TB-03



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

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

(Note 1) In the table above, the asterisk* symbol next to the code indicates a reverse logic signal.

(Note 2) In all PIO patterns other than 1, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.

(Note 3) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)

(Note 4) Pin number 13 and 14 of PIO pattern 3 or 4, can select PE* and LS* by by setting Parameter No. 186.

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

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

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

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

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

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

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

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

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

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

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

I/O Specification

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

Function by controller type

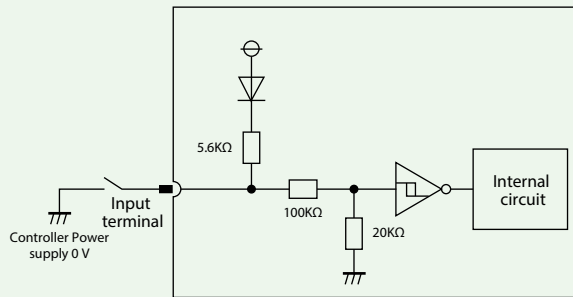
Model	CYB	PLB / POB	Summary
Name	Positioner / Solenoid valve type	Pulse-train control type	
Positioner mode	○	×	It is the basic operation mode that operates by specifying the position number and inputting the start signal.
Solenoid valve mode	○	×	It is possible to move just by turning ON/OFF the position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

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

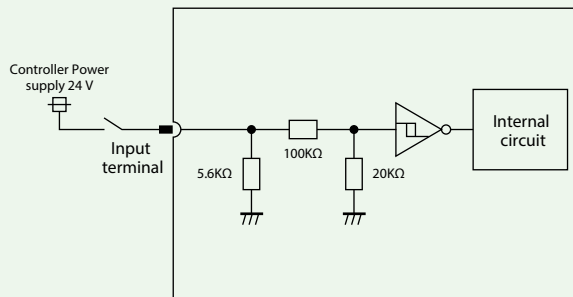
Input Part External Input Specifications

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

NPN Specification



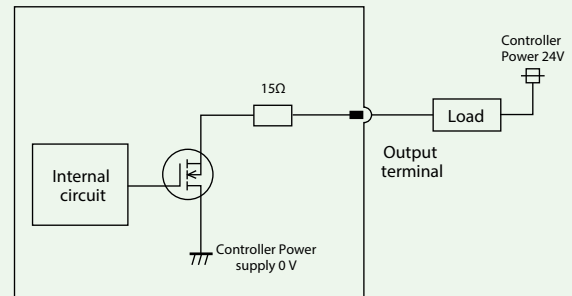
PNP Specification



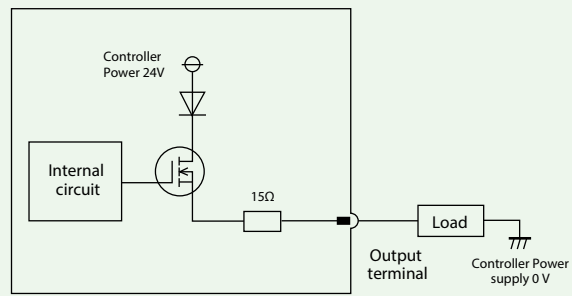
Output Part External Output Specifications

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

NPN Specification



PNP Specification

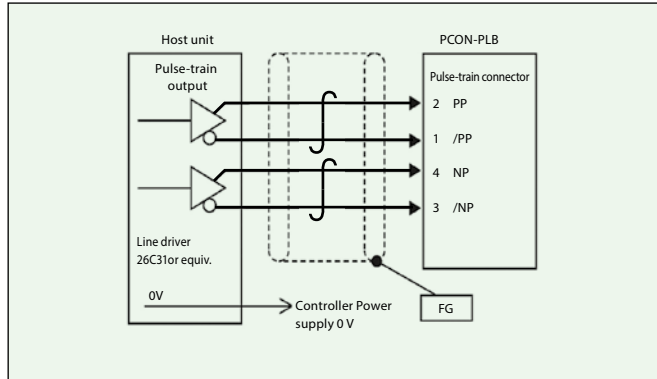


Pulse-train input circuit

Differential line driver

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

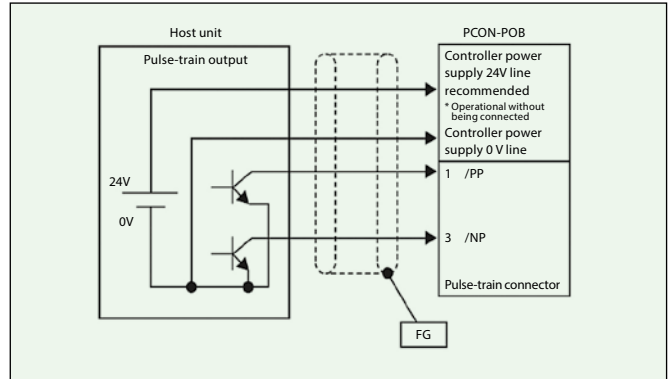
*The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



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.			
Forward logic	Phase A/B pulse-train	PP · /PP		
	Phase A/B pulse-train	NP · /NP		
	Command phases A and B having a 90° phase difference (multiplier is 4) indicate the amount of rotation and the rotating direction.			
	Forward pulse-train	PP · /PP		
	Reverse pulse-train	NP · /NP		
	Sign	NP · /NP	High	Low

Note) The number of encoder pulses that can be operated with PCON is are followings.

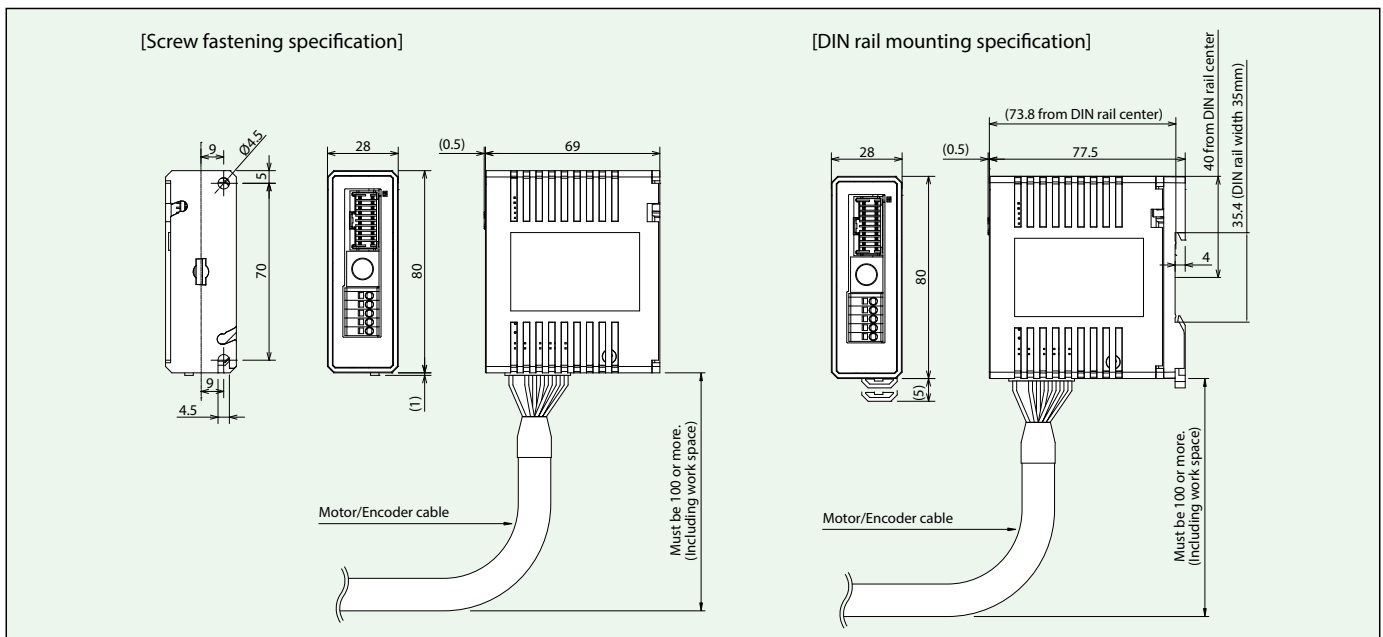
RCP5·RCP4·RCP3·RCP2 ... 800 pulse

RCP6 ... 8192 pulse

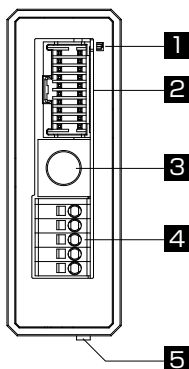
Specification Table

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

External Dimensions



Names of each part



1 Controller status display LED

Displays the operation status of the controller.

○: ON ×: OFF ☆: Blinking

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

2 PIO connector

Connector for input/output signal connection for control.

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

3 SIO connector (SIO)

Connector for communication cable connection of teaching tool.

4 Power connector

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

5 Motor encoder connector

Connector for the actuator's motor and encoder cable.

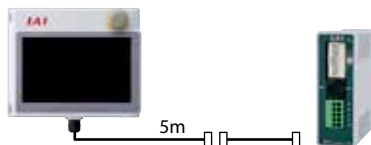
Option

Touch panel teaching box

Features Teaching device for positioning input, test operation, and monitoring.

Model **TB-02-**□

Configuration



Specification

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

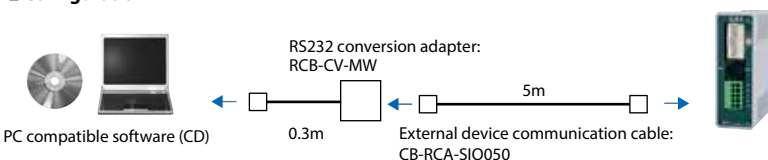
PC dedicated teaching software (Windows only)

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

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

Configuration

Please contract IAI for the current supported versions.



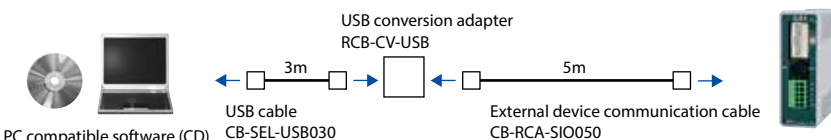
Supported Windows version 7/8/8.1/10



Model **RCM-101-USB** (External device communication cable)

Configuration

Please contract IAI for the current supported versions.



Maintenance parts

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

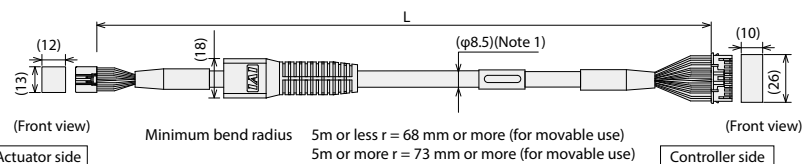
Table of Applicable Cables

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	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	GRSS/GRLS/GRST/GRHM/GRHB/SRA4R/SRG54R/SRGD4R		
⑥	RTBS/RTBSL RTCS/RTCSL	—	CB-RPSEP-MPA □□□
⑦	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



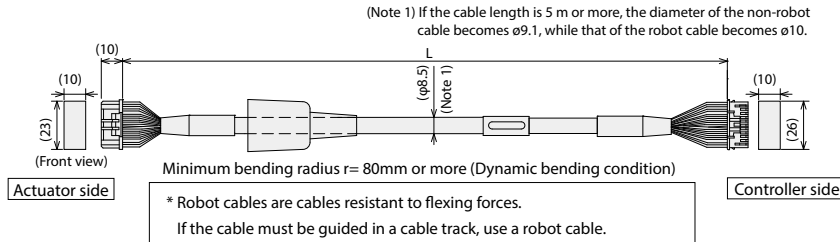
* Robot cables are cables resistant to flexing forces.
If the cable must be guided in a cable track, use a robot cable.

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

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

Model CB-CA-MPA / CB-CA-MPA-RB

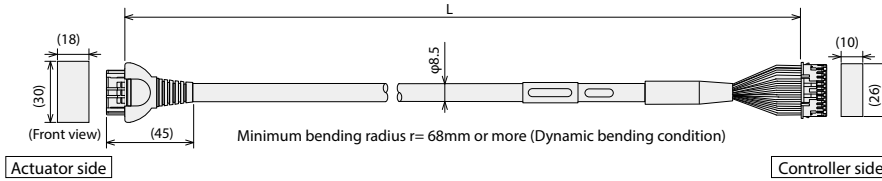
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



Actuator side 1-1827863-1 (AMP)			Controller side PADP-24V-1-S (J.S.T.MFG.CO.,LTD.)		
Pin No.	Signal name	Color	Pin No.	Signal name	Color
A1	φA/U	Blue (Black)	1	φA/U	Blue (Black)
B1	VMM/V	Orange (White)	2	VMM/V	Orange (White)
A2	φA/W	Green (Brown)	3	φA/W	Green (Brown)
B2	φB/-	Brown (Green)	4	φB/-	Brown (Green)
A3	VMM/-	Gray (Yellow)	5	VMM/-	Gray (Yellow)
B3	φB/+	Red (Red)	6	φB/+	Red (Red)
A4	L5+/BK+	Black (Orange)	7	L5+/BK+	Black (Orange)
B4	L5-/BK-	Yellow (Gray)	8	L5-/BK-	Yellow (Gray)
A6	-/A+	Blue (White)	11	-/A+	Blue (White)
B6	-/A-	Orange (Yellow)	12	-/A-	Orange (Yellow)
A7	A+/B+	Green (Red)	13	A+/B+	Green (Red)
B7	A-/B-	Brown (Green)	14	A-/B-	Brown (Green)
A8	B+/Z+	Gray (Black)	15	B+/Z+	Gray (Black)
B8	B-/Z-	Red (Brown)	16	B-/Z-	Red (Brown)
A5	BK+/L5+	Blue (Black)	9	BK+/L5+	Blue (Black)
B5	BK-/L5-	Orange (Brown)	10	BK-/L5-	Orange (Brown)
A9	L5, GND	Green (Green)	20	L5, GND	Green (Green)
B9	VP5	Brown (Red)	18	VP5	Brown (Red)
A10	VCC	Gray (White)	17	VCC	Gray (White)
B10	GND	Red (Yellow)	19	GND	Red (Yellow)
A11	—	—	21	—	—
B11	FG	Black (—)	22	—	—
			23	—	—
			24	FG	Black (—)

Model CB-APSEP-MPA * The default specification of this cable is robot cable.

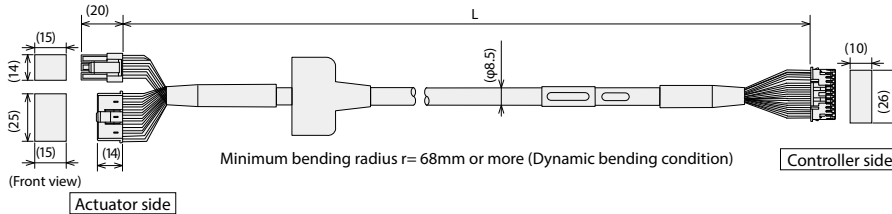
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



Actuator side 1-1827863-1 (AMP)			Controller side PADP-24V-1-S (JST)		
Pin No.	Signal name	Color	Pin No.	Signal name	Color
A1	φA	Black	1	φA	Black
B1	VMM	White	2	VMM	White
A2	φA	Brown	3	φA	Brown
B2	φB	Green	4	φB	Green
A3	VMM	Yellow	5	VMM	Yellow
B3	φB	Red	6	φB	Red
A4	L5+	Orange	7	L5+	Orange
B4	L5-	Gray	8	L5-	Gray
A6	—	White	11	—	White
B6	—	Yellow	12	—	Yellow
A7	A+	Red	13	A+	Red
B7	A-	Green	14	A-	Green
A8	B+	Black	15	B+	Black
B8	B-	Brown	16	B-	Brown
A5	BK+	Black (id tape)	9	BK+	Black (id tape)
B5	BK-	Brown (id tape)	10	BK-	Brown (id tape)
A9	GND+	Green (id tape)	20	GND+	Green (id tape)
B9	VP5	Red (id tape)	18	VP5	Red (id tape)
A10	VCC	White (id tape)	17	VCC	White (id tape)
B10	GND	Yellow (id tape)	19	GND	Yellow (id tape)
A11	NC	—	21	NC	—
B11	Shield, FG	—	24	Shield, FG	—
			23	—	—

Model CB-PSEP-MPA * The default specification of this cable is robot cable.

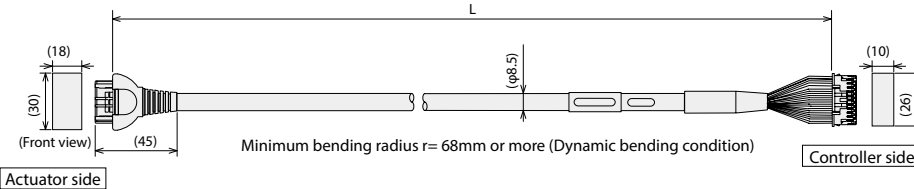
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



Actuator side Terminal number			Controller side Terminal number		
1	Black(φA)	1	1	Black	1
2	White(VMM)	2	2	White	2
3	Red(φB)	3	3	Red	3
4	Green(VMM)	4	4	Green	4
5	Brown(φA)	5	5	Brown	5
6	Yellow(φB)	6	6	Yellow	6
7	Orange(BK+)	7	7	Orange	7
8	Gray(BK-)	8	8	Gray	8
9	NC	9	9	NC	9
10	NC	10	10	NC	10
11	NC	11	11	NC	11
12	NC	12	12	NC	12
13	Black(L5+)	13	13	Black	13
14	Brown(L5-)	14	14	Brown	14
15	White(A+)	15	15	White	15
16	Yellow(A-)	16	16	Yellow	16
17	Red(B+)	17	17	Red	17
18	Gray(L5-)	18	18	Gray	18
19	White (identification tape)(VP5)	19	19	White	19
20	Red (identification tape)(GND)	20	20	Red	20
21	Yellow (identification tape)(GND)	21	21	Yellow	21
22	NC	22	22	NC	22
23	NC	23	23	NC	23
24	Shield(FG)	24	24	Shield, FG	24

Model CB-RPSEP-MPA * The default specification of this cable is robot cable.

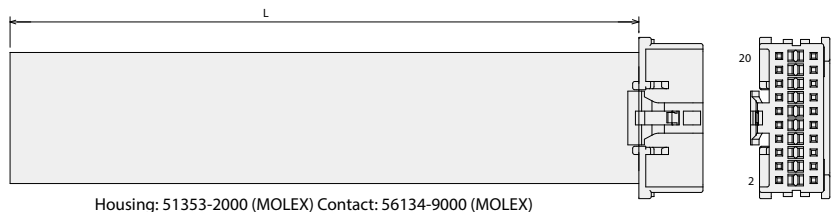
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



Actuator side Terminal number			Controller side Terminal number		
1	Black(φA)	1	1	Black	1
2	White(VMM)	2	2	White	2
3	Brown(φA)	3	3	Brown	3
4	Green(φB)	4	4	Green	4
5	Yellow(VMM)	5	5	Yellow	5
6	Red(φB)	6	6	Red	6
7	Orange(L5+)	7	7	Orange	7
8	Gray(L5-)	8	8	Gray	8
9	Red(A+)	9	9	Red	9
10	Green(A-)	10	10	Green	10
11	Black(B+)	11	11	Black	11
12	Brown(B-)	12	12	Brown	12
13	NC	13	13	NC	13
14	Black (identification tape)(BK+)	14	14	Black	14
15	Brown (identification tape)(BK-)	15	15	Brown	15
16	Green (identification tape)(GNDL)	16	16	Green	16
17	Red (identification tape)(VP5)	17	17	Red	17
18	White (identification tape)(VCC)	18	18	White	18
19	Yellow (identification tape)(GND)	19	19	Yellow	19
20	NC	20	20	NC	20
21	NC	21	21	NC	21
22	NC	22	22	NC	22
23	NC	23	23	NC	23
24	Shield(FG)	24	24	Shield, FG	24

Model CB-PAD-PIO

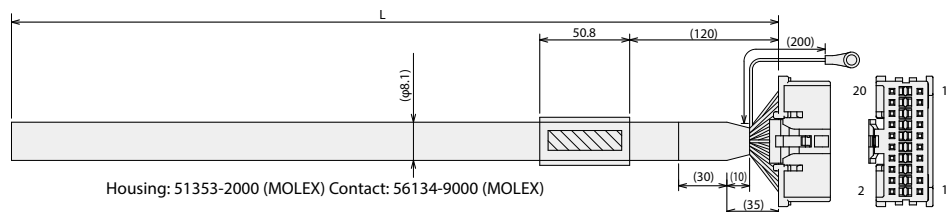
* Please indicate the cable length (L) in □□□, maximum 10m, e.g.) 080 = 8m



No.	Cable color	Wiring	No.	Cable color	Wiring
1	Brown-1	11 Brown-2	11	Brown-2	11
2	Red-1	12 Red-2	12	Red-2	12
3	Orange-1	13 Orange-2	13	Orange-2	13
4	Yellow-1	14 Yellow-2	14	Yellow-2	14
5	Green-1	15 Green-2	15	Green-2	15
6	Blue-1	16 Blue-2	16	Blue-2	16
7	Purple-1	17 Purple-2	17	Purple-2	17
8	Gray-1	18 Gray-2	18	Gray-2	18
9	White-1	19 White-2	19	White-2	19
10	Black-1	20 Black-2	20	Black-2	20

Model CB-PAD-PIOS

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



No.	Signal name	Cable color	Wiring
1	PP	Orange/Black	1
2	NP	Gray/Black	2
3	IN1	White/Red	3
4	IN2	White/Black	4
5	IN3	Yellow/Red	5
6	IN4	Pink/Red	6
7	IN5	Pink/Black	7
8	IN6	Orange/Red	8
9	IN7	Orange/Black	9
10	OUT1	Gray/Black	10
11	OUT2	White/Red	11
12	OUT3	White/Black	12
13	OUT4	Yellow/Red	13
14	OUT5	Yellow/Black	14
15	OUT6	Pink/Red	15
16	OUT7	Pink/Black	16
17	OUT8	Black/Black	17
18	OUT9	Black/Red	18
19	OUT10	Black/Black	19
20	OUT11	Black/Black	20

* Maximum length if DCON-POB type is selected is 2m.

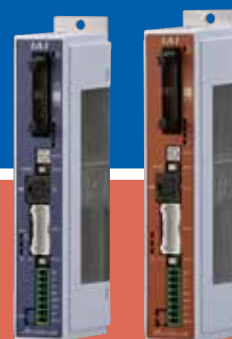
ACON-CB

Position Controller
for RoboCylinder



DCON-CB

Position Controller
for Mini-cylinder



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

Features

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

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

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



2 Compatible with Many Major Field Networks

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

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

DeviceNet



EtherCAT

CompoNet



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>

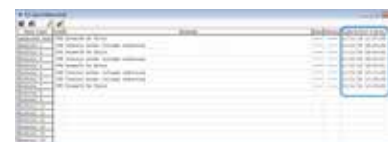
Maintenance information(Axis No.0)	
Total moving count	123 < < < Send
Total moving count threshold	0
Total moving distance[m]	456 < < < Send
Total moving distance threshold[m]	0



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.

[illegible]

ACON

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

CB	Standard						0	24VDC	(Blank)
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	HA	Hi-accel./decel. specification
A	Incremental	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 P7-20 for the caution when selecting.

(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

- CB Standard
- CGB Safety category compliant type

Type

- 3 3W

Motor Type

- 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

Encoder Type

- I Incremental

I/O Type

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

I/O Cable Length

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

Power Supply Voltage

- 0 24VDC

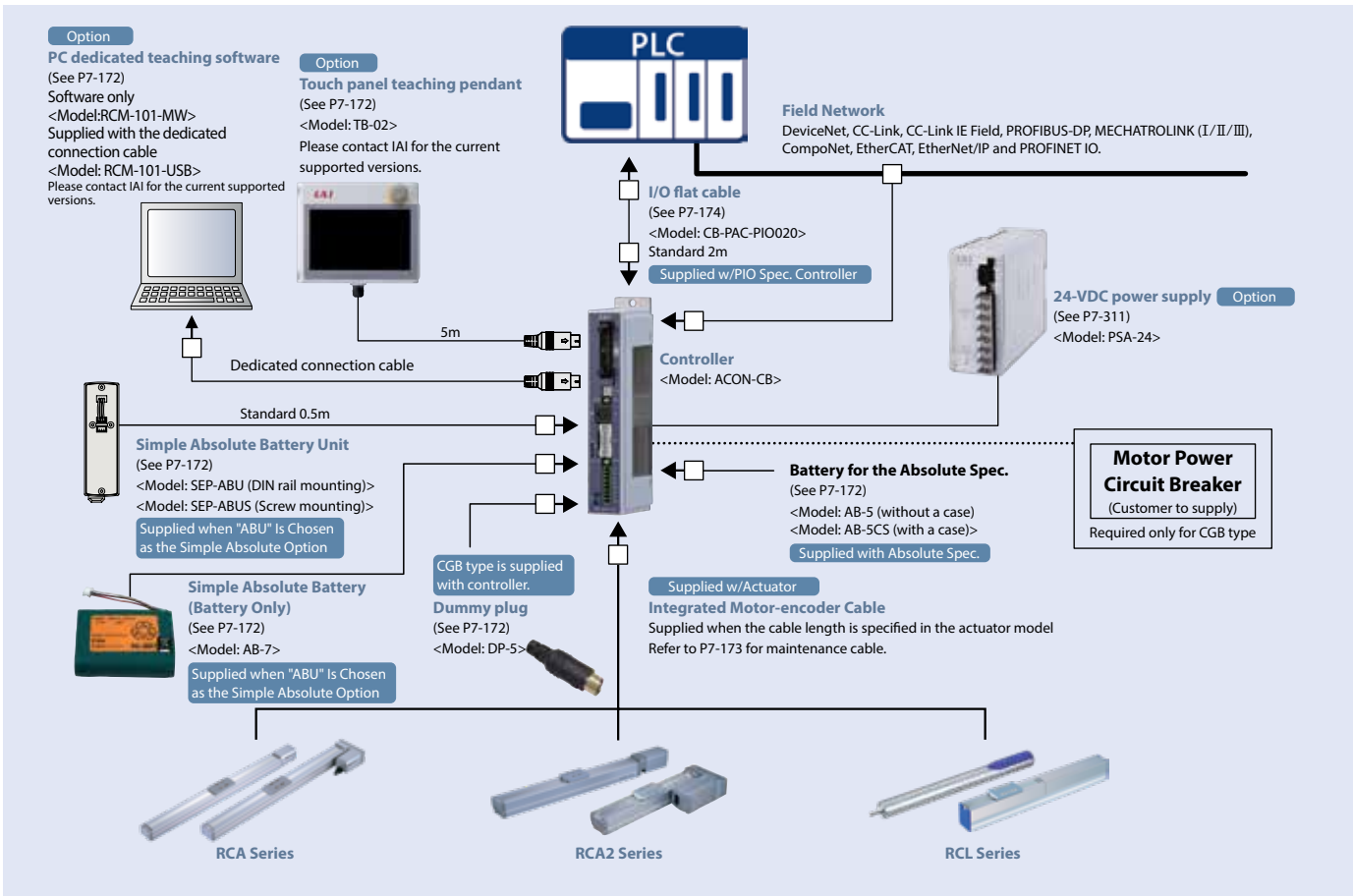
Controller Mounting Specification

- (Blank) Screw Mounting specification
- DN DIN rail mounting specification

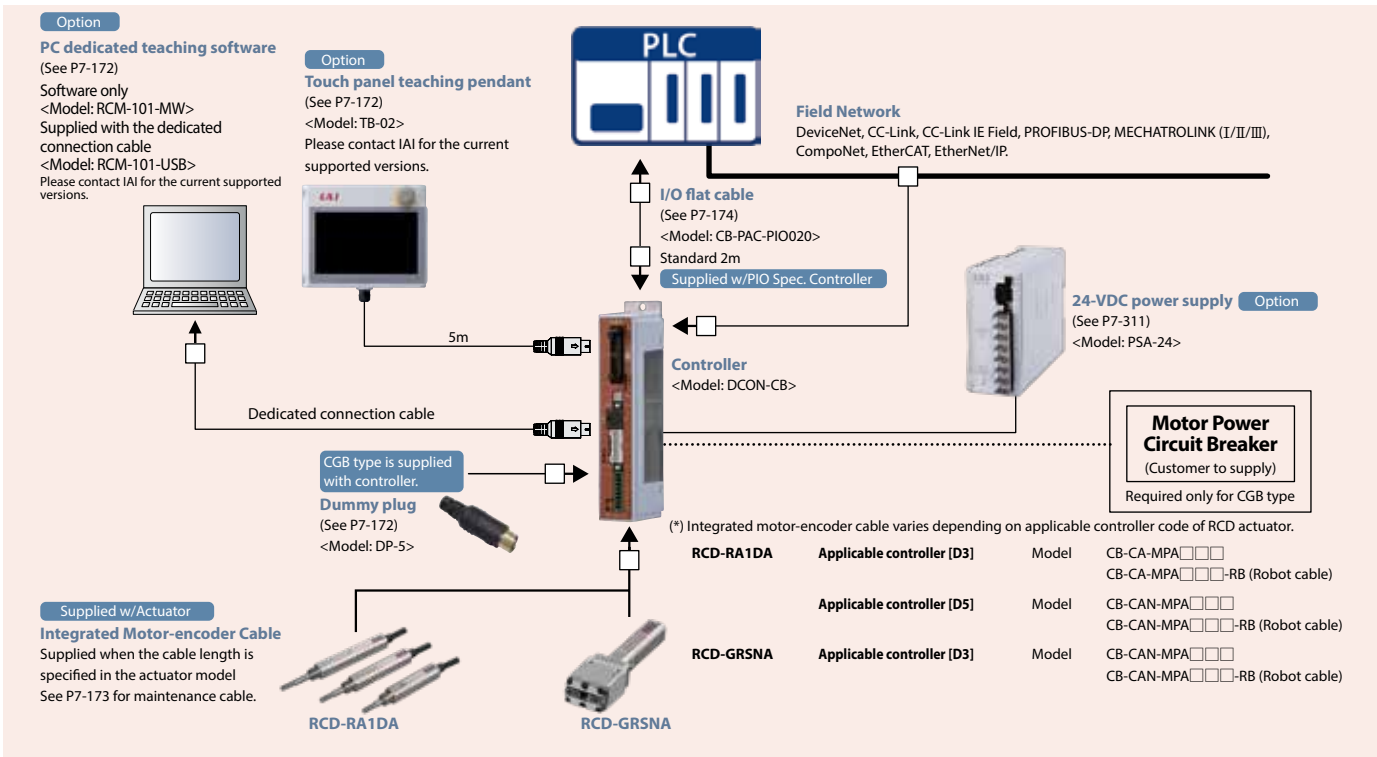
(Note 1) Please be sure to check P7-20 for the caution when selecting.

System Configuration

<ACON-CB/CGB>



<DCON-CB/CGB>

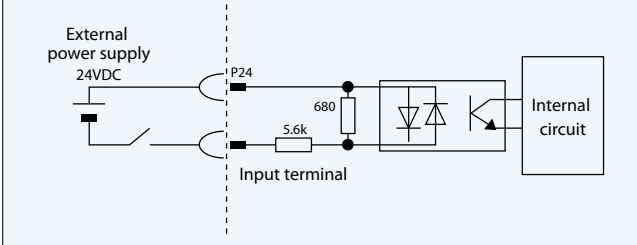


PIO I/O Interface (Common to ACON-CB/DCON-CB)

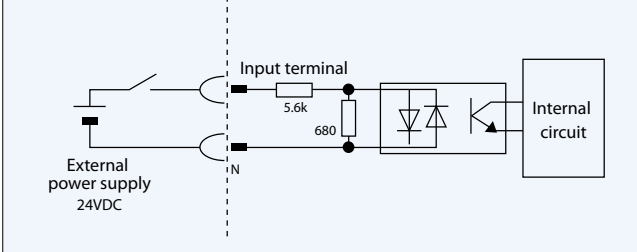
Input part External input specification

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

NPN specification



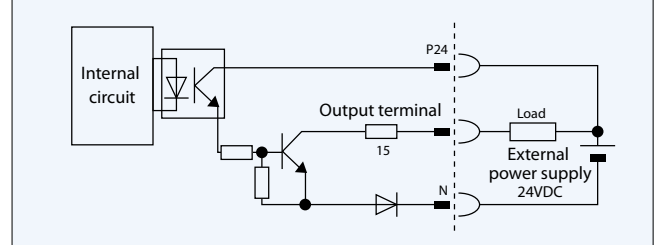
PNP specification



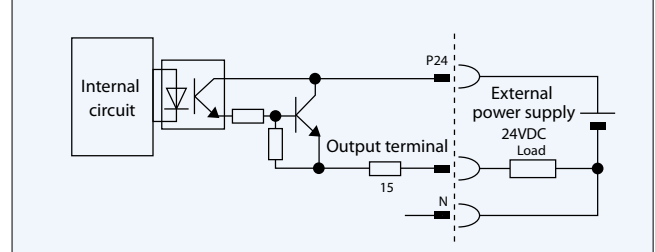
Output part External output specification

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

NPN 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)	<ul style="list-style-type: none"> Number of positioning points: 64 points Position number command: Binary Coded Decimal (BCD) Zone signal output*: 1 point Position zone signal output*: 1 point
PIO Pattern 1	1	Teaching mode (Teaching type)	<ul style="list-style-type: none"> Number of positioning points: 64 points Position number command: Binary Coded Decimal (BCD) Position zone signal output*: 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)	<ul style="list-style-type: none"> Number of positioning points: 256 points Position number command: Binary Coded Decimal (BCD) Position zone signal output*: 1 point
PIO Pattern 3	3	512-point mode (512 positioning points)	<ul style="list-style-type: none"> Number of positioning points: 512 points Position number command: Binary Coded Decimal (BCD) No zone signal output
PIO Pattern 4	4	Solenoid valve mode 1 (7-point type)	<ul style="list-style-type: none"> Number of positioning points: 7 points Position number command: Individual number signal ON Zone signal output*: 1 point Position zone signal output*: 1 point
PIO Pattern 5	5	Solenoid valve mode 2 (3-point type)	<ul style="list-style-type: none"> Number of positioning points: 3 points 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 point Position zone signal output*: 1 point
PIO Pattern 6 (Note 1)	6	Pulse-train control mode for incremental	<ul style="list-style-type: none"> Differential pulse input (200 kpps max.) Home return function Zone signal output*: 2 point No feedback pulse output
PIO Pattern 7 (Note 1)	7	Pulse-train control mode for incremental	<ul style="list-style-type: none"> Reference point setting (1 point) Differential pulse input (200 kpps max.) Home return function Zone signal output*: 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	MODE5	PM128	PM128	ZONE1	ZONE1
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—
13B		OUT12	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B		OUT15	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML	*BALM (Note3)/*ALML
17B	Pulse input	—						
18B		—						
19B	0V	N						
20B	0V	N						

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

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

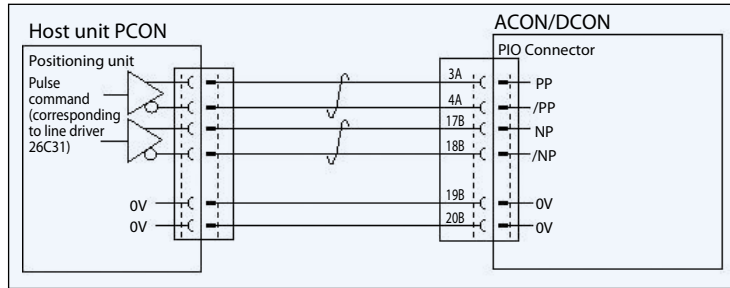
(Note 2) The setting will not become effective until the home return is completed.

Reference) Negative logic signal

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

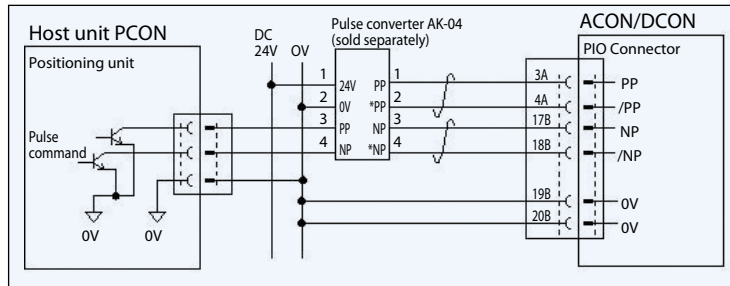
Pulse-train Control Circuit (Common to ACON-CB/DCON-CB)

■ **Host Unit = Differential Type**



■ **Host Unit = Open Collector Type**

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

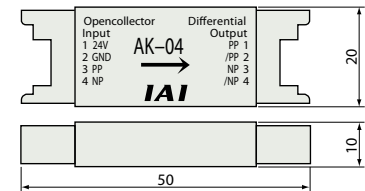


Pulse Converter: AK-04

Open-collector command pulses are pulses.
Use this converter if the host controller outputs open-collector pulses.

■ **Specification**

Item	Specification
Input power	24VDC \pm 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 \cdot /PP		
	Reverse pulse-train	NP \cdot /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 \cdot /PP		
	Sign	NP \cdot /NP	Low	High
	The command pulses indicate the amount of motor rotation, while the sign indicates the rotating direction.			
Positive logic	Phase A/B pulse-train	PP \cdot /PP		
		NP \cdot /NP		
	Command phases A and B having a 90° phase difference (multiplier is 4) indicate the amount of rotation and the rotating direction.			
	Forward pulse-train	PP \cdot /PP		
	Reverse pulse-train	NP \cdot /NP		
Positive logic	Pulse-train	PP \cdot /PP		
	Sign	NP \cdot /NP	High	Low
	Phase A/B pulse-train	PP \cdot /PP		
		NP \cdot /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)

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

Mode Description

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

Required Data Size for Each Network

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

* No required data size is set for MECHATROLINK I & II.

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

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

* ○ indicates that the operation is supported, and X indicates that it is not supported.

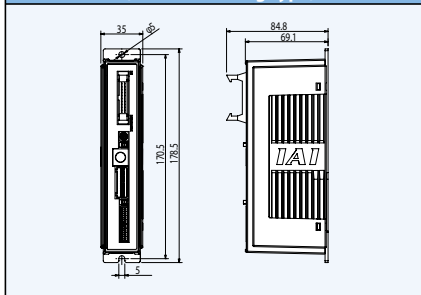
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

External Dimensions (Common to ACON-CB/DCON-CB) * DCON-CB is only available Incremental specification.

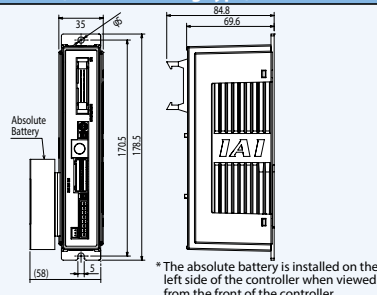
CAD drawings can be downloaded from our website.
www.intelligentactuator.com

2D CAD 3D CAD

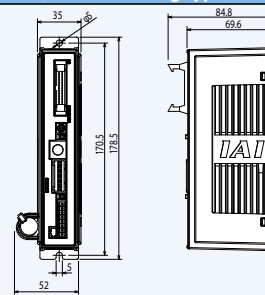
Battery-less Absolute/Incremental Specifications (Screw Mounting Type)



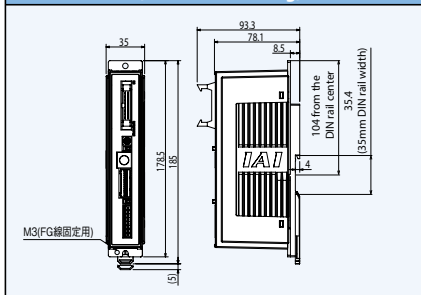
Simple Absolute Specification (Screw Mounting Type)



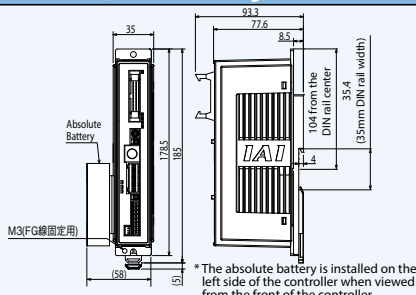
Absolute Specification (Screw Mounting Type)



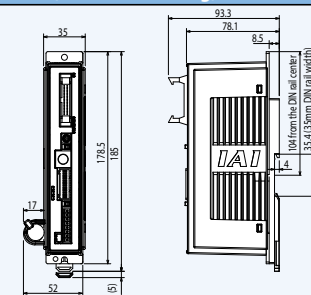
Battery-less Absolute/Incremental Specifications (DIN Rail Mounting)



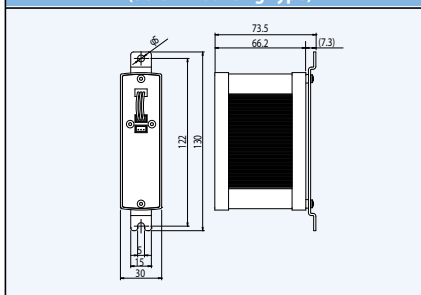
Simple Absolute Specification (DIN Rail Mounting)



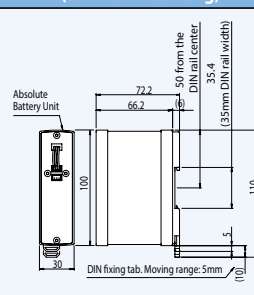
Absolute Specification (DIN Rail Mounting)



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 $\pm 10\%$	
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 $\pm 10\%$	
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	85% RH or less (non-condensing)	
Protection degree	IP20	
Mass	Battery-less absolute/incremental spec.: 230g, simple absolute spec.: 240g (incl. battery: 430g) Absolute spec.: 240g (incl. battery: 260g)	Incremental specification: 230g —

Motor Power Capacity

	Motor type	Standard / High-accel/decel		Power-saving	
		Rated [A]	Max. [A]	Rated [A]	Max. [A]
ACON-CB	RCA/RCA2	5W	1.0	3.3	—
		10W	1.3	4.4	1.3
		20W	1.3	4.4	1.3
		30W	1.3	4	1.3
		20W(20S)	1.7	5.1	1.7
DCON-CB	RCL	2W	0.8	4.6	—
	RCD	5W	1	6.4	—
		10W	1.3	6.4	—
		3W	0.7	1.5	—

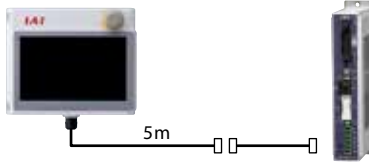
Option (Common to ACON-CB/DCON-CB)

Touch panel teaching pendant

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

Model **TB-02-**☐

Configuration



Specifications

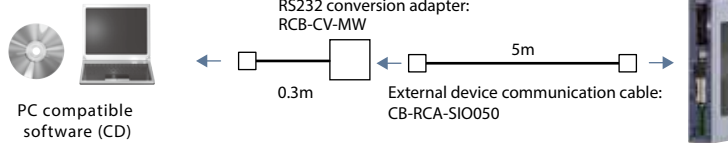
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~ 85% RH (Non-condensing)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

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

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

Configuration

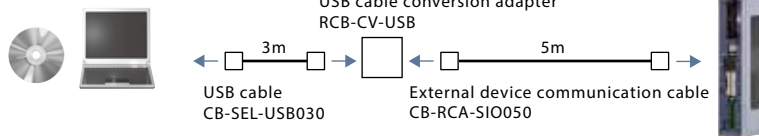


Supported Windows version 7/8/8.1/10



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

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-CS3 (Battery with case)



Maintenance Parts

Table of Applicable Cables

ACON-CB

Model Number		Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCA2/RCA2CR/RCA2W	—	CB-APSEP-MPA □□□
②	RCA2/RCA2CR/RCA2W (when selecting CNS)	CB-CAN-MPA □□□	CB-CAN-MPA □□□ -RB
③	RCA RCACR RCAW	SRA4R SRGS4R SRGD4R	CB-APSEP-MPA □□□
④		(Models other than ②)	CB-ASEP2-MPA □□□
②	RCL	—	CB-APSEP-MPA □□□

DCON-CB

Model Number		Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCD	RA1DA	CB-CAN-MPA □□□ -RB
②		GRSNA	

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

Common to ACON-CB/DCON-CB

Model Number	PIO Flat Cable
⑤ ACON-CB/DCON-CB	CB-PAC-PIO □□□

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

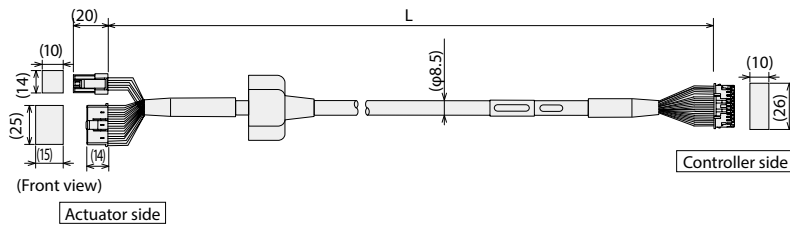
PSA-24

TB-02

TB-03

Model number **CB-ASEP2-MPA** *The standard is the robot cable.

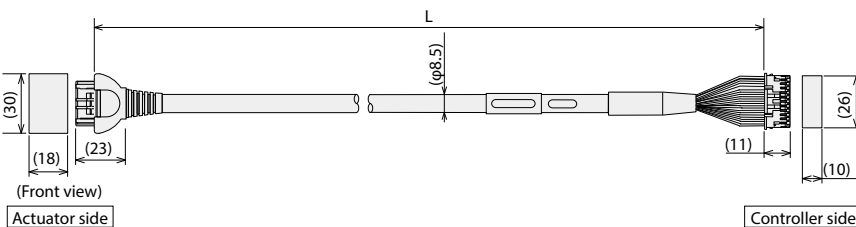
* Please indicate the cable length (L) in , maximum 20m, e.g.) 080 = 8m



Actuator side Terminal number		Controller side Terminal number
1	Red(U)	1
2	Yellow(V)	2
3	NC	3
4	NC	4
5	Black(W)	5
6	NC	6
7	Orange(BK+)	7
8	Gray(BK-)	8
9	Black(LS+)	9
10	Brown(LS-)	10
11	White(A+)	11
12	Yellow(A-)	12
13	Red(B+)	13
14	Green(B-)	14
15	Black (identification tape)(Z+)	15
16	Brown (identification tape)(Z-)	16
17	White (identification tape)(VCC)	17
18	Yellow (identification tape)(GND)	18
19	Red (identification tape)(VPS/BAT-)	19
20	Green (identification tape)(Spares)	20
21	White(BAT+)	21
22	NC	22
23	NC	23
24	Shield(FG)	24

Model number **CB-APSEP-MPA** *The standard is the robot cable.

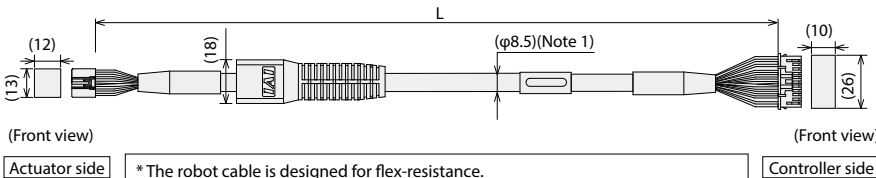
* Please indicate the cable length (L) in , maximum 20m, e.g.) 080 = 8m



Actuator side 1-1827863-1 (AMP)	Signal name	Color	Controller side PADP-24V-1-5 (JST)	Signal name	Color
A1	U	Black	2	V	White
B1	W	Brown	3	W	Brown
A2	W	Brown	4	-	Yellow
B2	Green	Green	5	-	Red
A3	-	Yellow	6	-	Orange
B3	-	Red	7	BK+	Orange
A4	BK+	Orange	8	BK-	Gray
B4	BK-	Gray	9	A+	White
A5	A+	White	10	A-	Yellow
B5	A-	Yellow	11	B+	Red
A6	B+	Red	12	B-	Green
B6	B-	Green	13	Z+	Black
A7	Z+	Black	14	Z-	Brown
B7	Z-	Brown	15	LS+	Black
A8	LS+	Black	16	LS-	Brown
B8	LS-	Brown	17	LS GND	Green
A9	LS GND	Green	18	VPS	Red
B9	VPS	Red	19	VCC	White
A10	VCC	White	20	GND	Yellow
B10	GND	Yellow	21	-	-
A11	-	-	22	-	-
B11	FG	-	23	-	-
			24	FG	-

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)

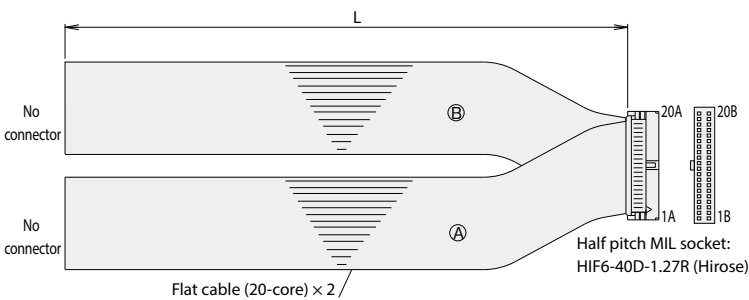
(Note 1) If the cable length is 5m or more, $\phi 9.1$ cable diameter applies for both non-robot cables and robot cables.

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

Pin No.	Signal name	ACON	DCON	Pin No.	Signal name	ACON	DCON
3	U	U	U	1	U	U	U
5	V	V	V	2	V	V	V
10	-	-	-	3	-	-	-
4	W	W	W	4	W	W	W
15	-	-	-	5	-	-	-
12	A+	A+	A+	6	-	-	-
17	A-	A-	A-	11	A+	A+	A+
1	B+	B+	B+	12	A-	A-	A-
6	B-	B-	B-	13	B+	B+	B+
11	Z+/SA(mABS)	HST IN	HST IN	14	B-	B-	B-
16	Z-/SB(mABS)	HS2 IN	HS2 IN	15	Z+/SA(mABS)	HST IN	HST IN
18	VPS/BAT-	-	-	16	Z-/SB(mABS)	HS2 IN	HS2 IN
8	BK+	-	-	18	VPS/BAT-	-	-
20	LS+	-	-	7	BK+	-	-
2	LS-	-	-	9	LS+	-	-
21	VCC	VCC	VCC	10	LS-	-	-
7	GND	GND	GND	17	VCC	VCC	VCC
14	BK-	-	-	19	GND	GND	GND
13	LS GND	HS3 IN	HS3 IN	8	BK-	-	-
19	BAT+	-	-	20	LS GND	HS3 IN	HS3 IN
22	-	-	-	21	BAT+	-	-
23	-	-	-	22	-	-	-
24	FG	FG	FG	23	-	-	-
				24	FG	FG	FG

Model number **CB-PAC-PIO**

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



HIF6-40D-1.27R


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



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.



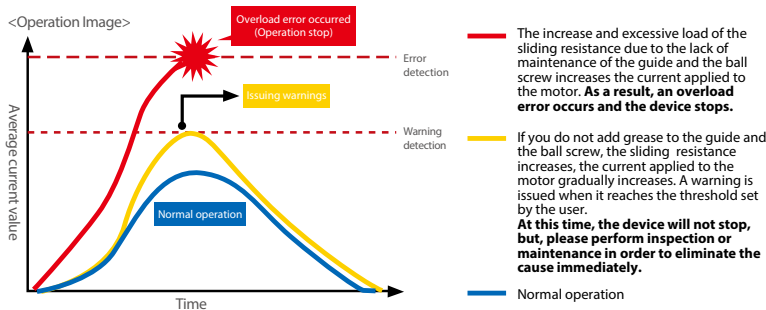
Battery-less Absolute Encoder
No Battery, No Maintenance,
No Homing, and No Price Increase.
No Going Back to Incremental.

2 Equipped with Smart tuning function (ACON only)

Supports the smart tuning function, allowing optimal setting of the speed and acceleration/deceleration values based on the payload.

3 Preventative maintenance

Warning is issued before an overload error is generated from a change in the average current value.



- 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.

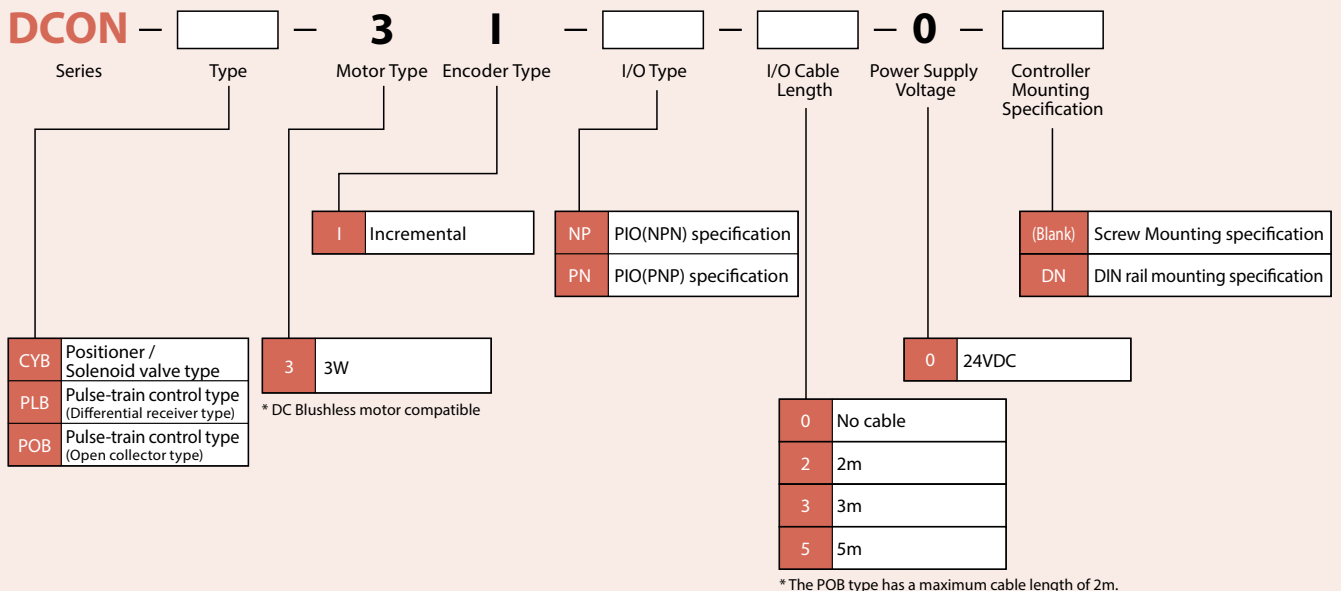
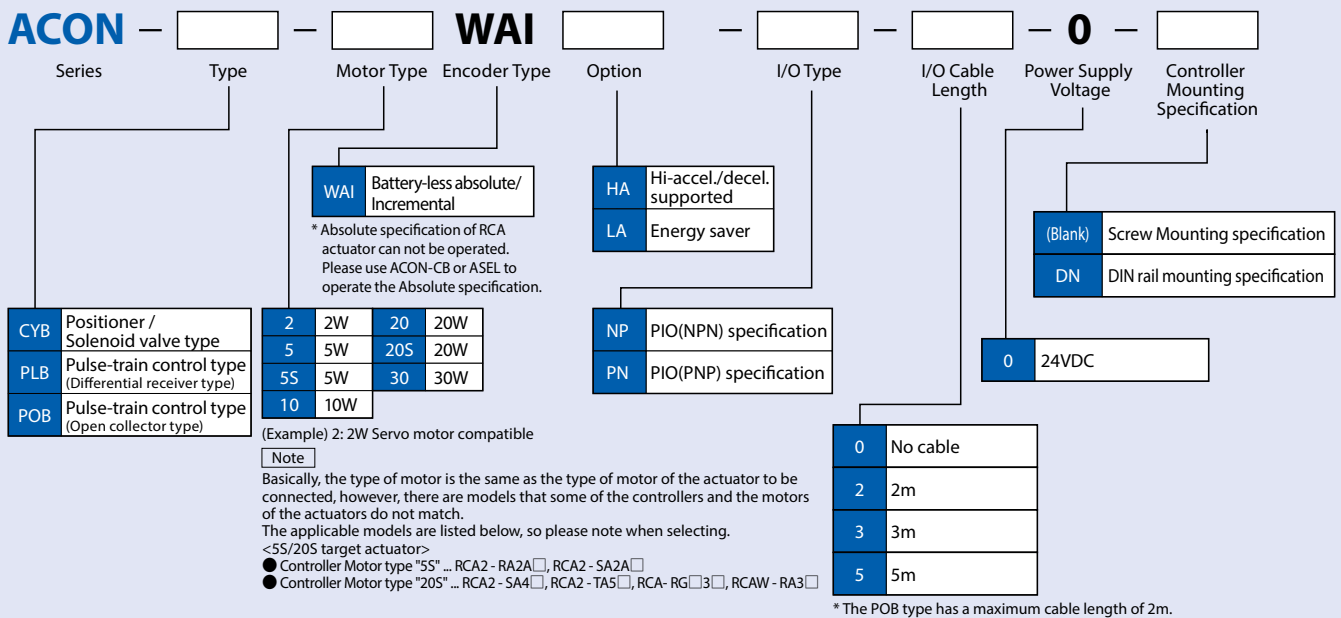
Product model		High resolution battery-less absolute	Simple absolute	Calendar function	Maintenance function	I/O point	Positioning point	Field network
ACON	CYB/PLB/POB	○	×	×	○	Non insulated 8IN/8OUT	Standard 16 points Max. 64 points	×
	CB	○	○	○	○	Insulated 16IN/16OUT	Standard 64 points Max. 512 points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

List of Models/Price

Positioner Controller that can operate RCP6/RCP5/RCP4/RCP3/RCP2. Lineup for 3 types that can support various control.

