



IAI

GENERAL CATALOG

2022

8

1 Introduction / Maintenance Parts Technical Documents

- About IAI
- IAI technologies
- Products and features
- Application examples
- Maintenance parts
- Cautions
- Technical documents
- Models not specified in this catalog
- Discontinued and successor models
- Conversion table for old models

2 ELECYLINDER® (2-point positioning)

Slider



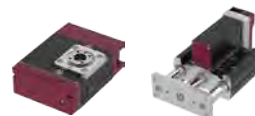
Rod
Radial Cylinder®



Table gripper



Rotary stopper



Clean/dust- & splash-proof



Control equipment
specification



5 Cartesian/Table Top Cartesian 6-axis/SCARA

Cartesian



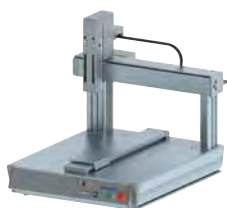
SCARA



Cartesian 6-axis



Table top

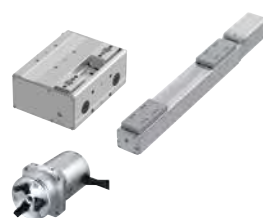


6 Pulse Press/Servo Press, Gripper, Rotary, Special Applications

Pulse press
Servo press



Gripper



Rotary



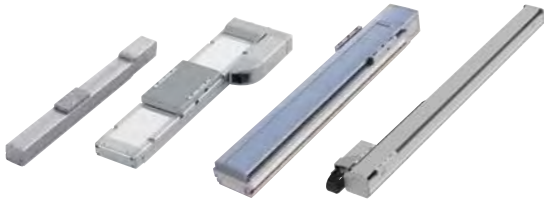
[Special applications]
Wrist unit
Rotary chuck



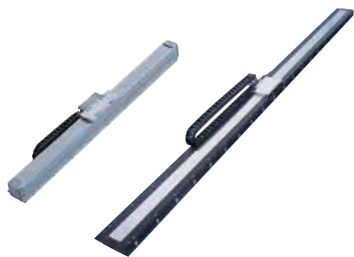
3

Slider & Linear Servo

Slider



Linear servo



7

Cleanroom and Dust & Splash-proof

Cleanroom specification



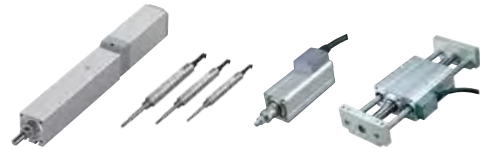
Dust- & splash-proof specification



4

Rod, Radial Cylinder Table

Rod



Radial Cylinder®



Table



8

Controller

Single-axis controller



Multi-axis controller



DC24V power source



PC-compatible
Teaching pendant




IAI Controller Lineup


Controllers to control actuators, PC-compatible teaching software and teaching pendant to set up positions and parameters are equipped with a lot of features.

Single-axis controller to control a single axis by one controller


	PCON	ACON	DCON	SCON
Available control method				
I/O (input/output)				
Pulse-train				
Field network				
Serial communication (Modbus)				



24v stepper motor
8 191



24v ACservo motor
8 229



24v DCbrush-less motor
8 229



200v ACservo motor
8 253


SCON enables pulse output. It is convenient for links with relevant control devices. (Contact IAI when field network control and pulse output are used)

- ✓ Low Price
- ✓ Same control mode with solenoid valve is possible.
- ✓ Programs dedicated to the controller are not necessary.

Multi-axis controller to control multi axes by one controller


	RCON	RSEL	MSEL	SSEL	XSEL
Available control method	<ul style="list-style-type: none"> ✓ Compact ✓ Low price ✓ Connectable up to 16 axes <p>(there are some limitations. Refer to P8-71 for details)</p>	<ul style="list-style-type: none"> ✓ Compact ✓ Low price ✓ Connectable up to 16 axes <p>(there are some limitations. Refer to P8-115 for details)</p>	<ul style="list-style-type: none"> ✓ Built-in power source (AC100 - 230V±10%) ✓ Possible to control SCARA robot IXP and wrist unit WU 	<ul style="list-style-type: none"> ✓ Power source 100V ✓ Selectable specifications (according to the actuator wattage) ✓ 2-axis synchronized control 	<ul style="list-style-type: none"> ✓ possible to control SCARA robot IX / IXA ✓ 2-axis synchronized control
SEL language (IAI original program)					
I/O (input/output)					
Field network					

Unit-connecting type




24v stepper motor 24v ACservo motor 24v DCbrush-less motor 200v ACservo motor
8 31


Unit-connecting type




24v stepper motor 24v ACservo motor 24v DCbrush-less motor 200v ACservo motor
8 31



24v stepper motor
8 291



200v ACservo motor
8 279



200v ACservo motor
8 305

Use these models for interpolation motions.

Do you have these problems?

I want to avoid getting a large controller...

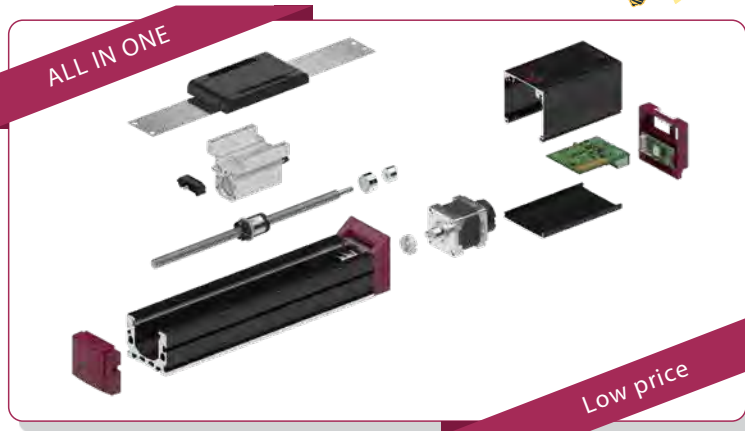
Equipment has to be modified, but there's no space for the controller...

I have difficulty working with complicated wiring and programs

Your problems → ELECYLINDER® solves!

ELECYLINDER® has a built-in controller!

You can easily operate it by selecting numeric values!



We Materialize Your Wishes

PC-compatible teaching software

There are two type of software for setting positions and parameters.

① IA-OS-□



✓ Compatible with the controller models showing "□CON"

② IA-101-□



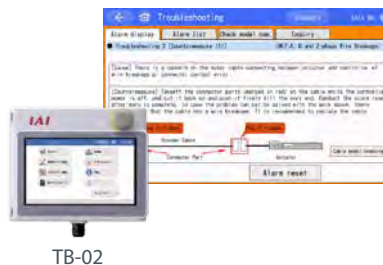
✓ Compatible with the controller models showing "□SEL"

→ See p.8-361 for details.

Teaching Pendant

8 353

- ✓ Equipped with a full-color touch panel
- ✓ Enables registration of positions, trial operations, troubleshooting for errors and display of the maintenance parts list
- ✓ Enable save to SD card



24VDC Power Source

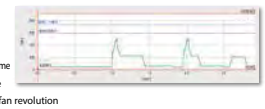
8 349

- ✓ IAI dedicated power source
- ✓ Monitoring of power source conditions by connecting with the R-unit (not available during motion control)
- ✓ Enables parallel operation of up to 5 units

Output of power source internal data

Possible to monitor the following items by connecting with the R-unit.

- Output voltage
- Output current
- Load factor
- Cumulative energized time
- Internal temperature
- Warning of reduced fan revolution



MEMO

Handwriting practice area with horizontal dotted lines.

MEMO

Handwriting practice area with horizontal dotted lines.

Controller

R-unit
RCP6S
PCON
ACON/DCON
SCON

SSEL
MSEL
XSEL

PSA-24
TB-03
TB-02



R-unit (RCON/RSEL/REC)



PCON



ACON



DCON



SCON-CB



SSEL



MSEL



XSEL



PSA-24



TB-03



TB-02

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	Supporting networks	8-15
	Devices connectable to IAI products	8-19
	Safety category compliant types	8-29
R-unit	RCON/RSEL/REC	8-31
RSEL (for cartesian 6-axis robots)	RSEL	8-103
RCP6S	RCP6S/RCM-P6□C	8-177
PCON	PCON-CB/CGB/CFB/CGFB/CYB/PLB/POB	8-191
PCON (for pulse press)	PCON-CBP/CGBP	8-207
ACON/DCON	ACON-CB/CGB/CYB/PLB/POB DCON-CB/CGB/CYB/PLB/POB	8-229
SCON	SCON-CB/CGB	8-253
SSEL	SSEL-CS	8-279
MSEL	MSEL-PC/PG/PCF/PGF/PCX/PGX	8-291
XSEL	XSEL-RA/SA/P/Q	8-305
XSEL (for SCARA robots)	XSEL-RAX/RAXD/SAX/SAXD	8-333
PSA-24	PSA-24/24L	8-349
TB-03/TB-02	TB-03/TB-02	8-353
	Introduction of software	8-361

Models not shown in the General Catalog 2022

The following models are available for sale although they are not specified in the General Catalog 2022.
For the details of the products, refer to the latest relevant catalog or visit IAI website.

Past General Catalog

https://www.intelligentactuator.com/iai-catalogs-search-index/?table_filter=cj0203



Website URL

<https://www.intelligentactuator.com/>



Classification	Type	Latest catalog	Information on website
Controller	ROBONET	2010 General Catalog	—
	PCON-CY	2015 General Catalog	—
	PCON-PL		
	PCON-PO		
	PCON-SE		
	ACON-CA		
	ACON-CG		
	DCON-CA		
	ACON-CY		
	ACON-PL		
	ACON-PO		
	ACON-SE		
	SCON-CA		
	ERC2	2016 General Catalog	—
	ERC3		
	MSEP-C/LC		
	XSEL-R/RX/RXD8		
	XSEL-S/SX/SXD8		
	MCON-LC/LCG	2019 General Catalog	—
	SCON-LC/LCG		
	PSEL		
	ASEL		
	MCON-C/CG	2020 General Catalog	—
	SCON-CAL/CGAL		
	MSCON		
	XSEL-PCT/QCT		
	XSEL-PX/QX	2021 General Catalog	—
Controller options	PCON-ABU	2015 General Catalog	—
	ACON-ABU	2018 General Catalog	—
	EIOU		
	PS-24		
	RCM-101-USB	Integrated into the IA-OS-C (Note 1)	—

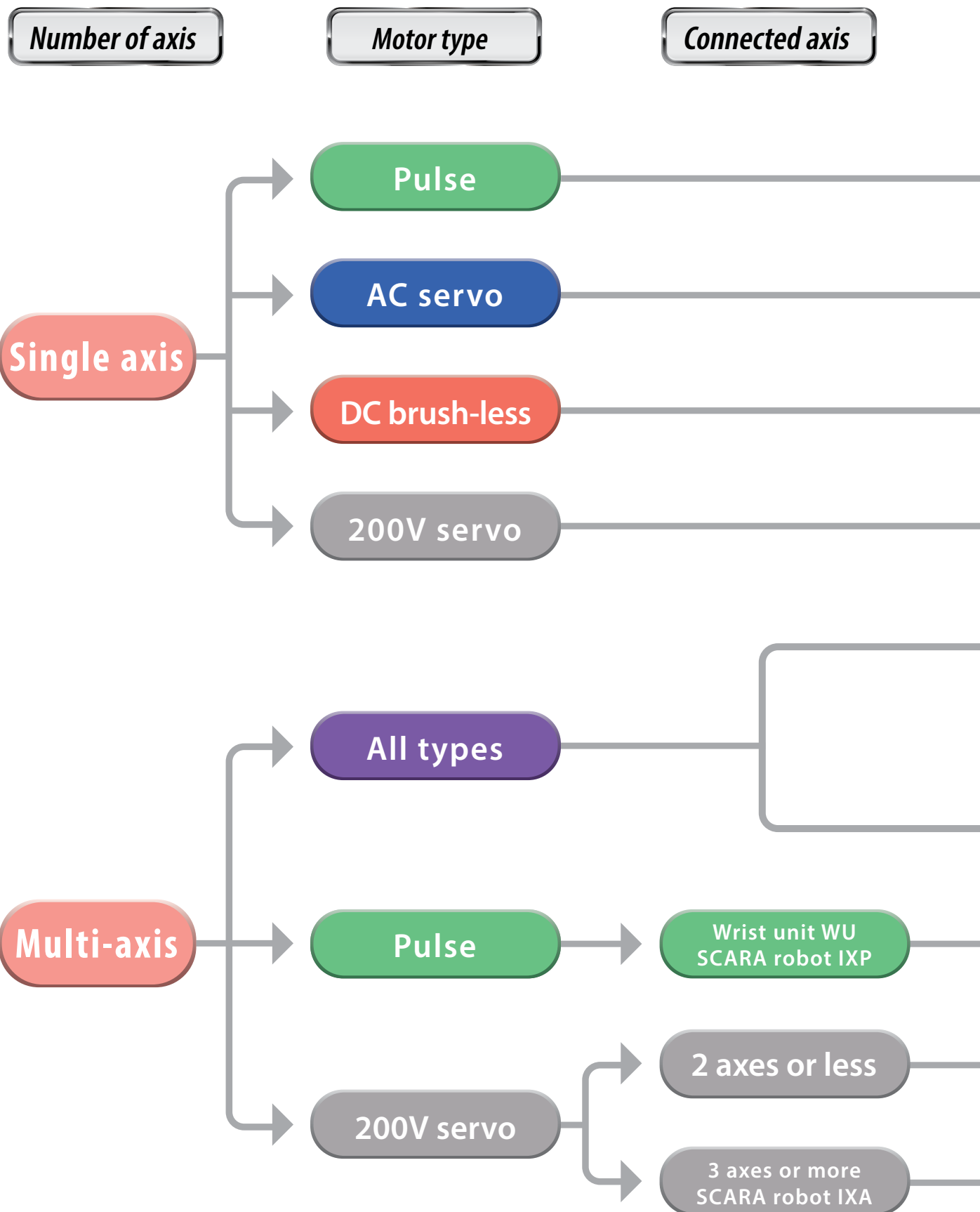
(Note 1) The PC-compatible teaching software "RCM-101-USB" has been integrated into the "IA-OS-C" of this General Catalog.
(The RCM-101 software is included into the IA-OS.)

Models
not shown
here

Model
selection

- RCON
- RSEL
- REC
- RSEL
(Cartesian
6-axis)
- RCP6S
- PCON
-CB/CFB
- PCON
-CBP
(Pulse press)
- PCON
- ACON-CB
DCON-CB
- ACON
DCON
- SCON
-CB
- SCON
-CB
(Servo press)
- SSEL
- MSEL
- XSEL
-RA/SA
- XSEL
-P/Q
- XSEL
(SCARA)
- PSA-24
- TB
-03/02
- Software

Controller model selection - from the actuator



Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB

DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

Interpolation motion

Series

PCON
>> See P8-191

ACON
>> See P8-229

DCON
>> See P8-229

SCON
>> See P8-253

None

RCON
>> See P8-57

Yes

RSEL
>> See P8-103

Yes

MSEL
>> See P8-291

Yes

SSEL
>> See P8-279

Yes

X-SEL
>> See P8-305



Positioner type

This type operates by registering position and velocity information in the position data prior to operation, and specifying the registered number (position No.) externally. It is also possible to directly indicate positions and velocity, using a PLC and a positioning unit. These low-cost controllers are useful.



Program type

These controllers are controlled by programs using IAI's original language (SEL Language). In the case of RSEL, programs can easily be created by a supporting tool. Because general-purpose I/Os, general protocol communications and internal arithmetic operation by variables are possible, it can be operated independently without a host device such as PLC.

Selection according to control method

Selection of controller models - according to control method

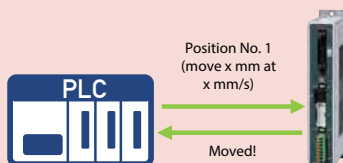
Motion by specified position using I/O signals



RCON **PCON** **ACON** **DCON** **SCON**
RSEL **SSEL** **MSEL** **XSEL**

➤ Select PIO specification. (equipped standard with MSEL)

A "Move" command is sent to the position registered before hand.



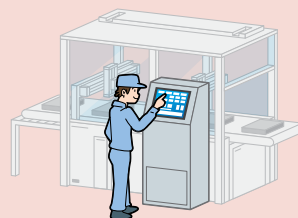
Direct numerical command control from PLC



RCON **PCON** **ACON** **DCON** **SCON**
RSEL **SSEL** **MSEL** **XSEL**

➤ Select field network specification.

Operation is done by indicating positions and velocity freely each time from the touch panel on the equipment, etc.



Interpolation control

(Dispensing and palletizing, etc.)



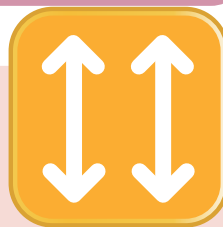
RSEL **SSEL** **MSEL** **XSEL**

➤ IAI original language (SEL Language) is needed to create programs. In the case of RSEL, it can be done easily by the SEL program support tool.

Free motions such as diagonal and arc motions are possible.



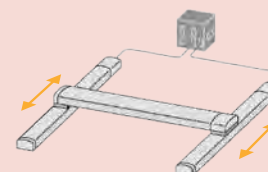
Synchronized control



SSEL **XSEL**

➤ Select a connecting actuator with a limit switch.

Two axes are perfectly synchronized at the same timing.

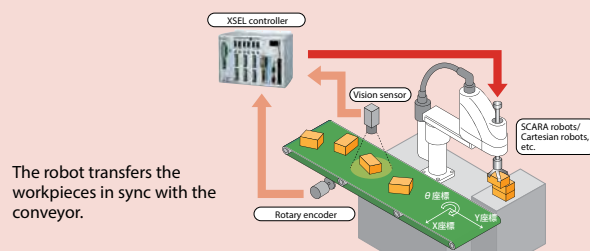


Conveyor tracking



XSEL

➤ Special specification is needed. Contact IAI sales representatives.



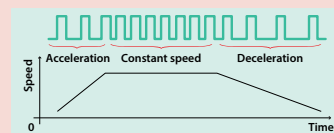
The robot transfers the workpieces in sync with the conveyor.

Rotary encoder



PCON **ACON** **DCON** **SCON**

➤ Select pulse-train specification.



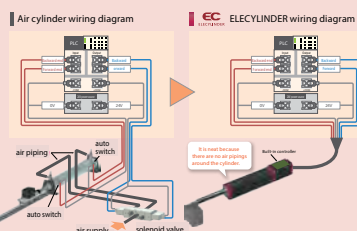
Positions and velocity are indicated by number of pulses and speed.

Replacement of air cylinders



EC **PCON** **ACON** **DCON**

- Select PIO specification.
A solenoid valve mode is available.



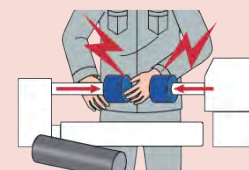
Possible to operate with the same wiring and program as that for the air cylinder.

Torque limit in motion



RCON **PCON** **ACON** **DCON** **SCON**
RSEL **SSEL** **MSEL** **XSEL**

- It is possible to limit the motor current value by the parameter.
(For the PCON, ACON, DCON and SCON, only the pulse-train specification is supported)



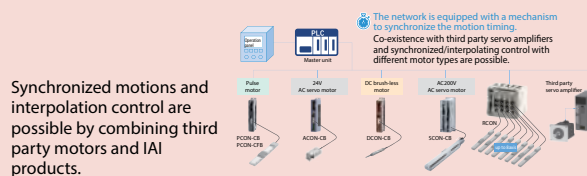
It is possible to stop the actuator in motion when there is an interference with workers or objects.

Motion control



RCON **PCON** **ACON** **DCON** **SCON**

- Select motion specification.



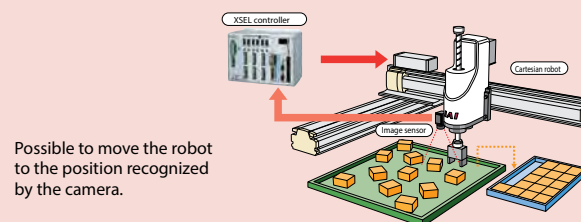
Synchronized motions and interpolation control are possible by combining third party motors and IAI products.

Vision system



TTA **MSEL** **XSEL** **RSEL**

- Connections via Ethernet or RS-232C.



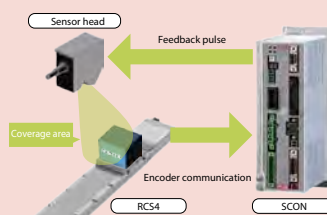
Possible to move the robot to the position recognized by the camera.

Feedback pulse output



SCON

- Select PIO specification.
Field network spec is a special specification.



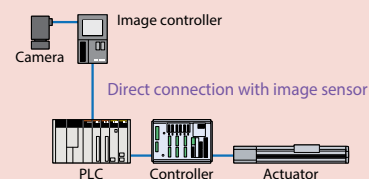
The actuator's motions can be fed back and logged to check if it has moved as commanded.

Direct control by serial communication



RCON **PCON** **ACON** **DCON** **SCON**

- Supports all types of I/Os.



Possible to connect with third party software and hardware using the common protocol.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

Network Compatibility

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

1 Compatible with main field networks

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

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

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



Compatible network and functions

As of February 2022

Controller series		Ellipsis	position controller						program controller					
			PCON -CB	ACON -CB	SCON -CB	SCON-CB (servo press specification)	DCON -CB	RCON	SSEL	TTA	RSEL	MSEL	XSEL -P/Q	XSEL -RA/SA
Field network type	DeviceNet	DV	●	●	●	●	●	●	●	●	●	●	●	●
	CompoNet	CN	●	●	●	●	●	—	—	—	—	—	—	—
	EtherCAT	EC	●	●	●	●	●	●	—	●	●	●	—	●
	EtherCAT Motion	ECM	—	—	—	—	—	●	—	—	—	—	—	—
	EtherNet/IP	EP	●	●	●	●	●	●	●	● (*3)	●	● (*3)	● (*3)	● (*4)
	CC-Link	CC	●	●	●	●	●	●	●	●	●	●	●	●
	CC-Link IE 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					128	20000	30000	36000	30000	20000	55000
Operating method	Position No. Movement by specifying positions		●	●	●	●	●	●	●	●	●	●	●	●
	Direct number Movement by specifying direct values		●	●	●	—	●	●	—	—	—	—	—	—
Reference page for controllers			P8-191	P8-229	P8-255	P8-267	P8-229	P8-57	P8-279	P5-541	P8-103	P8-291	P8-319	P8-305

(*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.

Legend:

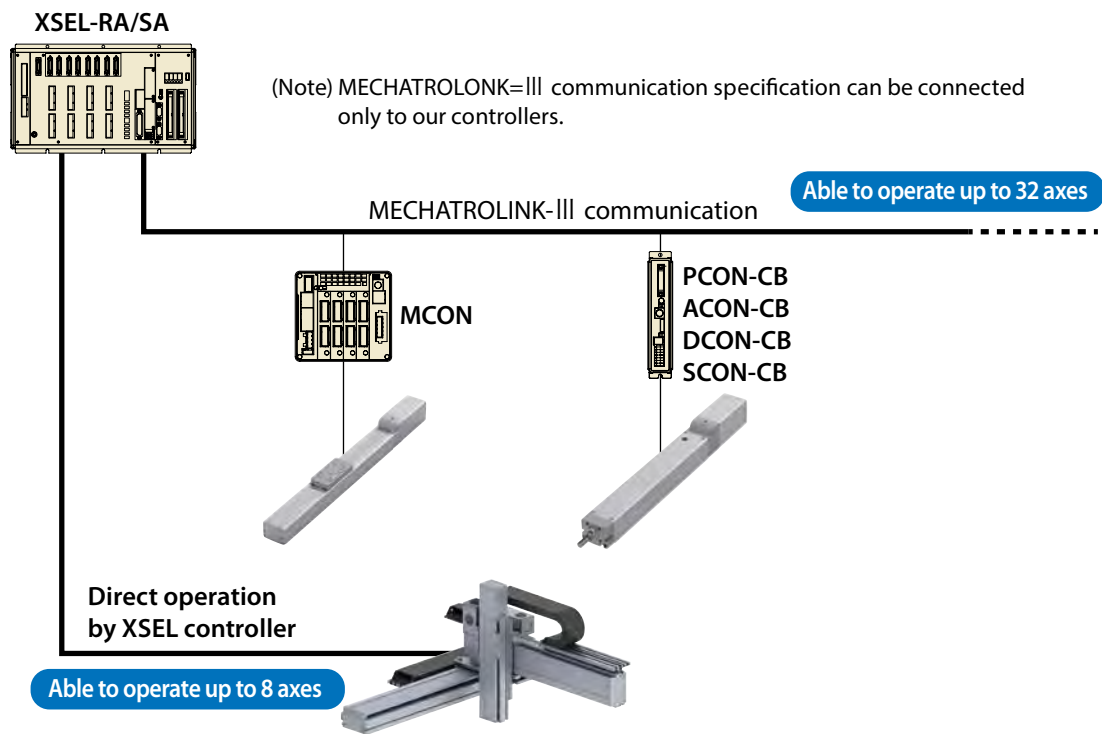
● : Compatible
— : Incompatible

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.



Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

■ Specifications

	MECHATROLINK-III communication method
Compatible controller	XSEL-RA/RAX/RAXD/SA/SAX/SAXD 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

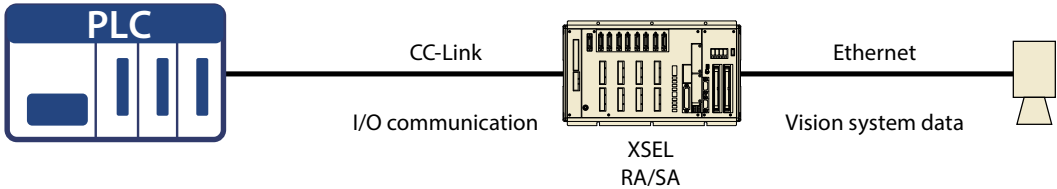
Coordinate values from the camera are stored as position data in the robot controller by dedicated instruction. Communication programs are not necessary.



(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, etc.

* 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 II is compatible with the standard servo profile.
- When controlling rotary actuators using MECHATROLINK III, indexing operations are not possible.
Please contact IAI if to learn more about caution on rotary selections.

<SSCNET III/H> <EtherCAT motion specification>

- When controlling rotary actuators, indexing operations are not possible.
Please contact IAI if to learn more about caution on rotary selections.

Models
not shown
here

Model
selection

RCON
RSEL
REC
RSEL (Cartesian 6-axis)
RCP6S
PCON -CB/CFB
PCON -CBP (Pulse press)
PCON
ACON-CB DCON-CB
ACON DCON
SCON -CB
SCON -CB (Servo press)
SSEL
MSEL
XSEL -RA/SA
XSEL -P/Q
XSEL (SCARA)
PSA-24
TB -03/02
Software

Devices that can be connected to IAI products

IAI products are connectable with various FA devices easily.

1 PLC

1-1 Field network

1-2 Implementation of a smart factory

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

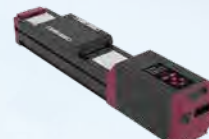
IAI products help achieve a smart factory thanks to IoT and making use of big data.

IAI supports DX (digital transformation) and contributes to "visual operations" such as cycle times.

5

Connection between the ELECYLINDER and devices

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



3 Touch panel

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

Supporting manufacturers

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

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

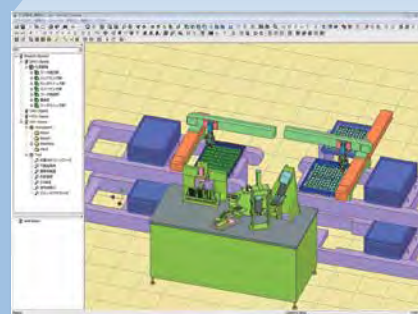
2 Motion network

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



4 3D Simulator

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



Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

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

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

TB
-03/02

Software

Devices that can be connected to IAI products

1 Connection with PLCs

1► Field networks

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

Information control system
to manage the whole production line.

CC-Link IE Field

EtherCAT®

Device system
to manage inside the device.

EtherNet/IP™

PROFINET®

MECHATROLINK

Sensor system
for small volume/multiple branches.

CC-Link

DeviceNet™

PROFIBUS®

CompoNet™

Controllers compatible with field networks



RCON



PCON



ACON



DCON



SCON

Field network operating modes

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

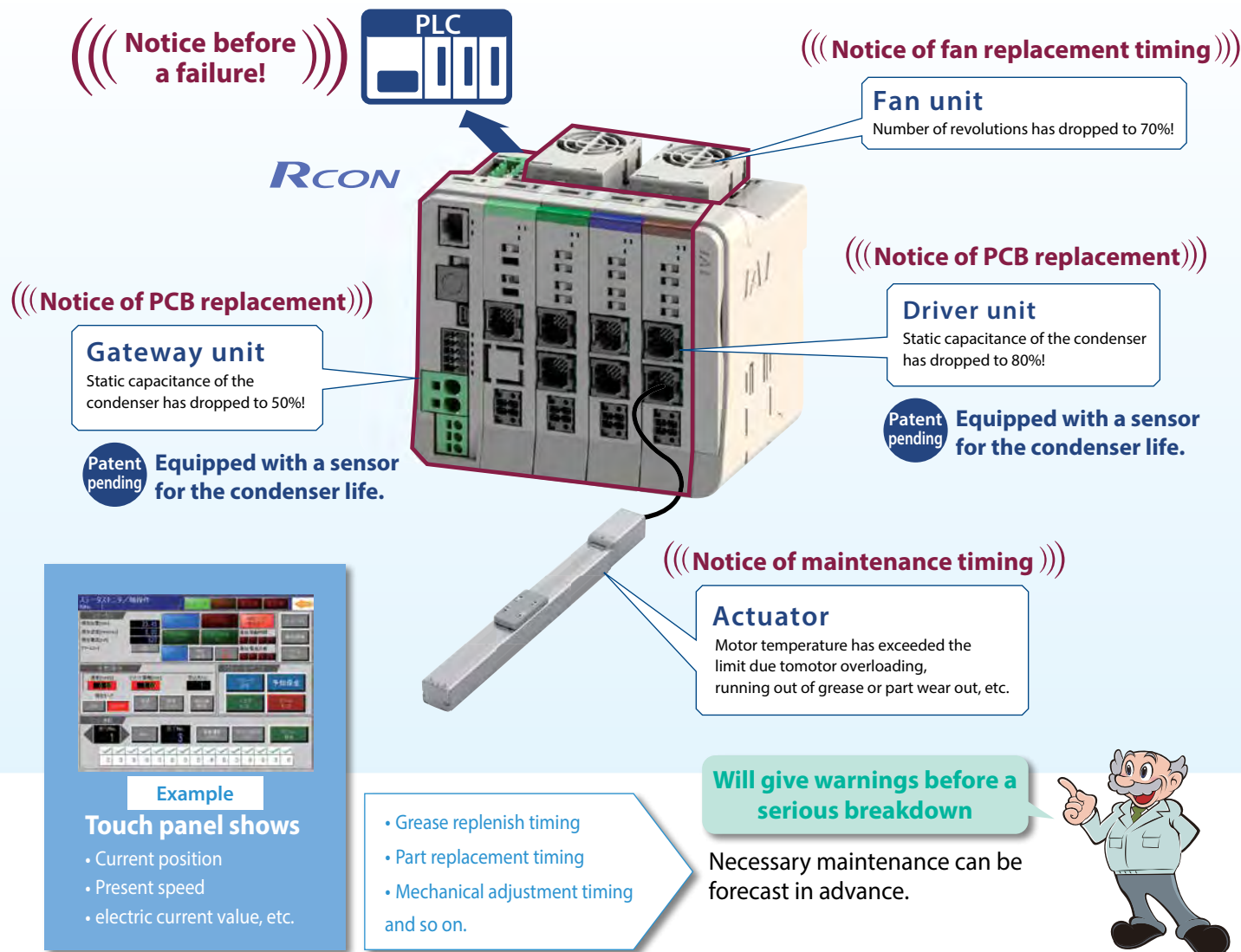
Operation mode	Content	Description
Direct numerical control	Target position, velocity, acceleration/deceleration and push current limit can be designated numerically. present speed and command current value can also be monitored.	PLC Target position, Positioning width, Speed, Acceleration, Push force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

* The above shows typical operating modes for IAI controllers.

* Refer to the Instruction Manual for detail.

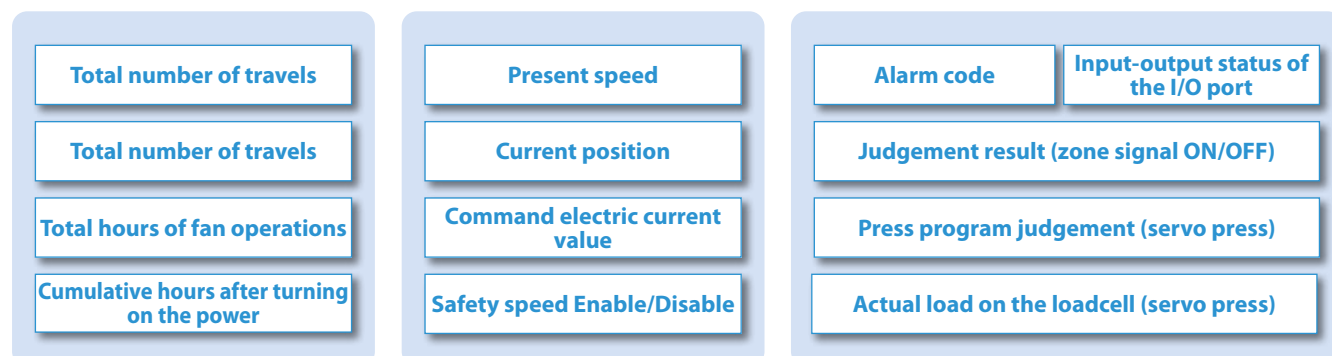
2► Implementation of a smart factory

Supporting IoT by "visualization."



Information that can be uploaded to host unit.

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



Devices that can be connected to IAI products

2 Motion network

A wide variety of controllers support motion network.

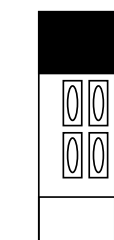


Cost reduction for designing and assembling

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



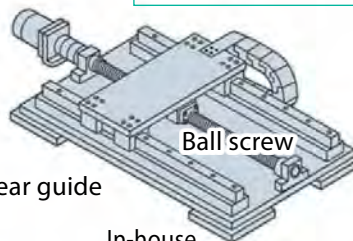
Motion network master unit



Servo driver



Servo motor



Linear guide

In-house positioning equipment

It is necessary to purchase individual parts and spend time for designing and assembling.

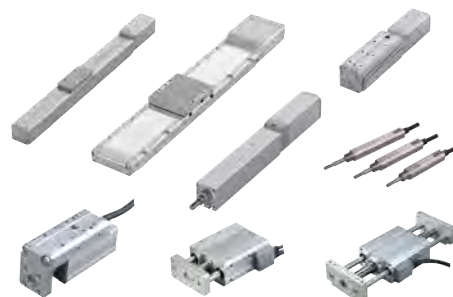
Controllers compatible with motion network



SCON PCON ACON DCON RCON



IAI actuators



Pre-designed and pre-assembled unit products

Controller
Models not shown here
Model selection
RCON
RSEL
REC
RSEL (Cartesian 6-axis)
RCP6S
PCON -CB/CFB
PCON -CBP (Pulse press)
PCON
ACON-CB
DCON-CB
ACON
DCON
SCON -CB
SCON -CBP (Servo press)
SSEL
MSEL
XSEL -RA/SA
XSEL -P/Q
XSEL (SCARA)
PSA-24
TB -03/02
Software

Controllers compatible with motion network

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

About each controller

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

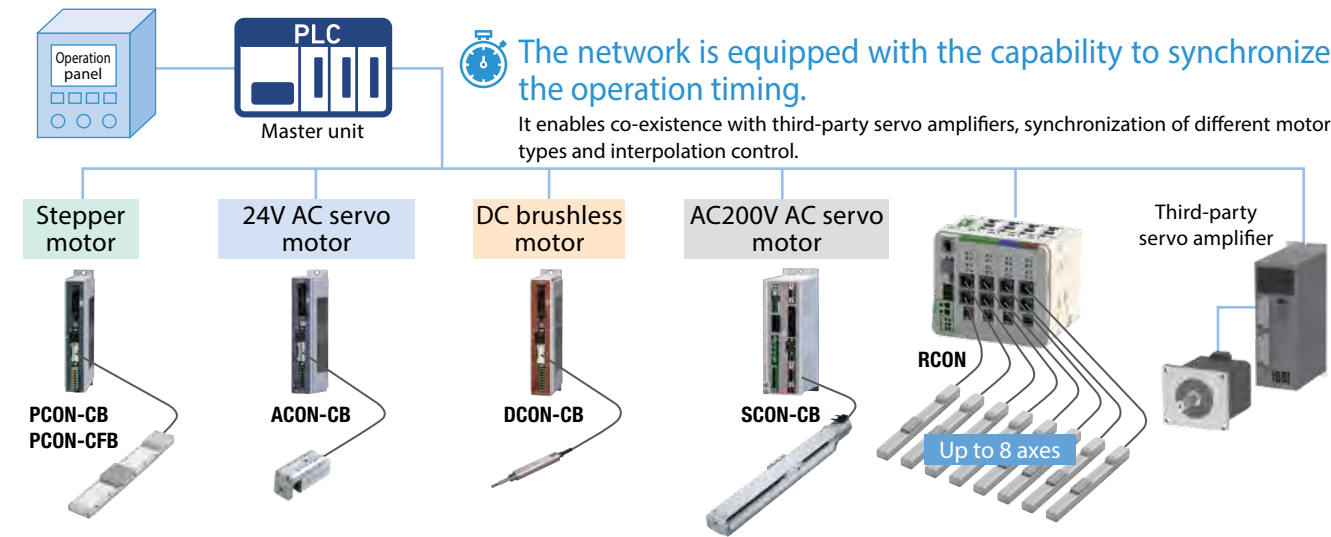
SCON
Single-axis controller for a 200V AC servo motor.

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

Compatible

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

Connection image



A variety of monitoring from the PLC

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

- Position
- Velocity
- Electric current value, number of revolutions

It is also possible to set up various parameters.

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



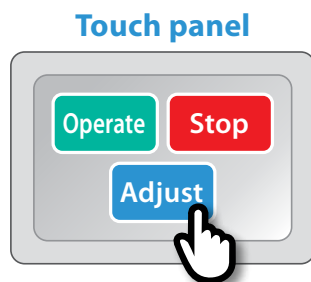
Example) Monitoring of position, velocity and electric current value by SysmacStudio (made by OMRON).

Devices that can be connected to IAI products

3 Connection with the touch panel

1▶ Connection method

Direct connection with the touch panel



Modbus protocol



IAI dedicated protocol



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

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

Specific example

Example Testing equipment



Display and control are integrated into one

LT4000M series

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



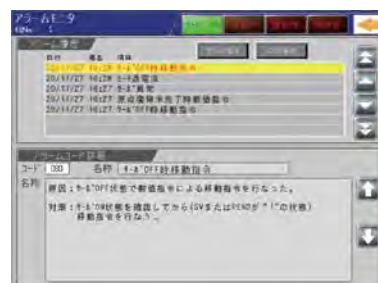
Status monitor








Preventive maintenance



Alarm code monitor

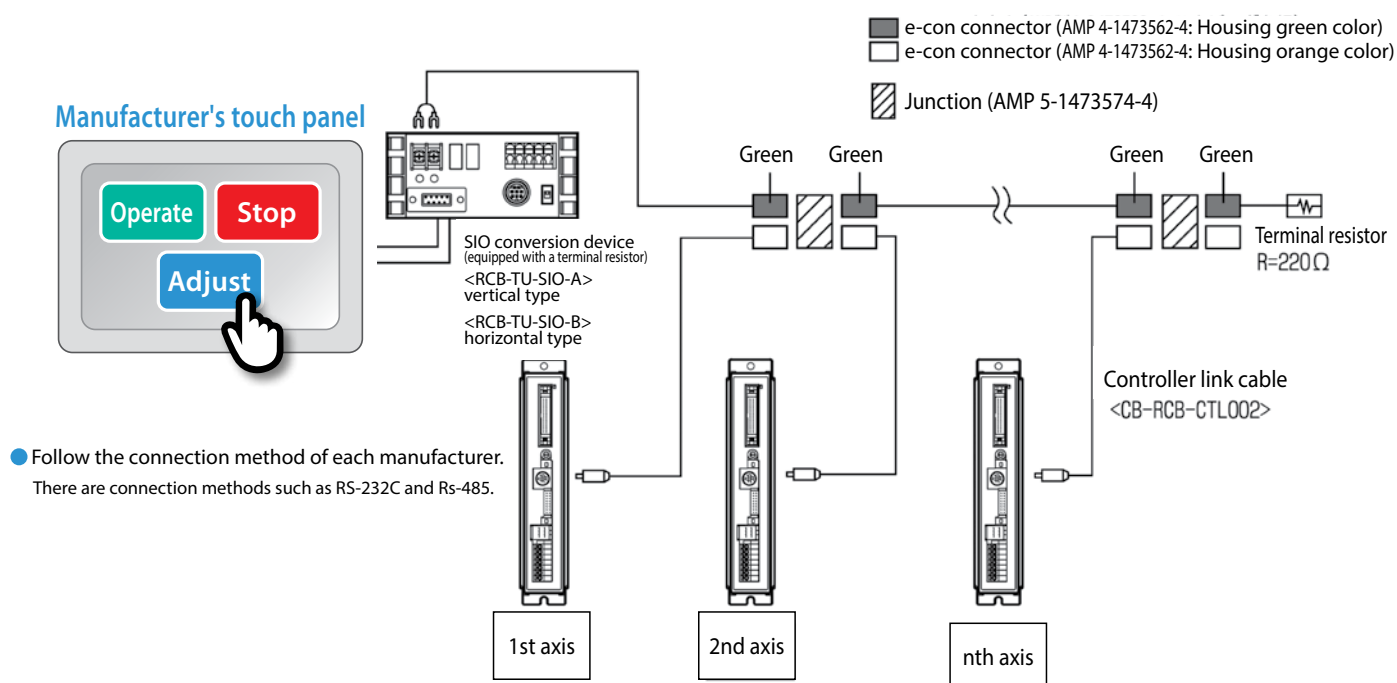


2 ▶ Compatible manufacturers (direct connection with the touch panel)

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

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

Basic connection example (for multiple axis connection)

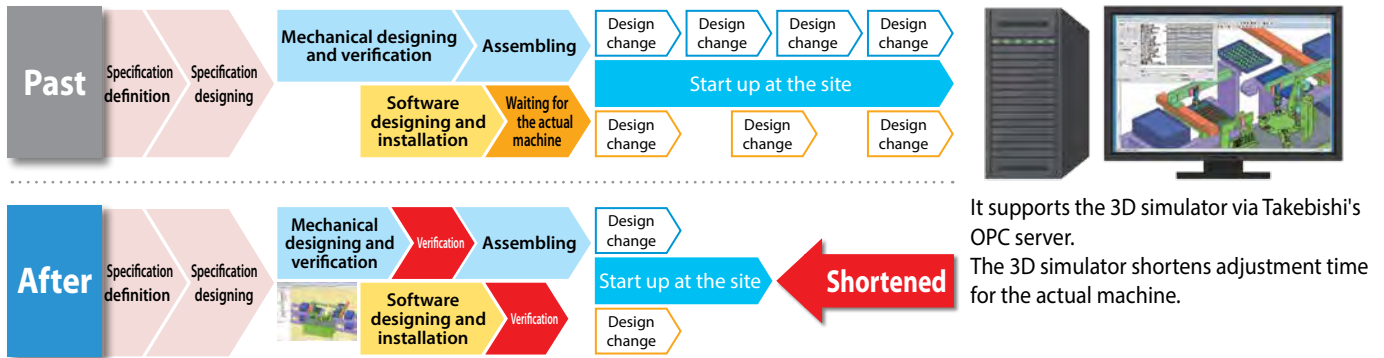


Devices that can be connected to IAI products

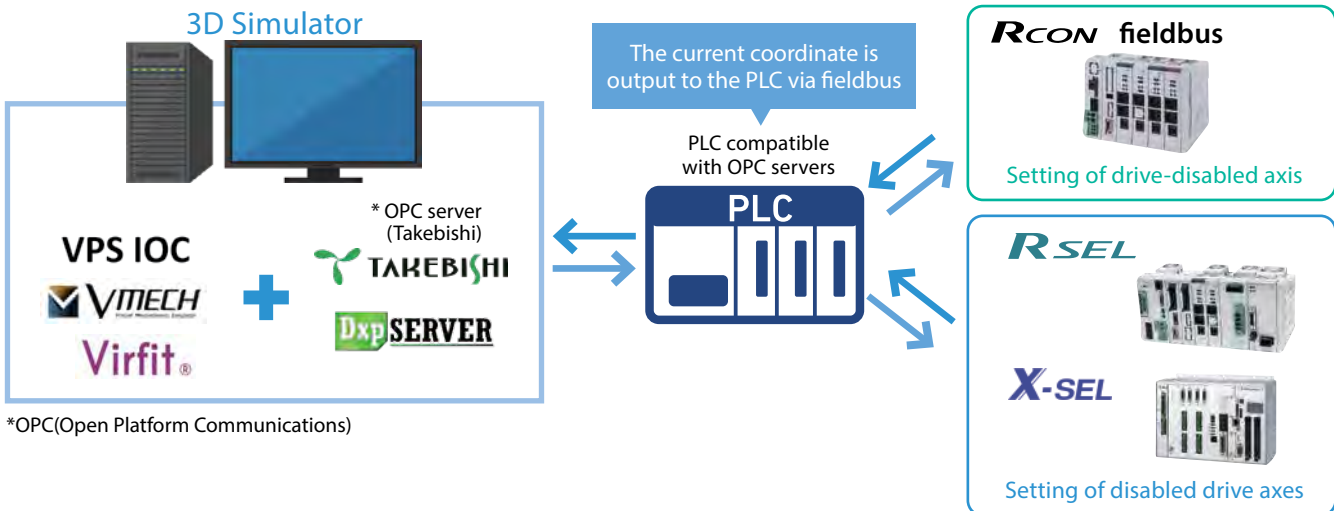
4 Connection with the 3D simulator

Reduced work for control software developers

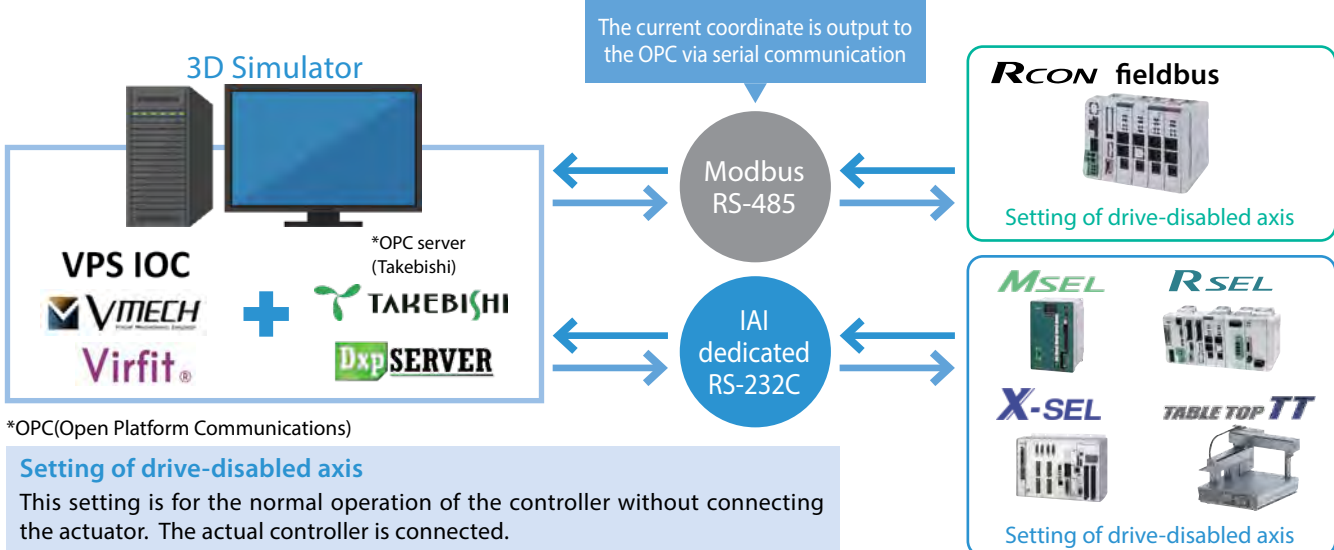
- In-advance verification using the virtual mechanism made of a 3D CAD model is possible.
- It is possible to shorten the lead time for manufacturing and to reduce man-hour for reworking.



Connection using field networks



Connection using serial communication



5 Connection between an ELECYLINDER and devices

Connection with field networks

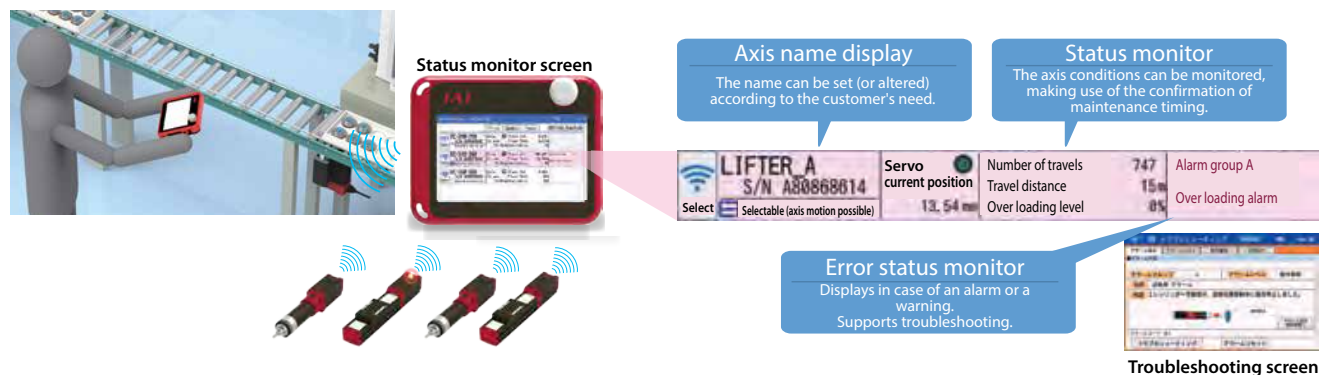


I/O signals can be transmitted via network to operate the ELECYLINDER.