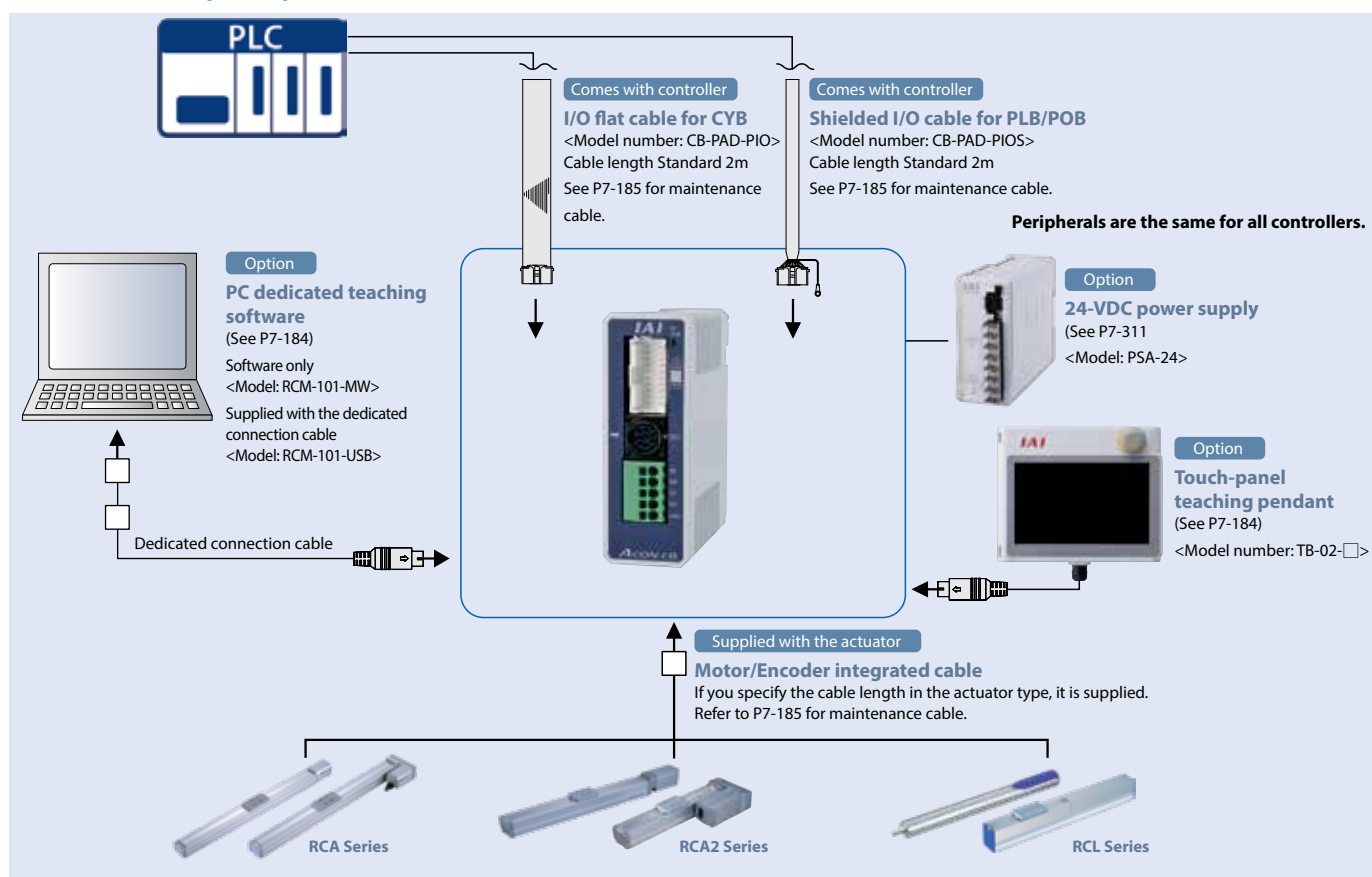
Model	CYB	PLB / POB
Type	Positioner/ Solenoid valve type	Pulse-train control type
External view		
Details	Operable with control similar to air cylinder	Controller for Pulse-train control
Number of positions	64	—

Model number

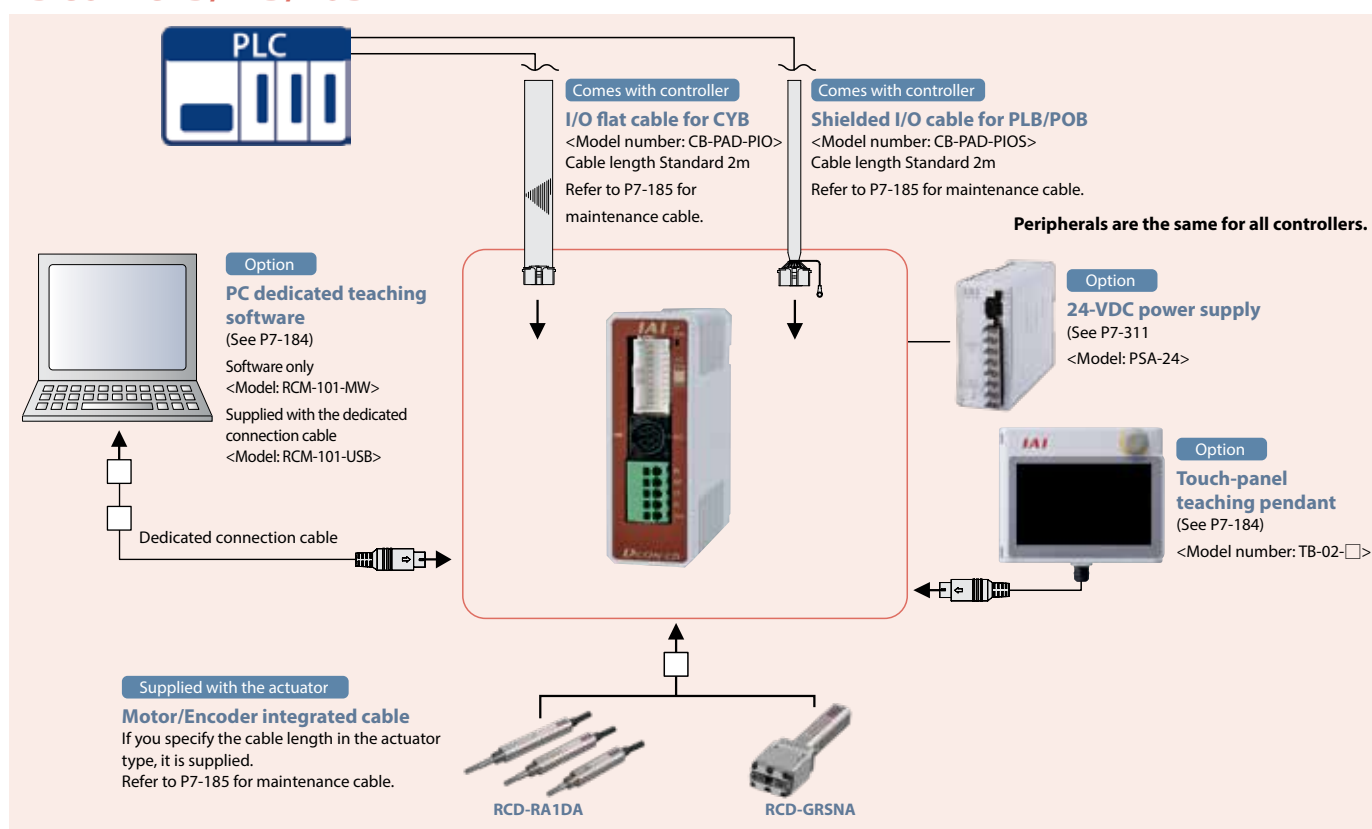


System configuration

<ACON-CYB/PLB/POB>



<DCON-CYB/PLB/POB>



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

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

(Note 1) In the table above, the asterisk* symbol next to the code indicates a reverse logic signal.

(Note 2) In all PIO patterns other than 1, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.

(Note 3) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)

(Note 4) Pin number 13 and 14 of PIO pattern 3 or 4, can select PE* and LS* by 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.
Output	ASTR	Continuous cycling operation signal	When this signal is turned ON, continuous cycling between two points is performed. If this signal is turned OFF while moving, it stops after arriving at the current target position.
	PM1~PM8	Completed position No.	It outputs (binary output) the number of the position reached after positioning is complete.
	HEND	Home return complete	This signal turns ON upon completion of home return.
	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
	PZONE	Position zone	This signal turns ON when the current position of the actuator enters desired zone set by the position data when moving to the position. It is possible to select with ZONE 1, PZONE is effective only when moving to the set position.
	PEND	Positioning complete	This signal turns ON when it reaches within the positioning band after moving. It remains ON even if it exceeds the positioning band.
	*ALM	Alarm	This signal turns ON when the controller is normal, and turns OFF when an alarm generates.
	PE0~6	Current position No.	In solenoid valve mode 1, this signal turns ON after movement is complete.
	LS0~2	Limit switch output	This signal turns ON when the current position of the actuator reaches within the positioning band. In home return complete status, this signal is output even before the movement command or in the servo OFF status.
	SV	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	Output	IN7	-	RSTR
13		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

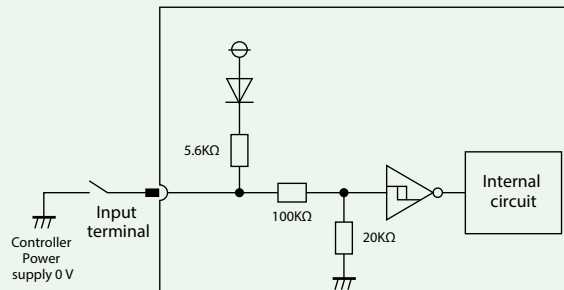
Model	CYB	PLB / POB	Summary
Name	Positioner / Solenoid valve type	Pulse-train control type	
Positioner mode	○	×	It is the basic operation mode that operates by specifying the position number and inputting the start signal.
Solenoid valve mode	○	×	It is possible to move just by turning ON/OFF the position 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)

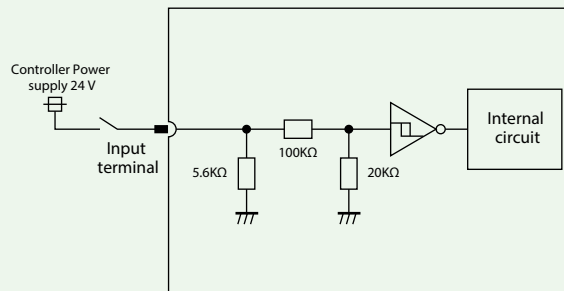
Input Part External Input Specifications

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

NPN Specification



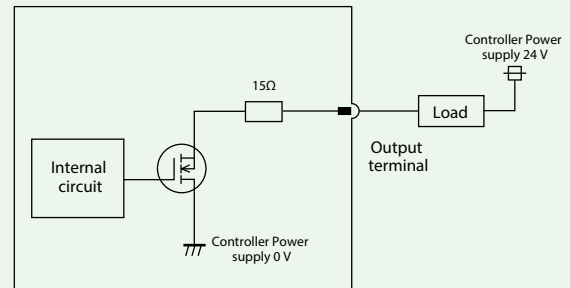
PNP Specification



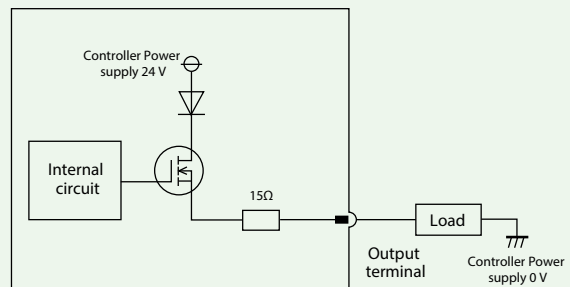
Output Part External Output Specifications

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

NPN Specification



PNP Specification

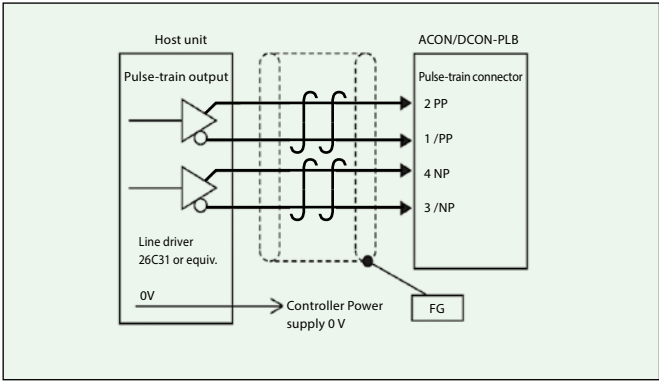


Pulse-train input circuit

Differential line driver

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

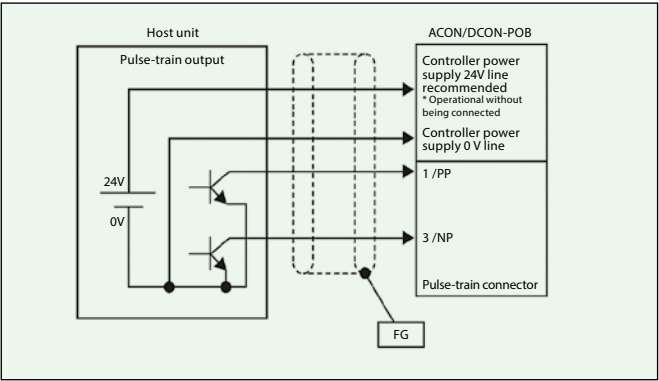
* The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



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

Specification Table

Item	Specification		
Controller type	CYB	PLB	POB
Number of controlled axes	1 axis		
Operation method	Positioner/Solenoid valve type	Pulse-train control type	
Number of positioning points	Up to 64 points	—	
Back up memory	FRAM		
I/O connector (PIO connector)	20 pin connector		
Number of I/Os	8 input points/8 output points	8 input points/8 output points	
I/O power supply	External supply 24VDC±10%		
Serial communication (SIO connector)	RS485 1ch		
Command pulse-train input method	—	Differential line driver	Open collector
Maximum input pulse frequency	—	Max 200kpps	Max 60kpps
Position detection method	Incremental encoder/Battery-less absolute encoder		
Forced electromagnetic brake release	Supply 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	85% RH or less (non-condensing)		
Operating ambience	Not exposed to corrosive gases		
Degree of protection	IP20		
Mass	230g (DIN rail mounting specification 265g)		

Motor power capacity

		Motor type	Standard/High-acceleration		Power-saving	
			Rated [A]	Max. [A]	Rated [A]	Max. [A]
ACON	RCA/RCA2	5W(5S)	1.0	3.3	—	—
		10W	1.3	4.4	1.3	2.5
		20W	1.3	4.4	1.3	2.5
		30W	1.3	4.0	1.3	2.2
		20W(20S)	1.7	5.1	1.7	3.4
	RCL	2W	0.8	4.6	—	—
		5W	1.0	6.4	—	—
		10W	1.3	6.4	—	—
DCON	RCD	3W	0.7	1.5	—	—

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

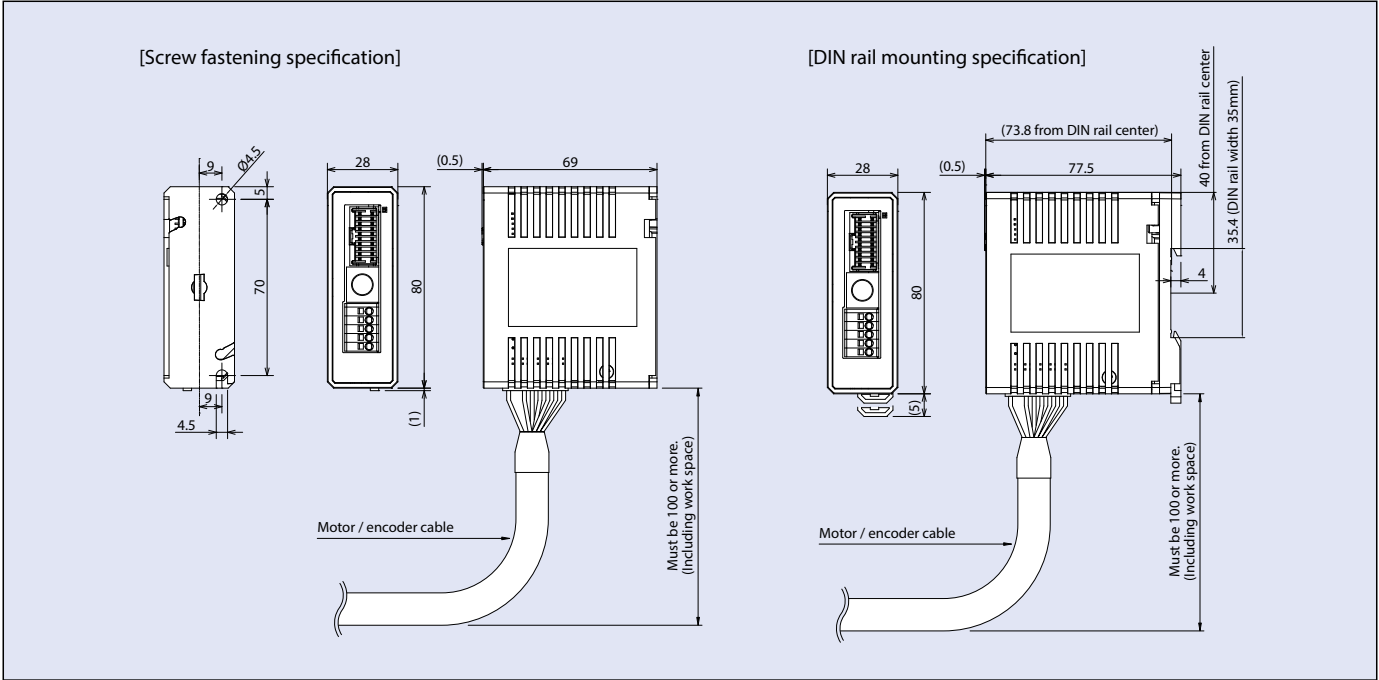
XSEL
(SCARA)

PSA-24

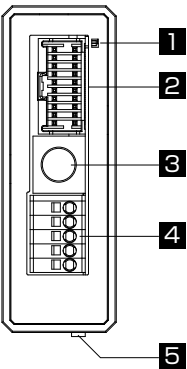
TB-02

TB-03

External Dimensions



Names of each part



1 Controller status display LED

Displays the operation status of the controller.

○: ON ×: OFF ☆: Blinking

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

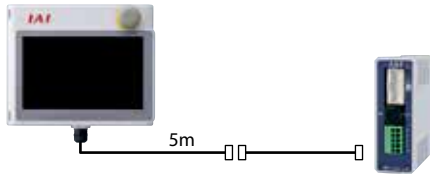
Option

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	20 to 85%RH (Non-condensing)
Degree of protection	IP20
Weight	470g (TB-02 only)

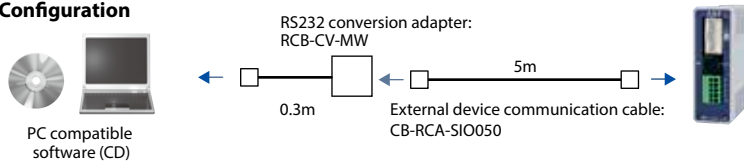
PC dedicated teaching software (Windows only)

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

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

Please contract IAI for the current supported versions.

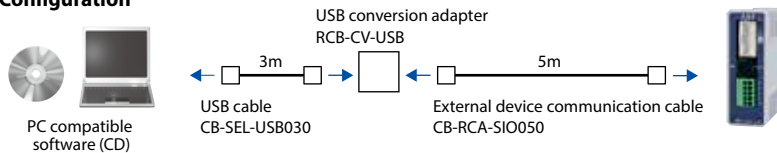
Configuration



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

Please contract IAI for the current supported versions.

Configuration



Supported Windows version 7/8/8.1/10



Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

**ACON
DCON**

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

Maintenance parts

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

Table of Applicable Cables

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	—
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	—
②	GRSNA	CB-CAN-MPA □□□ -RB

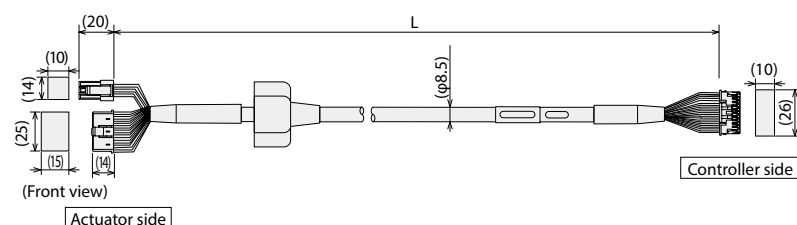
* When the applicable controller of the RCD - RA1DA model uses "D3", the cable model is CB - CA - MPA □□□ / CB - CA - MPA □□□ - RB.

Common to ACON/DCON

Model Number	I/O flat cable for CYB (Without shield)	I/O cable for PLB/POB (With shield)
① ACON/DCON	CB-PAD-PIO □□□	CB-PAD-PIOS □□□

Model CB-ASEP2-MPA □□□ *The standard is the robot cable.

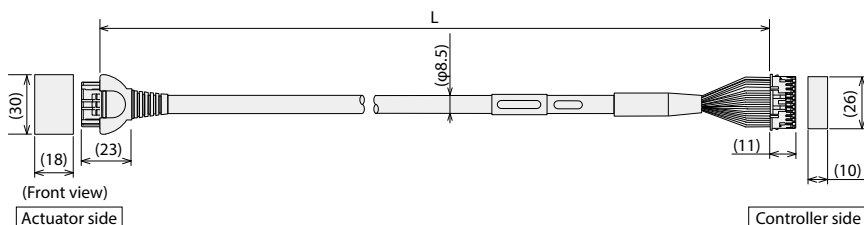
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



Actuator side Terminal number		Controller side Terminal number
1	Red(U)	1
2	Yellow(V)	2
3	NC	3
4	NC	4
5	Black(W)	5
6	NC	6
7	Orange(BK+)	7
8	Gray(BK-)	8
9	Black(LS+)	9
10	Brown(LS-)	10
11	White(A+)	11
12	Yellow(A-)	12
13	Red(B+)	13
14	Green(B-)	14
15	Black (identification tape)(Z+)	15
16	Brown (identification tape)(Z-)	16
17	White (identification tape)(VCC)	17
18	Yellow (identification tape)(GND)	18
19	Red (identification tape)(VPS/BAT+)	19
20	Green (identification tape)(Spares)	20
21	White(BAT+)	21
22	NC	22
23	NC	23
24	Shield(FG)	24

Model CB-APSEP-MPA □□□ *The standard is the robot cable.

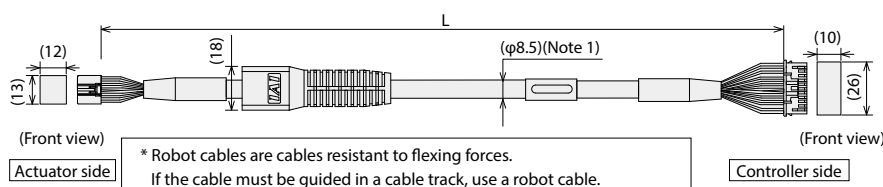
* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



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

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

* Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m (When connecting to RCD, it corresponds to a maximum of 10 m)



Pin No.	Signal name	Pin No.	Signal name
3	U	1	U
5	V	2	V
10	W	3	W
9	—	4	—
4	W	5	W
15	—	6	—
12	A+	11	A+
17	A-	12	A-
1	B+	13	B+
6	B-	14	B-
11	Z+/SA(mABS)	15	Z+/SA(mABS)
16	Z-/SB(mABS)	16	Z-/SB(mABS)
18	VPS/BAT+	17	VPS/BAT+
8	BK+	18	BK+
20	LS+	19	LS+
2	LS-	20	LS-
21	VCC	21	VCC
7	GND	22	GND
14	BK-	23	BK-
13	LS GND	24	LS GND
19	HS1_IN	25	HS1_IN
22	BAT+	26	BAT+
23	—	27	—
24	FG	28	FG

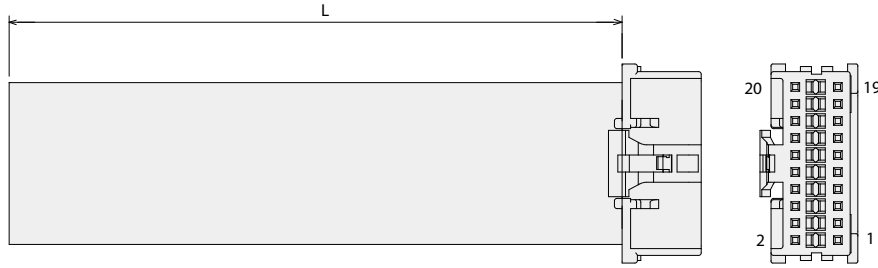
Minimum bending radius $r = 68\text{mm}$ or more (Dynamic bending condition)

(Note 1) If the cable length is 5 m or more, the diameter of the non-robot cable becomes $\phi 9.1$, while that of the robot cable becomes $\phi 8$.

(Note 2) When connecting to RCD, maximum 10m.

Model **CB-PAD-PIO**

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

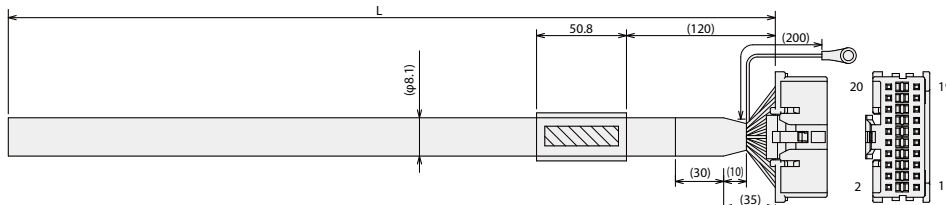


Housing: 51353-2000 (MOLEX)
Contact: 56134-9000 (MOLEX)

No.	Cable color	Wiring	No.	Cable color	Wiring
1	Brown-1	Flat cable AWG28	11	Brown-2	Flat cable AWG28
2	Red-1		12	Red-2	
3	Orange-1		13	Orange-2	
4	Yellow-1		14	Yellow-2	
5	Green-1		15	Green-2	
6	Blue-1		16	Blue-2	
7	Purple-1		17	Purple-2	
8	Gray-1		18	Gray-2	
9	White-1		19	White-2	
10	Black-1		20	Black-2	

Model **CB-PAD-PIOS**

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



Housing: 51353-2000 (MOLEX)
Contact: 56134-9000 (MOLEX)

* Maximum length if ACON·DCON-POB type is selected is 2m.

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	0.5-5(JST)
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	
1	FG	Green	AWG22

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

**ACON
DCON**

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

SCON-CB

Position Controller for Single-axis robot / Cartesian robot / Linear servo /
ROBO Cylinder RCS2/RCS3/RCS4



(*1) MECHATROLINK-I/II connection specification is not compliant with CE Marking.
(*2) 3000 and 3300W types are not compliant with UL standard.

Features

1 Compatible with Battery-less Absolute Encoder

The RCS2, RCS3, RCS4, ISB and ISDB equipped with a battery-less absolute encoder are supported.
Since no battery is needed to retain position data, less space is required in the control panel, which contributes to saving initial cost and maintenance cost.



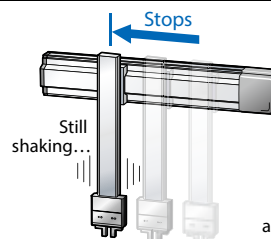
2 Supporting Major Field Networks <Optional Function>

In addition to DeviceNet, CC-Link, CC-Link IE Field and PROFIBUS-DP, direct connections are now possible to MECHATROLINK, CompoNet, EtherCAT, EtherNet/IP and PROFINET IO.
The actuator can also be operated by specifying coordinate values directly via a field network.



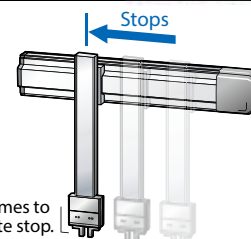
3 Vibration Control Function <Optional Function>

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>

Date	Time	Alarm No.	Message
2017/12/12	11:57:00	Alarm 1	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 2	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 3	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 4	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 5	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 6	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 7	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 8	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 9	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 10	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 11	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 12	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 13	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 14	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 15	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 16	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 17	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 18	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 19	SCON Control power on/Off alarm (warning)
2017/12/12	11:57:00	Alarm 20	SCON Control power on/Off alarm (warning)

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.

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.

I/O connector for safety function
(for STO/SS1-t specification only)



List of Models

Model													
SCON-CB													
External view													
I/O type													
I/O type code		Standard specification		Field network type (*1)									
		PIO connection specification (*1)		DeviceNet	CC-Link	CC-Link IE	PROFIBUS	CompoNet	MECHATROLINK	MECHATROLINK	EtherCAT	EtherNet/IP	PROFINET IO
I/O type code		NP/PN		DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT
Applicable encoder type		Battery-less absolute Incremental Index absolute		Battery-less absolute/ Incremental/Absolute/Quasi-absolute									
SCON-CB	12~150W	<input type="radio"/>	<input type="radio"/>										
	200W	<input type="radio"/>	<input type="radio"/>										
	100S/200S/300S	<input type="radio"/>	<input type="radio"/>										
	300~400W	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	600W	<input type="radio"/>	<input type="radio"/>										
	750W	<input type="radio"/>	<input type="radio"/>										
3000~3300W		<input type="radio"/>	<input type="radio"/>										

(Note) Index absolute type can not be used during pulse-train control and MECHATROLINK control. (See P1-323)

(*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

CB	High-function type
CGB	Safety category compliant type

* For RCS 3 - RA 15 R / 20 R, only CGB can be chosen.

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

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 "200S"
DD-LT18□ DDCR-LT18□
DDA-LT18C DDACR-LT18C

● Controller Motor type "30R"
RS

* For 200S, the housing of the controller will be 400W.
Please check the 400w specifications for the price.

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

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.

Not specified	Standard type
STO	STO type
SS	SS1-t type

* Only the standard type is selectable for RCS3-RA15R/20R.

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.

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
EP	EtherNet/IP
PRT	EtherNet/IP
RC	RCON connection specification

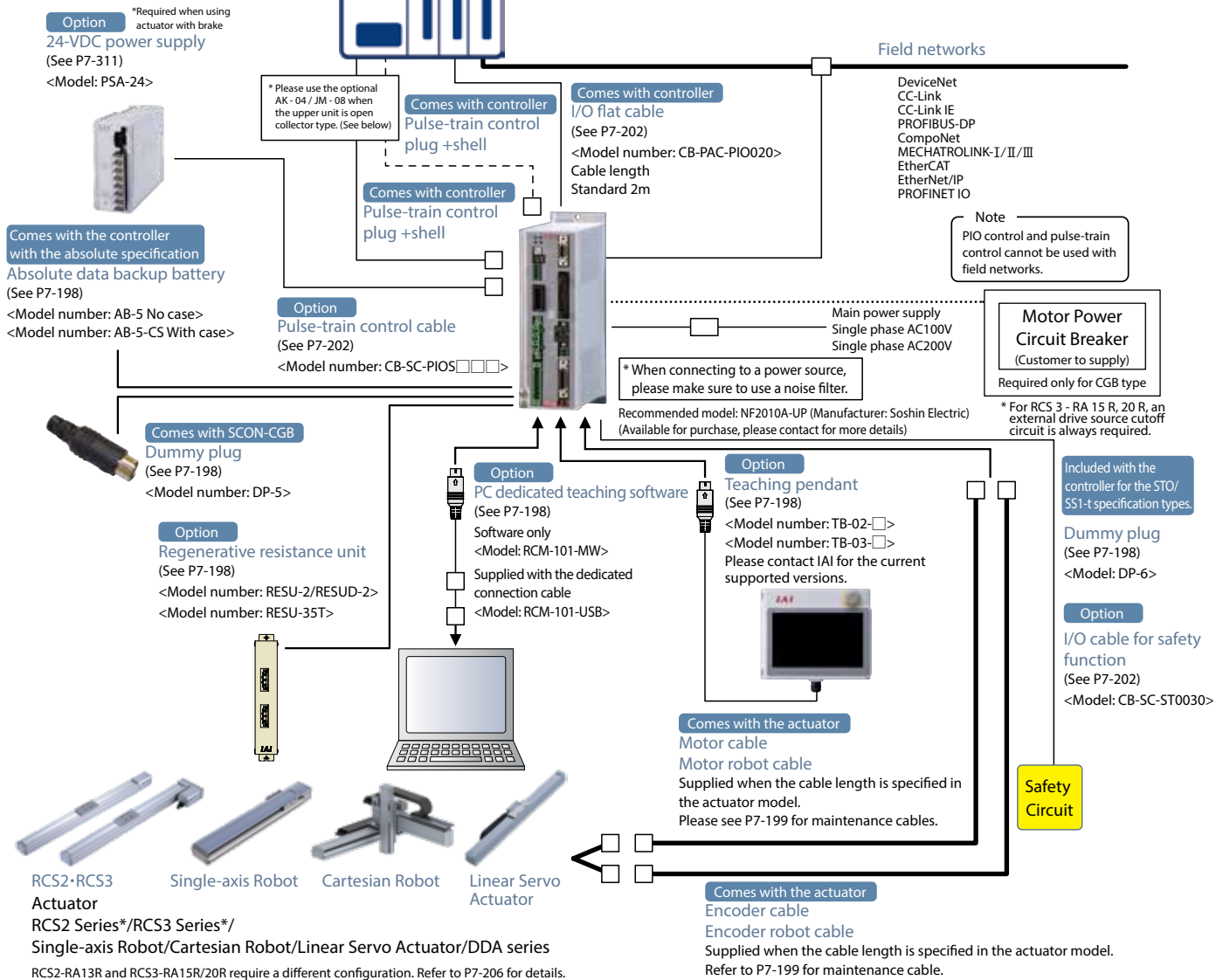
(Note 1) Please be sure to check P7-20 for the caution when selecting.

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*.

System configuration

<SCON-CB/CGB>

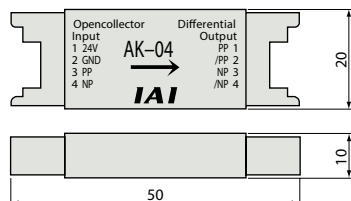


■ Pulse Converter: Model number AK-04

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

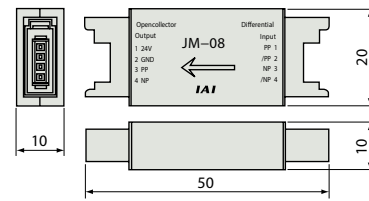


■ Pulse Converter: Model number JM-08

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	Positioning point	Parameter (PIO Pattern) Selection								
			0	1	2	3	4	5	6 (Note 1)	7 (Note 1)	0/1 (Note 1)
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2	Force mode 1	Force mode 2	Pluse-train mode
			64	64	256	512	7	3	32	5	—
1A	24V		P24								
2A	24V		P24								
3A	—		NC								
4A	—		NC								
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0	PC1	ST0	SON
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)	PC2	ST1	RES
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (-)	PC4	ST2	HOME
8A		IN3	PC8	PC8	PC8	PC8	ST3	—	PC8	ST3	TL
9A		IN4	PC16	PC16	PC16	PC16	ST4	—	PC16	ST4	CSTP
10A		IN5	PC32	PC32	PC32	PC32	ST5	—	—	—	DCLR
11A		IN6	—	MODE	PC64	PC64	ST6	—	—	—	BKRL
12A		IN7	—	JISL	PC128	PC128	—	—	—	—	RMOD
13A		IN8	—	JOG+	—	PC256	—	—	CLBR	CLBR	RSTR (Note 2)
14A		IN9	BKRL	JOG-	BKRL	BKRL	BKRL	BKRL	BKRL	BKRL	—
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	—
16A		IN11	HOME	HOME	HOME	HOME	HOME	—	HOME	HOME	—
17A		IN12	*STP	*STP	*STP	*STP	*STP	—	*STP	*STP	—
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—	CSTR	—	—
19A		IN14	RES	RES	RES	RES	RES	RES	RES	RES	—
20A		IN15	SON	SON	SON	SON	SON	SON	SON	SON	—
1B	Output	OUT0	PM1	PM1	PM1	PM1	PE0	LSO	PM1	PE0	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								
20B	0V		N								

* In the above table, signals in () represent functions available before the home return.

* In the above table, signals preceded by * are turned OFF while the actuator is operating.

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

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	MECHATROLINK I,II	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 bytes	2 bytes	1 channel	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes
1	Position/simple direct value mode	8 bytes	8 bytes	1 channel	8 bytes	8 bytes	8 bytes	8 bytes	8 bytes
2	Half direct value mode	16 bytes	16 bytes	2 channel	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes
3	Full direct value mode	32 bytes	32 bytes	4 channel	× (Note 1)	32 bytes	32 bytes	32 bytes	32 bytes
4	Remote I/O mode 2	12 bytes	12 bytes	1 channel	12 bytes	12 bytes	12 bytes	12 bytes	12 bytes
5	Position/simple direct value mode 2	8 bytes	8 bytes	1 channel	8 bytes	8 bytes	8 bytes	8 bytes	8 bytes
6	Half direct value mode 2	16 bytes	16 bytes	2 channel	16 bytes	16 bytes	16 bytes	16 bytes	16 bytes
7	Remote I/O mode 3	12 bytes	12 bytes	1 channel	12 bytes	12 bytes	12 bytes	12 bytes	12 bytes
8	Half direct value mode 3	16 bytes	16 bytes	2 channel	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 × indicates that it is not supported.

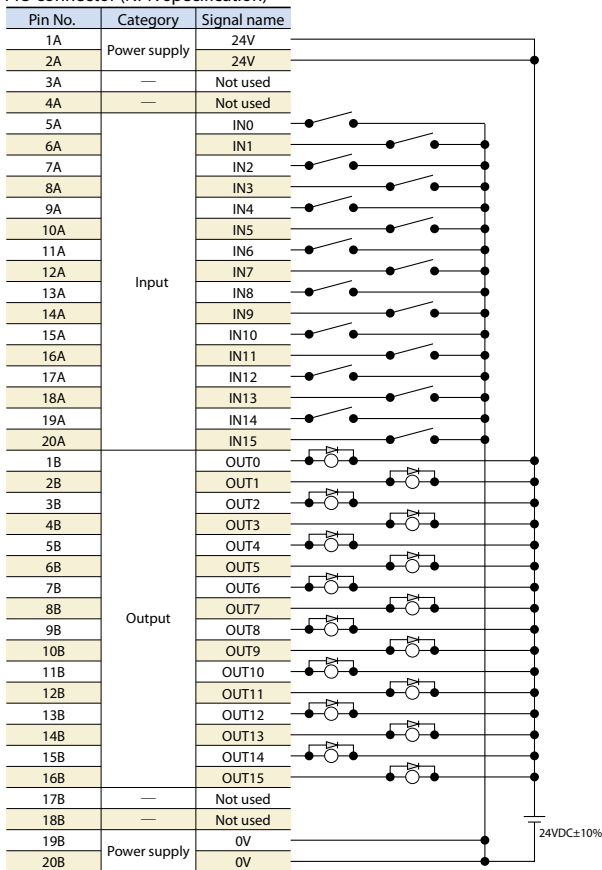
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

(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

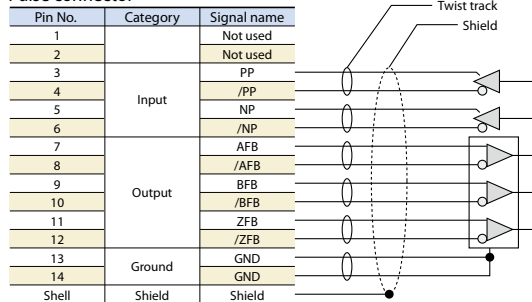
PIO connector (NPN specification)



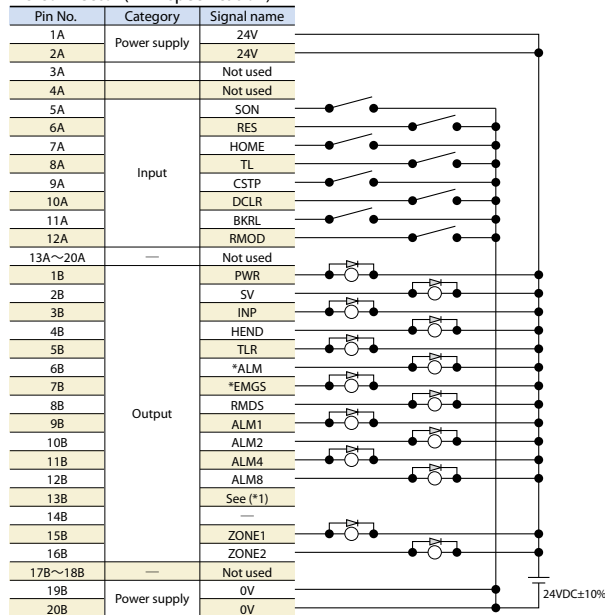
* Connect Pins 1A and 2A to 24V, and Pins 19B and 20B to 0V.

Pulse-train Mode (Differential Output)

Pulse connector



PIO connector (NPN specification)



* Please make sure to connect the Shield of the twisted pair cable, which connects to the Pulse connector, to the Shell. Also keep the cable length to 10m or less.

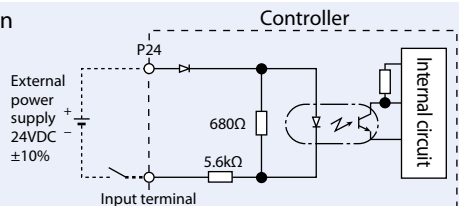
* Connect Pins 1A and 2A to 24V, and Pins 19B and 20B to 0V.
(*1) —/*ALML/*OVLW/*BALM (switchable with parameters)

PIO Input and Output Interface

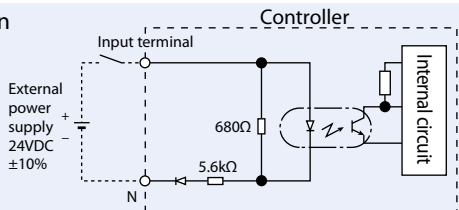
Input Part External Input Specifications

Item	Specification
Input voltage	24VDC $\pm 10\%$
Input current	4mA/1 circuit
ON/OFF voltage	ON voltage: DC 18V min. OFF voltage: DC 6V max.
Isolation method	Photocoupler

NPN specification



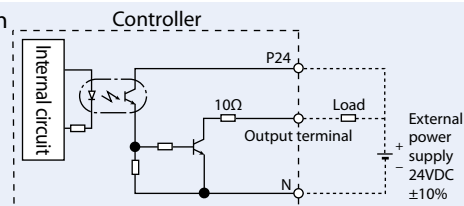
PNP specification



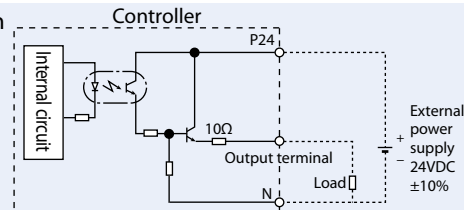
Output Part External Output Specifications

Item	Specification
Load voltage	24VDC
Max. load current	50mA/1 point
Leak current	Max. 0.1mA/1 point
Isolation method	Photocoupler

NPN specification



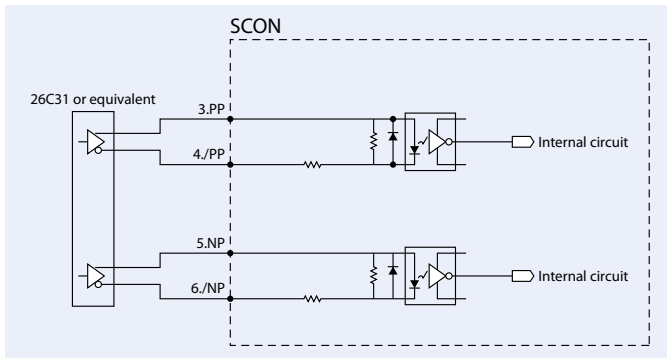
PNP specification



Pulse-train Type I/O Specification (Differential Line Driver Specification)

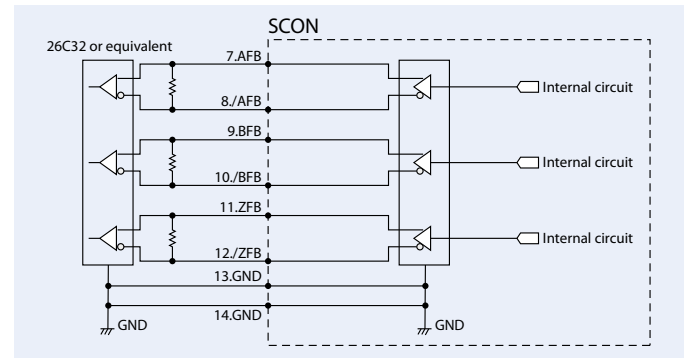
Input Part

Maximum number of input pulses : Line driver interface 2.5Mpps
Isolation method : Photocoupler isolation



Output Part

Maximum number of output pulses : Line driver interface 2.5Mpps
Isolation/non-isolation : Non-isolation



Pulse-train Type I/O Specification (Open-collector Specification)

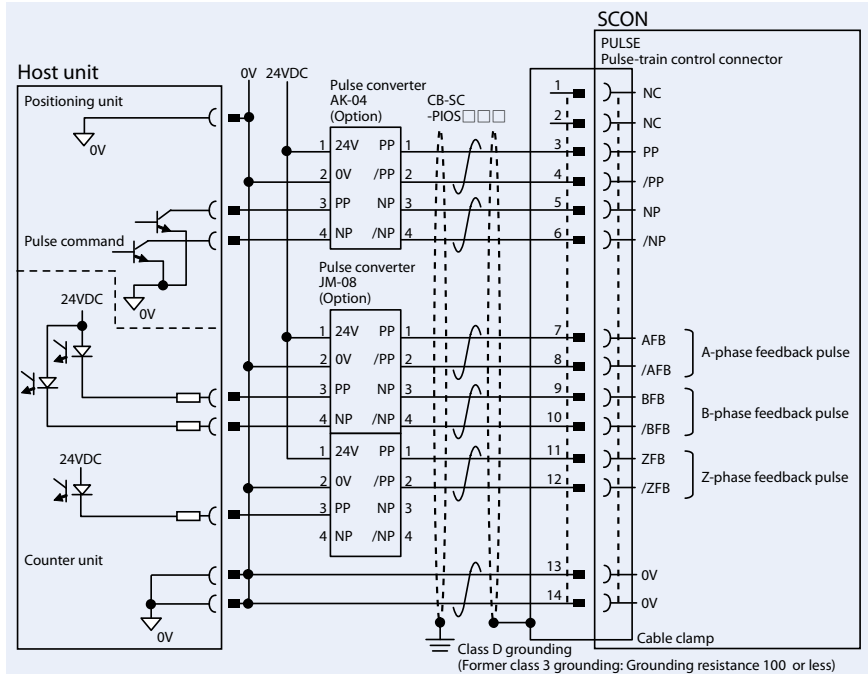
The AK-04 (Option) is needed to input pulses. The JM-08 (Option) is needed to output pulses.

Maximum number of input pulses : 200kpps (AK-04 required)
Maximum number of output pulses : 500kpps (JM-08 required)

- * The 24VDC power supply connected to the AK-04 must be shared with the PIO interface.
- * Keep the length of the cable connecting the pulse output unit (PLC) and AK-04/JM-08 as short as possible.
Also keep the cable between the AK-04/JM-08 and PULSE connector to 2m or less.

Note

Use the same power supply for opencollector input/output to/from the host and for the AK-04, JM-08.



Command Pulse Input Patterns

Command pulse-train pattern		Input terminal	Forward	Reverse
Negative logic	Forward pulse-train	PP•/PP		
	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.				
Positive logic	Phase A/B pulse-train	PP•/PP		
		NP•/NP		
	Command phases A and B having a 90° phase difference (multiplier is 4) indicate the amount of rotation and the rotating direction.			
	Forward pulse-train	PP•/PP		
	Reverse pulse-train	NP•/NP		
Positive logic	Pulse-train	PP•/PP		
	Sign	NP•/NP	High	Low
	Phase A/B pulse-train	PP•/PP		
		NP•/NP		

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	RS485 2ch
Command pulse-train input method (Note 1)		Differential line driver output supported	—
Maximum input pulse frequency		Differential line driver method: 2.5Mpps max./ Open-collector method (pulse converter used): 200kpps max.	—
Position detection method		Incremental encoder / Absolute encoder / Quasi-absolute serial encoder	Battery-less absolute encoder
Driving power shut-off function		CB: Available (built-in relay) CGB: Unavailable	Unavailable
Forced electromagnetic brake release		Brake release switch ON/OFF	
Input power supply		Single-phase AC100~115V±10% Single-phase AC200~230V±10%	Three-phase AC200V~230V±10%
Power-supply capacity (Note 2)		12W/89VA 20W/74VA 30W(other than RS)/94VA 30W(RS)/186VA 60W(other than RCS3-CTZ5C)/186VA 60W(RCS3-CTZ5C)/245VA 100W/282VA 150W/376VA 200W/469VA	100SW(LSA/LSAS-N10)(*)/331VA 200SW(LSA-S10H, LSA/LSAS-N15S)(*)/534VA 200SW(LSA/LSAS-N15H)(*)/821VA 300W(LSA-N19)(*)/710VA 400W(other than RCS3-CT8C)/968VA 400W(RCS3-CT8C)/1278VA 600W/1212VA 750W/1569VA 3000W/5705VA 3300W/6062VA
Vibration resistance		X,Y, and Z directions 10~57Hz single-side width 0.035mm(continuous), 0.075mm(continuous) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (continuous)	X,Y, and Z directions 10~57Hz single-side width 0.035mm(continuous), 0.075mm(intermittent) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (intermittent)
Calendar/ clock function	Retention time	Approx. 10 days	
	Charge time	Approx. 100 hours	
Protective functions		Overcurrent, abnormal temperature, low fan speed monitoring, encoder disconnection, etc.	
Ambient operating temperature		0~40℃	
Ambient operating humidity		85%RH or less (non-condensing)	
Operating atmosphere		Free from corrosive gases	
Protection degree		IP20	
Mass		Approx. 900g (+ 25g for the absolute specification)	Approx. 1.2kg (+ 25g for the absolute specification) Approx. 2.8kg
External dimensions		58mm(W)×194mm(H)×121mm(D)	72mm(W)×194mm(H)×121mm(D) 92.7mm(W)×300mm(H)×172mm(D)

(Note 1) For the command pulse input method, use the differential line driver method resistant to noise.

If the open-collector method must be used, use the optional pulse converter (AK-04/JM-08) to convert open-collector pulses to differential pulses.

(Note 2) 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 3072 pulses for RCS2-SRA7BD/SRG57BD/SRGD7BD, 1600 pulses for RCS2-□□5N (Incremental), 1048576 pulses for DD-□18P:20bit, 131072 pulses for DD-□18S:17bit, 2400 pulses for NS-S□M□ (Incremental) and 16384 pulses for all other models.

External Dimensions

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



Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

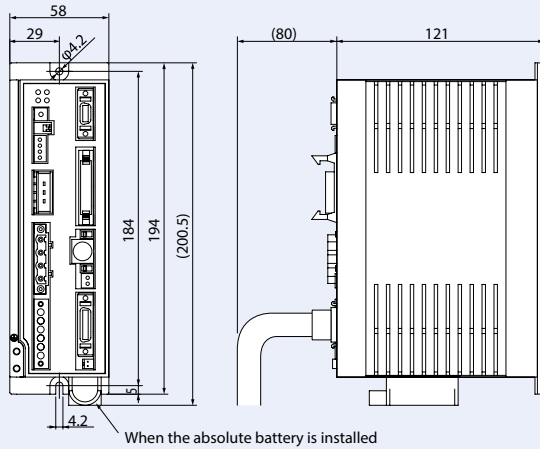
XSEL
(SCARA)

PSA-24

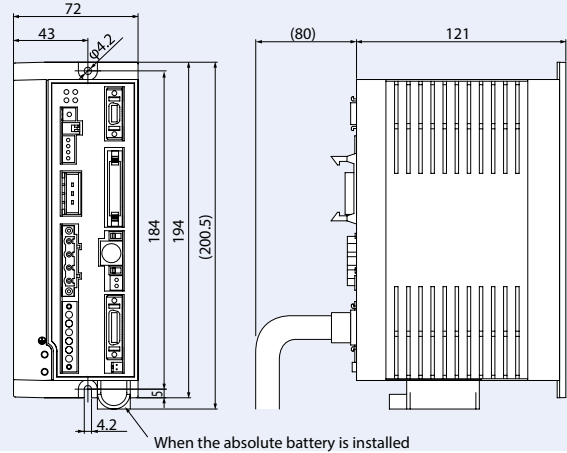
TB-02

TB-03

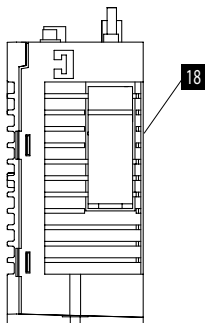
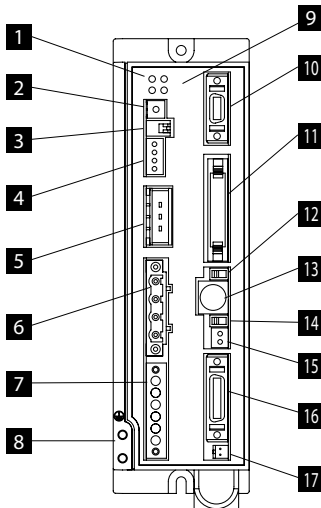
Less than 400W



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 or SIO communication cable.

13 SIO connector

The connector for the teaching pendant or the PC communications cable.

14 Brake release switch

The forced release switch for the electromagnetic brake integrated with an actuator.

* It is necessary that 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

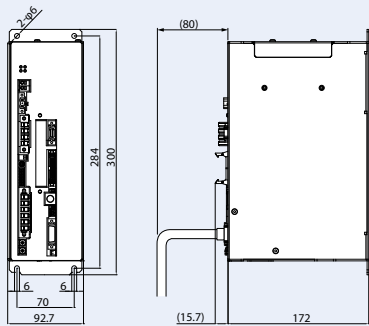
The connector for the absolute data backup battery (necessary only for absolute encoder type).

18 Absolute battery holder

It is a battery holder in order to mount the absolute data backup battery.

External Dimensions

For 3000W, 3300W

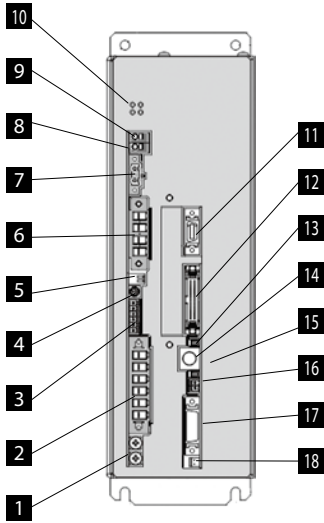


CAD drawings can be downloaded from our website.
www.intelligentactuator.com



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.

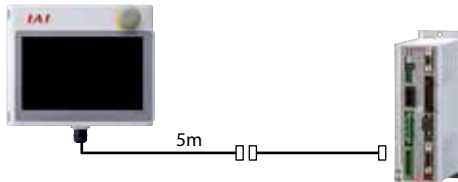
Options

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	20~ 85% RH (Non-condensing)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

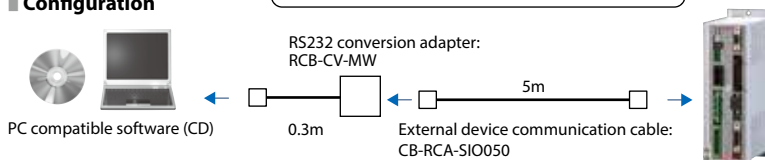
PC dedicated teaching software (Windows only)

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

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

Configuration

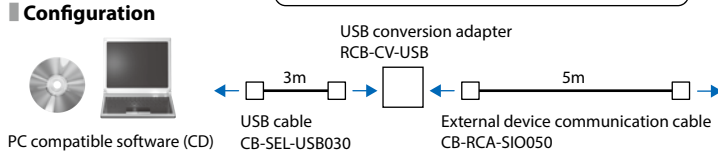
Please contract IAI for the current supported versions.



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

Configuration

Please contract IAI for the current supported versions.



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 confirm the total wattage of the actuators, and use the regenerative unit as necessary.

<For ~750W>

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

Specification

Model number	RESU-2	RESUD-2
Mass	Approximately 0.4kg	
Internal regen. resistance value	235Ω 80W	
Mounting method	Screw mounting	DIN rail mounting
Included cable	CB-SC-REU010	

Necessary 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-N105 type is required.

Necessary Amount Guideline (RCS2-RA13R)

	Lead 2.5	Lead 1.25
Horizontal	1	0
Vertical	1	0

* The required regenerative resistance may be more than as specified above depending on the operating conditions.

Necessary Amount Guideline(DD)

Series	Type	Required Quantity
DD	LT18□	1
DDA	LH18□	2

<For 3000W~3300W>

Model **RESU-35T**

Specification

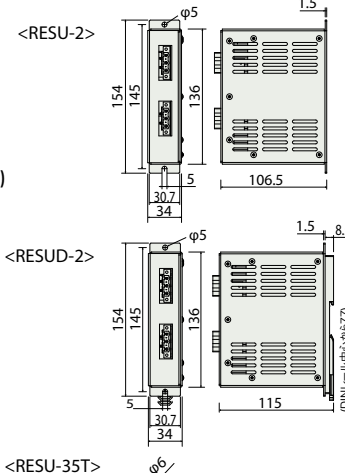
Mass	Approximately 1.8kg
Internal regen. resistance value	30Ω 450W
Mounting method	Screw mounting

* The cable is required to prepare by the customer.

Necessary Amount Guideline

● 3000W, 3300W
Number of connected units
2

External dimensions



* When two regenerative units are required, please use one RESU-2 and one RESU-1 (Please refer to P7-302).

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 (PCON-CGB/CGFB) 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)	Models other than ② - ⑥	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS3(CR)	RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③	RCS2	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-RCS3-MA□□□-RB	-	CB-X1-PA□□□
⑥	RCS3	RA15R RA20R			-	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) *

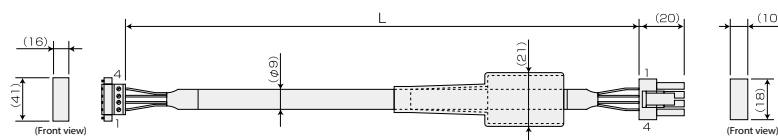
* Model that is not battery-less absolute specification will be CB-X1-PA□□□ / CB-X1-PLA□□□ even when it is 20 m or more.

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 P7-214~ 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



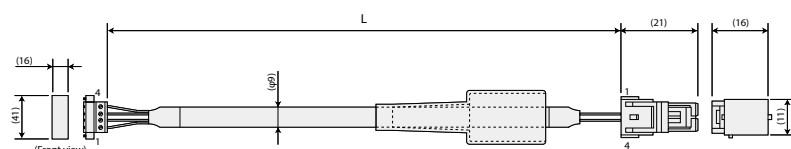
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
0.75sq	Green	PE	1	1	U	Red	0.75sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)

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

Model Number CB-XMC-MA□□□

* Please indicate the cable length (L) in □□□, e.g.) 080 = 8m maximum SCON/SSEL:20m, XSEL:30m



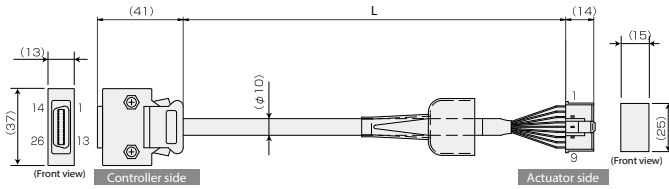
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
1.25sq	Green	PE	1	1	U	Red	1.25sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Minimum bending radius $r = 55\text{mm}$ or more (Dynamic bending condition)

* Only robot cable is available for this model.