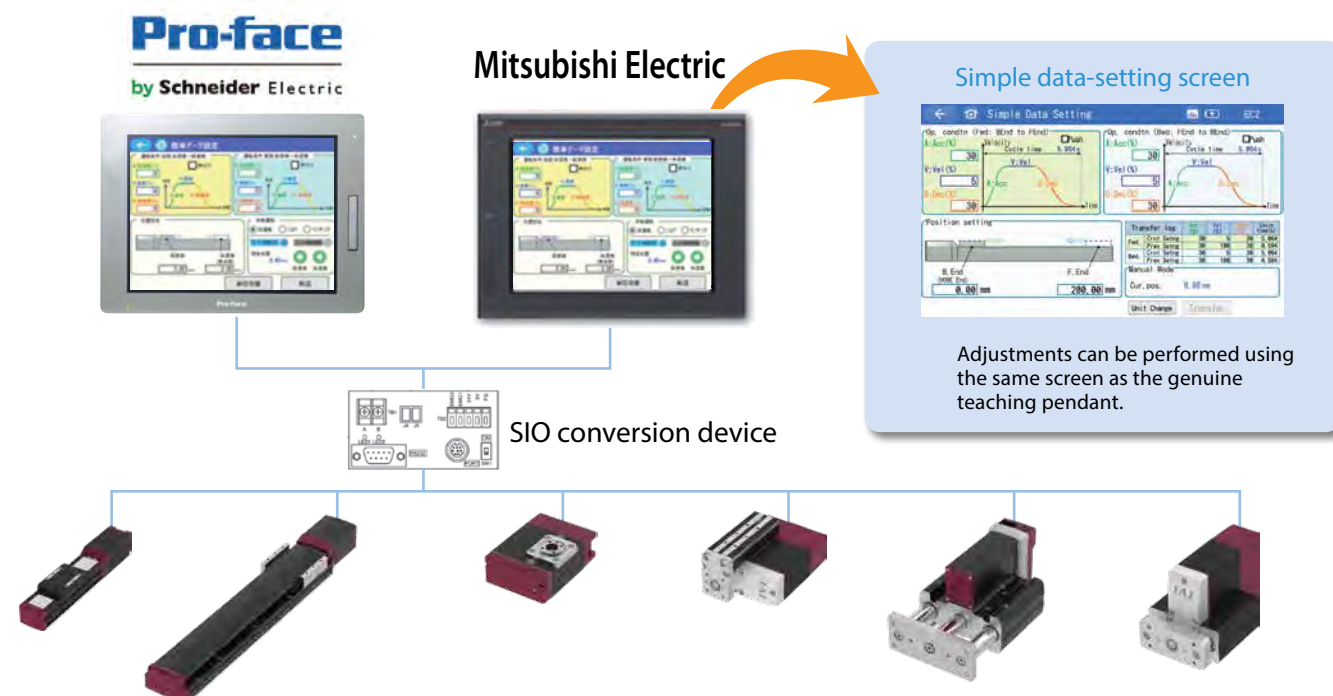


Wireless teaching

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



Direct connection between the touch panel and ELECYLINDER



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

Safety Category Compliant Types

<Compliance of controllers with the Safety category>

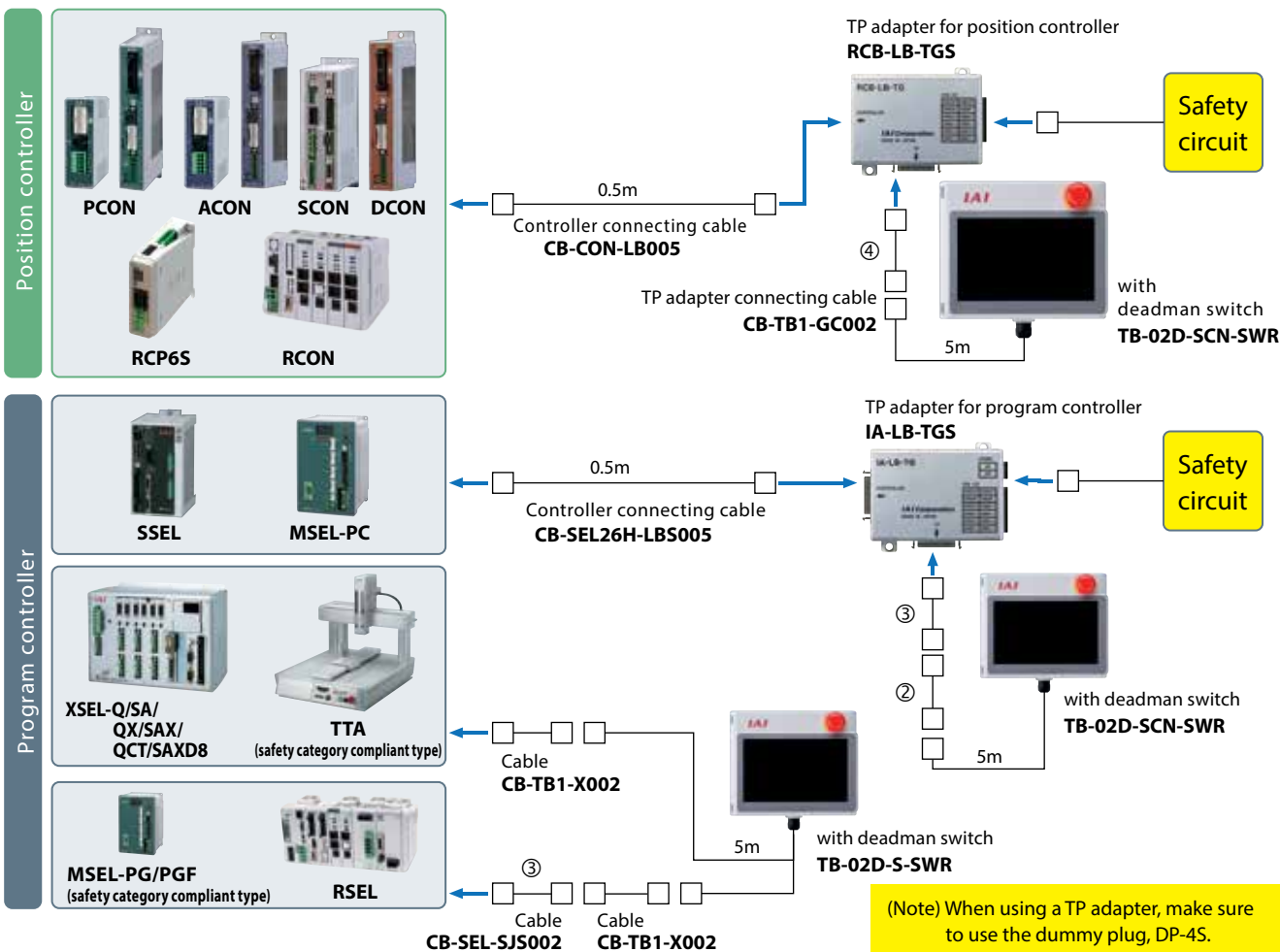
When building a system in compliance with the safety category (ISO 13849-1), use a touch panel teaching pendant (TB-02D) and a TP adapter (RCB-LB-TGS, IA-LB-TGS).

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

Controller type	Safety category	ISO standard
RCON-GWG	B~4	ISO13849-1
PCON-CGB/CGFB	B~4	
ACON-CGB	B~4	
DCON-CGB	B~4	
SCON2-CG	B~4	
SCON-CGB	B~4	
RSEL-G	B~4	
MSEL-PG/PGF	B~4	
XSEL-SA/SAX/SAXD8	B~4	
XSEL2	B~4	
TTA- <input type="checkbox"/> G	B~4	

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

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



MEMO

Controller

Models
not shown
here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

R-unit

Unit-linkage type controller



The R-unit is the unit-connecting controller series that can combine connecting actuators and control methods freely

Positioner Type

RCON



R-unit



Program Type

RSEL



ELECYLINDER Drive Unit

REC

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

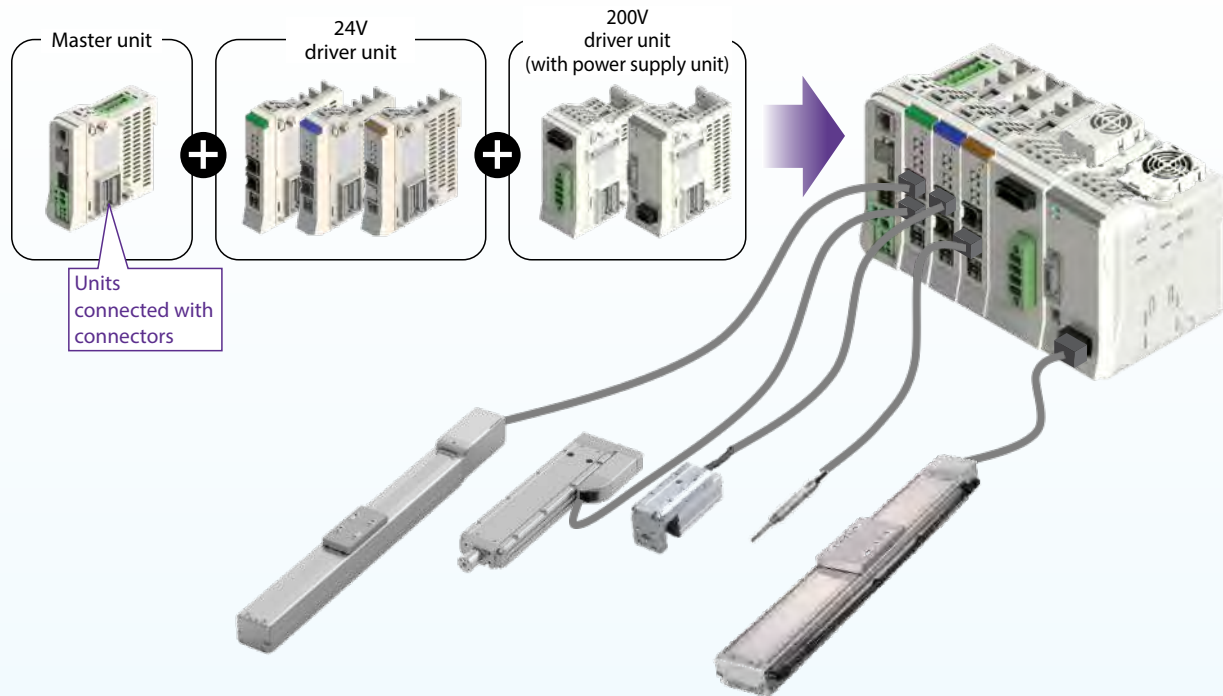
TB
-03/02

Software

Unit-connecting controllers support a wide array of combinations!

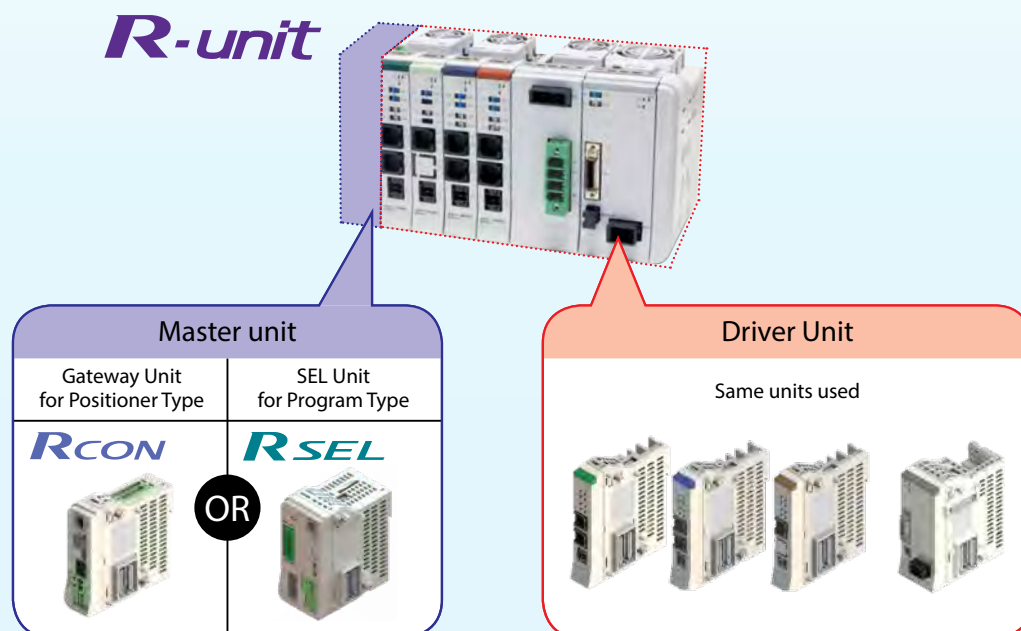
Combine a driver unit with the exact number of required axes for a more compact controller and reduced installation space.

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.



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

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

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

* Connectable networks differ depending on the series.

CC-Link CC-Link IE Field DeviceNet EtherNet/IP

EtherCAT

PROFI BUS

PROFI NET

MECHATROLINK

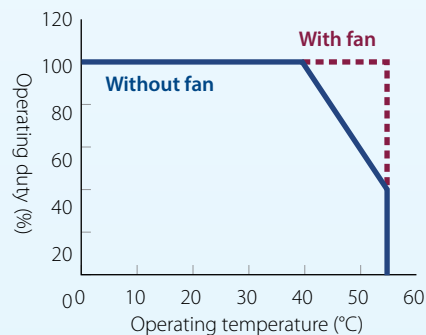
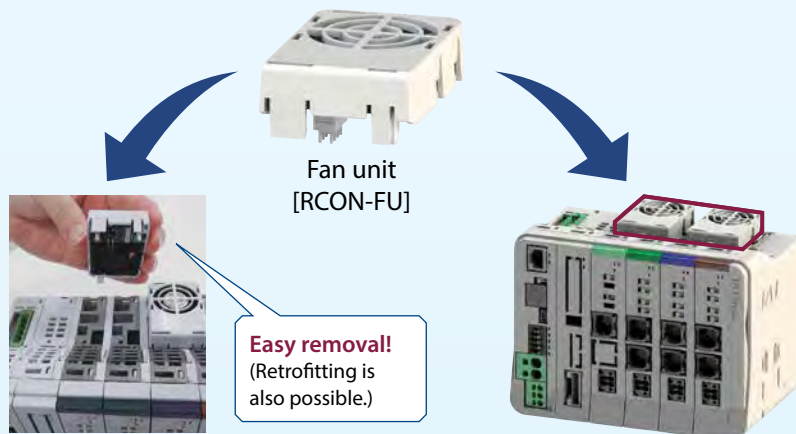
SSCNET III/H
SERVO SYSTEM CONTROLLER NETWORK

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

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

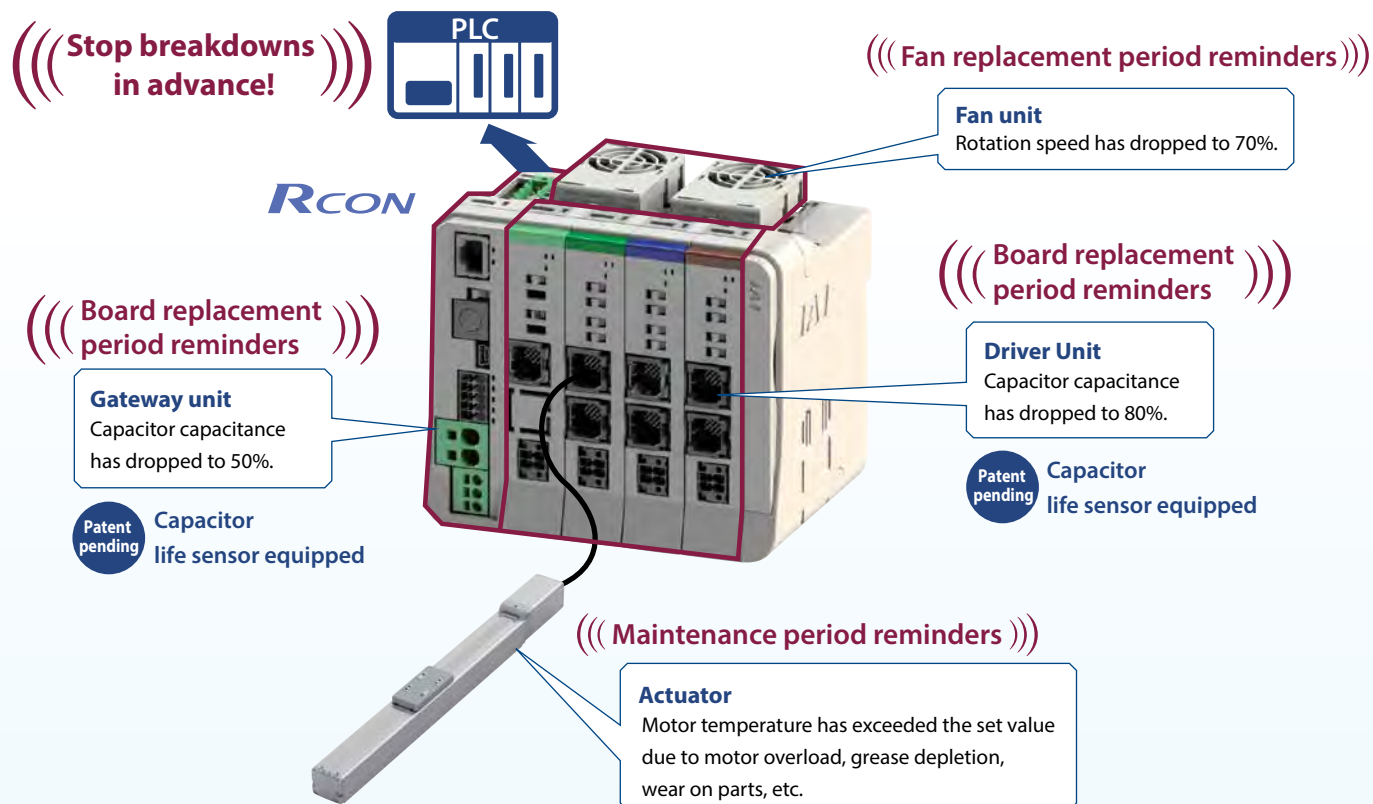
* Simple absolute units support 0~40°C.

REC supports 55°C without a fan.



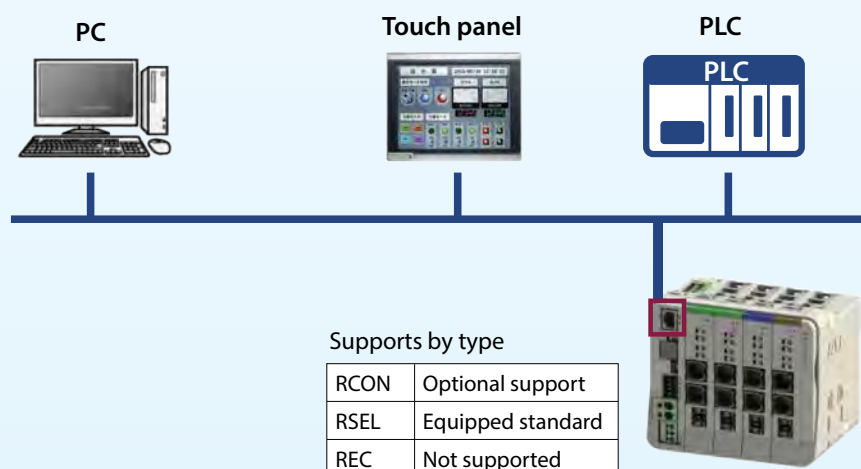
High function3 Predictive maintenance/preventative maintenance function

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



High function4 Ethernet-equipped

Supports Ethernet connections. (Excluding REC.)



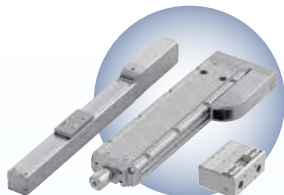
High function5 Highest number of connection actuators in the industry! Can be connected with over 1000 IAI actuators

* See P.8-71 for connectable actuators.

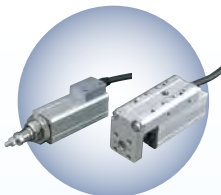
● Models with 24V motors

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

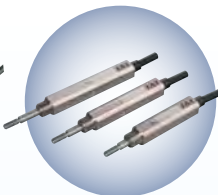
RCP Series



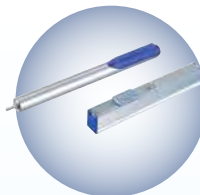
RCA Series



RCD Series



RCL Series



24V driver unit



WU Series



IK Series



EC Series



EC connection unit

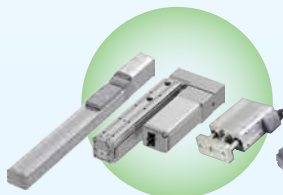


● Models with 200V motors

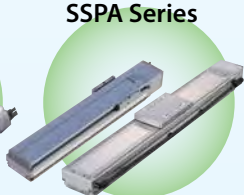
These products are capable of driving actuators equipped with 200V, 60W to 750W motors. 200V driver units support actuators equipped with battery-less absolute encoders and incremental encoders.

When connecting to extended unit+SCON, actuators equipped with 12W to 3300W motors are operable and all encoders are supported

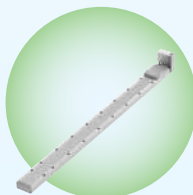
RCS Series



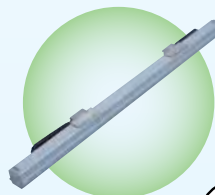
IS(D)B Series
SSPA Series



IF(A) Series



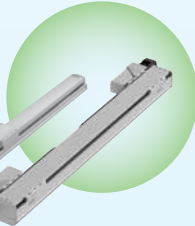
LSA Series



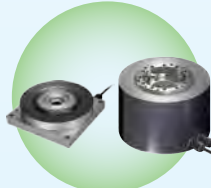
200V driver unit
+ power supply unit



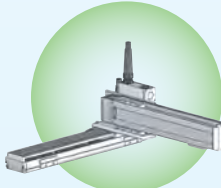
NS(A) Series



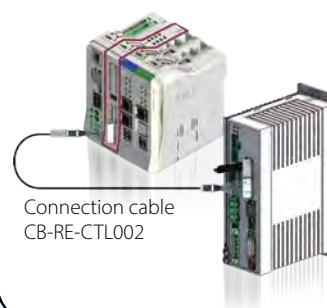
DD(A) Series



ICSB Series



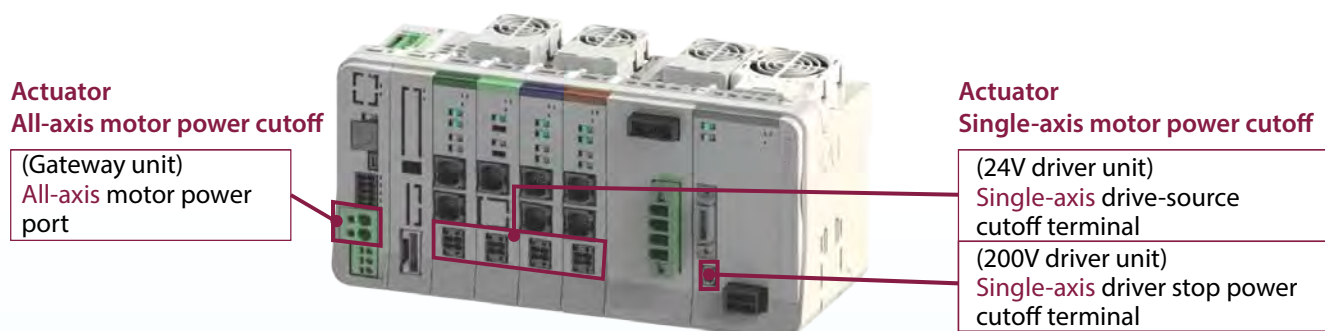
Expansion unit
+ SCON connection



Connection cable
CB-RE-CTL002

High function6 Motor power cutoff method can be selected

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

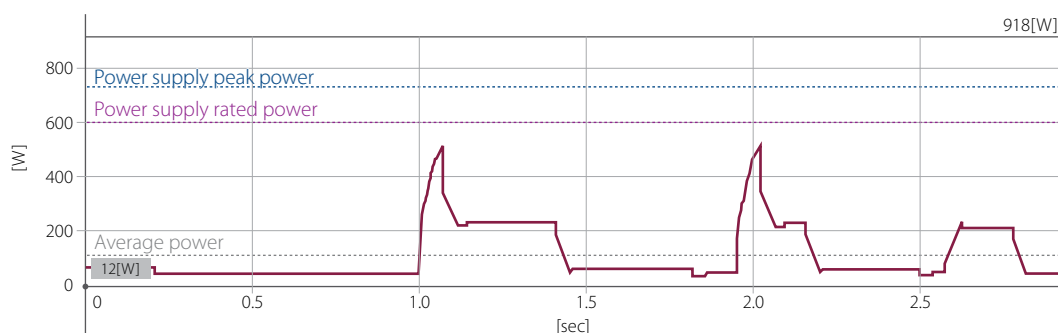


High function7 Helps visualize equipment with 24V power monitor

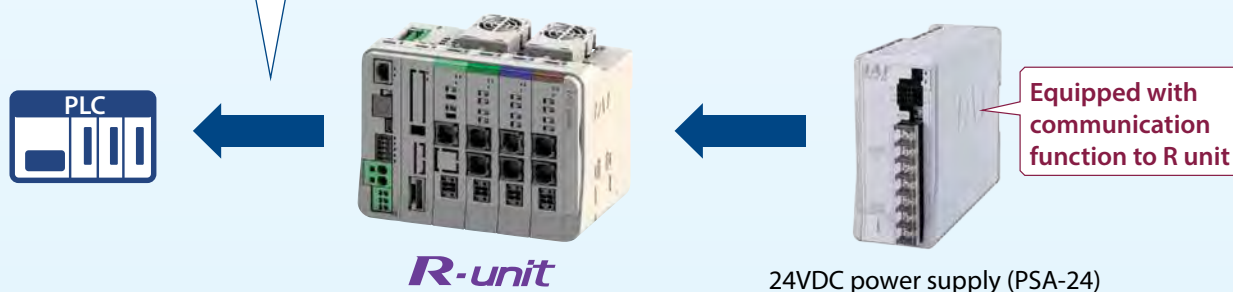
Helps visualize equipment.

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.
* Not supported for motion control operations.



Power supply calculator

PSA-24 is recommended for the 24V power source that is connected to the R-unit.

The "Calculator" software calculates optimal power supply capacity using a simulation for actuator operations to determine the number of required power units.



- 1 Enter the operating conditions of the actuator to be connected to set up an operation pattern. The operation pattern can be selected by icon.



- 2 The power capacity and required number of power units are displayed.

Operation pattern	
Calculation result	
Peak power value	522.86 [W]
Average power	108.07 [W]
Required number of PSA-24	
<input checked="" type="radio"/> with FAN	2 units
<input type="radio"/> without FAN	2 units

Number of 24V power units is displayed (PSA-24)

2 units are necessary!



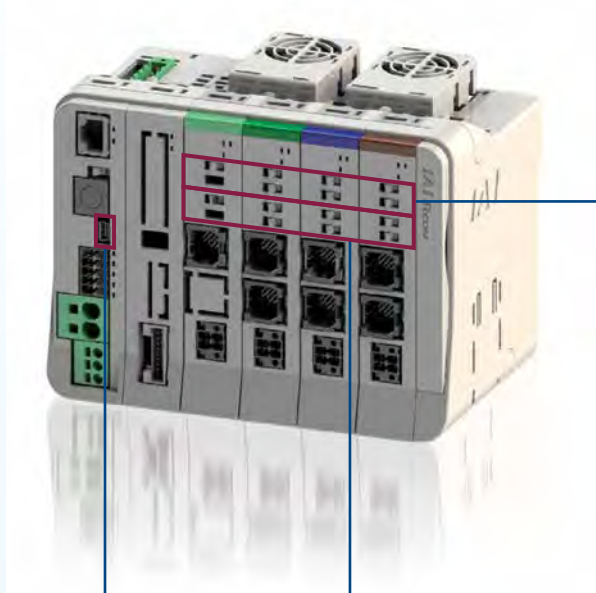
Where to get the "Calculator" software.



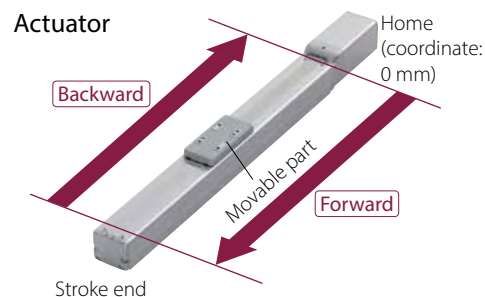
Calculator software comes with IA-OS software.

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.



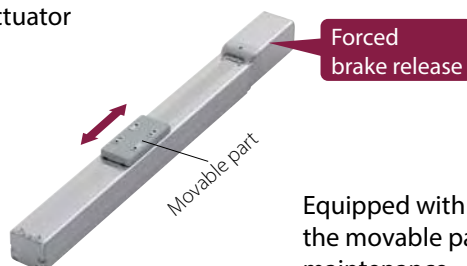
Each axis JOG (+/-) switch



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

MEMO

Models
not shown
here

Model
selection

RCO

RSE

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCO
-CB/CFB

PCO
-CBP
(Pulse press)

PCO

ACO-CB
DCO-CB

ACO
DCO

SCO
-CB

SCO
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

MEMO

Models
not shown
here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

MEMO

Models
not shown
here

Model
selection

RCO

RSE

REC

RSE
(Cartesian
6-axis)

RCP6S

PCO
-CB/CFB

PCO
-CBP
(Pulse press)

PCO

ACO-CB
DCO-CB

ACO
DCO

SCO
-CB

SCO
-CB
(Servo press)

SSE

MSE

XSE
-RA/SA

XSE
-P/Q

XSE
(SCARA)

PSA-24

TB
-03/02

Software

MEMO

Models
not shown
here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

MEMO

Models
not shown
here

Model
selection

RCO

RSE

REC

RSE
(Cartesian
6-axis)

RCP6S

PCO
-CB/CFB

PCO
-CBP
(Pulse press)

PCO

ACO-CB
DCO-CB

ACO
DCO

SCO
-CB

SCO
-CB
(Servo press)

SSE

MSE

XSE
-RA/SA

XSE
-P/Q

XSE
(SCARA)

PSA-24

TB
-03/02

Software

MEMO

Models
not shown
here

Model selection

RCON

RSEL

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

R-unit

The selection process

The selection process using the printed catalog is explained.

R-unit Selection method

The selection flow in which the "R-unit model selection system" is not used is shown here.








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

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

Applicable controller

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

Name	External view	Max. connectable axes	Power supply voltage	Control method														Max. positioning points	Reference page	
				Positioner	Pulse train	Program	Network * select													
DV	CC	CIE	PR				CN	ML	ML3	EC	EP	PRT	SSN	ECM						
MSEL-PC/PG		4	Single phase AC100-230V	—	—	●	●	●	—	●	—	—	—	●	●	●	—	—	30000 (768 for network specification)	8-291
PCON-CB/CGB		1	DC24V	● * Select	● * Select	—	●	●	●	●	●	●	●	●	●	●	—	—	512	8-191
PCON-CYB/PLB/POB		1		● * Select	● * Select	—	—	—	—	—	—	—	—	—	—	—	—	—	64	8-217
RCON		16 (8 for ML3, SSN, ECM)		—	—	—	●	●	●	●	—	—	—	●	●	●	●	●	128 (No position data for ML3, SSN, ECM)	8-57
RSEL		8		—	—	●	●	●	●	—	—	—	●	●	●	—	—	36000	8-103	

Legend:
● : Compatible
— : Incompatible

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

(Note) Refer to P8-15 for abbreviated network such as DV and CC.

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

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

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

| Note |

- Refer to P8-71 for actuators that are not connectable.

Model Selection

Confirm the control method and the maximum number of connected axes as well as the "selection process" for each unit.

Positioner Type

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

Max. number of connected axes:
16 axes



RCON

Refer to the selection pages beginning from P. 8-57

Program Type

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

Max. number of connected axes:
8 axes



RSEL

Refer to the selection pages beginning from P. 8-103

ELECYLINDER Unit

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

Max. number of connected axes:
16 axes



REC

Refer to the selection pages beginning from P. 8-145

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

RCON Selection method

Step
1Step
2Step
3Step
4

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

Step

1 Selection of the master unit

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



✓ Master unit model



RCON - [] - [] - []

Series

Type

I/O

Option

GW	Standard type
GWG	Safety category compatible type

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

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

| Note |

- The number of maximum connectable axes differs depending on the I/O type. Refer to P8-89 for details.
- The number of fan units to be installed is one half of the total number of the 24V driver units that are selected in Step 2. If the total number of 24V driver units is an odd number, add "1."
- When selecting RCON-SC-1 at Step 2, choose "without terminal unit."
- There is a limit for connected actuator axes. Refer to P8-115 for details.

Step

2

Selection of driver unit model

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

Driver unit model



RCON - [] - []

Series

Type

Number of axes

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

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

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

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

Type	Motor type
24V specification	PC
	20P 20□ stepper motor
	20SP 20□ stepper motor (for RA* C)
	28P 28□ stepper motor
	35P 35□ stepper motor
	42P 42□ stepper motor
	42SP 42□ stepper motor (for RCP4-RA5C)
	56P 56□ stepper motor
	56SP 56□ high-thrust type stepper motor
	60P 60□ high-thrust type stepper motor
	86P 86□ high-thrust type stepper motor
	PCF
200V specification	AC
	2 2W servo motor
	5 5W servo motor
	10 10W servo motor
	20 20W servo motor
	20S 20W servo motor (for RCA2-SA4/RCA-RA3)
	30 30W servo motor
	3D 2.5W DC brushless motor
	DC
	30R 30W (for RS)
	60 60W servo motor
	100 100W servo motor
	100S 100W servo motor (for LSA)
	150 150W servo motor
	200 200W servo motor
	200S 200W servo motor (for LSA and DD)
	300S 300W servo motor (for LSA)
	400 400W servo motor
	600 600W servo motor
	750 750W servo motor

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

* Supplied with a terminal unit, select one power unit.
Equipped standard with a fan unit.

Power unit model



RCON - **PS2** - **3**

Series

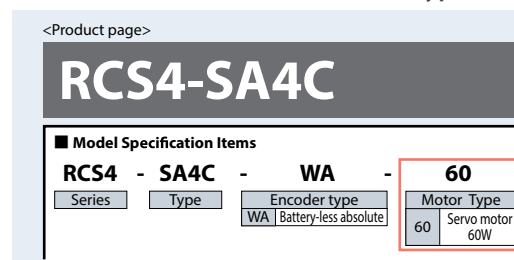
Type

Power supply voltage

3	3-phase/Single phase 200V
---	---------------------------

CHECK!

Confirmation method of the motor type



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

* Refer to P8-62 for details of the simple absolute unit.

Simple absolute unit model



RCON - **ABU** - []

Series

Absolute unit

Type

P	Stepper motor
A	AC servo motor

When connecting an ELECYLINDER, select an EC connection unit.

Up to 4 axes can be connected to one unit.

(Note) Cannot be connected to motion network.

EC connection unit model



RCON - **EC** - **4**

Series

Type

Number of axes

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

Step

3

Model selection of the expansion unit

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

(Note) The unit with PIO cannot be connected to motion network.

* See P8-64 for details.



Expansion unit model



RCON

Series

Expansion

I/O cable length

EXT	SCON expansion	0	No cable
EXT-NP	PIO/SIO/SCON expansion (NPN spec)	2	2m (standard)
EXT-PN	PIO/SIO/SCON expansion (PNP spec)	3	3m
		5	5m

* No need to select when SCON expansion (EXT) is selected.



SCON controller model

SCON

Type

Motor type

Encoder type

Option

RC

I/O type

0

I/O cable length

Power supply voltage

Refer to P8-255 for model selection items.



When using with remote I/O, select the following unit.

* Refer to P8-70 for details.



PIO unit model



RCON

Series

Expansion

I/O cable length

NP	PIO expansion (NPN)	0	No cable
PN	PIO expansion (PNP)	2	2m (standard)
		3	3m
		5	5m

Step

4

Confirming the power supply capacity (connectability check)



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

① Control power capacity

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

* Refer to P8-77 for the power capacity.

Item	Electric current limit value
Control power	Less than 9.0A

② Motor power capacity

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

* Refer to P8-77 for the electric current value for each motor..

Item	Electric current limit value
Motor power	Less than 37.5A

③ Motor wattage

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

* Calculate the wattage value of each actuator motor type.

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

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

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

RSEL Selection method

Step
1Step
2Step
3Step
4

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

Step

1 Selection of the master unit

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



Master unit model



RSEL – G – – –

Series Type I/O I/O cable length Option

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

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

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

FU <input type="checkbox"/>	Equipped with fan unit (<input type="checkbox"/> : specify the number from 1 to 5)
TRN	Without terminal unit

Note

- The number of fan units to be installed is one half of the total number of the 24V driver units that is selected in Step 2. If the total number of 24V driver units is an odd number, add "1."
- When selecting RCON-SC-1 in Step 2, choose "without terminal unit."
- There is a limit on the number of connectable actuator axes. Refer to P8-115 for details.


Step

2

Selection of driver unit model

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

Driver unit model



RCON - [] - []

Series Type Number of axes

PC	Stepper motor	1	1-axis spec.
PCF	High-thrust stepper motor	2	2-axis spec.
AC	AC servo motor		
DC	DC brushless motor		
SC	200V AC servo motor		


* Type: PCF and SC are selected only 1-axis.
* Type: SC is equipped standard with a fan unit.

Type	Motor type
24V specification	20P 20 stepper motor
	20SP 20 stepper motor (for RA* C)
	28P 28 stepper motor
	35P 35 stepper motor
	42P 42 stepper motor
	42SP 42 stepper motor (for RCP4-RA5C)
	56P 56 stepper motor
	56SP 56 high-thrust type stepper motor
	60P 60 high-thrust type stepper motor
	86P 86 high-thrust type stepper motor
	2 2W servo motor
	5 5W servo motor
200V specification	10 10W servo motor
	20 20W servo motor
	20S 20W servo motor (for RCA2-SA4/RCA-RA3)
	30 30W servo motor
	3D 2.5W DC brushless motor
	30R 30W (for RS)
	60 60W servo motor
	100 100W servo motor
	100S 100W servo motor (for LSA)
	150 150W servo motor
	200 200W servo motor
	200S 200W servo motor (for LSA and DD)
	300S 300W servo motor (for LSA)
	400 400W servo motor
	600 600W servo motor
	750 750W servo motor

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

* Supplied with a terminal unit, select one power unit.
Equipped standard with a fan unit.

Power unit model



RCON - **PS2** - **3**


Series Type Power supply voltage

3 3-phase/Single phase 200V

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

* Refer to P8-106 for details of the simple absolute unit.

Simple absolute unit model



RCON - **ABU** - []

Series Absolute unit Type

P	Stepper motor
A	AC servo motor

CHECK!

Confirmation method of the motor type

<Product page>

RCS4-SA4C

Model Specification Items


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

When connecting an ELECYLINDER,
select the EC connection unit.

One unit can connect up to 4 axes.

(Note) Motion network cannot be connected.

EC connection unit model



RCON - **EC** - **4**

Series Type Number of axes

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

Step

3

Model selection of the expansion unit

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

* See P8-69 for details.



Expansion unit model



RCON — [] — []
Series Expansion I/O cable length

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

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

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



SCON controller model

SCON — [] — [] — [] — [] — **RC** — **0** — []
Type Motor type Encoder type Option I/O type I/O cable length Power supply voltage



Refer to P8-255 for model selection items.

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

* See P8-108 for details.



PIO unit model



RCON — [] — []
Series Expansion I/O cable length

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

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

Step

4

Confirming the power supply capacity (connectability check)



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

① Control power capacity

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

* Refer to P8-121 for the power capacity.

Item	Electric current limit value
Control power	Less than 9.0A

② Motor power capacity

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

* Refer to P8-121 for the electric current value for each motor..

Item	Electric current limit value
Motor power	Less than 37.5A

③ Motor wattage

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

* Calculate the wattage value of each actuator motor type.

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

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

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

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

Step

1

Selection of the master unit

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

✓ Master unit model



REC – GW –

Series Type I/O type

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



Step

2

Selection of EC connection unit

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

✓ EC connection unit model



RCON – EC – 4

Series Type Number of axes

Models
not shown
hereModel
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

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

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

TB
-03/02

Software

Step

3

Confirming the power supply capacity (connectability check)



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

① Control power capacity

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

* Refer to P8-151 for the power capacity.

Item	Electric current limit value
Control power	Less than 9.0A

② Motor power capacity

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

* Refer to P8-151 for the electric current value for each motor..

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



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

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

RCON

Unit-connecting type
position controller

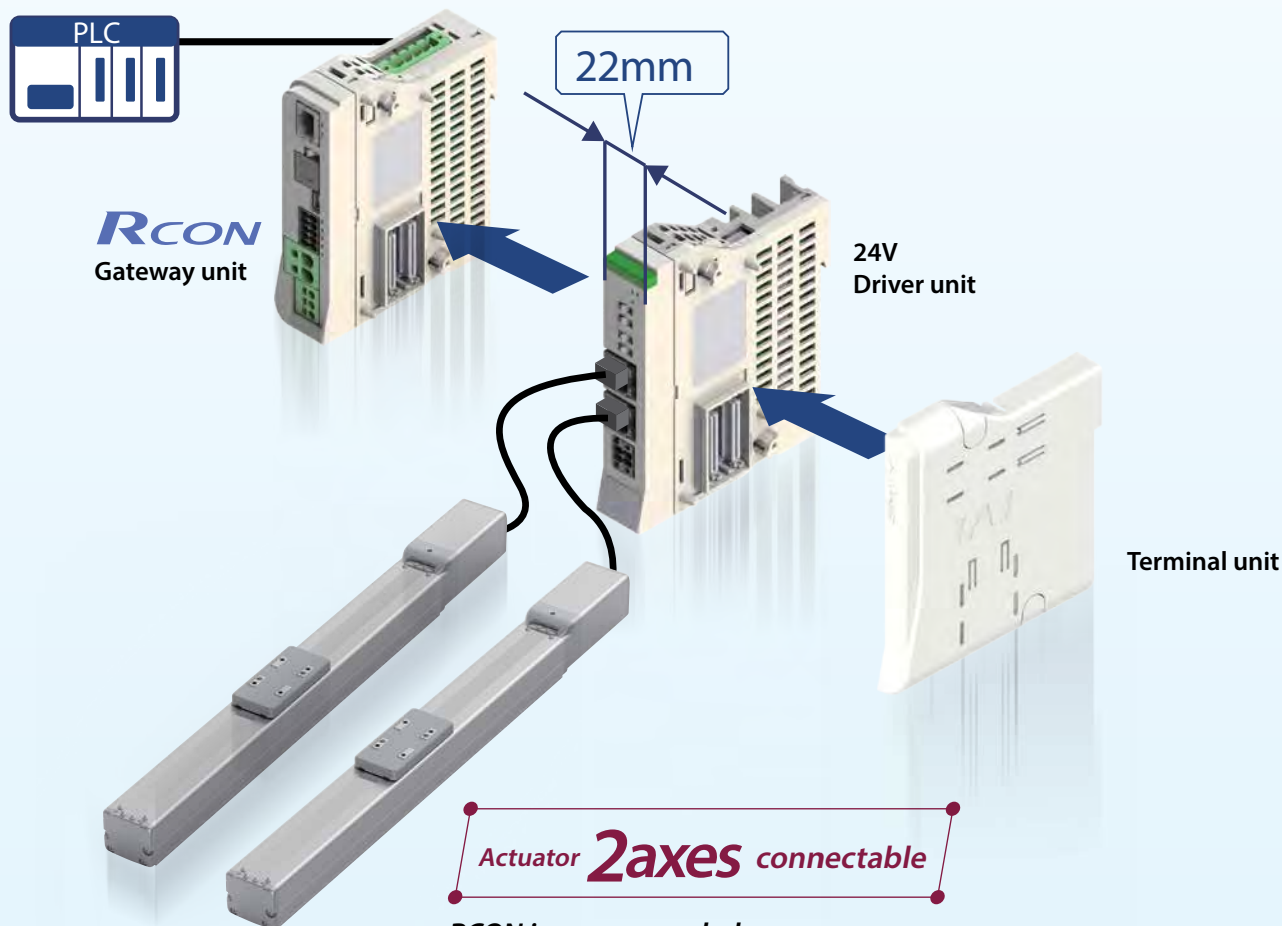


Saves space inside the control panel



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.

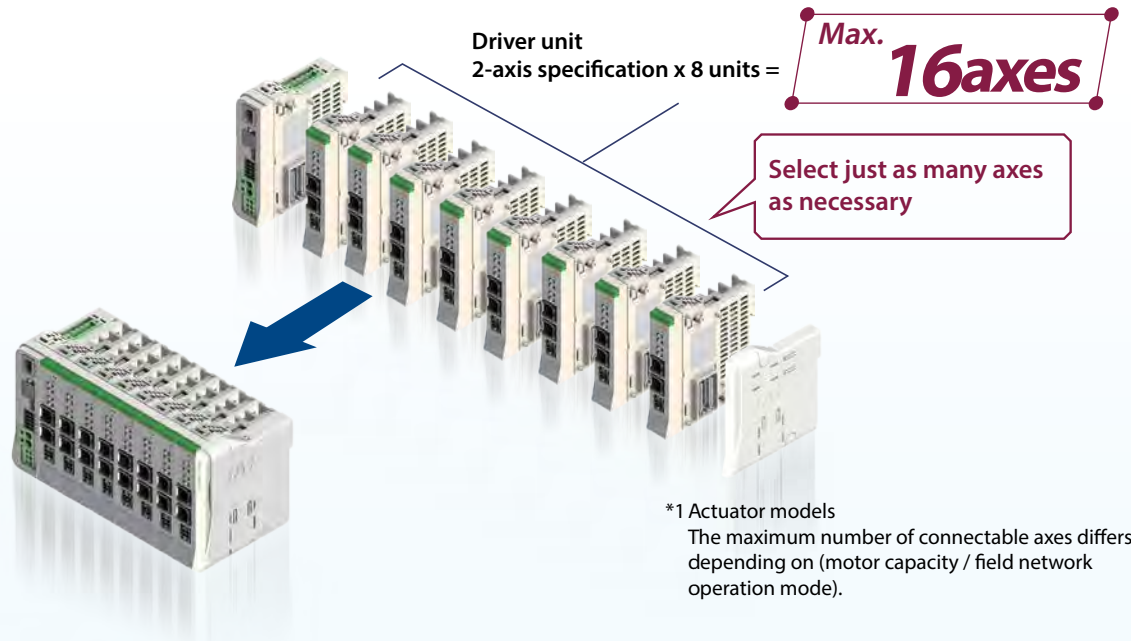


RCON is recommended

for customers who plan on using 2 axes or more.

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.



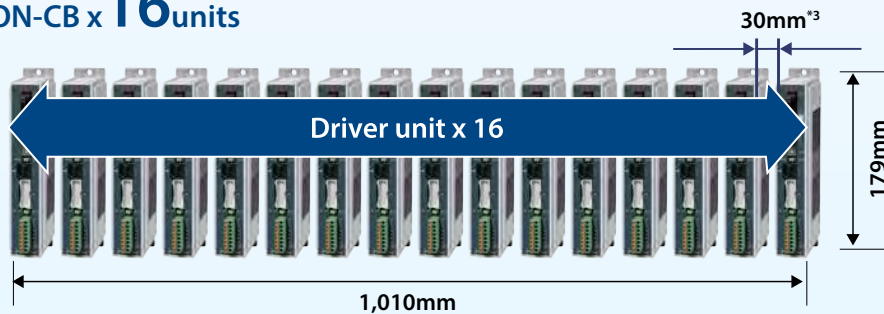
Saves up to 85%*² of control panel space and reduces costs by as much as 60%.

*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



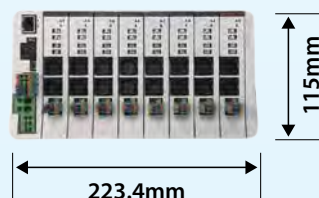
*3 Minimum distance required for natural heat dissipation of the controller

PCON-CB
CC-Link specification x 16 units

60% cost reduction

RCON x 16-axis connection specification

85% Space saving



RCON
CC-Link specification
stepper motor 16 axes

PC-compatible teaching software

IA-OS

Easy to program even for a beginner!

The PC-dedicated teaching software

"IA-101" supports users.

Even beginners can operate easily because it shows operation procedures process by process from controller wiring to troubleshooting.



Troubleshooting Examples

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

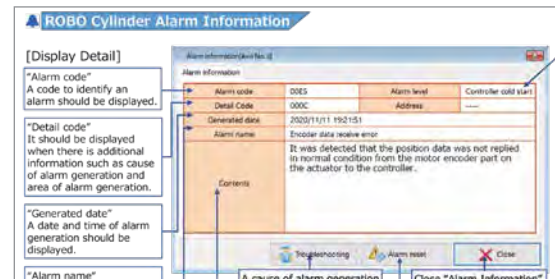
Alarm List

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



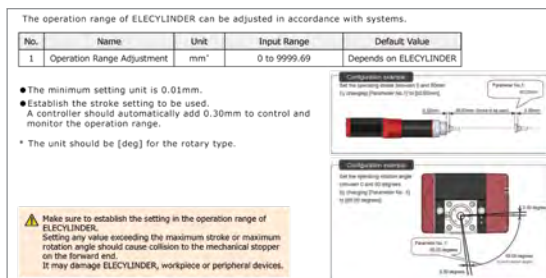
Alarm Information

Alarm details / troubleshooting information.



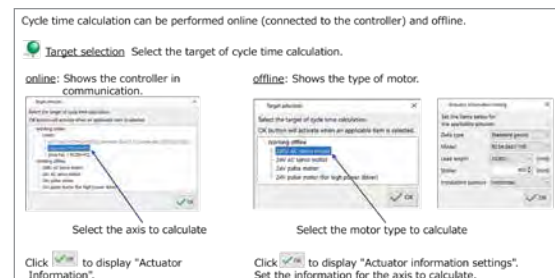
Parameter Edit : Operation Range Adjustment

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



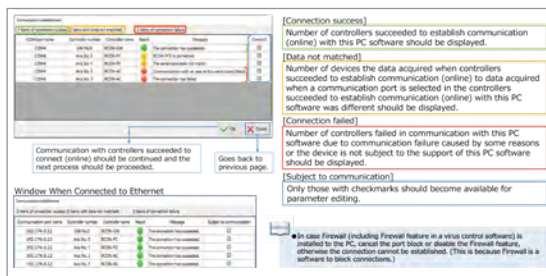
Cycle Time Calculation

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



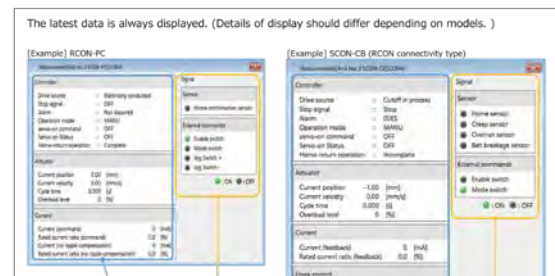
Communication Establishment

Success or failure of connectivity establishment is displayed.



Status Monitor

The latest status data is displayed.



Motion control

RCON supports motion network.

EtherCAT®

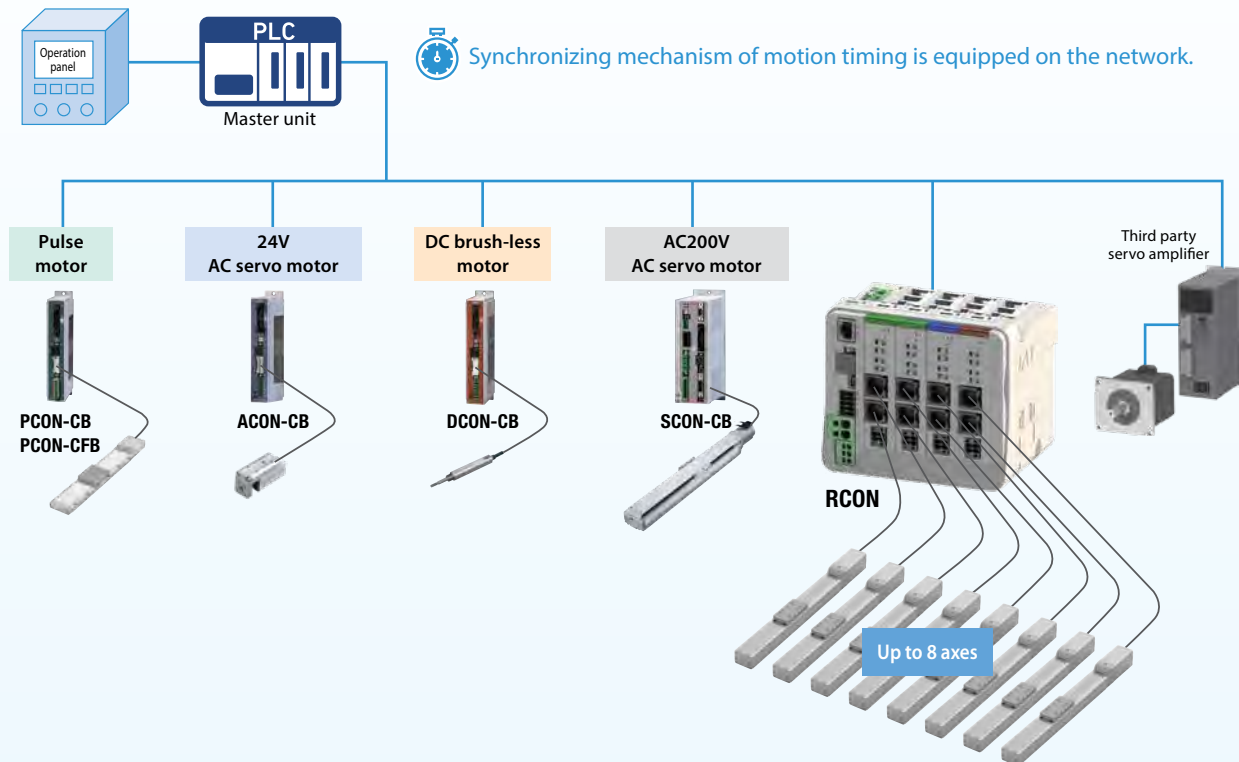
MECHATROLINK

SSCNET III/H
SERVO SYSTEM CONTROLLER NETWORK

* Supports III only

Co-existence with third party servo amplifiers and synchronized/interpolating control with different motor types are possible.