Maintenance Parts

Model Number **CB-RCS2-PA** (For RCS2/RCS3) / **CB-X3-PA** (For NS/RCS2/RCS3) * Please indicate the cable length (L) in , maximum 30m, e.g.) 080 = 8m



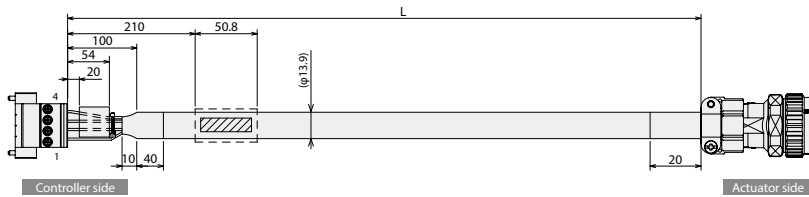
Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)

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

(Controller side)				(Actuator side)			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG26 (soldered)	Gray/White	White/Green	OV	1	LS	White/Blue	1
	Brown/White	White/Orange	LS	2	SP	Purple	2
	-	-	OT	3	BAT+	White/Red	3
	-	-	RSV	4	BAT-	White/Black	4
	-	-	-	5	VCC	Black	5
	-	-	-	6	LS+	Green/White	6
	-	-	-	7	LS-	Brown/White	7
	-	-	-	8	FG	Ground	8
	-	-	-	9	SD	Blue	9
	-	-	-	10	BAT+	Orange	10
	-	-	-	11	BAT-	Gray	11
	-	-	-	12	VCC	Green	12
	-	-	-	13	LS+	White/Blue	13
	-	-	-	14	LS-	White/Red	14
	-	-	-	15	SP	Purple	15
	-	-	-	16	BAT+	White/Black	16
	-	-	-	17	VCC	Black	17
	-	-	-	18	LS+	Green/White	18
	-	-	-	19	LS-	Brown/White	19
	-	-	-	20	FG	Ground	20
	-	-	-	21	SD	Blue	21
	-	-	-	22	BAT+	Orange	22
The shield is clamped to the hood.				Drain wire and meshed shield			

Model Number **CB-RCS3-MA** -RB

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

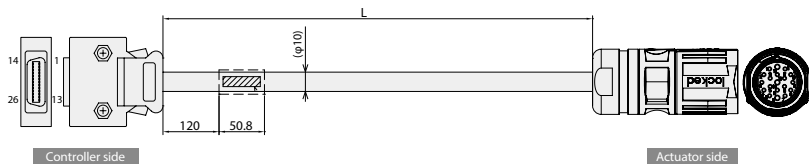


Minimum bending radius $r = 83.4\text{mm}$ or more (Dynamic bending condition)

IPC5/4-STF-7.62				JL10-6A18-105E-EB			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG12	Green/Yellow	PE	1	A	U	Black1	AWG12 (soldered)
	Black1	U	2	B	V	Black2	
	Black2	V	3	C	W	Black3	
	Black3	W	4	D	PE	Green/Yellow	

Model Number **CB-RCS3-PLA** -RB

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

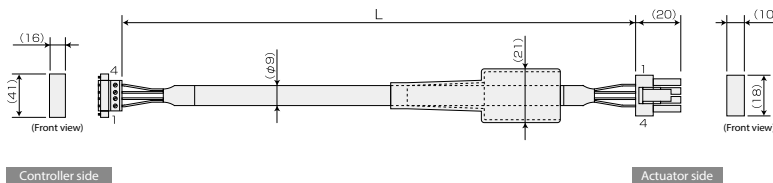


Minimum bending radius $r = 50\text{mm}$ or more (Dynamic bending condition)

10126-3000PE				CA-1951N1280DNS			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG26 (soldered)	White/Orange	E24V	12	1	LS	Brown/Blue	AWG26 (soldered)
	White/Green	E24G	13	2	CLEP	Brown/Yellow	
	Brown/Blue	LS	26	3	OT	Brown/Red	
	Brown/Yellow	CLEP	25	4	RSV	Brown/Black	
	Brown/Black	OT	24	5	BAT+	Purple	
	Brown/Red	RSV	23	6	VCC	Red	
	White/Blue	LC SRD+	9	7	LC SRD+	White/Blue	
	White/Yellow	LC SRD-	10	8	LC SRD-	White/Yellow	
	White/Black	LC VCC	18	9	LC VCC	White/Red	
	White/Red	LC GND	19	10	BKR+	Yellow	
	---	---	1	11	BKR-	Blue	
	---	---	2	12	FG	Ground	
	---	---	3	13	E24V	White/Orange	
	---	---	4	14	BAT-	Gray	
	---	---	5	15	SRD+	Orange	
	---	---	6	16	SRD-	Green	
	Orange	SRD+	7	17	LC GND	White/Black	
	Green	SRD-	8	18	E24G	White/Green	
	Purple	BAT+	14	19	GND	Black	
	Gray	BAT-	15				
	Red	VCC	16				
	Black	GND	17				
Blue	BKR-	20					
Yellow	BKR+	21					
---	---	22					
The shield is clamped to the hood.							

Model Number **CB-X-MA**

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



Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)

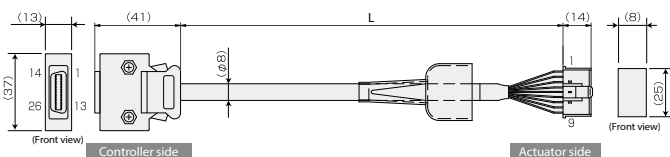
* Only robot cable is available for this model.

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

When replacing a cable after purchasing the product, please refer to the list of models below.

Model Number CB-X1-PA□□□

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



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

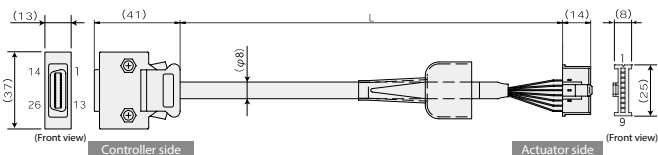
* For ISB · ISDB · ISDBCR (Encoder types are battery-less absolute), please select CB-X1-PA □□□-AWG 24 if you want a cable of 21 m or more.

Wiring	Color	Signal	No.
—	—	—	10
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CREEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	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+	22	

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	AWG26 (crimped)
6	GND	Black	
7	F.G	Blue	
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



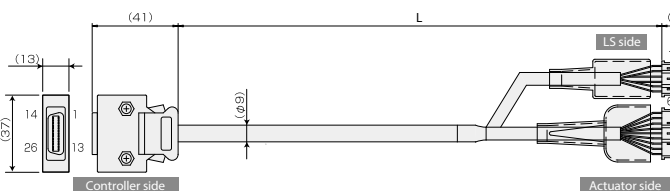
Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Wiring	Color	Signal	No.
—	—	—	11
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CREEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	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+	22	

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	AWG24 (crimped)
6	GND	Black	
7	F.G	Blue	
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 $r = 54\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

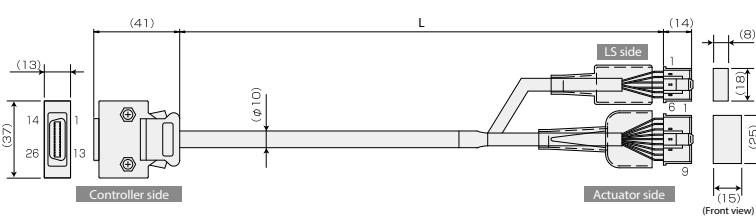
* For ISB · ISDB · ISDBCR (Encoder types are battery-less absolute), please select CB-X1-PA □□□-AWG 24 if you want a cable of 21 m or more.

Wiring	Color	Signal	No.
—	—	—	10
White/Blue	E24V	12	
White/Yellow	OV	13	
White/Red	LS	26	
White/Black	CREEP	25	
White/Purple	OT	24	
White/Gray	RSV	23	
—	—	—	9
—	—	—	18
—	—	—	19
—	—	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+	22	

No.	Signal	Color	Wiring
1	E24V	White/Blue	
2	OV	White/Yellow	
3	LS	White/Red	AWG26 (crimped)
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	AWG26 (crimped)
6	GND	Black	
7	F.G	Blue	
8	BK-	Blue	
9	BK+	Yellow	

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



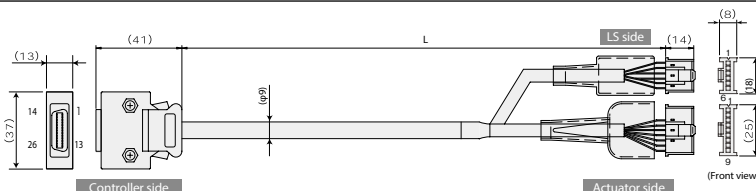
Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

Wiring	Color	Signal	No.
—	—	—	10
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CREEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	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+	22	

No.	Signal	Color	Wiring
1	E24V	Brown/White	
2	OV	Gray/White	
3	LS	Red/White	AWG26 (crimped)
4	CREEP	Black/White	
5	OT	Yellow/Black	
6	RSV	Pink/Black	
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	AWG26 (crimped)
6	GND	Black	
7	F.G	Blue	
8	BK-	Blue	
9	BK+	Yellow	

Model Number CB-X1-PLA□□□-AWG24

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



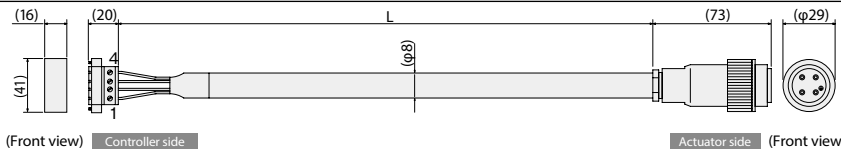
Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Wiring	Color	Signal	No.
—	—	—	11
White/Blue	E24V	12	
White/Yellow	OV	13	
White/Red	LS	26	
White/Black	CREEP	25	
White/Purple	OT	24	
White/Gray	RSV	23	
—	—	—	9
—	—	—	18
—	—	—	19
—	—	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+	22	

No.	Signal	Color	Wiring
1	E24V	White/Blue	
2	OV	White/Yellow	
3	LS	White/Red	AWG24 (crimped)
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	AWG24 (crimped)
6	GND	Black	
7	F.G	Blue	
8	BK-	Blue	
9	BK+	Yellow	

Model Number CB-XEU-MA□□□

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



Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Plug
GIC2.5/4-STF-7.62 (Phoenix)

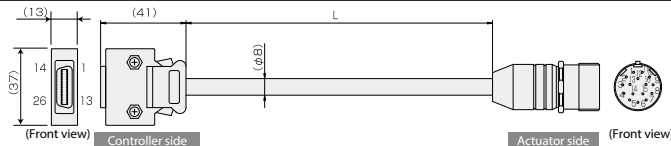
Wiring	Signal	No.
P	E	1
U	2	
V	3	
W	4	

Plug connector
99-4222-00-04(BINDER)

No.	Signal	Wiring
1	P	E
2	U	
3	V	
	W	

Model Number CB-X1-PA□□□-WC

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



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Wiring	Color	Signal	No.
—	—	—	10
—	—	—	11
—	E24V	12	
—	OV	13	
—	LS	26	
—	GREEN	25	
—	OT	24	
—	RSV	23	
—	—	9	
—	—	18	
—	—	19	
—	A+	2	
—	B+	3	
—	C+	4	
—	Z+	5	
—	SRD+	7	
—	SRD+	8	
Purple	BAT+	14	
Gray	BAT+	15	
Red	VCC	16	
Black	GND	17	
Blue	BKR+	20	
Yellow	BKR+	21	
—	—	22	

No.	Signal	Color	Wiring
2	SD	Orange	
3	SD	Green	
4	—	—	
5	—	—	
6	—	—	
7	—	—	
8	—	—	
9	—	—	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT+	Gray	
14	—	—	
15	BK+	Blue	
16	BK+	Yellow	

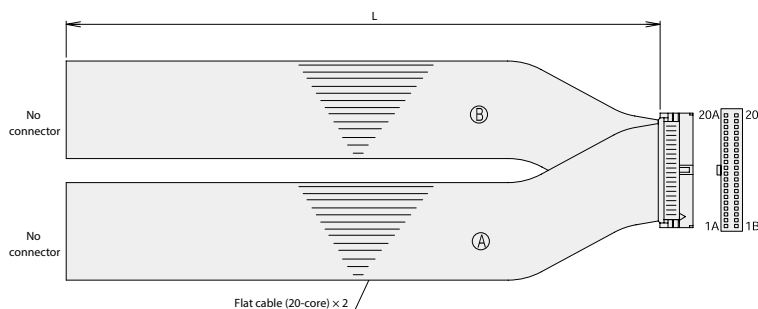
The shield is connected to cable clamp.

Drain wire and meshed shield
(The wire color "White/Blue" indicates the colors of the band and insulation)

The shield is connected to metal sleeve.

Model Number CB-PAC-PIO□□□

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



HIF6-40D-1.27R

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

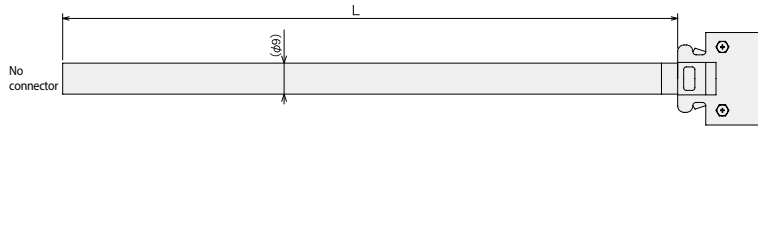
No.	Signal name	Cable Color	Wiring
1B	OUT0	Brown-3	
2B	OUT1	Red-3	
3B	OUT2	Orange-3	
4B	OUT3	Yellow-3	
5B	OUT4	Green-3	
6B	OUT5	Blue-3	
7B	OUT6	Purple-3	
8B	OUT7	Gray-3	
9B	OUT8	White-3	
10B	OUT9	Black-3	
11B	OUT10	Brown-4	
12B	OUT11	Red-4	
13B	OUT12	Orange-4	
14B	OUT13	Yellow-4	
15B	OUT14	Green-4	
16B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

Flat cable (20-core) x 2

Flat cable (20-core) x 2

Model Number CB-SC-PIOS□□□

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



Wiring	Color	Signal	No.
Black	—	—	1
White/Black	—	—	2
Red	—	—	3
White/Red	—	—	4
Green	—	—	5
White/Green	—	—	6
Yellow	—	—	7
White/Yellow	—	—	8
Brown	—	—	9
White/Brown	—	—	10
Blue	—	—	11
White/Blue	—	—	12
Gray	—	—	13
White/Gray	—	—	14
Shield	—	—	15

Wiring

Color

Signal

No.

Black

White/Black

Red

White/Red

Green

White/Green

Yellow

White/Yellow

Brown

White/Brown

Blue

White/Blue

Gray

White/Gray

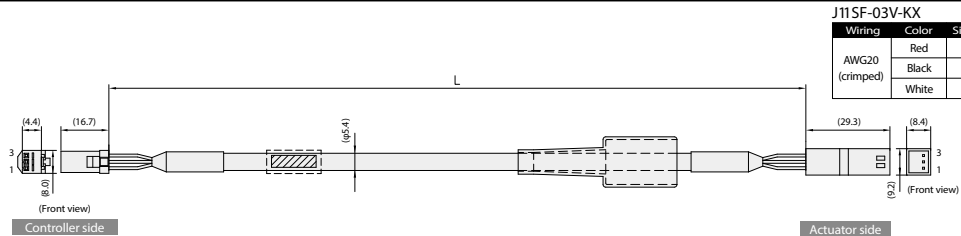
Shield

Shield

The shield is connected to cable clamp.

Model Number CB-DOB-BK□□□

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



J11SF-03V-KX

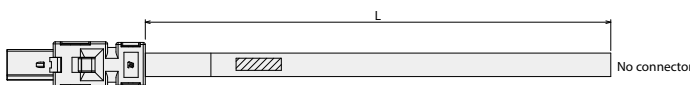
Wiring	Color	Signal	No.
AWG20 (crimped)	Red	+	3
—	Black	—	2
—	White	FG	1

J11SFM-03V-KX

No.	Signal	Color	Wiring
3	+	Red	
2	—	Black	
1	FG	White	

Model Number CB-SC-STO 030

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



Wiring	Color	Signal	No.
—	—	—	2
Black	—	—	3
Black/White	—	—	4
Red	—	—	5
Red/White	—	—	6
Green	—	—	7
Green/White	—	—	8

Twisted pair

Black

Black/white

Red

Red/white

Green

Green/white

Shield

No connector

* Wire color: (ex.) Black/White represents white lines on the black insulator.

SCON-CB

<Sero press specification>

Servo Press dedicated controller (SCON-CB F)



(*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

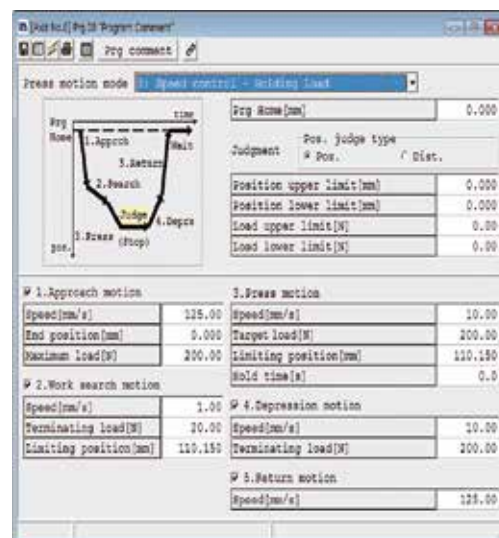
Simply operate the program by inputting the values into the screen for each press-operation mode that you are using.

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 Plc
- 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 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 - [] - [] - [] **F** - [] - [] - [] - []

Series Type Motor Type Encoder Type I/O Type I/O Cable Length Power Supply Voltage Safety type

CB Standard
CGB Safety category compliant type
* Only CGB can be selected for RCS3-RA15R/20R.

F For servo press only (Note 1)

WAI PROFINET IO

30D	30W	400	400W
60	60W	750S	750W
100	100W	3000	3000W
200	200W	3300	3300W

(Example) 60: 60 W servo motor compatible

(Note 1) If you do not use the press program, it will be blank. (Excluding 3000 W, 3300 W)

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

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.

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 P7-20 for the caution when selecting.

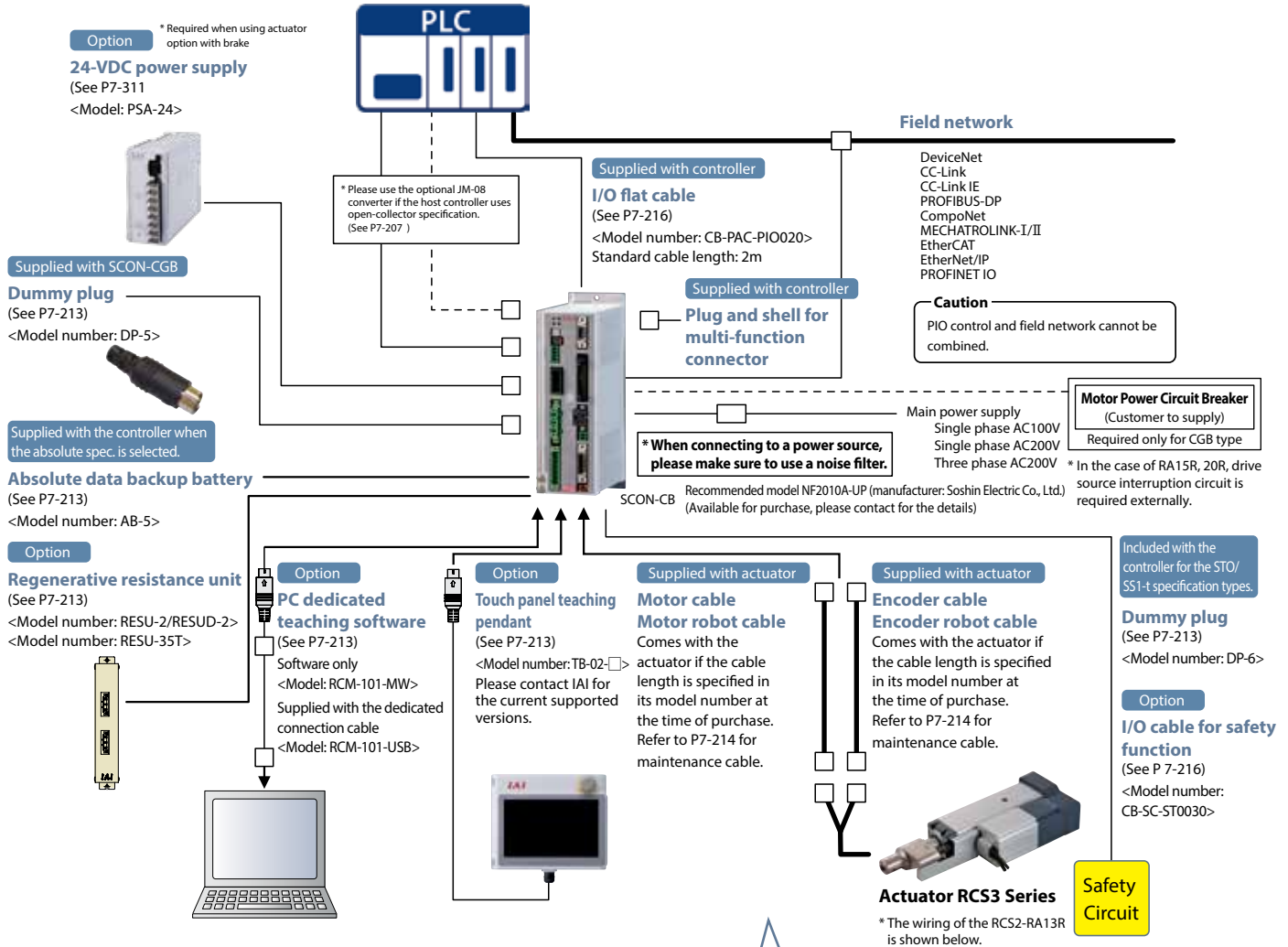
Not specified	Standard type
STO	STO type
SS	SS1-t type

* Only the standard type is selectable for RCS3-RA15R/20R.

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

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

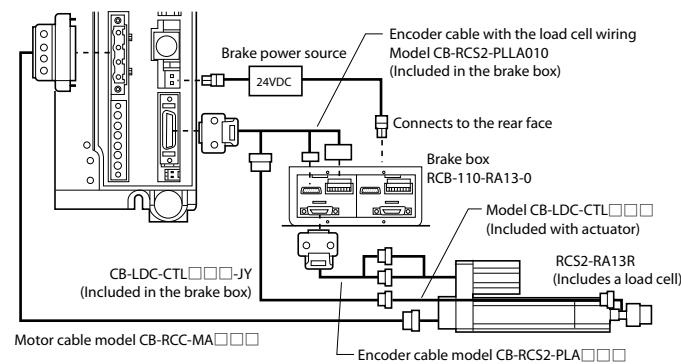
System Configuration



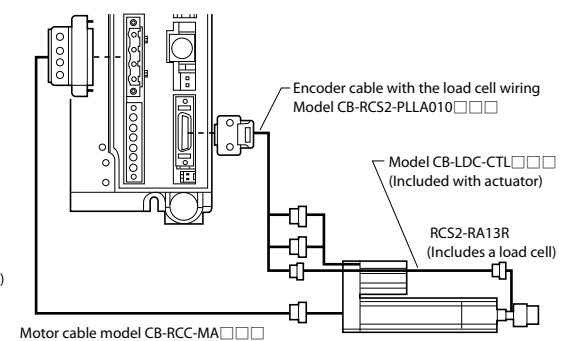
RCS2-RA13R wiring

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



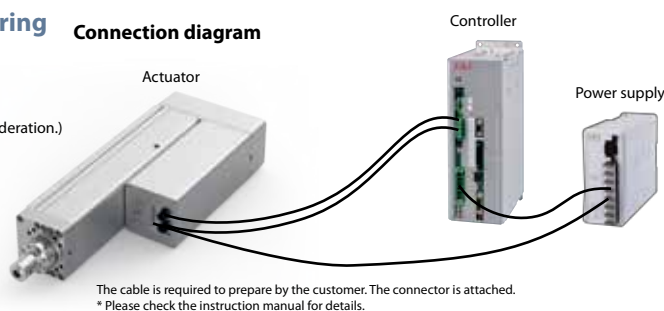
Without a Brake



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

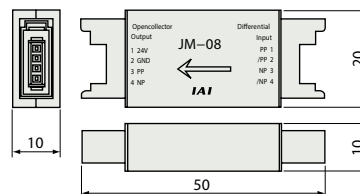


Pulse Converter: JM-08

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.

Required Data Size for Each Network

	Mode	DeviceNet	CompoNet	CC-Link	MECHATROLINK I, II	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 byte	2 byte	2 byte	2 byte	2 byte	2 byte	2 byte	2 byte
1	Full direct value mode	32 byte	32 byte	32 byte	× (Note 1)	32 byte	32 byte	32 byte	32 byte

(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	Full direct value mode (Note 1)
Operation by position data input	×	○
Direct speed/acceleration input	×	○
Current position reading	×	○
Current speed reading	×	○
Operation by program No. input	○	○
Judgment result reading	○	○
Current speed read	×	○
Overload level monitor	×	○
Servo gain switching	○ (*1)	○ (*1)

(*1) One servo gain can be registered in one press program.

(Note 1) Please note that Mechatrolink does not support full function mode.

I/O connector for safety function

	Model	Manufacturer
Controller side	2294417-1	Tyco Electronics (TE Connectivity)
Cable side	2013595-1 (*1)	

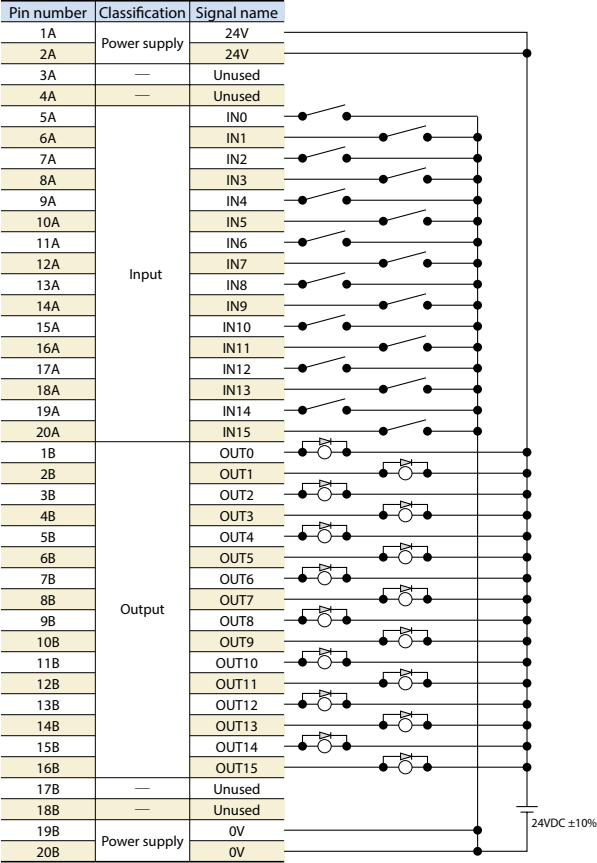
(*1) Customer's supply. Cable with connector (CB-SC-ST0030) is sold separately.

Signals of I/O connector for safety function

Pin No.	Signal name	Name	Description
1	NC	—	Do not connect.
2	NC	—	Do not connect.
3	/SRI1-	Safety request input signal 1	Input the safety request input signal 1 ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function
4	/SRI1+		
5	/SRI2-	Safety request input signal 2	Input the safety request input signal ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function
6	/SRI2+		
7	EDM-	Output signal for monitoring external device	Output signal to monitor the safety function is functioning without failure.
8	EDM+		

I/O Wiring Diagram

PIO connector (NPN specification)



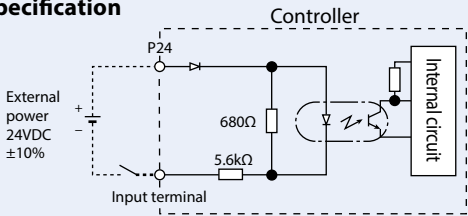
* Connect pin numbers 1A and 2A to 24V, and connect pin numbers 19B and 20B to 0V.

PIO Input/Output Interface

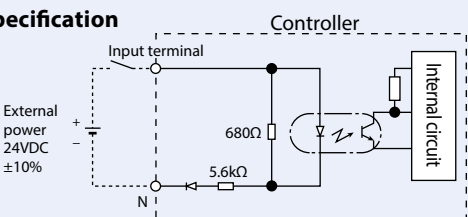
Input part External Input Specification

Item	Specification
Input voltage	24VDC ±10%
Input current	4mA, 1 circuit
ON/OFF voltage	ON voltage, 18VDC min. OFF voltage, 60VDC max.
Isolation method	Photo-coupler

NPN specification



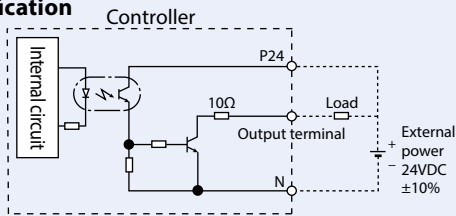
PNP specification



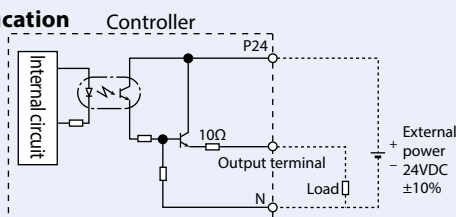
Output part Part External Output Specifications

Item	Specification
Load voltage	24VDC
Maximum load current	50mA, 1 circuit
Leakage current	0.1 mA or less / 1point
Isolation method	Photo-coupler

NPN specification

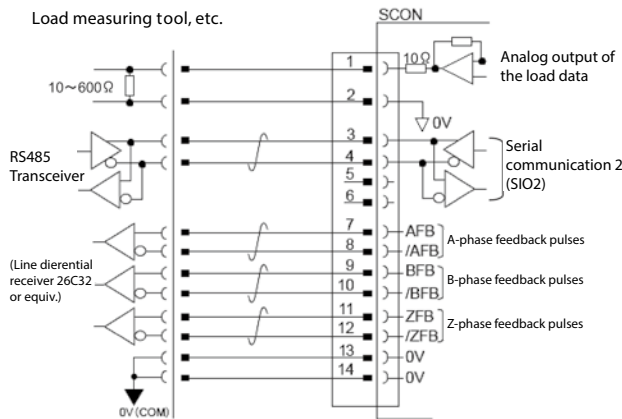


PNP specification

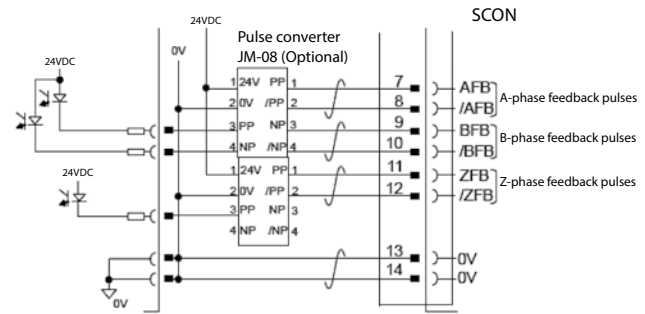


Multi-function Connector (Interface)

① When the host controller inputs feedback pulses with a line differential receiver.



② A pulse converter (JM - 08: option) is required when the host controller inputs feedback pulses with an open collector.



Specifications

Item			Specifications	
Supported motor capacity			Less than 400W	400W~750W 3000W・3300W
Connected actuator			RCS2/RCS3 series actuator (with load cell)	
Number of controlled axes			1 axis	
Operation method			Press program type	
Backup memory			Non-volatile memory (FRAM)	
I/O connector			40-pin connector	
Number of I/O points			Input 16 points/ output 16 points	
I/O power			External supply 24VDC ±10%	
Brake supply power			External supply 24VDC ±10% (Max1A)	External supply 24VDC ±10% (Max0.1A) *Max 1.5 A must be separately supplied for 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/s ² (continuous), 9.8m/s ² (intermittent)	
Calendar/ clock function	Retention time		Approximately 10 days	
	Charging time		Approximately 100 hours	
Protection functions			Excess current, temperature abnormalities, monitoring of fan speed drops, encoder disconnection, etc.	
Internal regenerative resisittance value			2000Ω 10W	34Ω 160W
Ambient operating temperature			0~40℃	
Ambient operating humidity			85% or less (non-condensing)	
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



Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

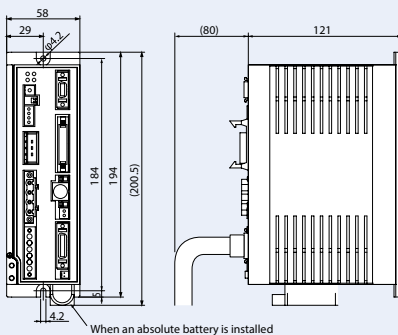
XSEL
(SCARA)

PSA-24

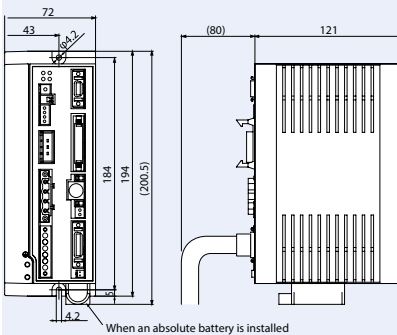
TB-02

TB-03

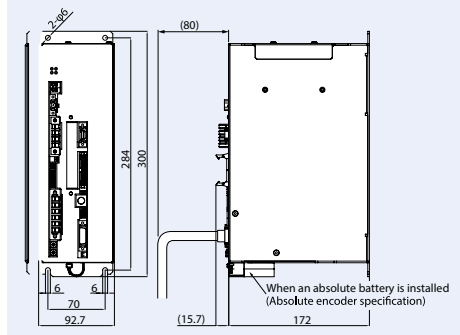
Less than 400W



400W~750W

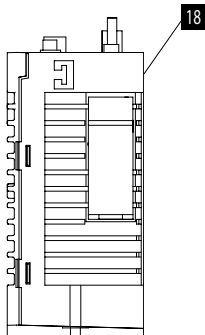
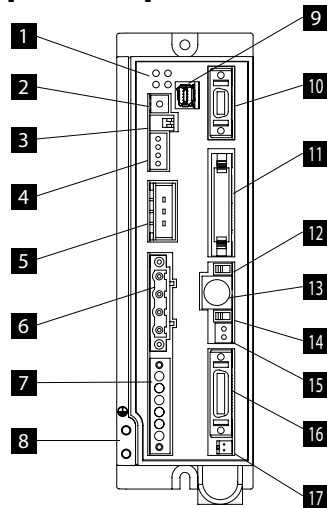


For 3000W, 3300W



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

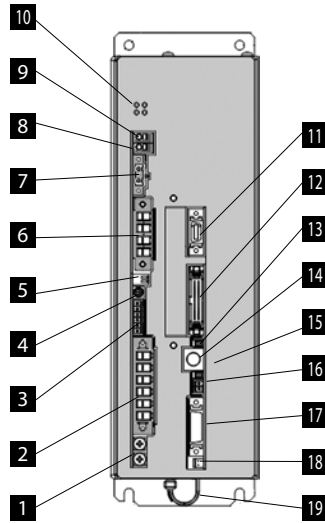
Connector used to connect the absolute data backup battery (only when the actuator with an absolute encoder is selected).

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.

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

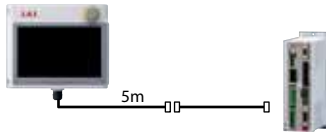
Options

Touch panel teaching pendant

Features Teaching tool that has functions for position inputs, test runs and monitoring.

Model **TB-02**-□

Configuration



Specification

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0-40°C
Ambient operating relative humidity	20-85%RH (no-condensing)
Protection class	IP20
Mass	470g (TB-02 main unit only)

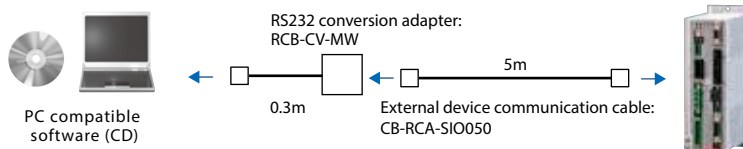
PC dedicated teaching software (Windows only)

Features Start-up support software that allows you to input positions, perform test operations, monitor functions, etc.
This software allows you to shorten the time until start-up by providing functions necessary for making adjustments.

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

Configuration

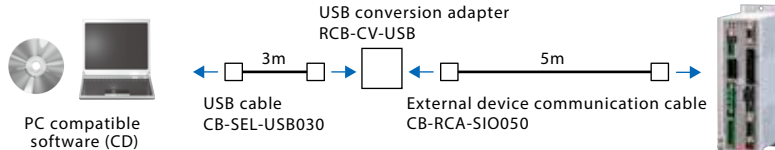
Please contract IAI for the current supported versions.



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

Configuration

Please contract IAI for the current supported versions.



Supported Windows version 7/8/8.1/10



Regenerative Resistance Unit

Features This unit converts the regenerative current, which is generated when the motor decelerates, into heat.
Please refer to the tables below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

<For ~750W>

Model **RESU-2** (Standard specification)/**RESUD-2** (DIN-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	

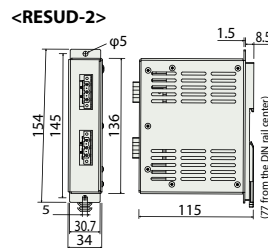
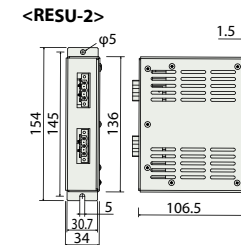
Necessary Amount Guideline **Necessary Amount Guideline (RCS2-RA13R)**

	Horizontal	Vertical		Lead 2.5	Lead 1.25
0	~100W	~100W	Horizontal	1	0
1	~400W	~400W	Vertical	1	1
2	~750W	~750W			

* Depending on the operating conditions, a regeneration resistance higher than that mentioned above may be necessary.

* When two regenerative units are required, please use one RESU-2 and one RESU-1 (Please refer to P7-302).

External dimensions



<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.

Absolute Data Backup Battery

Features This is an absolute data backup battery for an actuator with absolute specification.

Model **AB-5 (Battery only)**
AB-5-CS (With a case)
AB-5-CS3 (With a case)

* For 3000W·3300W



Dummy plug (Safety category specification)

Features This plug is required when the safety category specification (SCON-CGB) is used.

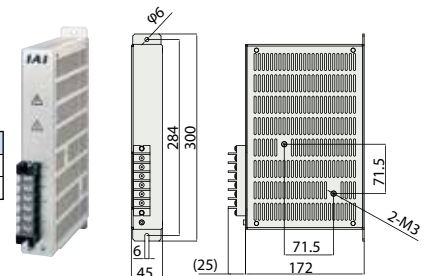
Model **DP-5**



Dummy plus (STO/SS1-t specification)

Features 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.

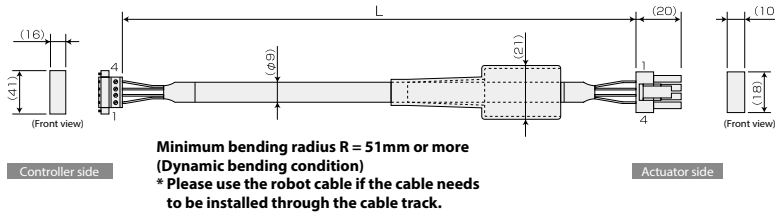
Table of Applicable Cables

Model Number	Motor Cable	Motor Robot Cable	Encoder cable	Encoder robot cable
RCS3	RA4R	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PLDA□□□□
	RA6R			
	RA7R			
	RA8R			
	RA10R			
	RA15R			
RCS2	RA20R	-	-	CB-RCS3-PLA□□□□-RB
	RA13R (With brake / load cell specification)			
RCS2	RA13R (No brake / Load cell specification)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PLA□□□□
	RA13R (No brake / Load cell specification)			

Model Number	PIO flatcable
SCON-CB	CB-PAC-PIO□□□□

Model CB-RCC-MA□□□□/CB-RCC-MA□□□□-RB

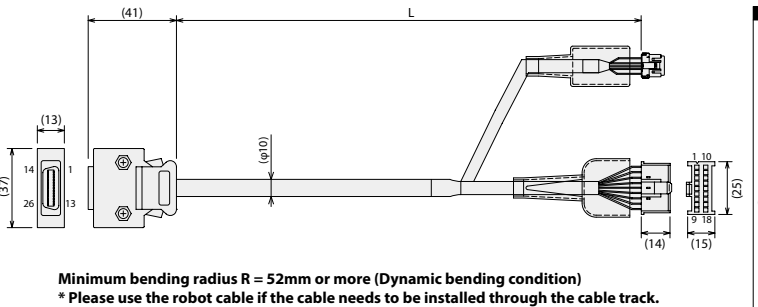
* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



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

Model CB-RCS2-PLDA□□□□/CB-RCS2-PLDA□□□□-RB

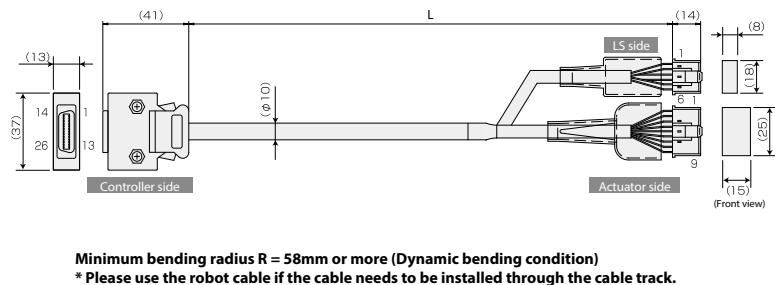
* Please indicate the cable length (L) in □□□□, maximum 30m, e.g.) 080 = 8m



Wiring	Signal	No.	No.	Signal	Wiring
AWG26 (Soldered)	—	1	1	A	AWG26 (pressure-welded)
	E24V	12	2	A	
	0V	13	3	B	
	LS	26	4	B	
	CLEP	25	5	Z	
	OT	24	6	Z	
	RSV	23	7	—	
	LC SRD+	9	8	—	
	LC SRD-	10	9	FG	
	LC VCC	18	10	SD	
	LC GND	19	11	SD	
	A+	1	12	BAT+	
	A-	2	13	BAT-	
	B+	3	14	VCC	
	B-	4	15	GND	
	Z+	5	16	—	
	Z-	6	17	BK-	
	SRD+	7	18	BK+	
	SRD-	8	—	—	
	BAT+	14	—	—	
	BAT-	15	—	—	
	VCC	16	—	—	
	GND	17	—	—	
	BKR+	20	—	—	
	BKR-	21	—	—	
	—	22	—	—	

Model CB-RCS2-PLA□□□□/CB-X2-PLA□□□□

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

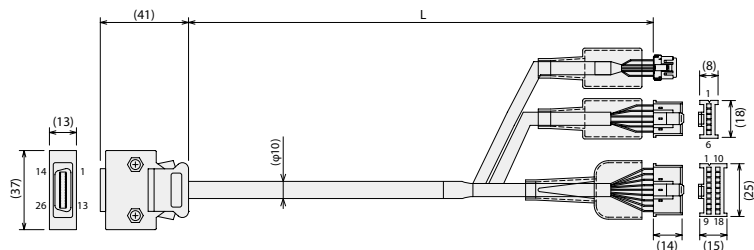


Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG26 (Soldered)	—	—	1	1	A	Pink	AWG26 (pressure-welded)
	Brown/White	E24V	12	2	A	Purple	
	Gray/White	0V	13	3	B	White	
	Red/White	LS	26	4	B	Blue/Red	
	Black/White	CLEP	25	5	Z	Orange/White	
	Yellow/Black	OT	24	6	Z	Green/White	
	Pink/Black	RSV	23	7	—	—	
	—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

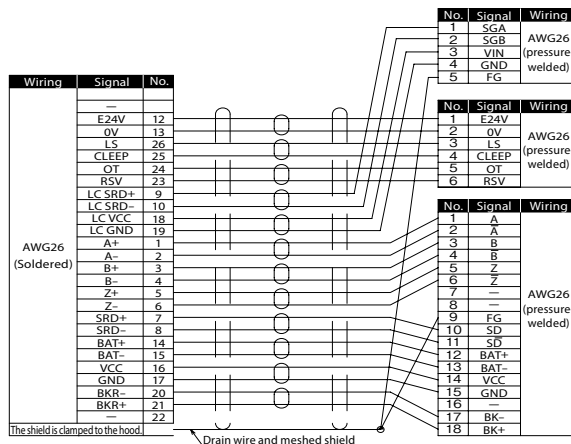
* The above is wiring diagram of the encoder cable. For wiring diagram of encoder robot cable, please check CB-X2-PLA □□□□ placement on page 7-253

Model CB-RCS2-PLLA□□□ / CB-RCS2-PLLA□□□-RB

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

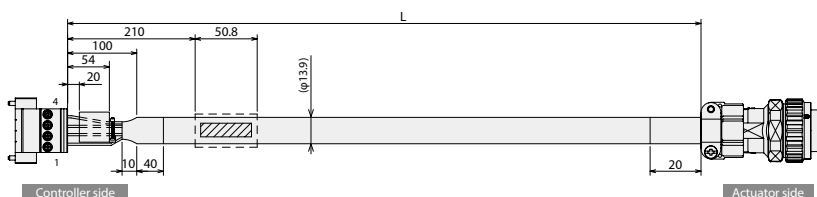


Minimum bending radius R = 52mm or more (Dynamic bending condition)
* Please use the robot cable if the cable needs to be installed through the cable track.

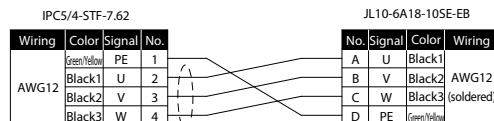


Model CB-RCS3-MA□□□-RB

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

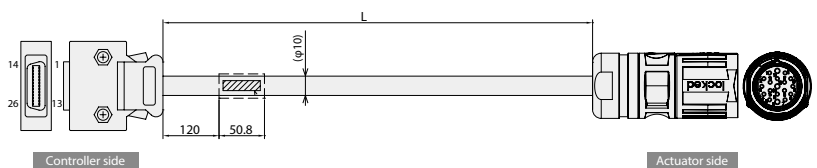


Minimum bending radius R = 83.4mm or more (Dynamic bending condition)

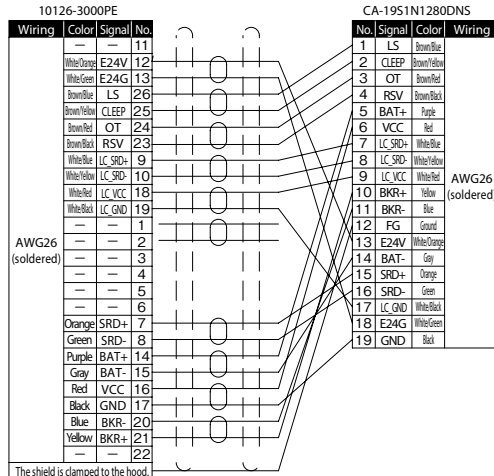


Model CB-RCS3-PLA□□□-RB

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



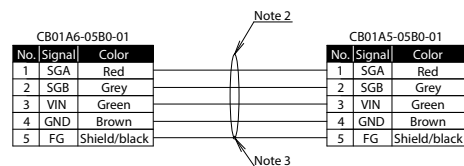
Minimum bending radius R = 50mm or more (Dynamic bending condition)



Model CB-LDC-CTL□□□-JY

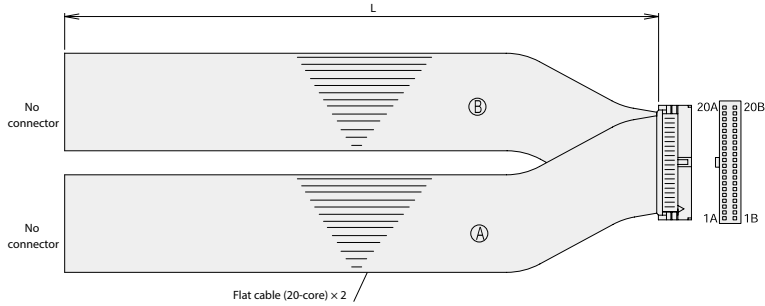


Minimum bending radius r=28mm or greater (Dynamic bending condition)



Model CB-PAC-PIO

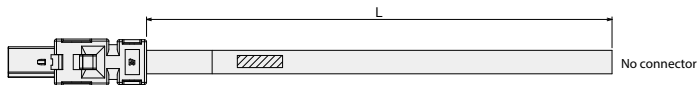
* Please indicate the cable length (L) in □□□, maximum 10m, e.g.) 080 = 8m



HIF6-40D-1.27R

No.	Signal name	Cable Color	Wiring	No.	Signal name	Cable Color	Wiring
1A	24V	Brown-1	Flat cable ② (pressure-welded)	1B	OUT0	Brown-3	Flat cable ② (pressure-welded) AWG28
2A	24V	Red-1		2B	OUT1	Red-3	
3A	—	Orange-1		3B	OUT2	Orange-3	
4A	—	Yellow-1		4B	OUT3	Yellow-3	
5A	IN0	Green-1		5B	OUT4	Green-3	
6A	IN1	Blue-1		6B	OUT5	Blue-3	
7A	IN2	Purple-1		7B	OUT6	Purple-3	
8A	IN3	Gray-1		8B	OUT7	Gray-3	
9A	IN4	White-1		9B	OUT8	White-3	
10A	IN5	Black-1		10B	OUT9	Black-3	
11A	IN6	Brown-2		11B	OUT10	Brown-4	
12A	IN7	Red-2		12B	OUT11	Red-4	
13A	IN8	Orange-2		13B	OUT12	Orange-4	
14A	IN9	Yellow-2		14B	OUT13	Yellow-4	
15A	IN10	Green-2		15B	OUT14	Green-4	
16A	IN11	Blue-2		16B	OUT15	Blue-4	
17A	IN12	Purple-2		17B	—	Purple-4	
18A	IN13	Gray-2		18B	—	Gray-4	
19A	IN14	White-2		19B	0V	White-4	
20A	IN15	Black-2		20B	0V	Black-4	

Model CB-SC-STO 030



Wiring	Color	Signal	No.
—	—	—	1
—	—	—	2
Black	/	SRI1-	3
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.

* Wire color: (ex.) Black/white represents white lines on the black insulator.

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

SCON-CAL

Position Controller for Single-axis Robot/Cartesian Robot/ROBO Cylinder

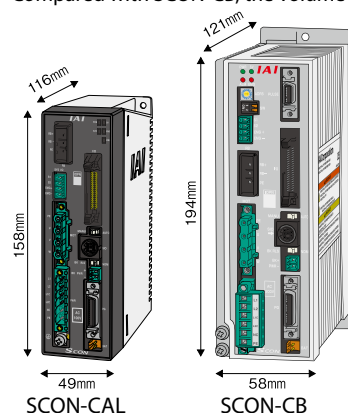
RCS2/RCS3



(*1) MECHATROLINK-I/II connection specification is not compliant with CE Marking.

1 Miniaturization realized

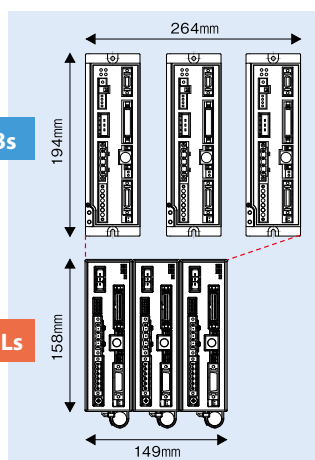
Compared with SCON-CB, the volume ratio has been reduced to **34%**. It contributes to the space saving of the control panel.



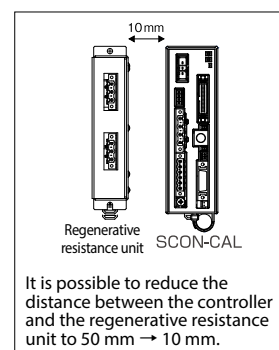
Smaller in volume 34%

Installing 3 SCON-CBs

Installing 3 SCON-CALs



Installation space: Approx. 53% less
Installation width: Approx. 43% less



It is possible to reduce the distance between the controller and the regenerative resistance unit to 50 mm → 10 mm.

2 Improve maintenance

- When the absolute battery voltage or fan speed drops, the "WRG (warning)" LED turns on to alert the situation. With this function, you are informed visually when to replace each maintenance part. (The controller can also be set up to output a warning signal.)
- The total number of actuator movements and the total distance travelled are calculated and recorded in the controller, and when the predetermined count or distance is exceeded, a signal is output to an external device. You can use this function to check when the actuator needs re-greasing or periodic inspection. Past alarms are displayed to facilitate the analysis of the alarms because the time and date of each alarm that has occurred is now shown on the alarm history screen.



3 Function comparison with SCON-CB


	SCON-CB	SCON-CAL
① Supported encoders	Incremental Battery-less absolute encoder Absolute ABZ (UVW) parallel encoder	Incremental Battery-less absolute encoder Absolute
② Pulse train control	○	×
③ Servo monitor function	○	×
④ Offboard tuning	○	△ Unable to analyze with servo monitor
⑤ Vibration control function	○	△ Unable to analyze with servo monitor

(Note) Depending on the actuator, some models can not be connected to SCON - CAL. Please refer to P7-219 for details.

<<Explanation of Functions>>

- ③ Servo monitor function: You can check the current speed, position, etc.
- ④ Offboard tuning: An optimal servo gain is calculated according to the load.
- ⑤ Vibration control function: When the actuator slider moves, oscillation (vibration) of the work installed on the slider is suppressed.

List of Models

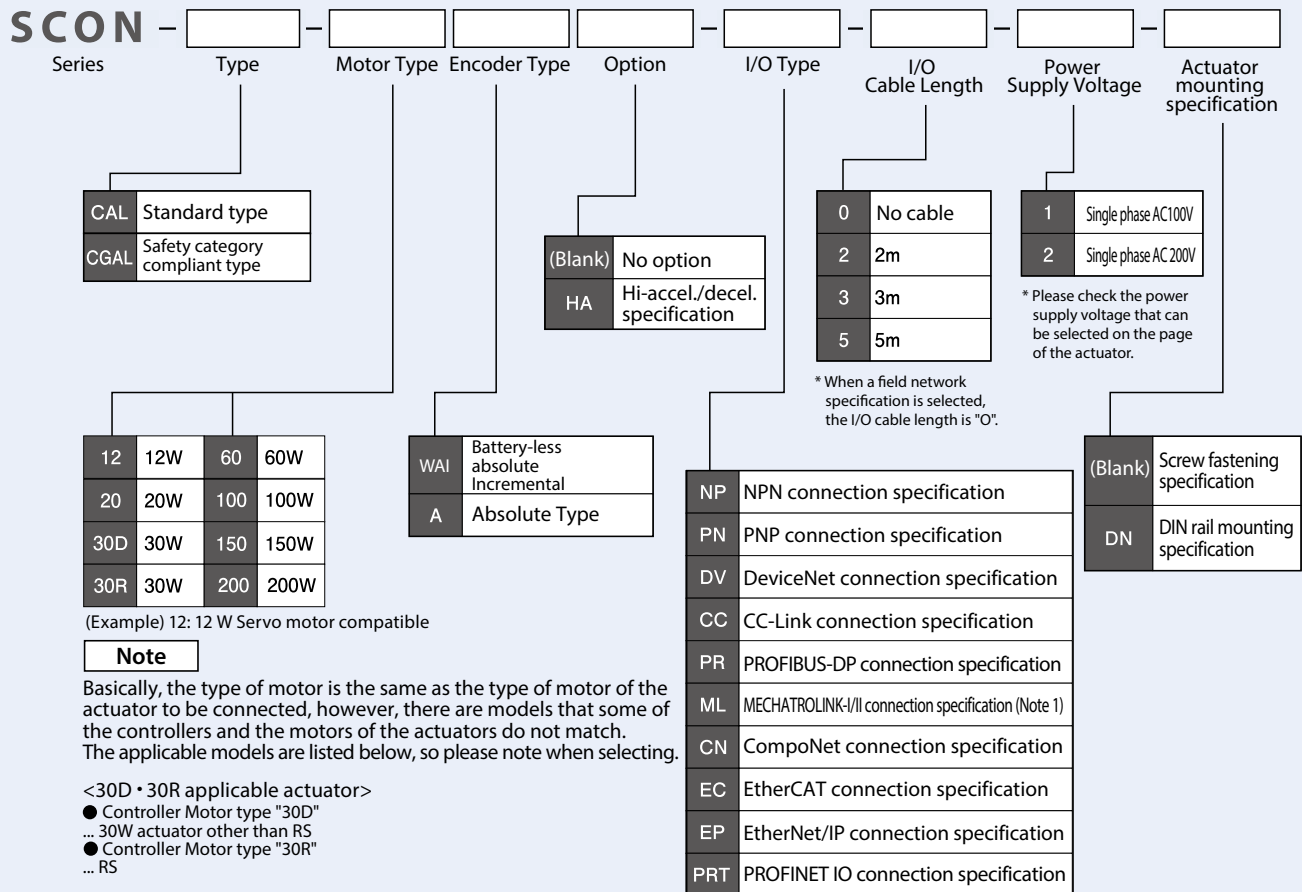
Model number	SCON-CAL / CGAL									
External view										
I/O type	Standard specification		Network connection specification (Option)*1							
I/O type specification	PIO connection specification		DeviceNet connection specification	CC-Link connection specification	PROFIBUS-DP connection specification	CompoNet connection specification	MECHATROLINK I/II connection specification *2	EtherCAT connection specification	EtherNet/IP connection specification	PROFINET IO connection specification
I/O type code	NP/PN		DV	CC	PR	CN	ML	EC	EP	PRT
Applicable encoder type	Battery-less absolute Incremental	Absolute	Battery-less absolute/ Incremental/Absolute							
SCON-CAL/CGAL	○	○	○	○	○	○	○	○	○	○

*1 If a network specification is selected, PIOs are not available.

* This product does not support pulse train control.

* The DIN rail mounting specification will be increased by ¥ 1000.

Model



(Note 1) Please be sure to check P7-20 for the caution when selecting.

System configuration

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

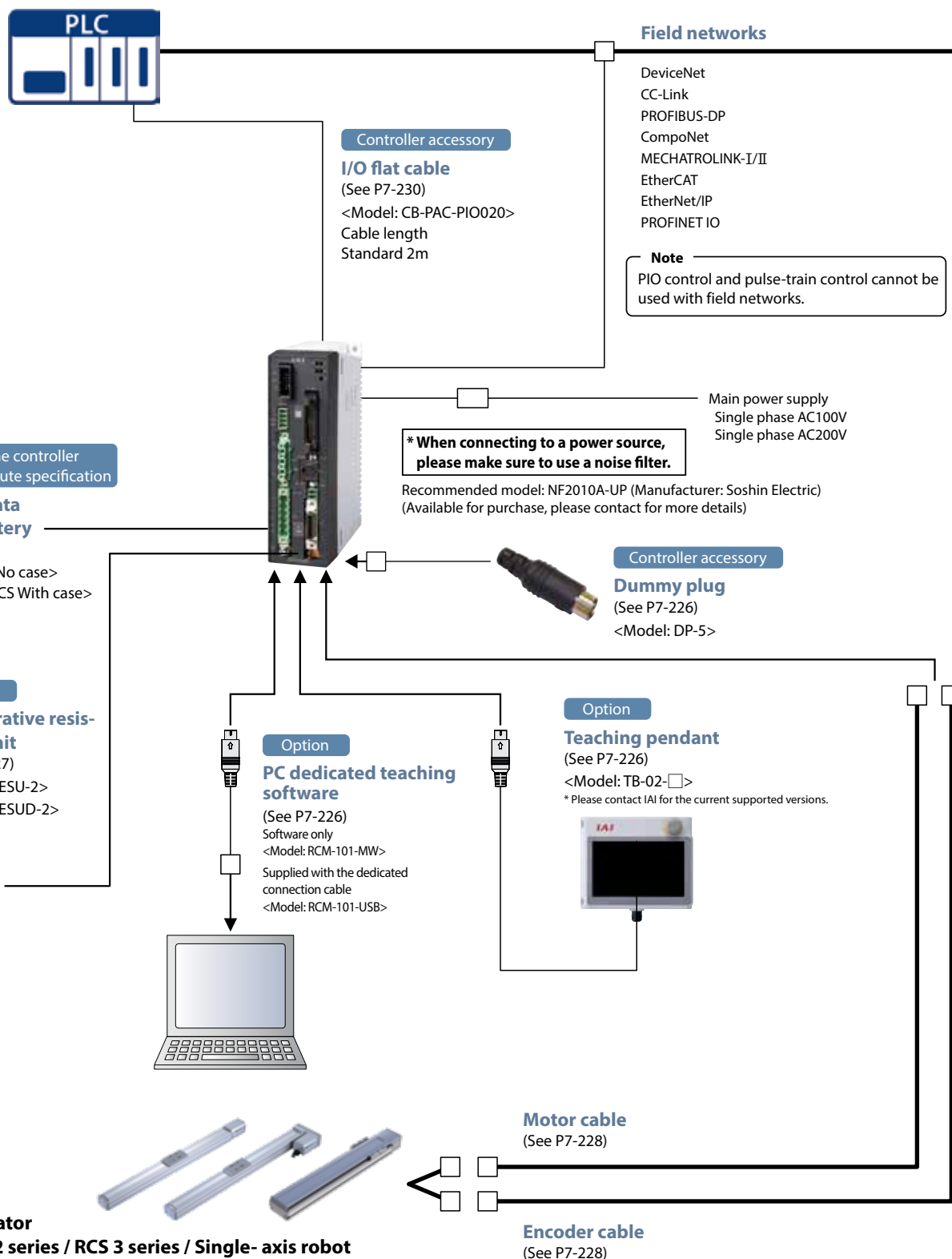
XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03



(Note) The actuators which cannot be connected to SCON-CAL

- Actuators which motor wattage is greater than 200 W
- Linear actuators • DD Series

Incremental types of the following models:

- NS-S types: RCS2-SRA7BD, SRGD7BD, SRGS7BD
- Mini ROBO Cylinders: RCS2-RN5N, RP5N, GS5N, GD5N, SD5N, TCA5N, TWA5N, TFA5N

Operation Models

This controller only supports the positioner control mode.

In the positioner mode, you can enter position data (target position, speed, acceleration, etc.) in the controller under the desired numbers and then specify each number externally via a I/O (input/output signal) to operate the actuator. Also, in the positioner mode, you can select the desired operation mode from the six modes using the parameter.

Mode	Number of positioning points	Features
Positioner mode	Positioning mode	64
	Teaching mode	64
	256-point mode	256
	512-point mode	512
	Solenoid valve mode 1	7
	Solenoid valve mode 2	3

I/O Signal Table

* You can select one of six types of I/O signal assignments.

PIN number	Category	Positioning point	Parameter (PIO pattern) selection					
			0	1	2	3	4	5
			Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2
			64	64	256	512	7	3
1A	24V		P24					
2A	24V		P24					
3A	—		NC					
4A	—		NC					
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2(—)
8A		IN3	PC8	PC8	PC8	PC8	ST3	—
9A		IN4	PC16	PC16	PC16	PC16	ST4	—
10A		IN5	PC32	PC32	PC32	PC32	ST5	—
11A		IN6	—	MODE	PC64	PC64	ST6	—
12A		IN7	—	JISL	PC128	PC128	—	—
13A		IN8	—	JOG+	—	PC256	—	—
14A		IN9	BKRL	JOG—	BKRL	BKRL	BKRL	BKRL
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD
16A		IN11	HOME	HOME	HOME	HOME	HOME	—
17A		IN12	*STP	*STP	*STP	*STP	*STP	—
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—
19A		IN14	RES	RES	RES	RES	RES	RES
20A		IN15	SON	SON	SON	SON	SON	SON
1B	Output	OUT0	PM1	PM1	PM1	PM1	PE0	LS0
2B		OUT1	PM2	PM2	PM2	PM2	PE1	LS1 (TRQS)
3B		OUT2	PM4	PM4	PM4	PM4	PE2	LS2(—)
4B		OUT3	PM8	PM8	PM8	PM8	PE3	—
5B		OUT4	PM16	PM16	PM16	PM16	PE4	—
6B		OUT5	PM32	PM32	PM32	PM32	PE5	—
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	—
8B		OUT7	ZONE1	MODES	PM128	PM128	ZONE1	ZONE1
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—
13B		OUT12	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B		OUT15	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM
17B	—		NC					
18B	—		NC					
19B	0V		N					
20B	0V		N					

* In the above table, signals in () represent functions available before the home return.

* In the above table, signals preceded by * are turned OFF while the actuator is operating.

Field network specification Operation mode Description

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

Mode Description

	Mode	Description
0	Remote I/O mode	Similarly to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1	Position/simple direct value mode	The target position value is directly input, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
2	Half direct value mode	The actuator is operated by directly 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.
8	Half direct value mode 3	This mode corresponds to the damping control function instead of the jog function of the half direct value mode.

Required Data Size for Each Network

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

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note1)	Remote I/O mode 2	Half direct value mode 3
Number of positioning points	512	768	No limit	No limit	512	No limit
Operation by direct position data input	×	○	○	○	×	○
Direct speed/acceleration input	×	×	○	○	×	○
Push-motion operation	○	○	○	○	○	○
Current position read	×	○	○	○	○	○
Current speed read	×	×	○	○	×	○
Operation by position number input	○	○	×	×	○	×
Completed position number read	○	○	×	×	○	×
Damping control	○	○	×	○	○	○
Servo gain switching	○	○	○	○	○	○

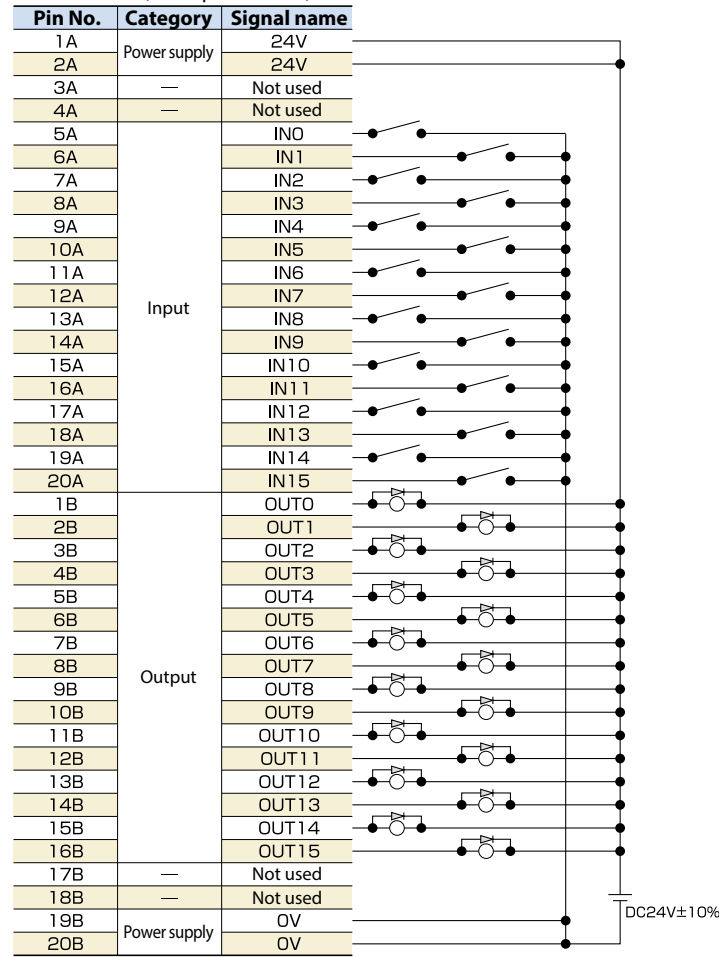
* ○ indicates that the operation is supported, and X indicates that it is not supported.

(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

I/O Wiring Diagrams

Positioning Mode/Teaching Mode/Solenoid Valve Mode

PIO connector (NPN specification)



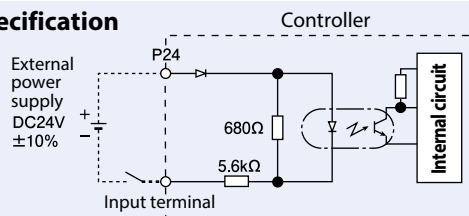
* Connect Pins 1A and 2A to 24 V, and Pins 19B and 20B to 0 V.

I/O Specification

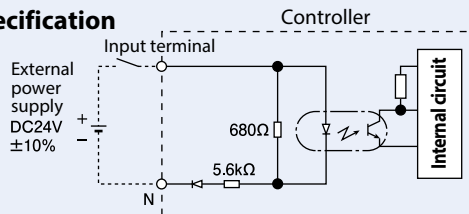
Input Part External Input Specifications

Item	Specification
Input voltage	DC24V $\pm 10\%$
Input current	4mA/1 circuit
ON/OFF voltage	ON voltage: Min.DC 18V min. OFF voltage: Max.DC 6V max.
Isolation method	Photocoupler

NPN specification



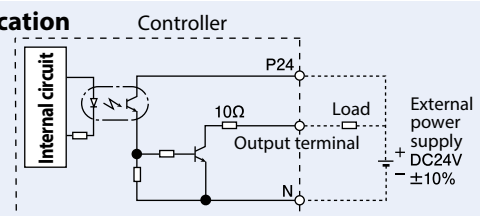
PNP specification



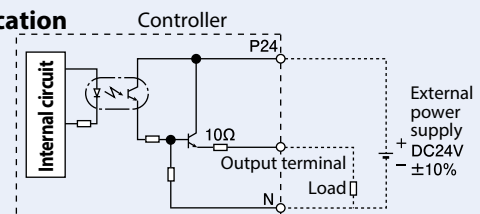
Output Part External Output Specifications

Item	Specification
Load voltage	DC24V
Max. load current	50mA/1 point
Leak current	Max.0.1mA/ 1 point
Isolation method	Photocoupler

NPN specification



PNP specification



Specification Table

Item		Specification
Applicable motor capacity		Less than 200W
Connected actuator		RCS2/RCS3 series actuator/single-axis robot
Number of controlled axes		1 axis
Operation method	Positioner	○
	Direct value	○ (Available only for the Fieldbus specification)
	Pulse train	×
Number of positioning points		512 points (PIO specification), 768 points (Fieldbus specification)
Backup memory		Non-volatile memory (FRAM)
I/O connector		40-pin connector
Number of I/O points		16 input points/16 output points (No fieldbus specification)
I/O power supply		External supply 24VDC ±10%
Serial communication		RS485 1ch
Peripherals communication cable		CB-PAC-PIO□□□
Position detection method		Incremental encoder / Absolute encoder / Battery-less absolute encoder
Driving power shut-off function		Standard type (CAL): Available (Built-in cutoff relay) Safety category compliant type(CGAL): Not available (External cutoff relay)
Forced electromagnetic brake release		Brake release switch ON/OFF
Input power supply		Single-phase AC100~115V±10% Single-phase AC200~230V±10%
Power-supply capacity		12W/89VA 20W/74VA 30W (other than RS)/94VA 30W (RS)/186VA 60W/186VA 100W/282VA 150W/376VA 200W/469VA
Vibration resistance		X,Y,and Z directions, 10~57Hz single-side width 0.035mm (continuous), 0.075mm (intermittent) 58~150Hz 4.9m/s ² (continuous), 9.8m/s ² (intermittent)
Calendar/ clock function	Retention time	Approx. 10 days
	Charge time	Approx. 100 hours
Protective functions		Overcurrent, abnormal temperature, low fan speed monitoring, encoder disconnection, etc.
Ambient operating temperature		0~40°C
Ambient operating humidity		85%RH or less (non-condensing)
Operating atmosphere		Free from corrosive gases
Installation	Installation direction	Vertical installation (Exhaust side on top)
	Installation method	Screw mounting or DIN rail mounting
Cooling method		Forced air cooling
Protection degree		IP20 or equivalent
Mass		Approx. 560g (+ 25g for the absolute specification)
External dimensions		49mm (W) × 158mm (H) × 116mm (D)

External Dimensions

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

2D
CAD

3D
CAD

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

SCON
-CAL

MSCON

SSEL

MSEL

XSEL

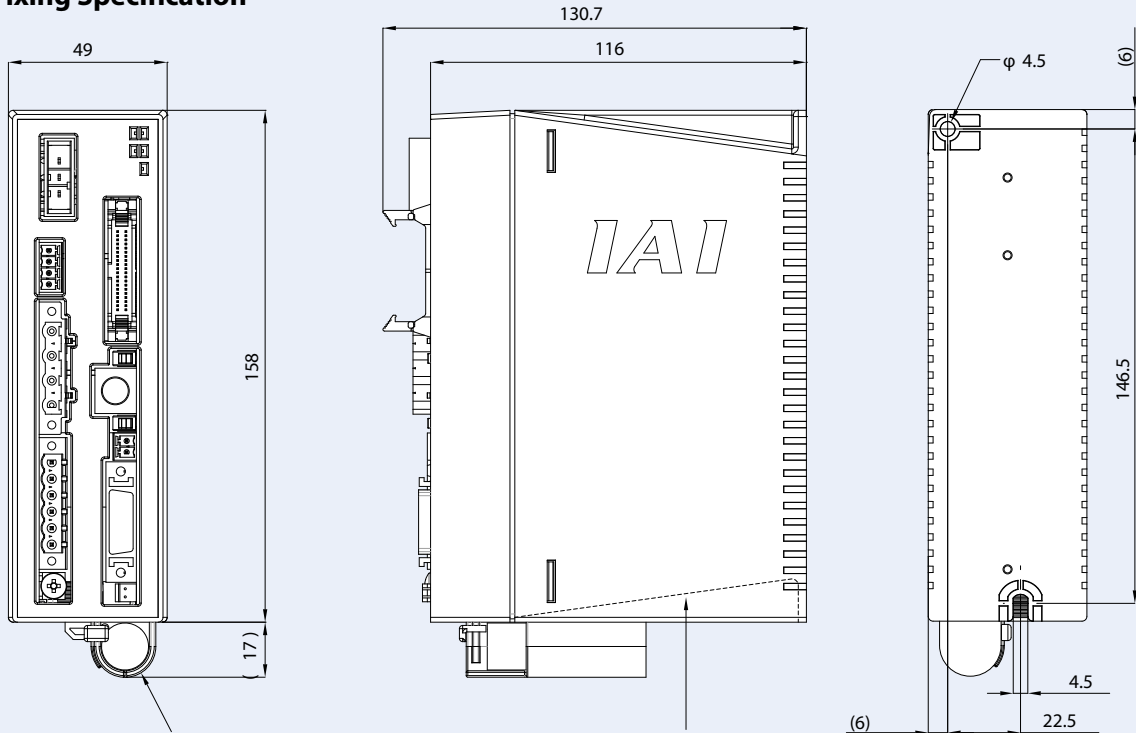
XSEL
(SCARA)

PSA-24

TB-02

TB-03

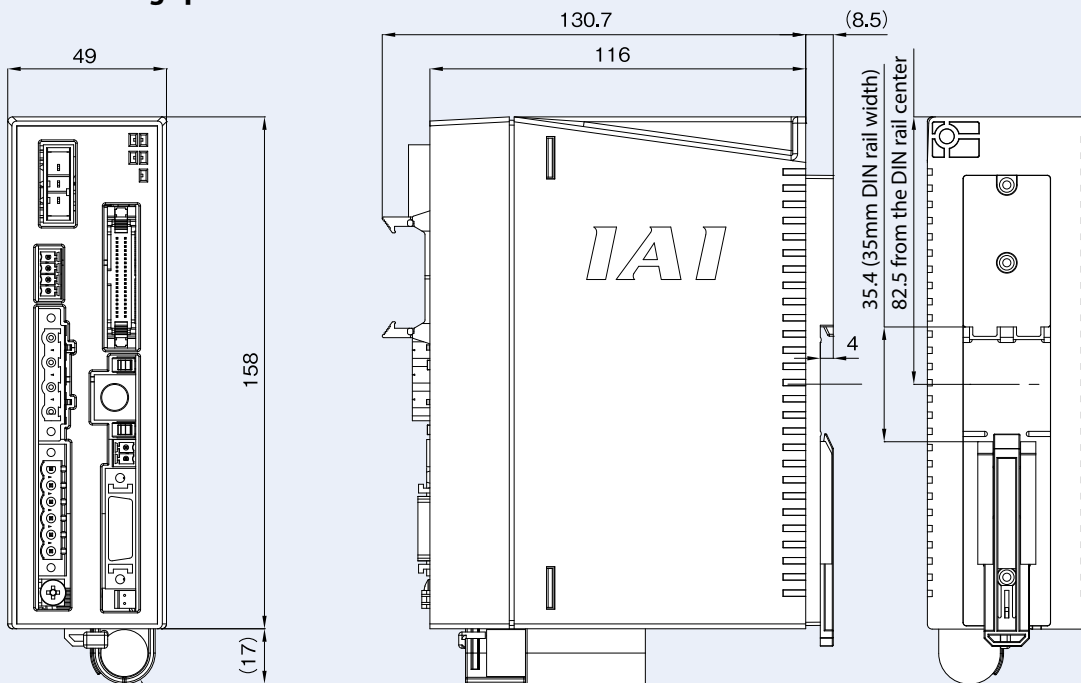
Screw Fixing Specification



When the absolute battery is installed
(Absolute encoder specification)

Dotted line indicates the open access to the screw
mount. The controller can be mounted with a screw
driver without removing the cover.

DIN rail mounting specification



When the absolute battery is installed
(Absolute encoder specification)

Name of Each Part

Controller

R-unit

RCP6S

MCON
-C

PCON
-CB/CFB

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON-CB
(Servo press)

**SCON
-CAL**

MSCON

SSEL

MSEL

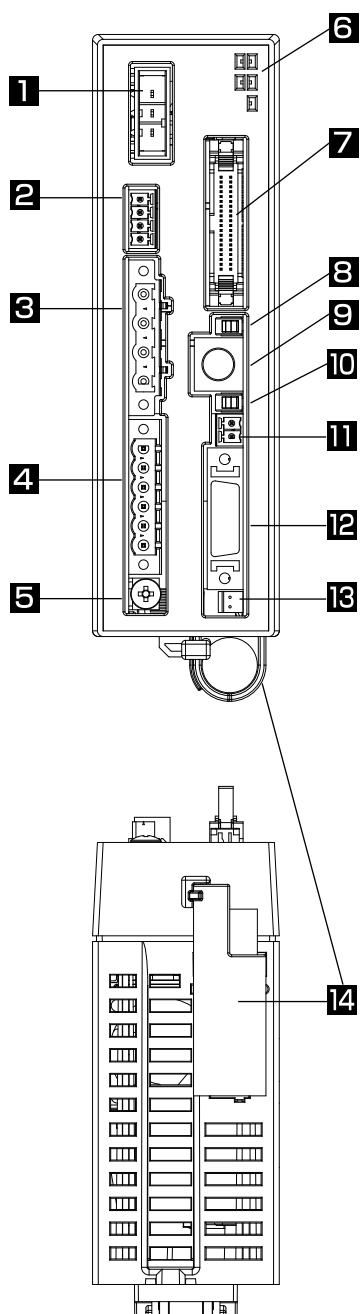
XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03



1 Regenerative unit connector

The connector for regenerative units which absorb the regenerative current generated when the actuator decelerates and stops.

2 System I/O connector

The connector for the emergency stop switch etc.

3 Motor connector

The actuator motor cable connector.

4 Power supply connector

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

5 Grounding terminal

The protective grounding screw. Please make sure to secure grounding.

6 LED display

These LED colors indicate the condition of the controller.

Name	Color	Function description
PWR	Green	Turned ON when the system is ready (after power 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.
WRG	Orange	Flashes when ABS battery voltage is low or a rotational speed of the fan decreases, etc.

7 PIO connector

PIO connector Connector for the cable connecting input/output signals to the peripheral equipments of PLC, etc.

8 Operation mode selection switch

Name	Function description
MANU	Does not accept PIO commands
AUTO	Accepts PIO commands

* For the standard type, the emergency stop switch on the touch panel teaching pendant becomes effective when the line is connected, regardless of whether this switch is set to AUTO or MANU.

9 Brake release switch

The connector for the touch panel teaching pendant or the PC communication cable.

10 Regenerative unit connector

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

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

11 Brake power supply connector

The connector for supplying 24VDC power to the brake (necessary only when brake-equipped actuator is connected).

12 Encoder connector

Connector for the encoder.

13 Absolute battery connector

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

14 Absolute battery holder

Battery holder for installing the absolute data backup battery.

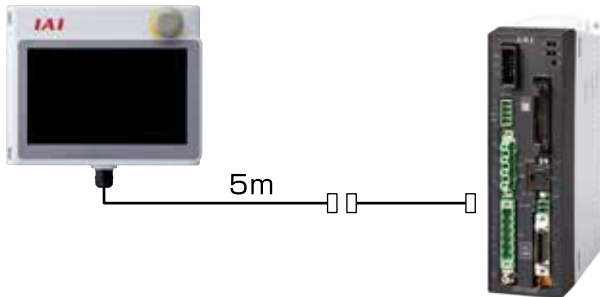
Options

Touch panel teaching pendant

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

Model **TB-02-**□

Configuration



The MCON is supported by Ver. 9.02.00.00 or later.

Specification

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

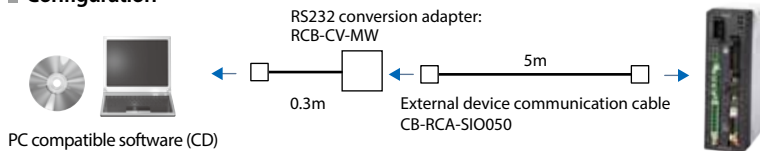
PC dedicated teaching software (Windows only)

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

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

The SCON-CAL is supported by Ver. 9.07.00.00 or later.

Configuration



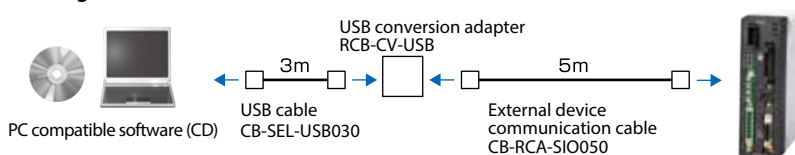
Supported Windows version 7/8/8.1/10



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

The SCON-CAL is supported by Ver. 9.07.00.00 or later.

Configuration



Absolute data backup battery

- Feature** This is an absolute data backup battery for an actuator with absolute specification.

Model **AB-5** (battery only) **AB-5-CS3** (with a case)



Dummy plug

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

Model **DP-5**



Regenerative Resistance Unit

Features This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the tables below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

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

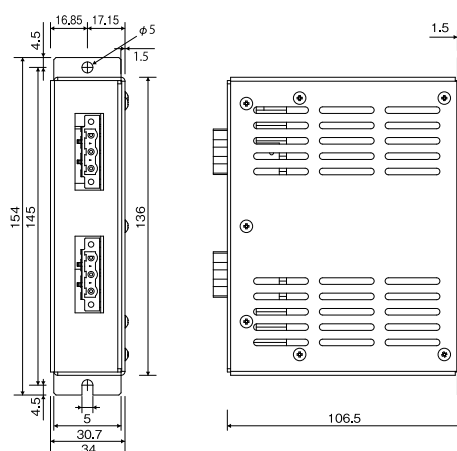
Specification

Model number	RESU-2	RESUD-2
Unit mass	Approximately 0.4kg	
Internal regenerative resistance value	235Ω 80W	
Actuator mounting method	Screw mounting	DIN rail mounting
Included cable	CB-SC-REU010	

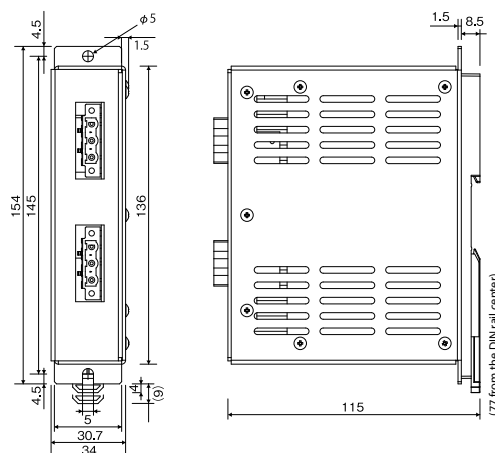
CAD drawings can be downloaded from our website.
www.intelligentactuator.com



External Dimensions <RESU-2>



<RESUD-2>



Guide for Required Quantity

	Horizontal	Vertical
0	~100W	
1	~200W	

* The required regenerative resistance may be more than as specified above depending on the operating conditions.
When connecting more than two regenerative resistance units, add RESU-1/RESUD-1 to RESU-2/RESUD-2.
The difference between "-1" and "-2" is the cable included to the regenerative resistance units.

Replacement Fan Unit

Model **SCON-FU**

Maintenance Parts

When placing an order for the replacement cable, please use the model number shown below. (* Refer to P1-101~ for the actuator to be connected.)

■ Table of Applicable Cables

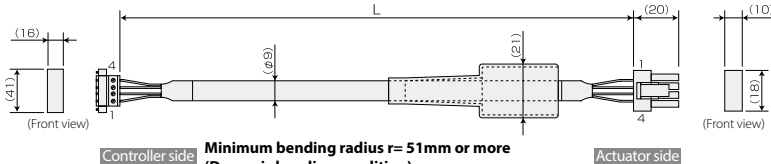
Model			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W) RCS3(CR)	Models other than ②~③	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS2	RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③	RCS3	CTZSC			—	CB-X1-PA□□□
④	RCS4(CR)		CB-RCC-MA□□□	CB-RCC-MA□□□-RB	—	CB-X1-PA□□□
⑤	NS	without LS	—	CB-X-MA□□□	—	CB-X3-PA□□□
⑥		with LS	—		—	CB-X2-PLA□□□
⑦	IS(P)WA	S/M/L	—	CB-XEU-MA□□□	—	CB-X1-PA□□□-WC
⑧	Models other than ①~⑦		—	CB-X-MA□□□	—	CB-X1-PA□□□ (in case of 20m or shorter) *
						CB-X1-PA□□□-AWG24 (in case of 21m or longer)
⑨	Models other than ① to ⑦ with LS specification		—		—	CB-X1-PLA□□□ (in case of 20m or shorter) *
						CB-X1-PLA□□□-AWG24 (in case of 21m or longer)

* Model that is not battery-less absolute specification will be CB-X1-PA□□□□ / CB-X1-PLA□□□□ even when it is 20 m or more.

Model Number	PIO flat cable
⑩ SCON-CB	CB-PAC-PIO□□□□

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

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

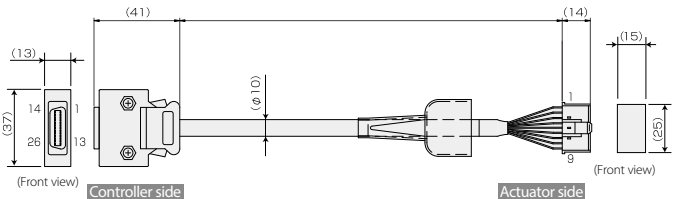


Wiring	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

Model Number CB-RCS2-PA□□□□ (For RCS2/RCS3)/CB-X3-PA□□□□ (For NS/RCS2/RCS3)

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

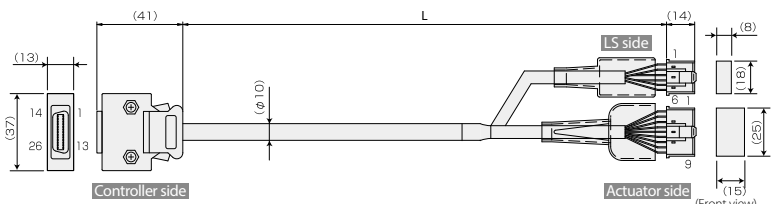


Wiring	Color	Signal	No.
(RCS2)	(X3)	—	10
—	—	—	11
—	—	—	12
Gray/White	White/Green	E24V	13
Brown/White	White/Orange	OV	14
—	—	—	15
—	—	—	16
—	—	—	17
—	—	—	18
—	—	—	19
—	—	—	20
—	—	—	21
—	—	—	22
—	—	—	23
—	—	—	24
—	—	—	25
—	—	—	26
—	—	—	27
—	—	—	28
—	—	—	29
—	—	—	30
—	—	—	31
—	—	—	32
—	—	—	33
—	—	—	34
—	—	—	35
—	—	—	36
—	—	—	37
—	—	—	38
—	—	—	39
—	—	—	40
—	—	—	41
—	—	—	42
—	—	—	43
—	—	—	44
—	—	—	45
—	—	—	46
—	—	—	47
—	—	—	48
—	—	—	49
—	—	—	50
—	—	—	51
—	—	—	52
—	—	—	53
—	—	—	54
—	—	—	55
—	—	—	56
—	—	—	57
—	—	—	58
—	—	—	59
—	—	—	60
—	—	—	61
—	—	—	62
—	—	—	63
—	—	—	64
—	—	—	65
—	—	—	66
—	—	—	67
—	—	—	68
—	—	—	69
—	—	—	70
—	—	—	71
—	—	—	72
—	—	—	73
—	—	—	74
—	—	—	75
—	—	—	76
—	—	—	77
—	—	—	78
—	—	—	79
—	—	—	80
—	—	—	81
—	—	—	82
—	—	—	83
—	—	—	84
—	—	—	85
—	—	—	86
—	—	—	87
—	—	—	88
—	—	—	89
—	—	—	90
—	—	—	91
—	—	—	92
—	—	—	93
—	—	—	94
—	—	—	95
—	—	—	96
—	—	—	97
—	—	—	98
—	—	—	99
—	—	—	100

Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

Model Number CB-RCS2-PLA□□□□ (For RCS 2 rotary)/CB-X2-PLA□□□□ (Specification with NS LS · For RCS 2 rotary)

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



Wiring	Color	Signal	No.
(RCS2)	(X2)	—	10
—	—	—	11
—	—	—	12
—	—	—	13
—	—	—	14
—	—	—	15
—	—	—	16
—	—	—	17
—	—	—	18
—	—	—	19
—	—	—	20
—	—	—	21
—	—	—	22
—	—	—	23
—	—	—	24
—	—	—	25
—	—	—	26
—	—	—	27
—	—	—	28
—	—	—	29
—	—	—	30
—	—	—	31
—	—	—	32
—	—	—	33
—	—	—	34
—	—	—	35
—	—	—	36
—	—	—	37
—	—	—	38
—	—	—	39
—	—	—	40
—	—	—	41
—	—	—	42
—	—	—	43
—	—	—	44
—	—	—	45
—	—	—	46
—	—	—	47
—	—	—	48
—	—	—	49
—	—	—	50
—	—	—	51
—	—	—	52
—	—	—	53
—	—	—	54
—	—	—	55
—	—	—	56
—	—	—	57
—	—	—	58
—	—	—	59
—	—	—	60
—	—	—	61
—	—	—	62
—	—	—	63
—	—	—	64
—	—	—	65
—	—	—	66
—	—	—	67
—	—	—	68
—	—	—	69
—	—	—	70
—	—	—	71
—	—	—	72
—	—	—	73
—	—	—	74
—	—	—	75
—	—	—	76
—	—	—	77
—	—	—	78
—	—	—	79
—	—	—	80
—	—	—	81
—	—	—	82
—	—	—	83
—	—	—	84
—	—	—	85
—	—	—	86
—	—	—	87
—	—	—	88
—	—	—	89
—	—	—	90
—	—	—	91
—	—	—	92
—	—	—	93
—	—	—	94
—	—	—	95
—	—	—	96
—	—	—	97
—	—	—	98
—	—	—	99
—	—	—	100

Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)
* Please use the robot cable if the cable has to be installed through the cable track.

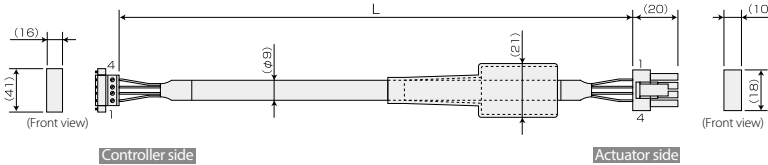
* For wiring diagram of encoder robot cable, please check CB - X2 - PLA □□□□ on P7-253.

Maintenance Parts

When replacing a cable after purchasing the product, please refer to the list of models below. (* Refer to P1-101~ for the actuator to be connected.)

Model Number CB-X-MA□□□

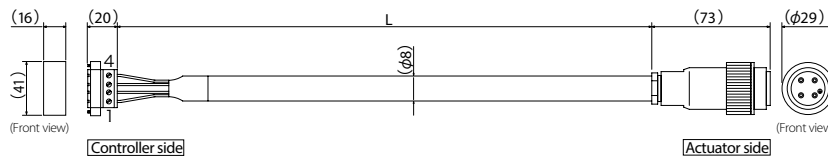
* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m



Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Model Number CB-XEU-MA□□□

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



Plug GIC2.5/4-STF-7.62 (Phoenix)

Plug connector 99-4222-00-04 (BINDER)

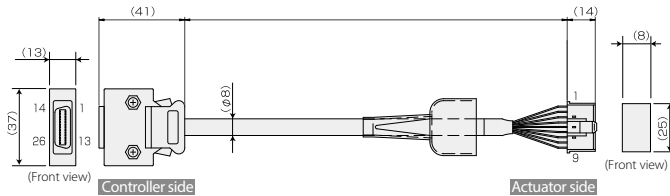
Wiring	Signal	No.
0.75sq	PE	1
	U	2
	V	3
	W	4

No.	Signal	Color	Wiring
④	PE		
1	U		0.75sq
2	V		(Crimped)
3	W		

Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Model Number CB-X1-PA□□□

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



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

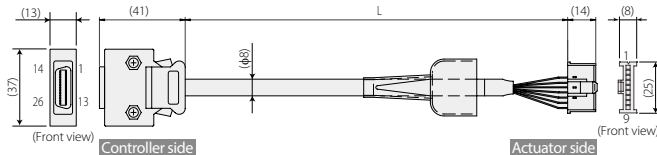
* For ISB · ISDB · ISDBCR · NSA (Encoder types are battery-less absolute), please select CB-X1-PA □□□-AWG24 if you want a cable of 21 m or more.

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

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	AWG26 (Crimped)
6	GND	Black	
7	F-G	Drain	
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



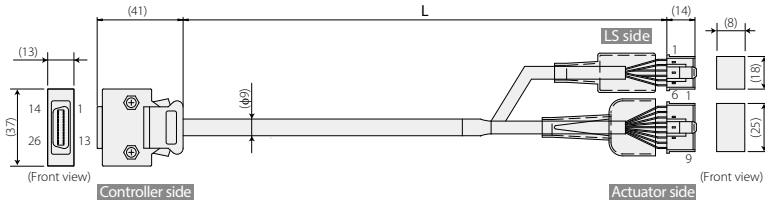
Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

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

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	AWG24 (Crimped)
6	GND	Black	
7	F-G	Drain	
8	BK-	Blue	
9	BK+	Yellow	

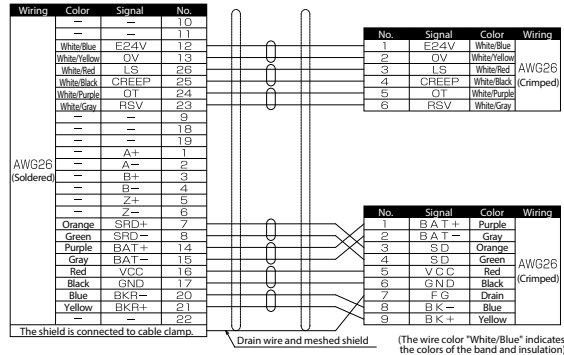
Model Number CB-X1-PLA□□□

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



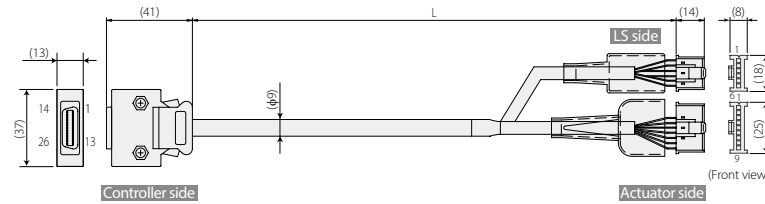
Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

* 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.

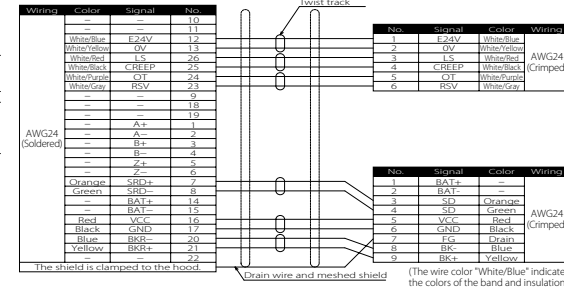


Model Number CB-X1-PLA□□□-AWG24

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

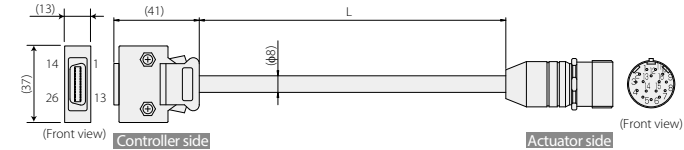


Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

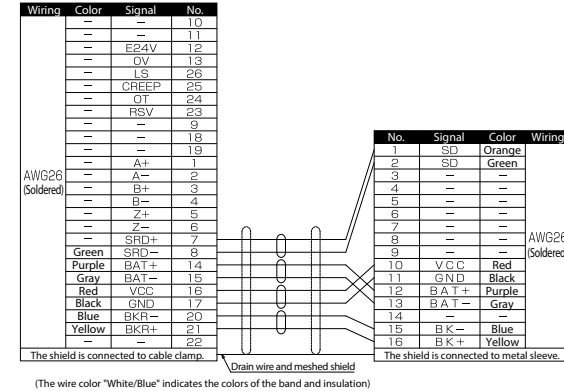


Model Number CB-X1-PA□□□-WC

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

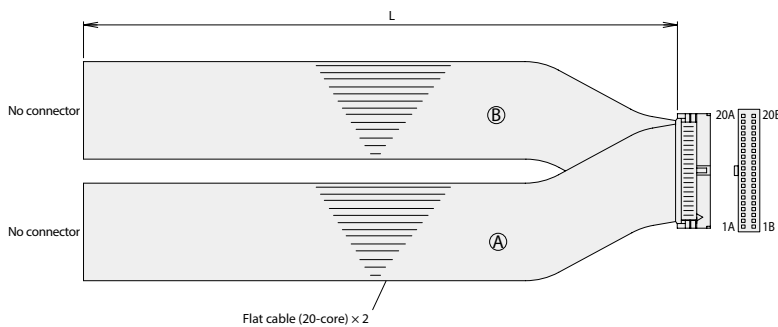


Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.



Model Number CB-PAC-PIO□□□

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



No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
1A	24V	Brown-1		1B	OUT0	Brown-3	
2A	24V	Red-1		2B	OUT1	Red-3	
3A	—	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	OV	White-4	
20A	IN15	Black-2		20B	OV	Black-4	

MSCON

**Position Controller for Single-axis Robot /
Cartesian Robot ROBO Cylinder RCS2/RCS3**
SCON Series, 6-axis Type



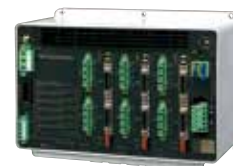
Features

1 Space-saving, low-cost, and easy to use

Six controllers (SCON-CB) are combined into one unit to save the installation space and achieve significant reduction in total cost.



Approx.
65% smaller



2 Movement by numerical specification via Field network

Substantially shorter transmission time

MSCON controllers can be connected directly to key field networks such as DeviceNet, CC-Link, PROFIBUS-DP, MECHATROLINK(*), CompoNet, EtherCAT(*) and EtherNet/IP.

DeviceNet™



CompoNet™

CC-Link

EtherNet/IP™

EtherCAT®

Features of Network Specification

- 256 positioning points per axis
- Moving the actuator after numerically specifying the position to move to, and the speed
- Checking the current position in real time
- Significantly shorter communication time within the controller (approx. one-sixth compared to conventional controllers)

3 Offboard tuning function to enhance actuator payload capacity


The offboard tuning function increases the acceleration/deceleration speed when the load is small, and decreases the acceleration/deceleration when the load is large, to ensure optimal operation settings according to the load. In addition, this function also adjusts the servo characteristics.

(Please refer to P1-194 for details)

4 Vibration control function for shorter cycle time

The vibration control function has been added to prevent the work from shaking (vibrating) on the actuator slider as the slider moves. The wait time for vibration to stabilize is shorter and the cycle time can also be shortened.

Model List/Standard Price

Model number		MSCON-C					
External view							
I/O type		DeviceNet connection specification	CC-Link connection specification	PROFIBUS-DP connection specification	CompoNet connection specification	EtherCAT connection specification	EtherNet/IP connection specification
		DeviceNet	CC-Link	PROFIBUS	CompoNet	EtherCAT	EtherNet/IP
I/O type model code		DV	CC	PR	CN	EC	EP
	Number of axes	Encoder	Standard price				
MSCON	1 axis	Battery-less absolute / Incremental	○	○	○	○	○
		Absolute	○	○	○	○	○
	2 axis	Battery-less absolute / Incremental	○	○	○	○	○
		Absolute	○	○	○	○	○
	3 axis	Battery-less absolute / Incremental	○	○	○	○	○
		Absolute	○	○	○	○	○
	4 axis	Battery-less absolute / Incremental	○	○	○	○	○
		Absolute	○	○	○	○	○
	5 axis	Battery-less absolute / Incremental	○	○	○	○	○
		Absolute	○	○	○	○	○
	6 axis	Battery-less absolute / Incremental	○	○	○	○	○
		Absolute	○	○	○	○	○

* The above price is for full axis battery-less absolute / incremental or absolute. When battery-less absolute / incremental and absolute are mixed, the price obtained by multiplying the number of axes of battery-less absolute / incremental by ¥ 1,800 is subtracted from the price of all axes absolute.

Model

(Specs for 1st axis) (Specs for axis 2 - 6)

MSCON - C - [] - [] - [] - [] - ([] [] []) - [] - 0 - []

Series Type Number of axes Motor Encoder Option Motor Encoder Option I/O type I/O cable length Power/voltage

1	Single-axis model	12 12W 60 60W	20 20W 100 100W	30D 30W 150 150W	30R 30W 200 200W	HA High acceleration/deceleration type	WAI Battery-less absolute/Incremental	A Absolute	DV DeviceNet connection specification	CC CC-Link connection specification	PR PROFIBUS-DP connection specification	CN CompoNet connection specification	EC EtherCAT connection specification	EP EtherNet/IP connection specification	1 AC100V	2 AC200V
---	-------------------	---------------	-----------------	------------------	------------------	--	---------------------------------------	------------	---------------------------------------	-------------------------------------	---	--------------------------------------	--------------------------------------	---	----------	----------

(Example) 12: 12 W Servo motor compatible * Encoder type can be specified for each axis.

Note
Basically, the type of motor is the same as 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 applicable actuator>
● Controller Motor type "30D" ... 30W actuator other than RS
● Controller Motor type "30R" ... RS

* Please check the power supply voltage that can be selected on the page of the actuator.

* The MSCON is available only in network specifications and does not come with I/O cables.

System configuration

Controller

Option

PC dedicated teaching software

(See P7-238)

Software only

<Model: RCM-101-MW>

Supplied with the dedicated

connection cable

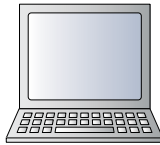
<Model: RCM-101-USB>

Option

Touch panel teaching pendant

(See P7-238)

<Model: TB-02-□>



Field networks

DeviceNet
CC-Link
PROFIBUS-DP
CompoNet
EtherCAT
EtherNet/IP

***To connect to a field network, the gateway parameter setting tool supplied with the PC dedicated software must be used to set up communication for the controller.**

Motor drive power supply

AC 100V
AC 200V
One of the above is supplied.
(selectable)

*** When connecting to a power source, please make sure to use a noise filter.**

Recommended model: NBC 10-472 (Manufacturer: COSEL)
(Available for purchase, please contact for more details)

Control power supply

Brake power supply

DC 24V is supplied



DC 24-C power supply

(See P7-311)

<Model: PSA-24>

Option

Included with PC dedicated teaching software

Comm. cable

<Model: CB-RCA-SIO050>

(See P7-238)

Option

Regenerative resistance unit

(See P7-238)

<Model: RESU-2>

<Model: RESUD-2>



Absolute data backup battery

(See P7-238)

<Model: AB-5 No case>

<Model: AB-5 With case>

Motor cable

Motor robot cable

Supplied when the cable length is specified in the actuator model.

Refer to P7-239 for maintenance cable.

Comes with the actuator

Slider type/Rod type

Encoder cable

Encoder robot cable

Supplied when the cable length is specified in the actuator model.

Refer to P7-239 for maintenance cable.

Comes with the actuator

Rotary/Limit switch option type

Encoder cable

Encoder robot cable

Supplied when the cable length is specified in the actuator model.

Refer to P7-239 for maintenance cable.

Comes with the actuator



Actuator

RCS2 series / RCS3 series / RCS4 series / Single-axis robot / Cartesian robot

Notes Please note that the following models are not supported by the MSCON:

- All linear servo actuator models
- RCS2-RN5N/RP5N/G55N/GD5N/SD5N/TCA5N/TWA5N/TFA5N/SRA7BD/SGS7BD/SGRD7BD, NS-SXM□/SZM□
(both incremental specifications only)
- DD series
- Actuator with more than 200W motor W

Operation Mode

When the MSCON is controlled via a field network, one of the following seven operation modes can be used. The necessary data areas on the PLC side vary depending on the mode, so please consult the MSCON controller manual or contact IAI before use.

Mode	Description
Simple direct input mode	The target position value is directly input, while all other operational conditions (speed, acceleration, etc) are set by indicating the position number corresponding to the desired operating conditions from the position data table.
Positioner 1 mode	The target position, speed, acceleration/deceleration, etc., are input to the position data table of the controller and input position numbers are specified to operate the actuator (maximum 256 points). The current position can be read, as well.
Direct input mode	The actuator is operated by specifying the target position, speed, acceleration/deceleration, push current control value, etc., by directly entering values. The current position, current speed, command current, etc., can also be read.
Direct input mode 2	Same as the direct input mode, except that jog operation is not supported and vibration control is added.
Positioner 2 mode	Same as the positioner 1 mode, except that the target position is not specified and reading of current position not supported, in order to reduce the amount of data to be transmitted/received.
Positioner 3 mode (*2)	Same as the positioner 2 mode, with the amount of data to be transmitted/received reduced further to allow for actuator operation with minimum input/output signals.
Remote I/O mode (*1)(*2)	In this mode, the actuator is operated by controlling the ON/OFF of bits via the network, just like with the PIO specification. The number of positioning points and functions vary with each of the operation patterns (PIO patterns) that can be set by the controller's parameter.

(*1) Please note that if the remote I/O mode is selected, all axes will operate in the remote I/O mode.

(*2) CompoNet can only select Positioner 3 mode and Remote I / O mode.

List of Functions by Operation Mode

	Simple direct input mode	Positioner 1 mode	Direct input mode	Direct input mode 2	Positioner 2 mode	Positioner 3 mode
Number of positioning points	Unlimited	256	Unlimited	Unlimited	256	256
Home return operation	○	○	○	○	○	○
Positioning operation	○	△	○	○	△	△
Speed & acceleration/deceleration setting	△	△	○	○	△	△
Pitch feed (inching)	△	△	○	○	△	△
Push-motion operation	△	△	○	○	△	△
Speed change during movement	△	△	○	○	△	△
Pause	○	○	○	○	○	○
Zone signal output	△	△	△	△	△	△
Vibration control	△	△	×	○	△	△
Reading of current value	○	○	○	○	×	×
Selection of PIO pattern (Note 1)	×	×	×	×	×	×

* ○ indicates that the operation is supported, △ indicates that position data or parameter must be input, and X indicates that the function is not supported.

(Note 1) It can be used when the PIO pattern is set to 8.

	Remote I/O mode				
	Positioning mode	Teaching mode	256-point mode	Solenoid valve mode 1	Solenoid valve mode 2
Number of positioning points	64	64	256	7	3
Home return operation	○	○	○	○	×
Positioning operation	△	△	△	△	△
Speed & acceleration/deceleration setting	△	△	△	△	△
Pitch feed (inching)	△	△	△	△	×
Push-motion operation	△	△	△	△	×
Speed change during movement	△	△	△	△	×
Pause	○	○	○	○	×
Zone signal output	△	△	△	△	△
Vibration control	△	△	△	△	△
Reading of current value	×	×	×	×	×
Selection of PIO patter	○	○	○	○	○

* ○ indicates that direct setting is possible; △ indicates that position data or parameter must be input; and × indicates that the function is not supported.

Explanation of I/O Signal Functions

The table below explains the functions assigned to the controller's I/O signals. The controller can be operated by setting the remote I/O mode, selecting one of modes 0 to 5, and then turning each port number ON/OFF via the network.

		Setting of MSCON Parameter No. 25									
		Positioning mode		Teaching mode		256-point mode		Solenoid valve mode 1		Solenoid valve mode 2	
		0		1		2		4		5	
Classification	Port No.	Code	Signal name	Code	Signal name	Code	Signal name	Code	Signal name	Code	Signal name
PLC output ↓ MSCON input	0	PC1	Command position number	PC1	Command position number	PC1	Command position number	ST0	Start position 0	ST0	Start position 0
	1	PC2		PC2		PC2		ST1	Start position 1	ST1	Start position 1
	2	PC4		PC4		PC4		ST2	Start position 2	ST2	Start position 2
	3	PC8		PC8		PC8		ST3	Start position 3	—	Cannot be used
	4	PC16		PC16		PC16		ST4	Start position 4	—	
	5	PC32		PC32		PC32		ST5	Start position 5	—	
	6	—	Cannot be used	MODE	Teaching mode command	PC64	Cannot be used	ST6	Start position 6	—	
	7	—		JISL	Jog/inch switching	PC128		—	Cannot be used	—	
	8	—		JOG+	+Jog	—		—	—	—	
	9	BKRL	Forced brake release	JOG—	—Jog	BKRL	Forced brake release	BKRL	Forced brake release	BKRL	Forced brake release
	10	—	Cannot be used	—	Cannot be used	—	Cannot be used	—	Cannot be used	—	Cannot be used
	11	HOME	Home return	HOME	Home return	HOME	Home return	HOME	Home return	—	
	12	*STP	Pause	*STP	Pause	*STP	Pause	*STP	Pause	—	
	13	CSTR	Positioning start	CSTR/ PWRT	Positioning start/ Position data load command	CSTR	Positioning start	—	Cannot be used	—	
	14	RES	Reset	RES	Reset	RES	Reset	RES	Reset	RES	Reset
	15	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command	SON	Servo ON command
MSCON output ↓ PLC input	0	PM1	Complete position number	PM1	Complete position number	PM1	Complete position number	PE0	Position complete 0	LS0	Limit switch output 0
	1	PM2		PM2		PM2		PE1	Position complete 1	LS1	Limit switch output 1
	2	PM4		PM4		PM4		PE2	Position complete 2	LS2	Limit switch output 2
	3	PM8		PM8		PM8		PE3	Position complete 3	—	Cannot be used
	4	PM16		PM16		PM16		PE4	Position complete 4	—	
	5	PM32		PM32		PM32		PE5	Position complete 5	—	
	6	MOVE	Moving signal	MOVE	Moving signal	PM64	Cannot be used	PE6	Position complete 6	—	
	7	ZONE1	Zone 1	MODES	Teaching mode signal	PM128		ZONE1	Zone 1	ZONE1	Zone 1
	8	PZONE/ ZONE2	Position zone/ Zone 2	PZONE/ ZONE1	Position zone/ Zone 1	PZONE/ ZONE1	Position zone/ Zone 1	PZONE/ ZONE2	Position zone/ Zone 2	PZONE/ ZONE2	Position zone/ Zone 2
	9	—	Cannot be used	—	Cannot be used	—	Cannot be used	—	Cannot be used	—	Cannot be used
	10	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete	HEND	Home return complete
	11	PEND	Positioning complete signal	PEND/ WEND	Positioning complete signal/ Position data load complete	PEND	Positioning complete signal	PEND	Positioning complete signal	—	Cannot be used
	12	SV	Ready	SV	Ready	SV	Ready	SV	Ready	SV	Ready
	13	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop	*EMGS	Emergency stop
	14	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm	*ALM	Alarm
	15	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning	*BALM	Absolute battery voltage low warning

* In the table above, * accompanying each code indicates a negative logic signal.

List of Base Controller Specifications

Item		Specification
Number of controlled axes		1 to 6 axes
Control power-supply voltage		24VDC \pm 10%
Control power-supply current consumption		2.4 A max.
Control power-supply rush current (Note 1)		7 A max., 5 msec or less
Drive (motor) powersupply voltage	Drive power-supply voltage AC 100 V specification	AC100~115V \pm 10%
	Drive power-supply voltage AC 200 V specification	AC200~230V \pm 10%
Drive (motor) power-supply rush current (Note 1)	Drive power-supply voltage AC 100 V specification	20 A, 10 A max. within 80 msec (Drive power-supply voltage 100 V 25°C ambience) 45 A, 10 A max. within 80 msec (Drive power-supply voltage 115 V \times 10%, 40°C ambience)
	Drive power-supply voltage AC 200 V specification	45 A, 10 A max. within 40 msec (Drive power-supply voltage 200 V 25°C ambience) 95 A, 10 A max. within 40 msec (Drive power-supply voltage 230 V \times 10%, 40°C ambience)
Connectable actuator motor capacity	Drive power-supply voltage AC 100 V specification	200 W max. per axis (Total of 6 axes limited to 450 W)
	Drive power-supply voltage AC 200 V specification	200 W max. per axis (Total of 6 axes limited to 900 W)
Electromagnetic brake power-supply voltage (when actuator with brake is connected)		24VDC \pm 10%
Brake power-supply current		1 A max. per axis (0.5 A per axis in steady state)
Brake power-supply rush current (Note 1)		10 A max., 10 msec or less
Leak current (Note 2)		3.5 mA (motor power supply) \odot No leak current from the control power supply or brake power supply
Motor control method		Sinusoidal PWM vector current control
Applicable encoder		Battery-less absolute encoder Incremental serial encoder Absolute serial encoder
Serial communication (SIO port: Teaching only)		RS485: 1 channel (conforming to Modbus protocol) / Speed: 9.6 to 230.4 kbps
External interface		DeviceNet, CC-Link, PROFIBUS-DP, CompoNet, MECHATROLINKII (*), EtherNet/IP
Data setting/input method		PC dedicated teaching software, Touch panel teaching pendant, Gateway parameter setting tool
Data retention memory		Saving of position data and parameters to nonvolatile memory (Memory can be rewritten an unlimited number of times)
Number of positioning points		Max. 256 points (Not limited in the simple direct input mode or direct input mode) Note: The number of positioning points varies depending on the operation mode selected by the parameter.
LED display (installed on the front panel)		Driver status LED \times 2 Fieldbus status LED \times 2 Gateway status LED \times 5 Power-supply status LED \times 2
Electromagnetic brake forced release switch (installed on the front panel)		Switched between NOM (standard) and RLS (forced releases)
Protective function		Overload, overcurrent, overvoltage, etc.
Electric shock protection mechanism		Class I
Isolation resistance		DC 500 V, 10 M Ω or more
Withstand voltage		AC 1500 V for 1 minute
External dimensions		225W \times 154H \times 115D
Weight	Incremental specification (When drivers for 6 axes are installed)	Approx. 1900g
	Absolute specification (When drivers for 6 axes are installed)	Approx. 2000g
Cooling method		Forced air cooling
Environment	Ambient operating temperature	0 to 40°C
	Ambient operating humidity	85% RH or less (non-condensing)
	Operating ambience	Free from corrosive gases
	Protection degree	IP20

Note 1: Please note that the rush current value varies depending on the impedance of the power supply line.

Note 2: Leak current varies depending on the motor capacity to be connected, cable length, and ambient environment.

To protect against leak current, measure leak current at locations where the earth leakage breaker is set.

An earth leakage breaker must be selected that serves the specific purpose required, such as fire protection and injury protection.

Use an earth leakage breaker of harmonic wave type (inverter type).

Power Supply Selection

With the MSCON controller, motor driver power (AC 100 V/AC 200 V) and control power (DC 24 V) must be supplied separately. Check the necessary power-supply capacity according to the table below.

RS: Rotational shaft

Motor Drive Power-supply Capacity

Actuator motor W number	Motor power supply capacity [VA]	Momentary maximum motor power-supply capacity [VA]	Heat output [W]
12	41	123	1.7
20	50	150	2.0
30D (other than RS)	47	141	2.0
30R (RS)	138	414	4.0
60	146	438	4.8
100	238	714	7.0
150	328	984	8.3
200	421	1263	9.2

Selecting the Circuit Breaker

Select the circuit breaker as follows:

- Three times the rated current will flow through the controller during acceleration/deceleration. (Refer to "Momentary maximum motor power-supply capacity" above).
Select a circuit breaker that will not trip when this current flows. If the selected circuit breaker trips under this current, select another breaker of the next higher rated current. (Confirm on the operation characteristic curve in the manufacturer's catalog to confirm that the circuit breaker will not trip.)
- Select a circuit breaker that will not trip due to rush current. (Confirm on the operation characteristic curve in the manufacturer's catalog to confirm that the circuit breaker will not trip.)
- Select a rated break current that will break the circuit even when a short-circuit current flows.
Rated break current > Short-circuit current = Primary power-supply capacity of circuit breaker / Power-supply voltage

Consider allowance when selecting the rated current of circuit breaker.