Connecting image



Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

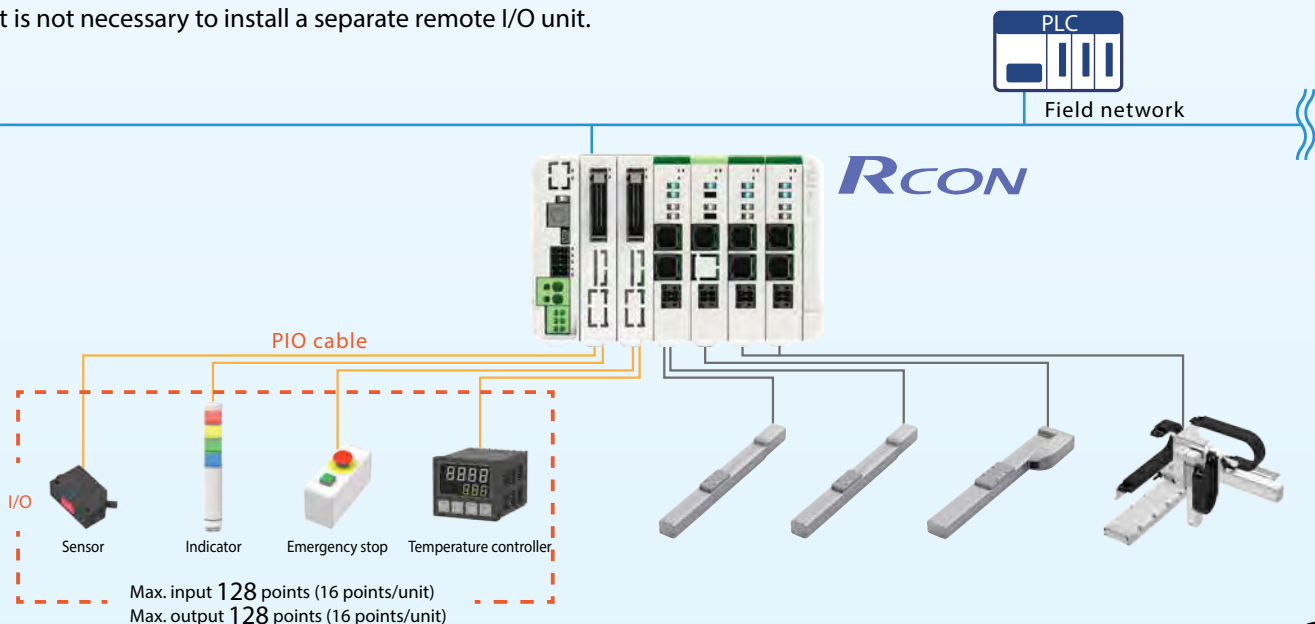
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Software

Remote I/O control

The PLC and the controller are connected by a single wire via network, enabling the reduction of wiring work.

It is not necessary to install a separate remote I/O unit.



RCON Selection Method

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

(Note) Refer to P8-71 for the details of non-connectable actuators and connection limitations.
* Make sure to select an optional "ACR" for the ELECYLINDER model.

<Selection example>



Step 2 Gateway unit selection

Select the gateway unit model from the network type.

(Note) There is a limit on the maximum number of connectable axes of actuators depending on the network and operation mode.
Refer to P8-71, 8-89 for details.

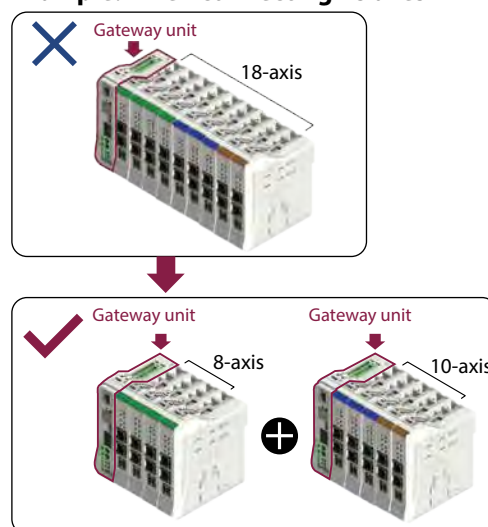
Network type	Gateway unit model
DeviceNet	RCON-GW/GWG-DV
CC-Link	RCON-GW/GWG-CC
CC-Link IE Field	RCON-GW/GWG-CIE
PROFIBUS	RCON-GW/PR
EtherCAT	RCON-GW/GWG-EC/ECM
EtherNet/IP	RCON-GW/GWG-EP
PROFINET	RCON-GW/GWG-PRT
MECHATROLINK	RCON-GW/GWG-ML3
SSCNET III/H	RCON-GW/GWG-SSN

<Selection example>

Select! 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














Step 3 Classify actuator types into three categories.

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

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

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

Actuator		24V driver unit			<Selection example>	
Series	Motor type	External view	Number of axes connected to actuator	Model	Classification	Required units
RCP2 RCP3 RCP4 RCP5 RCP6	20P, 28P 35P, 42P 56P		2-axis specification	RCON-PC-2	 	1
			1-axis specification	RCON-PC-1		1
	High thrust motor 56SP, 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.

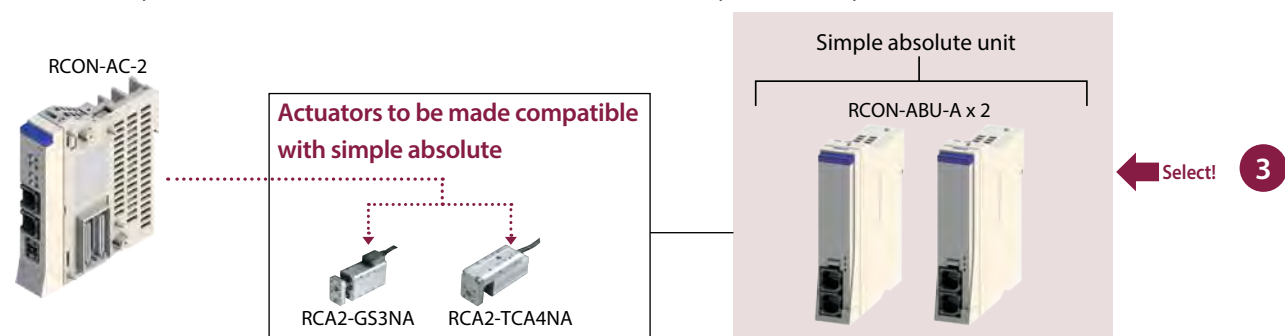
* Connect to the driver unit with a cable (CB-ADPC-MPA005).

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	 RCS4-RA6C-WA-100  ISB-LXM-WA-200
Expansion unit	Specifications that cannot connect to the 200V driver unit	 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	 RCS4  ISB	2




← Select! 5

← Select! 5

Step 9 Expansion unit selection

(1) Select one if there are any actuators connected with an expansion unit. (Simultaneous use of two units is impossible)



* Refer to P8-71 for cautions on selection of the PIO/SIO/SCON 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
PIS/SIO/SCON expansion unit		Max. 16 axes	RCON-EXT NP/PN	-	1

← Select! 6

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

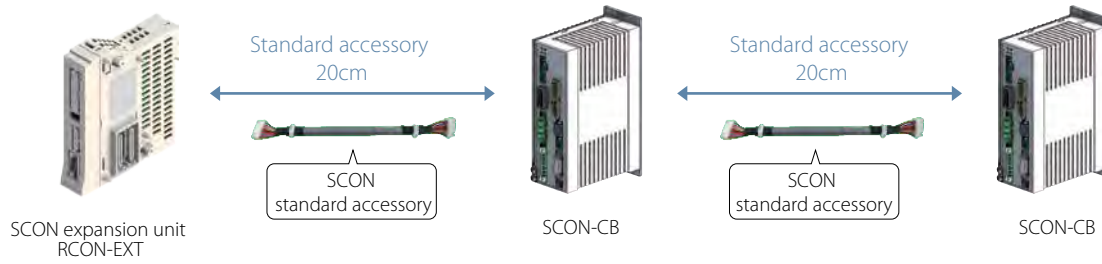
*A number of SCON-CBs must be purchased according to the number of connected axes. (Max. number of connections: 16 axes.)

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

← Select! 7

● Example of connecting an expansion unit and SCON-CB

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



Additional information

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

Model: CB-RE-CTL□□□

Refer to P8-98.



× Required number of units

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

(3) Connection with the PIO unit

It is possible to increase the number of PIO input/output by connecting a PIO unit.

(Max. input 128 points, max. output 128 points)

The number of points for one unit is 16 input and 16 output, maximum number of connectable units is 8.

(When PIO/SIO/SCON expansion unit is used, the maximum number of units is 7)

When connecting EC connection units, the maximum connectable number is obtained by subtracting the number of EC connection units from the maximum number of connections of 8.

Refer to P8-71 on the limit of connection.

Divide the number of input or output points by 16.

If an integer number is obtained, order the number of PIO units. If not divisible, round up to the nearest whole number for ordering.

<Example>

In case of increasing 24 inputs and 20 outputs in NPN specification.

Input 24 points / 16 = 1.5 → 2 units

PIO unit [RCON-NP]



← Select! 8

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

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

Item	Total Current Limit
Control power (CP)	9.0A or less

How to check

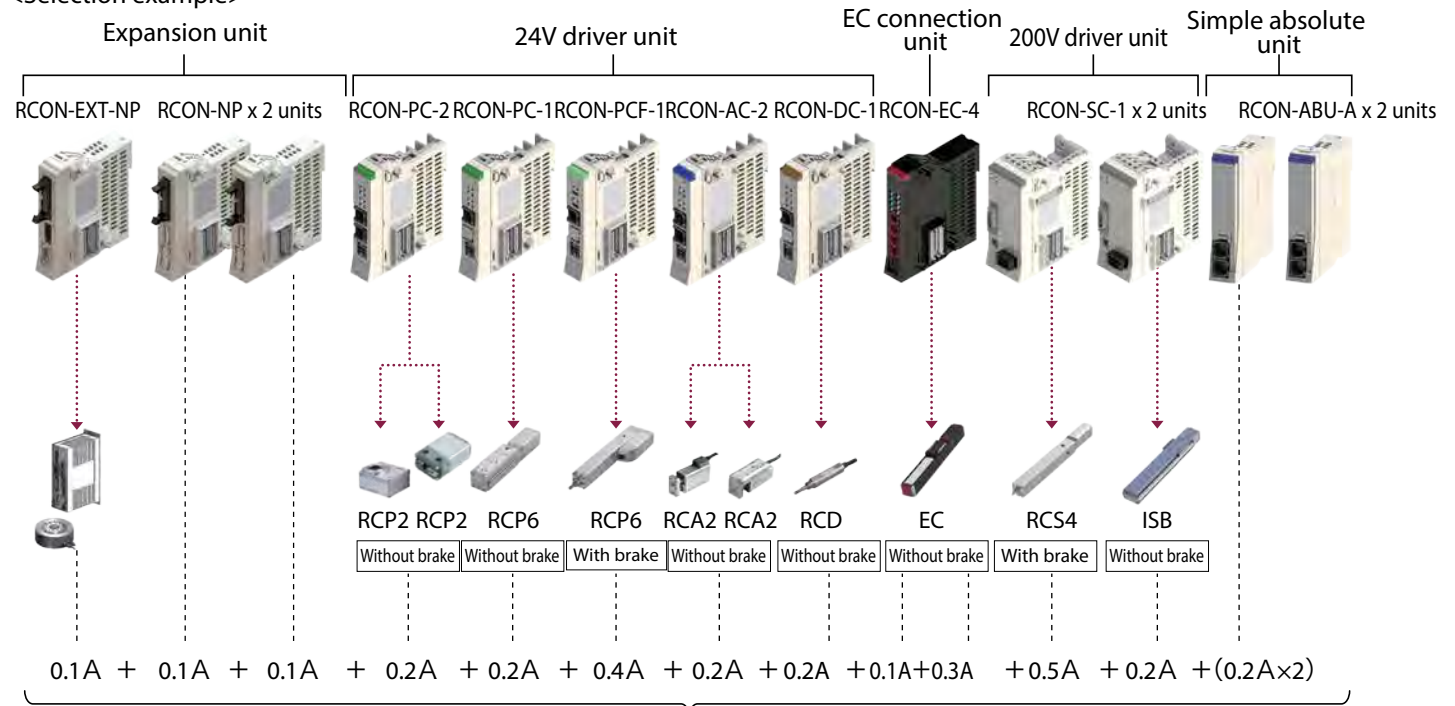
Add up while checking the "Control power capacity list" below.

Control power capacity list

Item	Specifications			Power capacity	<Selection example>
Control power capacity (per unit)	Master unit (including terminal unit)	Gateway unit	Without Ethernet	0.8A	
			With Ethernet	1.0A	
	24V driver unit (common for all types)	Without brake		0.2A	x 4 units
		With brake (1-axis specification)		0.4A	x 1 unit
		With brake (2-axis specification)		0.6A	
	200V driver unit	Without brake		0.2A	x 1 unit
		With brake		0.5A	x 1 unit
	Expansion unit (common in all types)			0.1A	x 3 unit
	Simple absolute unit (common to all types)			0.2A	x 2 units
	EC connection unit (per unit)			0.1A	x 1 unit
	24V specification ELECYLINDER (per axis)	Without brake		0.3A	x 1 axis
		With brake		0.5A	
	200V specification ELECYLINDER (per axis)	Without brake		0.32A	
		With brake	EC-S10□, EC-S10X□	0.54A	
		With brake	EC-S13□, EC-S13X□ EC-S15□, EC-S15X□	1.2A	

* For selection of the unit, power capacity of the master unit is not included for calculation.
However, for the selection of a 24V power source, include the power capacity of the master unit.

<Selection example>



Total **3.0A** < **9.0A**

OK

(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	Total Current Limit
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.

Add the maximum current value if there is no rated current of the motor specified.

24V driver unit

Item	Actuator/driver unit				Rated current	Max. current		<Selection example>	
		Series	Motor type			When energysaving is set			
Motor power capacity (per 1-axis actuator)	Stepper motor /RCON-PC	RCP2	20P/20SP/28P		0.8A	—	—	x 2 axes	
		RCP3	28P [*] /35P/42P/56P		1.9A	—	—		
		RCP4 RCP5 RCP6	28P/35P/42P/ 42SP/56P		High output setting disabled	1.9A	—	—	x 1 axis
					High output setting enabled	2.3A	—	3.9A	
	Stepper motor /RCON-PCF	RCP2 RCP4 RCP5 RCP6	56SP/60P/86P		No high output setting	5.7A	—	—	x 1 axis
	AC servo motor /RCON-AC	RCA RCA2	5W		Standard / Hi-accel./decel.	1.0A	—	3.3A	x 1 axis
			10W		Standard / Hi-accel./decel. / Energy-saving	1.3A	2.5A	4.4A	
			20W			1.3A	2.5A	4.4A	
			20W(20S)			1.7A	3.4A	5.1A	
			30W			1.3A	2.2A	4.0A	
		RCL	2W		Standard / Hi-accel./decel.	0.8A	—	4.6A	
			5W			1.0A	—	6.4A	
			10W			1.3A	—	6.4A	
		DC brush-less motor /RCON-DC	RCD	3W		Standard	0.7A	—	1.5A

* Applicable models: RCP2-RA3, RCP2-RGD3

EC connection unit

Item	Actuator/EC connection unit					Power source current		
		Series	Type	Motor type		Rated	Maximum	
Motor power capacity (per 1-axis actuator)	24V stepper motor	EC	RTC18	<input type="checkbox"/> 56SP	—	—	5.7A	x 1 axis
			S/R/RR/B	<input type="checkbox"/> 56	Power-saving setting disabled	2.3A	3.9A	
					Power-saving setting enabled	—	1.9A	
			S/WS/R/RR/B/RTC12/SRG15	<input type="checkbox"/> 42	Power-saving setting disabled	2.3A	3.9A	
					Power-saving setting enabled	—	1.9A	
			ST	<input type="checkbox"/> 42	—	—	1.9A	
			S/WS/RR/B/SRG11/RP5/GD5/TC5/TW5	<input type="checkbox"/> 35	Power-saving setting disabled	2.3A	3.9A	
					Power-saving setting enabled	—	1.9A	
			S3/RR3	<input type="checkbox"/> 28	—	—	1.9A	
			RP4/GS4/GD4/TC4/TW4/RTC9/GRB10/GRB13		—	—	1.7A	
			GRB8		<input type="checkbox"/> 20	—	0.7A	
			SL3/GDS3/GDB3/T3	<input type="checkbox"/> 20	—	0.4A	0.8A	

<Selection example>

24V driver unit

EC connection unit

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

0.8A + 0.8A + 2.3A + 5.7A + 1.3A + 1.3A + 0.7A + 2.3A = **15.2A < 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

(Note)
Use the maximum current value for calculation when all axes operate only acceleration/deceleration motions and at 100% duty ratio.

Step 12 200V motor power limiting

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

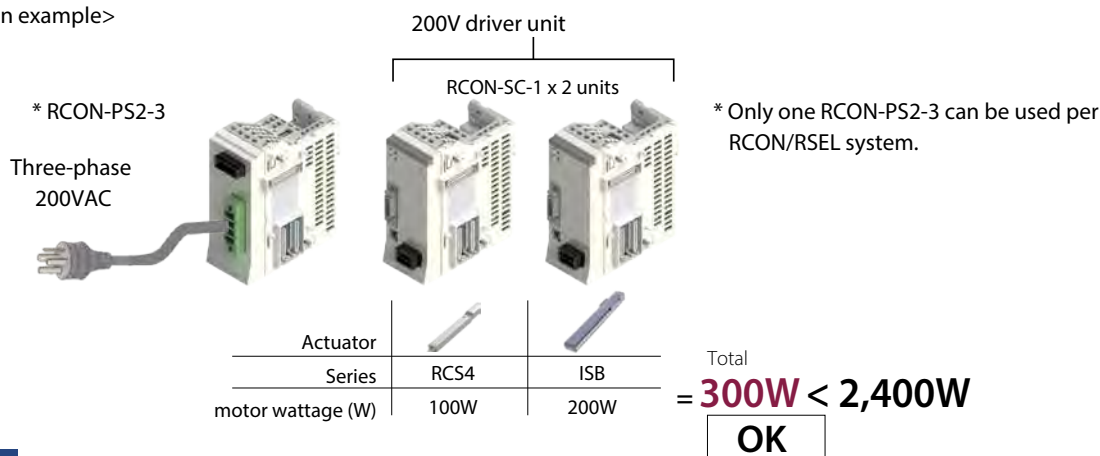
*Some limitations apply. See "Actuators that cannot connect to R-unit" (P. 8-71) for details.

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. Some models need to calculate the power capacity using the "motor wattage for calculation." Refer to P8-78 for details.

<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



Select! 9

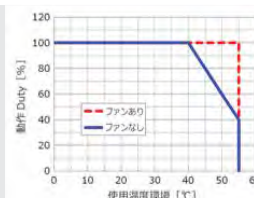
Note: The ambient operating temperature of the simple absolute unit is within the range of 0~40°C even when a fan unit is installed.

*The operating temperature of the gateway unit/driver unit is within the range of 0~55°C.

However, temperature derating may occur depending on whether a fan unit is installed.

Operation without derating is possible without a fan unit at 0 ~ 40°C;

however, at 40 ~ 55°C, actuator operating duty must be reduced by 20% every 5°C.



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

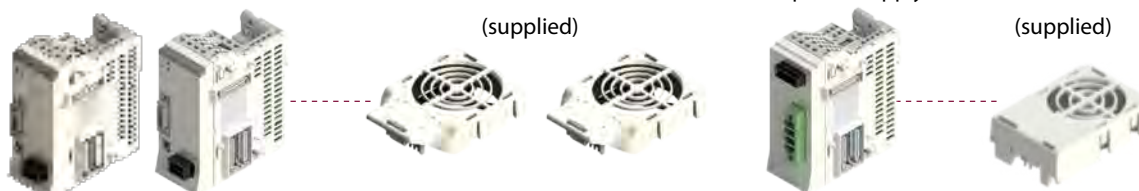
A single fan unit is always included with each installation unit. (There is no need to specify the model.)

<Selection example>

200V driver units x 2 units

RCON-FUH x 2 units
(supplied)

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



Step 14 Terminal units

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

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

← Selection 9

Step 15 Unit models to be ordered

Order using the model name for each unit.

<Selection example>

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

1 9

6

8

2

2

2

2

2

3

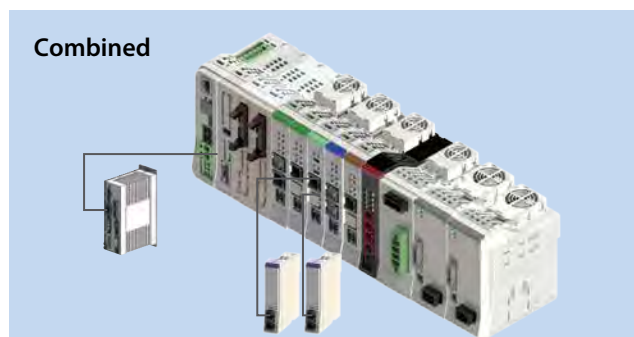
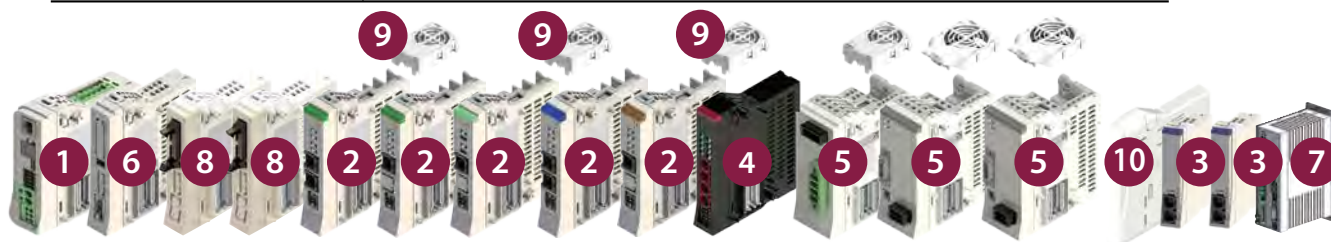
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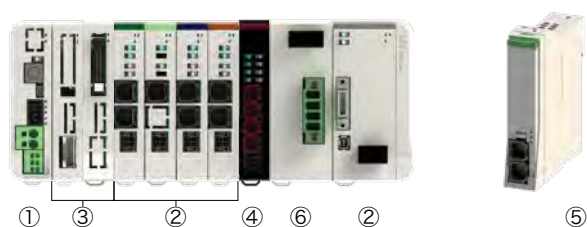
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10



Model specification items



(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
ECM	EtherCAT motion connection specification
PR	PROFIBUS-DP connection specification
PRT	PROFINET IO connection specification
ML3	MECHATROLINK III connection specification
SSN	SSCNET/H connection specification

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

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

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

○ : Available

(2) Driver unit

RCON – –

Series Type Number of Axes

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

1	1-axis specification
2	2-axis specification

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

24V specification

Type: PC 1.2A motor 1 axis 2 axes	20P 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
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200V specification

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

(5) Simple absolute unit

RCON – **ABU** –

Series Absolute Unit Type

P	Stepper motor
A	AC servo motor

(6) 200V power supply unit

RCON – **PS2** – **3** –

Series Type Power supply voltage Options

3	Three-phase/single-phase 200V
---	-------------------------------

TRN	Without terminal unit
-----	-----------------------

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

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

SCON – – – – – **RC** – **0** –

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

Refer to P. 8-255 for model selection items.

■ Actuators not connectable to RCON

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)	
RCON (Note 1)	Actuator	24V stepper motor/ 24V AC servo motor/ actuator equipped with DC brush-less motor	Actuator equipped with 200V AC servo motor		ELECYLINDER
		Wrist unit: WU Table top: TT(A) SCARA robot: IXP Pulse press: RCP6 (Actuators that fall under the following specifications) Actuators equipped with an absolute encoder	Servo press: RCS2/RCS3 Linear servo: LSA-W21H LSA-W21S (single-phase power supply) SCARA robot: IX/IXA Robo Cylinder: RCS3-CT8C/CTZ5C (single phase power source) Single-axis robot: IS(P)B-WXM/WXMX (single-phase power supply) Single-axis robot: ZR Rotary: DD/DDA (single phase power source) <Actuators to meet the following specifications> * Actuators equipped with less than 60W and more than 750W motors. (except for RS-30) * Actuators equipped with an absolute encoder and multi-rotation absolute.		Servo press: RCS2/RCS3 Linear servo: LSA-W21H SCARA robot: IX/IXA Single-axis robot: ZR * The RCON cannot connect to PIO/SIO/SCON expansion units.

(Note 1) For the motion network specification, some actuators cannot be connected. (See the table below)

Actuator (unit)	Motion network		
	ECM	ML3	SSN
Rotary index mode	×	×	×
LSAS actuator	○	○	×
ELECYLINDER (RCON-EC)	×	×	×

Legend:
○ : Compatible
× : Incompatible

■ Limitations on connection

* The total number of all actuator axes connected should be 16 or less.

In the case of a multi-slider, count the axes as two.

* Connection of the EC connection unit alone is not possible.

Make sure to connect together with a 24V/200V driver unit or an expansion unit SCON-CB RCON.

* The maximum connectable axes vary according to the operation mode. Refer to "Maximum connectable axes" (P8-89).

* There is a limit on the maximum connectable axes for the actuators in the below table. (Only the three-phase specification can be connected)

When actuators more than the maximum connectable axes are to be connected, connect SCON-CB RCON specification to the expansion unit for use.

When actuators are not specified in the below table, select them by calculating the power capacity (P8-77).

Actuator model	Max. connectable
DD(A)-LT18(C)□/T18□	8 axes
DD(A)-LH18(C)□/H18□	2 axes
RCS3-CTZ5C	8 axes
RCS3-CT8C	3 axes

* When connecting EC-RTC18 to one of the connection units (RCON-EC-4), the maximum number of connectable axes is 2.

EC-RTC18 connection	RCON-EC-4 (1 unit)	other than EC-RTC18
1 axis	○	3 axes
2 axes	○	not

* When connecting the expansion unit, select the actuator that meets the following conditions.

The maximum number of connectable expansion units is 8.

Either one of the SCON expansion units or the PIO/SIO/SCON expansion unit can be connected, and one can be connected to one master unit.

The total number of connectable units for the unit with PIO and the EC connection unit is up to 8.

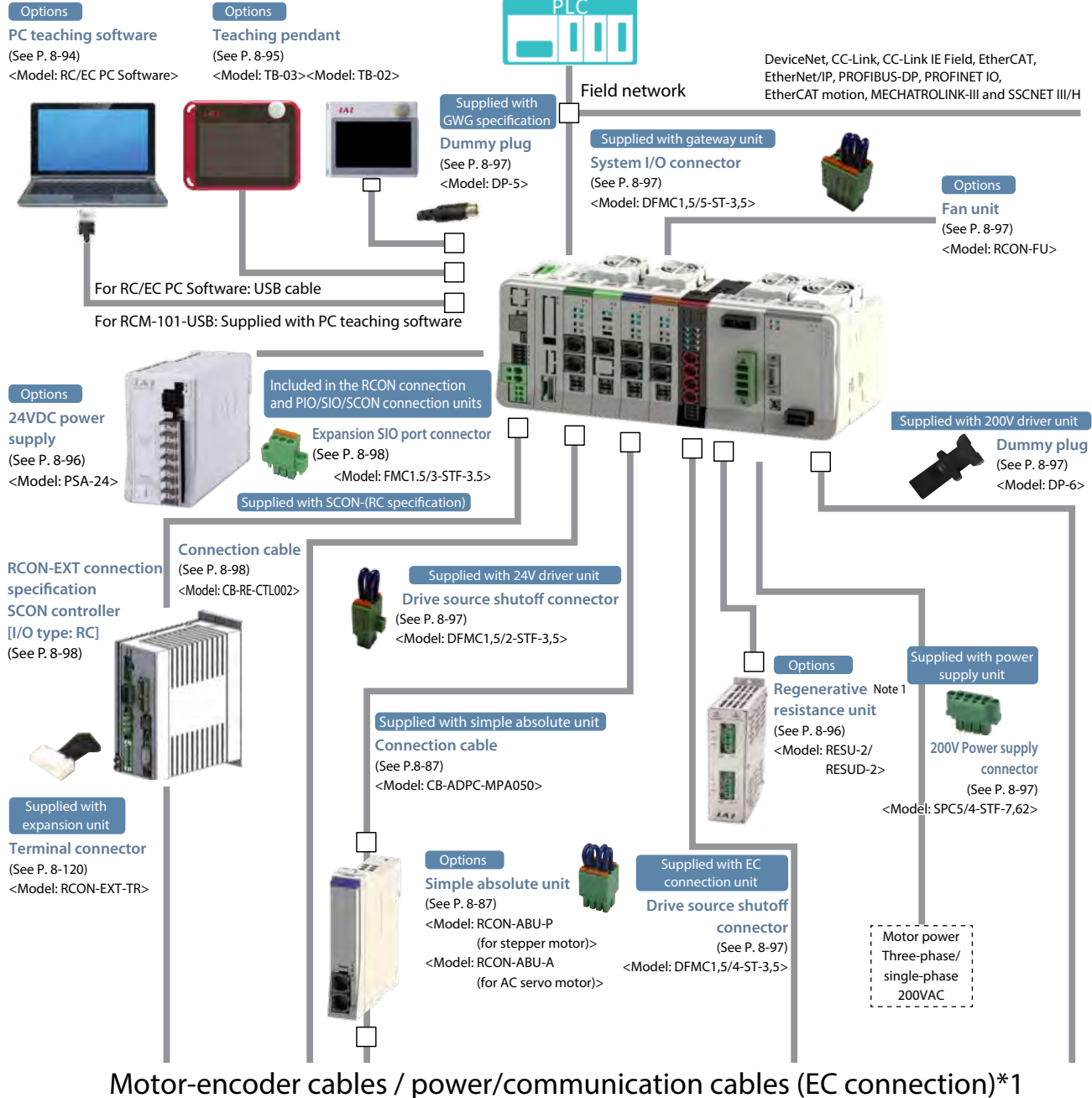
■ Recognition of connection

The order of recognition of the actuators connected to the R-unit is as shown in the table on the right. When the number of connectable actuators exceeds the limit, actuators in the lower priority order are not recognized.

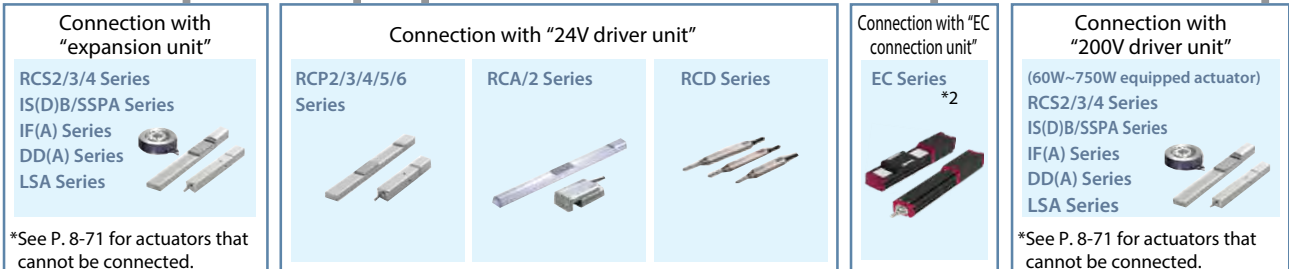
Priority order	Unit name
high ↓ low	24V driver unit
	200V driver unit
	Expansion unit (SCON connection spec.)
	EC connection unit

System configuration

RCON



Connectable actuators



*1 The motor/encoder cable is supplied with the actuator. The motor/encoder cables are different according to the actuator type to be connected. Prepare power/communication cables separately for the number of connected axes. Refer to P. 8-99 to order a cable alone.

*2: ELECYLINDER can operate double solenoid only. The connecting method varies depending on the type. Refer to P8-15 for details. When connecting an ELECYLINDER with a digital speed controller, the digital speed controller cannot be operated.

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".

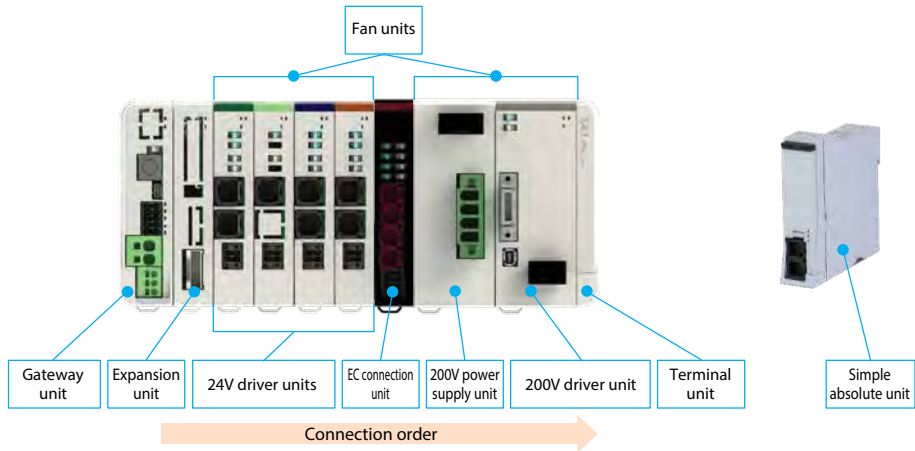
Note 2: Refer to P8-29 for the system configuration that complies the safety category (ISO 13849-1).

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 (SCON connection) spec.)	1	Select either type
Expansion unit (PIO unit)	(Max.) 8	Max. 7 units when PIO/SIO/SCON expansion units are connected
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)

(Note) There is a limit on the number of connected axes. Refer to P8-71 for the details.

Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

■ Unit name and single product model number list

Product name		Model	Reference page
Master unit/gateway unit	DeviceNet connection specification	RCON-GW/GWG-DV	P8-79
	CC-Link connection specification	RCON-GW/GWG-CC	P8-79
	CC-Link IE Field connection specification	RCON-GW/GWG-CIE	P8-80
	PROFIBUS-DP connection specification	RCON-GW/GWG-PR	P8-80
	EtherCAT [®] connection specification	RCON-GW/GWG-EC	P8-81
	EtherCAT [®] motion connection specification	RCON-GW/GWG-ECM	P8-81
	EtherNet/IP connection specification	RCON-GW/GWG-EP	P8-81
	PROFINET IO connection specification	RCON-GW/GWG-PRT	P8-82
	MECHATROLINK-III connection specification	RCON-GW/GWG-ML3	P8-82
	SSCNET III/H connection specification	RCON-GW/GWG-SSN	P8-83
Expansion unit	SCON expansion	RCON-EXT	P8-86
	PIO/SIO/SCON expansion (NPN spec.)	RCON-EXT-NP	
	PIO/SIO/SCON expansion (PNP spec.)	RCON-EXT-PN	
	PIO (NPN spec.)	RCON-NP	
	PIO (PNP spec.)	RCON-PN	
24V driver unit	Stepper motor 1-axis specification	RCON-PC-1	P8-84
	Stepper motor 2-axis specification	RCON-PC-2	
	High thrust stepper motor 1-axis specification	RCON-PCF-1	
	AC servo motor 1-axis specification	RCON-AC-1	
	AC servo motor 2-axis specification	RCON-AC-2	
	DC brush-less motor 1-axis specification	RCON-DC-1	
	DC brush-less motor 2-axis specification	RCON-DC-2	
EC connection unit	EC connection unit 4-axis specification	RCON-EC-4	P8-85
200V power supply unit	200VAC input power supply	RCON-PS2-3	P8-85
200V driver unit	AC200V motor 1-axis specification	RCON-SC-1	P8-85
Terminal unit	For 24V	RCON-GW-TR	P8-87
	For 200V	RCON-GW-TRS	
Simple absolute unit	For RCON-PC	RCON-ABU-P	P8-87
	For RCON-AC	RCON-ABU-A	
Fan unit	Other than the below	RCON-FU	P8-97
	For 200V driver	RCON-FUH	

General specification

■ 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		1-16 axes * There is a limit on the maximum number of axes, depending on the actuator and its type. Refer to "Connection limit" (P8-71), "Maximum number of connectable axes" (P8-89).109).						
Supported encoders	24V series	Incremental (including ABZ parallel) Battery-less absolute *1						
	200V series	Incremental (including ABZ parallel), battery-less absolute, quasi absolute, index absolute (SCON connection specification) absolute, absolute multi-rotation						
Supported field networks		CC-Link, CC-Link IE Field, DeviceNet, EtherCAT [®] , EtherNet/IP, PROFIBUS-DP, PROFINET IO, EtherCAT [®] motion, MECHATROLINK-III, SSCNET III/H						
Configuration units		Gateway unit, driver unit, SCON expansion unit, EC connection unit, power supply unit, fan unit, terminal unit, simple absolute unit.						
SIO interface	Teaching port	Communication method				RS485		
		Communication speed				9.6/19.2/38.4/57.6/115.2/230.4kbps		
	USB port	Communication method				USB		
		Communication speed				12Mbps		
Emergency stop/enable operation		Collective system support with gateway unit STOP signal input, equipped with connectors capable of shutting off the drive power supply to individual axes of each driver unit						
Data recording device		FRAM 256kbit (gateway unit, 24V driver unit) SRAM 4Mbit (200V driver unit)						
Data input method	Teaching port	Touch panel teaching pendant						
	USB	PC teaching software						
Expansion I/O		PIO units can be connected up to 8 units.						
Ethernet (optional)		10/100BASE-T (RJ-45 connector)						
		Modbus/TCP *1						
Calendar function	Retention function	Approx. 10 days						
	Charging time	Approx. 100 hours						
Safety category compliance		B (the safety category specification supports up to 4 external circuits)						
Protection functionality		Overcurrent, abnormal humidity, encoder disconnection, overload						
Preventative/predictive maintenance function		Low electrolytic capacitor capacity and low fan rotation speed						
Ambient operating temperature		(Without fan) 0~40°C, (with fan) 0~55°C *0~40°C for simple absolute units						
Ambient operating humidity		5%RH ~ 85%RH (non-condensing, no frost)						
Operating atmosphere		Avoid corrosive gas and excessive dust						
Vibration resistance		Frequency: 10~57Hz / Amplitude: 0.075mm, Frequency: 57~150Hz / Acceleration: 9.8m/s ² XYZ directions Sweep time: 10 minutes Number of sweeps: 10 times						
Shock resistance		Drop height: 800mm 1 corner, 3 edges, 6 faces						
Electric shock protection mechanism	24V	Class III						
	200V	Class I						
Degree of protection		IP20						
Insulation withstanding voltage		500VDC 10MΩ						
Cooling method		Natural cooling and forced cooling by fan unit (option)						
Connections between each unit		Unit connection method						
Installation/mounting method		DIN rail (35mm) mounting						
Regulations/standards	Unit name	Gateway unit	24V driver unit	200V driver unit	200V power supply unit	Simple absolute unit	SCON expansion unit	EC connection unit
	CE Marking	○	○	○	○	○	○	○
	UL	○	○	○	○	○	○	○

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

○: Compliant

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	
	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		Battery-less Absolute	131072
				Incremental	16384
		SSPA/ISA/ISDA/IF		Incremental	16384
		IFA		Battery-less Absolute	16384
		NSA		Battery-less Absolute	131072
		NS	<input type="checkbox"/> <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/multi-rotation	131072
<input type="checkbox"/> 18P	Index absolute/multi-rotation		1048576		
EC connection unit	Stepper motor	EC		Battery-less Absolute	800
	Stepper motor (<input type="checkbox"/> 20)			Incremental	
	AC servo motor			Battery-less Absolute	16384

Generated heat (per unit)

Unit name	Unit model	Type	Value
24V driver unit	RCON-PC	High output setting disabled	5.0W
		High output setting enabled	8.0W
	RCON-PCF	High output setting unavailable	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

RCON, make sure for each unit that the calculated results for control power and motor power do not exceed the current limit value for selection calculation, based on the connection configuration.

When selecting a 200V driver unit, ensure that the total motor wattage (W) does not exceed the total wattage (W) for the maximum number of connectable axes. Only one RCON-PS2-3 can be used per RCON/RSEL system.

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

*The maximum number of connectable axes varies by series.

Current limit value

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

Total motor wattage (W)

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

DC power supply for driving motor

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

Power supply capacity

<Control power>

Item	Specification			Power capacity
Control power capacity (per unit)	Master unit (including terminal unit)	Gateway unit	Without Ethernet	0.8A
			With Ethernet	1.0A
	24V driver unit (common for all types)	Without brake		0.2A
		With brake (1-axis specification)		0.4A
		With brake (2-axis specification)		0.6A
	200V driver unit (including 200V power supply unit)	Without brake		0.2A
		With brake		0.5A
	Expansion unit (common for each unit)			0.1A
	Simple absolute unit (common to all types)			0.2A
	EC connection unit (per unit)			0.1A
	24V specification ELECYLINDER (per axis)	Without brake		0.3A
		With brake		0.5A
	200V specification ELECYLINDER (per axis)	Without brake		0.32A
		With brake	EC-S10□、EC-S10X□	
EC-S13□、EC-S13X□ EC-S15□、EC-S15X□			1.2A	

* Calculate all the axes of connected ELECYLINDERS.

Note: When selecting the unit, the master unit is not included in the calculation of the power capacity. Because the 24V power current value of a 200V power unit is minimal, it is not necessary to consider it in calculation. However, when 24V power is used, include the master unit power capacity in selection.

<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	High output setting	0.8A	-	-
		RCP3	28P/35P/42P/56P	unavailable	1.9A	-	-
		RCP4	28P/35P/42P/42SP/56P	High output setting disabled	1.9A	-	-
		RCP5 RCP6		High output setting enabled	2.3A	-	3.9A
	Stepper motor /RCON-PCF	RCP2 RCP4 RCP5 RCP6	56SP/60P/86P	High output setting unavailable	5.7A	-	-
	AC servo motor /RCON-AC	RCA RCA2	5W	Standard / Hi-accel./decel.	1.0A	-	3.3A
			10W	Standard / High accel./decel. Energy saving	1.3A	2.5A	4.4A
			20W		1.3A	2.5A	4.4A
			20W (20S)		1.7A	3.4A	5.1A
			30W	1.3A	2.2A	4.0A	
		RCL	2W	Standard / Hi-accel./decel.	0.8A	-	4.6A
			5W		1.0A	-	6.4A
			10W		1.3A	-	6.4A
	DC brush-less motor /RCON-DC	RCD	3W	Standard	0.7A	-	1.5A

* Available models:RCP2-RA3, RCP2-RGD3

200V Driver Unit

Actuator motor wattage	Motor power capacity [VA]	Max. instantaneous motor power supply [VA]
30R (for RS)	138	414
60	138	414
60 (RCS3-CTZ5)	197	591
100	234	702
100S (LSA)	283	851
150	328	984
200	421	1263
200S (DD)	503	1509
200S (other than LSA (S) -N15H)	486	1458
200S (LSA (S)-N15H)	773	2319
300S (LSA)	662	1986
400	920	2760
400 (RCS3-CT8)	1230	3690
600	1164	2328
600 (DD)	1462	4386
750	1521	3042

For the actuator models specified below, calculate the power capacity using the "Motor wattage for calculation."

Actuator model	Actuator motor wattage	Motor wattage for calculation	
		Single-phase	Three-phase
RCS3-CTZ5C	60W	—	120W
RCS3-CT8C	400W	—	800W
LSA-S6S□/S8S□/S8H□/N10S□、LSAS-N10S□	100W	300W/1slider	100W/1slider
LSA-S10S□/S10H□/H8S□/H8H□/L15S□/N15S□、LSAS-N15S□/N15H□	200W	600W/1slider	200W/1slider
LSA-N19S□	300W	600W/1slider	300W/1slider
LSA-W21S□	400W	—	400W/1slider

* Specify S (single slider) or M (multi-slider) in □ of the model code.
The motor wattage for calculation is for a single slider.
For the multi-slider, calculate the wattage using the value of two sliders.

EC connection unit (24V specification ELECYLINDER)

Item	Actuator/connection unit				Power current	
	Series	Type	Motor type		Rated	Max
Motor power capacity (per one actuator axis)	24V stepper motor	EC	RTC18	□56SP	—	5.7A
			S,R,RR,B	□56	Power-saving setting disabled Power-saving setting enabled	2.3A — 1.9A
			S,WS,R,RR,B,RTC12,SRG15	□42	Power-saving setting disabled Power-saving setting enabled	2.3A — 1.9A
			ST	□42	—	1.9A
			S/WS/RR/B/SG11/RP5/GD5/TC5/TW5	□35	Power-saving setting disabled Power-saving setting enabled	2.3A — 1.9A
			S3/RR3	□28	—	1.9A
			RP4/GS4/GD4/TC4/TW4/RTC9/GRB10/ GRB13		—	1.7A
			GRB8		—	0.7A
			SL3,GDS3,GDB3,T3		0.4A	0.8A
				□20	—	0.8A

(200V specification ELECYLINDER)

Motor	Actuator model	Motor wattage	Motor Power capacity [VA]	Instantaneous max. motor power capacity [VA]
Motor Power capacity (per one actuator axis)	EC-S10□、EC-S10X□	100	238	714
	EC-S13□、EC-S13X□	200	402	1206
	EC-S15□、EC-S15X□	400	772	2316



Warning!

*Use the maximum current value for calculation when all axes operate acceleration/deceleration motions at 100% duty ratio.
Calculate the motor power using the maximum current value. (Use the rated current value if the max. current value is not specified)
*Use the following software when the power capacity should be calculated more accurately according to the operating conditions.
The necessary power capacity can be calculated automatically. "Calculator" software comes with the IA-OS software.

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

Configuration unit description

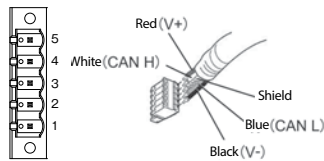
Master unit

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

DeviceNet connection specification



Connector for network



Network connection cable

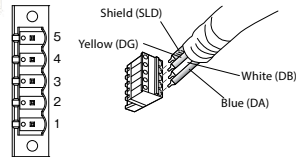
Pin No.	Signal name (color scheme)	Description	Compatible wire diameter
1(6)	V- (black)	Power supply cable - side	DeviceNet dedicated cable
2(7)	CAN L (blue)	Signal data Low side	
3(8)	-	Drain (shield)	
4(9)	CAN H (white)	Signal data High side	
5(10)	V+ (red)	Power supply cable + side	

() indicates the bifurcated connector specification

CC-Link connection specification



Connector for network



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

Model
RCON-GW-DV
RCON-GWG-DV

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC \pm 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4 compatible
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 Network connector MSTB2.5/5-STF-5.08 AUM (GWG spec.) dummy plug DP-5
External dimensions	W30mmxH115mmxD95mm
PC teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

Model
RCON-GW-CC
RCON-GWG-CC

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC \pm 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4 compatible
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 Network connector MSTB2.5/5-STF-5.08 AU with Terminal resistor 110Ω/130Ω (GWG spec.) dummy plug DP-5
External dimensions	W30mmxH115mmxD95mm
PC teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

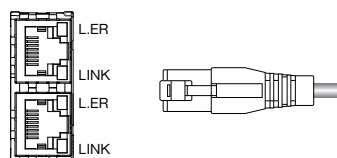
*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

CC-Link IE field connection specification



Connector for network



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-	Ethernet ANSI/TIA-568-B 8P8C modular plug (RJ45) with a shield of category 5e or higher
6	TP1-	Data 1-	
7	TP3+	Data 3+	
8	TP3-	Data 3-	

Model
RCON-GW-CIE
RCON-GWG-CIE

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC \pm 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4 compatible
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 (GWG spec.) dummy plug DP-5
External dimensions	W30mmxH115mmxD95mm
PC teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

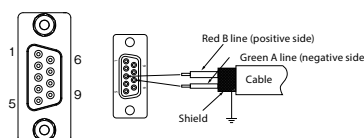
*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

PROFIBUS-DP connection specification



Connector for network



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)	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA568-B category 5 or higher.
6	+5V	+5 V output (isolated)	
7	NC	Not connected	
8	A-Line	Signal line A (RS-485)	
9	NC	Not connected	

Model
RCON-GW-PR
RCON-GWG-PR

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC \pm 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4 compatible
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 (GWG spec.) dummy plug DP-5
External dimensions	W30mmxH115mmxD95mm
PC teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

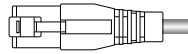
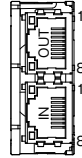
*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

EtherCAT®/EtherCAT® connection specification



Connector for network



Model
RCON-GW-EC
RCON-GWG-EC
RCON-GW-ECM
RCON-GWG-ECM

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC ± 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4 compatible
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 (GWG spec.) dummy plug DP-5
External dimensions	W30mm×H115mm×D95mm
PC teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

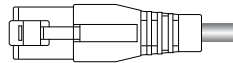
Network connection cable

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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA-568-B category 5 or higher..
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

EtherNet/IP connection specification



Connector for network



Model
RCON-GW-EP
RCON-GWG-EP

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC ± 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4 compatible
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 (GWG spec.) dummy plug DP-5
External dimensions	W30mm×H115mm×D95mm
PC teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

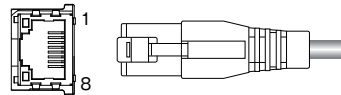
Network connection cable

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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA568-B category 5 or higher.
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

PROFINET IO connection specification



Connector for network



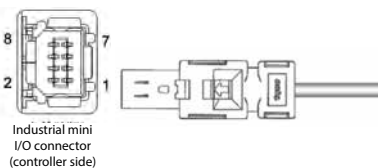
Network connection cable

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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA568-B category 5 or higher.
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

MECHATROLINK-III connection specification



Connector for network



Industrial mini I/O connector (controller side)

Network connection cable

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

Model
RCON-GW-PRT
RCON-GWG-PRT

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC \pm 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4 compatible
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 (GWG spec.) dummy plug DP-5
External dimensions	W30mm×H115mm×D95mm
PC teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

Model
RCON-GW-ML3
RCON-GWG-ML3

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC \pm 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 (GWG spec.) dummy plug DP-5
External dimensions	W30mm×H115mm×D95mm
PC software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

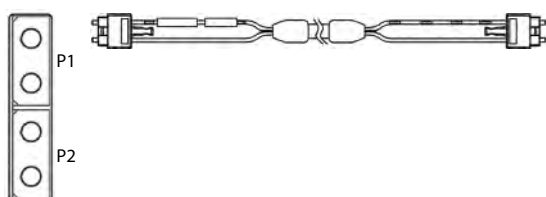
*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

SSCNET III /H connection specification



Connector for network



Connector model
PF-2D103 (Japan Aviation Electronics)

Model
RCON-GW-SSN
RCON-GWG-SSN

Specifications

Operation type	Positioner Type
Power supply input voltage	24VDC \pm 10%
Power supply current	0.8A (with Ethernet: 1.0A)
Ambient operating temperature & humidity	0~55°C 1* , 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Safety category compliance	GWG specification: 4
Degree of protection	IP20
Mass	167g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/5-ST-3.5 (GWG spec.) dummy plug DP-5
External dimensions	W30mm×H115mm×D95mm
PC software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

*1: A fan unit must be attached during use in environments exceeding 40°C

*2: Not included when selecting an optional "TRN."

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

Configuration unit description

Driver unit

■ Features a controller unit for actuator control

24V driver unit for RCP series connection

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



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

Specifications

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

24V driver unit for RCA series connection

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



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

Specifications

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

24V driver unit for RCD series connection

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



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

Specifications

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

Configuration unit description

200V driver unit 200V AC motor-equipped actuator connection

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



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

Specifications

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

Other units

200V power supply unit

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



Model
RCON-PS2-3

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

Specifications

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

* A noise filter is installed inside.

EC connection unit

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



Model
RCON-EC-4

Specifications

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

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, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	99g
External dimensions	W22.6mm \times H115mm \times D95mm
Accessories	Terminal connector RCON-EXT-TR

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

* Refer to P8-88 for the PIO signals and internal circuit.

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

* Refer to P8-88 for the PIO signals and internal circuit.

Configuration unit description

Simple absolute unit *For 24V driver connection

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



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, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	Avoid corrosive gas and excessive dust
Degree of protection	IP20
Mass	271g (including 173g for absolute battery)
External dimensions	W22.6mm×H115mm×D95mm
Accessories	Cable (CB-ADPC-MPA005)

Terminal unit

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



Model
RCON-GW-TR

Specifications

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

200V terminal unit

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



Model
RCON-GW-TRS

Specifications

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

PIO signal chart

Standard PIO connector, expansion PIO connector pin layout

Category	Pin No.	Assignment	Pin No.	Category	Assignment
24V	1A	P24	1B	Output	OUT0
24V	2A	P24	2B		OUT1
-	3A	-	3B		OUT2
-	4A	-	4B		OUT3
	5A	IN0	5B		OUT4
	6A	IN1	6B		OUT5
	7A	IN2	7B		OUT6
	8A	IN3	8B		OUT7
	9A	IN4	9B		OUT8
	10A	IN5	10B		OUT9
	11A	IN6	11B		OUT10
	12A	IN7	12B		OUT11
	13A	IN8	13B		OUT12
	14A	IN9	14B		OUT13
	15A	IN10	15B		OUT14
	16A	IN11	16B		OUT15
	17A	IN12	17B	-	-
	18A	IN13	18B	-	-
	19A	IN14	19B	0V	N
	20A	IN15	20B	0V	N

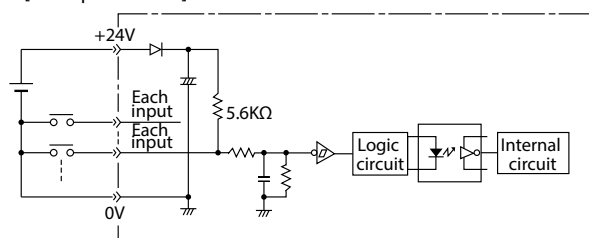
*The same assignment will be applied to each unit even for an expansion unit (PIO specification).