<Rated current of circuit breaker>
Total sum of motor power-supply capacities of all actuators connected [VA] / AC input voltage \times Safety factor (Rough guide: 1.2 to 1.3)

Control Power-supply (DC 24-V) Capacity

Calculate the DC 24-V power-supply capacity as follows:

(1) Current consumption of control power supply: Select the applicable control power-supply current shown in the table below.....①

Number of controlled axes (Note 1)	1 axis	2 axes	3 axes	4 axes	5 axes	6 axes
Heat generation from control power supply [W]	25.5	31.5	38.2	44.2	50.9	56.9
Control power-supply current [A]	1.1	1.3	1.6	1.8	2.1	2.4

(Note 1): Check the maximum number of controlled axes that can be connected to the MSCON. This information is available on the manufacturer's nameplate.
MSCON-C-*-*-*: * represents the maximum number of axes that can be connected.

(2) Current consumption of brake power supply: 1 A or 0.5 A (Note 2) x Number of actuators with brakes.....②

(Note 2): When the brake is released, up to 1 A of current will flow per actuator for a period of approx. 100 ms.

If this maximum current can be accommodated by the DC 24-V power supply used which is capable of handling momentary load fluctuation at the time of peak load, etc., calculate at 0.5 A/unit. If not, calculate at 1 A/unit.

(3) Rush current of control power supply: 7 A.....③

[Selection of power supply]

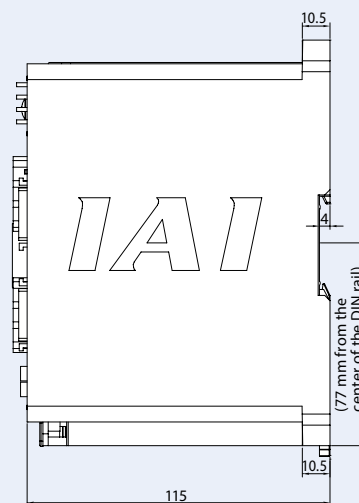
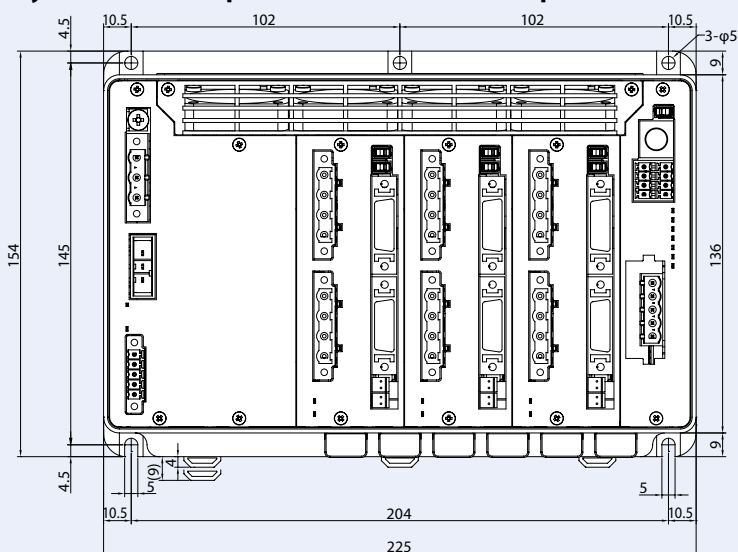
Normally a power supply whose rated current is approx. 1.3 times is selected by considering approx. 30% of allowance on top of the load current of ① + ② above. Since the current of ③ will flow for a short period, select a power supply of the "peak load accommodation" specification or having enough allowance. If the selected power supply has no allowance, voltage may drop momentarily. In particular, pay attention to the power supply with remote sensing function.

External Dimensions

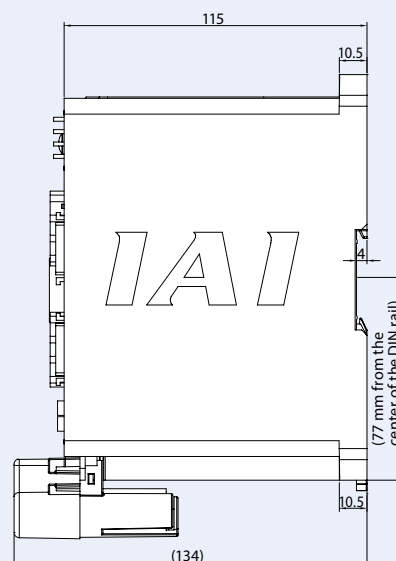
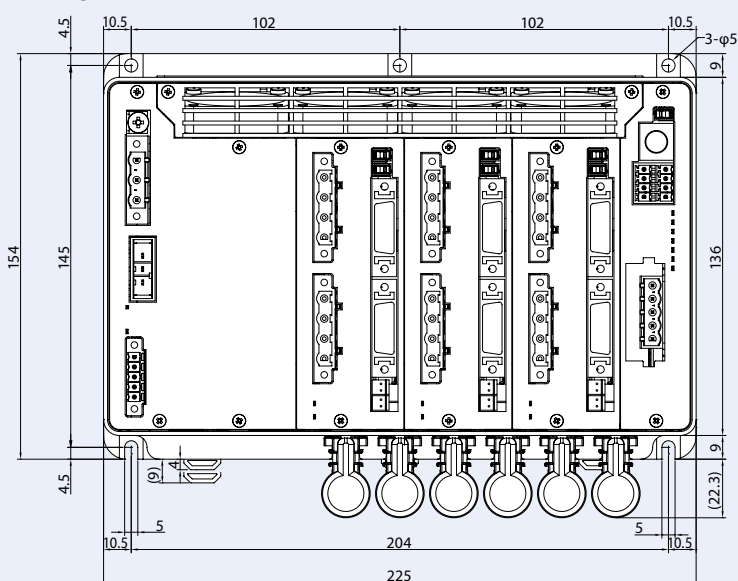
CAD drawings can be downloaded from our website.
www.intelligentactuator.com



Battery-less absolute specification/Incremental specification



Absolute specification



MSCON 7-238

Maintenance Parts

When replacing a cable after purchasing the product, please refer to the list of models below. (* Refer to P1-101 for the actuator to be connected.)

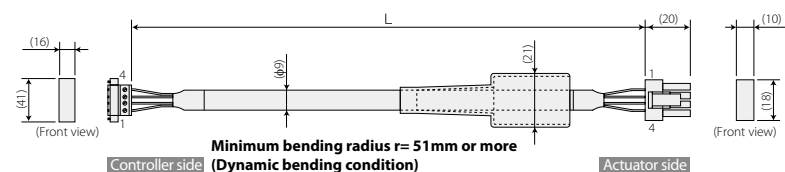
■ Table of Applicable Cables

Model Number			Motor Cable	Motor Robot Cable	Encoder Cable	Encoder Robot Cable
①	RCS2(CR/W) RCS3(CR)	Models other than ②	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA □□□
②	RCS2	RT			CB-RCS2-PLA□□□	CB-X2-PLA □□□
③	RCS4(CR)		CB-RCC-MA□□□	CB-RCC-MA□□□-RB	—	CB-X1-PA □□□
④	NS	Without LS	—	CB-X-MA□□□	—	CB-X3-PA □□□
⑤		With LS	—		—	CB-X2-PLA □□□
⑥	IS(P)WA	S/M/L	—	CB-XEU-MA□□□	—	CB-X1-PA □□□ -WC
⑦	Models other than ① to ⑥		—	CB-X-MA□□□	—	CB-X1-PA □□□ (In case of 20 m or less)*
			—		—	CB-X1-PA □□□ -AWG24 (In case of 21 m or more)
⑧	Models other than ① to ⑥ Specification with LS		—		—	CB-X1-PLA □□□ (In case of 20 m or less)*
			—		—	CB-X1-PLA □□□ -AWG24 (In case of 21 m or more)

* Model that is not battery-less absolute specification will be CB-X1-PA □□□□ / CB-X1-PLA □□□□ even when it is 20 m or more.

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

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

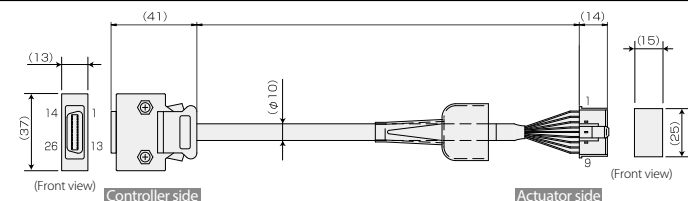


Wiring	Color	Signal	No.
Green	PE	1	
Red	U	2	
White	V	3	
Black	W	4	

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

Model Number CB-RCS2-PA□□□□ (For RCS2/RCS3)/CB-X3-PA□□□□ (For NS/RCS2/RCS3)

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



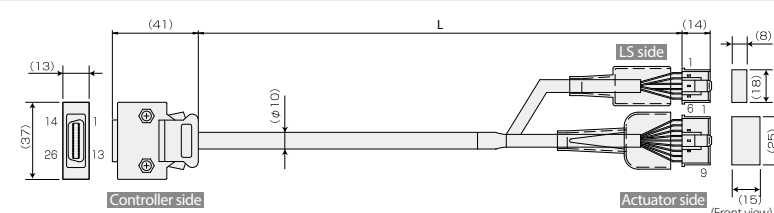
Wiring	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	—	12
—	—	—	13
Gray/White	White/Green	EP2V	13
Brown/White	White/Gray	LS	26
—	—	CHREP	26
—	—	OT	24
—	—	RSV	24
—	—	—	18
—	—	—	19
Pink	White/Blue	A+	2
Purple	White/Yellow	A-	3
White	White/Red	B+	4
Black	White/Black	B-	5
Orange/White	White/Purple	Z+	6
Green/White	White/Gray	Z-	7
Blue	Orange	SFD+	8
Orange	Green	SFD-	9
Black	Purple	BA+	14
Yellow	Gray	BA-	15
Green	Red	VCC	16
Brown	Black	GND	17
Gray	Blue	BK+	20
Red	Yellow	BK-	21
—	—	—	22

The shield is clamped to the hood.

No.	Signal	Color	Wiring
2	A+	Purple	
3	A-	White	
4	B+	White	
5	B-	Black	
6	Z+	Orange	
7	Z-	Green	
8	SFD+	Brown	
9	SFD-	Gray	
10	SFD	Blue	
11	SFD	Orange	
12	BA+	Black	
13	BA-	Gray	
14	VCC	Green	
15	GND	Black	
16	LS	Gray/White	
17	BK+	Blue	
18	BK-	Red	

Model Number CB-RCS2-PLA□□□□ (For RCS 2 rotary)/CB-X2-PLA□□□□ (Specification with NS LS · For RCS 2 rotary)

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



Wire	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	—	12
—	—	—	13
Brown/White	White/Orange	EP2V	13
Gray/White	White/Green	OV	13
Red/White	White/Black	LS	26
Black/White	Brown/Yellow	CHREP	26
Yellow/Black	Brown/Red	OT	24
Pink/Black	Brown/Black	RSV	24
—	—	—	18
—	—	—	19
Pink	White/Blue	A+	2
Purple	White/Yellow	A-	3
White	White/Red	B+	4
Black	White/Black	B-	5
Orange/White	White/Purple	Z+	6
Green/White	White/Gray	Z-	7
Blue	Orange	SFD+	8
Orange	Green	SFD-	9
Black	Purple	BA+	14
Blue	Gray	BA-	15
Green	Red	VCC	16
Brown	Black	GND	17
Gray	Blue	BK+	20
Red	Yellow	BK-	21
—	—	—	22

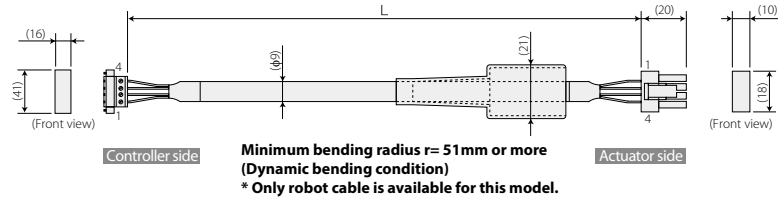
The shield is clamped to the hood.

No.	Signal	Color	Wire
2	A+	Purple	
3	A-	White	
4	B+	White	
5	B-	Black	
6	Z+	Orange	
7	Z-	Green	
8	SFD+	Brown	
9	SFD-	Gray	
10	SFD	Blue	
11	SFD	Orange	
12	BA+	Black	
13	BA-	Gray	
14	VCC	Green	
15	GND	Black	
16	LS	Gray/White	
17	BK+	Blue	
18	BK-	Red	

* The above is wiring diagram of the encoder cable. For wiring diagram of encoder robot cable, please check CB-X2-PLA □□□□ on P7-253.

Model Number CB-X-MA

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

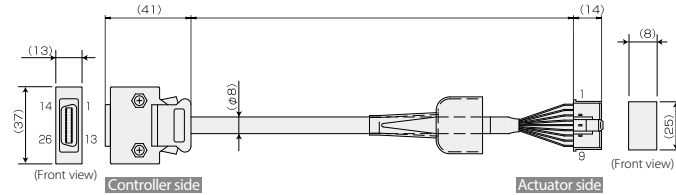


Wiring	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

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

Model Number CB-X1-PA

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



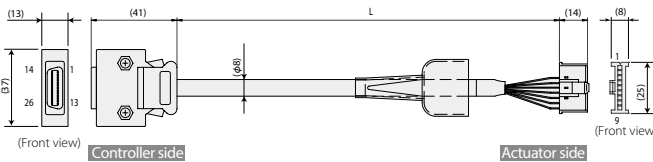
Minimum bending radius $r = 44$ mm or more (Dynamic bending condition)
 * Only robot cable is available for this model.
 * For ISB · ISDB · ISDBCR · NSA (Encoder types are battery-less absolute) with the cable length of 21m or longer, please select CB-X1-PA -AWG24.

Wiring	Color	Signal	No.
AWG26 (Soldered)	—	—	10
	—	E24V	11
	—	OV	12
	—	LS	13
	—	LS	26
	—	LS	26
	—	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

No.	Signal	Color	Wiring
1	BAT+	Gray	AWG26 (Crimped)
2	BAT-	Purple	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	F.G	Drain	
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



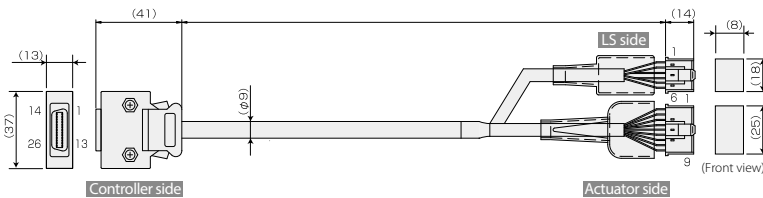
Minimum bending radius $r = 44$ mm or more (Dynamic bending condition).
 * Robot cable is the standard.

Wiring	Color	Signal	No.
AWG24 (Soldered)	—	—	10
	—	E24V	11
	—	OV	12
	—	LS	13
	—	LS	26
	—	LS	26
	—	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

No.	Signal	Color	Wiring
1	BAT+	Gray	AWG24 (Crimped)
2	BAT-	Orange	
3	SD	Green	
4	SD	Red	
5	VCC	Black	
6	GND	Drain	
7	F.G	Blue	
8	BK-	Yellow	
9	BK+	—	

Model Number CB-X1-PLA

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



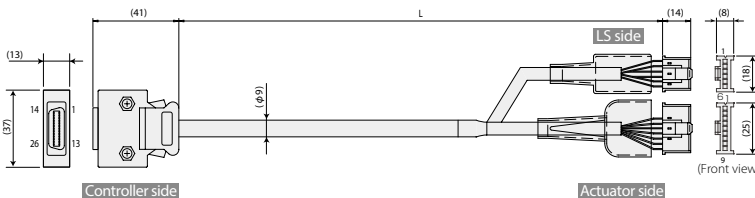
Minimum bending radius $r = 54$ mm or more (Dynamic bending condition)
 * Only robot cable is available for this model.
 * For ISB · ISDB · ISDBCR (Encoder types are battery-less absolute), please select CB-X1-PA -AWG24 if you want a cable of 21 m or more.

Wiring	Color	Signal	No.
AWG26 (Soldered)	—	—	10
	—	E24V	11
	—	OV	12
	—	LS	13
	—	LS	26
	—	LS	26
	—	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

No.	Signal	Color	Wiring
1	BAT+	Gray	AWG26 (Crimped)
2	BAT-	White/Yellow	
3	SD	White/Red	
4	SD	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	

Model Number CB-X1-PLA -AWG24

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



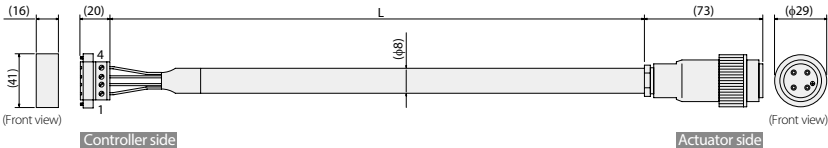
Minimum bending radius $r = 54$ mm or more (Dynamic bending condition).
 * Robot cable is the standard.

Wiring	Color	Signal	No.
AWG24 (Soldered)	—	—	10
	—	E24V	11
	—	OV	12
	—	LS	13
	—	LS	26
	—	LS	26
	—	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

No.	Signal	Color	V
1	BAT+	White/Blue	—
2	BAT-	White/Red	—
3	SD	White/Black	—
4	SD	White/Gray	—
5	OT	White/Purple	—
6	RSV	White/Gray	—

Model Number **CB-XEU-MA**

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



Plug
GIC2.5/4-STF-7.62 (Phoenix)

Wiring	Signal	No.
0.75sq	PE	1
	U	2
	V	3
	W	4

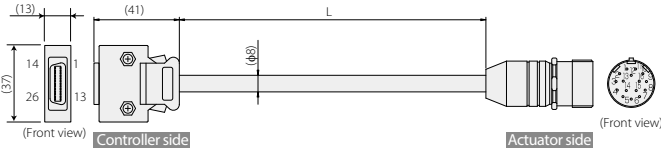
Plug connector
99-4222-00-04(BINDER)

No.	Signal	Wiring
1	PE	0.75sq
2	U	(Crimped)
3	V	
4	W	

Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Model Number **CB-X1-PA** **-WC**

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



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
* The standard is robot cable.

Wiring	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CHIEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	1
—	—	A-	2
—	—	B+	3
—	—	B-	4
—	—	Z+	5
—	—	Z-	6
—	—	SRD+	7
—	—	SRD-	8
—	—	BAT+	14
—	—	BAT-	15
—	—	VCC	16
—	—	GND	17
—	—	BKR+	20
—	—	BKR-	21
—	—	—	22

The shield is clamped to the hood.
(Line / white / blue in cable color indicates band color / insulator color.)

No.	Signal	Color	Wiring
1	SD	Orange	
2	SD	Green	
3	—	—	
4	—	—	
5	—	—	
6	—	—	
7	—	—	
8	—	—	
9	—	—	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT-	Gray	
14	—	—	
15	BK+	Blue	
16	BK+	Yellow	

Shield is connected to the earth sleeve

MEMO


Controller

MSCON



CE RoHS

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	○	○	○	○	○

SSEL - CS - - - () - - -

* 2nd axis specs not applicable to the single-axis model.

Series

CS	Standard type
----	---------------

Type

1	Single-axis model
2	2-axis model

Number of axes

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

(Specs for 1st axis)

Motor	Encoder	Option
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

(Specs for 2nd axis)

Motor	Encoder	Option
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

I/O type

1	Single-phase AC
2	Single-phase AC

* Please confirm that the supply voltage is correct with the actuator you are selecting.

I/O cable length

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

* The I/O cable length is for the actuator only.

Power voltage

1	Single-phase AC
2	Single-phase AC

(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

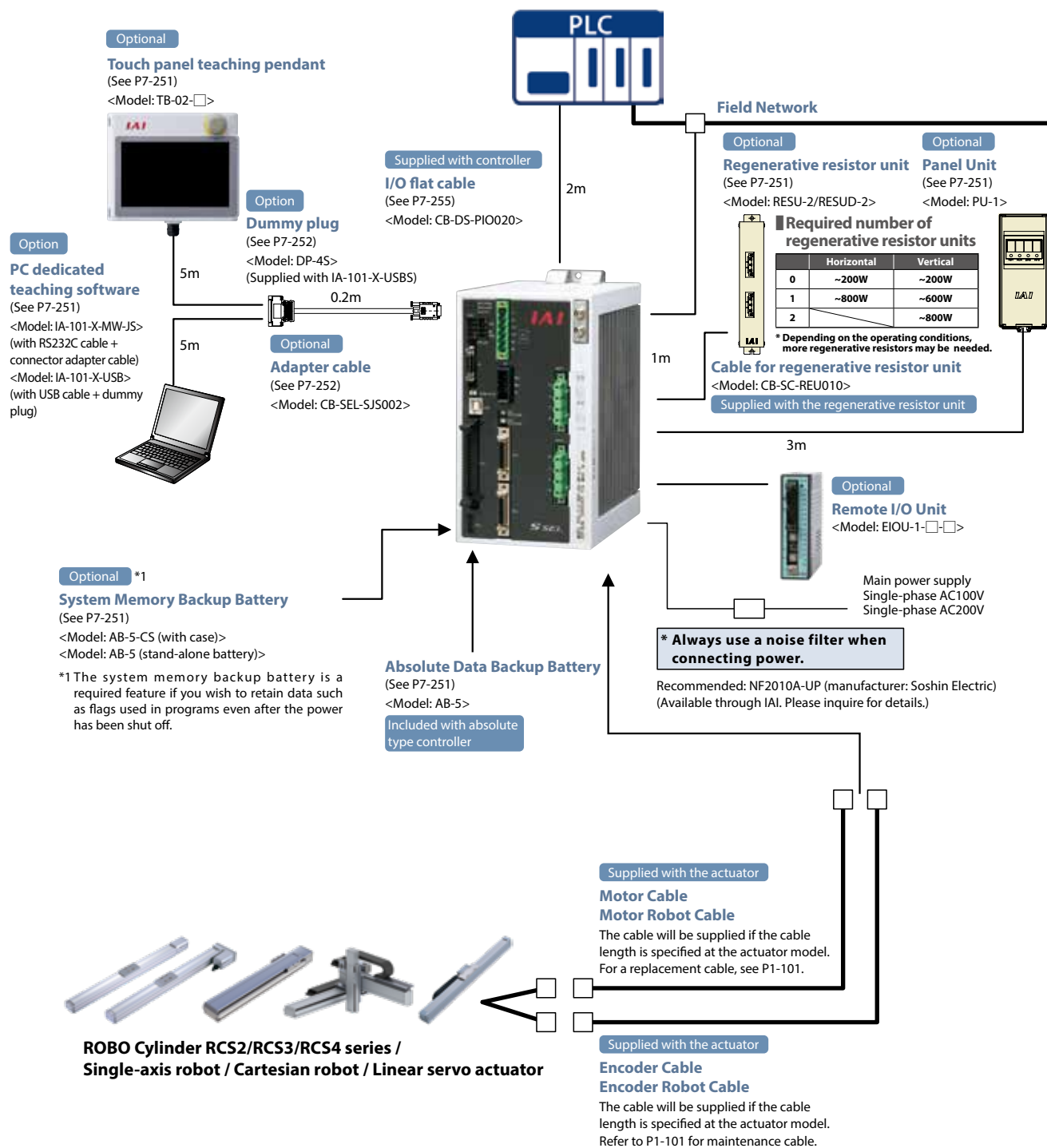
12	12W	150	150W
20	20W	200	200W
30D	30W	200S	200W
30R	30W	300S	300W
60	60W	400	400W
100	100W	600	600W
100S	100W	750	750W

(Ex.) 12: compatible with servomotor

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.

System Configuration

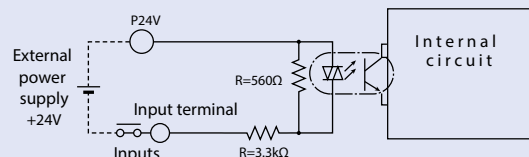


I/O Specifications

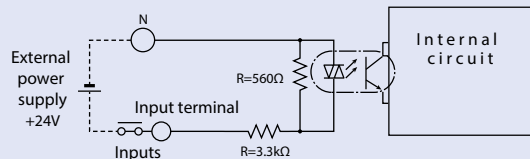
Input Section External input specifications

Item	Specifications
Input voltage	24VDC $\pm 10\%$
Input current	7mA / circuit
ON/OFF voltage	ON voltage (min.) OFF voltage (max.)
Isolation method	Photocoupler

NPN Specifications



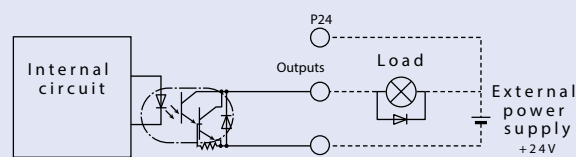
PNP Specifications



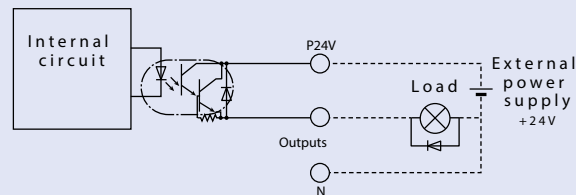
Output Section

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point, 400mA / 8 points total
Leakage current (max.)	Max. 0.1mA / point
Isolation method	Photocoupler

NPN Specifications



PNP Specifications



Explanation of I/O Signal Functions

Two modes can be selected for the SSEL controller: "Program Mode," in which the actuator is operated by entering a program, and "Positioner Mode," in which PLC signals are received and the actuator is moved to designated positions.

The Positioner Mode has the five input patterns listed below to enable various applications.

Controller Function by Type

Operation mode	Features
Program mode	Various operations including linear/arc interpolation operation, ideal path operation for 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	Wiring diagram
1A	Input		24V input	Connect 24V.	
1B		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	Resets the system to the same state as when the power is turned on.	
4B		022	Select program No.40		
5A		023	CPU reset	Starts the program selected by ports 016 to 022.	
5B		000	Start		
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	Turns off when an alarm occurs. (Contact B)		
13B	300	Alarm			
14A	Output	301	Ready	Turns on when the controller starts up normally and is in an operable state.	
14B		302	General-purpose output		
15A		303	General-purpose output	These outputs can be turned ON/OFF as desired via program instructions.	
15B		304	General-purpose output		
16A		305	General-purpose output		
16B		306	General-purpose output		
17A		307	General-purpose output		
17B	N		0V input	Connect 0V.	

Positioner Standard Mode

Pin No.	Category	Port No.	Positioner Standard Mode	Functions	Wiring diagram	
1A	Input		24V input	Connect 24V.		
1B			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			Position input 11			
2B			Position input 12			
3A			Position input 13			
3B			020	Position input 14		—
4A			021	Position input 15		—
4B			022	Position input 16		—
5A			023	Error reset		Resets minor errors. (Severe errors require a restart.)
5B			000	Start		Starts moving to the selected position.
6A			001	Home return		Performs Home Return.
6B			002	Servo ON		Switches between Servo ON and OFF.
7A			003	Push		Performs a push motion.
7B			004	Pause		Pauses the motion when turned OFF, and resumes motion when turned ON.
8A			005	Cancel		Stops the motion when turned OFF. The remaining motion is canceled.
8B			006	Interpolation settings		When this signal turned ON for a 2-axis model, the actuator moves by linear interpolation.
9A			007	Position input 1		Specifies the position numbers to move to, using ports 007 to 019. The number can be specified either as BCD or binary.
9B			008	Position input 2		
10A			009	Position input 3		
10B			010	Position input 4		
11A			011	Position input 5		
11B			012	Position input 6		
12A			013	Position input 7		
12B			014	Position input 8		
13A			015	Position input 9		
13B		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.		

Controller

R-unit

RCP6S

MCON
-CPCON
-CB/CFB

PCON

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

MCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

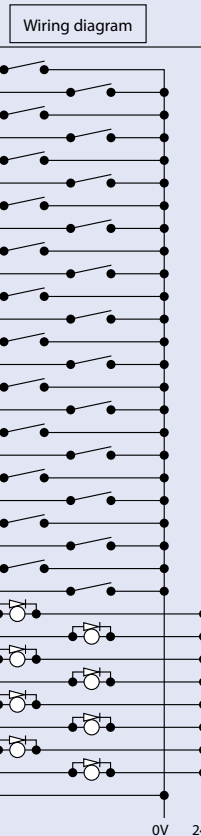
PSA-24

TB-02

TB-03

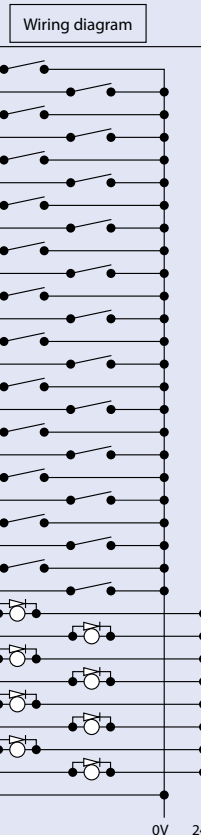
Positioner, Product-Type Change Mode

Pin No.	Category	Port No.	Program mode	Functions
1A	P24		24V Input	Connect 24V.
1B		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	Resets minor errors. (Severe errors require a restart.)
4A		021	Position/product Type Input 15	
4B		022	Position/product Type Input 16	
5A		023	Error reset	
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	Input	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	Turns on when an alarm occurs. (Contact B)
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	Turns on when moving to the specified position is completed.
13B		300	Alarm	
14A		301	Ready	
14B		302	Positioning complete	
15A	Output	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.



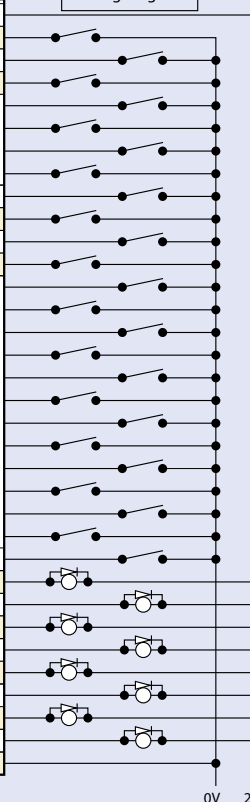
Positioner, 2-axis Independent Mode

Pin No.	Category	Port No.	Program mode	Functions
1A	Input	P24	24V Input	Connect 24V.
1B			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			Position Input 8	
2B			Position Input 9	
3A			Position Input 10	
3B			Position Input 11	Resets minor errors. (Severe errors require a restart.)
4A			Position Input 12	
4B			Position Input 13	
5A			Error reset	
5B			Start 1	Starts moving to selected position on the first axis.
6A			Home return 1	Performs a home return on the 1st axis.
6B			Servo ON 1	Switches over the servo ON/OFF for the 1st axis.
7A			Pause 1	Performs a push motion on 1st axis and resumes motion when turned ON (B contact)
7B			Cancel 1	Stops the motion on the 1st axis when turned OFF. The remaining motion is cancelled. (Contact B)
8A			Start 2	Starts the movement to the selected position number on the 2nd axis.
8B			Home return 2	Performs home return on the 2nd axis.
9A			Servo On 2	Switches between servo ON and OFF for the 2nd axis.
9B			Pause 2	Pauses the motion on 2nd axis when turned OFF, and resumes when turned ON. (Contact B)
10A			Cancel 2	Cancels the movement on the 2nd axis. (Contact B)
10B			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			Position input 2	
11B			Position input 3	
12A			Position input 4	
12B			Position input 5	Turns on when an alarm occurs. (Contact B)
13A			Position input 6	
13B			Alarm	
14A			Ready	
14B	Output	P24	Positioning complete 1	Turns on when the controller starts up normally and is in an operable state.
15A			Home position complete 1	Turns on when the movement to the specified position on the 1st axis is complete.
15B			Servo ON output 1	Turns on when home return on the 1st axis is complete.
16A			Positioning complete 2	Turns on when the 1st axis is in a servo ON state.
16B			Home return complete 2	Turns on when the movement to the specified position on the 2nd axis is complete.
17A			Servo On output 2	Turns on when home return on the 2nd axis is complete.
17B			0V Input	Turns on when the 2nd axis is in a servo ON state.
	N			Connect 0V.

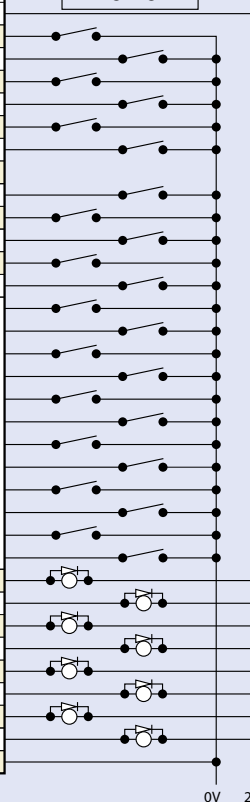


Positioner, Teaching Mode

Wiring diagram



Wiring diagram



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

Table of Specifications

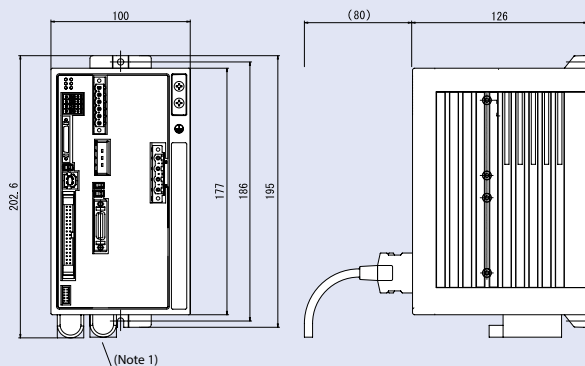
	Item	Specifications	
Basic specifications	Connected actuator	RCS2 / RCS3 / RCS4 series / Single-axis robot / Cartesian robot / Linear servo actuator	
	Input voltage	Single-phase AC100 to AC115V $\pm 10\%$	Single-phase AC200 to AC230V $\pm 10\%$
	Power supply capacity	Maximum 1660VA (for 400W, 2-axis operation)	
	Dielectric strength voltage	DC500V 10M Ω 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/s ² (continuous), 9.8m/s ² (intermittent)	
Control specifications	Number of control axes	1 axis / 2 axes	
	Maximum total output of connected axes	400W	800W
	Position detection method	Incremental encoder / Absolute encoder / Battery-less absolute encoder	
	Speed setting	1 mm/s and up, the maximum depends on the actuator.	
	Acceleration setting	0.01G and up, the maximum depends on the actuator.	
Program specifications	Operating method	Program operation / Positioner operation (switchable)	
	Programming language	Super SEL language	
	Number of programs	128 programs	
	Number of program steps	9999 steps	
	Number of multi-tasking programs	8 programs	
Communication specifications	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	
	Number of I/Os	24 input points / 8 output (NPN or PNP selectable)	
	I/O power	Externally supplied 24VDC $\pm 10\%$	
General specifications	PIO cable	CB-DS-PIO <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> (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	
	Protection function	Motor over-current, motor drive temperature check, overload check, encoder open-circuit, soft limit over, system battery error, etc.	
	Ambient operating humidity and temperature	0 to 40°C, 10 to 95% RH (non-condensing)	
	Ambient atmosphere	Free from corrosive gases, In particular, there shall be no significant dust.	
	Protection class	IP20	
	Weight	1.4kg	
	External dimensions	100mm(W)×202.6mm(H)×126mm(D)	

External Dimensions

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

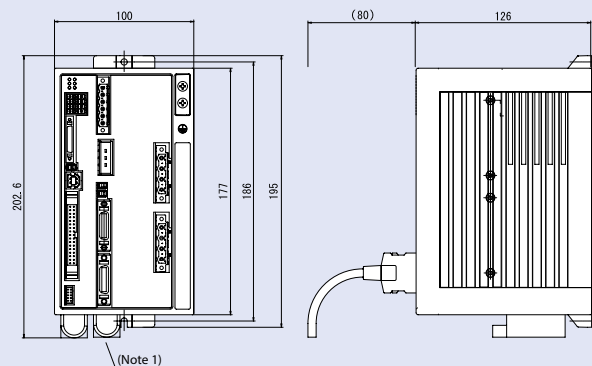


SSEL 1-axis controller



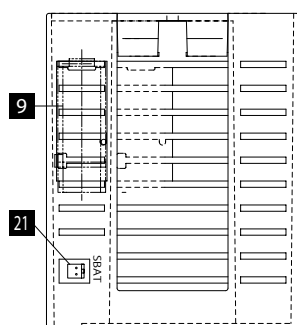
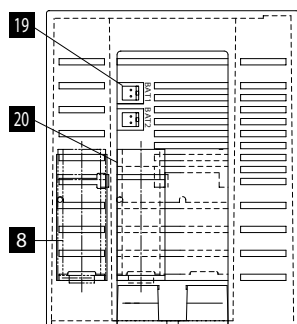
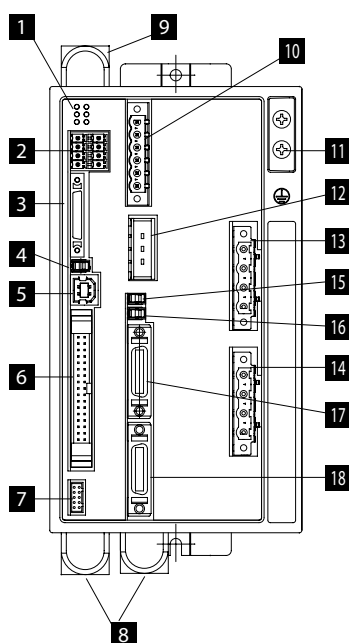
(Note 1) Absolute data back-up battery.
 Not installed with incremental specification.

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.

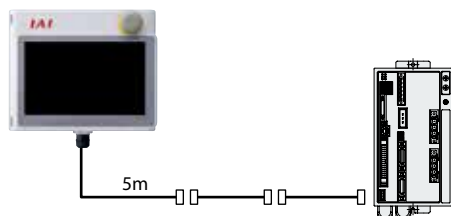
Options

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

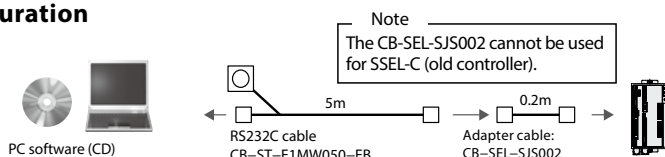
Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operational temperature	0 to 40°C
Ambient operational humidity	20 to 85% RH (non-condensing)
Protection class	IP20
Weight	470g (TB-02 only)

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.

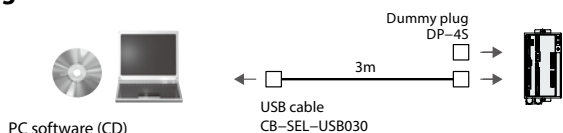
Model IA-101-X-MW-JS (with RS232C cable + adapter cable)

Configuration

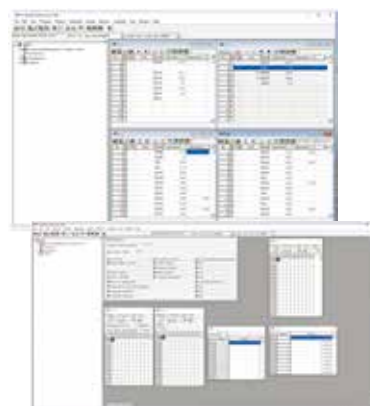


Model IA-101-X-USBS (with USB cable)

Configuration



Compatible with Windows ver.: 7/8/8.1/10



Note
Only versions 7.0.0.0 and later can be used with the SSEL controller.

Regenerative Resistor Unit

Features A unit that converts the regenerative current, generated during the acceleration/ deceleration of the motor, into heat. In the table on the right, check the total power output of the actuator to see if a regenerative 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	

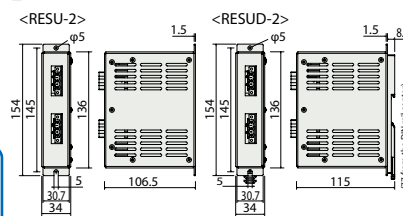
Required number of units

	Horizontal	Vertical
0	~200W	~200W
1	~800W	~600W
2	~800W	~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 7-302)

External dimensions



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

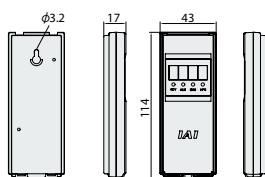
2D CAD

3D CAD

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)

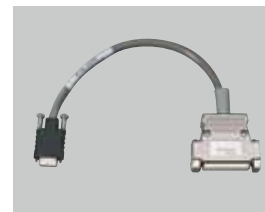


Adapter Cable

- **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. (* Please refer to P1-101 for actuators to be connected.)

■ Table of applicable cables

Product model			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W)	Models other than ② - ④ .	CB-RCC-MA □□□	CB-RCC-MA □□□ -RB	CB-RCS2-PA □□□	CB-X3-PA □□□
②	RCS3(CR)	RT			CB-RCS2-PLA □□□	CB-X2-PLA □□□
③	RCS2	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.

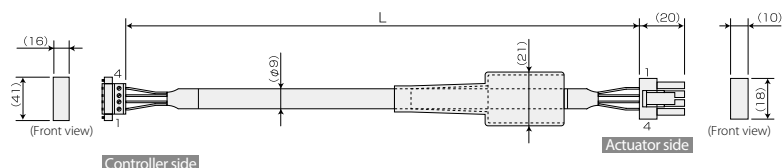
Product model		PIO flat cable
⑭	SSEL-CS	CB-DS-PIO□□□

Spare Parts

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-101 for the actuators to be connected.)

Model CB-RCC-MA /CB-RCC-MA -RB

* Enter the cable length (L) into .
Compatible to a maximum of 30m. Ex.: 080=8m



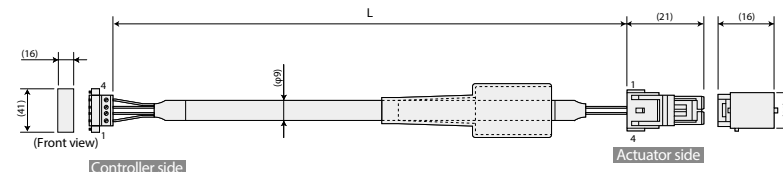
Wire	Color	Signal	No.
Green	PE	1	
Red	U	2	
White	V	3	
Black	W	4	

No.	Signal	Color	Wire
1	U	Red	0.75sq
2	V	White	(crimped)
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.



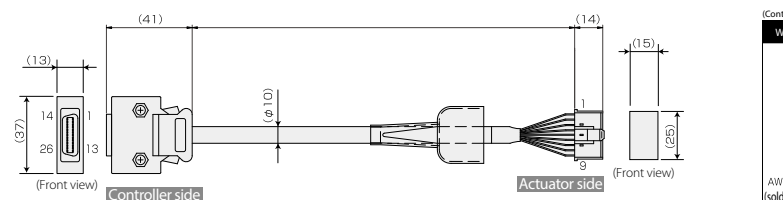
Wire	Color	Signal	No.
Green	PE	1	
Red	U	2	
White	V	3	
Black	W	4	

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

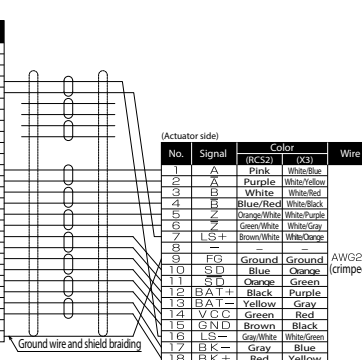
Min. bend radius r=55 mm or larger (when movable type is used)
* The robot cable is the standard.

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



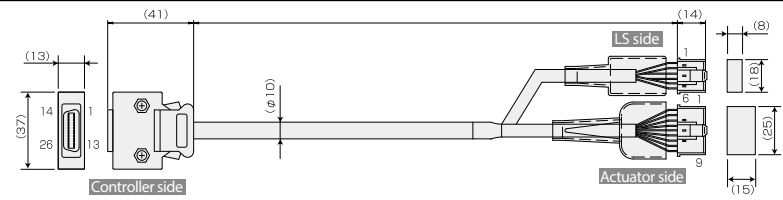
Wire	Color	Signal	No.
(RCS2)	(X3)		
—	—	—	10
—	—	E24V	12
Gray/White	White/Green	OV	13
Brown/White	White/Orange	LS	26
—	—	CREEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	8
—	—	—	18
—	—	—	19
Pink	White/Blue	A+	2
Purple	White/Yellow	A-	3
White	White/Red	B+	4
Blue/Red	White/Black	B-	5
Orange/White	White/Purple	Z+	6
Green/White	White/Gray	Z-	7
Blue	Orange	SRD+	8
Orange	Green	SRD-	9
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



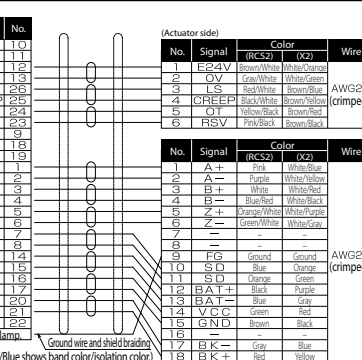
Min. bend radius r=58 mm or larger (when movable type is used)
* Only the robot cable is to be used in a cable track.

Model CB-RCS2-PLA (for RCS2 rotary)/CB-X2-PLA (for NS with LS and RCS2 rotary)

* Enter the cable length (L) into .
Compatible to a maximum of 30m. Ex.: 080=8m



Wire	Color	Signal	No.
(RCS2)	(X2)		
—	—	—	10
—	—	E24V	12
Gray/White	White/Green	OV	13
Black/White	Brown/Blue	LS	26
Yellow/Black	Brown/Red	OT	24
Pink/Black	Brown/Black	RSV	23
—	—	—	8
—	—	—	18
—	—	—	19
Pink	White/Blue	A+	2
Purple	White/Yellow	A-	3
White	White/Red	B+	4
Blue/Red	White/Black	B-	5
Orange/White	White/Purple	Z+	6
Green/White	White/Gray	Z-	7
Blue	Orange	SRD+	8
Orange	Green	SRD-	9
Black	Purple	BAT+	14
Blue	Gray	BAT-	15
Green	Red	VCC	16
Brown	Black	GND	17
Gray	Blue	BKR+	20
Red	Yellow	BKR-	21
—	—	—	22

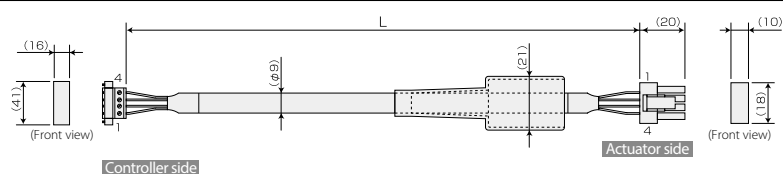


Min. bend radius r=58 mm or larger (when movable type is used)
* Only the robot cable is to be used in a cable track.

* The above shows a wiring diagram for the encoder robot cable. For the encoder cable, see CB-RCS2-PLA in P 7-201.

Model CB-X-MA

* Enter the cable length (L) into .
Compatible to a maximum of 30m. Ex.: 080=8m



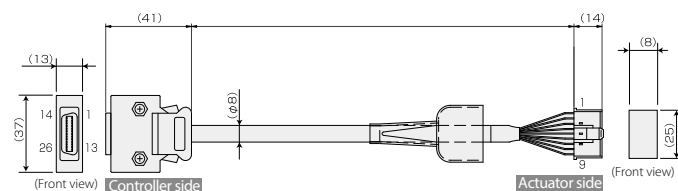
Wire	Color	Signal	No.
Green	PE	1	
Red	U	2	
White	V	3	
Black	W	4	

No.	Signal	Color	Wire
1	U	Red	0.75sq
2	V	White	(crimped)
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.

Wire	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CHREEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	2
—	—	A-	3
—	—	B+	4
—	—	B-	5
—	—	Z+	6
—	—	Z-	7
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

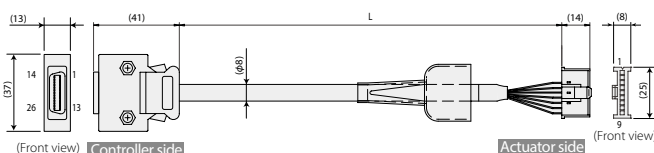
The shield is connected to the hood by a clamp.

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	

Ground wire and shield braiding

Model **CB-X1-PA** -AWG24

* Specify the cable length in .
Maximum length is 30m. Ex: 210=21m



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

* Robot cable is the standard.

Wire	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CHREEP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	2
—	—	A-	3
—	—	B+	4
—	—	B-	5
—	—	Z+	6
—	—	Z-	7
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

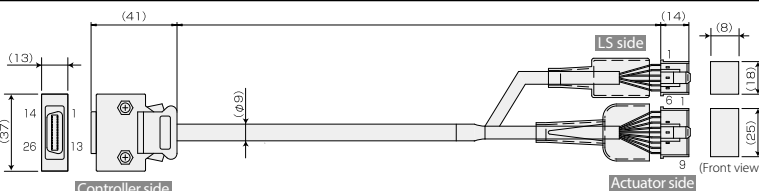
The shield is connected to the hood by a clamp.

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	

Ground wire and shield braiding

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.

Wire	Color	Signal	No.
—	—	—	10
—	—	—	11
White/Blue	E24V	12	
White/Yellow	OV	13	
White/Red	LS	26	
White/Black	CHREEP	25	
White/Purple	OT	24	
White/Gray	RSV	23	
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	2
—	—	A-	3
—	—	B+	4
—	—	B-	5
—	—	Z+	6
—	—	Z-	7
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

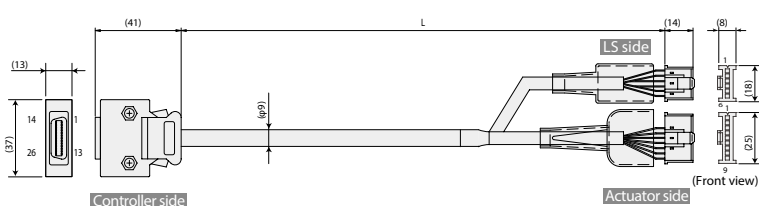
The shield is connected to the hood by a clamp.

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	

Ground wire and shield braiding

Model **CB-X1-PLA** -AWG24

* Specify the cable length in .
Maximum length is 30m. Ex: 210=21m



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

* Robot cable is the standard.

Wire	Color	Signal	No.
—	—	—	10
—	—	—	11
White/Blue	E24V	12	
White/Yellow	OV	13	
White/Red	LS	26	
White/Black	CHREEP	25	
White/Purple	OT	24	
White/Gray	RSV	23	
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	2
—	—	A-	3
—	—	B+	4
—	—	B-	5
—	—	Z+	6
—	—	Z-	7
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

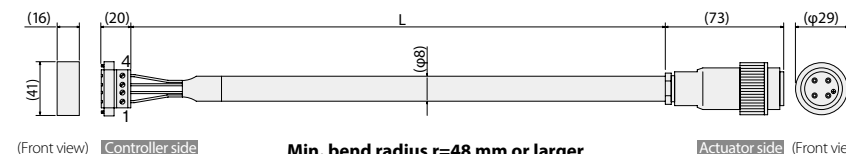
The shield is connected to the hood by a clamp.

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	Ground	
8	BK-	Blue	
9	BK+	Yellow	

Ground wire and shield braiding

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)

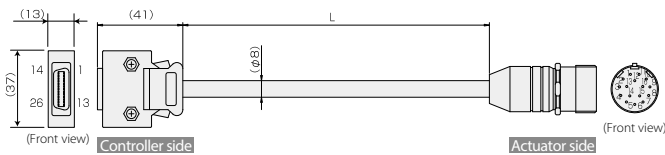
Wire	Signal	No.
PE	1	
U	2	
V	3	
W	4	

Plug connector
99-4222-00-04(BINDER)

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

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.

Wire	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	E24V	12
—	—	OV	13
—	—	LS	26
—	—	CHFFP	25
—	—	OT	24
—	—	RSV	23
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	1
—	—	A-	2
—	—	B+	3
—	—	B-	4
—	—	Z+	5
—	—	Z-	6
—	—	SRD+	7
—	—	SRD-	8
Green	—	—	—
Purple	BAT+	14	—
Gray	BAT-	15	—
Red	VCC	16	—
Black	GND	17	—
Blue	BKR-	20	—
Yellow	BKR+	21	—
—	—	—	22

No.	Signal	Color	Wire
1	SD	Orange	—
2	SD	Green	—
3	—	—	—
4	—	—	—
5	—	—	—
6	—	—	—
7	—	—	—
8	—	—	—
9	—	—	—
10	VCC	Red	—
11	GND	Black	—
12	BAT+	Purple	—
13	BAT-	Gray	—
14	—	—	—
15	BK-	Blue	—
16	BK+	Yellow	—

The shield is connected to the hood by a clamp.

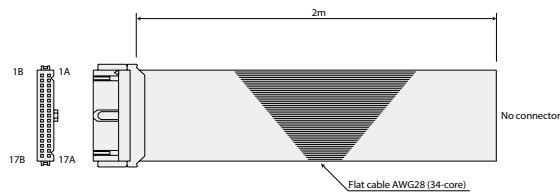
Ground wire and shield braiding

(Wire color of White/Blue shows band color/isolation color.)

The shield is connected to the hood by a clamp.

Model **CB-DS-PIO**

* Specify the cable length in .
Maximum length is 10m. Ex.: 080=8m



No.	Color	Wire	No.	Color	Wire
1A	Brown 1	—	9B	Gray 2	—
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

Controller

SSEL

MSEL

Program Controller
for RCP6/RCP5/RCP4/RCP3/RCP2/IXP
Wrist Unit WU

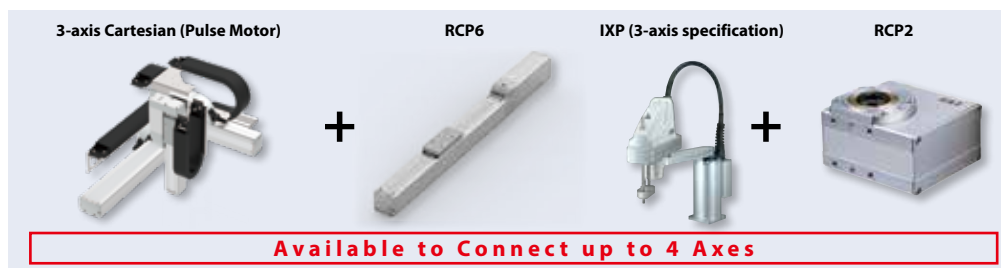


Features

1 Control Maximum of 4 Axes Available with Pulse Motor Mounted ROBO Cylinder

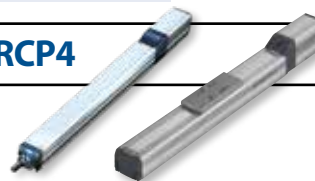
Actuators with pulse motor in the past were able to control only up to two axes with one program controller. By using MSEL, four axes will be available for control. It is also available for interpolation operations, which enhances the ways of use.

Examples of Combinations



2 Available to Connect ROBO Cylinders RCP6, RCP5 and RCP4

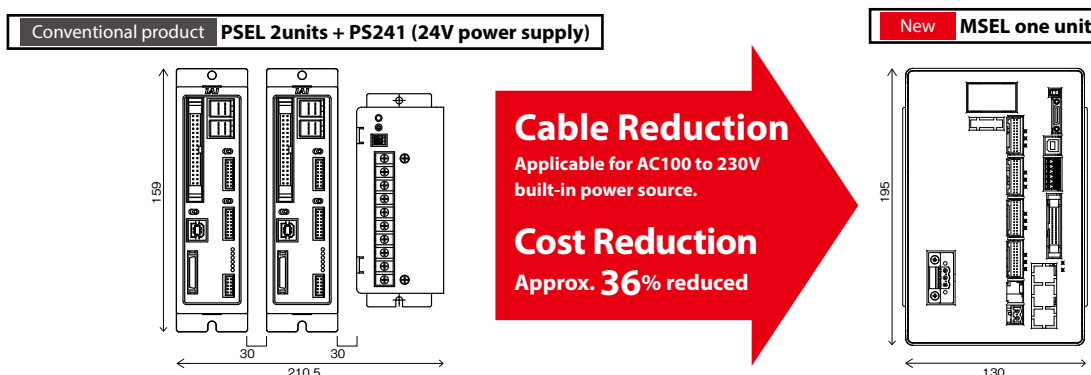
By applying to PowerCON, it is now possible to perform interpolation operations with ROBO Cylinders RCP6, RCP5 and RCP4, which are applicable for high-output driver, but were not feasible with the program controller PSEL in the past.



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




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 — — — — — — — — — — — — **4** — —

Series Type Number of axes (Specs for 1st axis) (Specs for axis 2 to 4) Standard I/O Expansion I/O I/O cable length Power voltage Simple absolute unit Mounting specification

PC	Standard type										
PG	Safety category compliant type										

1	1-axis										
2	2-axis										
3	3-axis										
4	4-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.

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.

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.

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

Blank	With absolute battery box										
ABB	Without absolute battery box										
Blank	Battery-less or Incremental										

* Make sure to select ABB / ABBN when simple absolute type "SA" is selected.


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.

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 ¹¹

*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

PCF 56SP/60P/86P motor type

PGF Safety category compliant 56SP/60P/86P motor type

1	1-axis
2	2-axis
3	3-axis
4	4-axis

(Ex) 20P: 20□ pulse motor compatible

Motor

Option

B Brake

WAI Battery-less absolute Incremental

SA Simple absolute specification

* The simple absolute cannot be selected when connecting 56SP, 60P and 86P actuators.

Motor

Encoder

Option

B Brake

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.

Standard I/O

NP	NPN
PN	PNP

B Brake

WAI Battery-less absolute Incremental

SA Simple absolute specification

Expansion I/O

NP	NPN
PN	PNP

B Brake

WAI Battery-less absolute Incremental

SA Simple absolute specification

I/O cable length

4 AC100~230

Blank Screw fixation

DN DIN rail mount

56SP 56□

60P 60□

86P 86□

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.

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.

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

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.