I/O internal circuit

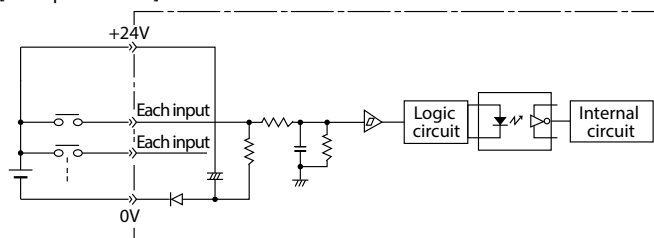
[Input]

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



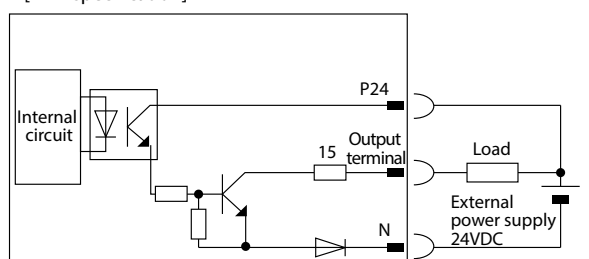
[PNP specification]



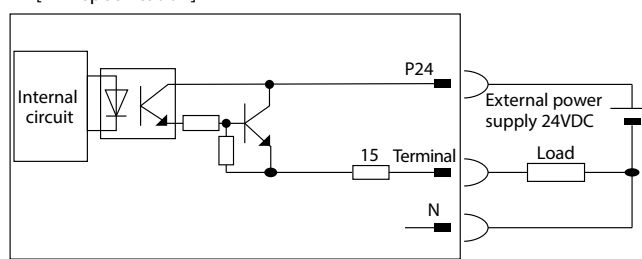
[Output]

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

[NPN specification]



[PNP specification]



Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

Maximum connectable axes by RCON-GW operation mode

The maximum number of connectable axes when all the axes are in the operation mode.

* When the operation modes are mixed, use the model selection software for confirmation.

Field network	Remote I/O						Motion network
	Direct numerical control mode	Simple direct mode	Positioner mode 1	Positioner mode 2	Positioner mode 3	Positioner mode 5	
DeviceNet	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes	-
CC-Link	16 axes	16 axes	16 axes	16 axes	16 axes	16 axes	-
CC-Link IE Field	16 axes	16 axes	16 axes	16 axes	16 axes	16 axes	-
PROFIBUS-DP	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes	-
EtherCAT®	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes	-
EtherNet/IP	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes	-
PROFINET IO	8 axes	16 axes	16 axes	16 axes	16 axes	16 axes	-
EtherCAT® motion	-	-	-	-	-	-	8 axes
MECHATROLINK-III	-	-	-	-	-	-	8 axes
SSCNET III/H	-	-	-	-	-	-	8 axes

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

The RCON-GW field network control operation mode can be selected from the following control modes.

Data required for operation (target position, speed, acceleration, push current value, etc.) are written by a connected PLC or other host controller into the specified addresses. * The EC connection unit is not supported.

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

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

* Does not support the EC connection unit.

	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	○	○	r	r	r	r
Speed, acceleration/deceleration settings	○	r	r	r	r	r
Different acceleration and deceleration settings	×	r	r	r	r	r
Pitch feed (incremental)	○	r ^(Note 1)	r	r	×	r
JOG operation	r	r	r	r	×	r
Position data writing	×	×	○	○	×	×
Push-motion operation	○	r	r	r	r	r
Speed changes while traveling	○	r	r	r	r	r
Pausing	○	○	○	○	○	○
Zone signal output	r(2 points)	r(2 points)	r(2 points)	r(2 points)	r(1 point)	r(2 points)
Position zone signal output	×	r	r	r	×	×
Overload warning output	○	○	○	○	×	○
Vibration control (Note 2)	×	r	r	r	r	r
Collision detection function (Note 3)	×	r	r	r	r	r
Current position reading (Note 4) (resolution)	○(0.01mm)	○(0.01mm)	○(0.01mm)	×	×	○ ^(Note 5) (0.1mm)

* ○: Direct setting is possible, r: Position data or parameter input is required, x: 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.

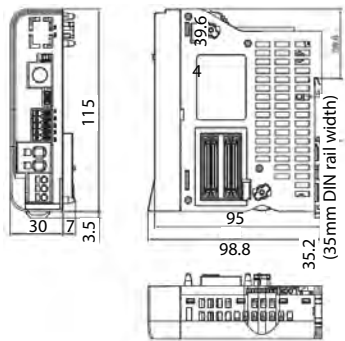
ELECYLINDER I/O signal table

Pin assignment of the power supply and I/O connector			
Pin No.	Connector ID plate	Signal name	Description of function
B3	Backward	STO	Backward command
B4	Forward	ST1	Forward command
B5	Alarm cancel	RES	Alarm cancel
A3	Backward complete	LSO/PEO	Backward complete/Push complete
A4	Forward complete	LS1/PE1	Forward complete/Push complete
A5	Alarm	*ALM	Alarm detection (b-contact)
B2	Brake release	BKRLS	Brake forced release (in case of with brake specification)
B1	24V	24V	24V input
A1	0V	0V	0V input
A2	(24V)	(24V)	24V input

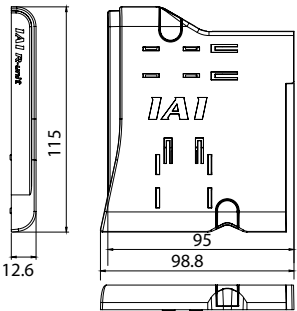
Controller
Models not shown here
Model selection
RCON
RSEL
REC
RSEL (Cartesian 6-axis)
RCP6S
PCON -CB/CFB
PCON -CBP (Pulse press)
PCON
ACON-CB DCON-CB
ACON DCON
SCON -CB
SCON -CB (Servo press)
SSEL
MSEL
XSEL -RA/SA
XSEL -P/Q
XSEL (SCARA)
PSA-24
TB -03/02
Software

External dimensions

Master unit

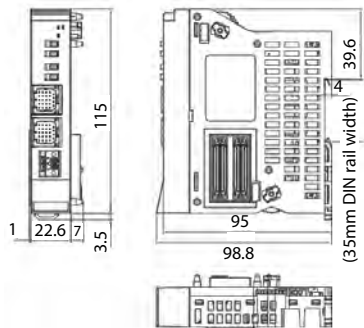


Terminal unit

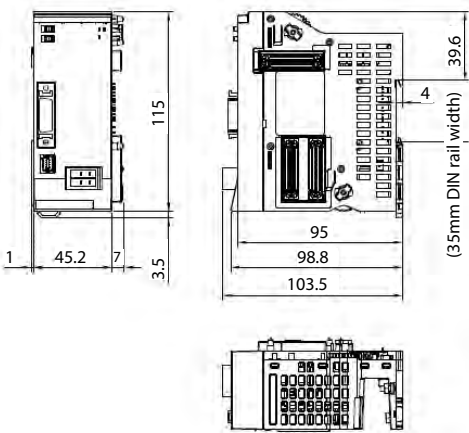


Driver Unit

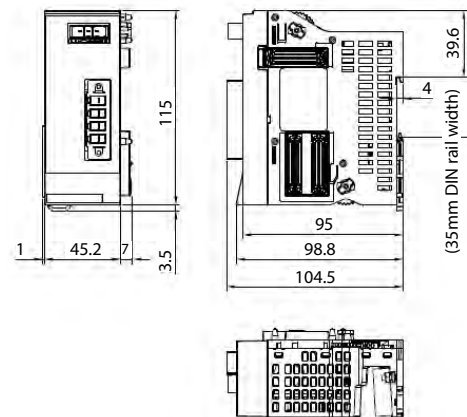
24V



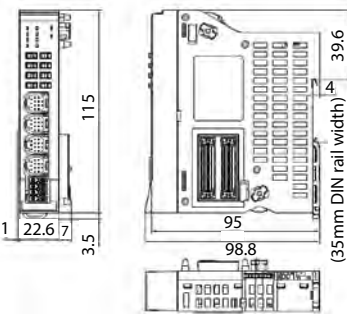
200V



200V power supply unit



EC connection unit



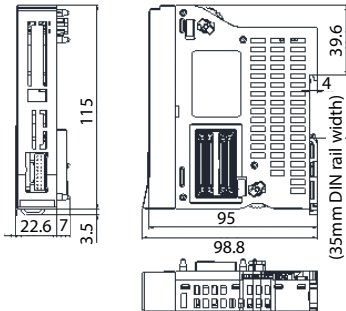
External dimensions

CAD drawings are downloadable from IAI website.
www.intelligentactuator.com

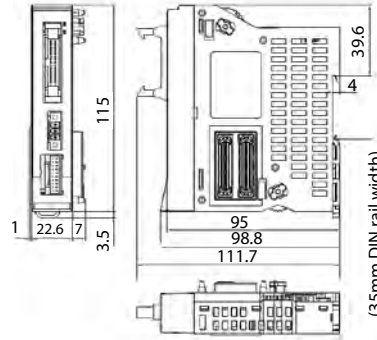


Expansion unit

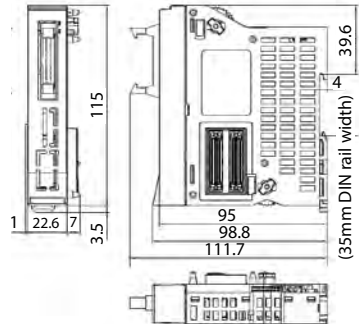
SCON expansion



PIO/SIO/SCON expansion



PIO

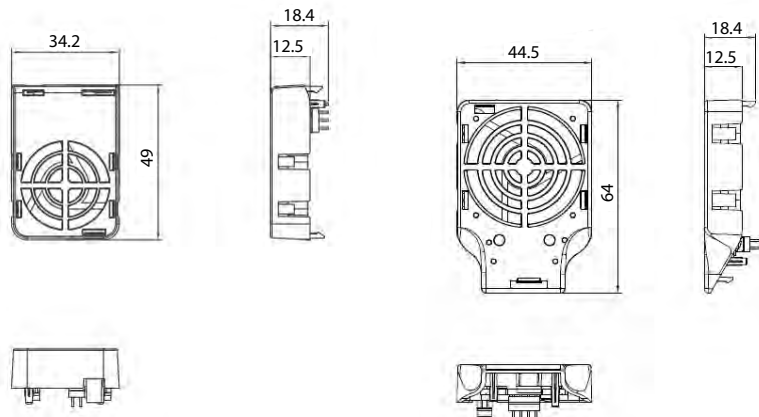


Simple absolute unit



Fan unit

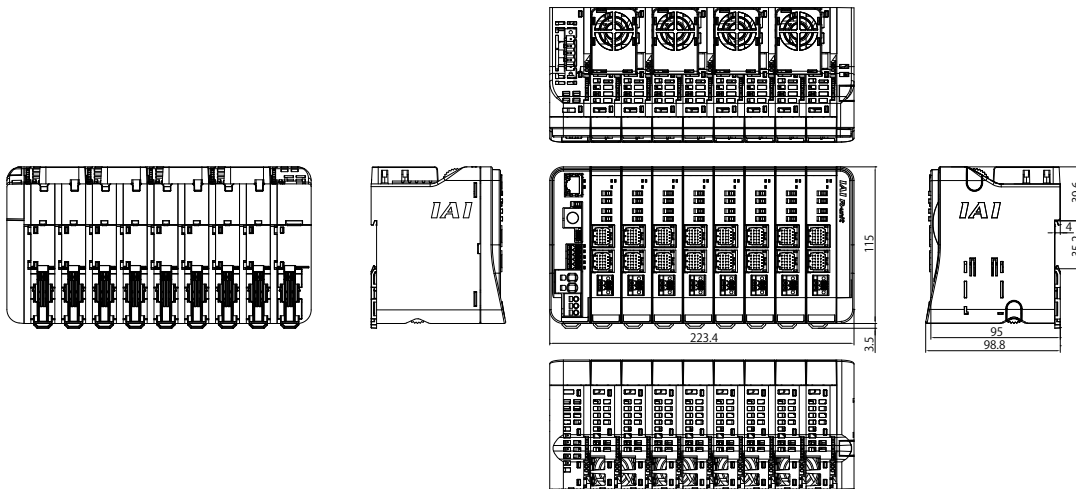
For 200V driver



Unit combination examples

RCON

8 24V driver units (16 axes)
With fan



Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

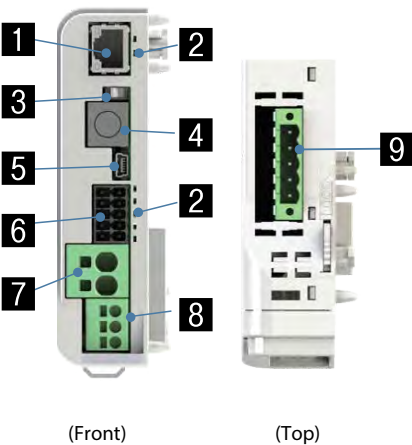
TB -03/02

Software

Name of Each Component

Master unit

RCON-GW/GWG



- 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

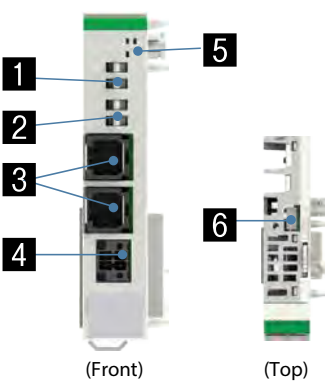
Motor power connector
Motor power +24V supply connector.
- 8

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.

Driver Unit

24V series



- 1

Jog switch
A switch used for jog operations.
- 2

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

MPG connector
A connector to connect the motor encoder cable for actuators equipped with a 24V stepper motor, AC servo motor, or DC brush-less motor.
- 4

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

Status LED
Represents the state of the controller.
- 6

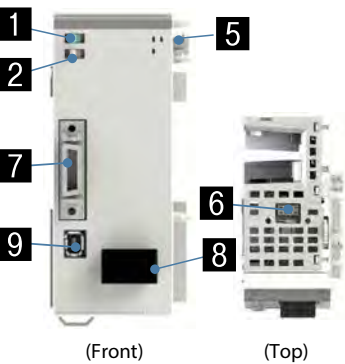
Fan connector
A connector to attach the fan unit.
- 7

Encoder connector
Connects the 200V actuator encoder cable.
- 8

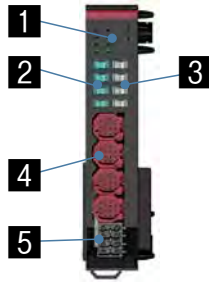
Motor connector
Connects the 200V actuator motor cable.
- 9

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

200V series



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.)

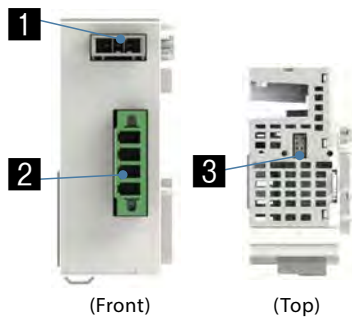
4 EC connector

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

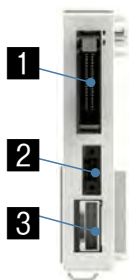
A connector for three-phase/single-phase 200VAC.

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).

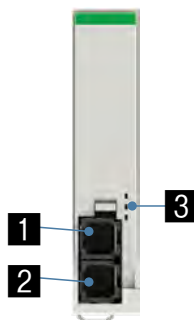
2 SIO cable connector

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.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

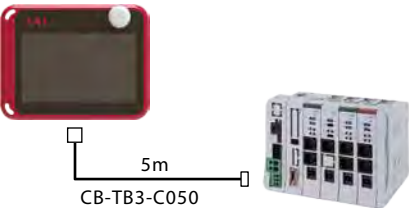
Options

Touch panel teaching pendant

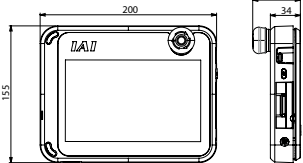
■ Features A teaching device equipped with functions such as position teaching, trial operation, and monitoring.

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

■ Configuration



■ External dimensions

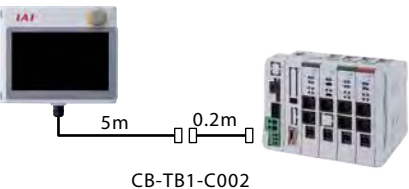


■ Specifications

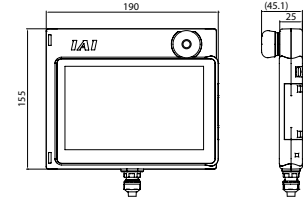
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	5~85% RH (non-condensing)
Environmental resistance	IPX0
Mass	670g (TB-03 unit only)
Charging method	Wired connection with dedicated AC adapter/ controller
Wireless connection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

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

■ Configuration



■ External dimensions



■ Specifications

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

PC Teaching Software (Windows only)

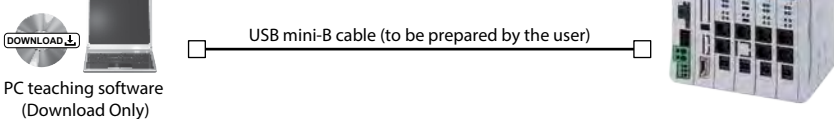
■ Features Start-up support software which comes equipped with functions such as position/program teaching, trial operation, and monitoring.

For RCON/REC

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

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

■ Configuration



Supported Windows versions: 7/10



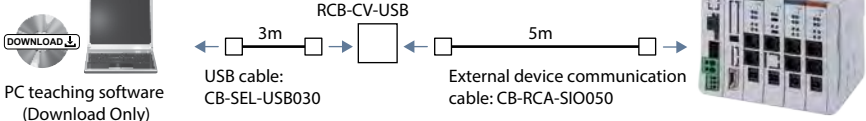
or PC Software downloaded link

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

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

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

■ Configuration



Supported Windows versions: 7/10



24 VDC power supply

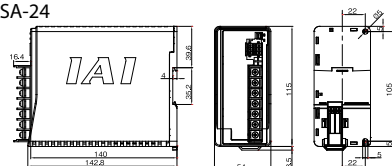
- Overview** The recommended power supply for connection to R-units. The power supply is the same height as RCON and can be easily installed on control panels. It can also be connected to R-units to monitor power status.

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

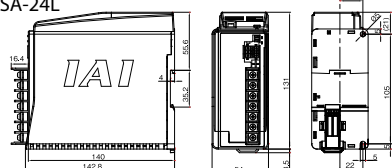
Model **PSA-24L (with fan)**

External dimensions

PSA-24



PSA-24L



DC power supply for driving motors

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

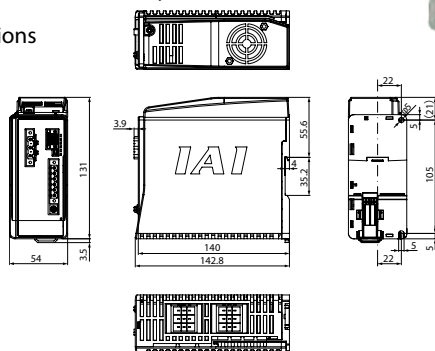
Model **PSA-200-1**

(Input voltage: Single phase AC100V, Max. 800W connectable)

Model **PSA-200-2**

(Input voltage: Single phase AC200V, Max. 1600W connectable)

External dimensions



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	23W (at 204W continuous rated) 37W (at 300W continuous rated)	23W (at 204W continuous rated) 37W (at 300W continuous rated)
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

Specifications

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

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

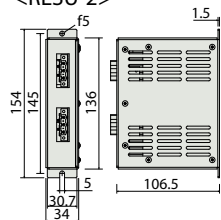
Regenerative resistance unit

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

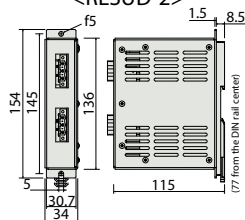
Model **RESU-2 (standard specification)/ RESUD-2 (DIN rail mounting specification)**

External dimensions

<RESU-2>



<RESUD-2>



Specifications

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

* When two regenerative units are required, please use one RESU-2 and one RESU-1 (See P.8-316).

Maintenance Parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

Gateway unit (for RCON-GW/GWG-□)

System I/O connector

■ Model **DFMC1,5/5-ST-3,5**



Dummy plug

For RCON-GWG
■ Model **DP-5**



Fan unit

■ Model **RCON-FU**

* Optional



Network connector

for DeviceNet

■ Model **MSTB2.5/5-STF-5.08 AUM**



Terminal resister for CC-Link
with 110Ω/130Ω

■ Model **MSTB2.5/5-STF-5.08 AU**



For 24V driver unit (RCON-PC/PCF/AC/DC-1/2)

Drive source shutoff connector

■ Model **DFMC1,5/2-STF-3,5**



For Simple absolute unit (RCON-ABU-P/A)

Replacement battery

■ Model **AB-7**



For 200V driver unit (RCON-SC-1)

Dummy plug

■ Model **DP-6**



Fan unit

■ Model **RCON-FU**



For 200V power unit (RCON-PS2-3)

200V power supply connector

■ Model **SPC5/4-STF-7,62**



Fan unit

■ Model **RCON-FUH**



For EC connection unit (RCON-EC-4)

Shutoff connector for drive power

■ Model **DFMC1,5/4-ST-3,5 (REC)**



Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

For SCON expansion unit (RCON-EXT)

Terminal connector

■ Model **RCON-EXT-TR**



For PIO/SIO/SCON expansion unit (RCON-EXT-NP/PN)

Terminal connector

■ Model **RCON-EXT-TR**



SIO port connector

■ Model **FMC1.5/3-STF-3.5**



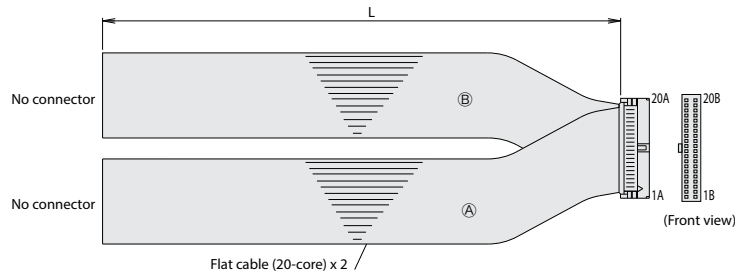
For PIO unit (RCON-NP/PN) and PIO/SIO/SCON expansion unit (RCON-EXT-NP/PN)

PIO cable

* Included when unit model option is specified.

■ Model **CB-PAC-PIO** □ □ □

* Specify cable length in □ □ □
Max. 10m, (ex.) 080=8m



HIF6-40D-1.27R (Hirose)

No.	Signal	Cable color	Wiring	No.	Signal	Cable color	Wiring
1A	24V	Brown-1		18	OUT0	Brown-3	
2A	24V	Red-1		28	OUT1	Red-3	
3A	—	Orange-1		38	OUT2	Orange-3	
4A	—	Yellow-1		48	OUT3	Yellow-3	
5A	IN0	Green-1		58	OUT4	Green-3	
6A	IN1	Blue-1		68	OUT5	Blue-3	
7A	IN2	Purple-1		78	OUT6	Purple-3	
8A	IN3	Gray-1		88	OUT7	Gray-3	
9A	IN4	White-1		98	OUT8	White-3	
10A	IN5	Black-1		108	OUT9	Black-3	
11A	IN6	Brown-2		118	OUT10	Brown-4	
12A	IN7	Red-2		128	OUT11	Red-4	
13A	IN8	Orange-2		138	OUT12	Orange-4	
14A	IN9	Yellow-2		148	OUT13	Yellow-4	
15A	IN10	Green-2		158	OUT14	Green-4	
16A	IN11	Blue-2		168	OUT15	Blue-4	
17A	IN12	Purple-2		178	—	Purple-4	
18A	IN13	Gray-2		188	—	Gray-4	
19A	IN14	White-2		198	0V	White-4	
20A	IN15	Black-2		208	0V	Black-4	

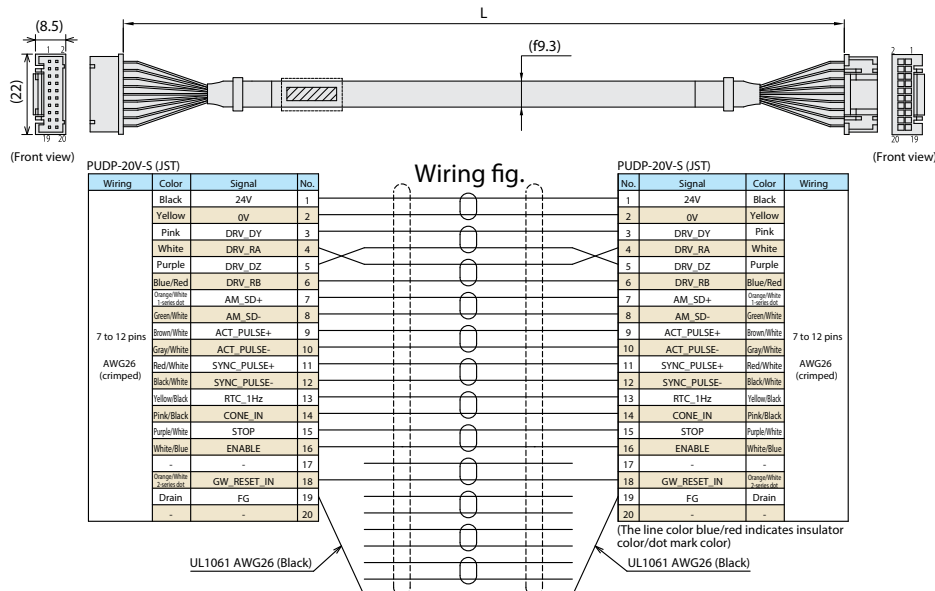
For SCON expansion unit (RCON-EX) and PIO/SIO/SCON expansion unit (RCON-EXT-NP/PN)

SCON connection cable

* Included when SCON-CB for RCON connection is ordered.

■ Model **CB-RE-CTL** □ □ □

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



Maintenance parts (Cables)

When placing an order for a replacement cable, please use the model name shown below.
Refer to P1-89 for details of cables.
The connector of the connection cable (controller side) is attached with a protective cover.
Remove the protective cover when connecting to the controller.

Table of compatible cables

The cable model search system is recommended!

URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



● Motor encoder cable for 24V driver connection

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

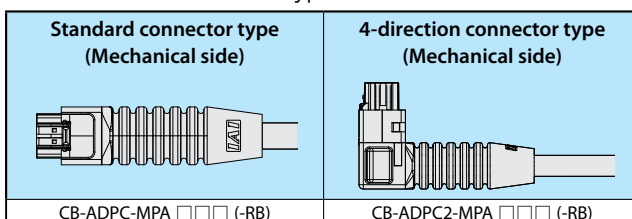
* 1: It is also possible to select the 4-direction connector type for the CB-ADPC-MPA□□□(-RB) cable.

Note 1: An actuator that uses a high thrust stepper motor (56SP, 60P, 86P)

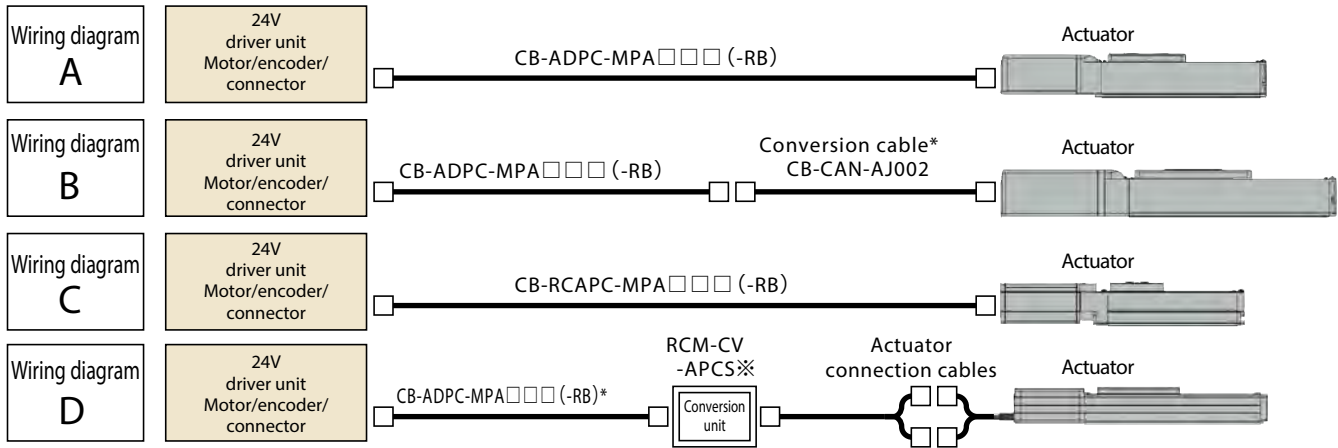
Note 2: Up to 20m from each driver unit to the actuator, with or without the conversion unit.

Note that the maximum length from the driver unit to the RCD actuator will be 10m.

● 4-direction connector type



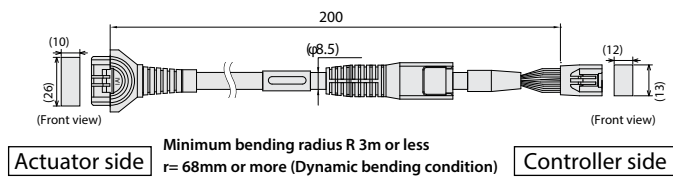
Wiring diagram



* 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.

Conversion cable

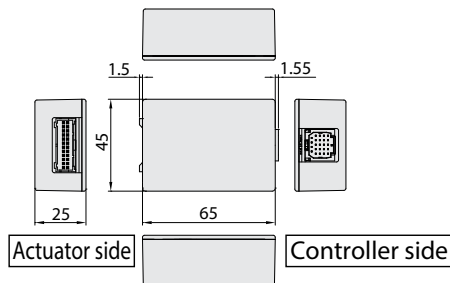
Model CB-CAN-AJ002



1-1827863-1 (AMP)					DF62B-24EP-2.2C (HIROSE ELECTRIC CO., LTD.)				
Color	PC	AC	DC	Pin No.	Pin No.	PC	AC	DC	Color
Black (AWG22)	□A	U	U	A1	3	□A	U	U	Black (AWG22)
White (AWG22)	VMM	V	V	B1	5	VMM	V	V	White (AWG22)
Green (AWG22)	□B	-	-	B2	10	□B	-	-	Green (AWG22)
Yellow (AWG22)	VMM	-	-	A3	9	VMM	-	-	Yellow (AWG22)
Brown (AWG22)	□A	W	W	A2	4	□A	W	W	Brown (AWG22)
Red (AWG22)	□B	-	-	B3	15	□B	-	-	Red (AWG22)
White (AWG26)	SA(mABS)	A+	A+	A6	12	SA(mABS)	A+	A+	White (AWG26)
Yellow (AWG26)	SB(mABS)	A-	A-	B6	17	SB(mABS)	A-	A-	Yellow (AWG26)
Red (AWG26)	A+	B+	B+	A7	1	A+	B+	B+	Red (AWG26)
Green (AWG26)	A-	B-	B-	B7	6	A-	B-	B-	Green (AWG26)
Black (AWG26)	B+	Z+/SA(mABS)	HS1_IN	A8	11	B+	Z+/SA(mABS)	HS1_IN	Black (AWG26)
Brown (AWG26)	B-	Z-/SB(mABS)	HS2_IN	B8	16	B-	Z-/SB(mABS)	HS2_IN	Brown (AWG26)
Blue (AWG26)	VPS	VPS/BAT-	-	B9	18	VPS	VPS/BAT-	-	Blue (AWG26)
Pink (AWG26)	LS+	BK+	-	A4	8	LS+	BK+	-	Pink (AWG26)
Black (AWG26)	BK+	LS+	-	A5	20	BK+	LS+	-	Black (AWG26)
Brown (AWG26)	BK-	LS-	-	B5	2	BK-	LS-	-	Brown (AWG26)
White (AWG26)	VCC	VCC	VCC	A10	21	VCC	VCC	VCC	White (AWG26)
Yellow (AWG26)	GND	GND	GND	B10	7	GND	GND	GND	Yellow (AWG26)
Red (AWG26)	LS-	BK	-	B4	14	LS-	BK	-	Red (AWG26)
Green (AWG26)	LS_GND	LS_GND	HS3_IN	A9	13	LS_GND	LS_GND	HS3_IN	Green (AWG26)
-	-	-	-	A11	19	-	-	-	-
Green (AWG26)	FG	FG	FG	B11	22	CF_VCC	BAT+	-	White (AWG26)
					23	-	-	-	-
					24	FG	FG	FG	Green (AWG26)

Conversion unit

Model RCM-CV-APCS

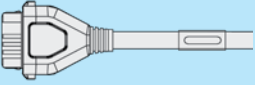
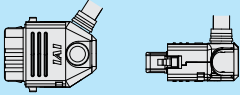


● Motor encoder cable for 200V driver connection

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

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

● EC connection unit Cable for connection, power source and communication

Standard connector type (Mechanical side) 	4-direction connector type (Mechanical side) 
CB-REC-PWBIO □□□ (-RB)	CB-REC2-PWBIO □□□ (-RB)

● Motor power cable for 200

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

RSEL

Unit-connecting type
Program controller



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

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

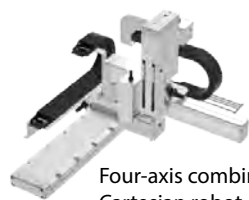
RSEL

Group 1

Group 2



Four-axis combined
Cartesian robot



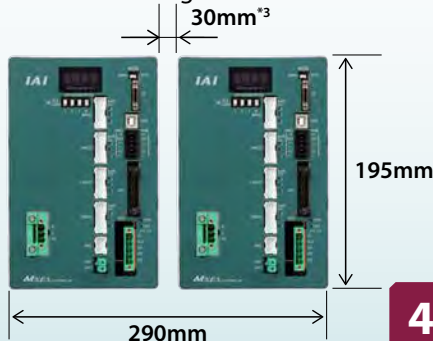
Four-axis combined
Cartesian robot

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)

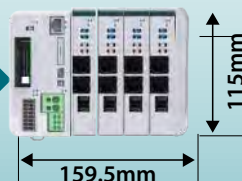


MSEL
CC-Link specification
8 axes (4 axes x 2 units)

44% cost reduction

RSEL x8-axis connection specification

67%
Space saving



RSEL
CC-Link specification
stepper motor 8 axes

SEL Programming support tool

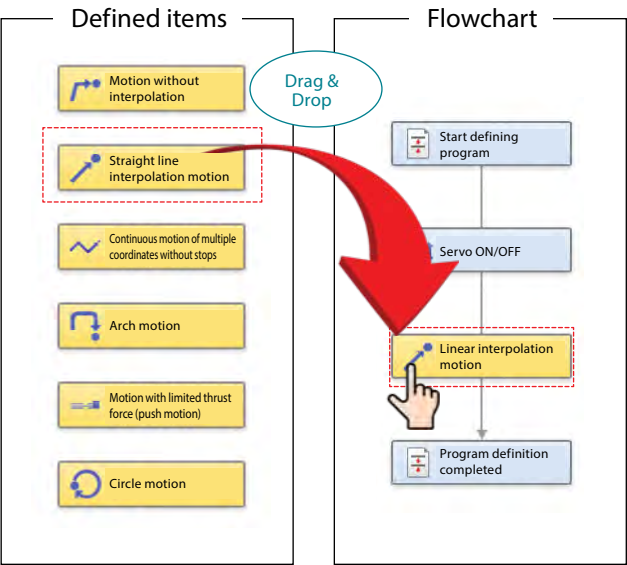
SEL Programming support tool

The "SEL programming support tool" of the PC-compatible teaching software "IA-101" supports customers.

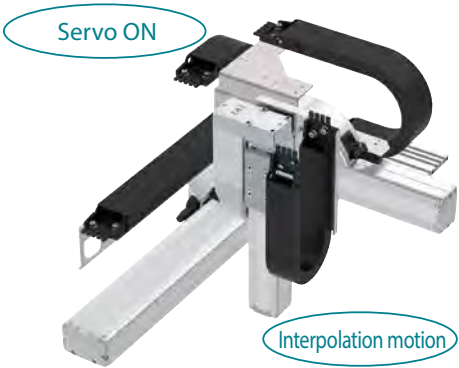
The "SEL programming support tool" creates SEL programs by placing defined items for motions. Programs can be created without learning the SEL language.



PC-compatible teaching software for RSEL is available for V.14.00.00.00 or later.

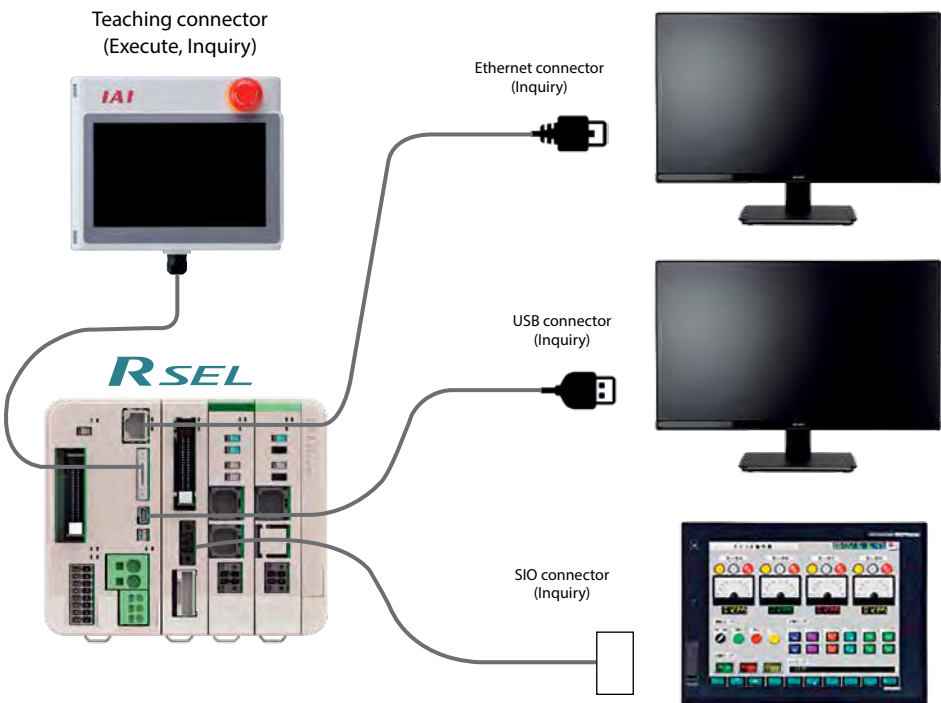


Execution



Serial communication protocol

With RSEL, the XSEL communication protocol can now communicate with multiple channels. The controller conditions can be monitored by multiple devices.



Selection method

Step 1 Select actuators to be connected (up to 16 axes)

(Note) Refer to P8-115 for connection limitations for actuators that are not connectable.
* Make sure to select option "ACR" for the ELECYLINDER model.

<Selection example>



RCS2
Series



RCA2
Series



RCP6
Series



WU
Series



RCS4
Series



IS(P)B
Series



EC
series

Step 2 Selection of the SEL unit

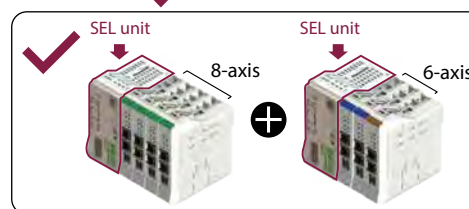
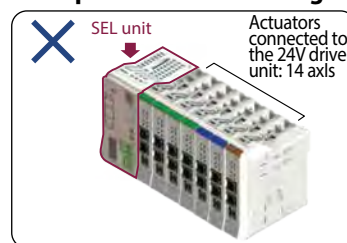
Select the SEL unit from the I/O types shown below.

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

Selection 1

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

Example: When connecting 14 axes



The maximum number of connected axes to the driver unit and EC connection unit.

* 24V/200V driver unit: up to 8 axis

* EC connection unit: up to 16 axis







Step 3 Classify actuator types into three categories.

*See P. 8-115 for actuators that cannot be connected.

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

Step 4 Selection of 24V driver (24V motor type)

Select a driver unit model and quantity according to the actuator series and motor type.

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		2-axis specification	RCON-PC-2	 WU-S	1 unit
	1-axis specification		RCON-PC-1	 RCP6-RTFML	1 unit	
	1-axis specification		RCON-PCF-1	-	-	
	RCA RCA2 RCL	2 5 10 20, 20S 30		2-axis specification	RCON-AC-2	-
1-axis specification		RCON-AC-1		 RCA2-GS3NA	1 unit	
RCD	3D		2-axis specification	RCON-DC-2	-	-
			1-axis specification	RCON-DC-1	-	-

Step 5 Selection of the simple absolute unit

When there is an actuator with the simple absolute unit, select simple absolute units (RCON-ABU-A/P) in the same quantity as the number of axes.

* Connect the driver unit and cable (CB-ADPC-MPA005).

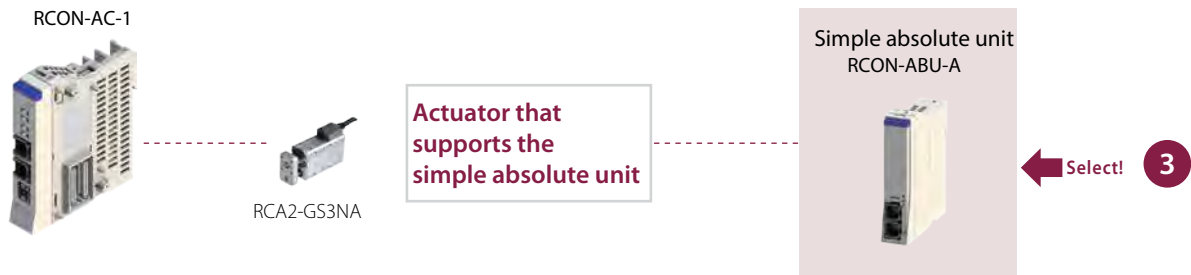
The cable comes with the simple absolute unit.

(Note) The ambient temperature for the simple absolute unit is 0 to 40°C.






<Selection example>

In case of selecting an RCA2 series actuator with the simple absolute specification.






Step 6 Selection of the EC connection unit (ELECYLINDER model)

When connecting the EC series, select the necessary number of connection units according to the number of units to be connected to EC.

Actuator		EC connection unit			<Selection example>	
Series	Motor type	External view	Number of axis connected to actuator	Model	Classification	Required units
EC	28P, 35P 42P, 56P		4-axis specification	RCON-EC-4	 EC-RR6  EC-GRB10	1 unit ← Select! 4





Step 7 Classify 200V motor models in two categories

Classify the axis into two categories: those connected to the 200V driver unit and those connected to the expansion unit.

Connection unit	Actuator specifications	Selected actuator
200V driver unit	Specification that meets all conditions below (Motor wattage [W]) 60W~750W (Encoder type) Incremental Battery-less Absolute	 RCS4-WRA16R-WA-400  IS(P)B-LXL-WA-400
Expansion unit	Other than the 200V driver unit specification	 RCS2-RTC8L-I-20 <p>* This is because the 20W specification cannot be connected to RCON-SC.</p>

Step 8 Selection of the 200V driver unit

Select the driver units in the same quantity as actuators connected to one 200V power unit.




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

Select! 5

Select! 5



Step 9 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. (Two different types can not be used in one system.)

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

Select! 6

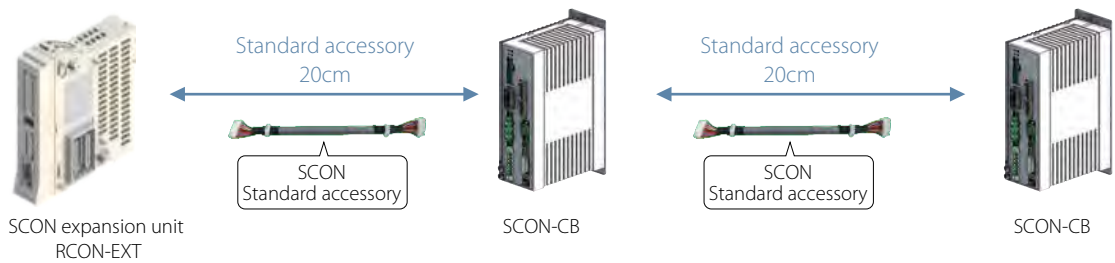
(2) Select a number of controllers (SCON) to connect through the expansion unit according to the number of connected actuators. *A number of SCONs must be purchased according to the number of connected axes. (Max. number of connections: 8 axes.)

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

Select! 7

● Example of connections for the expansion unit and SCON -CB

Each SCON-CB for RCON connection comes with a cable (CB-RE-CTL002) as standard.



Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

Additional
information

If the supplied connecting cable is too short, it is possible to order a longer cable for connection.

Model: CB-RE-CTL□□□

See P. 8-140



x Necessary quantity

(Note) The cable length between the equipment is maximum 3m, and the total cable length is up to 10m.

(3) In the case of selecting the PIO unit

It is possible to increase the PIO input/output points by connecting the PIO unit. (Input max. 128, Output max. 128)

One unit has 16 input and 16 output points. The maximum number of connections is 8.
(When connecting to the PIO/SIO/SCON expansion unit, the maximum connection is 7 units.)

When connecting EC connection units, the maximum connected number is obtained by subtracting the number of EC connection units from the maximum number of connections of 8.
Refer to P8-115 for the connection limitations.

Divide the number of input or output points by 16.

If an integer number is obtained, order the number of PIO units. If not divisible, round up to the nearest whole number for ordering.

<Example>

In the case of increasing 24 inputs and 20 outputs in NPN specification.

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



2 units

PIO unit [RCON-NP]



Select!

8

Step 10 Calculation of each unit control power capacity (CP)

Confirm that the total control power capacity for all units connected to RSEL is less than the specified value below.

Item	Total Current Limit
Control power (CP)	9.0A or less

Confirmation method

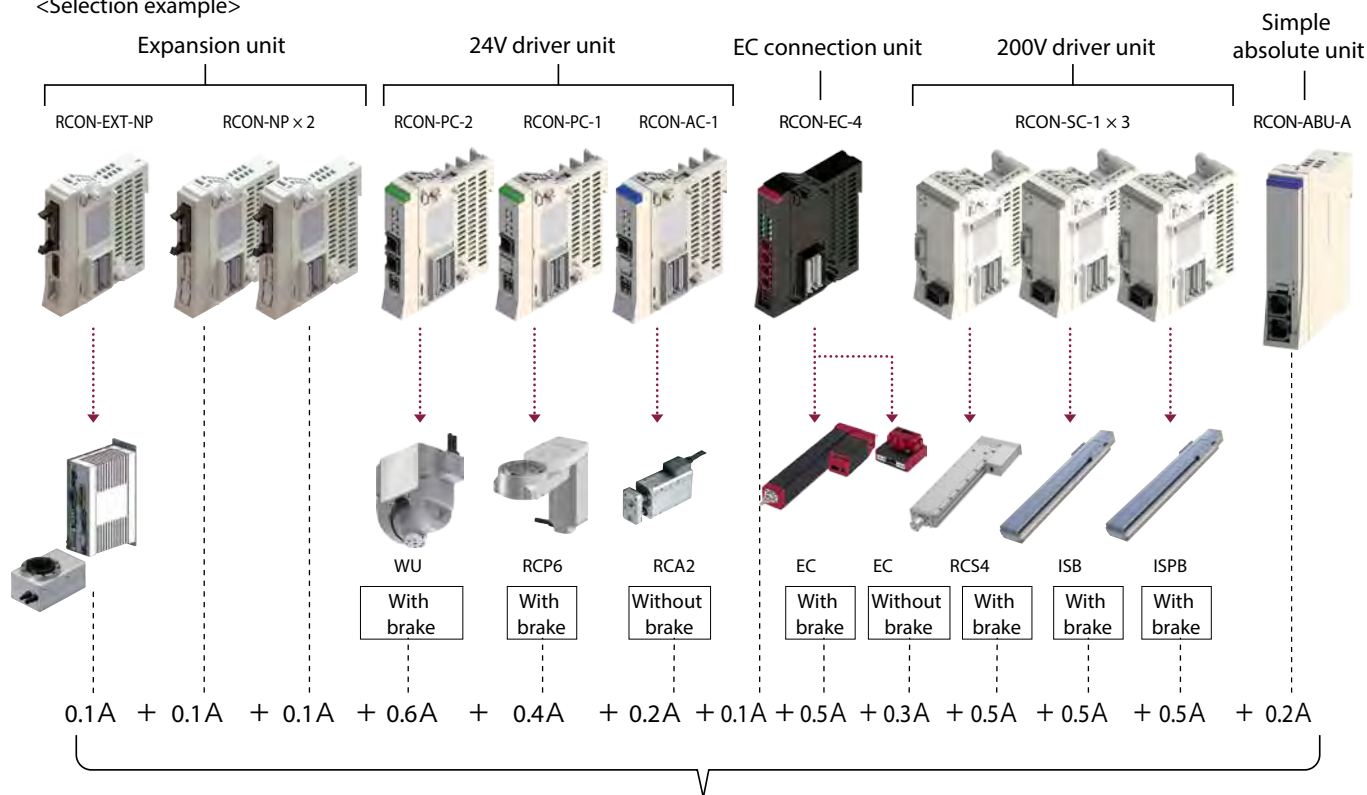
Add up referring to the following the "List of control power capacity."

Control power capacity list

Item	Specification		Power capacity	<Selection example>
Control power capacity (per unit)	Master unit (including terminal unit)	SEL unit	1.2A	
	24V driver unit (common for all types)	Without brake	0.2A	x 1 unit
		With brake (1-axis specification)	0.4A	x 1 unit
		With brake (2-axis specification)	0.6A	x 1 unit
	200V driver unit	Without brake	0.2A	
		With brake	0.5A	x 3 units
	Expansion unit (common for all types)		0.1A	x 3 units
	Simple absolute unit (common to all types)		0.2A	x 1 unit
	EC connection unit (per one unit)		0.1A	x 1 unit
	24V spec. ELECYLINDER (per one axis)	Without brake	0.3A	x 1 axis
		With brake	0.5A	x 1 axis
	200V spec. ELECYLINDER (per one axis)	Without brake	0.32A	
		With brake	EC-S10□/S10X□	0.54A
			EC-S13□/S13X□ EC-S15□/S15X□	1.2A

* For unit selections, the power capacity of the master unit is not included in calculation, but for the 24V power selections, include it.

<Selection example>



OK

(It is confirmed that the current value is less than 9.0A. When it is over 9.0A, one more SEL unit is needed.)

Step 11 Step 11 Calculation of the motor power capacity (MP)

Confirm that the total of the motor power capacities for all units connected to RSEL is less than the value stated below.

Item	Total Current Limit
Motor power (MP)	37.5A or less

Confirmation method

Add up the values, referring to the "List of motor capacities."
If no rated current is specified, add the maximum current.

24V driver unit

Item		Actuator / driver unit			Rated current	Max. current.		<Selection example>
		Series	Motor type			Power-saving		
Motor power capacity (per one actuator)	Stepper motor /RCON-PC	RCP2	20P/20SP/28P	High output not available	0.8A	—	—	x 3 axes
		RCP3	28P ¹ /35P/42P/56P		1.9A	—	—	
		RCP4	28P/35P/42P/ 42SP/56P	High output disabled	1.9A	—	—	
		RCP5		High output enabled	2.3A	—	3.9A	
		RCP6		2.3A	—	3.9A		
		WU ²	28P/35P	High output only	2.3A	—	3.9A	
	Stepper motor /RCON-PCF	RCP2	56SP/60P/86P	High output not available	5.7A	—	—	
		RCP4						
		RCP5						
	RCP6							
	AC servo motor /RCON-AC	RCA RCA2	5W	Standard/ High accel.& decel	1.0A	—	3.3A	x 1 axis
			10W		1.3A	2.5A	4.4A	
			20W	Standard/ High accel.& decel/ Power-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/ High accel.& decel	0.8A	—	4.6A	
			5W		1.0A	—	6.4A	
			10W		1.3A	—	6.4A	
DCbrush-less motor /RCON-DC	RCD	3W	Standard	0.7A	—	1.5A		

*1 Supporting models: RCP2-RA3 and RCP2-RGD3

*2 One WU is equipped with 2 motor axes. The current values in the table show for one motor axis.