0 No cable

2 2m (standard)

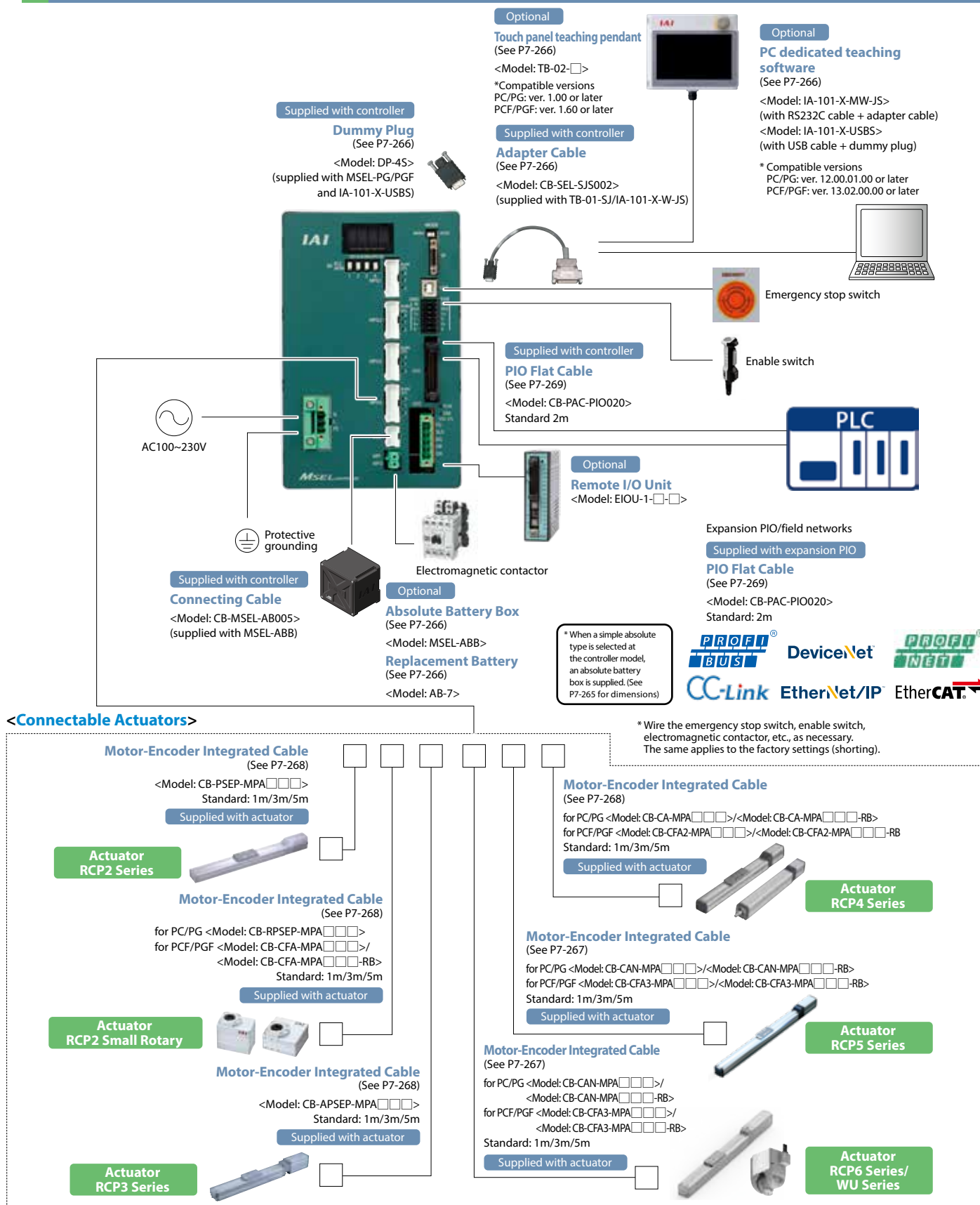
3 3m

5 5m

NOTE

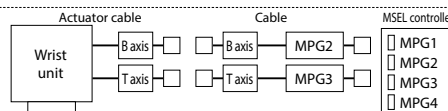
One WU can be connected to one MSEL.

System Configuration




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.

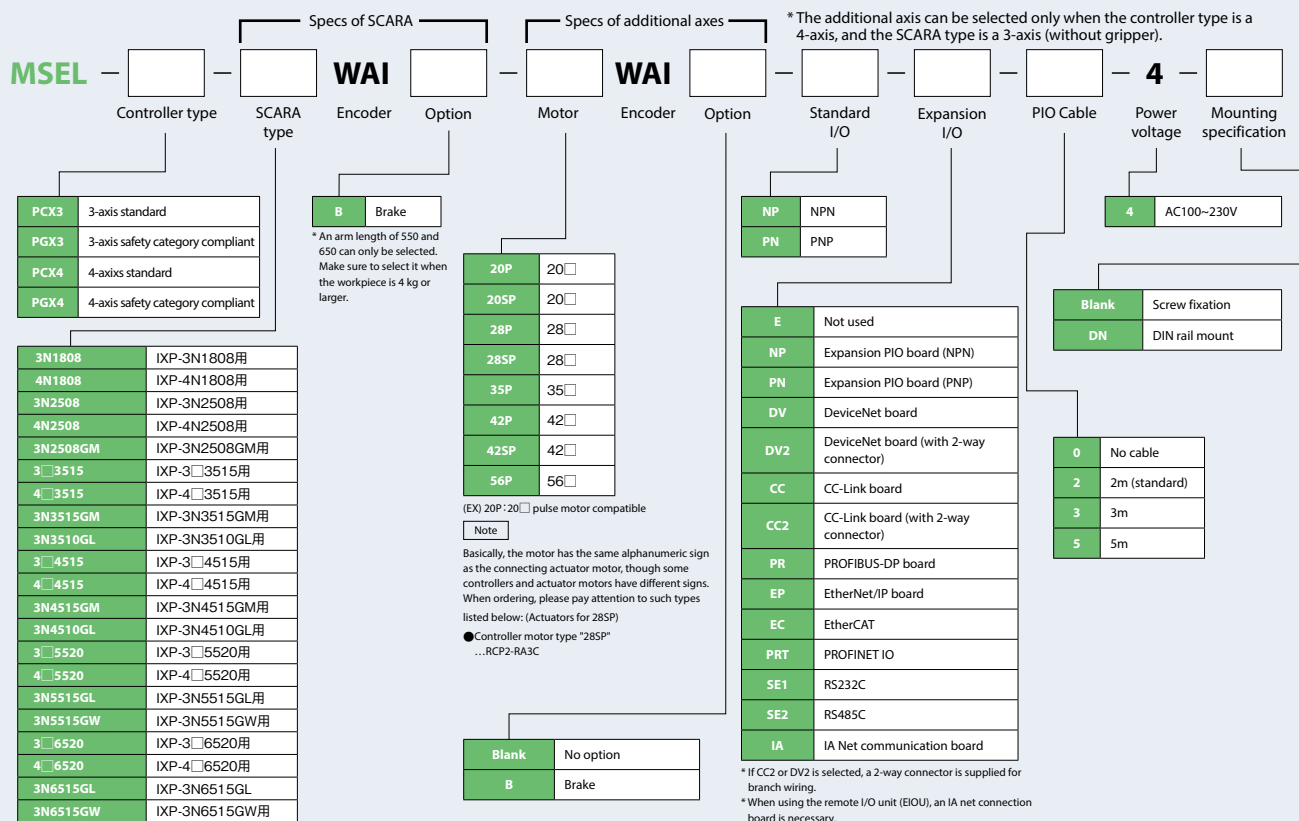


For IXP (PowerCON SCARA)

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



* The signs below are specified in the □:

N: Standard specification

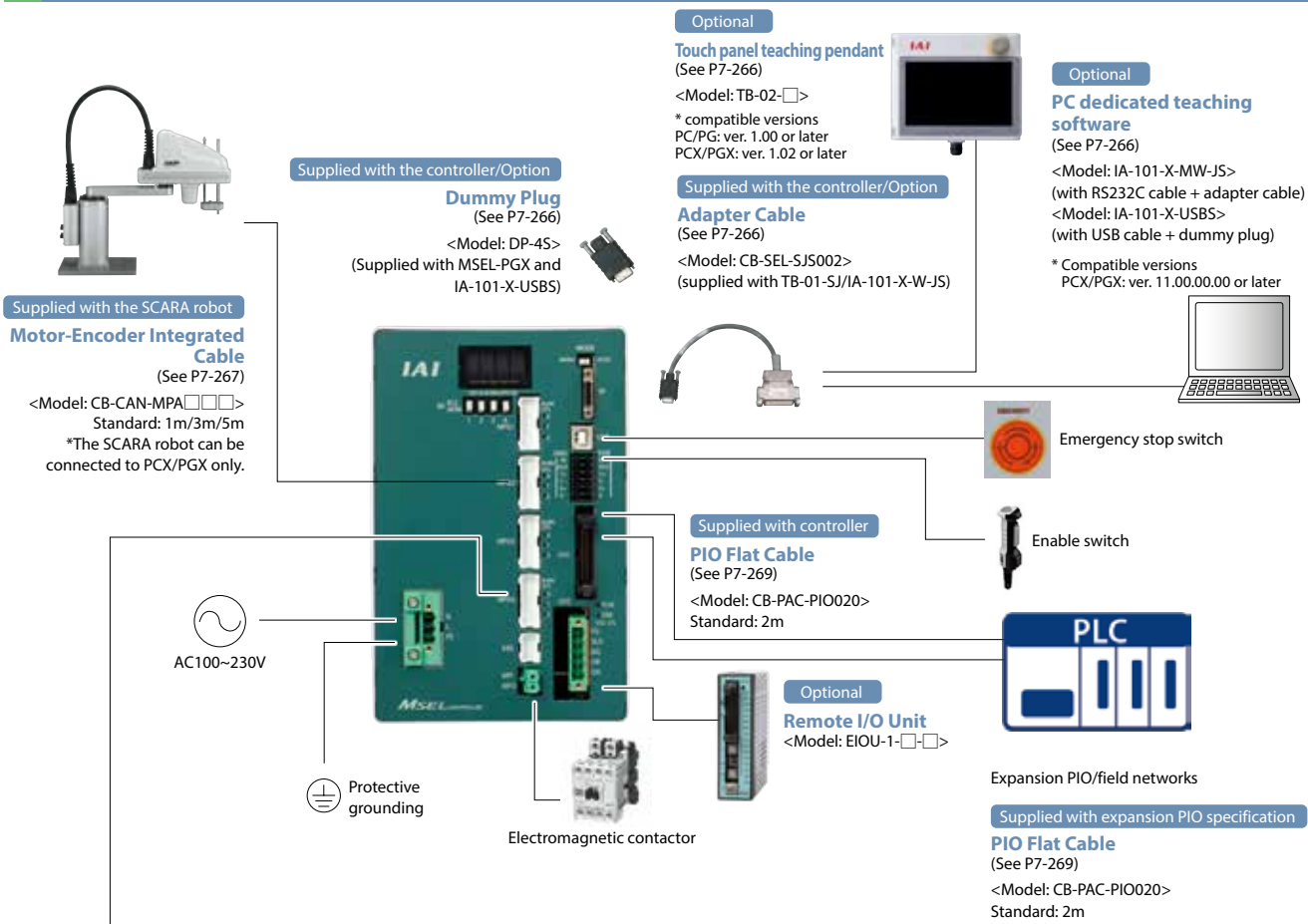
C: Clean specification

W: Dust- & splash-proof

* If CC2 or DV2 is selected, a 2-way connector is supplied for branch wiring.

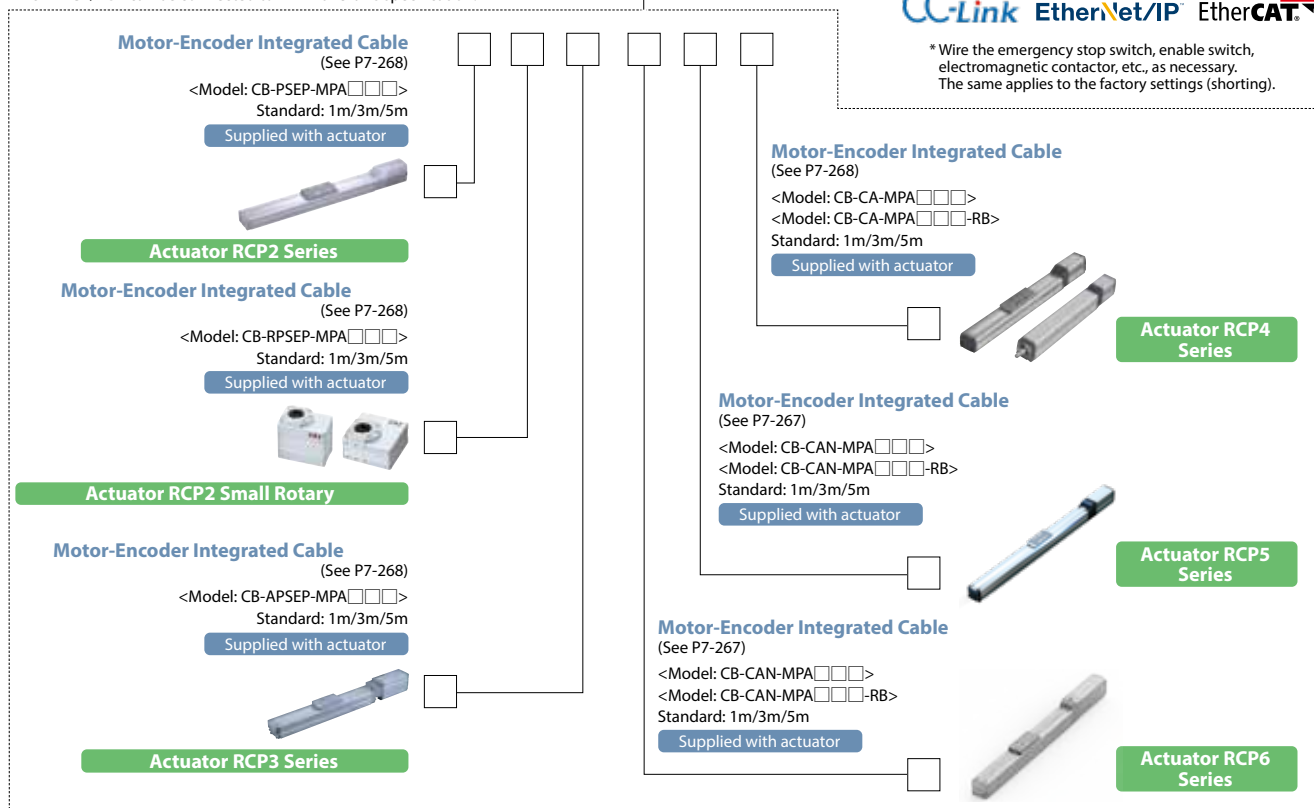
* When using the remote I/O unit (EIOU), an IA net connection board is necessary.

System Configuration



Compatible Actuators

* MSEL-PCX/PGX can be connected to IXP with 3-axis specification.



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 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℃
Operating humidity range			85% RH or lower (no condensing)
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℃/AC ON/OFF no cycling of power)
Air cooling method			Forced air cooling
External dimensions			130 mm wide x 195 mm high x 125 mm deep
Mass			Approx. 1400g

(Note 1) The total load current shall be 400mA for every eight points from standard I/O No. 316. (The maximum current per points shall be 100mA.)

PIO Signal Chart

Standard PIO connector, Expansion PIO connector, Pin layouts

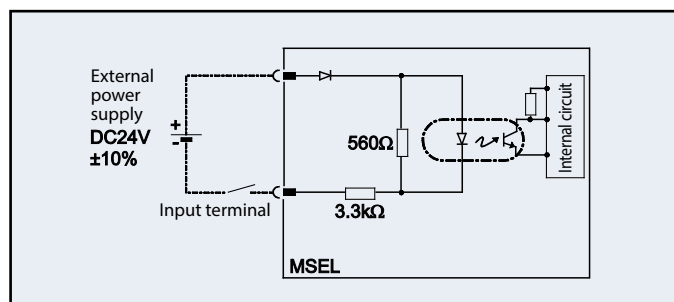
Pin No.	Category	Assignment	Pin No.	Category	Assignment
1A	24V	P24	1B	Output	OUT0
2A	24V	P24	2B		OUT1
3A	—	—	3B		OUT2
4A	—	—	4B		OUT3
5A	Input	IN0	5B		OUT4
6A		IN1	6B		OUT5
7A		IN2	7B		OUT6
8A		IN3	8B		OUT7
9A		IN4	9B		OUT8
10A		IN5	10B		OUT9
11A		IN6	11B		OUT10
12A		IN7	12B		OUT11
13A		IN8	13B		OUT12
14A		IN9	14B		OUT13
15A		IN10	15B		OUT14
16A		IN11	16B		OUT15
17A		IN12	17B	—	—
18A		IN13	18B	—	—
19A		IN14	19B	0V	N
20A		IN15	20B	0V	N

Internal Circuits for Standard I/O (NPN Specifications)

[Input Section] External input specifications (NPN specifications)

Item	Specifications
Input voltage	24VDC $\pm 10\%$
Input current	7mA / circuit
On/Off voltage	On voltage... Min. 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.

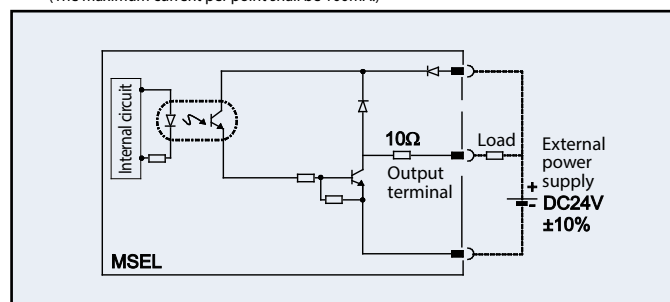


* For the standard IO (PNP specifications), refer to the operation manual.

[Output Section] External output specifications (NPN specifications)

Item	Specifications	Use
Load voltage	24VDC $\pm 10\%$	TD62084 (or equivalent)
Maximum load current	100mA / point, 400mA/8 points (Note)	
Leak current	Leak current... max. 0.1 mA/point	
Insulation method	Photocoupler insulation	

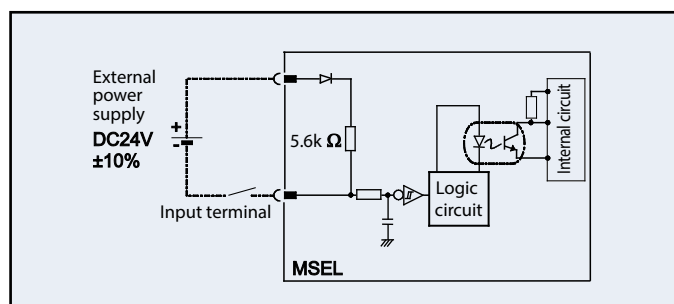
* The port numbers in the circuit diagram below represent the factory-set port numbers.
 Note: The total load current shall be 400 mA for every eight points from standard I/O No. 316.
 (The maximum current per point shall be 100mA.)



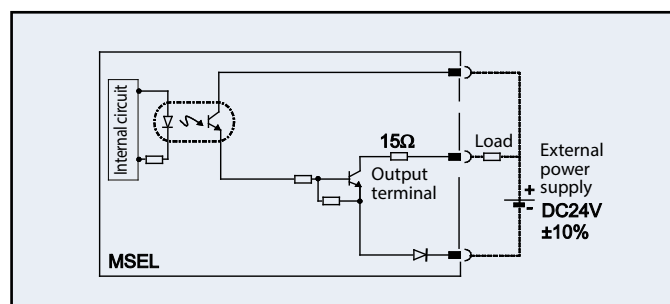
Internal Circuits for Standard I/Os (NPN Specifications)

[Input Section] External input specifications

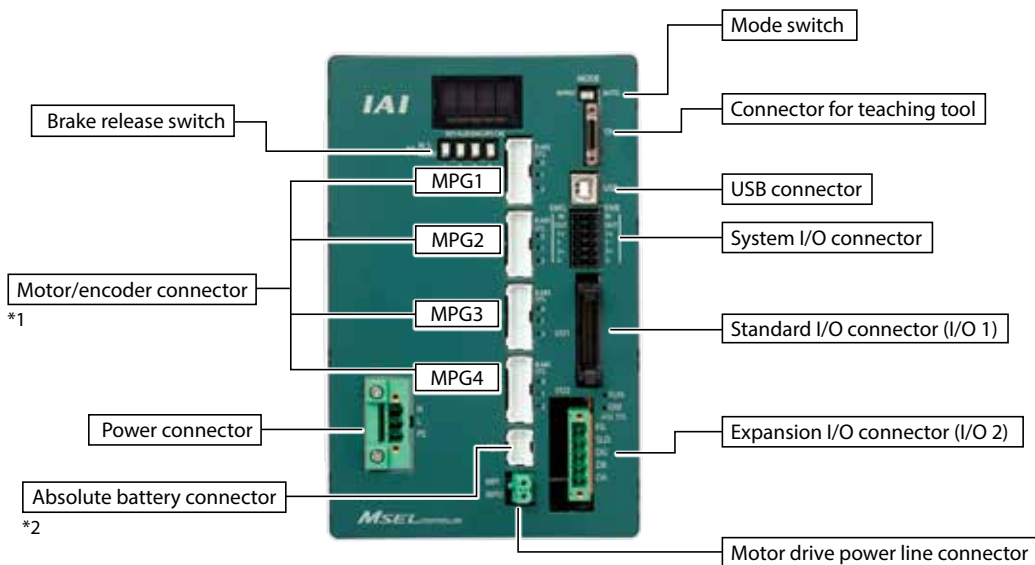
Item	Specifications
Number of input points	16 points
Input voltage	24VDC $\pm 10\%$
Input current	4mA / circuit
On/Off voltage	On voltage... Min. DC 18V (3.5mA) Off voltage... Max. DC 6V (1mA)
Insulation method	Photocoupler insulation

**[Output Section]** External output specifications

Item	Specifications
Number of output points	16 points
Rated load current	24VDC $\pm 10\%$
Maximum current	50mA / circuit
Insulation method	Photocoupler insulation



Name of Each Part



*1: Do not connect a wrong motor to the MPG1, MPG2, MPG3 or MPG4 connectors. It may cause malfunction or failure.
 *2: Not available for MSEL-PCX/PGX.

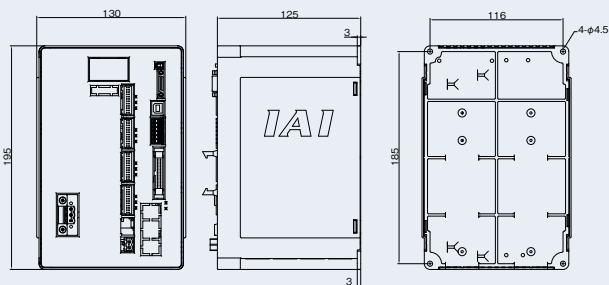
External Dimensions

Controller

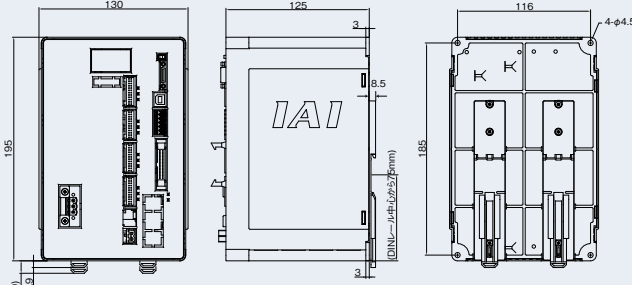
CAD drawings can be downloaded from our website.
www.intelligentactuator.com



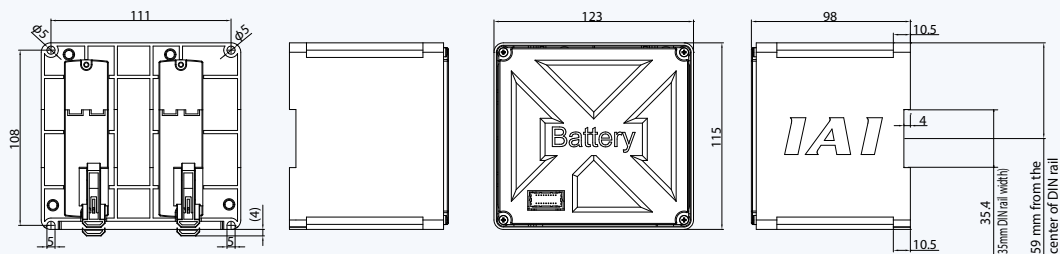
Screw fixing specification



DIN rail mounting specification



Absolute Battery Box



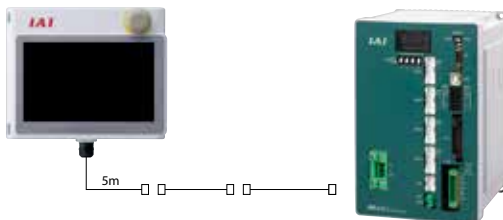
Options

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°C
Ambient operating humidity	20~85%RH (No-condensing)
Protective structure	IP20
Weight	470g (TB-02 unit only)

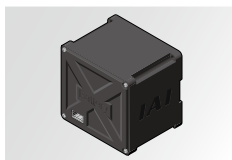
Absolute Battery Box

Outline If the absolute position encoder specification is selected with code ABB, the absolute battery box is included with the controller. However, if the battery box is ordered as a separate unit, it does not include the battery. Purchase the battery separately if needed (model: AB-7).

Model MSEL-ABB (battery not included)

Exterior dimensions See P7-265

* The cable to connect the absolute battery box and MSEL (Model CB-MSEL-AB005) are supplied with the absolute battery box. Simple absolute type (Model: ABB) can be selected only for the MSEL-PC/PG/PCF/PGF.



Dummy Plug

Features This plug is required for the safety category compliant specification (MSEL-PG/PGX/PGF) and when the MSEL is operated using a USB cable. (Supplied with MSEL-PG/PGF type and PC dedicated teaching software IA-101-X-USBS.)

Model number DP-4S



Adapter Cable

Features Converts the D sub 25 pin connector of the touch panel teaching pendant or RS232C cable to MSEL teaching connector. (Comes with TB-01-SJ and IA-101-X-MW-JS.)

Model number CB-SEL-SJS002



Replacement Battery

Features The replacement battery for the absolute battery box.

Model AB-7

* Same quantity of absolute battery units is required as the number of axes.

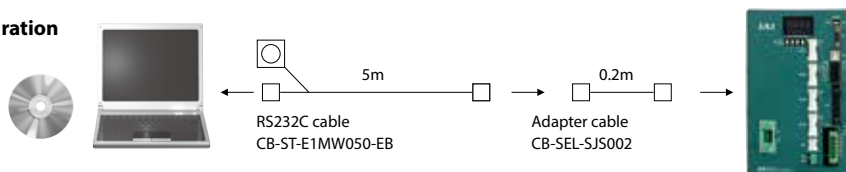


PC dedicated teaching software

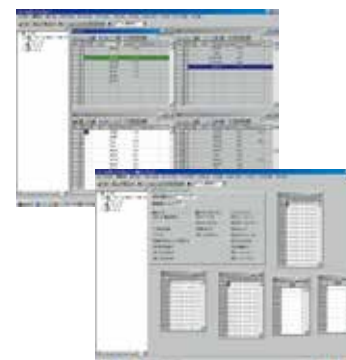
Features The startup support software provides program/position input, test operation and monitoring functions, among others. With its enhanced functions required for debugging, this software helps shorten the startup time.

Model number IA-101-X-MW-JS (with RS232C cable + Connector adapter cable)

Configuration



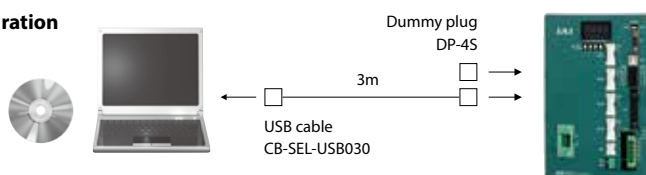
Compatible Windows: 7/8.1/10



The MSEL-PC/PG are supported by ver. 12.00.01.00 or later.

Model number IA-101-X-USBS (with USB cable + dummy plug)

Configuration



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

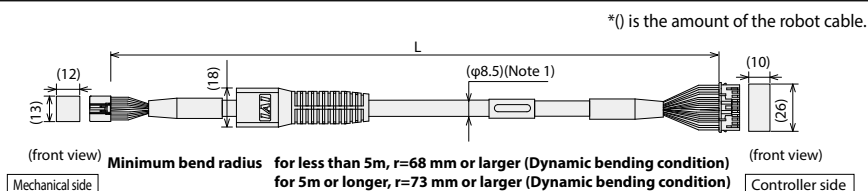
When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-253 for the actuators to be connected.)

■ Table of Applicable Cables

Product Model			Motor-Encoder Integrated Cable	Motor-Encoder Integrated Cable
①	RCP6 RCP6CR RCP6W	SA8/WSA16 RA8/RAA8 WRA16	CB-CFA3-MPA□□□	CB-CFA3-MPA□□□-RB
②		Models other than the above	CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
③	RCP5 RCP5CR RCP5W	RA8/RA10 RA7C High thrust type	CB-CFA3-MPA□□□	CB-CFA3-MPA□□□-RB
④		Models other than the above	CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
⑤	RCP4 RCP4CR RCP4W	SA3/RA3 RCP4 Gripper RCP4 Stopper cylinder	CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
⑥		Models other than the above	CB-CA-MPA□□□(MSEL-PC/PG用) CB-CFA2-MPA□□□(MSEL-PCF/PGF用)	CB-CA-MPA□□□-RB(MSEL-PC/PG用) CB-CFA2-MPA□□□-RB(MSEL-PCF/PGF用)
⑦	RCP3		—	CB-APSEP-MPA□□□
⑧	RCP2	RTBS/RTBSL RTCS/RTCSL	—	CB-RPSEP-MPA□□□
⑨	RCP2CR RCP2W	GRS/GRM GR3SS/GR3SM RT8	CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
⑩	RCP2 RCP2CR RCP2W	GRSS/GRSL/GRST GRHM/GRHB SRA4R/SRG54R 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□□□

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m



* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.
* Only the robot cable is to be used in a cable rack.

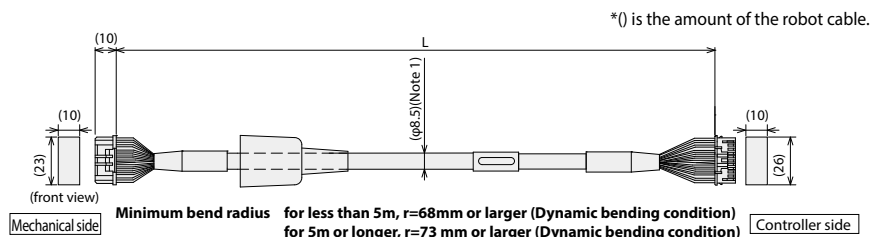
(Note 1) If the cable is 5m or longer, $\Phi 9.1$ cable diameter applies for a non-robot cable and $\Phi 10$ for a robot cable.

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

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



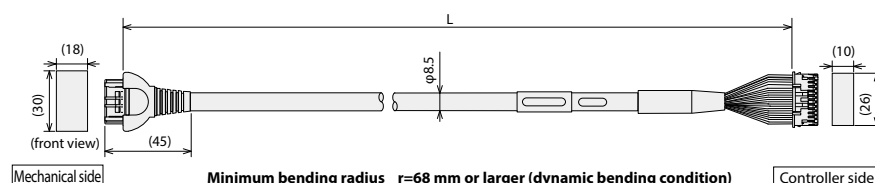
* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.
* Only the robot cable is to be used in a cable rack.

(Note 1) If the cable is 5m or longer, $\Phi 9.1$ cable diameter applies for a non-robot cable and $\Phi 10$ for a robot cable.

Mechanical side 1-1827863-1 (AMP)	Controller side PADP-24V-1-S (JST)
Pin No. Signal	Pin No. Signal
A1 ϕA	1 ϕA
B1 VMM	2 VMM
A2 ϕA	3 ϕA
B2 ϕB	4 VMM
A3 VMM	5 ϕB
B3 ϕB	6 VMM
A4 LS+	7 LS+
B4 LS-	8 LS-
A5 BK+	9 BK+
B5 BK-	10 BK-
A9 LS GND	20 LS GND
B9 VPS	18 VPS
A10 VCC	17 VCC
B10 GND	19 GND
A11 FG	21 FG
B11 FG	22 FG
	23 FG
	24 FG

Model **CB-APSEP-MPA**

* Enter the cable length (L) into . Compatible to a maximum of 20m.
Ex.: 080=8m

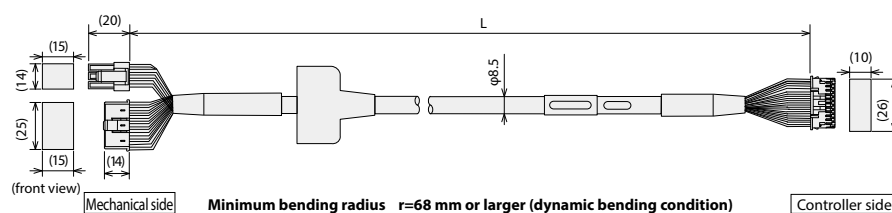


Mechanical side Terminal No.	(PCON)(ACON)	Controller side Terminal No.
A1 [ϕA]U		1
B1 [VMM](V)		2
A2 [ϕA]W		3
B2 [ϕB](-)		4
A3 [VMM](+)		5
B3 [ϕB](-)		6
A4 [LS+](BK+)		7
B4 [LS-](BK-)		8
A5 [(-)](A+)		9
B5 [(-)](A-)		10
A6 [(-)](B+)		11
B6 [(-)](B-)		12
A7 [(-)](Z+)		13
B7 [(-)](Z-)		14
A8 [(-)](Z+)		15
B8 [(-)](Z-)		16
A9 [BK+](LS+)		17
B9 [BK-](LS-)		18
A10 GNDLS		19
B10 VPS		20
A11 VCC		21
B11 GND		22
	Shield (FG)(FG)	23
	NC	24
	NC	25

Model **CB-PSEP-MPA**

* The robot cable is standard.

* Enter the cable length (L) into . Compatible to a maximum of 20m.
Ex.: 080=8m

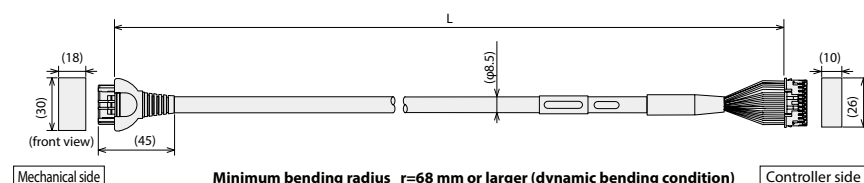


Mechanical side Terminal No.	Controller side Terminal No.
1 [ϕA]	1
2 [VMM]	2
3 [ϕB]	3
4 [VMM]	4
5 [ϕA]	5
6 [ϕB]	6
7 [BK+]	7
8 [BK-]	8
9 NC	9
10 NC	10
11 NC	11
12 NC	12
13 [LS+]	13
14 [LS-]	14
15 [A+]	15
16 [A-]	16
17 [B+]	17
18 [B-]	18
19 [VCC]	19
20 [VPS]	20
21 [GND]	21
22 [Spare]	22
23 NC	23
24 NC	24
25 NC	25
26 NC	26
27 NC	27
28 NC	28
29 NC	29
30 NC	30
31 NC	31
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91 NC	91
92 NC	92
93 NC	93
94 NC	94
95 NC	95
96 NC	96
97 NC	97
98 NC	98
99 NC	99
100 NC	100

Model **CB-RPSEP-MPA**

* The robot cable is standard.

* Enter the cable length (L) into . Compatible to a maximum of 20m.
Ex.: 080=8m



Mechanical side Terminal No.	Controller side Terminal No.
A1 [ϕA]	1
B1 [VMM]	2
A2 [ϕA]	3
B2 [ϕB]	4
A3 [VMM]	5
B3 [ϕB]	6
A4 [LS+]	7
B4 [LS-]	8
A5 [A+]	9
B5 [A-]	10
A6 [B+]	11
B6 [B-]	12
A7 [Z+]	13
B7 [Z-]	14
A8 [Z+]	15
B8 [Z-]	16
A9 NC	17
B9 NC	18
A10 [BK+]	19
B10 [BK-]	20
A11 [GNDLS]	21
B11 [VPS]	22
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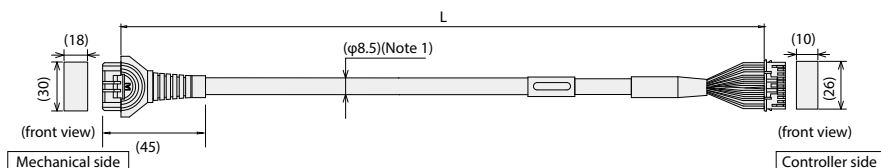
Spare Parts

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below. (* Refer to P1-101 for the actuators to be connected.)

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m

*() is the amount of the robot cable.



Minimum bend radius or less than 3m, $r=68\text{mm}$ or larger (Dynamic bending condition)
for 3m or longer, $r=73\text{mm}$ or larger (Dynamic bending condition)

* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.
* Only the robot cable is to be used in a cable rack.

(Note 1) If the cable is 3m or longer, $\Phi 9.1$ cable diameter applies for a non-robot cable and $\Phi 10$ for a robot cable.

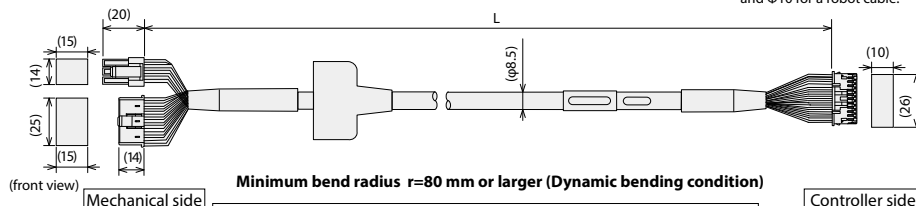
Mechanical side 1-1827863-1 (AMP)		Controller side PADP-24V-1-S (JST)	
Pin No.	Signal	Pin No.	Signal
A1	ϕA	1	ϕA
B1	VMM	2	VMM
A2	ϕA	5	ϕA
B2	ϕB	3	ϕB
A3	VMM	4	VMM
B3	ϕB	6	ϕB
A4	LS+	8	LS+
B4	LS-	8	LS-
A6	SA(mABS)	11	SA(mABS)
B6	SB(mABS)	12	SB(mABS)
A7	A+	13	A+
B7	A-	14	A-
A8	B+	15	B+
B8	B-	16	B-
A5	BK+	9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

Model CB-CFA-MPA□□□/CB-CFA-MPA□□□-RB

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m

*() is the amount of the robot cable.

(Note 1) If the cable is 3m or longer, $\Phi 9.1$ cable diameter applies for a non-robot cable and $\Phi 10$ for a robot cable.



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

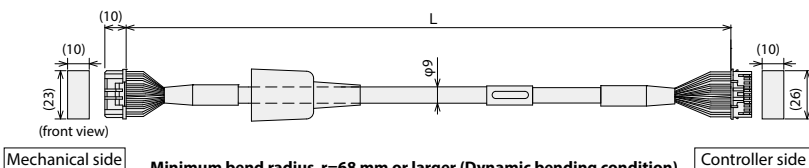
* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.

Mechanical side SLP-06V (JST)		Controller side PADP-24V-1-S (JST)	
Pin No.	Signal	Pin No.	Signal
1	ϕA	1	ϕA
2	VMM	2	VMM
4	ϕB	3	ϕB
5	VMM	4	VMM
3	ϕA	5	ϕA
6	ϕB	6	ϕB
5	NC	11	NC
6	NC	12	NC
13	LS+	7	LS+
14	LS-	8	LS-
1	A+	13	A+
2	A-	14	A-
3	B+	15	B+
4	B-	16	B-
16	BK+	9	BK+
17	BK-	10	BK-
12	VCC	21	VCC
9	GND	19	GND
11	VPS	18	VPS
10	NC	20	NC
18	FG	24	FG
15	NC	17	NC
7	NC	22	NC
8	NC	23	NC

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

* Enter the cable length (L) into □□□. Compatible to a maximum of 20m.
Ex.: 080=8m

*() is the amount of the robot cable.



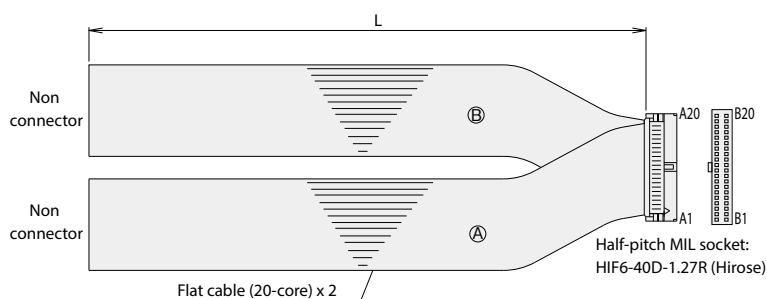
Minimum bend radius $r=68\text{mm}$ or larger (Dynamic bending condition)

* Robot cables are designed for flex-resistance.
Use a robot cable if the cable has to be installed through a cable track.

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

Model CB-PAC-PIO□□□

* Enter the cable length (L) into □□□. Compatible to a maximum of 10m.
Ex.: 080=8m



Flat cable (20-core) x 2

Half-pitch MIL socket:
HIF6-40D-1.27R (Hirose)

HIF6-40D-1.27R			
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	Flat cable (B) (Crimped) AWG28
A17	IN12	Purple-2	
A18	IN13	Gray-2	
A19	IN14	White-2	
A20	IN15	Black-2	
B1	OUT0	Brown-3	
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

Controller

MSEL

X-SEL

Program Controller
for Single-axis robot / Cartesian robot / Linear servo /
RCS4/RCS3/RCS2 series.



(*) Only SA, Q/QCT 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/PCT (*1)	Q/QCT (*1)
External view				
Description	Standard specification	Safety category compliant	Standard specification	Safety category compliant
Maximum number of control axes	8 axes		6 axes	
Number of positions	Maximum 55000 positions (It varies depending on the number of axes.) (See specification table on P7-279.)		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 (*2)	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) The PCT/QCT types are controllers for high-speed axes (CT4).

(*2) Compliance with the Safety Category requires the customer to install a safety circuit externally to the controller.

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



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**

Model

[XSEL-PCT/QCT]

Model for CT4 Series

* This controller is dedicated to the high-speed axis (CT4).

<Cartesian 4-axis + Rotational axis Specification>

XSEL - [] - [] - 400A - 400A - 400A - 60AB - 60AL - [] - [] - [] - [] - [] - 3

Series Type Number of connected axes Specs for 1st axis Specs for axis 2 Specs for axis 3 Specs for axis 4 Specs for axis 5 Specs for axis 6 Network Standard I/O Expansion I/O I/O cable length Power voltage

PCT Standard type
QCT Safety category compatible

400A 400W Absolute
400A 400W Absolute
400A 400W Absolute
60AB 60W Absolute with limit switch
60AL 60W Absolute with limit switch

5 5-axis spec
6 6-axis spec

* When operating CT4 only, it is a 5-axis specification.

Blank Not used
DV DeviceNet
CC CC-Link
PR PROFIBUS-DP
EP EtherNet/IP

* EtherNet/IP is compatible with EtherNet.

12WAI *1 12W 30DWA *1 30W
12A *2 12W 30RA *2 30W
20WAI *1 20W 30RWAI *1 30W
20A *2 20W 30RA *2 30W

(Note) The wattage of the 6th axis is maximum 30W.
(Beyond this wattage, operations are impossible due to the power supply capacity)
*1 Battery-less absolute/Incremental
*2 Absolute

See the [Note] below for motor specs.

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)
S Expansion I/O with base

* 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 is "with expansion I/O base".
When retrofitting the expansion I/O, specify "with expansion I/O board" in the cabinet, and "S" in the slots 2-4.

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

* If the standard I/O and expansion I/O are all E (not used) or S (with expansion I/O base), the I/O cable length is 0 (no cable).

<Cartesian 4-axis + Pick & Rotary Specifications>

XSEL - [] - [] - 400A - 400A - 400A - 60AB - 12APAR - [] - [] - [] - [] - [] - 3

Series Type Number of connected axes Specs for 1st axis Specs for axis 2 Specs for axis 3 Specs for axis 4 Specs for axis 5 Specs for axis 6 Network Standard I/O Expansion I/O I/O cable length Power voltage

PCT Standard type
QCT Safety category compatible

400A 400W Absolute
400A 400W Absolute
400A 400W Absolute
60AB 60W Absolute with limit switch
12APAR 12W Absolute

5 5-axis spec
6 6-axis spec

* When operating CT4 only, it is a 5-axis specification.

Blank Not used
DV DeviceNet
CC CC-Link
PR PROFIBUS-DP
EP EtherNet/IP

* EtherNet/IP is compatible with EtherNet.

12WAI *1 12W 30DA *2 30W
12A *2 12W 30RWAI *1 30W
20WAI *1 20W 30RA *2 30W
20A *2 20W 60WAI *1 60W
30DWA *1 30W 60A *2 60W

(Note) The wattage of the 6th axis is maximum 60W.
(Beyond this wattage, operations are impossible due to the power supply capacity)
*1 Battery-less absolute/Incremental
*2 Absolute

See the [Note] below for motor specs.

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)
S Expansion I/O with base

* 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 is "with expansion I/O base".
When retrofitting the expansion I/O, specify "with expansion I/O board" in the cabinet, and "S" in the slots 2-4.

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

* If the standard I/O and expansion I/O are all E (not used) or S (with expansion I/O base), the I/O cable length is 0 (no cable).

<Cartesian 4-axis Specifications>

XSEL - [] - [] - 400A - 400A - 400A - 60AB - [] - [] - [] - [] - [] - 3

Series Type Number of connected axes Specs for 1st axis Specs for axis 2 Specs for axis 3 Specs for axis 4 Specs for axis 5 Specs for axis 6 Network Standard I/O Expansion I/O I/O cable length Power voltage

PCT Standard type
QCT Safety category compatible

400A 400W Absolute
400A 400W Absolute
400A 400W Absolute
60AB 60W Absolute with limit switch

4 4-axis spec
5 5-axis spec
6 6-axis spec

* When operating CT4 only, it is a 5-axis specification.

Blank Not used
DV DeviceNet
CC CC-Link
PR PROFIBUS-DP
EP EtherNet/IP

* EtherNet/IP is compatible with EtherNet.

12WAI *1 12W 30WAI *1 30W
12A *2 12W 30RA *2 30W
20WAI *1 20W 60WAI *1 60W
20A *2 20W 60A *2 60W
30DWA *1 30W 100WAI *1 100W
30DA *2 30W 100A *2 100W

(Note) The wattage of the 6th axis is maximum 60W.
(Beyond this wattage, operations are impossible due to the power supply capacity)
*1 Battery-less absolute/Incremental
*2 Absolute

See the [Note] below for motor specs.

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)
S Expansion I/O with base

* 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 cabinet is "with expansion I/O base".
When retrofitting the expansion I/O, specify "with expansion I/O board" in the cabinet, and "S" in the slots 2-4.

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

* 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 cabinet is "with expansion I/O base".
When retrofitting the expansion I/O, specify "with expansion I/O board" in the cabinet, and "S" in the slots 2-4.

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"...DD-LT18, DD-T18, DDCR-LT18, DDCR-T18.

System Configuration

XSEL-RA

Optional

PC dedicated teaching software

(See P7-288) *P=PC side, C=Controller side

P RS232-C RS232

<Model: IA-101-X-MW>

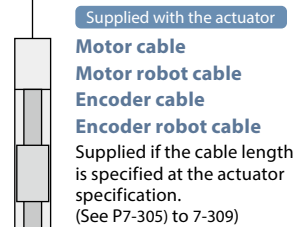
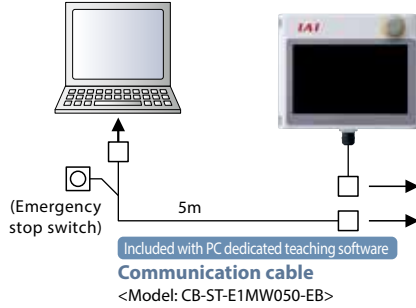
P USB-C RS232

<Model: IA-101-X-USBMW>

P USB-C USB/Ethernet

<Model: IA-101-N>

Compatible with Ver. 13.00.00.00 or later



Connectable Actuator
<Refer to the product page of each actuator>

Optional
Touch panel teaching pendant
(See P7-288)
<Model: TB-02-□>

Supplied with the controller
Dummy Plug
(See P7-287)
<Model: DP-2>

Supplied with the controller
PIO Cable
(See P7-309)
<Model: CB-X-PIO020>
Standard: 2m
(Supplied with the PIO controller)

Extended Motion
(Cable is supplied by the customer)

PCON/ACON/
SCON-CB
MCON
(MECHATROLINK Link III specification)

Motor power supply
3-phase/single-phase
AC200V/230V

Control power supply
Single-phase
AC200V/230V

Brake release power
24VDC

Power for I/O
24VDC

* When connecting the power, make sure to mount the following filters or equivalent:

- Noise filter recommended model
3-phase TAC-20-683 (maker: COSEL)
Single-phase NBH-20-432 (maker: COSEL)
- Ring core recommended model
ESD-R-25 (maker: NEC Tokin)
- Clamp filter recommended mode
Control power: ZCAT3035-133 (maker: TDK)
Motor power RFC-H3 (maker: Kitagawa)
- Surge protector recommended model
3-phase RAV-781BXZ-4
Single-phase RAV-781BWZ-2A (maker: Okaya Electric)

Field Network

DeviceNet
CC-Link
PROFIBUS-DP
EtherCAT
EtherNet/IP
EtherNet/IP is compatible with EtherNet

XSEL-SA

Optional

PC Software

(See P7-288) *P=PC side, C=Controller side

P RS232-C RS232

<Model: IA-101-XA-MW>

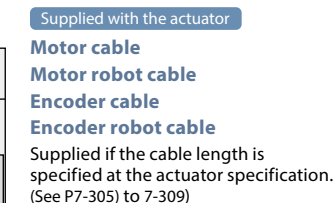
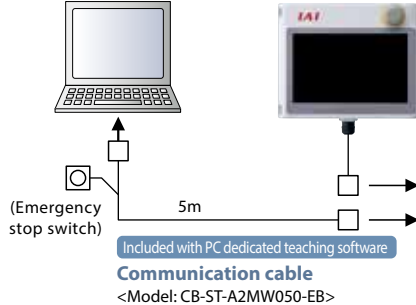
P USB-C RS232

<Model: IA-101-X-USBMW>

P USB-C USB/Ethernet

<Model: IA-101-N>

Compatible with Ver. 13.00.00.00 or later



Connectable Actuator
<Refer to the product page of each actuator>

Optional
Touch panel teaching pendant
(See P7-288)
<Model: TB-02-□>

Supplied with the controller
Dummy Plug
(See P7-287)
<Model: DP-2>

Supplied with the controller
PIO Cable
(See P7-309)
<Model: CB-X-PIO020>
Standard: 2m
(Supplied with the PIO controller)

Extended motion
(Cable is supplied by the customer)

PCON/ACON/
SCON-CB
MCON
(MECHATROLINK III specification)

Motor power supply
3-phase/single-phase
AC200V/230V

Control power supply
Single-phase
AC200V/230V

Brake release power
24VDC

Power for I/O
24VDC

Drive power shut-off circuit
(supplied by customer)

* When connecting the power, make sure to mount the following filters or equivalent:

- Noise filter recommended model
3-phase TAC-20-683 (maker: COSEL)
Single-phase NBH-20-432 (maker: COSEL)
- Ring core recommended model
ESD-R-25 (maker: NEC Tokin)
- Clamp filter recommended mode
Control power: ZCAT3035-133 (maker: TDK)
Motor power RFC-H3 (maker: Kitagawa)
- Surge protector recommended model
3-phase RAV-781BXZ-4
Single-phase RAV-781BWZ-2A (maker: Okaya Electric)

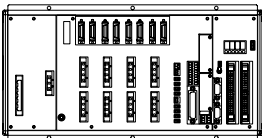
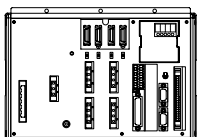
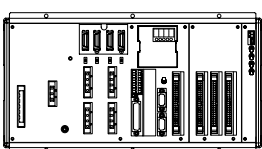
Field network

DeviceNet
CC-Link
PROFIBUS-DP
EtherCAT
EtherNet/IP
EtherNet/IP is compatible with EtherNet

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 PCT type QCT 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)	(not applicable)	E N1 N2 N3 P1 P2 P3	E N1 N2 N3 P1 P2 P3 S	E N1 N2 N3 P1 P2 P3 S	E N1 N2 N3 P1 P2 P3 S

System Configuration

XSEL-P/Q/PCT/QCT

Connectable Actuators

- XSEL-P/Q
(See the product page of each actuator)
- XSEL-PCT/QCT
CT4

* Note that the 5th and 6th axes of XSEL-P/Q/PCT/QCT types are not operable.
LSA Series, RCS2-RA7/SRA7/SRGS7/SRGD7 and the following models' incremental specifications: RCS2-□□5N (small) Series, NS-SXM□/SZM□.

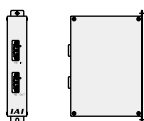
Supplied with the actuator

Motor Cable
Motor Robot cable
Encoder cable
Encoder robot cable

Supplied if the cable length is specified at the actuator specification.
Refer to P1-101 for maintenance cable.

Supplied with the regenerative unit
Regenerative unit cable 1m

Regenerative Unit



Please refer to P7-287 for the necessary number of regenerative units.

External Device

PLC, etc.

Supplied with the controller
I/O flat cable
2m
(See P7-309)

Field Network Connection

- Device Net
 - CC-Link
 - PROFIBUS-DP
 - EtherNet/IP
- EtherNet/IP is compatible with EtherNet

Serial Communication Port
Standard 2ch for RS232

Optional

PC dedicated teaching software for RS232

(See P7-288)
<Model: IA-101-X-MW>
<Model: IA-101-X-USBMW>
(for P/PCT)
<Model: IA-101-XA-MW>
(for Q/QCT)

Optional
Touch panel teaching pendant
(See P7-288)
<Model: TB-02-□>



(Emergency stop switch)
5m

Included with PC dedicated teaching software

Communication cable

<Model: CB-ST-E1MW050-EB> (for P/PCT)
<Model: CB-ST-A2MW050-EB> (for Q/QCT)

Expansion I/O

- PIO board

* The controller enclosure changes when an expansion I/O is attached to the P/Q types.
(Refer to the above "Connectable I/O by Controller Type")

Control Power

Single-phase AC200V

Power Supply for Motor Driving

3-phase AC200V (Q type)

System I/O

- Emergency stop
- Enable
- System ready

Brake I/O
Power supply
24VDC

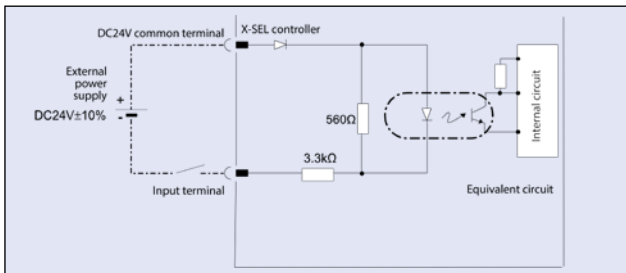
Drive power shut-off circuit
(supplied by customer)

Necessary only for Q type (Not necessary for P type)

I/O Wiring Diagram

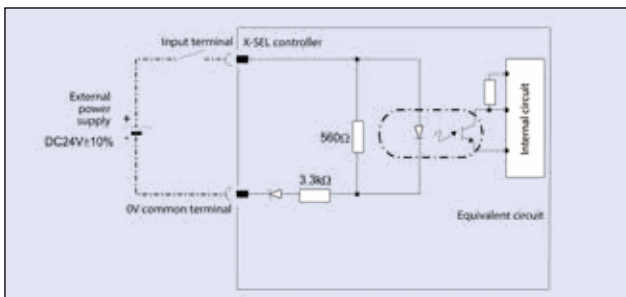
Input Section External input specification (NPN specification)

Item	Specifications
Input voltage	24VDC $\pm 10\%$
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)

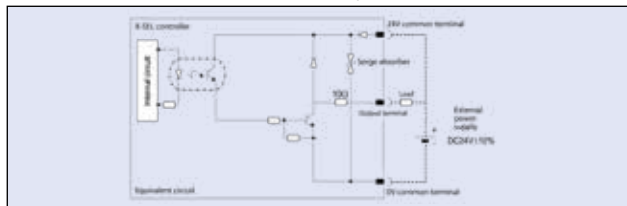
Item	Specifications
Input voltage	24VDC $\pm 10\%$
Input current	7mA / circuit
ON/OFF voltage	ON voltage...min. DC 8V / OFF voltage ... max. DC19V
Isolation method	Photocoupler



Output Section External input specification (NPN specification)

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point 400mA / 8 ports (note)
Leak current	Max. 0.1 mA / point
Isolation method	Photocoupler

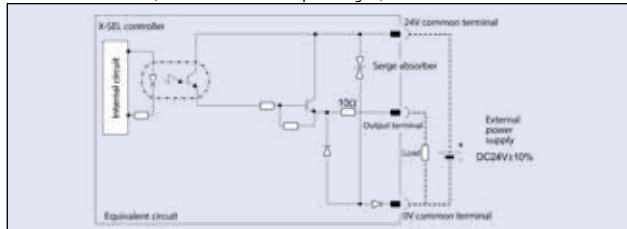
(Note) The maximum total load current for each set of the eight ports from output port No. 300 is 400mA. (The maximum total current output for output port No. 300+n to No. 300+n+7 must be 400mA, where n = 0 or a multiple of eight.)