EC connection unit

Item		Series	Actuator / connection unit			Power current		
			Type	Motor type		Rated	Max.	
Motor power capacity (per one actuator axis)	24V stepper motor	EC	RTC18	<input type="checkbox"/> 56SP	—	—	5.7A	x 1 axis
			S/R/RR/B	<input type="checkbox"/> 56	Power-saving disabled	2.3A	3.9A	
			S/R/RR/B	<input type="checkbox"/> 56	Power-saving enabled	—	1.9A	
			S/WS/R/RR/B/RTC12/SG15	<input type="checkbox"/> 42	Power-saving disabled	2.3A	3.9A	
			ST	<input type="checkbox"/> 42	Power-saving enabled	—	1.9A	x 1 axis
			S/WS/RR/B/SG11/RP5/GD5/TC5/TW5	<input type="checkbox"/> 35	Power-saving disabled	2.3A	3.9A	
			S/WS/RR/B/SG11/RP5/GD5/TC5/TW5	<input type="checkbox"/> 35	Power-saving enabled	—	1.9A	
			S3/RR3	<input type="checkbox"/> 28	—	—	1.9A	
			RP4/GS4/GD4/TC4/TW4/RTC9/GRB10/GRB13	<input type="checkbox"/> 28	—	—	1.7A	
			GRB8	<input type="checkbox"/> 20	—	—	0.7A	
			SL3/GDS3/GDB3/T3	<input type="checkbox"/> 20	—	0.4A	0.8A	

24V driver unit EC connection unit

<Selection example>

Actuator	Series	Motor type	Current
RCON-PC-2	WU	28P	(2.3A×2)
RCON-PC-1	RCP6	42P	2.3A
RCON-AC-1	RCA2	10W	1.3A
RCON-EC-4	EC	42P	2.3A
RCON-EC-4	EC	28P	1.7A

Total = 12.2A < 37.5A

OK

[Caution] (It is confirmed that the current value is less than 37.5A. When it is over 37.5A, one more SEL unit is needed.)
Use the maximum current value for calculation when all axes operate acceleration/deceleration motions at 100% duty ratio.
Use the following software when the power capacity should be calculated more accurately according to the operating conditions.

How to get the calculator software



Calculator software comes with the IA-OS software.

Step 12 Limitations on the 200V motor power

Confirm that the total wattage of the actuator motors connected to RCON-SC is less than the values specified in the table below.

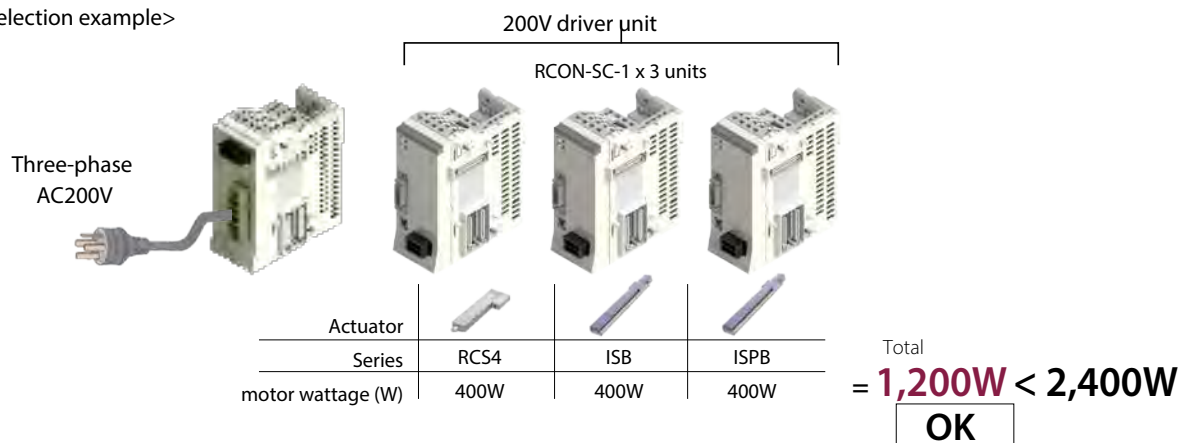
* There are some limitations. Refer to the "Actuators that cannot be connected to R-Unit on P8-115.

Connected power	Total output of Max. connected axes
Three-phase AC200V	2,400W
Single-phase AC200V	1,600W

Confirmation method

Confirm the motor wattage from the actuator specification. It is necessary to calculate the power capacity of some models using the "Motor wattage for calculation." Refer to P8-122 for details.

<Selection example>



Step 13 Selection of the fan unit

When the environment for the controller operation can exceed 40°C, it is necessary to install the fan unit. (Maximum 55°C) *

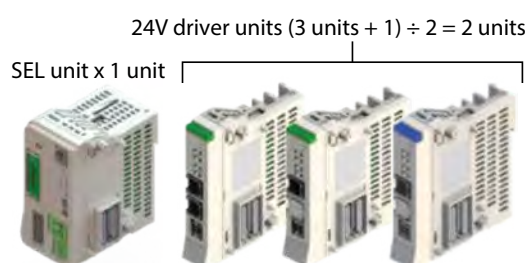
(1) Fan unit for the SEL unit and 24V driver unit

The SEL unit can install one fan unit.

The number of fan units for the 24V driver unit is obtained by dividing the total number of the 24V driver units by 2. If the value is an odd number, add 1 and then divide by 2.

Specify the number at the SEL unit model for order.

<Selection example>



Fan unit [RCON-FU] x 3 units

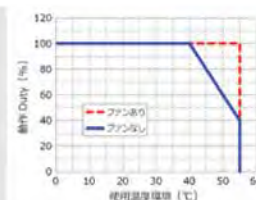
(Note) The operating ambient temperature is 0-40°C even when the fan unit is installed.

Select! 9

* The range of operating temperature of the gateway unit and driver unit is 0 - 55°C.

However, there is a temperature derating depending on the existence of the fan unit.

When there is no fan unit, operation is possible at 0-40°C without derating. However, it is necessary to lower the operating duty rate by 20% for every 5°C at 40-55°C.



(2) Fan unit for the 200V driver unit and 200V power unit

One fan unit is included in each unit (No need to specify the model code.).

<Selection example>



Step 14 Terminal unit

Select the terminal unit according to the unit connected to the left side of the terminal unit.
(The construction does not allow wrong connections. Confirm the model and attach it.)

Unit connected to left	Terminal unit single product model number	Cautions on the included unit and ordering
RCON-SC	RCON-GW-TRS	Included in the 200V power unit. (Select the SEL unit option of TRN (without terminal unit)).
Other than RCON-SC	RCON-GW-TR	Included in the SEL unit.

← Select! 10

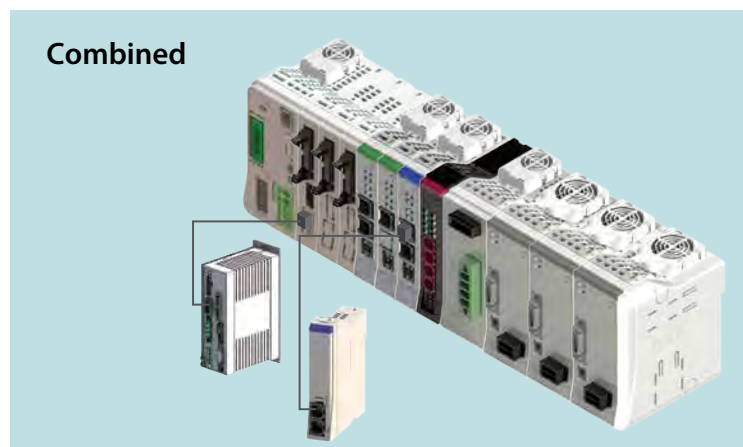
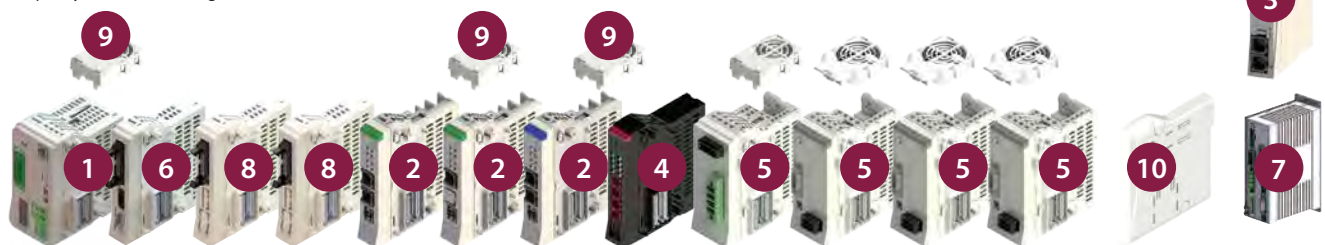
Step 15 Ordering unit model

Order each unit model code

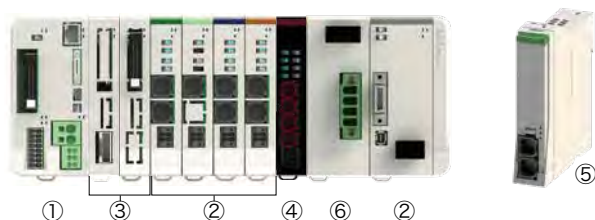
<Selection example>

Model for order (x quantity)	Name, Specifications
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-EC-4	EC connection unit
RCON-PS2-3	200V Power unit
RCON-SC-1 x 3 units	200V driver unit
SCON-***-RC	RCON connection specification SCON controller Select the model code for ordering according to the actuator to be connected.

* Specify the IO cable length in □.



Model specification items



(1) Master unit

Model

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)
DV	DeviceNet connection specification
DV2	DeviceNet connection specification (bifurcated connector supplied)
CC	CC-Link connection specification
CC2	CC-Link connection specification (bifurcated connector supplied)
CIE	CC-Link IE Field connection specification
PR	PROFIBUS-DP connection specification
EC	EtherCAT connection specification
EP	EtherNet/IP connection specification
PRT	PROFINET IO connection specification

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




































































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

FU	Fan unit installed (□: specify quantity of 1 - 5)
TRN	No terminal unit

* The fan units show the quantity of fans connected to the master unit and 24V driver unit.

* The terminal unit is necessary for operations. However, when connecting/ ordering the RCON-SC, the terminal unit included in the 200V power unit is connected. Therefore, select "TRN."

Legend:
○ : Available

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

(2) Driver unit

Model

RCON – [] – []

Series Type Number of Axes

PC	Stepper motor	1	1-axis specification
PCF	High thrust stepper motor	2	2-axis specification
AC	AC servo motor		
DC	DC brush-less motor		
SC	200V AC servo motor		

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

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	30R 60 100 100S 150 200 200S 300S 400 600 750	30W (for RS) 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
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(3) Expansion unit

RCON – [] – []

Series Expansion I/O Cable Length

EXT	SCON expansion	0	No cable
EXT-NP	PIO/SIO/SCON expansion (NPN specification)	2	2m (Standard)
EXT-PN	PIO/SIO/SCON expansion (PNP specification)	3	3m
NP	PIO (NPN specification)	5	5m
PN	PIO (PNP specification)		

*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

(5) Simple absolute unit

RCON – **ABU** – []

Series Absolute Unit Type

P	Stepper motor
A	AC servo motor

(6) 200V power unit

RCON – **PS2** – **3** – []

Series Type Power supply voltage Options

3	Three-phase/single-phase 200V	TRN	Without terminal unit
---	-------------------------------	-----	-----------------------

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

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

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

Refer to P. 8-255 for model selection items.

■ Actuators not connectable to the RSEL.

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)	
RSEL	Actuator	24V stepper motor/ 24V AC servo motor/ actuator equipped with DC brush-less motor	Actuators with 200V AC servo motor		ELECYLINDER
		Table top: TT(A) SCARA robot: IXP Pulse press: RCP6 <Actuators with specs below> Actuators with an absolute encoder	Servo press: RCS2/RCS3 Linear servo: LSA-W21H LSA-W21S (single phase-power) SCARA robot: IX/IXA ROBO Cylinder: RCS3-CT8C/CTZ5C (single-phase power) Single-axis robot: ZR Single-axis robot: IS(P)B-WXM/WXMX (single-phase power supply) Rotary: DD/DDA (single-phase power) <Actuators with specs below> * Actuators with a motor of less than 60W and over 750W. (Except for RS-30) * Actuators with an absolute encoder and a multi-rotation absolute.		ELECYLINDER with no "ACR" option code

■ Limitations on connection

- * The total number of all actuators connected should be 16 or less.
The multi slider is calculated as 2 axes.
However, the total number of actuators that are connected to the 24V/200V driver unit or the expansion unit (SCON connection spec) is up to 8 axes.
- * There is a limitation on the maximum number of connected axes for the actuators shown in the table below due to the 200V power unit. (Connectable only for the three-phase specification)
When actuators in the table are connected in excess of the maximum number of connected axes, connect the SCON-CB RCON spec. to the expansion unit.
When actuators not listed in the table are connected, use the calculation of power capacity (P8-121) for selection.

Actuator model	Max. connected axes
DD(A)-LT18(C)□/T18□	8 axes
DD(A)-LH18(C)□/H18□	2 axes
RCS3-CTZ5C	8 axes
RCS3-CT8C	3 axes

- * When connecting EC-RTC18 to one of the EC connection units (RCON-EC-4), the maximum number of connected axes is 2.

EC-RTC18 Connected axes	RCON-EC-4 (1 unit)	ELECYLINDER (except for EC-RTC18)
1 axis	○	3 axes
2 axes	○	Not connectable

- * When connecting the expansion unit, select it so that the following conditions are satisfied.
The maximum number of connected units is 8.
Either one of the SCON expansion units of the PIO/SIO/SCON expansion unit is connected and one unit for one master unit can be connected.
The total number of connected units for the units with PIO and EC connection units is up to 8.

■ Connection recognition

The order of recognition of the actuators connected to the R-unit is as shown in the table on the right. When the number of connected actuators exceeds the limit, actuators in the lower priority order are not recognized.

Priority order	Unit name
high ↓ low	24V driver unit
	200V driver unit
	Expansion unit (SCON connection spec.)
	EC connection unit

System configuration

RSEL

Options

PC teaching software
(See P. 8-137)

<Model: XSEL PC
Software, IA-101-X>



For XSEL PC Software : USB cable, Ethernet cable
For IA-101-X(A): Supplied with PC teaching software

Options

Teaching pendant

(See P. 8-137)

<Model: TB-03><Model: TB-02(D)>



SEL unit (NP/PN specification)
option

PIO cable
(See P. 8-140)

<Model: CB-PAC-PIO***>

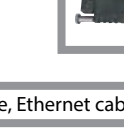


Included with SEL unit

Dummy plug

(See P. 8-139)

<Model: DP-4S>



Field network

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

Included with SEL unit

System I/O connector

(See P. 8-139)

<Model: DPMC1,5/8-ST-3,5>



Options

Fan unit

(See P. 8-139)

<Model: RCON-FU(H)>

Options

24VDC power
supply

(See P. 8-138)

<Model: PSA-24>



Included with unit

SCON connection, PIO/SIO connection

Expansion SIO port connector

(See P. 8-140)

<Model: FMC1,5/3-STF-3,5>



Included with SCON (RC specification)

Connection cable

(See P. 8-140)

<Model: CB-RE-CTL002>

RCON-EXT connection
specification
SCON controller
[I/O type: RC]



Included with

SCON connection

expansion unit

Terminal connector

(See P. 8-140)

<Model: RCON-EXT-TR>



Included with 24V driver unit

Drive source shutoff connector

(See P. 8-139)

<Model: DPMC1,5/2-STF-3,5>



Included with simple absolute unit

Connection cable

(See P. 8-130)

<Model: CB-ADPC-MPA050>

Included in the EC connection unit

Driving power shutoff connector

(See P. 8-140)

<Model: DPMC1,5/4-ST-3,5>

Options

Simple absolute unit

(See P. 8-130)

<Model: RCON-ABU-P

(for stepper motor)>

<Model: RCON-ABU-A

(for AC servo motor)>



Options

Regenerative

resistance unit (Note 1)

(See P. 8-120)

<Model: RESU-2/

RESUD-2>



Included with power

supply unit

Power supply

connector

(See P. 8-120)

<Model: SPC5/4-STF-7,62>



Motor power
Three-phase/
single-phase
200VAC

Motor-Encoder cable / Power and Communication cable (EC connection) *1

Connectable actuators

Connection with

"expansion unit"

RCS2/3/4 Series
IS(D)B Series
SSPA Series
DD(A) Series
LSA Series



* See P. 8-115 for actuators
that cannot be connected.

Connection with "24V driver unit"

RCP2/3/4/5/6 Series
WU Series



RCA/2 Series



RCD Series



Connected to

"EC connection unit"

EC series

*2



Connection with

"200V driver unit"

(60W~750W equipped actuator)
RCS2/3/4 Series
IS(D)B Series
SSPA Series
DD(A) Series
LSA Series



* See P. 8-115 for actuators
that cannot be connected.

*1 The motor/encoder cable is supplied with the actuator.
The motor/encoder cables are different according to the actuator type to be connected.
See P. 8-141 when ordering a spare cable.

*2 ELECYLINDER can control only the double solenoid.
The connection method varies depending on the type. Refer to P8-151 for details.
When connecting an ELECYLINDER with a digital speed controller, the digital speed controller cannot be controlled.

Note 1: The RCON-SC and RCON-PS2 are equipped with a 60W built-in regenerative resistance, respectively. Basically, a regenerative resistance is not necessary, but if it is not enough, an external regenerative resistance unit is used.

The necessary quantity of the resistance can be calculated by the "Calculator."

Note2: To configure the system that complies with the safety category (ISO 13849-1), refer to P8-29.

Controller

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

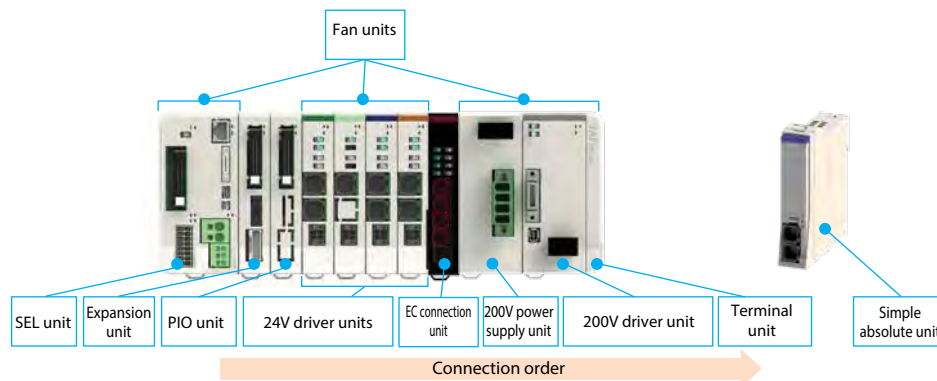
Software

Unit configuration

The RSEL has a lock construction of the unit-connecting type. The connectable units have the same connectors. However, there is a limitation on unit layout. Connect them based on the limitations for each unit.

Connect the units from the left viewing from the front side, starting from the SEL unit.

* If the units are not connected in the proper order shown below, they will not operate normally.



Unit name	Number of connected units	Additional information
Gateway unit	1	Placed at far left
Expansion unit (SCON connection) spec.)	1	Select either type
Expansion unit (PIO unit)	(Max.) 8	Max. 7 units when PIO/SIO/SCON expansion units are connected
24V driver unit	(Max.) 8	Exchanges within 24V driver units are possible
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.) 8	Can be rearranged within the 200V driver unit area
Terminal unit	1	Place at far right (type differs according to driver connected to left)

(Note) There is a limit on the number of connected axes. Refer to P8-115 for the details.

■ List of unit names and individual model codes

Product name		Model	Reference page
Master unit/ SEL unit	IO no connection spec.	RSEL-G-E	P8-123
	PIO (NPN) connection spec.	RSEL-G-NP	
	PIO (PNP) connection spec.	RSEL-G-PN	
	DeviceNet connection spec.	RSEL-G-DV	P8-124
	DeviceNet connection spec. (2-way connector)	RSEL-G-DV2	
	CC-Link connection spec.	RSEL-G-CC	P8-124
	CC-Link connection spec. (2-way connector)	RSEL-G-CC2	
	CC-Link IE Field connection spec.	RSEL-G-CIE	P8-125
	PROFIBUS-DP connection spec.	RSEL-G-PR	P8-125
	EtherCAT® connection spec.	RSEL-G-FC	P8-126
	EtherNet/IP connection spec.	RSEL-G-EP	P8-126
	PROFINET IO connection spec.	RSEL-G-PRT	P8-126
Expansion unit	SCON expansion	RCON-EXT	P8-129
	PIO/SIO/SCON expansion (NPN spec.)	RCON-EXT-NP	
	PIO/SIO/SCON expansion (PNP spec.)	RCON-EXT-PN	
	PIO (NPN spec.)	RCON-NP	
	PIO (PNP spec.)	RCON-PN	
24V driver unit	Stepper motor 1-axis specification	RCON-PC-1	P8-127
	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 spec.	RCON-EC-4	P8-128
200V power supply unit	200VAC input power supply	RCON-PS2-3	P8-128
200V driver unit	AC200V motor 1-axis specification	RCON-SC-1	P8-128
Terminal unit	For 24V	RCON-GW-TR	P8-130
	For 200V	RCON-GW-TRS	
Simple absolute unit	For RCON-PC	RCON-ABU-P	P8-130
	For RCON-AC	RCON-ABU-A	
Fan unit	Other than the below	RCON-FU	P8-139
	For 200V driver	RCON-FUH	

Basic specifications

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

Legend:
○ : Compliant

*1 XSEL serial communication protocol (Format B) enables communications with only one port.
The priority order is teaching port (high priority), USB and Ethernet (low priority). Lower priority does not respond.

Encoder resolution

Item	Motor type	Model		Encoder type	Value [pulse/r]
24V driver unit	Stepper motor	RCP6		Battery-less Absolute	8192
		RCP5/RCP4/RCP3/RCP2		Battery-less Absolute	800
				Incremental	
	WU			Battery-less Absolute	8192
	AC servo motor	RCA		Battery-less Absolute	16384
				Incremental	800
		RCA2	□□N/NA	Incremental	1048
			Models other than the above		Incremental
	DC brush-less motor	RCD	RA1R/GRSN RA1DA/GRSNA	Incremental	480
200V driver unit	AC servo motor	RCS4/RCS3		Battery-less Absolute	16384
				Incremental	
		RCS2	□□5N	Incremental	1600
			SR □7BD	Incremental	3072
			Models other than the above	Incremental	16384
				Battery-less Absolute	
		ISB/ISDB		Battery-less Absolute	131072
				Incremental	16384
		ISDBCR/SSPA/ISA/ISDA/IF/FS		Battery-less Absolute	131072
				Incremental	16384
		NSA		Battery-less Absolute	131072
		NS	□□	Incremental	2400
			Models other than the above		16384
		LSA/LSAS		Incremental	Resolution 0.001mm
		DD/DDA	□18S	Index absolute/multi-rotation	131072
			□18P	Index absolute/multi-rotation	1048576
EC connection unit	Stepper motor	EC	Battery-less Absolute Incremental	800	
	Stepper motor(□20)		Incremental	32768	
	AC servo motor		Battery-less Absolute	16384	

Generated heat (per unit)

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

Inrush current

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

Power capacity

Calculate the control power and motor power for each unit based on the RSEL connection configuration, and select the controller so that the current value does not exceed the current limit value.

Also confirm that the total motor wattage of the 200V driver unit does not exceed the maximum connected axes wattage.

When connecting the 200V ELECYLINDER, select the number of DC power units for the driving motor based on the total motor wattage.

* Follow the maximum connected axes of each 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
Single-phase 200VAC	1,600W
Three-phase 200VAC	2,400W

DC power supply for driving motor

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

Power supply capacity

<Control power>

Item	Specification	Power capacity
Control power capacity (per one unit)	Master unit (including terminal unit)	SEL unit 1.2A
		EC gateway unit 0.8A
	24V driver unit (common for all types)	Without brake 0.2A
		With brake (1-axis specification) 0.4A
		With brake (2-axis specification) 0.6A
	200V driver unit (including 200V power supply unit)	Without brake 0.2A
		With brake 0.5A
	Expansion unit (common for each unit)	0.1A
	Simple absolute unit (common to all types)	0.2A
	EC connection unit (per unit)	0.1A
	24V specification ELECYLINDER (per axis)	Without brake 0.3A
		With brake 0.5A
200V specification ELECYLINDER (per axis)	Without brake	0.32A
		EC-S10□, EC-S10X□ 0.5A
	With brake	EC-S13□, EC-S13X□ EC-S15□, EC-S15X□ 1.2A

* Calculate all the axes of ELECYLINDERs to be connected

Note: When selecting the unit, the master unit is not included in the calculation of the power capacity. Because the 24V power current value of a 200V power unit is minimal, it is not necessary to consider it in calculation. However, when 24V power is selected, include the master unit power capacity in the calculation.

<Motor power>

● 24V driver unit

Item	Actuator/driver unit				Rated current	Max. current	
		Series	Motor type			Power-saving enabled	
Motor power capacity (per 1-axis actuator)	Stepper motor /RCON-PC	RCP2	20P/20SP/28P	High output not available	0.8A	-	-
		RCP3	28P/35P/42P/56P		1.9A	-	-
		RCP4	28P/35P/42P/42SP/56P	High output disabled	1.9A	-	-
		RCP5		High output enabled	2.3A	-	3.9A
		RCP6					
		WU	28P/35P	High output setting only	2.3A *2	-	3.9A *2
	Stepper motor /RCON-PCF	RCP2	56SP/60P/86P	High output not available	5.7A	-	-
		RCP4					
		RCP5					
	AC servo motor /RCON-AC	RCA	5W	Standard/High accel. & decel./Power-saving	1.0A	-	3.3A
			10W		1.3A	2.5A	4.4A
			20W		1.3A	2.5A	4.4A
			20W (20S)		1.7A	3.4A	5.1A
			30W		1.3A	2.2A	4.0A
		RCL	2W	Standard/High accel. & decal.	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

*1: Supporting models:

*2: One unit is equipped with 2 motors.

The numbers in the table represents for 1 axis.

● 200V Driver Unit

Actuator motor wattage	Motor power capacity [VA]	Max. instantaneous motor power capacity [VA]
30R (for RS)	138	414
60	138	414
60 (RCS3-CTZ5)	197	591
100	234	702
100S (LSA)	283	851
150	328	984
200	421	1263
200S (DD)	503	1509
200S (other than LSA (S) -N15H)	486	1458
200S (LSA (S)-N15H)	773	2319
300S (LSA)	662	1986
400	920	2760
400 (RCS3-CT8)	1230	3690
600	1164	2328
600 (DD)	1462	4386
750	1521	3042

For the actuator models specified below, calculate the power capacity using the "Motor wattage for calculation."

Actuator model	Actuator motor wattage	Motor wattage for calculation	
		Single-phase	Three-phase
RCS3-CTZ5C	60W	—	120W
RCS3-CT8C	400W	—	800W
LSA-S6S□/S8S□/S8H□/N10S□、LSAS-N10S□	100W	300W/1slider	100W/1slider
LSA-S10S□/S10H□/H8S□/H8H□/L15S□/N15S□、LSAS-N15S□/N15H□	200W	600W/1slider	200W/1slider
LSA-N19S□	300W	600W/1slider	300W/1slider
LSA-W21S□	400W	—	400W/1slider

* Specify S (single slider) or M (multi-slider) in □ of the model code.
The motor wattage for calculation is for a single slider.
For the multi-slider, calculate the wattage using the value of two sliders.

● EC connection unit

(24V specification ELECYLINDER)

Item		Actuator/connection unit				Power current	
		Series	Type	Motor type		Rated	Max
Motor power capacity (per one actuator axis)	24V stepper motor	EC	RTC18	□56SP	—	—	5.7A
			S,R,RR,B	□56	Power-saving setting disabled	2.3A	3.9A
					Power-saving setting enabled	—	1.9A
			S,WS,R,RR,B,RTC12,SRG15	□42	Power-saving setting disabled	2.3A	3.9A
					Power-saving setting enabled	—	1.9A
			ST	□42	—	—	1.9A
			S/WS/RR/B/SRG11/RP5/GD5/TW5	□35	Power-saving setting disabled	2.3A	3.9A
					Power-saving setting enabled	—	1.9A
			S3/RR3	□28	—	—	1.9A
			RP4/GS4/GD4/TC4/TW4/RTC9/GRB10/GRB13		—	—	1.7A
			GRB8	□20	—	—	0.7A
			SL3,GDS3,GDB3,T3	□20	—	0.4A	0.8A

(200V specification ELECYLINDER)

Motor	Actuator model	Motor wattage	Motor Power capacity [VA]	Instantaneous max. motor power capacity [VA]
Motor Power capacity (per one actuator axis)	EC-S10□, EC-S10X□	100	238	714
	EC-S13□, EC-S13X□	200	402	1206
	EC-S15□, EC-S15X□	400	772	2316



Warning!

*Use the maximum current value for calculation when all axes operate acceleration/deceleration motions at 100% duty ratio.
Calculate the motor power using the maximum current value. (Use the rated current value if the max. current value is not specified)
*Use the following software when the power capacity should be calculated more accurately according to the operating conditions.
The necessary power capacity can be calculated automatically. "Calculator" is included with IA-OS software.

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 devices. These models have no options.

I/O non-connection specification



Model
RSEL-G-E

Specifications

Operation type	Program type
Power supply input voltage	24VDC \pm 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Safety category compliance	Class 4
Degree of protection	IP20
Mass	270g
Accessories	Terminal unit System IO connector Dummy plug
External dimensions	W56.6mm×H115mm×D95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

*1 When operating at over 40°C, install a fan unit.

*2 Not included when optional "TRN" is selected.

NPN/PNP connection specification



Model
RSEL-G-NP
RSEL-G-PN

Specifications

Operation type	Program type
Power supply input voltage	24VDC \pm 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Safety category compliance	Class 4
Degree of protection	IP20
Mass	270g
Accessories	Terminal unit System IO connector Dummy plug PIO cable (when selecting other than 0 cable length)
External dimensions	W56.6mm×H115mm×D95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

*1 When operating at over 40°C, install a fan unit.

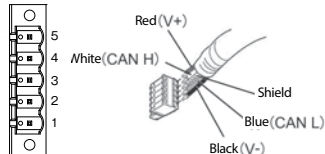
*2 Not included when optional "TRN" is selected.

* Refer to P8-131 for the PIO signal table and internal circuit.

DeviceNet connection specification



Connector for network



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

Model
RSEL-G-DV
RSEL-G-DV2

Specifications

Operation type	Program type
Power supply input voltage	24VDC \pm 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Safety category compliance	Class 4
Degree of protection	IP20
Mass	270g
Accessories	Terminal unit (in the case of DV spec.) RCON-GW-TR *2 MSTB2.5/5-STF-5.08 AUM (in the case of DV2 spec) TMSTBP2.5/5-STF-5.08 AUM System IO connector DFMCI.5/8-ST-3.5(RSEL) Dummy plug DP-4S
External dimensions	W56.6mmxH115mmxD95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

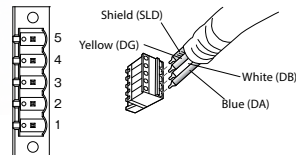
*1 When operating at over 40°C, install a fan unit.

*2 Not included when optional "TRN" is selected.

CC-Link connection specification



Connector for network



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

Model
RSEL-G-CC
RSEL-G-CC2

Specifications

Operation type	Program type
Power supply input voltage	24VDC \pm 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Safety category compliance	Class 4
Degree of protection	IP20
Mass	270g
Accessories	Terminal unit (in the case of CC spec.) RCON-GW-TR *2 MSTB2.5/5-STF-5.08 AU with terminal resistor 110 Ω /130 Ω (in the case of CC2 spec) Ω TMSTBP2.5/5-STF-5.08 AU with terminal resistor 110 Ω /130 Ω System IO connector DFMCI.5/8-ST-3.5(RSEL) Dummy plug DP-4S
External dimensions	W56.6mmxH115mmxD95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

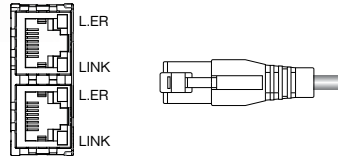
*1 When operating at over 40°C, install a fan unit.

*2 Not included when optional "TRN" is selected.

CC-Link IE field connection specification



Connector for network



Model
RSEL-G-CIE

Specifications

Operation type	Program type
Power supply input voltage	24VDC \pm 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Safety category compliance	Class 4
Degree of protection	IP20
Mass	270g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/8-ST-3.5(RSEL) Dummy plug DP-4S
External dimensions	W56.6mm×H115mm×D95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

*1 When operating at over 40°C, install a fan unit.

*2 Not included when optional "TRN" is selected.

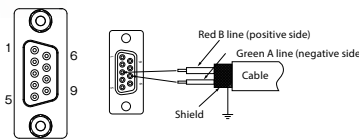
Network connection cable

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-	Ethernet ANSI/TIA-568-B 8P8C modular plug (RJ45) with a shield of category 5e or higher
6	TP1-	Data 1-	
7	TP3 +	Data 3+	
8	TP3 -	Data 3-	

PROFIBUS-DP connection specification



Connector for network



Model
RSEL-G-PR

Specifications

Operation type	Program type
Power supply input voltage	24VDC \pm 10%
Power supply current	1.2A
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Safety category compliance	Class 4
Degree of protection	IP20
Mass	270g
Accessories	Terminal unit RCON-GW-TR *2 System IO connector DFMC1.5/8-ST-3.5(RSEL) Dummy plug DP-4S
External dimensions	W56.6mm×H115mm×D95mm
PC teaching software	IA-101-N/X-*
Teaching pendant	TB-02/TB-03

*1 When operating at over 40°C, install a fan unit.

*2 Not included when optional "TRN" is selected.

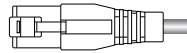
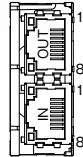
Network connection cable

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)	9-pin D-sub connector(male)
6	+5V	+5 V output (isolated)	
7	NC	Not connected	
8	A-Line	Signal line A (RS-485)	
9	NC	Not connected	

EtherCAT®/EtherCAT® connection specification



Connector for network



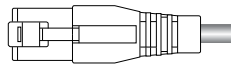
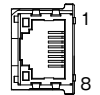
Network connection cable

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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA-568-B category 5 or higher..
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

EtherNet/IP connection specification



Connector for network



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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA568-B category 5 or higher.
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

Model
RSEL-G-EC

Specifications

Operation type	Program type	
Power supply input voltage	24VDC ± 10%	
Power supply current	1.2A	
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)	
Operating atmosphere	No corrosive gases, no dust	
Safety category compliance	Class 4	
Degree of protection	IP20	
Mass	270g	
Accessories	Terminal unit	RCON-GW-TR *2
	System IO connector	DFMC1.5/8-ST-3.5(RSEL)
	Dummy plug	DP-4S
External dimensions	W56.6mm×H115mm×D95mm	
PC teaching software	IA-101-N/X-*	
Teaching pendant	TB-02/TB-03	

*1 When operating at over 40°C, install a fan unit.

*2 Not included when optional "TRN" is selected.

Model
RSEL-G-EP
RSEL-G-PRT

Specifications

Operation type	Program type	
Power supply input voltage	24VDC ± 10%	
Power supply current	1.2A	
Ambient operating temperature & humidity	0~55°C *1, 5%RH to 85%RH (non-condensing or freezing)	
Operating atmosphere	No corrosive gases, no dust	
Safety category compliance	Class 4	
Degree of protection	IP20	
Mass	270g	
Accessories	Terminal unit	RCON-GW-TR *2
	System IO connector	DFMC1.5/8-ST-3.5(RSEL)
	Dummy plug	DP-4S
External dimensions	W56.6mm×H115mm×D95mm	
PC teaching software	IA-101-N/X-*	
Teaching pendant	TB-02/TB-03	

*1 When operating at over 40°C, install a fan unit.

*2 Not included when optional "TRN" is selected.

Configuration unit description

Driver unit

■ Features A controller unit for actuator control.

24V driver unit for RCP series connection

This driver unit is for connecting to stepper motors. Connectable to all RCP series actuators.



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

Specifications

Power	24VDC ± 10%
Control power	(Without brake) 0.2A (With brake, 1-axis specification) 0.4A (With brake, 2-axis specification) 0.6A
Ambient operating temperature & humidity	(Without fan) 0~40°C (With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no 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)

24V driver unit for RCA series connection

This driver unit is for connecting the AC servo motors. Connectable to all RCA series actuators.



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

Specifications

Power	24VDC ± 10%
Control power	(Without brake) 0.2A (With brake, 1-axis specification) 0.4A (With brake, 2-axis specification) 0.6A
Ambient operating temperature & humidity	(Without fan) 0~40°C (With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no 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)

24V driver unit for RCD series connection

This driver unit is for connection with DC brush-less motors. Connectable to all RCD series actuators.



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

Specifications

Power	24VDC ± 10%
Control power	(Without brake) 0.2A (With brake, 1-axis specification) 0.4A (With brake, 2-axis specification) 0.6A
Ambient operating temperature & humidity	(Without fan) 0~40°C (With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no 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)

Configuration unit description

200V driver unit 200V AC motor-equipped actuator connection

This driver unit is for connecting AC200V servo actuators of 60W to 750W.



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

Specifications

Control power input specification	24VDC \pm 10%
Control power	(Without brake) 0.2A (With brake) 0.5A
Ambient operating temperature & humidity	(With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Degree of protection	IP20
Mass	438g
External dimensions	W45.2mm×H115mm×D95mm
Accessories	Fan unit RCON-FU, Dummy plug DP-6

Other units

200V power supply unit

This is a power unit dedicated to AC200V input. Make sure to use this unit when connecting with 200V driver unit.



Model
RCON-PS2-3

* Including the terminal unit (RCON-GW-TRS).

Specifications

Motor power input voltage	Single-phase/three-phase 200VAC~230VAC \pm 10%
Maximum power capacity	(Single phase) 1,600W, (three-phase) 2,400W
Ambient operating temperature & humidity	(With fan) 0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Degree of protection	IP20
Mass	393g
External dimensions	W45.2mm×H115mm×D95mm
Accessories	Fan unit RCON-FU, Power supply connector SPC5/4-STF-7,62

* It is equipped with a noise filter inside.

EC connection unit

This unit can connect ELECYLINDERS up to 4 axes.



Model
RCON-EC-4

Specifications

Power	24VDC \pm 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no 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)

Configuration unit description

SCON expansion unit

This unit can operate actuators with a 200V motor by connecting SCON-CB/CGB.



Model	
RCON-EXT	
Specifications	
Power	24VDC \pm 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Degree of protection	IP20
Mass	99g
External dimensions	W22.6mm \times H115mm \times D95mm
Accessories	Terminal connector RCON-EXT-TR

PIO/SIO/SCON expansion unit

This unit is for connecting the PIO/SIO to the expansion unit for SCON-CB/CGB.



Model	
RCON-EXT-NP (NPN specification)	
RCON-EXT-PN (PNP specification)	
Specifications	
Power	24VDC \pm 10%
Control power	0.1A
Input Output	Input 16 points, Output 16 points
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no 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 CB-PAC-PIO*** (In case the cable length model other than "0" is specified)

* Refer to P8-131 for the PIO signals and internal circuit.

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
Input Output	Input 16 points, Output 16 points
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Degree of protection	IP20
Mass	105g
External dimensions	W22.6mm \times H115mm \times D95mm
Accessories	PIO cable CB-PAC-PIO*** (In case the cable length model other than "0" is specified)

* Refer to P8-131 for the PIO signals and internal circuit.

Configuration unit description

Simple absolute unit *For 24V driver connection

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



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, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Degree of protection	IP20
Mass	271g (including 173g for absolute battery)
External dimensions	W22.6mm×H115mm×D95mm
Accessories	Cable (CB-ADPC-MPA005)

Terminal unit

This is a terminal resistor for the loop-back of RCON/ RSEL serial communications and input/output signals. (Included when the gateway unit is purchased.)



Model
RCON-GW-TR

Specifications

Power	24VDC \pm 10%
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Degree of protection	IP20
Mass	48g
External dimensions	W12.6mm × H115mm × D95mm

200V terminal unit

This is a terminal resistor when connecting the driver unit for AC200V. (Included when a power unit is purchased.)



Model
RCON-GW-TRS

Specifications

Power	24VDC \pm 10%
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gases, no dust
Degree of protection	IP20
Mass	40g
External dimensions	W12.6mm×H115mm×D95mm

PIO signal table

Standard PIO connector, expansion PIO connection and pin assignment

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

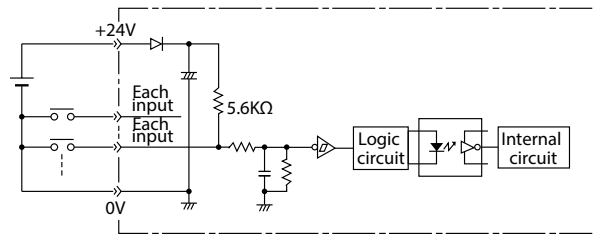
* The expansion unit (PIO specification) also has the same assignment for each unit.

I/O internal circuit

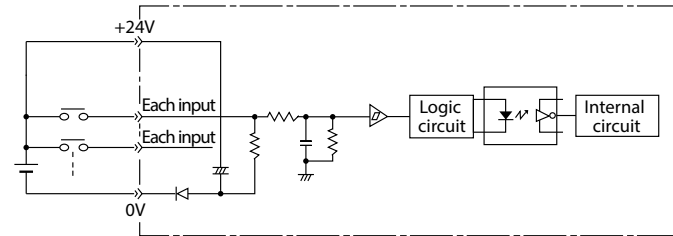
[Input]

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]



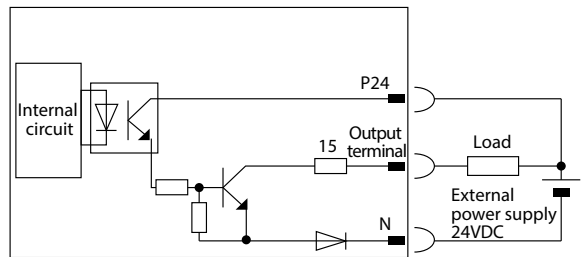
[PNP specification]



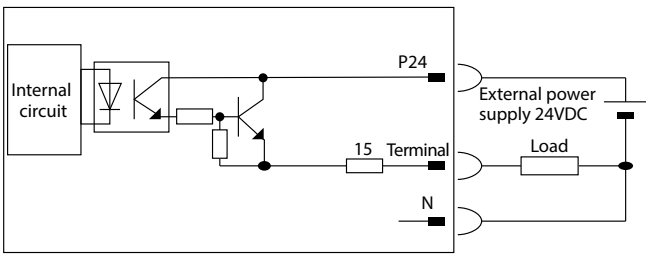
[Output]

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

[NPN specification]



[PNP specification]



Input/Output port

Input

Pin No.	Color	Port No.	Standard setting (Factory setting) functions
1A 2A	Brown-1 Red-1		+24V input
5A	Green-1	000	Program start
6A	Blue-1	001	General input
7A	Purple-1	002	General input
8A	Gray-1	003	General input
9A	White-1	004	General input
10A	Black-1	005	General input
11A	Brown-2	006	General input
12A	Red-2	007	Program No. specified (LSB: 1st bit)
13A	Orange-2	008	Program No. specified (2nd bit)
14A	Yellow-2	009	Program No. specified (3rd bit)
15A	Green-2	010	Program No. specified (4th bit)
16A	Blue-2	011	Program No. specified (5th bit)
17A	Purple-2	012	Program No. specified (6th bit)
18A	Gray-2	013	Program No. specified (7th bit)
19A	White-2	014	General input
20A	Black-2	015	General input

Output

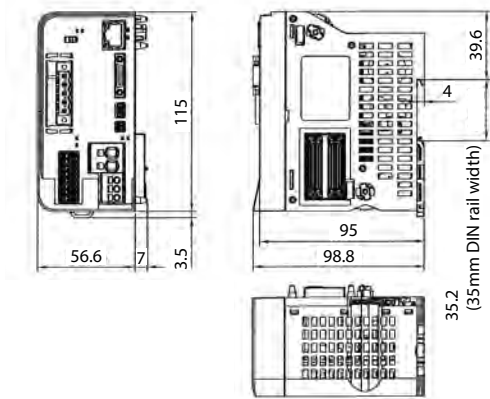
Pin No.	Color	Port No.	Standard setting (Factory setting) functions
1B	Brown-3	300	Error output for over operation release level or higher (OFF)
2B	Red-3	301	READY output (PIO trigger program operation is possible, and for no errors of cold-start level or higher)
3B	Orange-3	302	Emergency stop output (OFF)
4B	Yellow-3	303	General output
5B	Green-3	304	General output
6B	Blue-3	305	General output
7B	Purple-3	306	General output
8B	Gray-3	307	General output
9B	White-3	308	General output
10B	Black-3	309	General output
11B	Brown-4	310	General output
12B	Red-4	311	General output
13B	Orange-4	312	General output
14B	Yellow-4	313	General output
15B	Green-4	314	General output
16B	Blue-4	315	General output
19B 20B	White-4 Black-4		0V output

ELECYLINDER I/O signal table

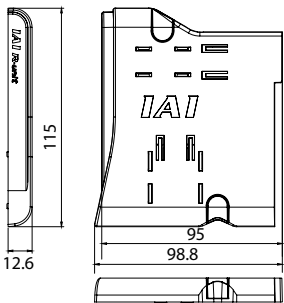
Pin assignment of the power supply and I/O connector			
Pin No.	Connector ID plate	Signal name	Description of function
B3	Backward	STO	Backward command
B4	Forward	ST1	Forward command
B5	Alarm cancel	RES	Alarm cancel
A3	Backward complete	LSO/PEO	Backward complete/Push complete
A4	Forward complete	LS1/PE1	Forward complete/Push complete
A5	Alarm	*ALM	Alarm detection (b-contact)
B2	Brake release	BKRLS	Brake forced release (in case of with brake specification)
B1	24V	24V	24V input
A1	0V	0V	0V input
A2	(24V)	(24V)	24V input

External dimensions

Master unit

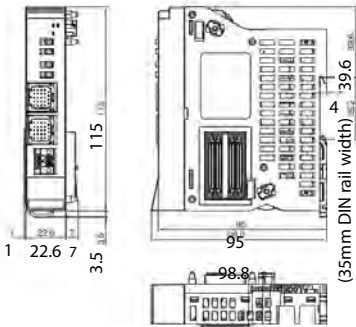


Terminal unit

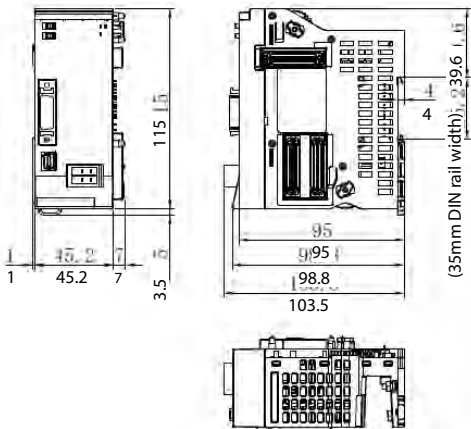


Driver Unit

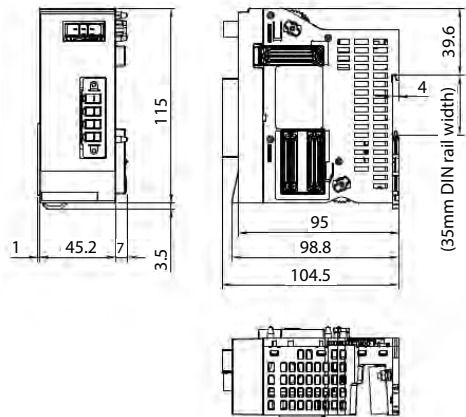
24V



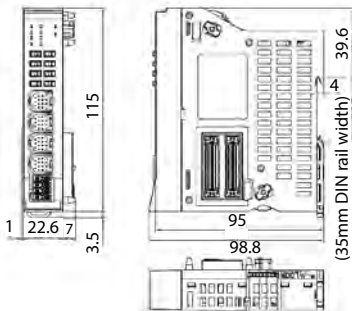
200V



200V power supply unit



EC connection unit



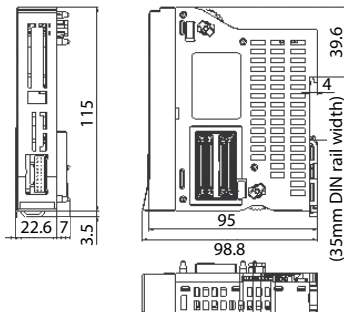
External dimensions

CAD drawings are downloadable from IAI website.
www.intelligentactuator.com

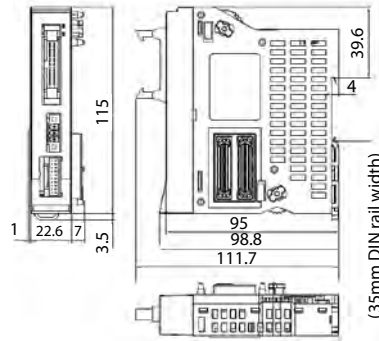


Expansion unit

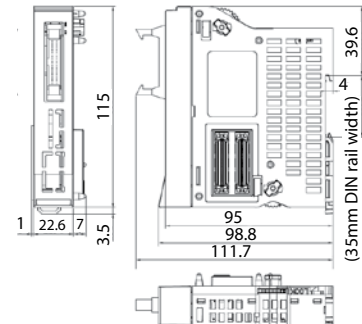
SCON expansion



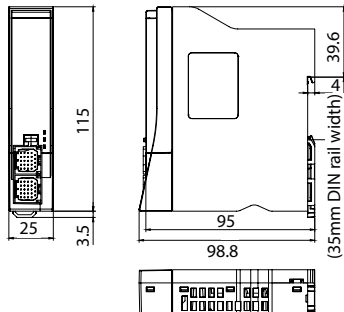
PIO/SIO/SCON expansion



PIO

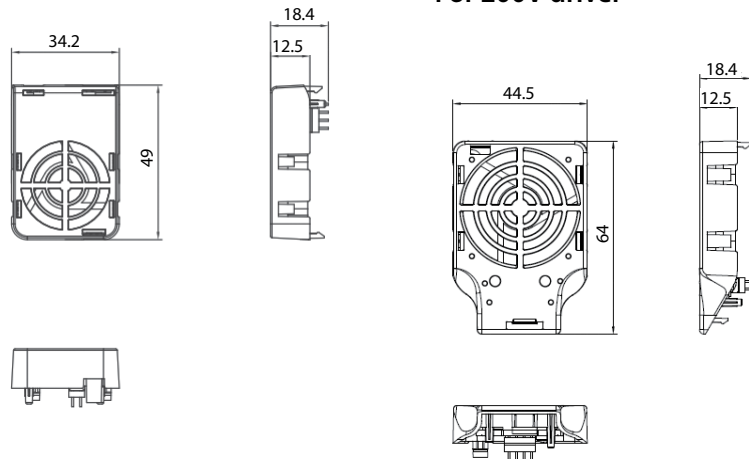


Simple absolute unit



Fan unit

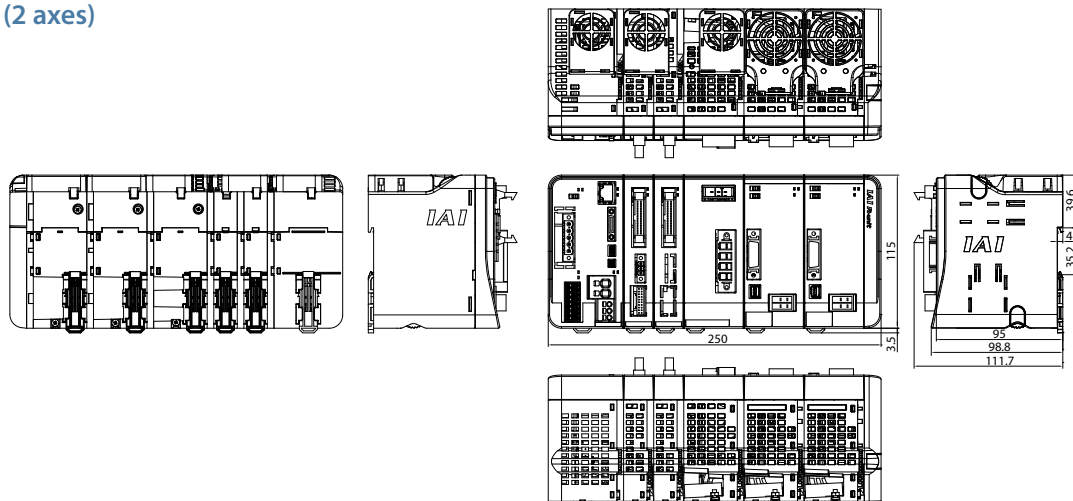
For 200V driver



Example of unit combination

RSEL

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



Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

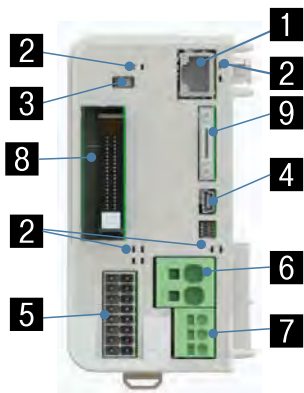
PSA-24

TB -03/02

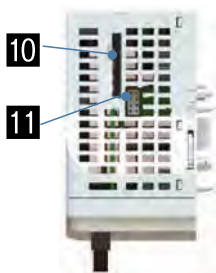
Software

Names of parts

Master unit



(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 **USB connector**

A connector for connecting the PC teaching software cable.