Output Section External input specification (PNP specification)

Item	Specifications
Load voltage	24VDC
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 input
5		003	General-purpose input
6		004	General-purpose input
7		005	General-purpose input
8		006	General-purpose input
9		007	Select program (PRG No.1)
10		008	Select program (PRG No.2)
11		009	Select program (PRG No.4)
12		010	Select program (PRG No.8)
13		011	Select program (PRG No.10)
14		012	Select program (PRG No.20)
15		013	Select program (PRG No.40)
16		014	General-purpose input
17	Input	015	General-purpose input
18		016	General-purpose input
19		017	General-purpose input
20		018	General-purpose input
21		019	General-purpose input
22		020	General-purpose input
23		021	General-purpose input
24		022	General-purpose input
25		023	General-purpose input
26		024	General-purpose input
27		025	General-purpose input
28		026	General-purpose input
29		027	General-purpose input
30		028	General-purpose input
31		029	General-purpose input
32		030	General-purpose input
33		031	General-purpose input
34		300	Alarm output
35		301	Ready output
36		302	Emergency stop output
37		303	General-purpose output
38		304	General-purpose output
39		305	General-purpose output
40		306	General-purpose output
41		307	General-purpose output
42	Output	308	General-purpose output
43		309	General-purpose output
44		310	General-purpose output
45		311	General-purpose output
46		312	General-purpose output
47		313	General-purpose output
48		314	General-purpose output
49		315	General-purpose output
50		—	0V connect

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

Pin No.	Classification	Standard settings
1		Connect 24V
2		General-purpose input
3		General-purpose input
4		General-purpose input
5		General-purpose input
6		General-purpose input
7		General-purpose input
8		General-purpose input
9		General-purpose input
10		General-purpose input
11		General-purpose input
12		General-purpose input
13		General-purpose input
14		General-purpose input
15		General-purpose input
16		General-purpose input
17	Input	General-purpose input
18		General-purpose input
19		General-purpose input
20		General-purpose input
21		General-purpose input
22		General-purpose input
23		General-purpose input
24		General-purpose input
25		General-purpose input
26		General-purpose input
27		General-purpose input
28		General-purpose input
29		General-purpose input
30		General-purpose input
31		General-purpose input
32		General-purpose input
33		General-purpose input
34		General-purpose output
35		General-purpose output
36		General-purpose output
37		General-purpose output
38		General-purpose output
39		General-purpose output
40		General-purpose output
41		General-purpose output
42	Output	General-purpose output
43		General-purpose output
44		General-purpose output
45		General-purpose output
46		General-purpose output
47		General-purpose output
48		General-purpose output
49		General-purpose output
50		0V connect

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

Pin No.	Classification	Standard settings
1		Connect 24V
2		General-purpose input
3		General-purpose input
4		General-purpose input
5		General-purpose input
6		General-purpose input
7		General-purpose input
8		General-purpose input
9	Input	General-purpose input
10		General-purpose input
11		General-purpose input
12		General-purpose input
13		General-purpose input
14		General-purpose input
15		General-purpose input
16		General-purpose input
17		General-purpose input
18		General-purpose output
19		General-purpose output
20		General-purpose output
21		General-purpose output
22		General-purpose output
23		General-purpose output
24		General-purpose output
25		General-purpose output
26		General-purpose output
27		General-purpose output
28		General-purpose output
29		General-purpose output
30		General-purpose output
31		General-purpose output
32		General-purpose output
33		General-purpose output
34	Output	General-purpose output
35		General-purpose output
36		General-purpose output
37		General-purpose output
38		General-purpose output
39		General-purpose output
40		General-purpose output
41		General-purpose output
42		General-purpose output
43		General-purpose output
44		General-purpose output
45		General-purpose output
46		General-purpose output
47		General-purpose output
48		General-purpose output
49		General-purpose output
50		0V connect

Standard Multi-point I/O Signal Table (when N3 or P3 is selected)

Pin No.	Classification	Port No.	Standard settings
1	—	—	External power supply (24VDC) Pin No.2-25/51-74)
2	Input	000	Program start
3		001	General-purpose input
4		002	General-purpose input
5		003	General-purpose input
6		004	General-purpose input
7		005	General-purpose input
8		006	General-purpose input
9		007	Select program (PRG No.1)
10		008	Select program (PRG No.2)
11		009	Select program (PRG No.4)
12		010	Select program (PRG No.8)
13		011	Select program (PRG No.10)
14		012	Select program (PRG No.20)
15		013	Select program (PRG No.40)
16		014	General-purpose input
17		015	General-purpose input
18		016	General-purpose input
19		017	General-purpose input
20		018	General-purpose input
21		019	General-purpose input
22		020	General-purpose input
23		021	General-purpose input
24		022	General-purpose input
25		023	General-purpose input
26	—	—	External power supply (24VDC) Pin No. 27-50/76-99)
27	Input	024	General-purpose input
28		025	General-purpose input
29		026	General-purpose input
30		027	General-purpose input
31		028	General-purpose input
32		029	General-purpose input
33		030	General-purpose input
34		031	General-purpose input
35		032	General-purpose input
36		033	General-purpose input
37		034	General-purpose input
38		035	General-purpose input
39		036	General-purpose input
40		037	General-purpose input
41		038	General-purpose input
42		039	General-purpose input
43		040	General-purpose input
44		041	General-purpose input
45		042	General-purpose input
46		043	General-purpose input
47		044	General-purpose input
48		045	General-purpose input
49		046	General-purpose input
50		047	General-purpose input
51	Output	300	Alarm output
52		301	Ready output
53		302	Emergency stop output
54		303	General-purpose output
55		304	General-purpose output
56		305	General-purpose output
57		306	General-purpose output
58		307	General-purpose output
59		308	General-purpose output
60		309	General-purpose output
61		310	General-purpose output
62		311	General-purpose output
63		312	General-purpose output
64		313	General-purpose output
65		314	General-purpose output
66		315	General-purpose output
67		316	General-purpose output
68		317	General-purpose output
69		318	General-purpose output
70		319	General-purpose output
71		320	General-purpose output
72		321	General-purpose output
73		322	General-purpose output
74		323	General-purpose output
75	—	—	External power supply (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	—	—	External power supply (24VDC) Pin No. 27-50/76-99)
26	Input	—	General-purpose input
27		—	General-purpose input
28		—	General-purpose input
29		—	General-purpose input
30		—	General-purpose input
31		—	General-purpose input
32		—	General-purpose input
33		—	General-purpose input
34		—	General-purpose input
35		—	General-purpose input
36		—	General-purpose input
37		—	General-purpose input
38		—	General-purpose input
39		—	General-purpose input
40		—	General-purpose input
41		—	General-purpose input
42		—	General-purpose input
43		—	General-purpose input
44		—	General-purpose input
45		—	General-purpose input
46		—	General-purpose input
47		—	General-purpose input
48		—	General-purpose input
49		—	General-purpose input
50		—	General-purpose 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)

Controller

R-unit

RCP6S

MCON

-C

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-CAL

MCON

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

Table of Specifications

■ RA/SA (Safety Category Compliant Type)

Item		Description	
Controller type		RA	SA
Compatible motor output		20W 750W	
Number of control axes		1 to 8 axes	
Maximum connected axes output		[3-phase specification] max. 2400W [Single-phase specification] max. 1600W	
Motor power voltage		[3-phase specification] 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		0 to 40°C, 85%RH or lower (non-condensing). Free from corrosive gases. In particular, there shall be no significant dust.	

* Refer to the operation manual, or contact us for the power supply capacity, etc.

Table of Specifications

■ P/Q (Safety Category Compliant Type)/PCT/QCT (Safety Category Compliant Type)

Item		Description												
Controller type		P/PCT						Q/QCT						
Connecting actuator		Actuator that can be connected only to RCS3/RCS2/IS(P)B/IS(P)A/IS(P)DB/IS(P)DBCR/IS(P)DACR/IF/FS/RS/linear PCT, QCT: CT4												
Compatible motor output (W)		20/30/60/100/150/200/300/400/600/750/1000												
Number of controlled axes		1-axis	2-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
		PCT/QCT	—	—	—	Max 4019VA	Max 4265VA	Max 4271VA	—	—	—	Max 4019VA	Max 4265VA	Max 4271VA
Position detection method		Battery-less absolute encoder/incremental encoder (wiring-saving type) Multi-rotation data backup absolute encoder (wiring-saving type)												
Safety circuit configuration		Redundancy not supported						Redundancy supported						
Drive power shut-off system		Internal cutoff relay						External safety circuit						
Enable input		B contact input (internal power supply model)						B contact input (external power supply, double redundant)						
Speed setting		1 mm/sec and up, the maximum depends on actuator specifications												
Acceleration/deceleration setting		0.01G and up, the maximum depends on actuator specifications												
Programming language		Super SEL language												
Number of programs		128 programs												
Number of program steps		9999 steps (total)												
Number of multi-tasking programs		16 programs												
Number of positions		20000 positions (total)												
Data memory device		Flash ROM + SRAM (battery backup)												
Data input method		By touch panel teaching pendant or PC dedicated teaching software												
Standard input/output		Input/Output 48-point PIO board (NPN/PNP), input/output 96-point PIO board (NPN/PNP), 1 board can be installed												
Extended input/output		Input/output 48-point PIO board (NPN/PNP), input/output 96-point PIO board (NPN/PNP), Up to 3 boards can be installed												
Serial communications function		Teaching Pendant (25-pin D-sub) Port + 2ch RS232C Port (9-pin D-sub x 2) included as standard												
Protective function		Motor overcurrent, overload, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, battery error.												
RC gateway function		1ch RS485 port (9-pin D-sub) (serial communication (RS232C). 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



	Controller specifications		Front view		Side view
			Battery-less absolute specification/Incremental specification/ Quasi-absolute specification/Index absolute specification	Absolute specification/Multi-rotation absolute specification	
RA	Single-phase/ 3-phase specifications	1 to 4 axis specifications			
		5 to 8 axis specifications			
SA	Single-phase specifications	1 to 4 axis specifications			
		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

■ P/PCT/Q/QCT (Safety Category Compliant Type)

XSEL-P/Q/PCT 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.

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



(Note)

The external dimensions of the Q type, single-phase 200V specification are different from that for the P type.

[XSEL-P/PCT]

		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		*P/PCT 		*P/PCT 	
	5 to 6 axis specifications		*P/PCT 		*P/PCT 	

* PCT applies only to those specified as "**P/PCT" whereas P applies to all.

Controller

R-unit

RCP6S

MCON

-C

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-CAL

MSCON

SSEL

MSEL

XSEL

XSEL

(SCARA)

PSA-24

TB-02

TB-03

External Dimensions
■ P/PCT/Q/QCT (Safety Category Compliant Type)

XSEL-P/Q/PCT types vary their shapes and dimensions according to the controller specifications (encoder class, brake, I/O expansion, power supply specifications). Confirm the dimensions to suit the desired type and number of axes.

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

2D
CAD

3D
CAD

(Note)

The external dimensions of the Q type, single-phase 200V specification are different from that of the P type.

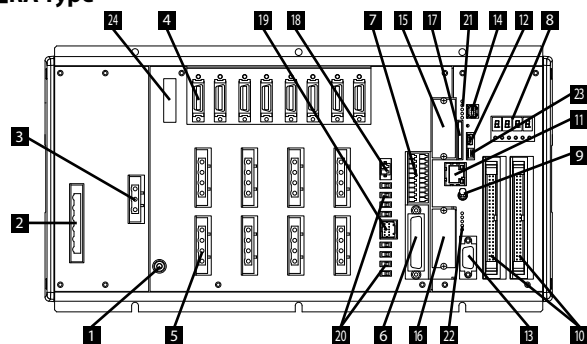
[XSEL-Q/QCT]

		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		*Q/QCT 		*Q/QCT 	
	5 to 6 axis specifications		*Q/QCT 		*Q/QCT 	

* QCT applies only to those specified as "Q/QCT" whereas Q applies to all.

Part Names

■ RA Type



1 FG Connection Terminal

A terminal for connecting to the FG (frame ground) on the enclosure. Make sure to ground properly to take measure for noise.

2 AC Power Input Connector

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.

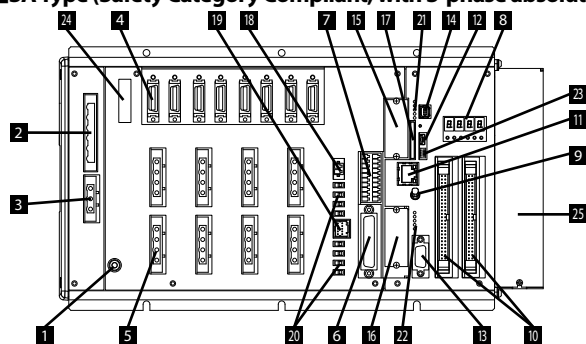
12 USB Connector

A USB device connector to connect to a PC.

13 General-purpose RS232C Port Connector

A port to connect general-purpose RS232C devices.

■ SA Type (Safety Category Compliant, with 3-phase absolute unit)



14 Extended Motion Control Connector

A connector to connect the IAI controller (MECHATROLINK III specification).

15 Field Network Board (optional) Slot 1

A field network board (optional) for the EtherNet/IP or EtherCAT is connected.

16 Field Network Board (optional) Slot 2

A field network board (optional) for the CC-Link, DeviceNet or PROFIBUS-DP is connected.

17 SD Card Slot Connector

This connector is used to update the system. It does not function under the normal operation.

18 Brake Power Input Connector

A power input connector for driving the actuator brake. 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

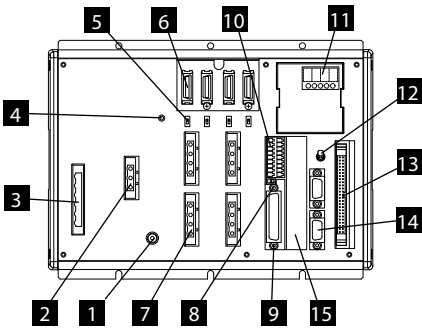
A connector to connect an encoder for conveyor tracking. It is included as standard for the controller for SCARA.

25 Absolute Battery Unit

This unit comes with the absolute specification.

Part Names

P/PCT (Standard 4-axis)



1 FG Connection Terminal

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

2 External Regeneration Unit Connector

A connector for the regenerative resistance 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.

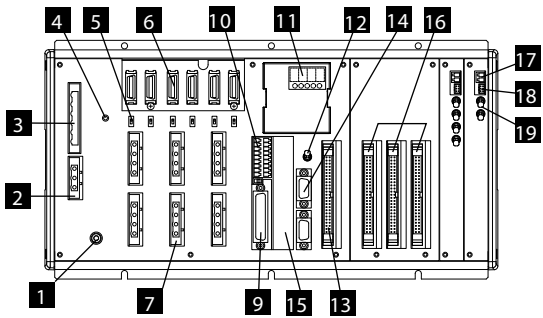
10 System I/O Connector

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.

Q/QCT (Absolute brake unit +6-axis with extended base)



Description of five LEDs

Name	Status when LED is lit
RDY	CPU Ready (programs can be run)
ALM	CPU Power (system down level error) CPU hardware problem
EMG	Emergency stop status, CPU hardware problem, or power system hardware problem
PSE	Power system hardware problem
CLK	System lock problem

12 Mode switch

This is a locking toggle switch for designating the controller operating mode. Pull the switch forward to use. The top position indicates the MANU (manual operation) mode, while the bottom position indicates the AUTO (automatic operation) mode. Teaching can only be performed in manual operation. In addition, automatic operations using external I/Os are not possible in the MANU mode.

13 Standard I/O Connector

50-pin flat connectors structure, comprised of 32 input / 16 output DIOs.

Outline of Standard I/O Interface Specifications

Item	Details
Connector name	I/O
Applicable connector	50-pin, flat connector
Power supply	Power is supplied through connector pins No.1 and 50.
Input	32 points (including general-purpose and dedicated inputs)
Output	16 points (including general-purpose and dedicated inputs)
Connected to	External PLC, sensors, etc.

14 General-purpose RS232C Port Connector

This port is for connecting general-purpose RS232C equipment. (2 channels are available)

15 Field Network Board Slot

A slot that accepts a fieldbus interface module.

16 Expansion I/O Board (optional)

Slots that accept optional expansion I/O boards.

17 Auxiliary Power (Brake etc.) Input Connector

A power input connector for driving the actuator brake. DC 24V must be supplied externally. If this power supply is not provided, the actuator brake cannot be released. Be certain that power is supplied to the brake-equipped axis. Use a shielded cable for the brake power cable, and connect the shielding on the 24V power supply side.

18 Brake Release Switch Connector

A connector for the switch that releases the actuator brake externally to the controller. Shorting the COM terminal and BKMRL* terminal of this connector will release the brake. Use this method if you wish to manually operate the actuator after the controller has experienced a power failure or malfunction.

19 Brake Switch

Locking toggle switch for releasing the axis brake. Pull the switch forward to use. Setting it to the top position (RLS side) forcibly releases the brake, while setting it to the bottom position (NOM side) causes the controller to automatically control the brake.

Option Table for XSEL Controller

Item		Description	Expansion I/O Model (Note 1)	Model for option single unit
Touch panel teaching pendant		Standard type	—	TB-02-SCN
		Safety category compliant	—	TB-02D-SCN
PC dedicated teaching software		for DOS/V	—	IA-101-X-MW
		Safety category compliant	—	IA-101-XA-MW
		for USB port	—	IA-101-X-USBMW
Expansion I/O board	PIO board	Expansion PIO (Input 32/Output 16, NPN)	N1	IA-103-X-32
		Expansion PIO (Input 32/Output 16, PNP)	P1	IA-103-X-32-P
		Expansion PIO (Input 16/Output 32, NPN)	N2	IA-103-X-16
		Expansion PIO (Input 16/Output 32, PNP)	P2	IA-103-X-16-P
	Network board	DeviceNet (Input 256/Output 256)	DV	(Not available)
		CC-Link (Input 256/Output 256)	CC	(Not available)
		PROFIBUS-DP (Input 256/Output 256)	PR	(Not available)
		EtherNet/IP board EtherNet	—	(Not available)
	Multi-point I/O board	Multi-point I/O board (Input 48/Output 48, NPN)	N3	IA-IO-3204-NP
		Multi-point I/O board (Input 48/Output 48, PNP)	P3	IA-IO-3204-PN
Connecting unit for ROBO Cylinder gateway (Note 2)			—	RCB-CV-GW CB-RCB-SIO050 CB-RCB-CTL 002
Regenerative resistance unit			—	RESU-1
Absolute data backup battery			—	AB-5

(Note 1) Represents the symbol of the expansion I/O within the controller model.

(Note 2) Not necessary for XSEL-R/S/RX/SX/RXD/SXD.

Calculation of Wattage for Connectable Actuators with Single-Phase

For the LSA/LSAS (linear actuator) connecting to the single-phase specification, calculate the wattage based on the "Controller Wattage Calculation Output" in the table below. The total wattage of LSA/LSA actuators and other actuators should be 1600W or smaller. XSEL-RA/SA can be connected only with LSAS.

$1600W \geq \text{LSA/LSAS total wattage (Controller Wattage Calculation Output)} + \text{total wattage (motor } W \times \text{number of axes) for actuators other than LSA/LSAS.}$

Table of Wattage Calculation for LSA/LSAS with single-phase specification

Actuator Model	Driver output (W)	Number of sliders (pc)	Controller Wattage Calculation Output (W)	Actuator Model	Driver output (W)	Number of sliders (pc)	Controller Wattage Calculation Output (W)
S6SS	100	1	300	H8SM/L15SM	200	2	1200
S6SM	100	2	600	H8HS	200	1	600
S8SS	100	1	300	H8HM	200	2	1200
S8SM	100	2	600	N15SS	200	1	600
S8HS	100	1	300	N15SM	200	2	1200
S8HM	100	2	600	N15HS	200	1	600
N10SS	100	1	300	N15HM	200	2	1200
N10SM	100	2	600	N19SS	300	1	600
S10SS	100	1	300	N19SM	300	2	1200
S10SM	100	2	1200	W21SS	400	1	800
S10HS	200	1	600	W21SM	400	2	1600
S10HM	200	2	1200	W21HS	1000	1	1500
H8SS/L15SS	200	1	600	W21HM (*)	1000	2	3000

(*) Not operable with single-phase specification.

Calculation of wattage when connecting RCS3-CT8C, CTZ5C to XSEL-RA/SA/P/Q.

When connecting RCS3-CT8C, CTZ5C to XSEL-P/Q, calculate the wattage by converting the wattage as follows.

The power supply voltage is limited to 3-phase, 200V.

RCS3-CT8C 400W → 800W

RCS3-CTZ5C 60W → 120W

Calculation of Wattage when connecting direct drive motors

When connecting the DD/DDA motor Series, calculate the wattage based on the "Controller Wattage Calculation Output" 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

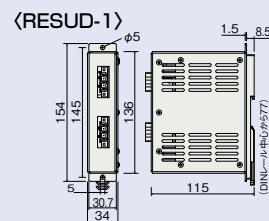
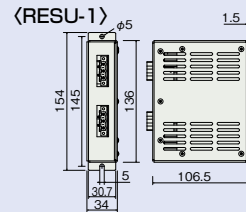
Determined by the total motor capacity of the connected axes.

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



Absolute Data Backup Battery (for XSEL-P/Q/RA/SA)

Model

AB-5

Features

Absolute data backup battery for operating actuators with absolute specification.



Expansion PIO Board

Details

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

Field Network Connection Board

Model

DV/CC/PR/EP/EC (* specified within the controller model)

Details

When specifying a field network option at the controller I/O, a field network board is installed in the I/O slot.

<Table of applicable networks>

	DeviceNet	CC-Link	PROFIBUS-DP	EtherNet/IP	EtherCAT
XSEL-P/Q	●	●	●	● (Note 1)	×
XSEL-RA/SA	●	●	●	● (Note 1)	●

(Note) The number of input/output points is input 256 points / output 256 points per one board (only one board can be installed).

(Note 1) The EtherNet/IP specification can 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.

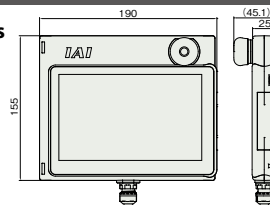
Options

Touch panel teaching pendant

Features A teaching device having functions of position inputs, trial operations, monitoring, etc.

Model TB-02-□

External dimensions



Specifications

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Operating ambient temperature	0~40°C
Operating ambient humidity	20 to 85%RH (non-condensing)
Protective class	IP20
Weight	470g (TB-02 single unit only)

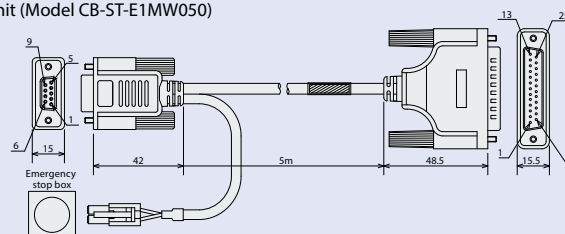
PC dedicated teaching software (Windows only)

Model IA-101-X-MW

Features Startup support software for inputting programs/positions, performing test runs and monitoring. More functions are added for debugging, enabling the start-up time to shorten.

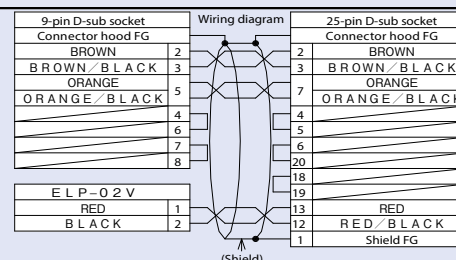
Details Software (CD-ROM), compatible Windows: XP SP2 or later/Vista 7/8
PC connecting cable 5m + emergency stop box (Model CB-ST-E1MW050-EB)

PC connecting cable single unit (Model CB-ST-E1MW050)



Note

- * Versions older than 3.0.0 cannot be used for the XSEL-P type.
- * Versions older than 2.0.0 cannot be used for the SCARA type.
- * Use IA-101-XA-MW if you use a safety category 4 compliant controller.
- * Cannot be used for the XSEL-Q/QX/S/SX/SXD types.
- * When you separately order a PC connecting cable for a maintenance purpose, beware that the cable single unit model is CB-ST-E1MW050, but when ordering it together with the emergency stop box, the model is CB-ST-E1MW050-EB.



Safety category 4 compliant PC dedicated software (for XSEL-Q/QX/SA/SAX)

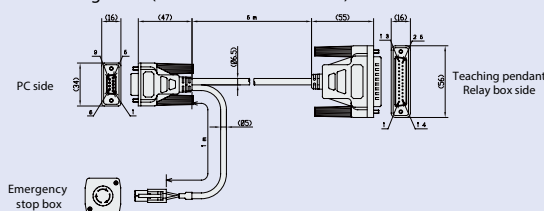
Model IA-101-XA-MW

* Exclusive use for XSEL-Q/QX/S/SX.
Cannot be used for other controllers.

Features A startup support software program offering program/position input function, test operation function, monitoring function, and more. The functions needed for debugging have been enhanced to help reduce the startup time. PC connecting cable is compatible to safety category 4 by duplicating the emergency stop circuits.

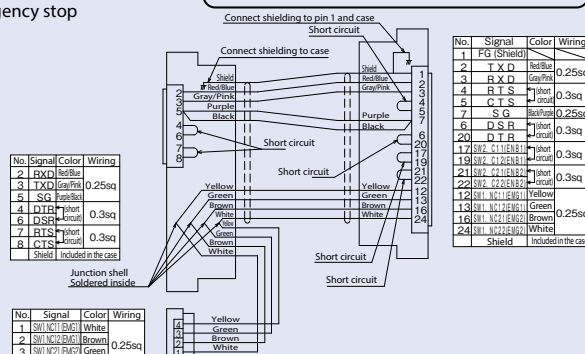
Details Software (CD-ROM)
Compatible Windows: 7/8/8.1/10
PC connecting cable 5m + emergency stop box (Model: CB-ST-A2MW050-EB)

Dimensions PC connecting cable (Model: CB-ST-A1MW050)



NOTE

When ordering a separate replacement PC cable the model number for the cable only is CB-ST-E1MW050, and for cable with the emergency stop box is CB-ST-E1MW050-EB. If a teaching tool is not used, connect the dummy plug DP-2 (supplied with the controller, to the teaching connector.

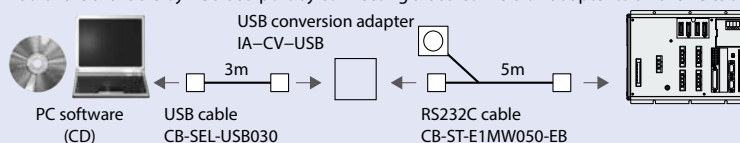


USB-compatible PC software

Model IA-101-X-USBMW

Features Software available by PC's USB port by connecting a USB conversion adapter to a RS232C cable.

Description Software (CD-ROM)
Compatible Windows: 7/8/8.1/10
PC connecting cable 5m + emergency stop box + USB conversion adapter + USB cable 3m



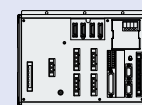
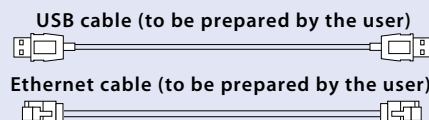
PC dedicated teaching software (for XSEL-RA/SA/RAX/SAX)

Model IA-101-N

Features Contains only the PC dedicated teaching software (CD-ROM). Order only the software when connecting both the controller and PC sides by USB cable or Ethernet cable. The cable that meets the following specifications is supplied by the customer.

Details Software (CD-ROM), compatible Windows: XP SP2 or later/Vista 7/8

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



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.

X-SEL




SCARA Robot Program Controller



(*1) Not compliant when connected to NNN10040/12040.

List of Models

Multi-Axes program controller enabling SCARA robot operation. Allows simultaneous control of up to 8 axes.

Type name		RAX	RAXD8	SAX	SAXD8	PX	QX
Connectable axes	IX	One SCARA / Single-axis and Cartesian	For two SCARA robots	One SCARA / Single-axis and Cartesian	For two SCARA robots	One SCARA / Single-axis and Cartesian	For one SCARA robot / Single-axis and Cartesian robot
	IXA	One SCARA / Single-axis and Cartesian				—	—
External view							
Type		Standard specification			Safety category compliant		Safety category compliant
Max. number of controlled axes		8-axis				6-axis	
No. of positions		(4-axis specification) Maximum 36,666 positions (Varies depending on the number of axes. Refer to the specification table (P7-297) for details.)				20,000 positions	
Number of programs		255				128	
Number of program steps		20000				9999	
Total allowable wattage		Three-phase 2,400W				Three-phase 2,400W	
Motor input power supply voltage		Three-phase AC200V/230V ±10%				Three-phase AC200V/230V ±10%	
Control power supply voltage		Single phase AC200V/230V ±10%				Single phase AC200V/230 ±10%	
Safety category (*1)		B			Safety category 4 compatible		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.

Model

XSEL

(Additional axis content 5th~8th axes)



Limitations on additional axis connection

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 1,500W or smaller (Max. 750W per axis)	Maximum 4 axes (from 5th to 8th axes)	
	IXA-4NNN1805			
	IXA-3NNN3015	Total 700W or smaller (Max. 700W per axis)		
	IXA-3NNN45□□			
	IXA-3NNN60□□	Total 600W or smaller (Max. 600W per axis)Not connectable		
	IXA-4NNN3015			
	IXA-4NNN45□□			
High-speed type	IXA-4NNN60□□	Not connectable	Maximum 3 axes (from 6th to 8th axes)	
	IXA-3NSN3015			
	IXA-3NSN45□□			
	IXA-3NSN60□□			
	IXA-4NSN3015			
	IXA-4NSN45□□			
Dust- and splash-proof specification	IXA-4NSN60□□			
	IXA-4NSW3015			
	IXA-4NSW45□□			
	IXA-4NSN60□□			

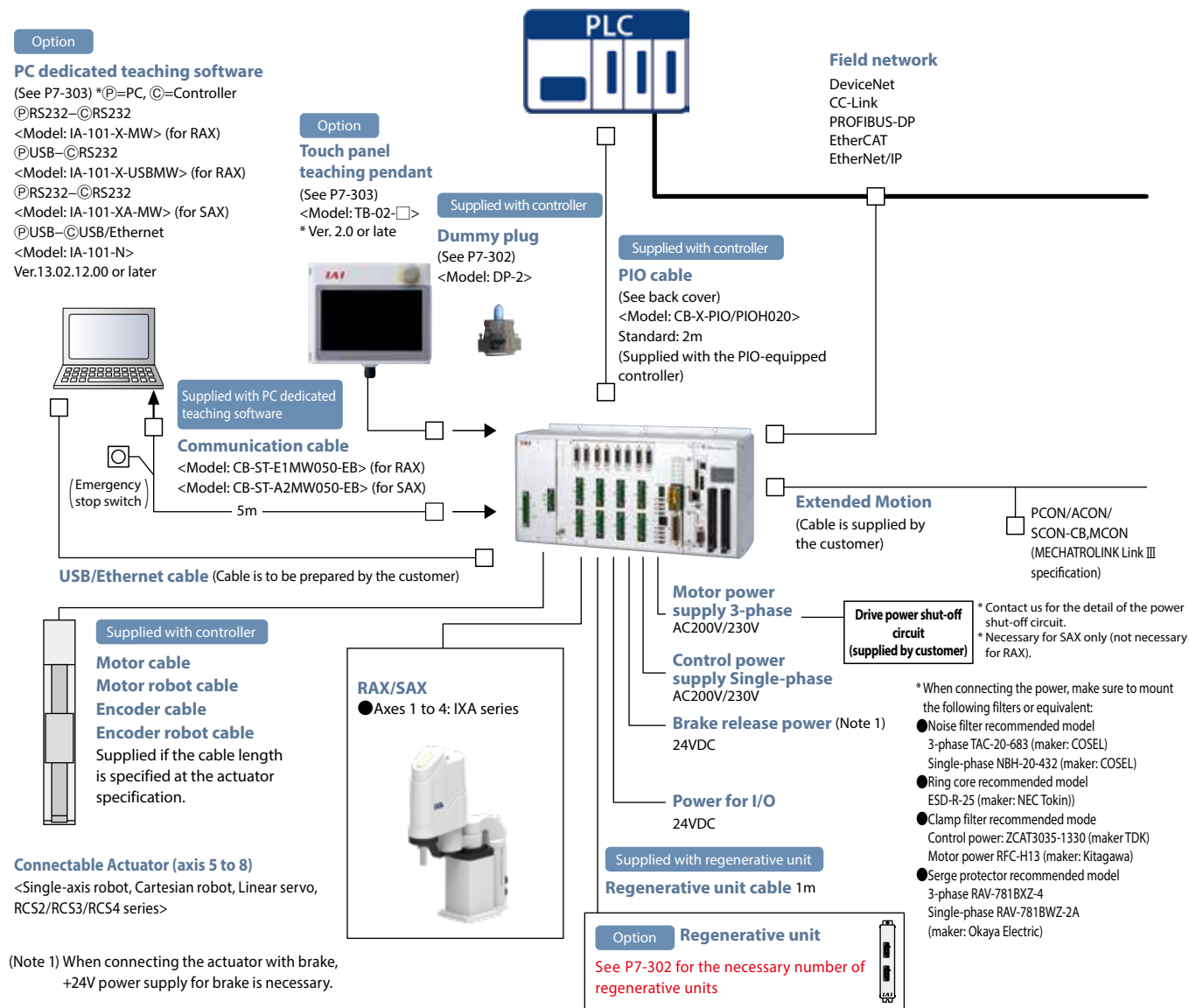
Note

- IAI

● 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.

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

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

3	3 Three-phase 200V
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NNN1205~8040H	Standard type	TNN3015H~3515H	Wall-mounting type
NNN10040~12040		UNN3015H~3515H	Wall-mounting inverse type
NNN1205B~1805B	Standard ultra-compact type with brake	HNN5020H~8040H	Ceiling-mounting type
NSN5016H~6016H	High-speed type	INN5020H~8040H	Inverse type
NNC1205~8040H	Clean room type		
NNC1205B~1805B	Clean room ultra-compact type with brake		
NNW2515H~8040H	Splash-proof type		

Note: When the brake option is selected with IX-NNN or NNC 1205/1505/1805, be sure to specify the model number of the IX type with the brake option (1205B/1505B/1805B).

(Example) 12:12W Servo motor type

Note
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 P7-294.

[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
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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 P7-294.

● 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) Expansion I/O

(Slot 3)

(Slot 4)

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

WAI	Battery-less abs. Incremental
A	Absolute
G	Quasi absolute
AI	Index absolute
AM	Multi-rotation abs.

WAI	Battery-less abs. Incremental
A	Absolute
G	Quasi absolute
AI	Index absolute
AM	Multi-rotation abs.

3	Three phase AC200V
---	--------------------

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

B	Brake equipped specification
C	Creep sensor specification
L	Home sensor/LS compatible
M	Master axis specified
S	Slave axis specified

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

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		

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

(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□

* 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 7-286.

* 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 7-301)

* 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.

* Ethernet/IP specification can support Ethernet.

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

* 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	Medium high-speed type
Mini high-speed type	NN*2515H / NN*3515H TNN3015H / UNN3015H TNN3515H / UNN3515H		Mini high-speed type
Medium high-speed type	NN*50□□H / NN*60□□H HNN5020H / INN5020H HNN6020H / INN6020H		
Large high-speed type	NN*70□□H / NN*80□□H HNN70□□H / INN70□□H HNN80□□H / INN80□□H	Cannot be connected	
High-speed type	NSN5016H / NSN6016H	Cannot be connected	

● For SCARA robot IX

System Configuration

■ XSEL-RAX/RAXD/SAX/SAXD Type

Option

PC dedicated teaching software

(See P7-303) *Ⓟ=PC, Ⓒ=Controller
 ⓅRS232-ⒸRS232
 <Model: IA-101-X-MW> (for RAX/RAXD)
 ⓅUSB-ⒸRS232
 <Model: IA-101-XA-MW> (for RAX/RAXD)
 ⓅRS232-ⒸRS232
 <Model: IA-101-XA-MW> (for SAX/SAXD)
 ⓅUSB-ⒸUSB/Ethernet
 <Model: IA-101-N>
 Ver.13.00.00.00 or later

Option

Touch panel teaching pendant

(See P7-303)
 <Model: TB-02-□>
 * Ver. 1.30 or later

Supplied with controller

Dummy plug
 (See P7-302)
 <Model: DP-2>

Supplied with controller

PIO cable
 (See P7-309)
 <Model: CB-X-PIO/PIOH020>
 Standard: 2m
 (Supplied with the PIO-equipped controller)

Field network

DeviceNet
 CC-Link
 PROFIBUS-DP
 EtherCAT
 EtherNet/IP
 Ethernet/IP specification can support Ethernet.

Supplied with PC dedicated teaching software

Communication cable
 <Model: CB-ST-E1MW050-EB> (for RAX/RAXD)
 <Model: CB-ST-A2MW050-EB> (for SAX/SAXD)
 5m

USB/Ethernet cable (Cable is to be prepared by the customer)

Expanded motion control

(Cable is to be prepared by the customer)
 PCON/ACON/
 SCON-CB,MCON
 (MECHATROLINK III specification)

Included with the actuator

RAX/SAX Motor cable
Motor robot cable
Encoder cable
Encoder robot cable
 These items will be provided if the cable length is specified in the actuator model number. (See P7-305 to 7-309)

Connectable actuators (5th~8th axes)

<Single-axis Robot, Cartesian Robot, Linear Servo, RCS2/RCS3 Series>

(Note 1) When connecting an actuator with brake, the brake power supply +24V is required.

RAX/SAX
 ● 1st~4th axis:
 IX Series
RAXD/SAXD
 ● 1st~8th axis:
 IX Series (2 units)

Note

The motor cable and encoder cable of the SCARA robot depends on the type of SCARA. Please see the SCARA robot specification for more information.

Motor power Three-phase
 AC200V/230V

Control power supply Single-phase
 AC200V/230V

Power supply for (Note 1)
brake release
 24VDC

I/O power supply
 24VDC

Supplied with regenerative resistance unit

Regenerative resistance unit cable 1m

Option **Regenerative resistance unit**

Please refer to P7-302 for the necessary number of regenerative units.

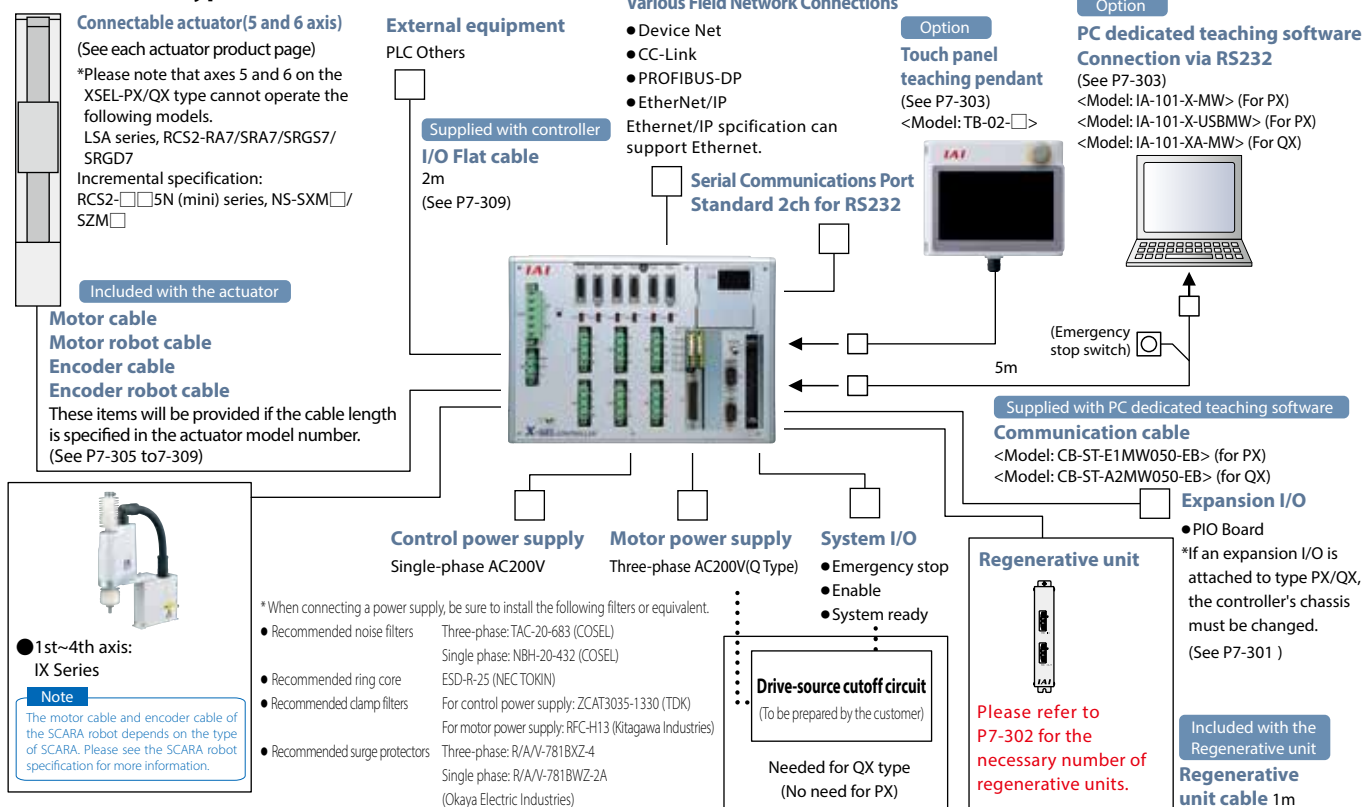
Drive-source cutoff circuit
 (To be prepared by the customer)

* Please contact IAI for more information regarding the drive-source cutoff circuit.
 * Required for SAX/SAXD type only (Not required for RAX/RAXD type)

* When connecting a power supply, be sure to install the following filters or equivalent.

- Recommended noise filters
 Three-phase: TAC-20-683 (COSEL)
 Single phase: NBH-20-432 (COSEL)
- Recommended ring core
 ESD-R-25 (NEC TOKIN)
- Recommended clamp filters
 For control power supply: ZCAT3035-1330 (TDK)
 For motor power supply: RFC-H13 (Kitagawa Industries)
- Recommended surge protectors
 Three-phase: R/A/V-781BXZ-4
 Single phase: R/A/V-781BWZ-2A (Okaya Electric Industries)

XSEL-PX/QX Type



Specifications Table

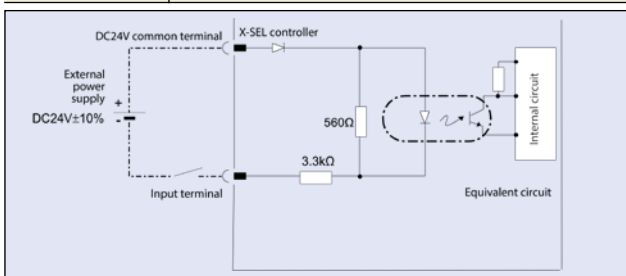
Controller type		RAX/RAXD type	SAX/SAXD type	PX type	QX type
Compatible motor output		12W~750W			
Number of controlled axes	connection with IXA	Axes 1-4: SCARA robot, Axes 5-8: Additional axes		—	
	connection with IX	Axes 1-4: SCARA robot, Axes 5-8: SCARA robot or additional axes		Axes 1-4: SCARA robot, Axes 5-6: additional axes	
Max. output of connected axes		[Three-phase] Up to 2400W			
Control power supply input		Single-phase 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)		5094VA (at max. output of connected axes)		6962.1VA	
Position detection method		Incremental, absolute, battery-less absolute		Incremental, absolute, Serial encoder quasi absolute, battery-less absolute	
Safety circuit configuration		Redundancy not possible	Redundancy possible	Redundancy not possible	Redundancy possible
Drive-source cutoff method		Internal relay cut-off	External safety circuit	Internal relay cut-off	External safety circuit
Emergency stop input		B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)	B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)
Enable input		B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)	B contact input (Internal power supply)	B contact input (External power supply, Redundancy possible)
Speed setting		1mm/s~ Upper limit depends on the actuator specification			
Acceleration/deceleration setting		0.01G~ Upper limit depends on the actuator specification			
Programming language		Super SEL language			
Number of programs		255 programs		128 programs	
Number of program steps		20,000 steps (total)		9,999 steps (total)	
No. of multi-tasking programs		16 programs			
Number of positions		Varies by the number of controlled axes 4-axis: 36,666, 5-axis: 33,000, 6-axis: 30,000, 7-axis: 27,500, 8-axis: 25,384		20,000	
Data recording element		Flash ROM + non-volatile RAM (FRAM): system battery (button battery) not required		Flash ROM+SRAM battery 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		AB-5 (built-in controller) * When additional axes are absolute specification / multi-rotation absolute specification.			
Protection function		Motor overcurrent, overload, motor driver temperature check, overload check, encoder disconnection detection, soft limit over, system malfunction, absolute battery error, etc.			
Ambient operating temperature, humidity and ambience		0 ~ 40°C, 85% RH or less (non-condensing), avoid corrosive gas and excessive dust			

* For the power supply capacity etc., please refer to the operation manual or contact IAI.

I/O Wiring Diagram

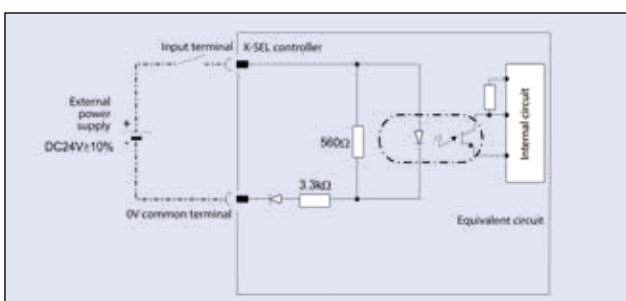
Input External input specification (NPN specification)

Item	Specification
Input voltage	24VDC \pm 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)

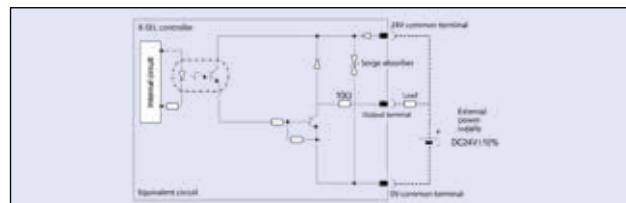
Item	Specification
Input voltage	24VDC \pm 10%
Input current	7mA, 1 circuit
ON/OFF voltage	ON voltage: min. 8VDC; OFF voltage: max. 19VDC
Isolation method	Photocoupler isolation



Output External input specification (NPN specification)

Item	Specification
Load voltage	24VDC
Maximum load current	100mA/1 point 400mA/8 ports. (Note)
Leakage current	Max. 0.1mA/1 contact
Isolation method	Photocoupler isolation

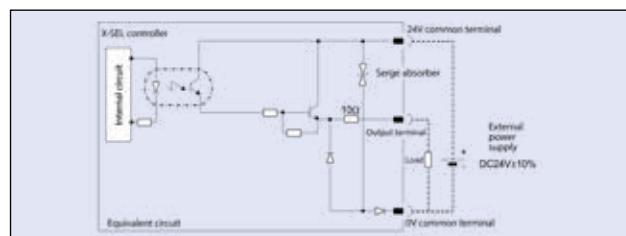
Note: The maximum load current will be 400mA per 8 ports from the output port No.300. (The maximum load current between the output port No.300 + n and No.300 + n + 7 is 400mA. n = 0 or multiple of 8.)



Output External input specification (PNP specification)

Item	Specification
Load voltage	24VDC
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 N°1)
10		008	Program No. (PRG N°2)
11		009	Program No. (PRG N°4)
12		010	Program No. (PRG N°8)
13		011	Program No. (PRG N°10)
14		012	Program No. (PRG N°20)
15		013	Program No. (PRG N°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	—	000	Program start
3	—	001	General-purpose input
4	—	002	General-purpose input
5	—	003	General-purpose input
6	—	004	General-purpose input
7	—	005	General-purpose input
8	—	006	General-purpose input
9	—	007	Program No. (PRG No 1)
10	—	008	Program No. (PRG No 2)
11	—	009	Program No. (PRG No 4)
12	—	010	Program No. (PRG No 8)
13	—	011	Program No. (PRG No 10)
14	—	012	Program No. (PRG No 20)
15	—	013	Program No. (PRG No 40)
16	—	014	General-purpose input
17	—	015	General-purpose input
18	—	016	General-purpose input
19	—	017	General-purpose input
20	—	018	General-purpose input
21	—	019	General-purpose input
22	—	020	General-purpose input
23	—	021	General-purpose input
24	—	022	General-purpose input
25	—	023	General-purpose input
26	—	—	External power supply (24VDC) for the pin No. 27~50/76~99
27	—	024	General-purpose input
28	—	025	General-purpose input
29	—	026	General-purpose input
30	—	027	General-purpose input
31	—	028	General-purpose input
32	—	029	General-purpose input
33	—	030	General-purpose input
34	—	031	General-purpose input
35	—	032	General-purpose input
36	—	033	General-purpose input
37	—	034	General-purpose input
38	—	035	General-purpose input
39	—	036	General-purpose input
40	—	037	General-purpose input
41	—	038	General-purpose input
42	—	039	General-purpose input
43	—	040	General-purpose input
44	—	041	General-purpose input
45	—	042	General-purpose input
46	—	043	General-purpose input
47	—	044	General-purpose input
48	—	045	General-purpose input
49	—	046	General-purpose input
50	—	047	General-purpose input
51	—	300	Alarm output
52	—	301	Ready output
53	—	302	Emergency stop output
54	—	303	General-purpose output
55	—	304	General-purpose output
56	—	305	General-purpose output
57	—	306	General-purpose output
58	—	307	General-purpose output
59	—	308	General-purpose output
60	—	309	General-purpose output
61	—	310	General-purpose output
62	—	311	General-purpose output
63	—	312	General-purpose output
64	—	313	General-purpose output
65	—	314	General-purpose output
66	—	315	General-purpose output
67	—	316	General-purpose output
68	—	317	General-purpose output
69	—	318	General-purpose output
70	—	319	General-purpose output
71	—	320	General-purpose output
72	—	321	General-purpose output
73	—	322	General-purpose output
74	—	323	General-purpose output
75	—	—	External power supply (0V) for the pin No. 2~25, 51~74
76	—	324	General-purpose output
77	—	325	General-purpose output
78	—	326	General-purpose output
79	—	327	General-purpose output
80	—	328	General-purpose output
81	—	329	General-purpose output
82	—	330	General-purpose output
83	—	331	General-purpose output
84	—	332	General-purpose output
85	—	333	General-purpose output
86	—	334	General-purpose output
87	—	335	General-purpose output
88	—	336	General-purpose output
89	—	337	General-purpose output
90	—	338	General-purpose output
91	—	339	General-purpose output
92	—	340	General-purpose output
93	—	341	General-purpose output
94	—	342	General-purpose output
95	—	343	General-purpose output
96	—	344	General-purpose output
97	—	345	General-purpose output
98	—	346	General-purpose output
99	—	347	General-purpose output
100	—	—	External power supply (0V) for the pin No. 27~50, 76~99

Expanded multi-point I/O signal table (When N3 or P3 is selected)

Pin No.	Category	Port No.	Standard setting
1	—	—	External power supply (24VDC) for the pin No. 2~25, 51~74
2	—	—	General-purpose input
3	—	—	General-purpose input
4	—	—	General-purpose input
5	—	—	General-purpose input
6	—	—	General-purpose input
7	—	—	General-purpose input
8	—	—	General-purpose input
9	—	—	General-purpose input
10	—	—	General-purpose input
11	—	—	General-purpose input
12	—	—	General-purpose input
13	—	—	General-purpose input
14	—	—	General-purpose input
15	—	—	General-purpose input
16	—	—	General-purpose input
17	—	—	General-purpose input
18	—	—	General-purpose input
19	—	—	General-purpose input
20	—	—	General-purpose input
21	—	—	General-purpose input
22	—	—	General-purpose input
23	—	—	General-purpose input
24	—	—	General-purpose input
25	—	—	General-purpose input
26	—	—	External power supply (24VDC) for the pin No. 27~50/76~99
27	—	—	General-purpose input
28	—	—	General-purpose input
29	—	—	General-purpose input
30	—	—	General-purpose input
31	—	—	General-purpose input
32	—	—	General-purpose input
33	—	—	General-purpose input
34	—	—	General-purpose input
35	—	—	General-purpose input
36	—	—	General-purpose input
37	—	—	General-purpose input
38	—	—	General-purpose input
39	—	—	General-purpose input
40	—	—	General-purpose input
41	—	—	General-purpose input
42	—	—	General-purpose input
43	—	—	General-purpose input
44	—	—	General-purpose input
45	—	—	General-purpose input
46	—	—	General-purpose input
47	—	—	General-purpose input
48	—	—	General-purpose input
49	—	—	General-purpose input
50	—	—	General-purpose input
51	—	—	General-purpose output
52	—	—	General-purpose output
53	—	—	General-purpose output
54	—	—	General-purpose output
55	—	—	General-purpose output
56	—	—	General-purpose output
57	—	—	General-purpose output
58	—	—	General-purpose output
59	—	—	General-purpose output
60	—	—	General-purpose output
61	—	—	General-purpose output
62	—	—	General-purpose output
63	—	—	General-purpose output
64	—	—	General-purpose output
65	—	—	General-purpose output
66	—	—	General-purpose output
67	—	—	General-purpose output
68	—	—	General-purpose output
69	—	—	General-purpose output
70	—	—	General-purpose output
71	—	—	General-purpose output
72	—	—	General-purpose output
73	—	—	General-purpose output
74	—	—	General-purpose output
75	—	—	External power supply (0V) for the pin No. 2~25, 51~74
76	—	—	General-purpose output
77	—	—	General-purpose output
78	—	—	General-purpose output
79	—	—	General-purpose output
80	—	—	General-purpose output
81	—	—	General-purpose output
82	—	—	General-purpose output
83	—	—	General-purpose output
84	—	—	General-purpose output
85	—	—	General-purpose output
86	—	—	General-purpose output
87	—	—	General-purpose output
88	—	—	General-purpose output
89	—	—	General-purpose output
90	—	—	General-purpose output
91	—	—	General-purpose output
92	—	—	General-purpose output
93	—	—	General-purpose output
94	—	—	General-purpose output
95	—	—	General-purpose output
96	—	—	General-purpose output
97	—	—	General-purpose output
98	—	—	General-purpose output
99	—	—	General-purpose output
100	—	—	External power supply (0V) for the pin No. 27~50, 76~99

External Dimensions

■ XSEL-RAX/RAXD/SAX/SAXD

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□□
- 3-axis and 4-axis of the standard types (NNN) with additional axes.
- Dust- and splash proof spec (NSW)

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



	Controller Specification		Front View		Side View
			Without absolute battery unit	With absolute battery unit	
RAX RAXD	Three-phase specification	4-axis specification			
		5~8-axis specification			
SAX SAXD	Three-phase specification	4-axis specification			
		5~8-axis specification			

* If absolute specification is included for more than 1 connected single actuator, the external dimensions will be that of the absolute specification.

FWhen only a SCARA robot is connected, the external dimensions are that of the no-absolute battery unit type, because the SCARA robot is equipped with a battery.

For the large type SCARAs (arm length 700/800) and high speed types, the controller size is the same as the 8-axis specification.

R-unit

RCP6S

MCON
-CPCON
-CB/CFB

PCON

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

MSCON

SSEL

MSEL

XSEL

XSEL
(SCARA)

PSA-24

TB-02

TB-03

External Dimensions

PX type/QX (safety category specification) type

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



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	120~180	External Dimensions ① ^{(*)1}	External Dimensions ③ ^{(*)2}	External Dimensions ⑤ ^{(*)3}	External Dimensions ⑦ ^{(*)4}	External Dimensions ⑨	External Dimensions ⑪	External Dimensions ⑬ ^{(*)5}	External Dimensions ⑮ ^{(*)6}
Clean type									
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								
High-speed type	500~600	External Dimensions ⑥ ^{(*)7}	External Dimensions ⑧ ^{(*)7}	—	—	External Dimensions ⑭ ^{(*)7}	External Dimensions ⑯ ^{(*)7}	—	—

(*)1 For brake equipped specification, please select external dimension ②.

(*)2 For brake equipped specification, please select external dimension ④.

(*)3 When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑥.

(*)4 When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑧.

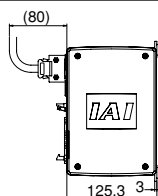
(*)5 When linear motor axis is brake equipped specification or absolute encoder specification, please select external dimension ⑭.

(*)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)	
External Dimensions ①		External Dimensions ⑤		External Dimensions ⑨		External Dimensions ⑬	
External Dimensions ②		External Dimensions ⑥		External Dimensions ⑩		External Dimensions ⑭	
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.

<When connecting a single axis robot>

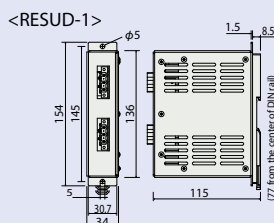
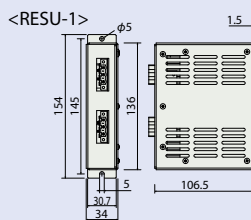
Installation criteria Determined by the total motor wattage of connected axes.

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

**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 SCARA robot>

Installation criteria

Connection with IXA

Model	Model number	Number of necessary regenerative units
NNN	1805	0
	3015	2
	45 □ □	
	60 □ □	
NSN	3015	3
	45 □ □	4
	60 □ □	
NSW	3015	3
	45 □ □	4
	60 □ □	
	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	
	80**H	4
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)	●

Note1 EtherNet/IP specification can support EtherNet (TCP/IP:message communication) by setting parameter.

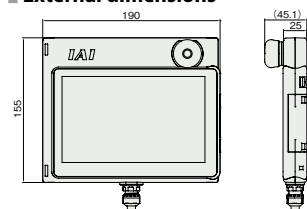
Option

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	20~85% RH (non-condensing)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (for XSEL-RA/RXA/RXAD/P/PX)

Model **IA-101-X-MW**

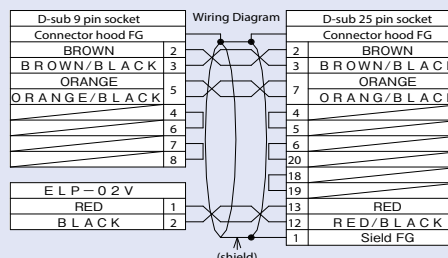
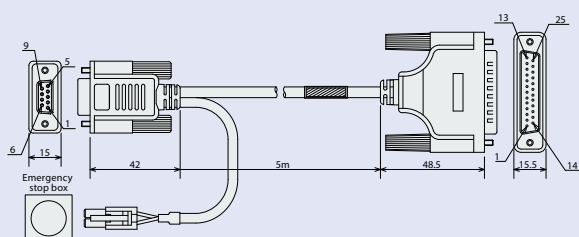
- Features** This is start-up support software which comes equipped with functions such as program/position input, trial operation and monitoring. The functions required for troubleshooting have been significantly improved to reduce the start-up time.

Description Software (CD-ROM), supported Windows: 7/8/8.1/10

(Accessories) 5m PC connection cable + emergency stop box (Model CB-ST-E1MW050-EB)

Notes

- * When using a Safety Category 4 compliant controller, please use IA-101-XA-MW.
- * Cannot be used for XSEL-SA/SAX/SAXD/Q/QX types.
- * When separately ordering a PC connection cable for maintenance, the model number will be CB-ST-E1MW050 for the cable only and CB-ST-E1MW050-EB when set with an emergency stop box.



Safety category 4 compliant PC dedicated software (for XSEL-SA/SAX/SAXD/Q/QX)

Model **IA-101-XA-MW** * Only for XSEL-SA/SAX/SAXD.

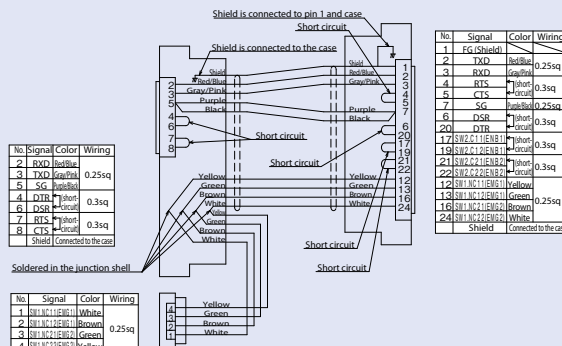
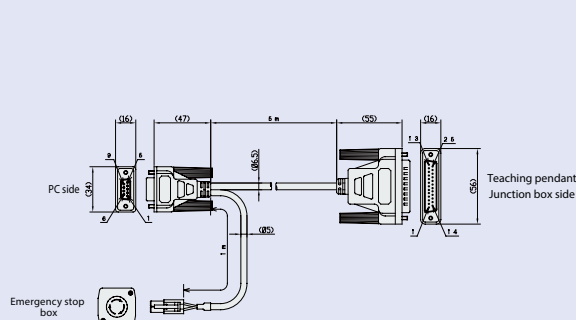
- Features** This is start-up support software which comes equipped with functions such as program/position input, trial operation and monitoring. The functions required for troubleshooting have been significantly improved to reduce the startup time. In addition, the PC connection cable has a duplex circuit for emergency stop to comply to the Safety Category 4.

Description Software (CD-ROM), supported Windows: 7/8/8.1/10

(Accessories) PC connection cable 5m + emergency stop box (Model CB-ST-A2MW050-EB)

Note

When separately ordering a PC connection cable for maintenance, the model number will be CB-ST-A1MW050 for the cable only and CB-ST-A1MW050-EB when 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.



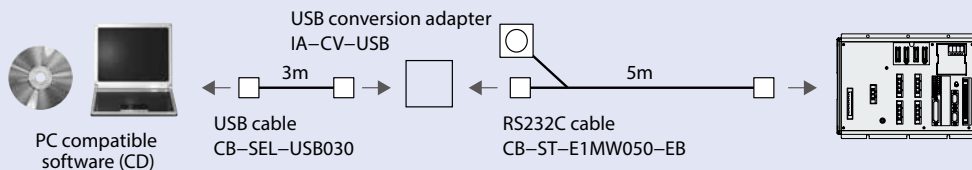
USB compatible PC dedicated teaching software (for XSEL-RA/RXA/RXAD/P/PX)

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 (CD-ROM), compatible Windows: 7/8/8.1/10

(Accessories) 5m PC connection cable + emergency stop box + USB adapter + USB cable 3m



PC dedicated teaching software (for XSEL-RA/SA/RAX/SAX/P/PX/Q/QX)

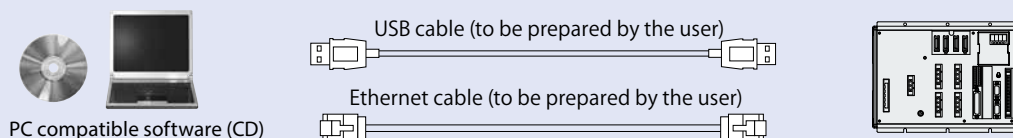
Model IA-101-N

Features It only comes with the PC compatible software (DVD-ROM).
If you want to connect both the controller and PC side with a USB cable or Ethernet cable, only the software needs to be purchased. A cable that meets the following specifications is to be prepared by the customer.

Description Software (CD-ROM), compatible Windows: 7/8/8.1/10

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".

	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. (* Refer to P1-101 for the actuators to be connected.)

Table of compatible cables

Model number			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W)	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-X-MA□□□	—	CB-X1-PA□□□
⑦	NS	Without LS			—	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	LT18□	—	CB-X-MA□□□	—	CB-X3-PA□□□ *Between the controller and brake CB-DDB-BK□□□
⑬	DDACR	LH18□	—	CB-XMC-MA□□□	—	
⑭	DDA	LT18□	—	CB-X-MA□□□	—	CB-X3-PA□□□ *Between the controller and brake CB-DDB-BK□□□
⑮	DDACR	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)*
⑲	Models other than ① ~ ⑪		—		—	CB-X1-PA□□□-AWG24 (For 21m or more)
⑲	Models other than ① ~ ⑪		—		—	CB-X1-PLA□□□ (For 20m or less)*
⑲	Models other than ① ~ ⑪		—		—	CB-X1-PLA□□□-AWG24 (For 21m or more)
⑳	IX (Joint cable specification)		—	CB-X-MA□□□	—	CB-X1-PA□□□

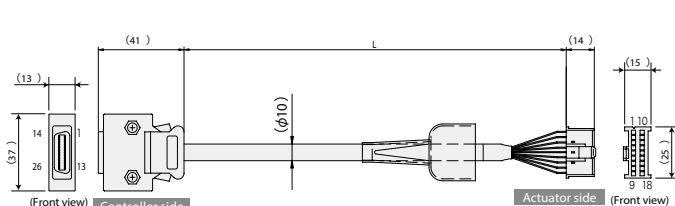
*Actuators without battery-less absolute encoders will still be CB-X1-PA□□□/CB-X1-PLA□□□ for over 20m.

Model number		PIO flat cable
⑳	XSEL- RA/SA/RAX/RAXD/SAX/SAXD	CB-X-PIO□□□
		Multipoint PIO flat cable
		CB-X-PIOH□□□

Model number		Brake cable for IXA		
㉑	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 $r = 50\text{mm}$ or more (Dynamic bending condition)

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

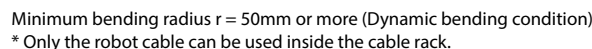
(Controller side)				(Actuator side)			
Wiring	Color (RCS2)	(X3)	Signal	No.	No.	Signal	Color (RCS2)
—	—	—	—	10	—	—	—
—	—	—	—	11	—	—	—
—	—	—	—	12	—	—	—
—	—	—	E24V	13	—	—	—
Gray/White	White/Green	OV	LS	26	—	—	—
Brown/White	White/Orange	LS	26	—	—	—	—
—	—	—	—	25	—	—	—
—	—	—	—	24	—	—	—
—	—	—	—	23	—	—	—
—	—	—	—	22	—	—	—
—	—	—	—	18	—	—	—
—	—	—	—	19	—	—	—
—	—	—	—	1	—	—	—
Pink	White/Blue	A+	1	2	—	—	—
Purple	White/Yellow	A-	2	3	—	—	—
White	White/Red	B+	3	4	—	—	—
Blue/Red	White/Black	B-	4	5	—	—	—
Orange/White	White/Purple	Z+	5	6	—	—	—
Green/White	White/Gray	Z-	6	7	—	—	—
Blue	Orange	SRD+	7	8	—	—	—
Orange	Green	SRD-	8	9	—	—	—
Black	Purple	BAT+	14	10	—	—	—
Yellow	Gray	BAT-	15	11	—	—	—
Green	Red	VCC	16	12	—	—	—
Brown	Black	GND	17	13	—	—	—
Gray	Blue	BKR+	20	14	—	—	—
Red	Yellow	BKR-	21	15	—	—	—
—	—	—	—	22	—	—	—

Shield is clamp connected to the hood

Drain wire and braided shield

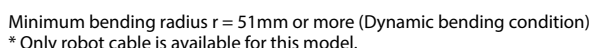
AWG26 (Crimped)

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



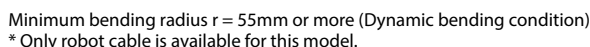
Wiring	Signal	No	No	Signal	Wiring
0.75 sq	PE	1	1	U	0.75sq (Crimped)
	U	2	2	V	
	V	3	3	W	
	W	4	4	PE	

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



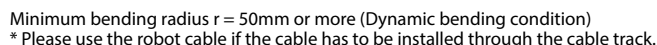
Wiring	Color	Signal	No	No	Signal	Color	Wiring
0.75 sq	Green	PE	1	1	U	Red	0.75sq (Crimpeo)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PF	Green	

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



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

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



Controller (side)				Actuator (side)					
Wiring	Color (RCS2)	(X2)	Signal	No.	No.	Signal	Color (RCS2)	(X2)	Wiring
				1	1	+	+		
				2	2	-	-		
	Brown/White	Orange	E24V	12	1	E24V	Brown/White	Orange	
	Gray/White	Green	+	13	2	0V	Gray/White	Green	AWG6 (Crimpe)
	Red/White	Brown	-	14	3	0V	Red/White	Brown	
	Black/White	Brown/Yellow	CREEP	25	4	CREEP	Black/White	Brown/Yellow	
	Yellow/Black	Brown/Red	0	24	5	0	Yellow/Black	Brown/Red	
	Pink/Black	Brown/Black	RSV	9	6	RSV	Pink/Black	Brown/Black	
				9					
				18					
				19					
	Pink	White/Blue	A+	1	1	A+	Pink	White/Blue	
	White	White	A-	2	2	A-	Purple	White/Yellow	
	White	Blue	B+	3	3	B+	White	White/Yellow	
	Blue	Blue	B-	4	4	B-	Blue/Red	White/Black	
	Orange/White	White/Purple	Z+	5	5	Z+	Orange	White/Purple	
	Green	White/Gray	Z-	6	6	Z-	Green/White	White/Purple	
	Blue	Orange	SFD+	7	7				
	Orange	Green	SFD-	8	8				
	Black	Purple	BA	10	10	FG	Black	Gray	AWG6 (Crimpe)
	Yellow	Gray	BA+	15	10	S2	Blue	Orange	
	Green	Red	VCC	16	11	S2	Black	Orange	
	Brown	Black	BA-	17	12	BA+	Black	Purple	
	Gray	Blue	BKR	20	13	BA+	Yellow	Gray	
	Red	Yellow	BKR+	21	14	VCC	Green	Red	
				22	15	GND	Brown	Black	
				23	16	BKR	Red	Blue	
				24	17	BKR+	Yellow	Gray	

Shield is clamp connected to the hood

White/blue cable colors indicate the bend color/insulated color

Drain wire and braided shield

Wiring	Color	Signal	No.
—	—	—	10
White/Orange	E24V	12	11
White/Green	OV	13	12
Brown/Blue	LS	26	13
Brown/Yellow	CREEP	25	14
Brown/Red	OT	24	15
Brown/Black	RSV	23	16
—	—	—	17
—	—	—	18
—	—	—	19
White/Blue	A+	1	20
White/Yellow	A-	2	21
White/Red	B+	3	22
White/Black	B-	4	23
White/Purple	Z+	5	24
White/Gray	Z-	6	25
Orange	SRD+	7	26
Green	SRD-	8	27
Purple	BAT+	14	28
Gray	BAT-	15	29
Red	VCC	16	30
Black	GND	17	31
Blue	BKR-	21	32
Yellow	BKR+	21	33
—	—	—	22

Shield is clamped together to the hood

Drain wire and braided shield

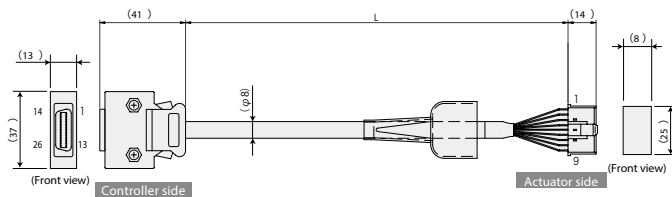
White/blue cable colors indicate the band color/insulator color

No.	Signal	Color	Wiring
1	E24V	White/Orange	AWG2
2	OV	White/Green	Crimp
3	LS	Brown/Blue	
4	CREEP	Brown/Yellow	
5	OT	Brown/Red	
6	RSV	Brown/Black	

No.	Signal	Color	Wiring
1	A	White/Blue	AWG2
2	A	White/Yellow	Crimp
3	B	White/Red	
4	B	White/Black	
5	Z	White/Purple	
6	Z	White/Gray	
7	—	—	
8	—	—	
9	FG	Drain	
10	SD	Orange	
11	SD	Green	
12	BAT+	Purple	
13	BAT-	Gray	
14	VCC	Red	
15	GND	Black	
16	BK-	Blue	
18	BK+	Yellow	

Maintenance Parts

Model CB-X1-PA ☐☐☐



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
 * Only robot cable is available for this model.

* For ISB · ISDB · ISDBC · NSA (Encoder types are battery-less absolute) with the cable length of 21m or longer, please select CB-X1-PA ☐☐☐-AWG 24.

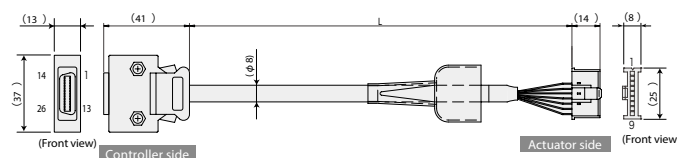
* Please indicate the cable length (L) in ☐☐☐, maximum 30m, E.g.) 080 = 8m

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

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK-	Blue	
9	BK+	Yellow	

Shield is clamp connected to the hood

Model CB-X1-PA ☐☐☐-AWG24



Minimum bending radius $r = 44\text{mm}$ or more (Dynamic bending condition)
 * Only robot cable is available for this model.

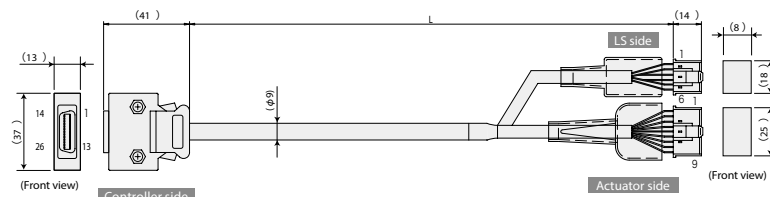
* Please indicate the cable length (L) in ☐☐☐, maximum 30m, E.g.) 210 = 21m

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

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK-	Blue	
9	BK+	Yellow	

Shield is clamp connected to the hood

Model CB-X1-PLA ☐☐☐



Minimum bending radius $r = 54\text{mm}$ 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.

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

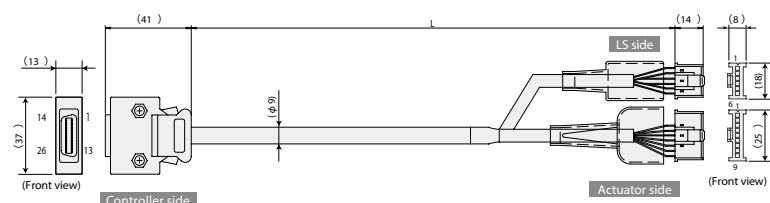
Wiring	Color	Signal	No.
—	—	—	10
—	—	—	11
White/Blue	E24V	12	
White/Yellow	OV	13	
White/Red	LS	26	
White/Black	CREEP	25	
White/Purple	OT	24	
White/Gray	RSV	23	
—	—	—	9
—	—	—	18
—	—	—	19
—	—	A+	1
—	—	A-	2
—	—	B+	3
—	—	B-	4
—	—	Z+	5
—	—	Z-	6
Orange	SRD+	7	
Green	SRD-	8	
Purple	BAT+	14	
Gray	BAT-	15	
Red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

No.	Signal	Color	Wiring
1	E24V	White/Blue	
2	OV	White/Yellow	
3	LS	White/Red	
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK-	Blue	
9	BK+	Yellow	

Shield is clamp connected to the hood

Model CB-X1-PLA ☐☐☐-AWG24



Minimum bending radius $r = 54\text{mm}$ or more (Dynamic bending condition)
 * Only robot cable is available for this model.

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

Wiring	Color	Signal	No.
—	—	—	10
—	—	—	11
White/Blue	E24V	12	
White/Yellow	OV	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

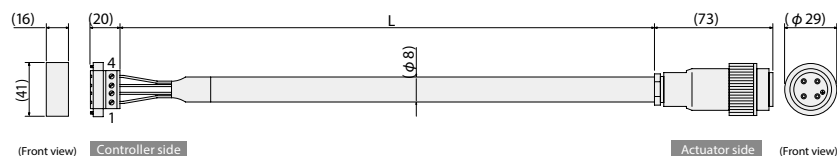
No.	Signal	Color	Wiring
1	E24V	White/Blue	
2	OV	White/Yellow	
3	LS	White/Red	
4	CREEP	White/Black	
5	OT	White/Purple	
6	RSV	White/Gray	

No.	Signal	Color	Wiring
1	BAT+	Purple	
2	BAT-	Gray	
3	SD	Orange	
4	SD	Green	
5	VCC	Red	
6	GND	Black	
7	FG	Drain	
8	BK-	Blue	
9	BK+	Yellow	

Shield is clamp connected to the hood

Model CB-XEU-MA

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



Plug G I C2.5/4-S T F-7.62 (Phoenix)

Wiring	Signal	No.
0.75sq	P E	1
	U	2
	V	3
	W	4

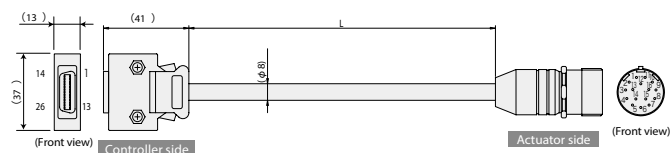
Plug connector 99-4222-00-04 (BINDER)

No.	Signal	Wiring
1	P E	0.75sq (Crimped)
2	U	
3	V	
4	W	

Minimum bending radius $r = 48\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Model CB-X1-PA -WC

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



Minimum bending radius $r = 38\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

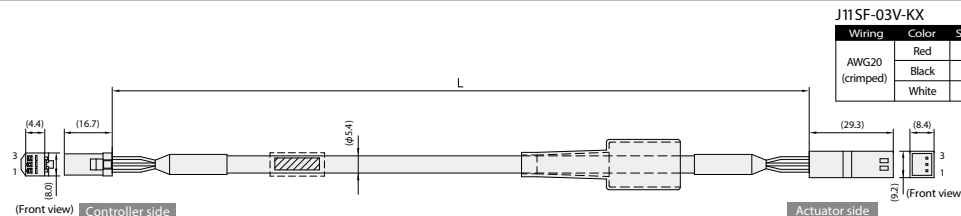
Wiring	Color	Signal	No.
—	—	—	10
—	—	—	11
—	—	—	12
—	—	—	13
—	—	—	14
—	—	—	15
—	—	—	16
—	—	—	17
—	—	—	18
—	—	—	19
—	—	—	20
—	—	—	21
—	—	—	22
—	—	—	23
—	—	—	24
—	—	—	25
—	—	—	26
—	—	—	27
—	—	—	28
—	—	—	29
—	—	—	30
—	—	—	31
—	—	—	32
—	—	—	33
—	—	—	34
—	—	—	35
—	—	—	36
—	—	—	37
—	—	—	38
—	—	—	39
—	—	—	40
—	—	—	41
—	—	—	42
—	—	—	43
—	—	—	44
—	—	—	45
—	—	—	46
—	—	—	47
—	—	—	48
—	—	—	49
—	—	—	50
—	—	—	51
—	—	—	52
—	—	—	53
—	—	—	54
—	—	—	55
—	—	—	56
—	—	—	57
—	—	—	58
—	—	—	59
—	—	—	60
—	—	—	61
—	—	—	62
—	—	—	63
—	—	—	64
—	—	—	65
—	—	—	66
—	—	—	67
—	—	—	68
—	—	—	69
—	—	—	70
—	—	—	71
—	—	—	72
—	—	—	73
—	—	—	74
—	—	—	75
—	—	—	76
—	—	—	77
—	—	—	78
—	—	—	79
—	—	—	80
—	—	—	81
—	—	—	82
—	—	—	83
—	—	—	84
—	—	—	85
—	—	—	86
—	—	—	87
—	—	—	88
—	—	—	89
—	—	—	90
—	—	—	91
—	—	—	92
—	—	—	93
—	—	—	94
—	—	—	95
—	—	—	96
—	—	—	97
—	—	—	98
—	—	—	99
—	—	—	100

No.	Signal	Color	Wiring
1	SD	Orange	
2	SD	Green	
3	—	—	
4	—	—	
5	—	—	
6	—	—	
7	—	—	
8	—	—	
9	—	—	
10	VCC	Red	
11	GND	Black	
12	BAT+	Purple	
13	BAT-	Gray	
14	—	—	
15	BK-	Blue	
16	BK+	Yellow	

(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

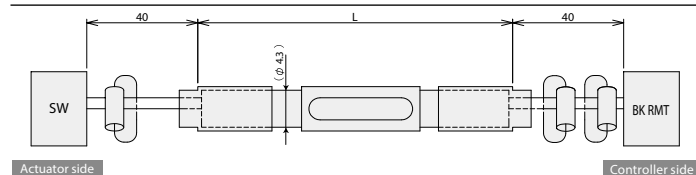
Wiring	Color	Signal	No.
AWG20 (crimped)	Red	+	3
	Black	—	2
	White	FG	1

J11SFM-03V-KX

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



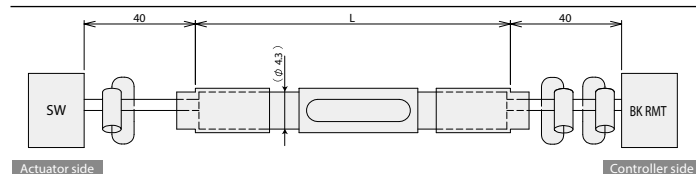
Connector	Color	Signal	Pin No.
SW	Red	BK3	1
	White	COM	2
	—	—	3

Sheath

Pin No.	Signal	Color	Connector
A2	BK3	Red	BK RMT
A3	COM	White	
Rest	—	—	

Model CB-IXA-BK -2

* Please indicate the cable length (L) in , maximum 15m, E.g.) 050 = 5m



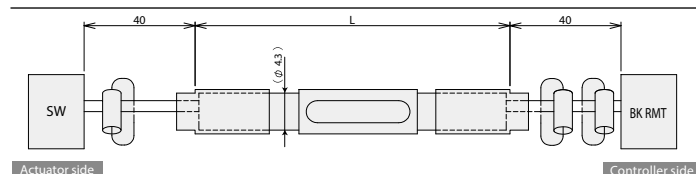
Connector	Color	Signal	Pin No.
SW	Red	BK4	1
	White	COM	2
	—	—	3

Sheath

Pin No.	Signal	Color	Connector
B2	BK4	Red	BK RMT
A3	COM	White	
Rest	—	—	

Model CB-IXA-BK -3

* Please indicate the cable length (L) in , maximum 15m, E.g.) 050 = 5m



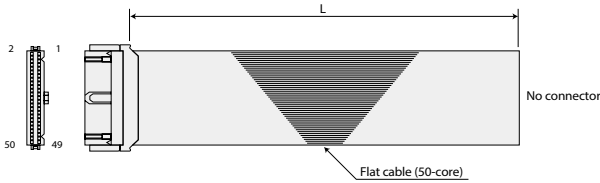
Connector	Color	Signal	Pin No.
SW	Red	BK5	1
	White	COM	2
	—	—	3

Sheath

Pin No.	Signal	Color	Connector
A4	BK5	Red	BK RMT
A3	COM	White	
Rest	—	—	

Model **CB-X-PIO**

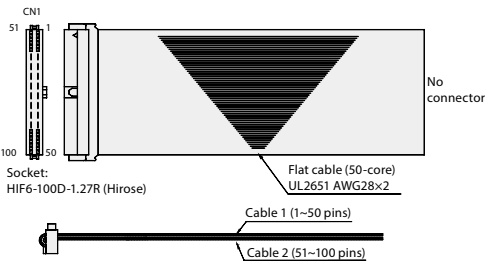
* Please indicate the cable length (L) in , maximum 10m,
E.g.) 080 = 8m



No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown 1	Flat cable (pressure-welded)	18	Gray 2	Flat cable (pressure-welded)	35	Green 4	Flat cable (pressure-welded)
2	Red 1		19	White 2		36	Blue 4	
3	Orange 1		20	Black 2		37	Purple 4	
4	Yellow 1		21	Brown-3		38	Gray 4	
5	Green 1		22	Red 3		39	White 4	
6	Blue 1		23	Orange 3		40	Black 4	
7	Purple 1		24	Yellow 3		41	Brown-5	
8	Gray 1		25	Green 3		42	Red 5	
9	White 1		26	Blue 3		43	Orange 5	
10	Black 1		27	Purple 3		44	Yellow 5	
11	Brown-2		28	Gray 3		45	Green 5	
12	Red 2		29	White 3		46	Blue 5	
13	Orange 2		30	Black 3		47	Purple 5	
14	Yellow 2		31	Brown-4		48	Gray 5	
15	Green 2		32	Red 4		49	White 5	
16	Blue 2		33	Orange 4		50	Black 5	
17	Purple 2		34	Yellow 4				

Model **CB-X-PIOH**

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



Cable 1					Cable 2				
Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function
Input	1	Brown-1	—	External power supply (AVDD) for the pin No. 2~25, 51~74	Input	26	Blue-3	—	External power supply (AVDD) for the pin No. 27~50, 76~99
	2	Red-1	000	Program start		27	Purple-3	024	General-purpose input
	3	Orange-1	001	General-purpose input		28	Gray-3	025	General-purpose input
	4	Yellow-1	002	General-purpose input		29	White-3	026	General-purpose input
	5	Green-1	003	General-purpose input		30	Black-3	027	General-purpose input
	6	Blue-1	004	General-purpose input		31	Brown-4	028	General-purpose input
	7	Purple-1	005	General-purpose input		32	Red-4	029	General-purpose input
	8	Gray-1	006	General-purpose input		33	Orange-4	030	General-purpose input
	9	White-1	007	Program No.(PRG No.1)		34	Yellow-4	031	General-purpose input
	10	Black-1	008	Program No.(PRG No.2)		35	Green-4	032	General-purpose input
	11	Brown-2	009	Program No.(PRG No.4)		36	Blue-4	033	General-purpose input
	12	Red-2	010	Program No.(PRG No.8)		37	Purple-4	034	General-purpose input
	13	Orange-2	011	Program No.(PRG No.10)		38	Gray-4	035	General-purpose input
	14	Yellow-2	012	Program No.(PRG No.20)		39	White-4	036	General-purpose input
	15	Green-2	013	Program No.(PRG No.40)		40	Black-4	037	General-purpose input
	16	Blue-2	014	General-purpose input		41	Brown-5	038	General-purpose input
	17	Purple-2	015	General-purpose input		42	Red-5	039	General-purpose input
	18	Gray-2	016	General-purpose input		43	Orange-5	040	General-purpose input
	19	White-2	017	General-purpose input		44	Yellow-5	041	General-purpose input
	20	Black-2	018	General-purpose input		45	Green-5	042	General-purpose input
	21	Brown-3	019	General-purpose input		46	Blue-5	043	General-purpose input
	22	Red-3	020	General-purpose input		47	Purple-5	044	General-purpose input
	23	Orange-3	021	General-purpose input		48	Gray-5	045	General-purpose input
	24	Yellow-3	022	General-purpose input		49	White-5	046	General-purpose input
	25	Green-3	023	General-purpose input		50	Black-5	047	General-purpose input
Output	51	Brown-1	300	Alarm output	Output	76	Blue-3	324	General-purpose output
	52	Red-1	301	Ready output		77	Purple-3	325	General-purpose output
	53	Orange-1	302	Emergency stop output		78	Gray-3	326	General-purpose output
	54	Yellow-1	303	General-purpose output		79	White-3	327	General-purpose output
	55	Green-1	304	General-purpose output		80	Black-3	328	General-purpose output
	56	Blue-1	305	General-purpose output		81	Brown-4	329	General-purpose output
	57	Purple-1	306	General-purpose output		82	Red-4	330	General-purpose output
	58	Gray-1	307	General-purpose output		83	Orange-4	331	General-purpose output
	59	White-1	308	General-purpose output		84	Yellow-4	332	General-purpose output
	60	Black-1	309	General-purpose output		85	Green-4	333	General-purpose output
	61	Brown-2	310	General-purpose output		86	Blue-4	334	General-purpose output
	62	Red-2	311	General-purpose output		87	Purple-4	335	General-purpose output
	63	Orange-2	312	General-purpose output		88	Gray-4	336	General-purpose output
	64	Yellow-2	313	General-purpose output		89	White-4	337	General-purpose output
	65	Green-2	314	General-purpose output		90	Black-4	338	General-purpose output
	66	Blue-2	315	General-purpose output		91	Brown-5	339	General-purpose output
	67	Purple-2	316	General-purpose output		92	Red-5	340	General-purpose output
	68	Gray-2	317	General-purpose output		93	Orange-5	341	General-purpose output
	69	White-2	318	General-purpose output		94	Yellow-5	342	General-purpose output
	70	Black-2	319	General-purpose output		95	Green-5	343	General-purpose output
	71	Brown-3	320	General-purpose output		96	Blue-5	344	General-purpose output
	72	Red-3	321	General-purpose output		97	Purple-5	345	General-purpose output
	73	Orange-3	322	General-purpose output		98	Gray-5	346	General-purpose output
	74	Yellow-3	323	General-purpose output		99	White-5	347	General-purpose output
	75	Green-3	—	External power supply (DV) for the pin No. 2~25, 51~74		100	Black-5	—	External power supply (DV) for the pin No. 27~50, 76~99

MEMO

Controller

XSEL
(SCARA)

PSA-24

Model PSA-24/PSA-24L

24VDC Power supply



Features

Compact

Compared with the conventional 24V power supply, it has a compact size, allowing a smaller installation space.



PS-24

NEW PSA-24

Output of internal data from the power supply

Possible to monitor the following data by connecting with RCON:

- Output voltage
- Output current
- Load factor
- Cumulative energizing time
- Internal temperature
- Alarm for low fan rotational speed



* an image graph



Power supply calculator

By simulating actuator operations in advance, an optimum power supply capacity and the required number of power supply units are calculated.

Enter conditions of the actuators to be connected and set up operation patterns. Operation patterns can easily be set up by icons.

Enter conditions of the actuators.



Setting operation patterns.



Calculation results

The power supply capacity and the required number of power supply units are displayed. Current values and axis operation status are also displayed.

Calculation results are displayed.



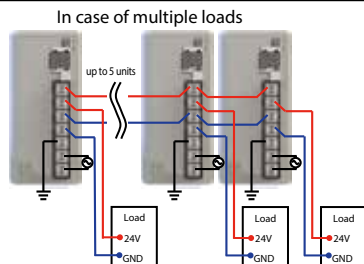
Required number of power supply units



Current value graph



Parallel operation of up to 5 units is possible

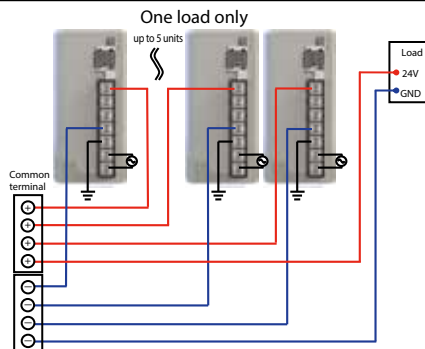


(Note) Parallel operations under the following condition are not possible.

* 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		Specifications		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		85% RH or less		No condensing
Ambient operating atmosphere		Not exposed to corrosive gases or dusts.		
Vibration resistance		Oscillation frequency: 10-57Hz / Amplitude: 0.075mm Oscillation frequency: 57-150Hz / Acceleration: 9.8m/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 exclusive use of IAI controllers. Please refer to the operation manual about output voltage by overload.

(Note 3) Represents leak current of the power supply unit.

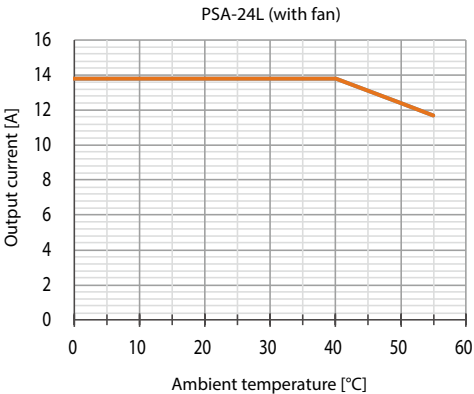
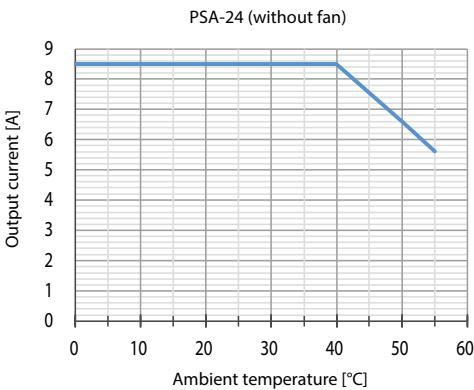


Caution

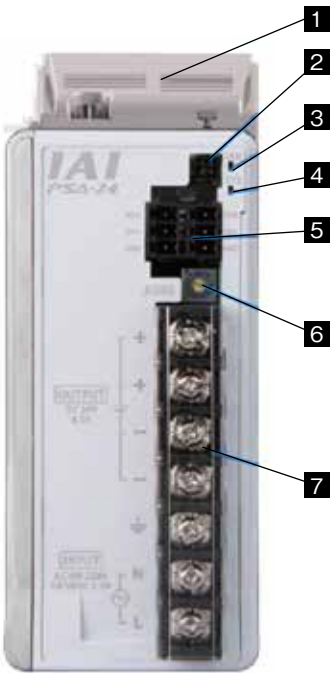
- **This power supply is not a constant voltage power supply. The output voltage changes with the load (voltage decreases according to the load percentage).**
- **Therefore, do not connect any equipment other than IAI actuators.**
- **Up to 5 units can be operated in parallel. Do not use any power supplies 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

2D
CAD3D
CAD

Controller

R-unit

RCP6S

MCON
-CPCON
-CB/CFB

PCON

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

MSCON

SSEL

MSEL

XSEL

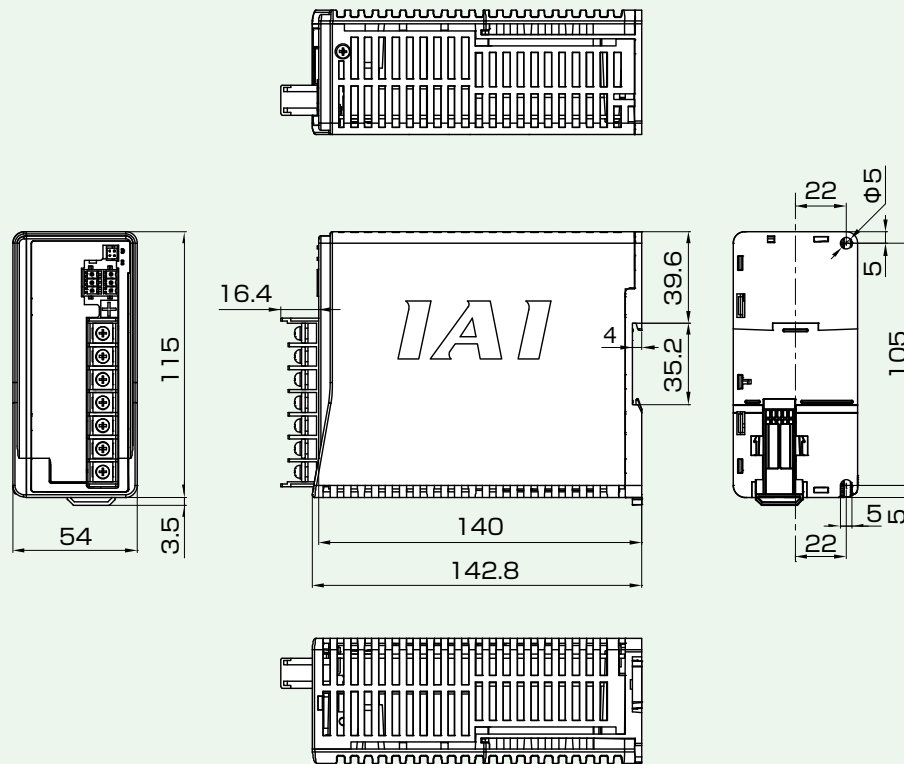
XSEL
(SCARA)

PSA-24

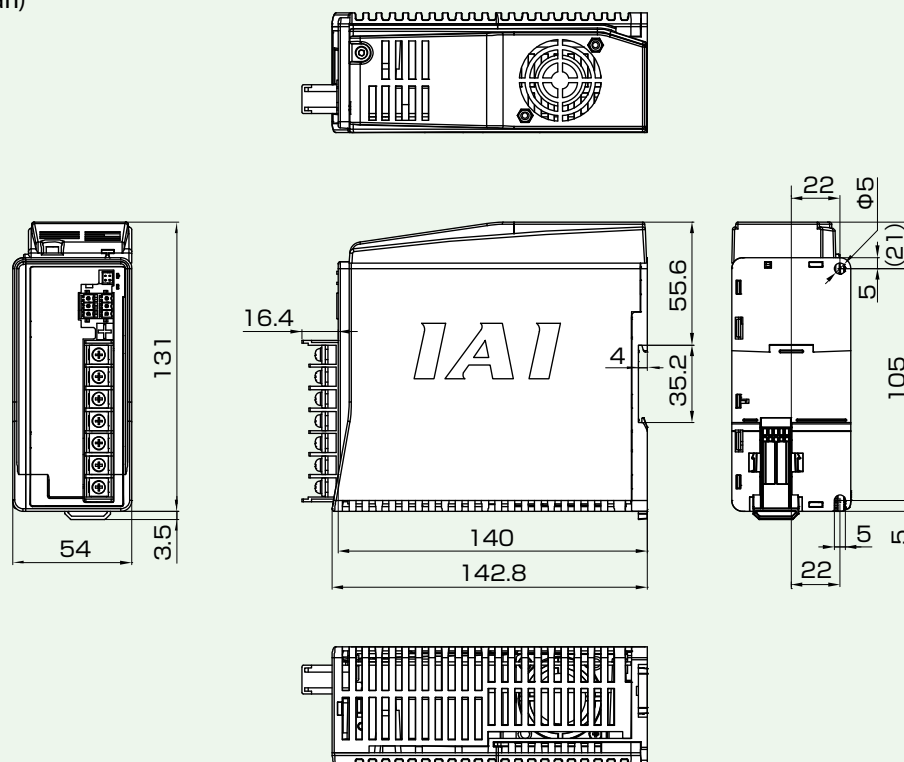
TB-02

TB-03

PSA-24 (without fan)



PSA-24L (with fan)



TB-02

Universal for Position controller/Program controller
Touch Panel Teaching Box TB-02



Features

- By equipping a 7" full color touch screen, the buttons and letters became easier to see, and operability improved.
 - When used with a program controller, it has the same functions as the previous model. When used with position controllers, new functions, such as the guide function, have been installed, and it is easy to set the model using the interactive method.
 - It can be used for both position controllers and program controllers.
 (Excludes models prior to RCP2 for the CON series and models prior to SEL-E/G)
 - For the standard specification, a Thickness of 25mm has been achieved.
 - Saving program/data into SD memory card.
 - Screen shot function convenient for procedure manual creation and recording conditions has been equipped.
- Various new functions for easy operation and enhanced support functions (2~13,18,19 are functions for position controllers)

1	Main Menu	A menu screen that is easy to select visually with the use of icons.
2	Position Editing Guide	A function that guides through position data setting method using an interactive method.
3	I/O Control Guide	A function that guides through the I/O operation method of the position controller using an interactive method.
4	Simple Program Setting	A function through which the operation method, position, and speed can be input using an interactive method.
5	Off-board Tuning	A function for calculating the settings of the optimal control parameter (each type of gain) and cycle time by inputting the operation conditions.
6	Trouble Shooting	A function that displays detailed alarm information when a problem occurs and the steps to deal with the trouble using an interactive method.
7	Maintenance Parts List	A function that display the time for regular maintenance and the maintenance parts list for parts exchange at the time malfunction.
8	Startup Screen Setting	A function for selecting the startup screen and hiding the guide function icon of the main menu.
9	Pulse-train Control Setting	A function that makes input easy by putting together the setting for the pulse-train control related parameters on a special screen.
10	Glossary of Terms	A function that displays the explanation of terms from the catalog and terms related to position controller operation.
11	Gateway Setting/Monitoring	A function for setting and monitoring the gateway unit in a gateway system for MCON/MSEP-C/RCP6S.
12	Simple Program	Function A function for performing easy program operations such as repeating position and setting stopping time.
13	Servo Monitoring	A monitoring function to check the actual operation condition with displays of waveforms.
14	Teaching Update	A function that lets you update software
15	Screen shot	A function for saving a bmp file of the screen shot into SD card by pressing and holding the bottom right section of the screen.
16	Large Monitor	By equipping a 7" full color touch panel, the buttons and letters became easier to see, and operability improved.
17	Multi-language Compatible	Compatible with Japanese, English, and Chinese.
18	Network data	Display I/O data between host PLC and controller when connecting single-axis of network specification
19	Press program function	Edit and conduct a test run for press program when connecting controller for servo press.

New Functions example

Main Menu

By using an icon for each menu, we made menu selection easier.



Position Editing Guide

A function that guides through position data setting method using an interactive method.



Simple Program Setting

This is a guide screen that allows easy position setting for even those operating for the first time.



Off-board Tuning

A function for calculating the setting of the optimal gain and cycle time by inputting the operation conditions.



Explanation of Terms

A function that displays the explanation of terms from the catalog and terms related to position controller operation.



Troubleshooting

Simply selecting YES/NO for the circumstances of the problem allows it to guide through the steps for dealing with the problem.



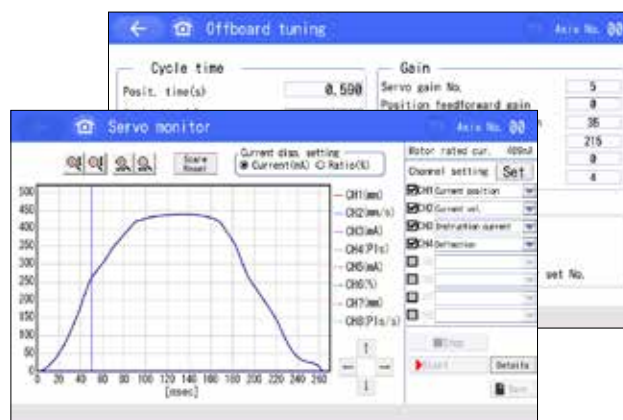
Maintenance Parts List

The maintenance parts list can be checked by inputting the model.



Servo monitor

It is possible to display the graphs of the current position of the actuator, speed, electric current value variation, etc.



Specifications

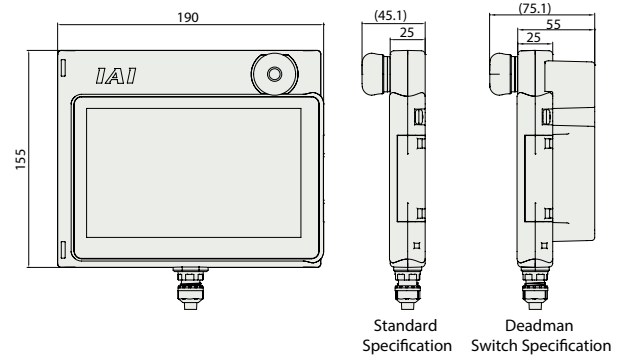
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temp.	0 ~ 40°C
Ambient operating humidity	20 ~ 80%RH (Non-condensing)
Environmental resistance	IP20
Overseas standard	CE
Mass	470g (TB-02 box only) + 330g (5m cable) 600g (TB-02D box only) + 330g (5m cable)
Cable length	5m (Standard cable is attached to the box)

External Dimensions

CAD drawings can be downloaded from our website:
www.intelligentactuators.com

2D
CAD

3D
CAD



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)		
	TB-02D-S-SWR	Deadman switch specification (Red 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
TP adapter connection cable	③CB-SEL-SJS002 (Adapter 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

Controller

R-unit

RCP6S

MCON

-C

PCON

-CB/CFB

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON-CB

(Servo press)

SCON

-CAL

MCON

SSEL

MSEL

XSEL

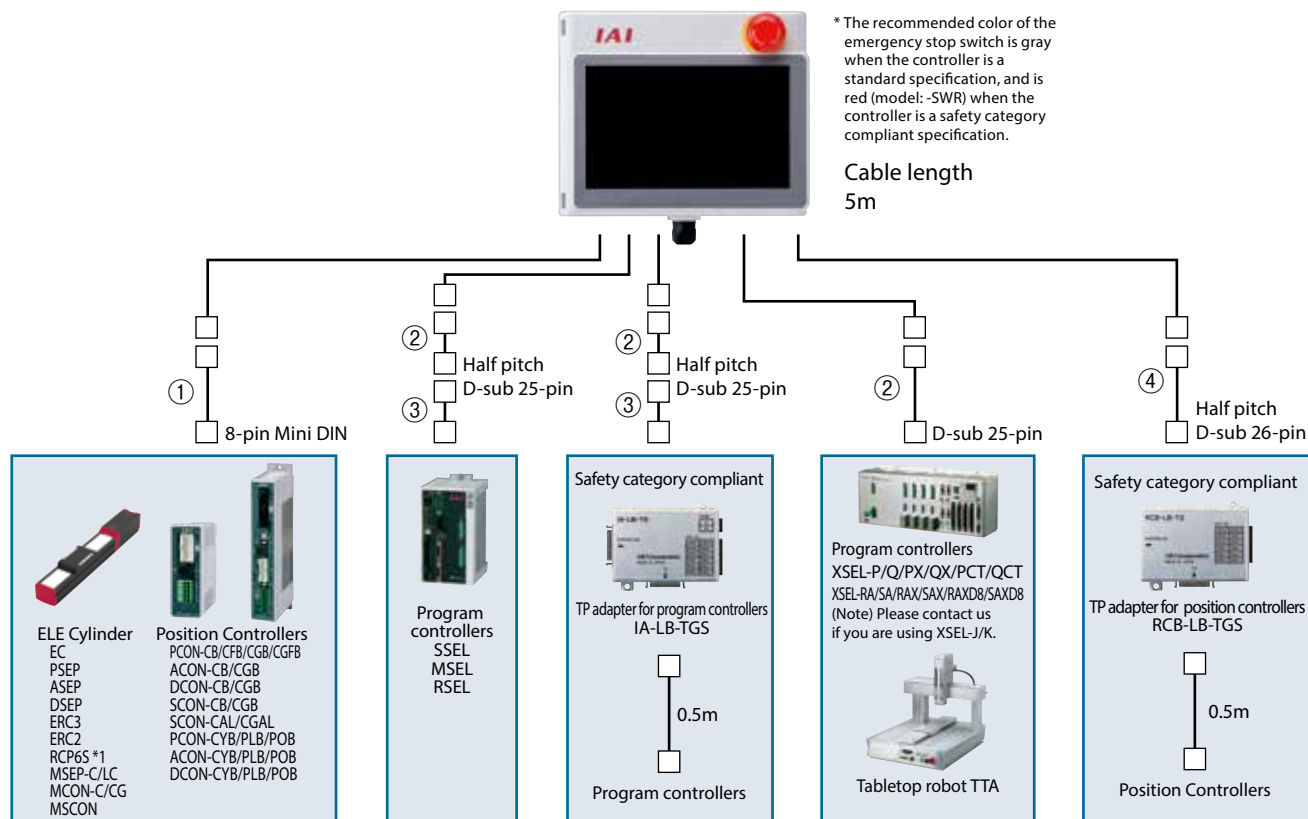
XSEL

(SCARA)

PSA-24

TB-02

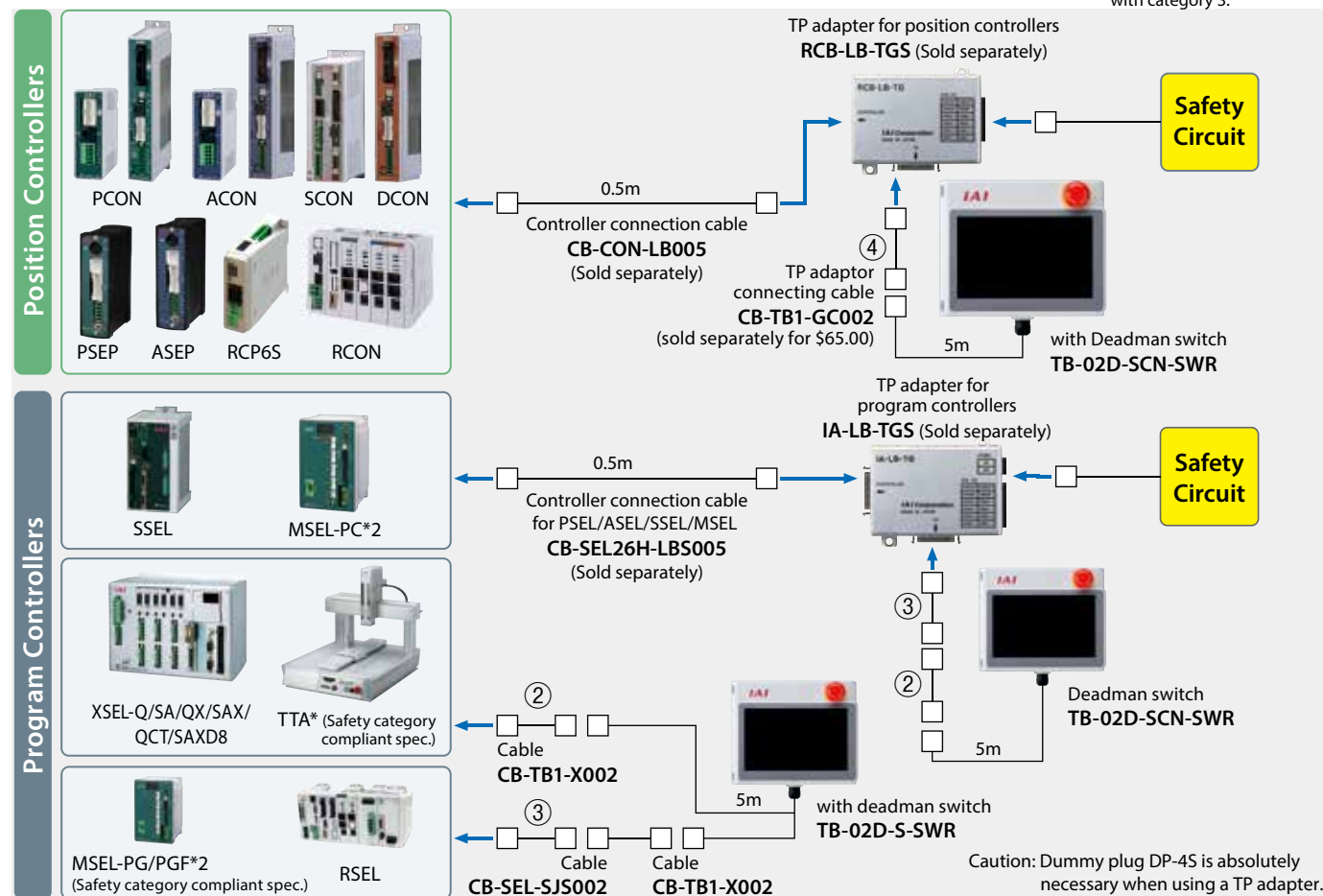
TB-03



*1 A gateway unit or a PLC connection unit is necessary to operate RCP6S.

*1 Compliant with category 4 when fitting the dummy plug.
*2 MSEL and TTA are compliant with category 3.

Compatibility with safety category will be constituted as below. Compliant with up to Safety Category B~4. *1 *2



TB-03

Universal for position controller / program controller
Touch panel teaching pendant TB-03



Features

1 Set operating conditions with wireless connection

Position adjustments, operating conditions setting and actuator operations can be performed from outside the equipment, even without a cable connection to the ELECYLINDER actuators.

* Stop switch is enabled only during "cable connection".
Please be careful that it is disabled during "wireless connection".



The wireless function of the ELE Cylinder that can be operated wirelessly varies according to the ELE Cylinder model options to be specified.
"-WL" = Edits only, "-WL2" = Edits and Operation.

2 Status monitoring makes daily maintenance easier and shortens trouble recovery time

TB-03 can monitor the operating status of up to 16 axes while receiving wireless data from the ELECYLINDER.
Error recovery time also can be shortened by troubleshooting with wireless communication.

Status monitor screen

Axis Name Display

Can be configured (changed) arbitrarily according to customer applications.

Status Monitor

Axis status check can be used for confirmation of maintenance timing.

EC2	S/N A70761788	Servo	Travel Cnt.	S2	Alarm Group	Warnin
Select	Selectable	Cur. pos.	Travel Dist.	1 m	Maintenance warning 1	
		0.00 mm	Over load Lv.	12 %		

Error Status Monitor

Alarms and warnings are displayed when generated.
Useful for troubleshooting.

Troubleshooting screen

3 Supports ELECYLINDER / Position Controller / Program Controller

Dedicated cables can connect the TB-03 to all the controllers. The same functions and operations of the previous TB-02 are available.



Cable connection

Controller



Wired or wireless of the ELECYLINDER can be selected at the ELECYLINDER model option.

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 N *2	① CB-TB3-C050	-
Program Controller	TB-03-S	(Blank)/C/E/K N *2	-	② CB-TB3-S050 + ③ CB-SEL-SJS002
ELECYLINDER Position Controller Program Controller	TB-03-SC	(Blank)/C/E/K N *2	① CB-TB3-C050	② CB-TB3-S050 + ③ CB-SEL-SJS002 (conversion cable) *3
		(Blank)/C/E/K 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

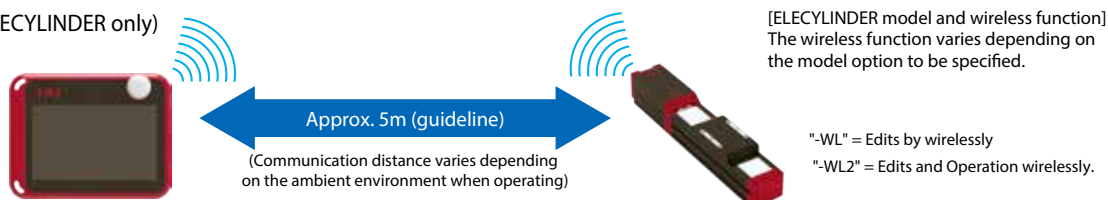
*3 Use with the ② cable when connecting to ASEL, PSEL, SSEL, or MSEL

● 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

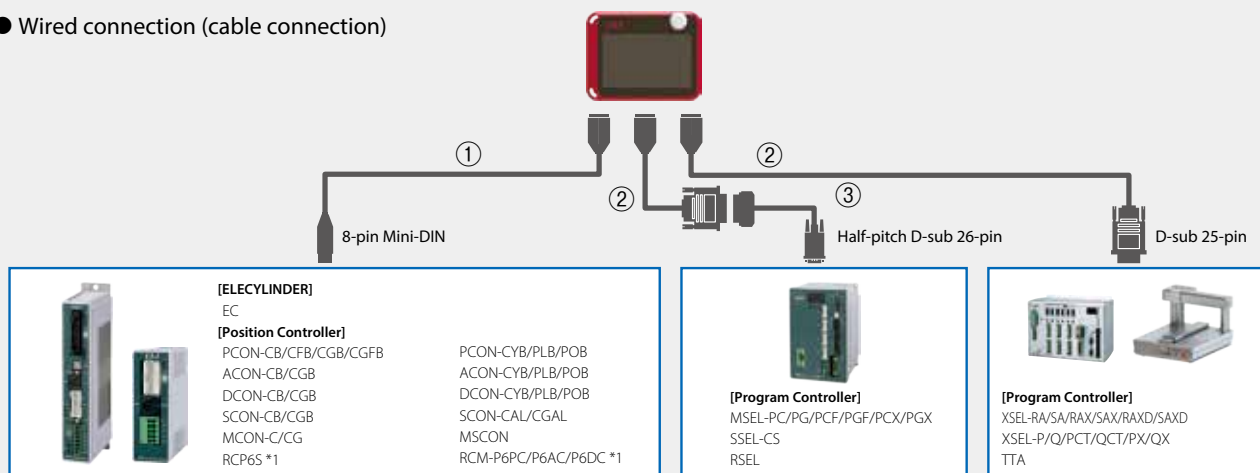
Connection

● Wireless connection (ELECYLINDER only)



Caution: Certification issues limit the countries in which wireless communication can be used. Contact our sales personnel for details.

● Wired connection (cable connection)



*1 To operate RCP6S and RCM-P6, a gateway unit or a PLC connecting unit is necessary.

Body Specifications

Power input	24VDC $\pm 10\%$ [supplied from controller]
Voltage range	5.9VDC (5.7 to 6.3V) [supplied from AC adapter]
Power consumption	3.6W or less
Consumption current	150mA (supplied from controller)
Ambient operating temperature	0 to 40°C (no condensation or freezing)
Ambient operating humidity	85% RH or less (no condensation or freezing)
Ambient storage temperature	-20 to 40°C
Vibration resistance	10 to 57Hz Amplitude 0.075mm
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

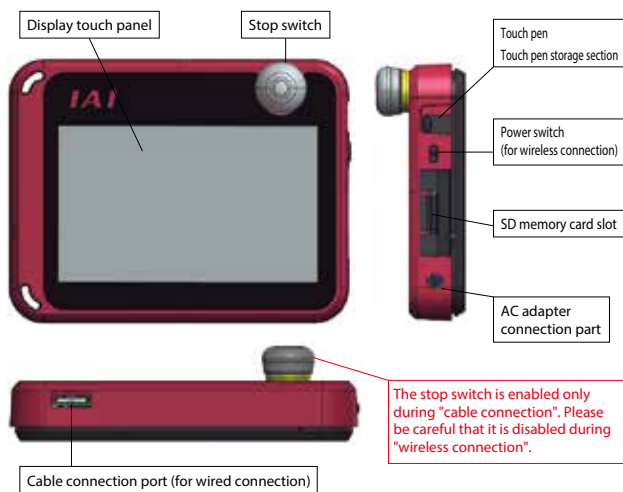
Wireless Function (when connected to ELECYLINDER only)

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 $\pm 10\%$
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 ± 100 mm

Name of Each Component

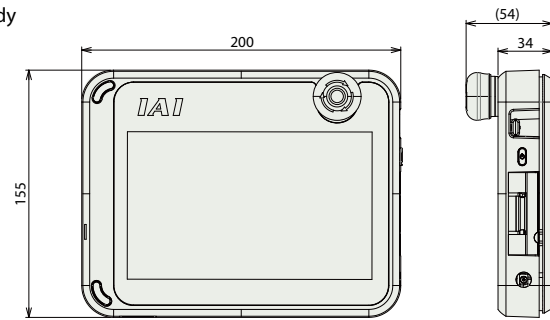


External Dimensions

CAD drawings can be downloaded from our website.
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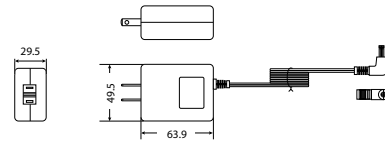


●Body

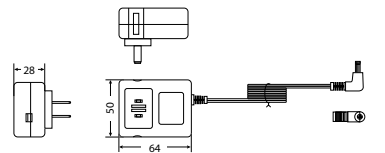


●AC adapter

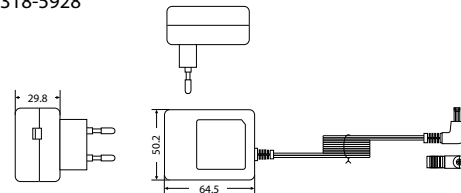
For Japan/North America/Thailand: UN318-5928



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, U.S.A., Canada, EU countries, China, South Korea, Thailand

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.

USA

- Sales & Support Centers
- 12 Sales Offices
- 48 local Distributors

CANADA

- 5 local Distributors

MEXICO

- 1 local Distributor

Midwest Branch Office (Chicago, IL)

Southeast Branch Office (Atlanta, GA)

IAI AMERICA
US Headquarters & Western Region
(Los Angeles, CA)

www.intelligentactuator.com/inquiry/

日本語 OK TEC 日本代表

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Phone 888-354-9470 FAX 678-354-9471

■ **Contact us for your local distributor information.**

The information contained in this booklet may change without prior notice due to product improvement.

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www.intelligentactuator.com

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