5 **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.

6 **Motor power connector**

Motor power +24V supply connector.

7 **Control power connector**

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

8 **Fieldbus connector/IO connector**

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

9 **Teaching connector**

A connector for connecting the teaching pendant and PC-compatible software via RS232.

10 **Memory card slot**

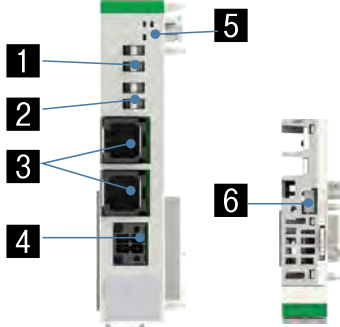
Inserting an SD/SDHC card to perform updates.

11 **Fan connector**

A connector to attach the fan unit.

Driver Unit

24V 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.

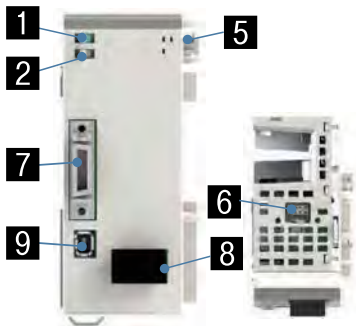
8 **Motor connector**

Connects the 200V actuator motor cable.

9 **Driver stop connector**

Shuts off power supply to the motor in the internal circuit.

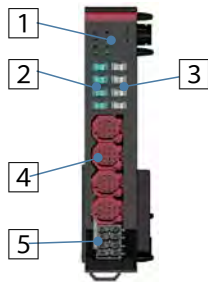
200V series



(Front)

(Top)

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.)

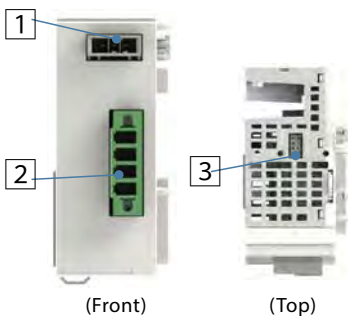
4 EC connector

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

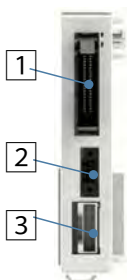
A connector for three-phase/single-phase 200VAC.

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 and PNP type IO (RCON).

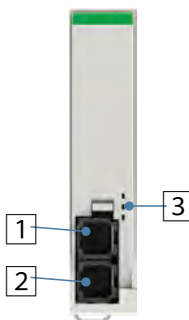
2 SIO cable connector

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.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

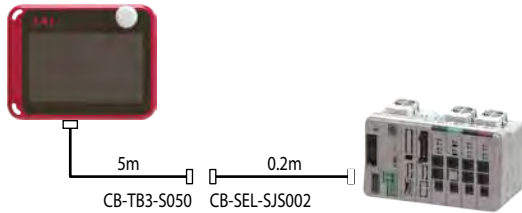
Options

Touch panel teaching pendant

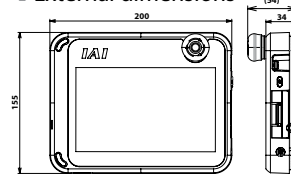
Feature A teaching device with functions such as position teaching, trial operation, and monitoring.

Model **TB-03-** See IAI website for supported versions.

Configuration



External dimensions

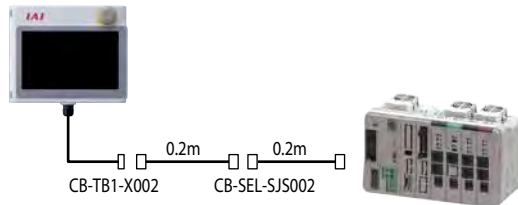


Specifications

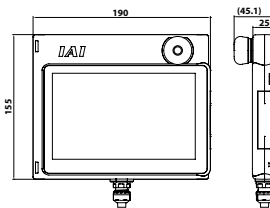
Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operation temp.	0-40°C
Ambient operation humidity	5%RH - 85%RH (non-condensing)
Degree of protection	IPX0
Mass	670g (TB-03 unit only)
Recharging method	Dedicated AC adaptor/ Wired connection with controller
Wireless connection	Bluetooth 4.2 class 2

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

Configuration



External dimensions



Specifications

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

PC dedicated teaching software (Windows only)

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

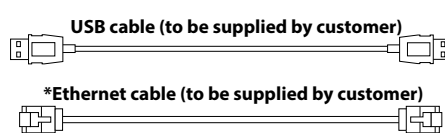
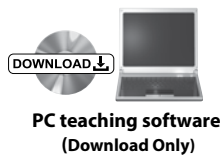
Features PC teaching software (Download Only) only.
If you want to connect both the controller and PC side with your USB cable or Ethernet cable, only the software needs to be purchased. A cable that meets the following specifications is to be prepared by the customer.

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

Configuration

See IAI website for supported versions.

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



Warning

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

Supported Windows versions: 7/10



Software Download Link will be provided.

Supported Windows versions: 7/10



Supported Windows versions: 7/10

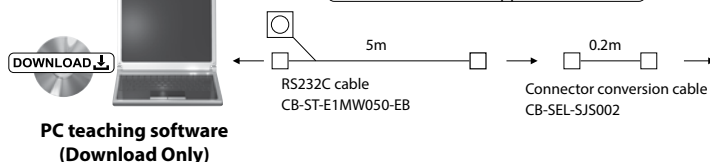


Model **IA-101-X-MW-JS** (including RS232C cable + connector conversion cable)

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

Configuration

See IAI website for supported versions.

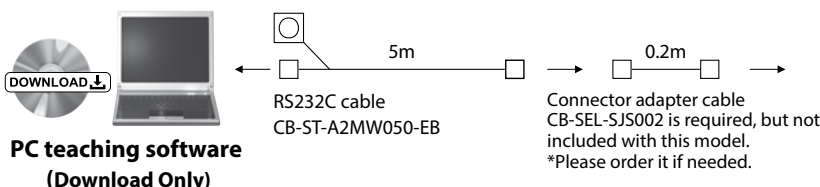


Model **IA-101-XA-MW** (including RS232C cable * Compliant with safety category 4)

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

Configuration

See IAI website for supported versions.



PC teaching software
(Download Only)

24 VDC power supply

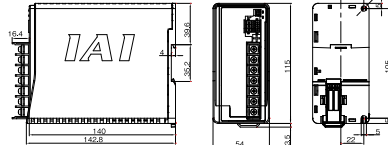
- Overview** The recommended power supply for connection to R-units. The power supply is the same height as RCON and can be easily installed on control panels. It can also be connected to R-units to monitor power status.

Model PSA-24 (without fan)

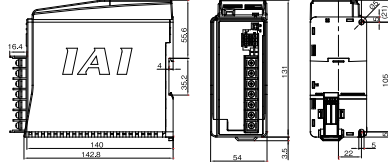
Model PSA-24L (with fan)

External dimensions

PSA-24



PSA-24L



Specifications Table

Item	Specification	
	100VAC input	200VAC input
Power input voltage range	100VAC~230VAC $\pm 10\%$	
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	23W (at 204W continuous rated) 37W (at 300W continuous rated)	23W (at 204W continuous rated) 37W (at 300W continuous rated)
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

DC power supply for driving motors

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

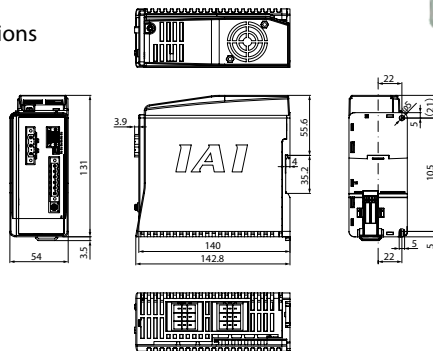
Model PSA-200-1

(Input voltage: Single phase AC100V, Max. 800W connectable)

PSA-200-2

(Input voltage: Single phase AC200V, Max. 1600W connectable)

External dimensions



Specifications

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

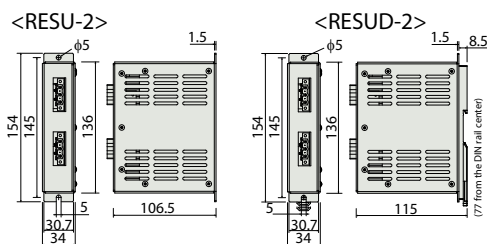
(Note 1) Rush current flows for approx. 20ms after turning on the power. Be aware that the rush current varies according to the power line impedance and internal element temperature (thermistor).

Regenerative resistance unit

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

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

External dimensions



Specifications

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

* When two regenerative units are required, please use one RESU-2 and one RESU-1 (See P.8-316).

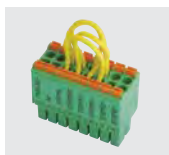
Maintenance Parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing. Refer to P1-89 for cable accessories.

SEL unit (for RSEL-G-□)

System I/O connector

■ Model
**DFMC1.5/
8-ST-3.5(RSEL)**



Dummy plug

For RCON-GWG
■ Model **DP-4S**



Fan unit

■ Model **RCON-FU**

* Optional



Network connector

for DeviceNet

■ Model **MSTB2.5/5-STF-5.08 AUM**



Terminal resistor for CC-Link
with 110Ω/130Ω

■ Model **MSTB2.5/5-STF-5.08 AU**



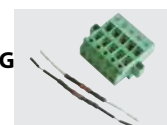
2-way spec. for DeviceNet

■ Model **TMSTBP2.5/5-STF-5.08 AUM**



2-way spec. for CC-Link
with 110Ω/130Ω

■ Model **TMSTBP2.5/5-STF-5.08 AUBD-FG**



For 24V driver unit (RCON-PC/PCF/AC/DC-1/2)

Drive source shutoff connector

■ Model **DFMC1,5/2-STF-3,5**



For Simple absolute unit (RCON-ABU-P/A)

Replacement battery

■ Model **AB-7**



For 200V driver unit (RCON-SC-1)

Dummy plug

■ Model **DP-6**



Fan unit

■ Model **RCON-FU**



For 200V power unit (RCON-PS2-3)

200V power supply connector

■ Model **SPC5/4-STF-7,62**



Fan unit

■ Model **RCON-FUH**



For EC connection unit (RCON-EC-4)

Shutoff connector for drive power

■ Model **DFMC1,5/4-ST-3,5 (REC)**



For SCON expansion unit (RCON-EXT)

Terminal connector

■ Model **RCON-EXT-TR**



For PIO/SIO/SCON expansion unit (RCON-EXT-NP/PN)

Terminal connector

■ Model **RCON-EXT-TR**



SIO port connector

■ Model **FMC1.5/3-STF-3.5**

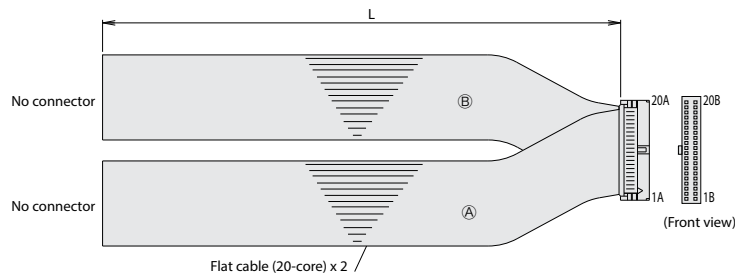


For PIO unit (RCON-NP/PN) and PIO/SIO/SCON expansion unit (RCON-EXT-NP/PN)

PIO cable * Included when unit model option is specified.

■ Model **CB-PAC-PIO** ☐ ☐ ☐

* Specify cable length in ☐☐☐
Max. 10m, (ex.) 080=8m



HIF6-40D-1.27R (Hirose)

No.	Signal	Cable color	Wiring	No.	Signal	Cable color	Wiring
1A	24V	Brown-1		18	OUT0	Brown-3	
2A	24V	Red-1		28	OUT1	Red-3	
3A	—	Orange-1		38	OUT2	Orange-3	
4A	—	Yellow-1		48	OUT3	Yellow-3	
5A	IN0	Green-1		58	OUT4	Green-3	
6A	IN1	Blue-1		68	OUT5	Blue-3	
7A	IN2	Purple-1		78	OUT6	Purple-3	
8A	IN3	Gray-1		88	OUT7	Gray-3	
9A	IN4	White-1		98	OUT8	White-3	
10A	IN5	Black-1		108	OUT9	Black-3	
11A	IN6	Brown-2		118	OUT10	Brown-4	
12A	IN7	Red-2		128	OUT11	Red-4	
13A	IN8	Orange-2		138	OUT12	Orange-4	
14A	IN9	Yellow-2		148	OUT13	Yellow-4	
15A	IN10	Green-2		158	OUT14	Green-4	
16A	IN11	Blue-2		168	OUT15	Blue-4	
17A	IN12	Purple-2		178	—	Purple-4	
18A	IN13	Gray-2		188	—	Gray-4	
19A	IN14	White-2		198	0V	White-4	
20A	IN15	Black-2		208	0V	Black-4	

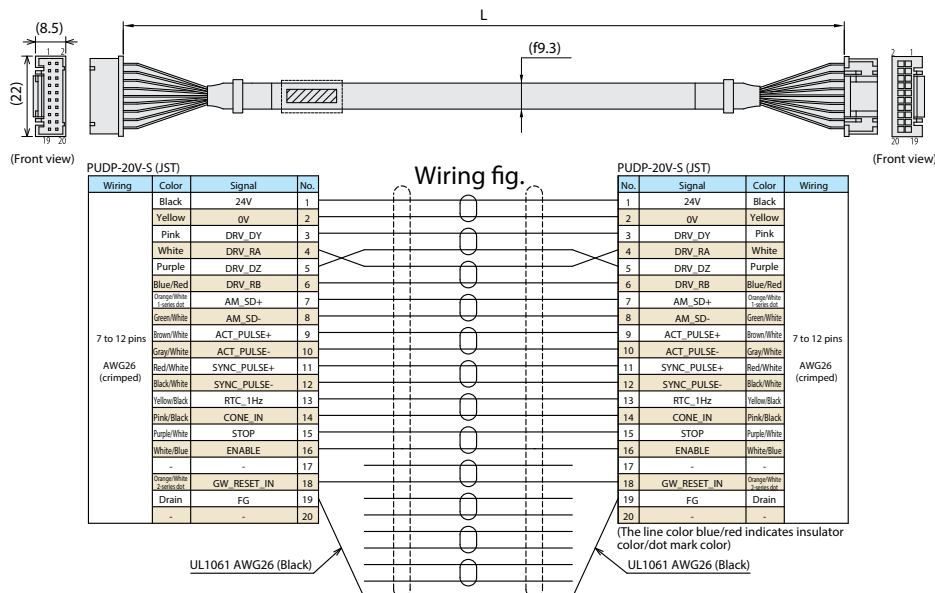
For SCON expansion unit (RCON-EX) and PIO/SIO/SCON expansion unit (RCON-EXT-NP/PN)

SCON connection cable

* Included when SCON-CB for RCON connection is ordered.

■ Model **CB-RE-CTL** ☐ ☐ ☐

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



Maintenance parts (cable)

When placing an order for a replacement cable, please use the model name shown below.
Refer to P1-89 for details of cables.
The connector of the connection cable (controller side) is attached with a protective cover.
Remove the protective cover when connecting to the controller.



Table of compatible cables

The cable model search system is recommended!

URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>

● Motor encoder cable for 24V driver connection

No.	Actuator		Applicable controller symbol	Max. cable length	Connection cable(Note 2)	Conversion unit	Wiring fig.
	Series	Type			Integrated motor-encoder cable (-RB: Robot cable) [Actuator connection cables]		
①	RCP6 RCP6CR RCP6W	Other than high thrust type (Note 1)	P5	20m	CB-ADPC-MPA□□□ (-RB) * 1	—	A
②	RCP5 RCP5CR RCP5W	High thrust type (Note 1)	P6	20m	CB-ADPC-MPA□□□ (-RB) * 1 CB-CAN-AJ002(conversion cable)	—	B
③	RCP4 RCP4CR RCP4W	Gripper (GR*), ST4525E, SA3/RA3	P5	20m	CB-ADPC-MPA□□□ (-RB) * 1	—	A
④		High thrust type (Note 1)	P6	20m	CB-ADPC-MPA□□□ (-RB) * 1 CB-CAN-AJ002(conversion cable)	—	B
⑤		Other than ③,④	P5	20m	CB-ADPC-MPA□□□ (-RB) * 1 CB-CAN-AJ002(conversion cable)	—	B
⑥	RCP3		P5	20m	CB-RCAPC-MPA□□□ (-RB)	—	C
⑦	RCP2 RCP2CR RCP2W	RCP2 (standard type) rotary compact type RCP2-RTBS/RTBSL/RTCS/RTCSL	P5	20m	CB-ADPC-MPA□□□ (-RB) * 1 [CB-RPSEP-MPA□□□]	Required	D
⑧		RCP2CR (clean room type), RCP2W(dust-proof/splash-proof type) Rotary (RT*) of above types GRS/GRM/GR3SS/GR3SM of above types	P5	20m	CB-ADPC-MPA□□□ (-RB) * 1	—	A
⑨		GRSS/GRLS/GRST/GRHM/GRHB of all types (standard / clean room / dust-proof/ splash-proof) Short type (RCP2 only) RCP2-SRA4R/SGS4R/SGD4R	P5	20m	CB-RCAPC-MPA□□□ (-RB)	—	C
⑩		High thrust type (Note 1)	P6	20m	CB-ADPC-MPA□□□ (-RB) [CB-CFA-MPA□□□ (-RB)]	Required	D
⑪		Other than ⑦~⑩	P5	20m	CB-ADPC-MPA□□□ (-RB) * 1 [CB-PSEP-MPA□□□]	Required	D
⑫	RCA2/RCA2CR/RCA2W, RCL		A6	20m	CB-RCAPC-MPA□□□ (-RB)	—	C
⑬	RCA2/RCA2CR/RCA2W small connector specification (CNS option)		A6	20m	CB-ADPC-MPA□□□ (-RB) * 1	—	A
⑭	RCA RCACR RCAW	Short type (RCA only) RCA-SRA4R/SGS4R/SGD4R	A6	20m	CB-RCAPC-MPA□□□ (-RB)	—	C
⑮		Other than ⑭	A6	20m	CB-ADPC-MPA□□□ (-RB) * 1 [CB-ASEP2-MPA□□□]	Required	D
⑯	RCD	RCD-RA1DA, RCD-GRSNA	D6	20m	CB-ADPC-MPA□□□ (-RB) * 1	—	A
⑰	WU		PM2	20m	CB-ADPC-MPA□□□ (-RB) * 1	—	A

* 1: It is also possible to select the 4-direction connector type for the CB-ADPC-MPA□□□(-RB) cable.

Note 1: An actuator that uses a high thrust stepper motor (56SP, 60P, 86P)

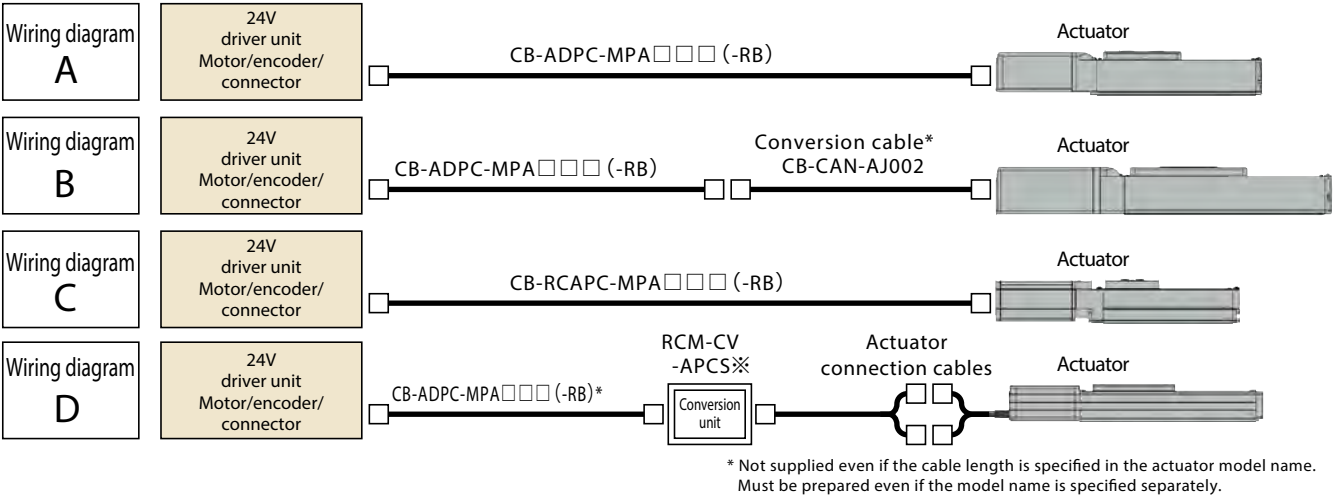
Note 2: Up to 20m from each driver unit to the actuator, with or without the conversion unit.

Note that the maximum length from the driver unit to the RCD actuator will be 10m.

● 4-direction connector type

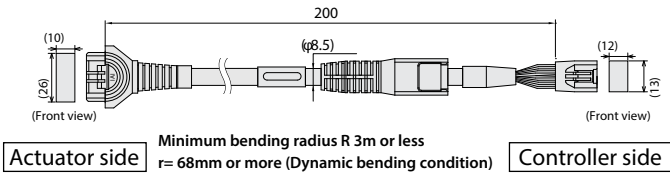
Standard connector type (Mechanical side)	4-direction connector type (Mechanical side)
CB-ADPC-MPA □□□ (-RB)	CB-ADPC2-MPA □□□ (-RB)

Wiring diagram



Conversion cable

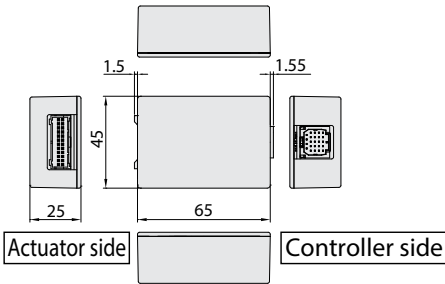
Model CB-CAN-AJ002



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

Conversion unit

Model RCM-CV-APCS



● Motor encoder cable for 200V driver connection

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

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

● EC connection unit Cable for connection, power source and communication

Standard connector type (Mechanical side)	4-direction connector type (Mechanical side)
CB-REC-PWBIO □□□ (-RB)	CB-REC2-PWBIO □□□ (-RB)

● Motor power cable for 200V ELECYLINDER

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

REC

Driving unit for ELECYLINDER

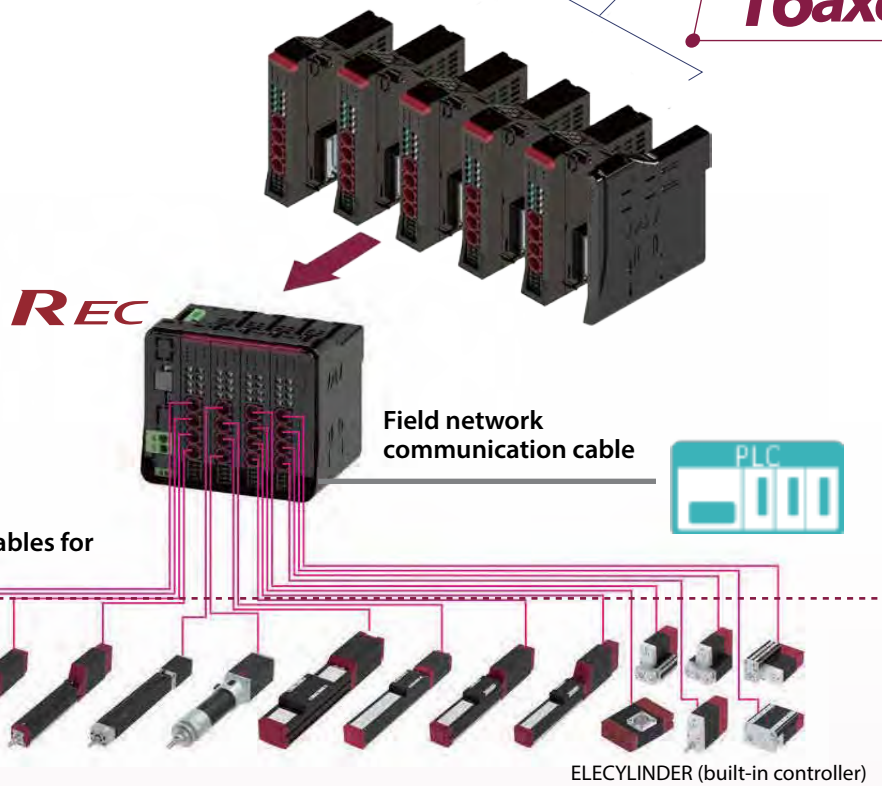


Connect ELECYLINDER to a field network

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

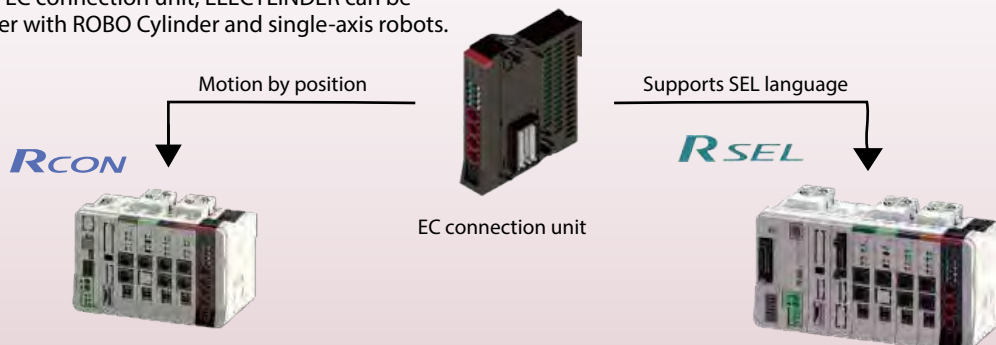
EC connection unit
4-axis specification
x 4 units =

Max.
16axes



The EC connection unit can be used mixed with the driver unit that is connected to the RCON/RSEL.

By connecting the EC connection unit, ELECYLINDER can be connected together with ROBO Cylinder and single-axis robots.



REC selection method

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

(Note) Refer to P8-150 for limitations on connection.
* Make sure to select the optional "ACR" in the ELECYLINDER model.

<Selection example>



Step 2 EC gateway unit selection

Select the EC gateway unit model from the network type.

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

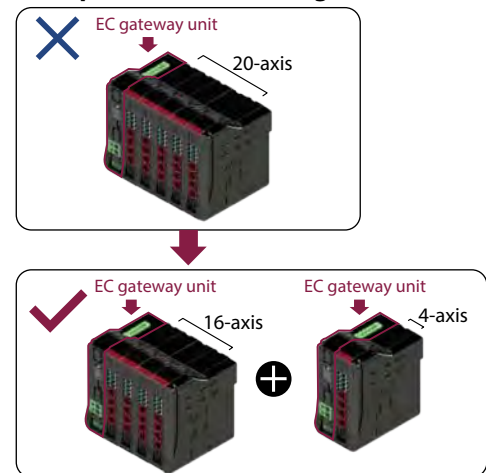
<Selection example>

← Select! 1

Caution

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

Example: When connecting 20 axes



Step 3 EC connection unit selection

Up to 4 axes of ELECYLINDER can be connected to one EC connection unit.

Select the required number of EC connection units based on the number of units for connecting ELECYLINDER.

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

Step 4 Calculation of control power capacity (CP)

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

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

Method of confirmation

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

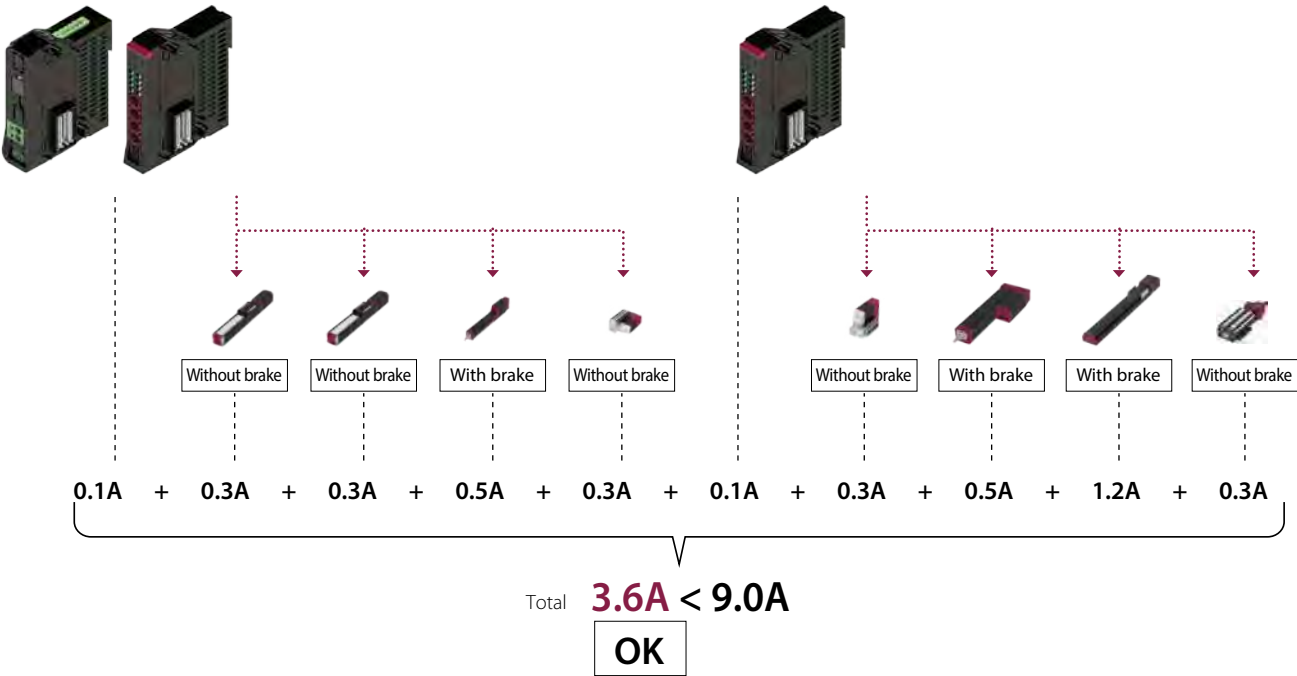
Item	Specification			Power source current	
Control power capacity	Master unit			0.8A	x 2 units x 4 axes x 2 axes
	EC connection unit			0.1A	
	24V specification ELECYLINDER (per one axis)	Without brake		0.3A	
		With brake		0.5A	
	200V specification ELECYLINDER (per one axis)	Without brake		0.32A	
		With brake	EC-S10□/S10X□	0.32A	x 1 axis
			EC-S13□/S13X□	1.2A	
EC-S15□/S15X□					

x 2 units
x 4 axes
x 2 axes

x 1 axis

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

<Selection example>



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

Step 5 Calculation of motor power capacity (MP)

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

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

How to check

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

Item		Actuator / connection unit			Power current	
		Series	Type	Motor type	Rated	Max.
Motor power capacity (per one actuator axis)	24V stepper motor	EC	RTC18	<input type="checkbox"/> 56SP	—	5.7A
			S/R/RR/B	<input type="checkbox"/> 56	Power-saving disabled Power-saving enabled	2.3A — 1.9A
			S/WS/R/RR/B/RTC12/SRG15	<input type="checkbox"/> 42	Power-saving disabled Power-saving enabled	2.3A — 1.9A
			ST	<input type="checkbox"/> 42	—	1.9A
			S/WS/RR/B/SRG11/RP5/GD5/TC5/TW5	<input type="checkbox"/> 35	Power-saving disabled Power-saving enabled	2.3A — 1.9A
			S3/RR3	<input type="checkbox"/> 28	—	1.9A
			RP4/GS4/GD4/TC4/TW4/RTC9/GRB10/GRB13		—	1.7A
			GRB8	<input type="checkbox"/> 20	—	0.7A
			SL3/GDS3/GDB3/T3	<input type="checkbox"/> 20	—	0.4A

x 1 axis

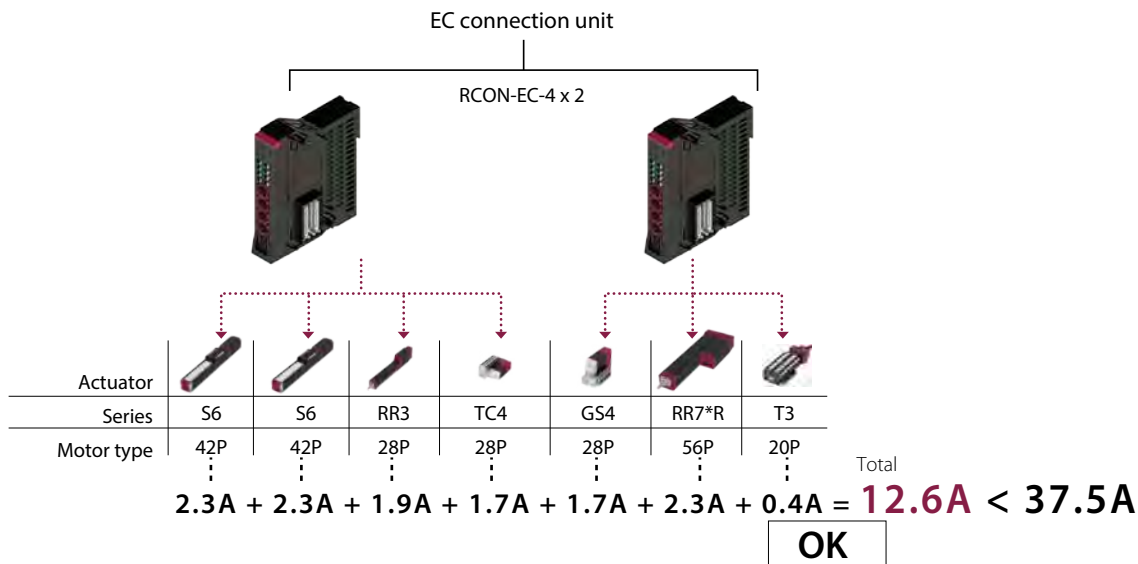
x 2 axes

x 1 axis

x 2 axes

x 1 axis

<Selection example>



(It is confirmed that the total current value is less than 37.5A. If it exceeds over 37.5A, another EC gateway unit is needed.)

[Caution] Current value for calculation when all axes operate acceleration/deceleration motions at 100% duty ratio.
Use the following software when the power capacity should be calculated more accurately according to the operating conditions.

How to get the calculator software



Calculator software comes with the IA-OS software

Step 6 Selection of the 200V specification motor

When connecting the 200V ELECYLINDER, select the DC power unit for driving the motors according to the total motor wattage.

DC power for motor driving

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

How to check

Confirm the motor wattage from the actuator specification.

<Selection example>



Order separately



DC power source (AC100V)

Series	EC-S13
Motor wattage	200W

Total

= **200W** < 800W (1 unit)

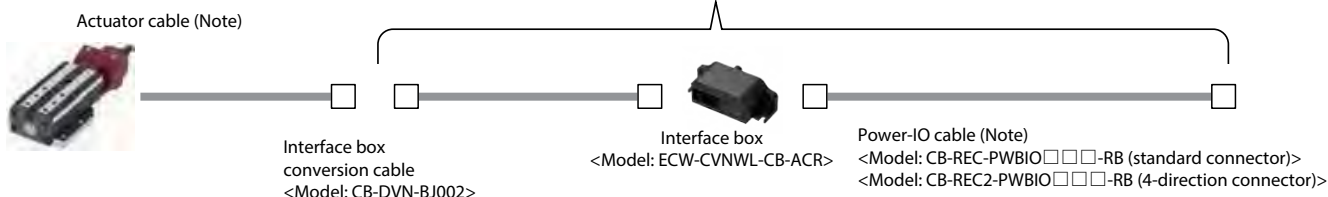
OK

Supplementary Connection to the ultra small ELECYLINDER

When connecting the teaching pendant (TB-03) and the ultra small ELECYLINDER, some additional parts are necessary.

* Additional parts are not necessary when the teaching pendant is connected by cable.

<Wireless connection>



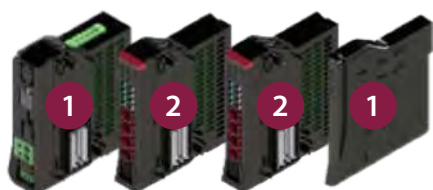
(Note)The total cable length should be 9m or less.

Step 7 Unit model code for ordering

When ordering, use the model code for each unit.

<Selection example>

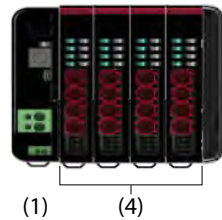
Order model (x number of units)	Name/specification
REC-GW-CC	EC gateway unit (with terminal unit)
RCON-EC-4 x 2 units	EC connection unit



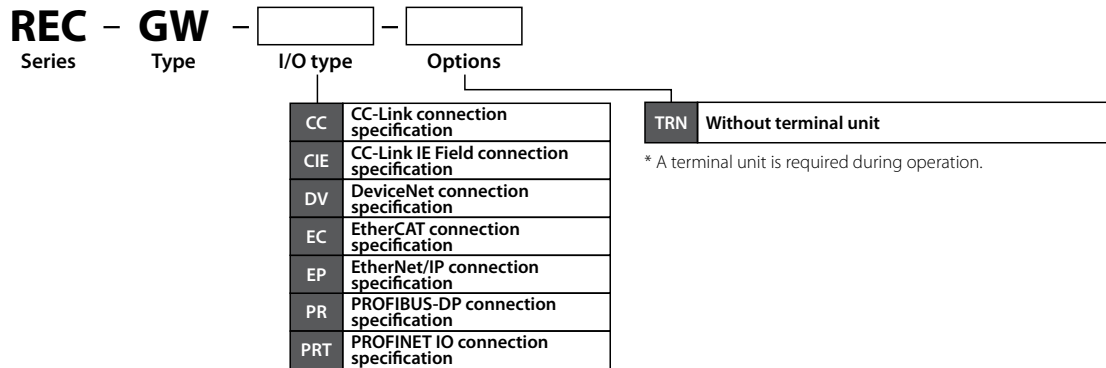
Combined



Model specification items



(1) Master unit



Model							
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/CC2	CIE	DV/DV2	EC	EP	PR	PRT

(2) EC connection unit

Model RCON – EC – 4

Series Type Number of Axes

Series	RCON
Type Number of axes	EC-4

Actuators that cannot be connected to the R-unit

ELECYLINDERS without optional "ACR"

Limitations on connection

* The total number of connected axes should be 16 or less.

* When connecting the EC-RTC18 to one of the EC connecting units (RCON-EC-4), the maximum connectable axes is 2.

EC-RTC18 Number of connections	RCON-EC-4 (1 unit)	other than EC-RTC18
1 axis	○	3 axes
2 axes	○	Not connectable

System configuration

Controller



Field network

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

Options

PC teaching software
(See P. 8-163)
<Model: IA-OS-C>

Options

Teaching pendant
(See P. 8-163)
<Model: TB-03><Model: TB-02>



For RC/EC PC Software: USB cable

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

Included in the EC connection unit
Drive source shutoff connector
(See P. 8-165)
<Model: DEMC1.5/4-ST-3.5>

Options

DC power for motor driving

(See P. 8-164)
<Model: PSA-200>
* Make sure to use a noise filter when connecting the power.
<Recommendable models>
NF2010A-UP (manufacturer: Soshin Electric)
NAC-10-472 (manufacturer: COSEL)

Options

DC24V power unit
(See P. 8-163)
<Model: PSA-24>



Included in the actuator
Power-IO cable
(See P. 8-165)
<Model: CB-REC-PWBIO□□□-RB (standard connector)>
<Model: CB-REC2-PWBIO□□□-RB (4-direction connector)>

Included in the actuator
Motor power cable
(See P. 8-165)
<Model: CB-EC-PW□□□-RB>

Included in the actuator
Power-IO cable
(See P. 8-165)
<Model: CB-REC-PWBIO□□□-RB (standard connector)>
<Model: CB-REC2-PWBIO□□□-RB (4-direction connector)>

Options
Power-IO cable
(See P. 8-165)
<Model: CB-REC-PWBIO□□□-RB (standard connector)>
<Model: CB-REC2-PWBIO□□□-RB (4-direction connector)>

Included in the actuator
Power-IO cable
(See P. 8-165)
<Model: CB-REC-PWBIO□□□-RB (standard connector)>
<Model: CB-REC2-PWBIO□□□-RB (4-direction connector)>

Included in the actuator
Interface box
* The specification varies depending on the options of the actuator.

Options
Interface box
(See P. 8-164)
<Model: ECW-CVNW-L-CB-ACR>

Options
Interface box conversion cable
(See P. 8-164)
<Model: CB-CVN-BJ002>

(Dust- & Splash-proof specification)



EC series (24V spec.)

(Teaching pendant wired connection)



Ultra small EC series (24V spec.)

(Teaching pendant wireless connection)



EC series (200V spec.)

Connect with "EC connection unit"

Note * Only the ELECYLINDER with a double solenoid can be connected.

* When ELECYLINDER with a digital speed controller is connected, the digital speed controller cannot be operated.

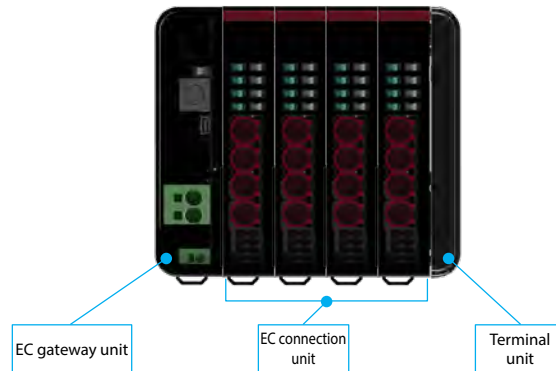
* The digital speed controller teaching and remote speed cannot be connected to REC.

Unit Configuration

The REC has a unit-connecting construction. Each unit has the same connector and the lock construction. However, there is a limitation on unit layout. Connect them based on the limitations for each unit.

Connect the units from the left viewing from the front side, starting from the EC gateway unit.

* If the units are not connected in the proper order shown below, they will not operate normally.



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

(Note) There is a limitation on the number of connectable axes. Refer to P8-150 for details.

Product name		Model	Reference page
Master unit/ EC gateway unit	DeviceNet connection specification	REC-GW-DV	P8-155
	CC-Link connection specification	REC-GW-CC	P8-155
	CC-Link IE Field connection specification	REC-GW-CIE	P8-156
	PROFIBUS-DP connection specification	REC-GW-PR	P8-156
	EtherCAT connection specification	REC-GW-EC	P8-157
	EtherNet/IP connection specification	REC-GW-EP	P8-157
	PROFINET IO connection specification	REC-GW-PRT	P8-158
EC connection unit	EC connection unit 4-axis specification	RCON-EC-4	P8-159
Terminal unit	For REC	RCON-GW-TRE	P8-159

Basic specifications

Item		Specifications	
Power supply voltage		24VDC ±10%	
Power supply current		Differs with system configuration	
Number of axes controlled		1~16-axis	
Supported encoders	EC connection	ELECYLINDER connection only Incremental, battery-less absolute	
Supported field networks		CC-Link, CC-Link IE Field, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS-DP, PROFINET IO	
Configuration units		EC gateway unit, EC connection unit, terminal unit	
Data input method		Teaching port	Touch panel teaching pendant
		USB	PC teaching software
Serial communication function	Teaching port	Communication method	RS485
		Communication speed	9.6/19.2/38.4/57.6/115.2/230.4kbps
	USB port	Communication method	USB
		Communication speed	12Mbps full speed
Emergency stop/Enable operation		Equipped with connectors capable of shutting off the drive power supply to individual axes of the EC connection unit	
Safety category compliance		Not applicable	
Ambient operating temperature		0~55°C	
Ambient operating humidity		5%RH ~ 85%RH (non-condensing, no frost)	
Operating atmosphere		Avoid corrosive gas and excessive dust	
Vibration resistance		Frequency: 10~57Hz / Amplitude: 0.075mm, Frequency: 57~150Hz / Acceleration: 9.8m/s² XYZ directions Sweep time: 10 minutes Number of sweeps: 10 times	
Shock resistance		Drop height: 800mm 1 corner, 3 edges, 6 faces	
Electric shock protection mechanism		Class III	
Degree of protection		IP20	
Insulation withstanding voltage		500VDC 10MΩ	
Cooling method		Natural cooling	
Connections between each unit		Unit connection method	
Installation/mounting method		DIN rail (35mm) mounting	
Regulations/standards	Unit name	EC gateway unit	EC connection unit
	CE Marking	○	○
	UL	○	○

Legend:
○ : Compliant

Encoder resolution

Item	Motor type	Model	Encoder type	Value [pulse/r]
EC connection unit	Stepper motor	EC	Battery-less Absolute	800
	Stepper motor(□20)		Incremental	32768
	AC servo motor		Battery-less Absolute	16384

Inrush current

Unit name	Unit model	Type	Value
EC connection unit	RCON-EC	(For 4-axis connection)	40A

Power capacity

Calculate the control power and motor power for each unit based on the RSEL connection configuration, and select the controller so that the current value does not exceed the limitation of current for calculation.

Also confirm that the total motor wattage of the 200V driver unit does not exceed the maximum connectable axis wattage.

When connecting the 200V ELECYLINDER, select the number of DC power units for the driving motor based on the total motor wattage.

* Follow the maximum connectable axes of each 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
Single-phase 200VAC	1,600W
Three-phase 200VAC	2,400W

DC power supply for driving motor

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

Power supply capacity <Control power>

Item	Specification	Power capacity
Control power capacity (per unit)	Master unit (including terminal unit)	Gateway unit 0.8A
	EC connection unit (per unit)	0.1A
	24V specification ELECYLINDER (per axis)	Without brake 0.3A
		With brake 0.5A
	200V specification ELECYLINDER (per axis)	Without brake 0.32A
		With brake EC-S10□, EC-S10X□ 0.54A
		EC-S10□, EC-S13X□ EC-S10□, EC-S15X□ 1.2A

* Calculate all the axes of connected ELECYLINDERS.

(Note) Do not include power capacity of the master unit in the calculation.

The 24V power source current of the 200V power unit is small and not necessary to include in the calculation.

EC connection unit (24V ELECYLINDER)

Item	Actuator/connection unit					Power current	
	Series	Type	Motor type	Rated	Max		
Motor power capacity (per one actuator axis)	24V stepper motor	EC	RTC18	□56SP	—	—	5.7A
			S,R,RR,B	□56	Power-saving setting disabled	2.3A	3.9A
					Power-saving setting enabled	—	1.9A
			S,WS,R,RR,B,RTC12,SRG15	□42	Power-saving setting disabled	2.3A	3.9A
					Power-saving setting enabled	—	1.9A
			ST	□42	—	—	1.9A
			S/WS/RR/B/SRG11/RP5/GD5/TC5/TW5	□35	Power-saving setting disabled	2.3A	3.9A
					Power-saving setting enabled	—	1.9A
			S3/RR3	□28	—	—	1.9A
			RP4/GS4/GD4/TC4/TW4/RTC9/GRB10/GRB13		—	—	1.7A
			GRB8		—	—	0.7A
			SL3,GDS3,GDB3,T3	□20	—	0.4A	0.8A

(200V ELECYLINDER)

Motor	Actuator model	Motor wattage	Motor Power capacity [VA]	Instantaneous max. motor power capacity [VA]
Motor Power capacity (per one actuator axis)	EC-S10□, EC-S10X□	100	238	714
	EC-S13□, EC-S13X□	200	402	1206
	EC-S15□, EC-S15X□	400	772	2316



Warning!

*Use the maximum current value for calculation when all axes operate acceleration/deceleration motions at 100% duty ratio.

Calculate the motor power using the maximum current value. (Use the rated current value if the max. current value is not specified)

*Use the following software when the power capacity should be calculated more accurately according to the operating conditions. The necessary power capacity can be calculated automatically. The calculator software comes with the IA-OS software.

Configuration unit description

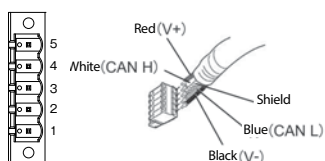
Master unit

- Features** This unit is used in order to connect to the field network. It connects a 24VDC power supply and teaching. These models have no options.

DeviceNet connection specification



Connector for network



Model
REC-GW-DV

Specifications

Operation type	Positioner type
Power	24VDC \pm 10%
Control power	0.8A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, not exposed to dust
Safety category	-
Degree of protection	IP20
Mass	135g
Accessories	-
External dimensions	W30mm×H115mm×D95mm
PC-compatible teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

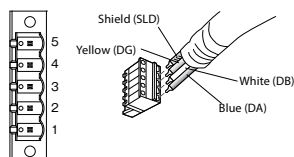
Network connection cable

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

CC-Link connection specification



Connector for network



Model
REC-GW-CC

Specifications

Operation type	Positioner type
Power	24VDC \pm 10%
Control power	0.8A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, not exposed to dust
Safety category	-
Degree of protection	IP20
Mass	135g
Accessories	-
External dimensions	W30mm×H115mm×D95mm
PC-compatible teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

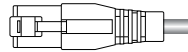
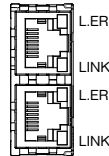
Network connection cable

Pin No.	Signal name (color scheme)	Description	Compatible wire diameter
1	DA (blue)	Signal line A	CC-Link dedicated cable
2	DB (white)	Signal line B	
3	DG (yellow)	Digital ground	
4	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)	

CC-Link IE field connection specification



Connector for network



Model
REC-GW-CIE

Specifications

Operation type	Positioner type
Power	24VDC \pm 10%
Control power	0.8A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, not exposed to dust
Safety category	-
Degree of protection	IP20
Mass	135g
Accessories	-
External dimensions	W30mm×H115mm×D95mm
PC-compatible teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

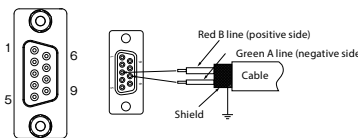
Network connection cable

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-	Ethernet ANSI/TIA-568-B 8P8C modular plug (RJ45) with a shield of category 5e or higher
6	TP1-	Data 1-	
7	TP3+	Data 3+	
8	TP3-	Data 3-	

PROFIBUS-DP connection specification



Connector for network



Model
REC-GW-PR

Specifications

Operation type	Positioner type
Power	24VDC \pm 10%
Control power	0.8A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, not exposed to dust
Safety category	-
Degree of protection	IP20
Mass	135g
Accessories	-
External dimensions	W30mm×H115mm×D95mm
PC-compatible teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

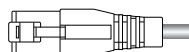
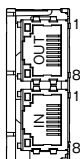
Network connection cable

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)	9-pin D-sub connector(male)
6	+5V	+5 V output (isolated)	
7	NC	Not connected	
8	A-Line	Signal line A (RS-485)	
9	NC	Not connected	

EtherCAT®/EtherCAT® connection specification



Connector for network



Model
REC-GW-EC

Specifications

Operation type	Positioner type
Power	24VDC ± 10%
Control power	0.8A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, not exposed to dust
Safety category	-
Degree of protection	IP20
Mass	135g
Accessories	-
External dimensions	W30mm×H115mm×D95mm
PC-compatible teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

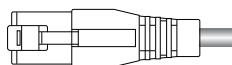
Network connection cable

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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA-568-B category 5 or higher..
5	-	Not used	
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

EtherNet/IP connection specification



Connector for network



Model
REC-GW-EP

Specifications

Operation type	Positioner type
Power	24VDC ± 10%
Control power	0.8A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, not exposed to dust
Safety category	-
Degree of protection	IP20
Mass	135g
Accessories	-
External dimensions	W30mm×H115mm×D95mm
PC-compatible teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

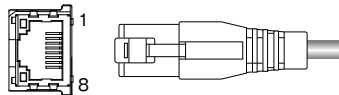
Network connection cable

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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA568-B category 5 or higher.
5	-	Not used	
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

PROFINET IO connection specification



Connector for network



Model
REC-GW-PRT

Specifications

Operation type	Positioner type
Power	24VDC \pm 10%
Control power	0.8A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, not exposed to dust
Safety category	-
Degree of protection	IP20
Mass	135g
Accessories	-
External dimensions	W30mm×H115mm×D95mm
PC-compatible teaching software	IA-OS(-C)
Teaching pendant	TB-02/TB-03

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	8P8C modular plug (RJ45) with a shield of Ethernet ANSI/TIA/EIA-568-B category 5 or higher..
5	-	Not used	
6	RD -	Receive data -	
7	-	Not used	
8	-	Not used	

EC connection unit

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



Model
RCON-EC-4

Specifications

Power	24VDC ± 10%
Control power	0.1A
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, no 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))

REC terminal unit

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



Model
RCON-GW-TRE

Specifications

Power	24VDC ± 10%
Ambient operating temperature & humidity	0~55°C, 5%RH to 85%RH (non-condensing or freezing)
Operating atmosphere	No corrosive gasses, no dust
Degree of protection	IP20
Mass	48g
External dimensions	W12.6mm×H115mm×D95mm

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

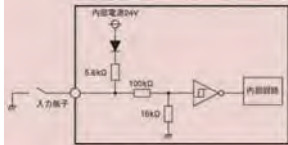
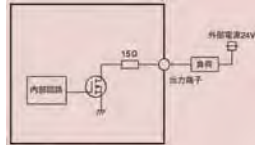
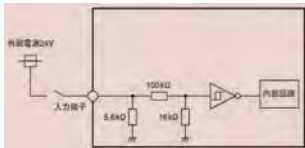
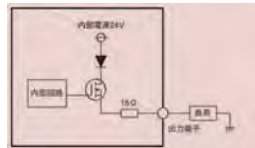
XSEL (SCARA)

PSA-24

TB -03/02

Software

I/O specifications (Input/Output specifications)

I/O		Input		Output	
Specification		Input voltage	DC24V±10%	Load voltage	DC24V±10%
		Input current	5mA/ one circuit	Max. load current	50mA /point
		ON/OFF voltage	ON voltage Min. DC 18V OFF voltage Max. DC 6V	Residual voltage	2V or less
		Leak current	Max. 1mA/ point	Leak current	Max. 0.1 mA /point
Insulation method		Not insulated from the external circuit		Not insulated from the external circuit	
I/O logic	NPN				
	PNP				

(Note) The insulation method is non-insulation. Make the ground of the external equipment (such as PLC) that is connected to ELECYLINDER in common with the ELECYLINDER's ground.

ELECYLINDER I/O signal table

Pin assignment of power and I/O connectors			
Pin No.	Connector name	Signal abbreviation	Function overview
B3	Backward	STO	Backward command
B4	Forward	ST1	Forward command
B5	Alarm cancel	RES	Alarm cancel
A3	Backward complete	LSO/PEO	Backward complete / push complete
A4	Forward complete	LS1/PE1	Forward complete / push complete
A5	Alarm	*ALM	Alarm detected (b-contact)
B2	Brake release	BKRLS	Brake forced release (in the case of the with brake specification)
B1	24V	24V	24V input
A1	0V	0V	0V input
A2	(24V)	(24V)	24V input

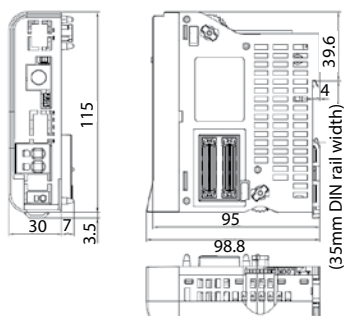
External dimensions

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

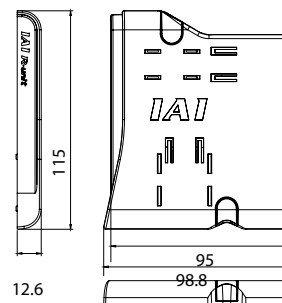
2D
CAD

3D
CAD

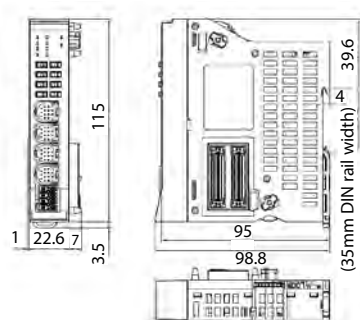
Master unit



Terminal unit



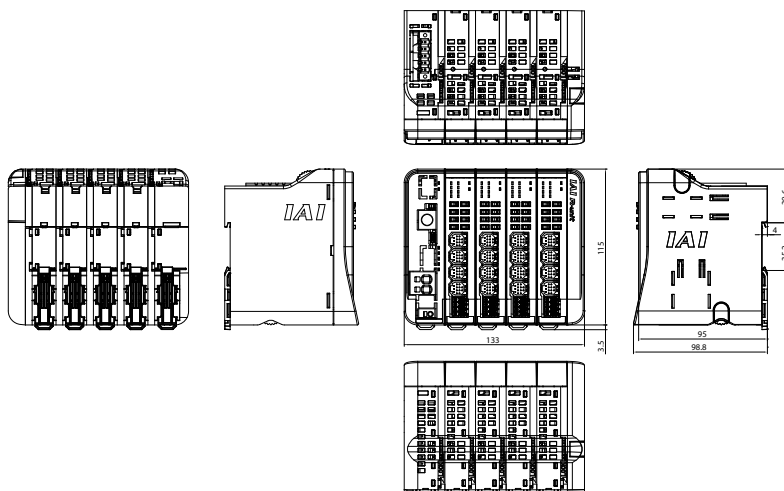
EC connection unit



Example of combined units

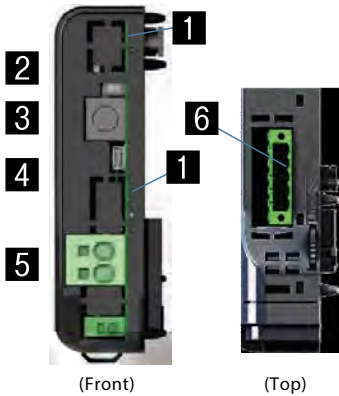
REC

For 4 EC connection units (16 axes)



Part names

Master unit



1 Status LED

Indicates the state of the controller.

2 AUTO/MANU switch

Switches between auto and manual operations.

3 SIO connector

A connector to connect the teaching pendant and the PC-compatible teaching software cable.

4 USB connector

Connector to connect the PC-compatible teaching software cable.

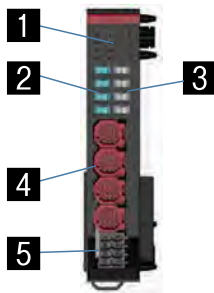
5 Motor power connector

Connector to supply +24V motor power.

6 Fieldbus connector / IO connector

For connecting the fieldbus connector that is selected at I/O type.

EC connection unit



1 Status LED

Indicates 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.

5 Drive source shutoff connector

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

Options

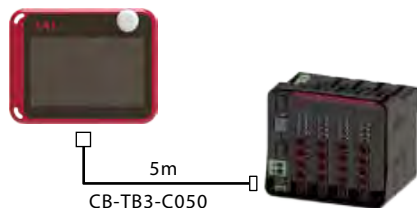
Touch panel teaching pendant

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

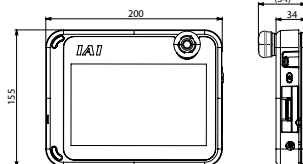
■ **Model TB-03-**

Please contact IAI for the current supported versions.

■ **Configuration**



■ **External dimensions**



Specifications

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

PC Teaching Software (Windows only)

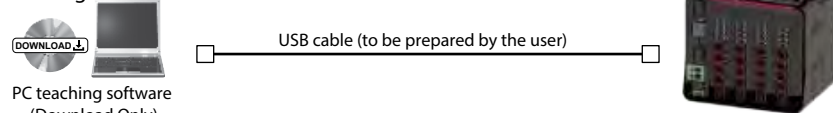
- **Features** Start-up support software which comes equipped with functions such as position/program teaching, trial operation, and monitoring.

■ **Model IA-OS**

Please contact IAI for the current supported versions.

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

■ **Configuration**



Supported Windows versions: 7/10



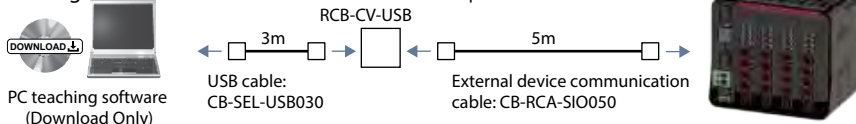
■ **Model IA-OS-C**

Please contact IAI for the current supported versions.

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

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

■ **Configuration**



Supported Windows versions: 7/10



24 VDC power supply

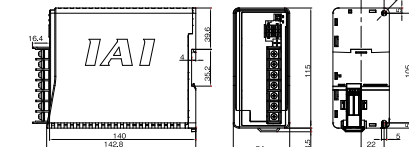
- **Overview** The recommended power supply to connect to the R-unit. The power supply has the same height as RCON and can be easily installed on control panels. It can also be connected to the R-unit for monitoring power status.

■ **Model PSA-24 (without fan)**

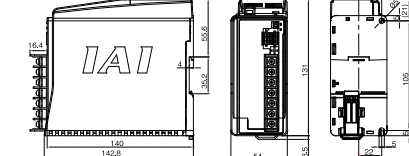
■ **Model PSA-24L (with fan)**

■ **External dimensions**

PSA-24



PSA-24L



Specifications Table

Item	Specification	
	100VAC input	200VAC input
Power input voltage range	100VAC~230VAC $\pm 10\%$	
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	23W (204W cont. rated) 37W (300W cont. rated)	33W (204W cont. rated) 54W (330W cont. rated)
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	
Parallel connection ³⁾	Max.: 5 units	

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

*2 In order to enable parallel operation, this power supply can vary the output voltage according to the load. Therefore, the power supply unit is dedicated for IAI controllers.

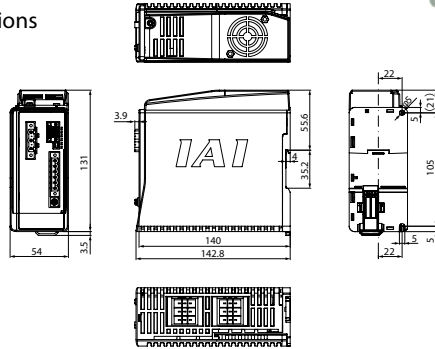
*3 Parallel connection cannot be used under the following conditions.
 · Parallel connection of PSA-24 (specification without fan) and PSA-24L (specification with fan)
 · Parallel connection with a power supply unit other than this power supply
 · Parallel connection with PS-24

DC power supply for driving motors

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

- Model PSA-200-1**
(Input voltage: Single phase AC100V, Max. 800W connectable)
- PSA-200-2**
(Input voltage: Single phase AC200V, Max. 1600W connectable)

- External dimensions**



Specifications

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

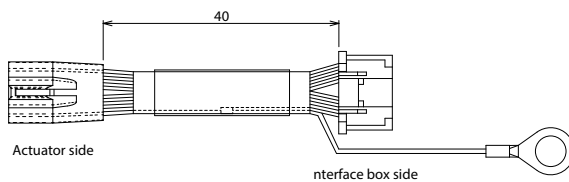
(Note 1) Rush current flows for approx. 20ms after turning on the power. Be aware that the rush current varies according to the power line impedance and internal element temperature (thermistor).

Parts for connecting the ultra-small ELECYLINDER and Teaching pendant (wireless).

Interface box conversion cable

Cable for connecting the actuator and interface box.

- Model CB-CVN-BJ002**



DF62B-13EP-2.2C (18) (Hirose)				PUDP-12V-S (JST)			
Color	Size	Signal	No.	No.	Signal	Size	Color
Yellow	AWG26	MP	1	4	MP	AWG26	Yellow
Black	AWG26	GND	2	10	GND	AWG26	Black
Pink	AWG26	INO	3	11	sub_SD+	AWG26	Pink
White	AWG26	INI	4	9	sub_SD-	AWG26	White
Purple	AWG26	SD+	6	7	main_SD+	AWG26	Purple
Green	AWG26	SD-	10	5	main_SD-	AWG26	Green
Light blue	AWG26	OUT0	7	12	STOP_EXT	AWG26	Light blue
Orange	AWG26	OUT1	8	3	rsv(VPS)	AWG26	Orange
Brown	AWG26	OUT2	9	1	rsv	AWG26	Brown
Blue	AWG26	BKRLS	11	6	BK_EXT	AWG26	Blue
Grey	AWG26	CP	12	8	VP24	AWG26	Grey
Red	AWG26	FG	13	2	FG	AWG26	Red

No.	Signal	Size	Color
1	FG	AWF22	Green

Interface Box

An interface box (supporting wireless) for RCON-EC connection specification twin power supply.

- Model ECW-CVNWL-CB-ACR**



Maintenance parts

This part is normally included in each unit. Please order individual parts if lost or need replacing.

for EC connection unit

■ Model **DFMC1,5/4-ST-3,5 (REC)**



Maintenance parts (cable)

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

Power-IO cable

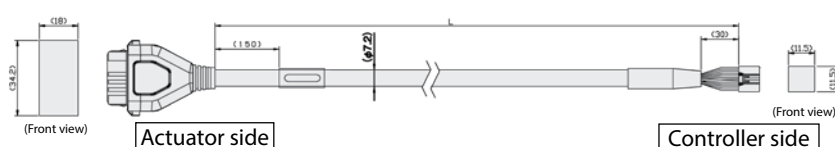
Name	Model
for RCON-EC	CB-REC-PWBIO□□□-RB
for RCON-EC (4-direction connector)	CB-REC2-PWBIO□□□-RB

Motor power cable for 200V ELECYLINDER

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

■ 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.

3-1871946-6

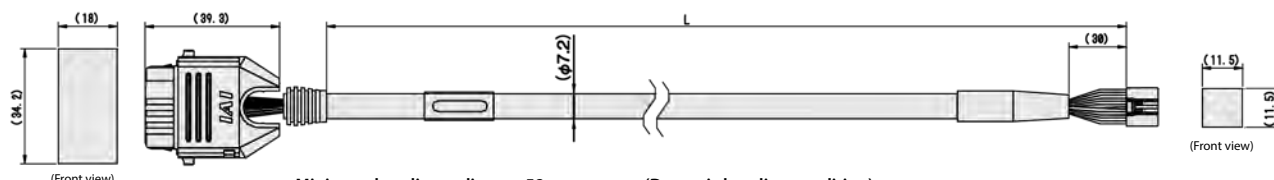
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V(MP)	B1
Light blue (AWG22)	24V(CP)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Pink (AWG26)	SD+	B6
White (AWG26)	SD-	A6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
Brown (AWG26)	BKRLS	B2

DF62C-135-2.2C(18)

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

■ Model **CB-REC2-PWBIO□□□-RB**

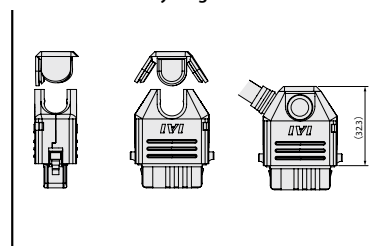
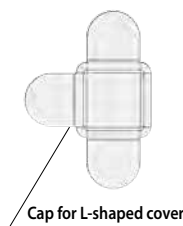
*Please indicate the cable length (L) in □□□, e.g. 030 = 3m, maximum 10m



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

* Only the robot cable is available for this model.

Connector assembly diagram



1-1871946-6

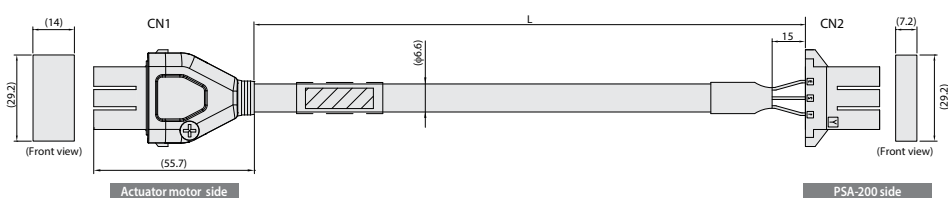
Color	Signal name	Pin No.
Black (AWG18)	0V	A1
Red (AWG18)	24V(MP)	B1
Light blue (AWG22)	24V(CP)	A2
Orange (AWG26)	IN0	B3
Yellow (AWG26)	IN1	B4
Green (AWG26)	IN2	B5
Yellow-Green (AWG26)	SD+	B6
Light gray (AWG26)	SD-	A6
Blue (AWG26)	OUT0	A3
Purple (AWG26)	OUT1	A4
Gray (AWG26)	OUT2	A5
Brown (AWG26)	BKRLS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

DF62C-135-2C(18)

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

■ Model **CB-EC-PW□□□-RB**

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



Minimum bending radius $r = 40\text{mm}$ or more (Dynamic bending condition)

* Only the robot cable is available for this model.

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

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

MEMO

Controller

Models
not shown
here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

TB
-03/02

Software

RSEL

Unit-connecting type controller
dedicated to the CRS Cartesian type 6-axis robot



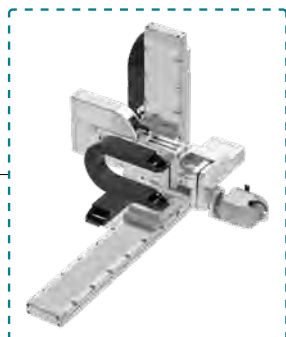
(*1) Mounting conditions differ depending on the model. Refer to P8-131 for details.

Features

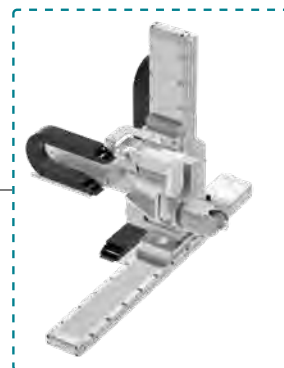
The RSEL controller combines necessary units for the CRS series.

The RSEL controller, which can be freely combined and operates with the units necessary for the Cartesian 6-axis robot "CRS series", is now available. Refer to P8-169 for the unit configurations.

RSEL for CRS
(Cartesian stepper motor type)



RSEL for CRS
(Cartesian AC servo motor type)



Driver units of two axes can be added

The RSEL controller can connect up to 8 axes.

An additional driver units of two axes can be added (*) to the CRS series of 6 axes.

(+) Please purchase driver units separately. Refer to P8-169 for details.

(Example)

RSEL **6 axes** for CRS

Up to **2 axes** for driver unit





CRS **6 axes**



Up to **2 axes**



Table of models

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

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

Model specification items

RSEL

Series

Type

I/O type

I/O cable length

Option

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

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

0	Without cable
2	2m (standard)
3	3m
5	5m

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

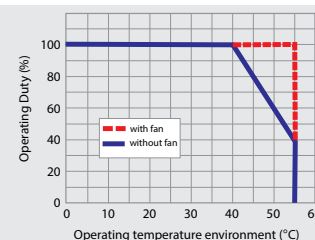
FN	Fan unit
-----------	----------

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

The number of fan units is shown below by type.

type	Quantity of fans
SX□A SXZC□ SXZD□	3 units
SX□B SXZE□	2 units

The range of operating temperature of the SEL unit and the driver unit is 0 - 55°C. However, when the SEL unit is used in an environment of over 40°C, a fan unit is needed. In addition, there is a temperature derating, depending on the existence of the fan unit. When there is no fan unit, operation is possible at 0-40°C without derating, but it is necessary to lower the operating duty ratio by 20% for every 5°C at 0-55°C



Contents of the unit configuration and external dimensions

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

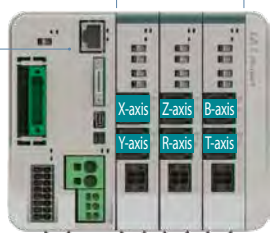
2D
CAD

3D
CAD

RSEL-SXBA
RSEL-SXGA

24V driver unit
RCON-PC-2, 3 units

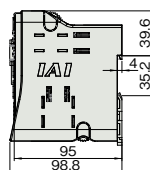
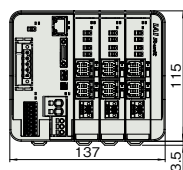
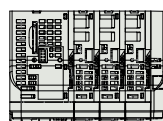
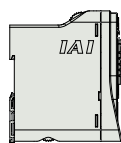
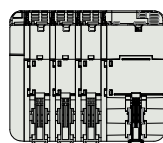
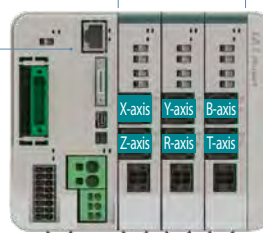
SEL unit
RSEL-G



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

24V driver unit
RCON-PC-2, 3 units

SEL unit
RSEL-G



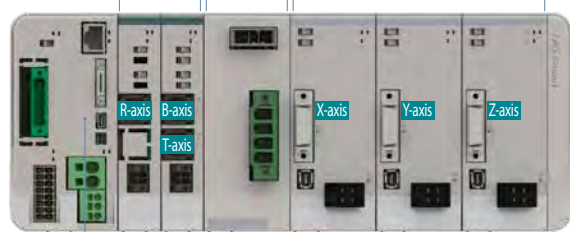
RSEL-SXBB
RSEL-SXGB

24V driver unit
RCON-PC-1, 1 unit
RCON-PC-2, 1 unit

200V power unit
RCON-PS2-3, 1 unit

200V driver unit
RCON-SC-1, 1 unit

SEL unit
RSEL-G



RSEL-SXZEY
RSEL-SXZEZ

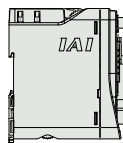
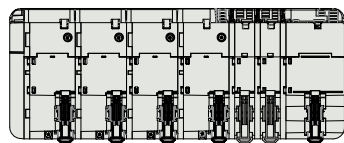
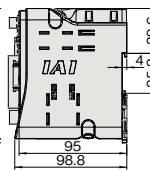
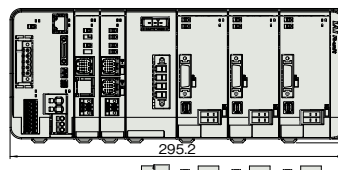
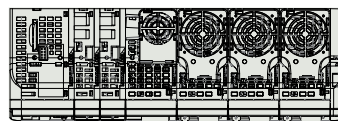
24V driver unit
RCON-PC-1, 1 unit
RCON-PC-2, 1 unit

200V power unit
RCON-PS2-3, 1 unit

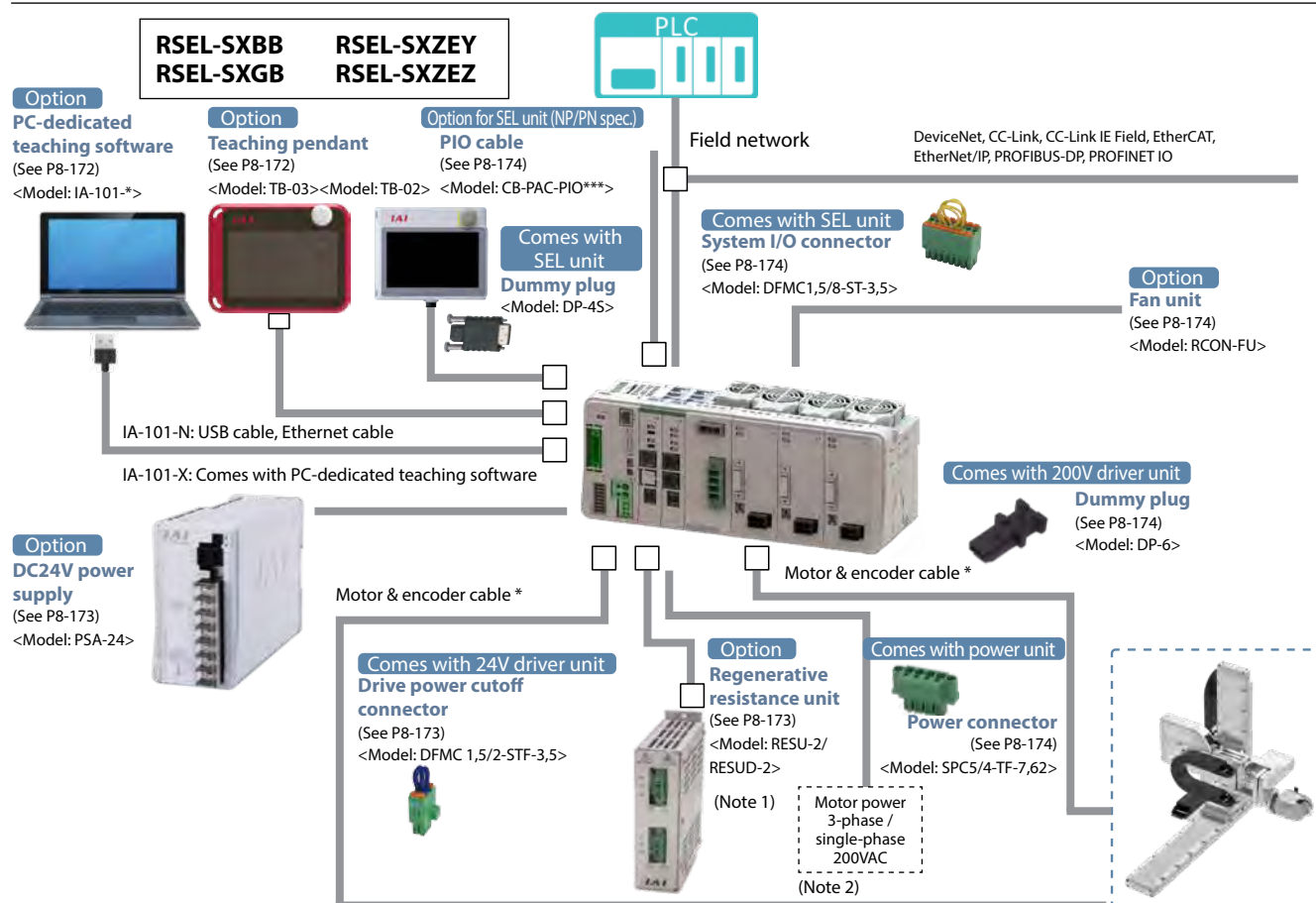
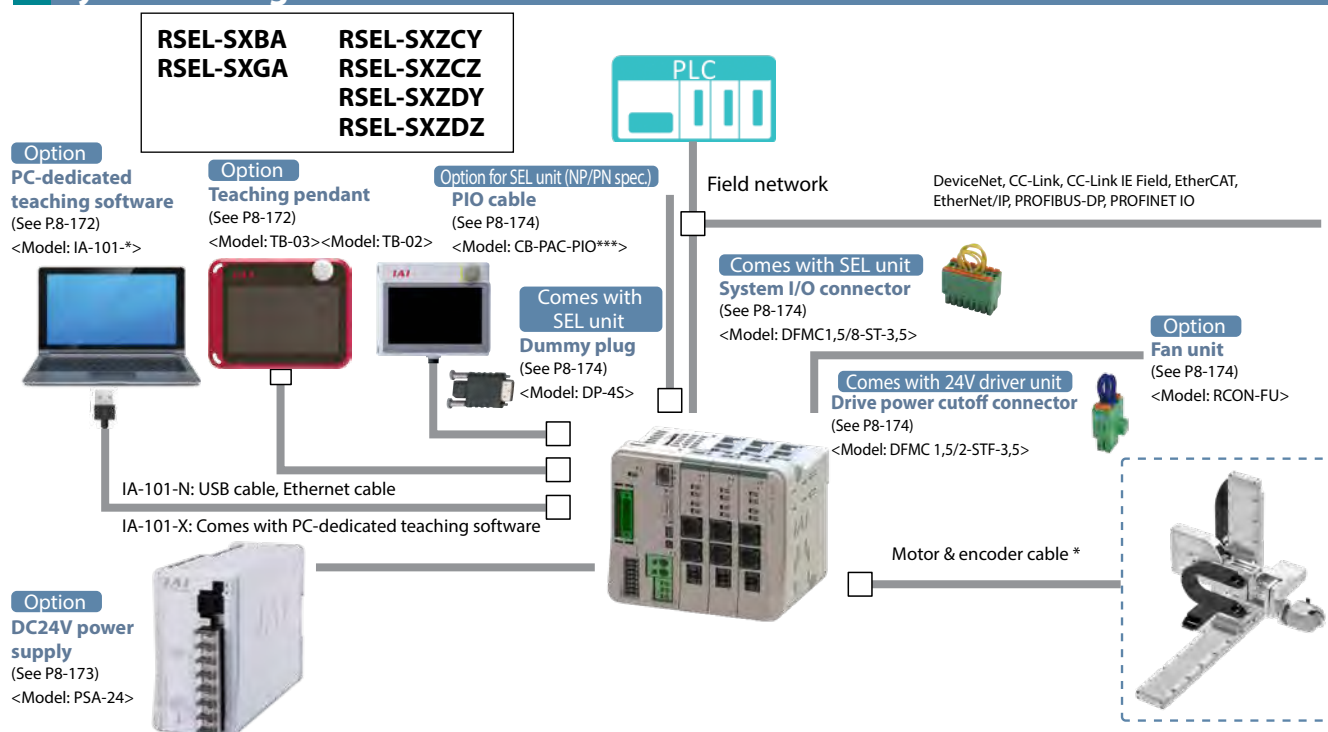
200V driver unit
RCON-SC-1, 1 unit



SEL unit
RSEL-G



System configuration



Note 1: The RCON-SC and RCON-PS2 are equipped with a 60W built-in regenerative resistance, respectively. Basically, a regenerative resistance is not necessary, but if it is not enough, an external regenerative resistance unit is used. The necessary quantity of the resistance can be calculated by the "Calculator."

The Calculator software comes with the IA-OS software.

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

* Motor & encoder cable comes with the actuator. The cable varies depending on the actuator type to be used. When ordering a replacement cable, see P8-175.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON

-CB/CFB

PCON

-CBP

(Pulse press)

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON

-CB

(Servo press)

SSEL

MSEL

XSEL

-RA/SA

XSEL

-P/Q

XSEL

(SCARA)

PSA-24

TB

-03/02

Software

Basic specifications

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

Legend:
○ : Compliant

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

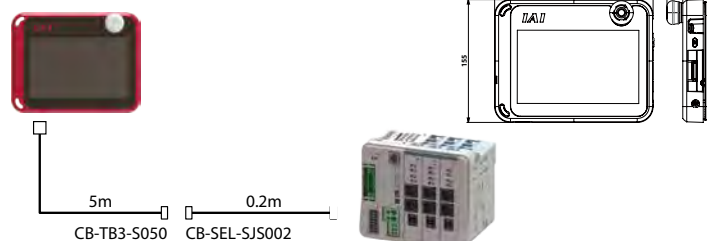
Option

Touch panel teaching pendant

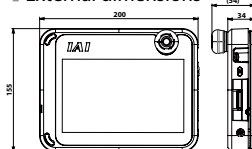
- Feature A teaching device with functions such as position teaching, trial operation, and monitoring.

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

- Configuration



External dimensions

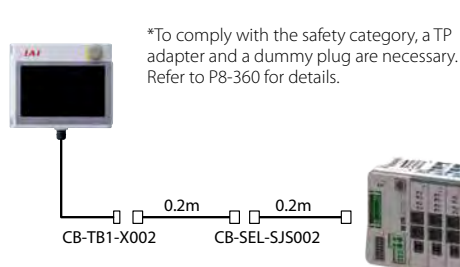


Specifications

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

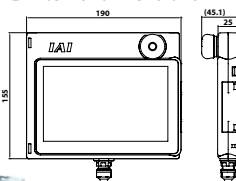
- Model **TB-02(D)-** ☐ See IAI website for supported versions.

- Configuration



*To comply with the safety category, a TP adapter and a dummy plug are necessary. Refer to P8-360 for details.

External dimensions



Specifications

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

PC dedicated teaching software (Windows only)

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

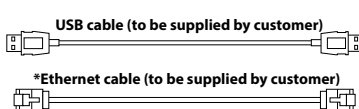
- Features PC teaching software (Download Only) only.
If you want to connect both the controller and PC side with your USB cable or Ethernet cable, only the software needs to be purchased. A cable that meets the following specifications is to be prepared by the customer.

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

- Configuration

See IAI website for supported versions.

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



Warning

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

Supported Windows versions: 8.1/10



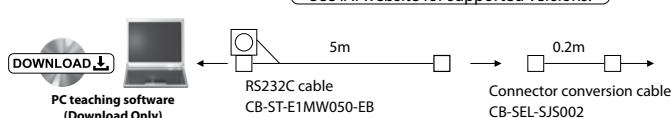
Software Download Link will be provided.

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

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

- Configuration

See IAI website for supported versions.



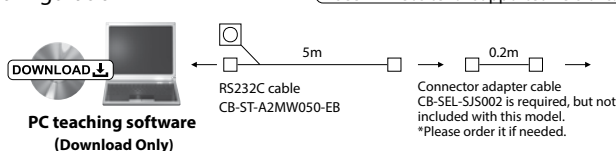
The CB-ST-E1MW050-EB cannot be used when "building an enable system that uses system I/O connector with external power supply" or when "building a duplex safety circuit." (It is necessary to use CB-ST-A2MW050-EB)

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

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

- Configuration

See IAI website for supported versions.



Supported Windows versions: 8.1/10



24V power supply

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

■ **Model** **PSA-24 (without fan)**

■ **Model** **PSA-24L (with fan)**



Specifications

Item	Specification	
	100VAC	200VAC
Input power voltage	100VAC-230VAC $\pm 10\%$	
Input current	3.9A or less	1.9A or less
Power capacity	without fan: 250VA with fan: 390VA	without fan: 280VA with fan: 380VA
Inrush current ^{*1}	without fan: 17A (typ) with fan: 27.4A (typ)	without fan: 34A (typ) with fan: 54.8A (typ)
Heat quantity	28.6W	20.4W
Output voltage ^{*2}	24V $\pm 10\%$	
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}	Up to 5 units	

*1 The pulse width of the inrush current is 5ms or less.

*2 For parallel operation, this power supply unit changes output voltage according to load. Therefore, this power supply unit is for an exclusive use for IAI controllers.

*3 Parallel connection is impossible on the following conditions:

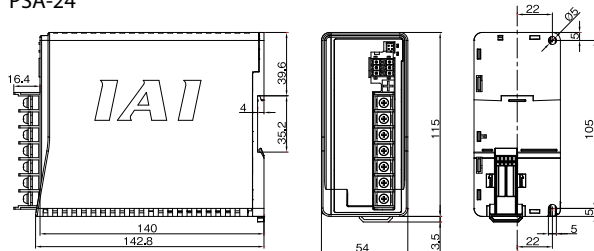
* Parallel connection of PSA-24 (without fan) and PSA-24L (with fan).

* Parallel connection with power unit other than this power supply unit.

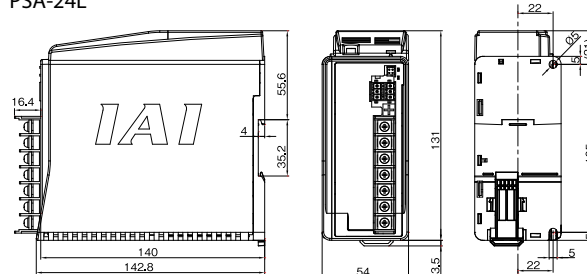
* Parallel connection with PS-24.

External dimensions

PSA-24



PSA-24L



Regenerative resistance unit

- **Description** This unit converts the regenerative current that generates when the motor decelerates into heat. The 200V driver unit and 200V power unit are equipped with internal regenerative resistance. However, when energy is generated at the same time, external regenerative resistance unit(s) is/are needed.

■ **Model** **RESU-2 (standard) / RESUD-2 (DIN rail mount spec.)**

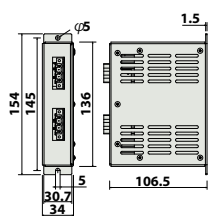
Specifications

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

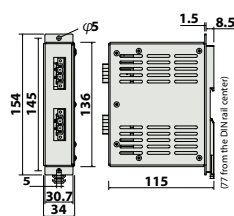
* When two regenerative resistance units are necessary, order one each of the RESU-2 and RESU-1. (See P8-316)

External dimensions

<RESU-2>



<RESUD-2>



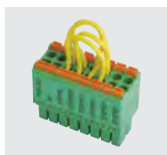
Maintenance Parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing. Refer to P1-89 for cable accessories.

SEL unit (for RSEL-G-□)

System I/O connector

■ Model
DFMC1.5/
8-ST-3.5(RSEL)



Dummy plug

■ Model DP-4S



Fan unit

■ Model RCON-FU

* Optional



Network connector

for DeviceNet

■ Model MSTB2.5/5-STF-5.08 AUM



Terminal resister for CC-Link
with 110Ω/130Ω

■ Model MSTB2.5/5-STF-5.08 AU



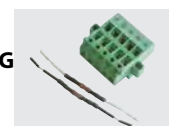
2-way spec. for DeviceNet

■ Model TMSTBP2.5/5-STF-5.08 AUM



2-way spec. for CC-Link
with 110Ω/130Ω

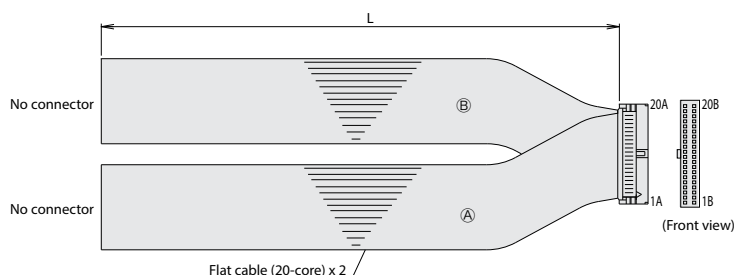
■ Model TMSTBP2.5/5-STF-5.08 AUBD-FG



PIO cable (for RSEL-G-NP/PN)

■ Model CB-PAC-PIO□□□

* Specify cable length in □□□
Max. 10m, (ex.) 080=8m



HIF6-40D-1.27R (Hirose)

No.	Signal	Cable color	Wiring	No.	Signal	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	

For 24V driver unit (RCON-PC/PCF/AC/DC-1/2)

Drive source shutoff connector

■ Model DFMC1.5/2-STF-3,5



For 200V driver unit (RCON-SC-1)

Dummy plug

■ Model DP-6



Fan unit

■ Model RCON-FU



For 200V power unit (RCON-PS2-3)

200V power supply connector

■ Model SPC5/4-STF-7,62



Fan unit

■ Model RCON-FUH



Maintenance parts (cable)

After purchasing the product, when a cable is purchased for replacement, use the model code below. Refer to P1-89 for the details of cables.

Actuator		Connection cable	
Type	Configured axis	Motor & encoder cable (-RB: Robot cable)	
		Standard connector	4-direction connector type
CRS-XBA CRS-XGA CRS-XZCY CRS-XZCZ CRS-XZDY CRS-XZDZ	All axes	CB-ADPC-MA□□□(-RB) CB-ADPC2-MA□□□(-RB)	
CRS-XBB CRS-XGB CRS-XZEY CRS-XZEZ	R and BT axes		

Actuator		Connection cable		
Type	Configured axis	Motor cable	Motor robot cable	Encoder robot cable
CRS-XBB	X, Y and Z axes	CB-RCC1-MA□□□	CB-X2-MA□□□	CB-X1-PA□□□
CRS-XGB				
CRS-XZEY				
CRS-XZEZ				

Controller

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

MEMO

Controller

Models
not shown
here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

RCP6S with Built-in Controller

Built-in controller for RCS6S



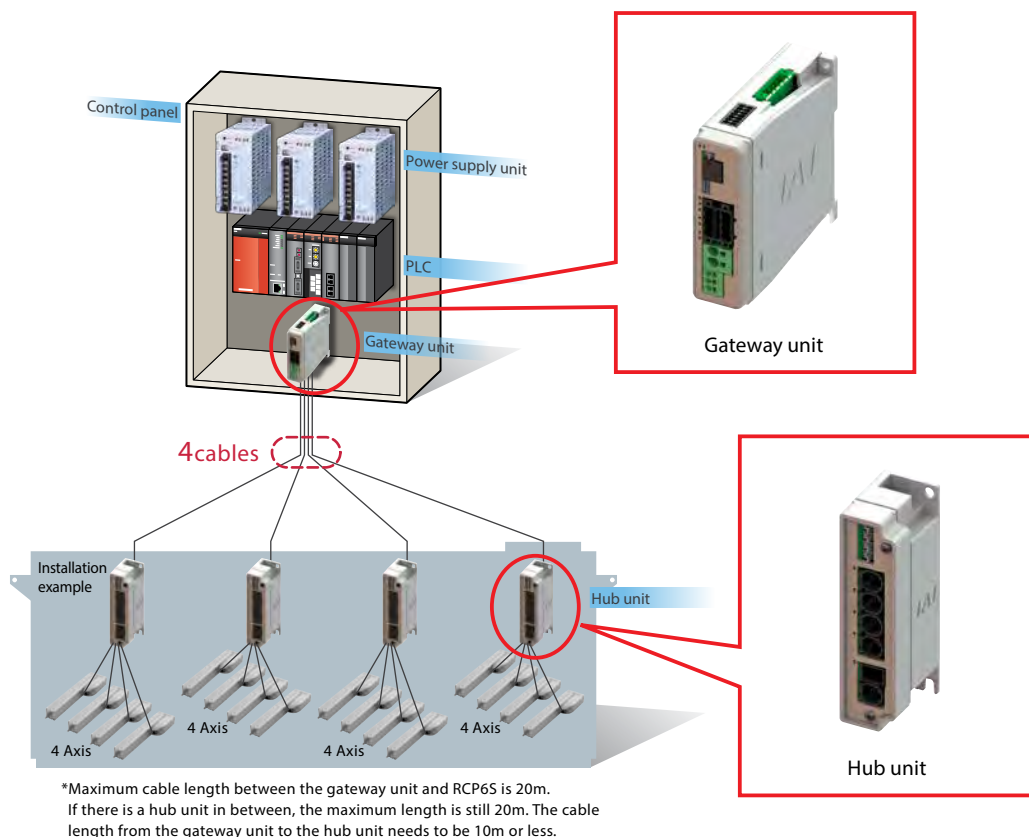
Features

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

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

*The number of connectable axes will vary depending on the type of field network and its mode. Please refer to P8-179 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 P8-179
- Hub unit: This unit can expand the number of axes connected to the gateway unit. → See P8-183
- PLC connection unit: This unit is used to connect RCP6S directly to the PLC using serial communication. → See P8-184
- Controller for RCP6S Gateway: Controllers for connection of actuators other than RCP6S to an RCP6S gateway within the system. → See P8-185

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)

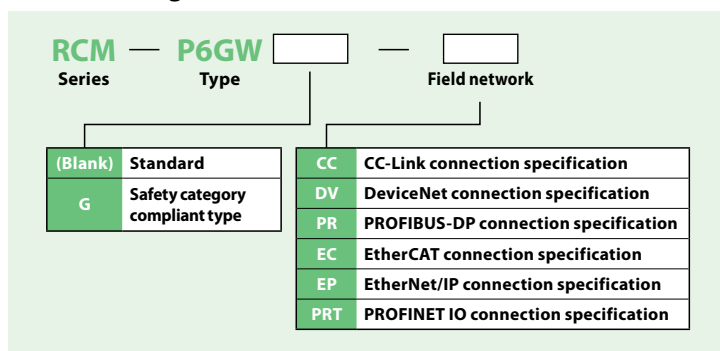
Features:

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

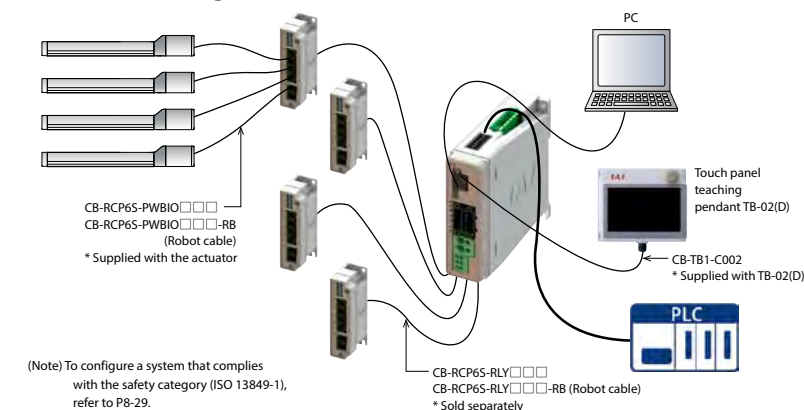
Details:

- 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 connect- ed axes increase.

Model Configuration



Connection Image



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



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

* The safety category specification includes a dummy plug DP-5 (single part).

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

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

(*2) Hub unit: See P8-183.

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.

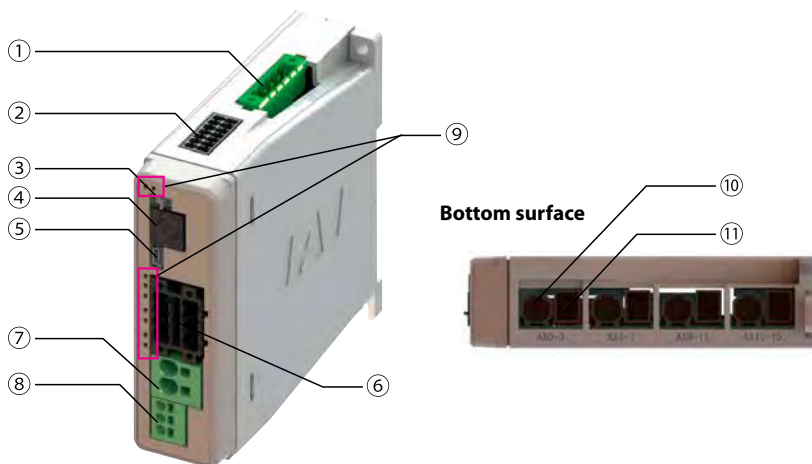
Operation mode	Description	Overview
Positioner 1/ Simple direct numerical value mode (Simple direct mode)	Positioner 1 mode can store up to 768 points of position data, and can move to the stored position. Both modes allow monitoring the current position numerically with 0.01mm increments. The simple 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

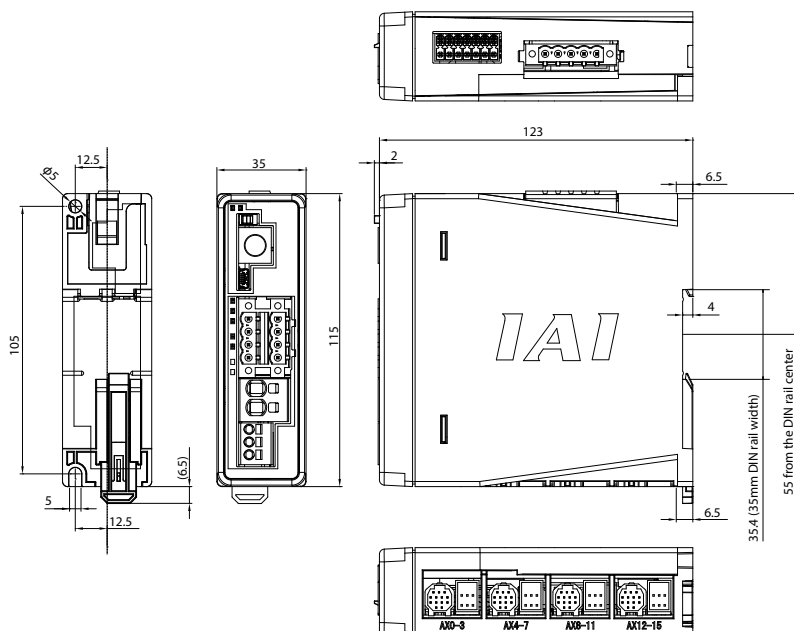
	Simple direct value mode	Positioner 1 mode	Direct numerical control mode (Direct indication/Full mode)	Positioner 2 mode	Positioner 3 mode	Positioner 5 mode
Number of positioning points	768	768	Unlimited	768	256	16
Home return operation	○	○	○	○	○	○
Positioning operation	○	△	○	△	△	△
Speed, acceleration/deceleration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

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 P8-179

Controller

Models
not shown
hereModel
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

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

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

TB
-03/02

Software

Option

Hub unit (RCM-P6HUB)

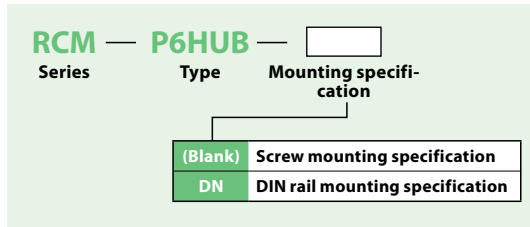
The hub unit cannot be used alone.
It must be used with a gateway unit.

Features:

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

* The number of connectable axes will vary depending on the type of field networks and its mode.
Please refer to P8-179 for details and confirm the "Number of connectable axes".

Model Configuration

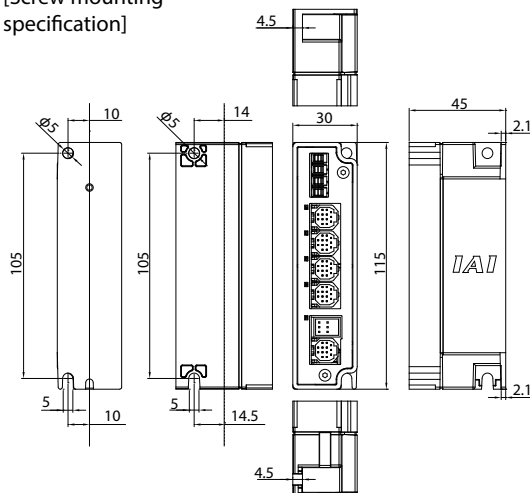


Specification

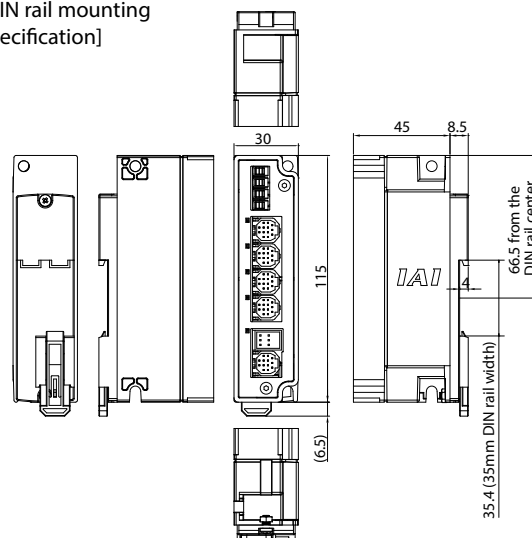
Specification	Description
Number of controlled axes	4 axes max.
Power supply voltage	24VDC \pm 10%
Control power capacity	0.3A (single hub unit)
Motor power capacity	12.8A max. from connected axes
Emergency stop input	None
Enable input	None
LED display	SYS LED \times 1 (RUN/ALM) AXIS LED \times 4 (RUN/ALM)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

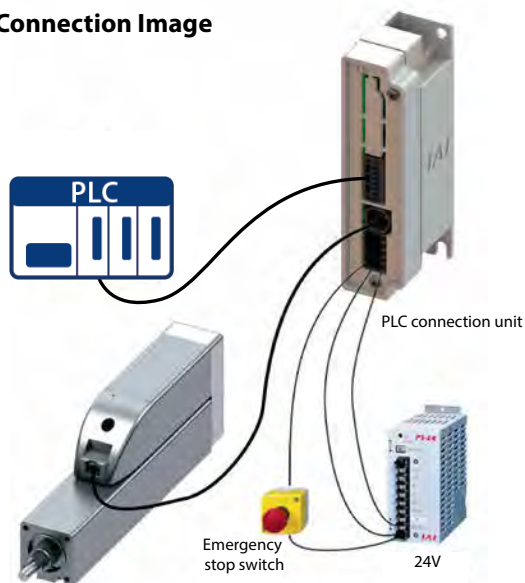
The RCP6S and the PLC connection unit can be easily connected with a cable.

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

■ Model Configuration

RCB	—	P6PLC	—	
Series		Type		Mounting specification
		(Blank)		Screw mounting specification
		DN		DIN rail mounting specification

■ Connection Image

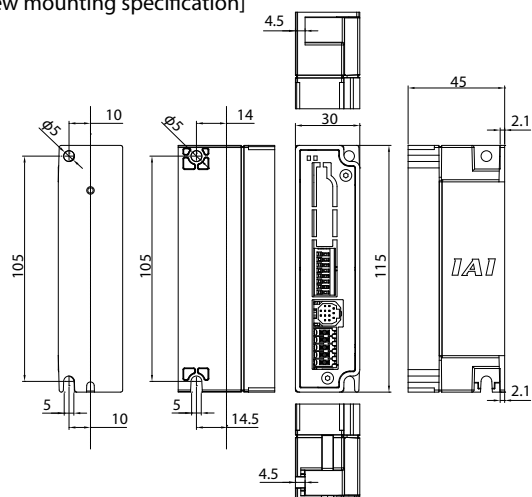


■ Specification

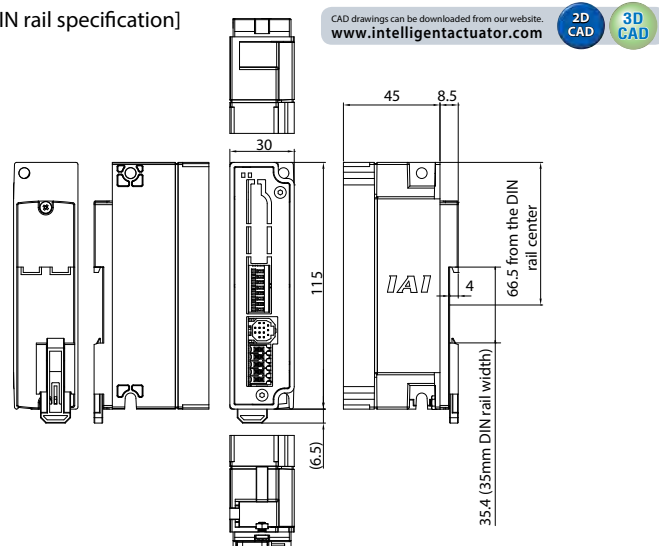
Specification	Description
Number of controlled axes	1-axis
Power supply voltage	24VDC \pm 10%
Control power capacity	0A for single PLC connection unit 0.3A for connected PLC units + RCP6S built-in driver • For brake types, 0.7A for 0.2 sec is required for releasing brake
Motor power capacity	Depending 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]



RCP6S gateway controller <RCM-P6□C>

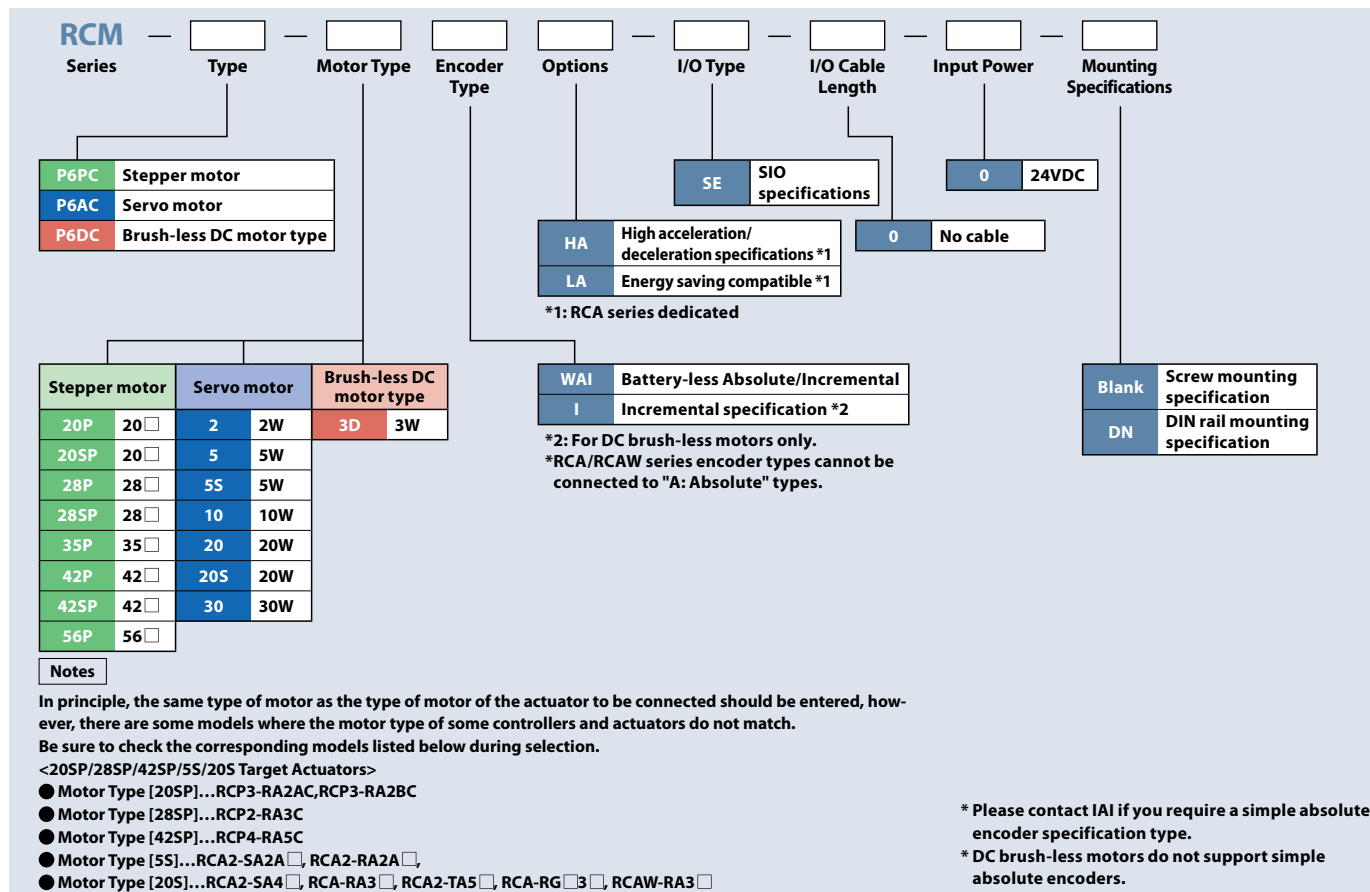
Actuators other than RCP6S can be driven by connecting to the RCP6S gateway unit and hub unit.

Details:

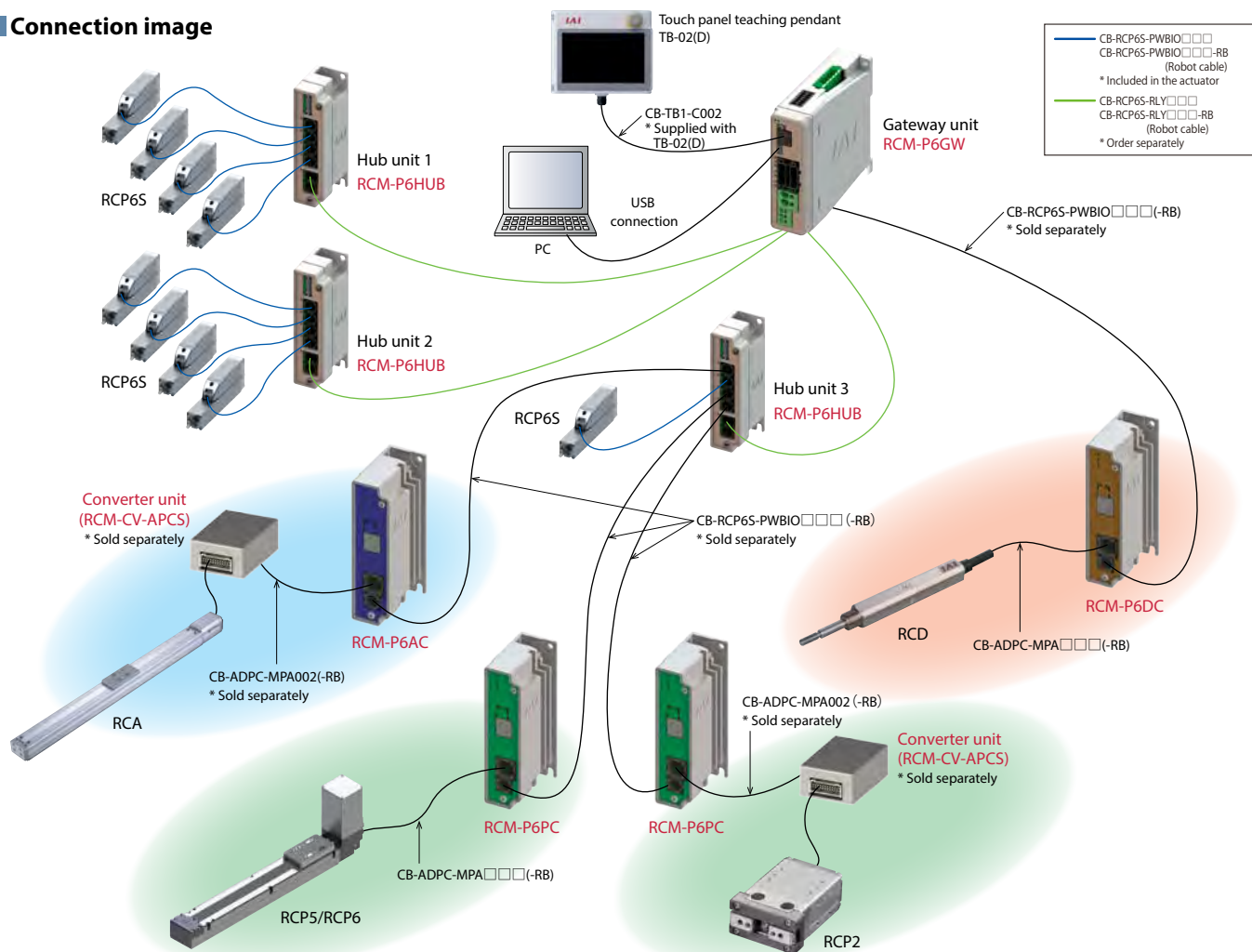
- RCP2~6, RCA, RCA2, RCD actuators can be connected.
 - * Some products may not be supported
- RCP2~4, RCA, and RCA2 connections require a converter unit.
- The same control as an RCP6S built-in controller is possible.
(Refer to P8-180 for details about control operation modes.)
- The actuator and controller information during operation can be displayed on a PC screen as a waveform through the use of PC dedicated software.
(Current position, current speed, servo motor, etc)

RCM-CV-APCS
(Converter unit)

Model Configuration



■ Connection image



*To configure the system that complies with the safety category (ISO 13849-1), refer to P8-29.

* As with some RCP 5 / RCP 6, some conversion units are unnecessary. Please confirm on P8-188.

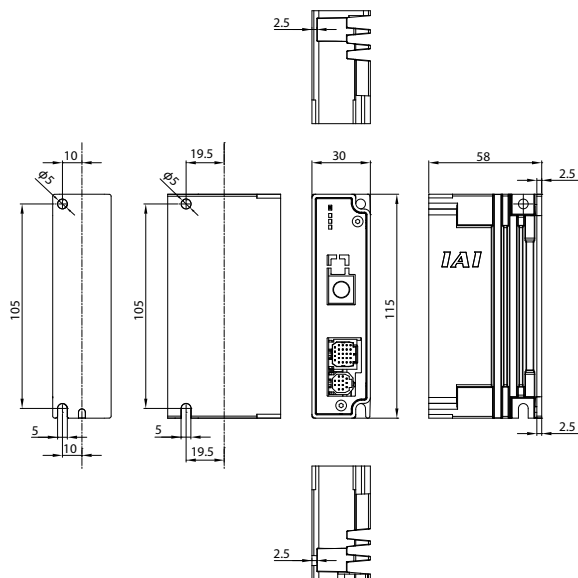
* The field network can be used by connecting to a gateway unit.

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

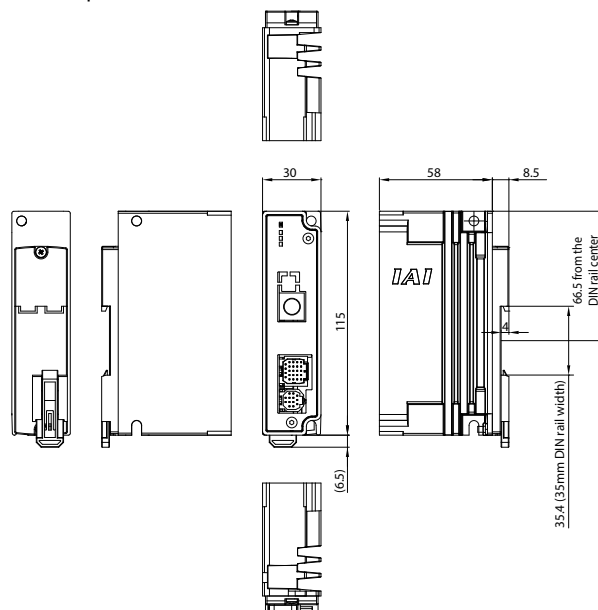
* Maximum cable length between the gateway unit and actuator is 20m for RCM-P6PC and RCM-P6AC, and 10m for RCM-P6DC.

■ 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-***N, RCA2-***NA: 1,048 pulses/rev		• Incremental encoder: 480 pulses/rev
LED display	SV/ALM LED×1				
Electromagnetic forced brake release mechanism	Brake release input (inside I/F connector)				
Electric shock protection mechanism	Class 1 basic insulation				
Insulation withstanding voltage	500VDC 10MΩ				
Contamination	Contamination 2				
Weight	Screw mounting specification: 200g, DIN rail mounting specification: 215g				
External dimensions	Screw mounting specification: 30W x 115H x 58D, DIN rail mounting specification: 30W x 115H x 66.5D				
Overseas accreditations	CE, cUL (Both Acquired)				

Compatible actuator list

● RCM-P6PC Compatible Actuators

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

Rod Type	
Model	Conversion unit
RCP6-RA4C	—
RCP6-RA6C	—
RCP6-RA7C	—
RCP6-RA4R	—
RCP6-RA6R	—
RCP6-RA7R	—
RCP6-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-GRL	—
RCP4-GRLW	—
RCP2-GRSS	○
RCP2-GRLS	○
RCP2-GRS	○
RCP2-GRM	○
RCP2-GRHM	○
RCP2-GRHB	○
RCP2-GR3LS	○
RCP2-GR3LM	○
RCP2-GR3SS	○
RCP2-GR3SM	○
RCP6-RTFML	—
RCP2-RTBS	○
RCP2-RTBSL	○
RCP2-RTCS	○
RCP2-RTCSL	○
RCP2-RTB	○
RCP2-RTBL	○
RCP2-RTC	○
RCP2-RTCL	○
RCP2-RTBB	○
RCP2-RTBBL	○
RCP2-RTCB	○
RCP2-RTCBL	○

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

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

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

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

● RCM-P6AC compatible actuators

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

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

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

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

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

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

● RCM-P6DC Compatible actuators

Rod Type	
Model	Conversion unit
RCD-RA1DA	—

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

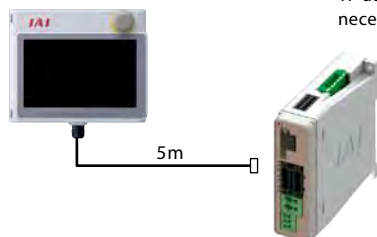
Option

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(D)-□

Configuration



* To comply with the safety category, a TP adapter and a dummy plug are necessary. Refer to P8-360 for details.

Specification

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0 to 40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Environmental resistance	IP20
Mass	470g (TB-02 unit only)

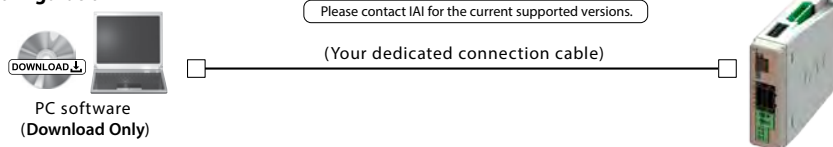
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model IA-OS (Software only, for customers who already own a dedicated connection cable)

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

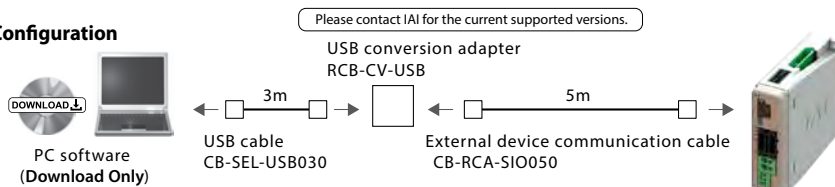
Configuration



Model IA-OS-C (Software with an external device communication cable + USB conversion adapter + USB cable)

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

Configuration



Supported Windows versions: 7/10



Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

Gateway unit (for RCM-P6GW)

Drive power shutoff connector

Model FKC2.5/4-STF-5.0



System I/O connector

Model DFMC1.5/7-ST-3.5



Dummy plug

for RCM-P6GWG
Model DP-5



Network connector

for DeviceNet

Model MSTB2.5/5-STF-5.08 AUM



for CC-Link
terminal resistor 110Ω/130Ω

Model MSTB2.5/5-STF-5.08 AU



Maintenance parts (Cable)

These parts are normally included in each unit. Please order individual parts if lost or need replacing. Refer to P1-89 for the details of cables.

* The total length of the cable is limited. See the cautions on P8-177, 8-186.

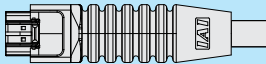
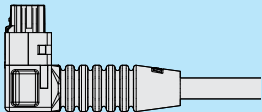
Table of compatible cables

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□□□*1	
	Robot cable		CB-ADPC-MP□□□-RB *1	

*1: It is also possible to select the 4-direction connector type for the CB-ADPC-MPA□□□ cable.

* When the connected actuator is RCP3/RCA2/RCA2CR/RCAW series, the cable is CB-RCAPC-MPA□□□.
Refer to the cable detail drawing page of Volume 1.

4-direction connector type

Standard connector type (Mechanical side)	4-direction connector type (Mechanical side)
	
CB-ADPC-MPA □□□ (-RB)	CB-ADPC2-MPA □□□ (-RB)

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

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.

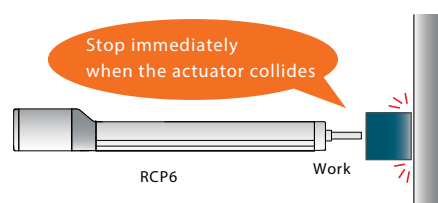


2 PowerCON® Equipped

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.



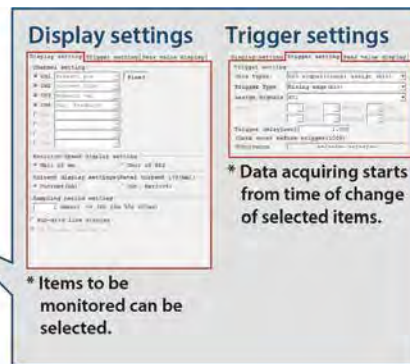
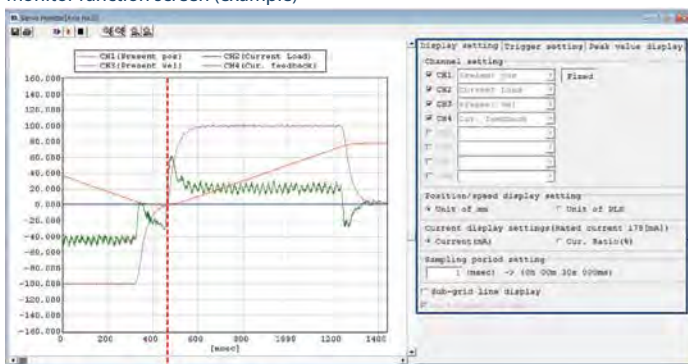
4 Enhanced Monitor Functions

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)



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

* Items to be monitored can be selected.

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	PROFIBUS DP	CompoNet	MECHATROLINK I	MECHATROLINK II	EtherCAT	EtherNet/IP	PROFINET IO
					DeviceNet	CC-Link	CC-Link IE Field connection specification	PROFIBUS DP	CompoNet	MECHATROLINK I, II*1	MECHATROLINK III*1	EtherCAT	EtherNet/IP	PROFINET IO
I/O type model number			NP/PN	PLN/PLP	DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT
PCON-CB/CGFB	Battery-less absolute specification		○	○	○	○	○	○	○	○	○	○	○	○
	Simple absolute spec.	With absolute battery	○	○	○	○	○	○	○	○	○	○	○	○
		With absolute battery unit	○	○	○	○	○	○	○	○	○	○	○	○
		Without absolute battery	○	○	○	○	○	○	○	○	○	○	○	○
PCON-CFB/CGFB	Battery-less absolute specification		○	○	○	○	○	○	○	○	○	○	○	○

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

Legend:
○ : Available

Model specification items

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

Series

CB	Standard
CGB	Safety category compliant type
CFB	56SP/60P/86P motor-compliant type
CGFB	Safety category compliant 56SP/60P/86P motor-compliant type

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

Motor Type

WAI	Battery-less absolute specification
SA	Simple absolute spec.

Encoder Type

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

I/O Type

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

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

Power Supply Voltage

0	24VDC
---	-------

Simple Absolute Specification

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

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

Controller Mounting Specification

(Blank)	Screw mounting specification
DN	DIN rail mounting specification

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

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

Please be sure to check P8-18 for the caution when selecting.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON-CB/CFB

PCON-CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON-CB

SCON-CB (Servo press)

SSEL

MSEL

XSEL-RA/SA

XSEL-P/Q

XSEL (SCARA)

PSA-24

TB-03/02

Software

System configuration

<PCON-CB-CGB>

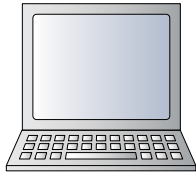
Option

PC dedicated teaching software

(See P8-204)

Software only
<Model: IA-OS>

Supplied dedicated connection cable
<Model: IA-OS-C>



Option

Touch panel teaching pendant

(See P8-204)

<Model: TB-02(D)->



* Please check HP for supported versions.

5m

Dedicated connection cable

Connecting cable standard: 0.5m

Supplied with absolute battery unit

Supplied with simple absolute type

Absolute battery unit

(See P8-205)
<Model: SEP-ABU (DIN rail mount)>
<Model: SEP-ABUS (screw mount)>



Battery for simple absolute type

(See P8-205)
<Model: AB-7>



Field network

DeviceNet/CC-Link/PROFIBUS-DP/MECHATROLINK(I, II, III)
CompoNet/EtherCAT/EtherNet/IP/PROFINET IO

Supplied with any PIO spec. controller

PIO cable

(See P8-205)
<Model: CB-PAC-PIO020>
Standard: 2m

Controller

<Model: PCON-CB/CGB>



Option

24VDC power supply

(See P8-349)
<Model: PSA-24>



Supplied with PCON-CGB

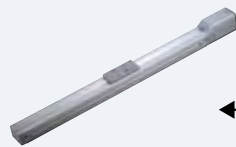
Dummy plug

(See P8-205)
<Model: DP-5>



* To configure the system that complies with the safety category (ISO 13849-1), refer to P8-29.

<Connectable actuators>



RCP2 Series

Supplied with the actuator

Integrated motor-encoder robot cable



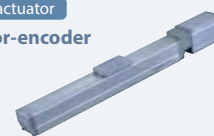
RCP5 Series

Supplied with the actuator

Integrated motor-encoder cable
Integrated motor-encoder robot cable

Supplied with the actuator

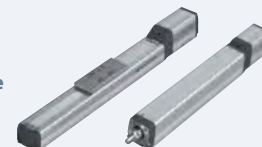
Integrated motor-encoder robot cable



RCP3 Series

Supplied with the actuator

Integrated motor-encoder cable
Integrated motor-encoder robot cable



RCP4 Series

Supplied with the actuator

Integrated motor-encoder cable
Integrated motor-encoder robot cable

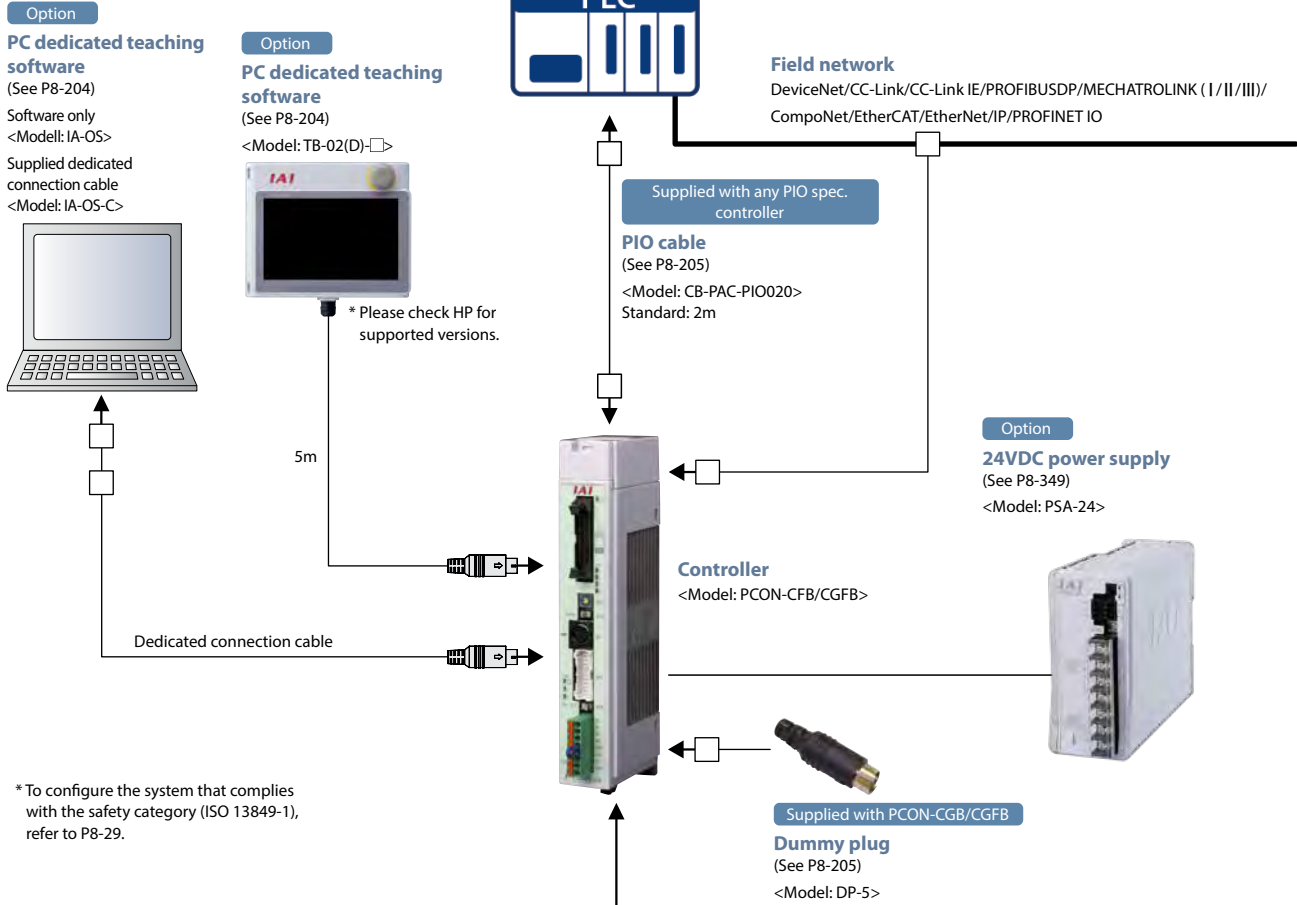


RCP6 Series

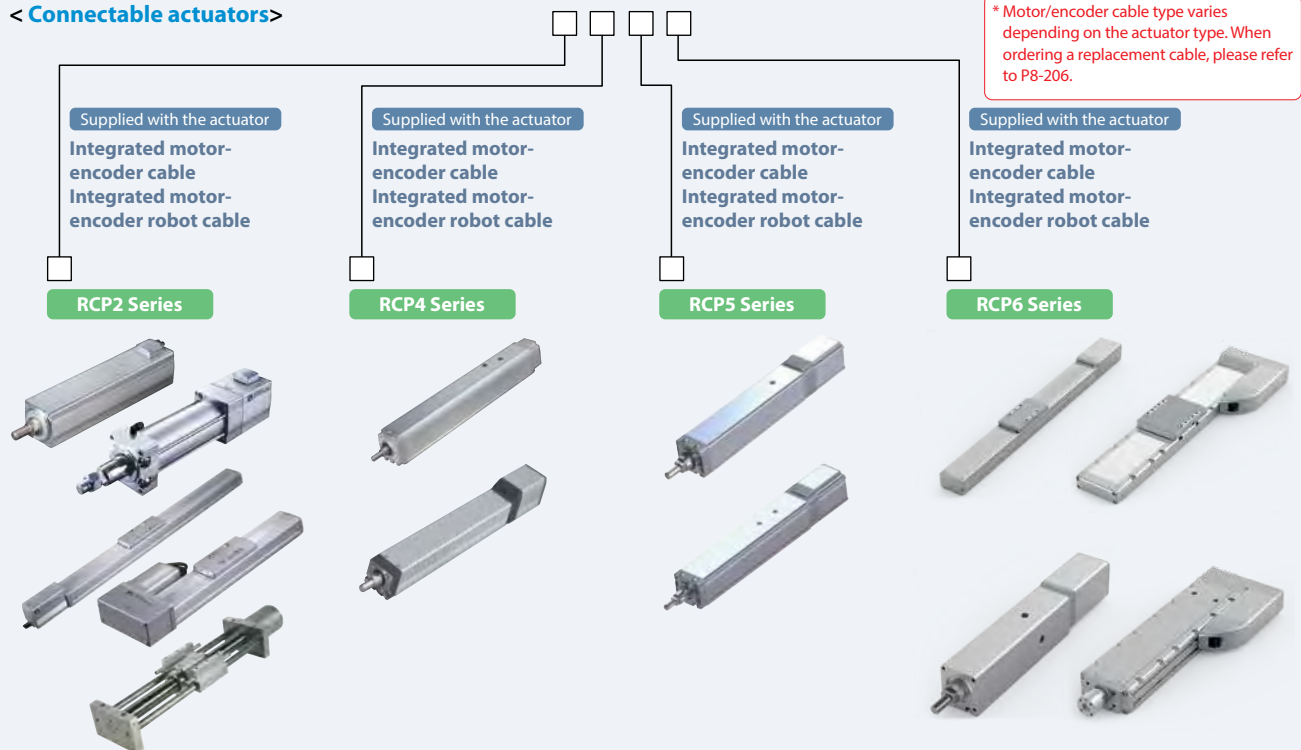
* Motor/encoder cable type varies depending on the actuator type. When ordering a replacement cable, please refer to P8-206.

System configuration

<PCON-CFB·CGFB>



<Connectable actuators>



Basic specifications

Item				Details	
				PCON-CB・CGB	PCON-CFB・CGFB
Number of controlled axes				1 axis	
Power supply voltage				24VDC±10%	
Load current (including controlside current consumption) (Note 1)	RCP2 RCP3	Motor type	20P, 28P, 28SP	1A max.	
			35P, 42P, 56P	2.2A max.	
			60P, 86P		6A max.
	RCP4 RCP5	Motor type	28P, 35P, 42P, 42SP, 56P	High-output setting disabled: 2.2A max. High-output setting enabled: 3.5A rated/4.2A max.	
			56SP, 60P, 86P		6A max.
	RCP6	Motor type	28P, 35P, 42P, 56P	High-output setting disabled: 2.2A max. High-output setting enabled: 3.5A rated/4.2A max.	
			56SP, 60P		6A max.
	Electromagnetic brake power (for actuator with brake)				24VDC ±10% 0.15A (max.)
Inrush current (Note 2)				8.3A	10A
Momentary power failure resistance				MAX.500μs	
Compatible encoder				High-resolution battery-less absolute encoder: Resolution 8,192 pulses/rev	
				Battery-less absolute encoder: Resolution 800 pulses/rev	
				Incremental encoder: Resolution 800 pulses/rev	
Actuator cable length				20m max.	
External interface		PIO specification		Dedicated 24VDC signal input/output (NPN/PNP selection) ... Input max. of 16 points, output max. of 16 points, cable length max. of 10m	
		Field network specification		DeviceNet, CC-Link, CC-Link IE, PROFIBUS-DP, CompoNet, MECHATROLINK I / II / III, EtherCAT, EtheNet/IP, PROFINET IO	
Data setting, input method				PC dedicated teaching software, Touch panel teaching pendant	
Data retention memory				Position data and parameters are saved in non-volatile memory. (No limit to rewrite)	
Operation mode				Positioner mode / pulse-train control mode (selectable by parameter setting)	
Number of positioner-mode positions				Up to 512 points for positioner type or up to 768 points for network type *The total number of positioning points varies depending on which PIO pattern is selected.	
Pulse-train interface		Input pulse		Differential type (line-driver type): 200kpps max., cable length up to 10m	
				Open-collector method: Not supported * If the host uses open-collector outputs, use AK-04 (optional, sold separately) to change them to differential outputs.	
		Command pulse magnification (Electronic gear: A/B)		1／50<A／B<50／1 Setting range of A and B (set by parameters): 1~4,096	
		Feedback pulse output		None	
Insulation resistance				Not less than 10M at 500VDC	
Electric shock protection mechanism				Class I, basic insulation	
Mass (Note 3)	Battery-less absolute specification / Incremental specification		Screw mounting type: Not more than 250g DIN rail mounting type: Not more than 285g	Screw mounting type: Not more than 270g DIN rail mounting type: Not more than 305g	
	Simple absolute specification (including 190g for battery)		Screw mounting type: Not more than 450g DIN rail mounting type: Not more than 485g		
Cooling method				Natural air cooling	Forced air cooling
Environment	Ambient operating temperature		0~40℃		
	Ambient operating humidity		5%RH - 85%RH (non-condensing, no frost)		
	Operating ambience		Free from corrosive gases		
	Degree of protection		IP20		

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

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

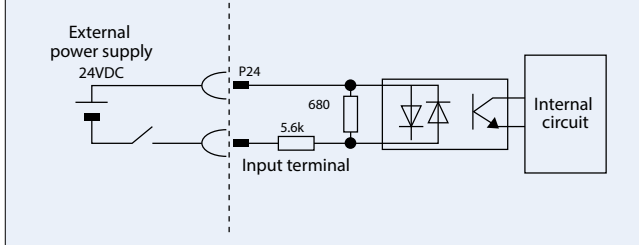
Note 3) 30g heavier for the field network specification.

PIO input/output circuit

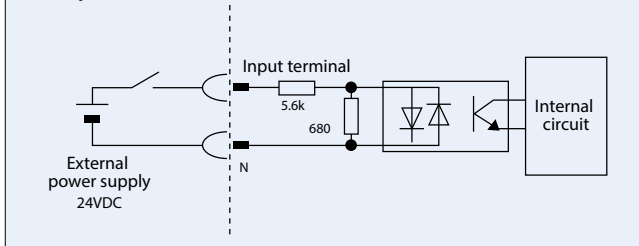
■ Input part External input specification

Item	Specification
Input voltage	24VDC $\pm 10\%$
Input current	5mA, 1 circuit
ON/OFF voltage	ON voltage Min. DC 18V OFF voltage Max. DC 6V

NPN specification



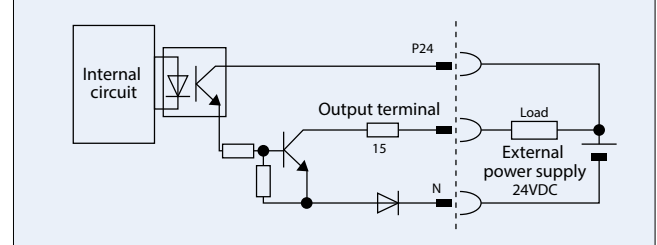
PNP specification



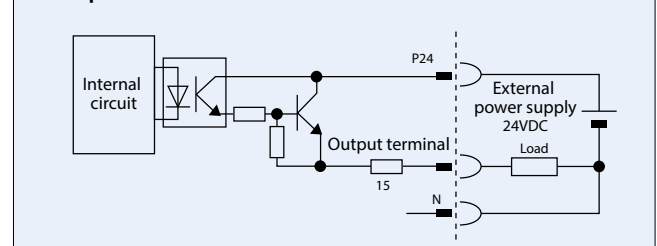
■ Output part External output specification

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

Legend:
○ : Available
× : Unavailable

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	—						
4A	input	—						
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(Note 2)
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, an asterisk * symbol accompanying each code indicates a negative logic signal. PM1~PM8 are alarm binary code output signals that are used when an alarm generates.

(Note 1) In all PIO patterns other than 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.

Description of I/O signal functions

Usable signals differ depending on the controller setting. Referring to the signal table, confirm available functions.

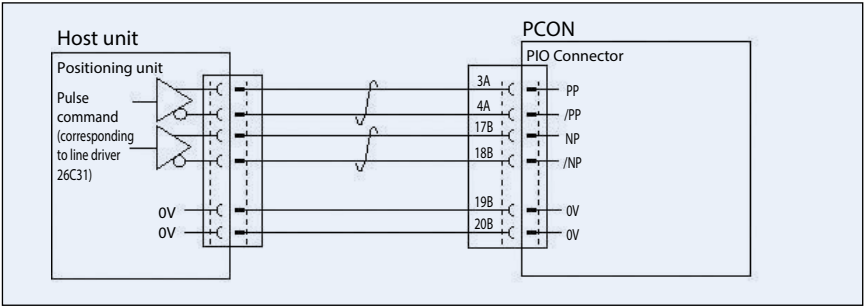
Category	Signal code	Signal name	Description of function
Input	CSTR	PTP strobe (start signal)	Start moving to the designated position of the command value.
	PC1~PC256	Command position No.	To enter the position No. (binary) of the desired position.
	BKRL	Forced brake release	Releases the brake forcibly
	RMOD	Switching operation mode	Enables the operation mode to be switched when the controller MODE switch is AUTO. (AUTO for signal OFF, MANU for signal ON)
	*STP	Temporary pause	Slows down to stop when this signal is OFF while moving. It resumes operation when the signal is ON while stopping with the rest of motions suspended.
	RES	Reset	Resets the alarm by an ON signal. Cancels the rest of motions by ON while temporarily stopping (*STP is OFF).
	SON	Servo ON	Servo is ON while the signal is ON, Servo is OFF while the signal is OFF.
	HOME	Home return	Performs Home return by an ON signal.
	MODE	Teach mode	Moves to the teach mode by an ON signal. The mode will not be switched over unless all of CSTR, JOG+ and JOG- are OFF and actuator is stopping.
	JISL	Jog/Inching switch	Performs jog motions by JOG+ and JOG- while this signal is OFF. Performs inching motions of JOG+ and JOG- when the signal is ON.
	JOG+ JOG-	Jog	Performs jog motions in the + (plus) direction for JOG+ signal ON edge detection and JOG- signal in the - (minus) direction when JISL is OFF. Slows down to stop when the OFF edge is detected while operating. It becomes an inching motion when the JISL signal is ON.
	PWRT	Writing of current position	In the teaching mode, the current position is written in the designated position when this signal is ON for more than 26ms with the writing position being designated.
	ST0~ST6	Start signal	Moves to the designated position when this signal is ON at the solenoid valve mode.
Output	PEND/INP	Positioning complete	This signal is ON when the positioning width range is reached after moving. PEND will not become OFF, even when the positioning width is exceeded. INP becomes OFF. PEND and INP can be changed by parameters.
	PM1~PM256	Complete position No.	Outputs the position number (binary output) that has reached after positioning is completed.
	HEND	Home return complete	This signal is ON when the home return is completed. This signal is kept ON unless the home position is not lost.
	ZONE1 ZONE2	Zone	This signal becomes ON when the actuator position is within the designated range of the parameter.
	PZONE	Position zone	This signal becomes ON while moving positions when the actuator current position is within the designated range specified by the position data. It can be used together with ZONE1. However, PZONE is enabled during operations with the selected position number only.
	RMDS	Output of operation mode	Outputs the status of operation mode. Turns ON when the controller is in manual mode.
	*ALM	Alarm	Turns ON when the controller is in a normal condition. Turns OFF when the alarm is activated.
	ALM1~ALM8	Alarm code	Outputs the alarm details in a binary code when an alarm is activated because the operation cancellation level is reached.
	MOVE	In motion	Turned ON when the actuator is in motion (including home return and push motion).
	SV	Servo ON	Turns ON when the servo is ON.
	*EMGS	Emergency stop output	Turns ON when the controller is in an emergency stop release condition, and turns OFF in the emergency stop condition. (regardless of the alarm)
	MODES	Teach mode output	Turns ON at the teach mode by a MODE signal input. Turns OFF in the normal mode.
	WEND	Writing complete	This signal turns OFF in the teach mode, and turns ON when writing is completed by the PWRT signal. When PWR signal turns OFF, this signal also turns OFF.
	PE0~PE6	Current position No.	Turns ON when travel to the target position is completed in the solenoid valve mode.
	LS0~LS2	Limit switch output	Turns ON when the actuator's current position is within the positioning width range (\pm) of the target position. In the Home return complete condition, this signal will be out e the travel command or in a servo OFF status.
	*ALML	Minor failure output	This signal is output when the message level alarm occurs .
	LOAD ^(Note 1)	Load output judgement status	This signal turns ON when the push current value exceeds the "threshold" set for the position data for a certain period of time within the push motion range and position data ranges of "ZONE+" and "ZONE-." It is used to judge whether or not press-fitting is performed normally. The signal also turns ON when a collision is detected (judgement) by the collision detection function.
	TRQS ^(Note 1)	Torque level status	This signal turns ON when the push current value exceeds the "threshold" set for the position data for a certain period of time (Note 3) within the push motion range. The signal turns OFF when the current value becomes below the "threshold." This is used to judge where or not press-fitting is performed normally. In the solenoid valve mode 2, when a motion is performed in the + direction by JOG+ before a home return, the motion becomes impossible due to an obstacle or the stroke end. In this case, the signal becomes ON when the motor current value exceeds the limit for home return current value.

* symbol accompanying each code indicates a negative logic signal. A negative logic signal is the signal that is processed when the input signal is turned OFF and the output signal is usually ON when the power is supplied and OFF when the signal is output.

Note 1: This is a signal dedicated to high thrust actuators (CFB type). It should be used as a guide output for other types of actuators.

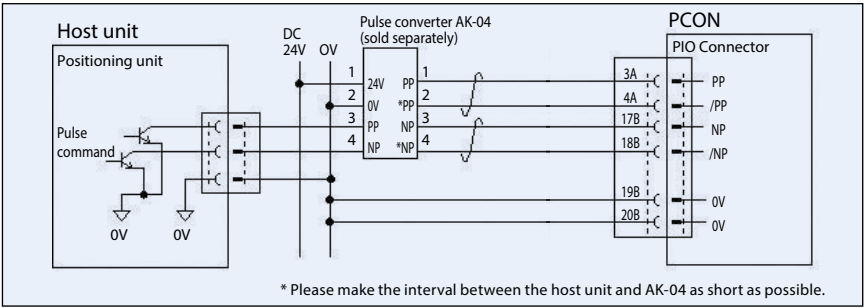
Pulse-train Control Circuit

■ Host Unit = Differential Type



■ Host Unit = Open Collector Type

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



* 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 canceled, 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 manual mode.
9B		OUT8	ALM1	Alarm code output signal	An alarm code is output when an alarm generates. For details, refer to the operation manual.
10B		OUT9	ALM2		
11B		OUT10	ALM4		
12B		OUT11	ALM8		
13B		OUT12	*ALML	Minor failure alarm	This signal turns ON when the controller is normal, and turns OFF when a message-level alarm has been generated.
14B		OUT13	REND*1	Reference position movement complete	This signal turns ON when movement to the reference point set in parameter No. 167 is completed. *1: Used only in PIO Pattern 7.
15B		OUT14	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
16B		OUT15	ZONE2	Zone signal 2	
17B	Pulse input		NP	Differential pulse-train input(+)	Differential pulses are input from the host. Up to 200kpps can be input.
18B			/NP	Differential pulse-train input(-)	
19B	0V		N	Power supply	I/O power supply 0V
20B	0V		N	Power supply	I/O power supply 0V

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

Field Network Specification: Explanation of Operation Modes (Except for MECHATROLINK-III)

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

Mode Description

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

Required Data Size for Each Network

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

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

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

Legend:
○ : Available
× : Unavailable

List of Functions by Operation Mode

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

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

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

External Dimensions

Controller

Models
not shown
hereModel
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

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

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

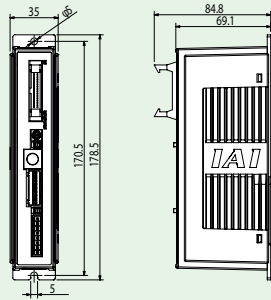
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Software

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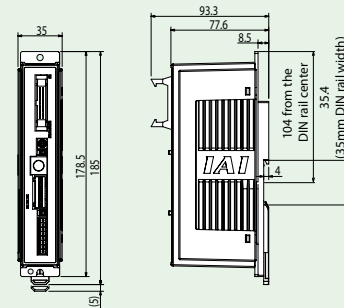
Battery-less Absolute/Incremental Specifications

Screw Mounting Spec.



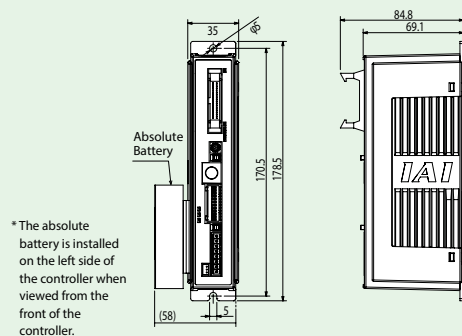
Battery-less Absolute/Incremental Specifications

DIN Rail Mounting Spec.



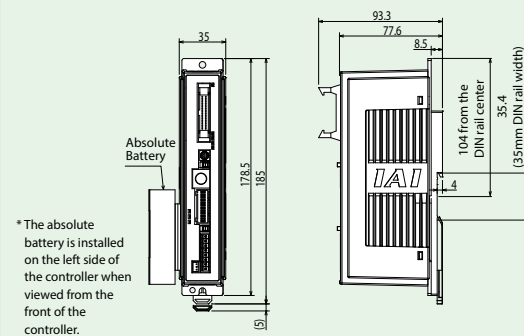
Simple Absolute Specification w/ Absolute Battery

Screw Mounting Spec.



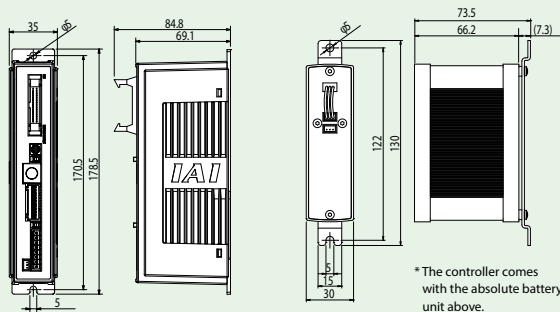
Simple Absolute Specification w/ Absolute Battery

DIN Rail Mounting Spec.



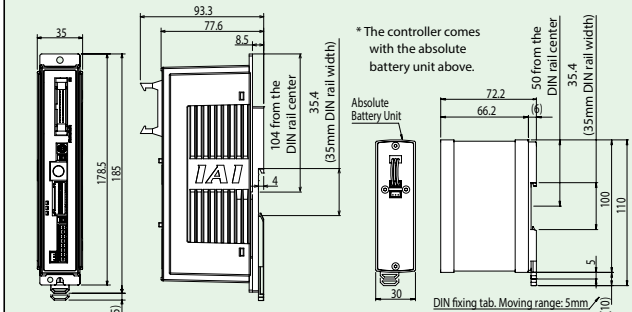
Simple Absolute Specification w/ Absolute Battery Unit

Screw Mounting Spec.



Simple Absolute Specification w/ Absolute Battery Unit

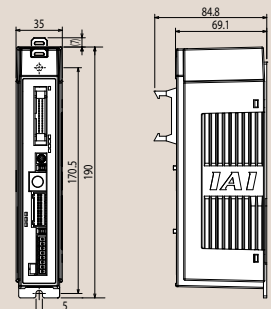
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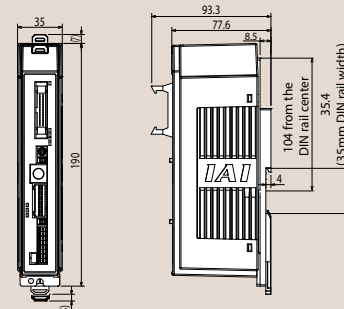
Battery-less Absolute/Incremental Specifications

Screw Mounting Spec.



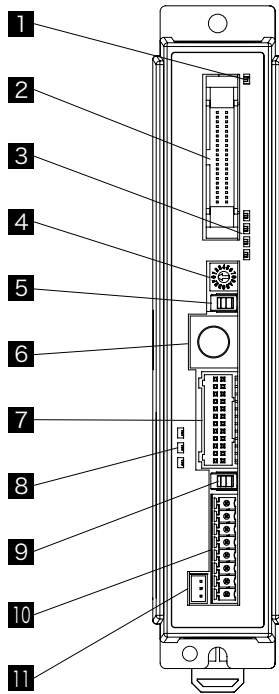
Battery-less Absolute/Incremental Specifications

DIN Rail Mounting Spec.



Names of parts

Controller



1 Controller indicator LED

Indicates the controller status.

○ : Light-on, X: Light-off, ☆ : Flashing

LED		Operating status
SV (green)	ALM (red)	
×	×	Control power OFF
		Servo OFF
×	○	Alarm (over operation cancel level)
		Motor power source OFF
		Emergency stop
○	×	Servo ON
☆	×	Automatic servo OFF
○(Orange)		Initialization after power ON

2 PIO connector / field network connector

Cable connector for parallel connection with the peripheral equipment such as PLC.

3 LED for current / alarm monitor

Cable connector for parallel connection with the peripheral equipment such as PLC.

LED	Operating condition				
STS3(green)	Status display * While servo ON: displays the present command current ratio (ratio to the rated current)				
	STATUS				Command current ratio
	3	2	1	0	
STS2(green)	ALM8	ALM4	ALM2	ALM1	Simple alarm code
	×	×	×	×	0.00%~6.24%
	×	×	×	○	6.25%~24.99%
STS1(green)	×	×	○	○	25.00%~49.99%
	×	○	○	○	50.00%~74.99%
STS0(green)	○	○	○	○	75.00%~100.00% or more

* During alarm activated: displays a simple alarm code.

4 Axis number setting switch

This switch sets the axis number when multi axes are operated by serial communication and in the case of gateway operations.

5 Operation mode setting switch

This switch is for interlock.

Name	Description
MANU	Not receives commands from PIO
AUTO	Receives commands from PIO

* When connected, the emergency stop switch of the touch panel teaching pendant is enabled regardless of AUTO/MANU.
When detaching the touch panel teaching pendant and SIO communication cables, turn off the power.

6 SIO connector

For the touch panel teaching pendant or connector for PC communications.

7 Motor-encoder connector

Connector to connect the actuator motor and encoder cable.

8 Absolute battery status indicator LED

Installed in the simple absolute specification (optional). Charging status and alarm activation, etc. are indicated.

○ : Light-on, X: Light-off

LED			Operation status
RDY (green)/ALM (red)	11 (green/red)	0 (green/orange/red)	
×	×	×	Control power OFF
○ (green)	○ (green)	○ (either color)	Absolute reset complete
○ (green)	○ (red)	○ (either color)	Absolute reset not complete
○ (red)	○ (red)	○ (either color)	Error activated
○ (either color)	○ (either color)	○ (green)	Battery fully charged
○ (either color)	○ (either color)	○ (orange)	Battery charging
○ (either color)	○ (either color)	○ (red)	Battery not connected

9 Brake release switch (BK RLS/NOM)

This switch releases the actuator brake forcibly.
BK RLS ... Brake forced release
NOM ... Normal operation (brake enabled)

10 Power connector

This connector supplies power and manages the input of the emergency stop status signal for the unit.

11 Absolute battery connector

Connects the supplied battery in case of the simple absolute spec (option).

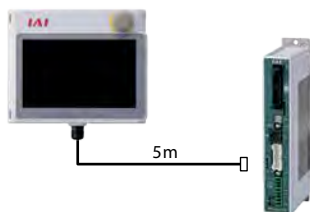
Option

Touch panel teaching pendant

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

■ **Model** TB-02(D)-□

■ **Configuration**



* To comply with the safety category, a TP adapter and a dummy plug are needed. Refer to P8-360 for details.

■ Specification

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

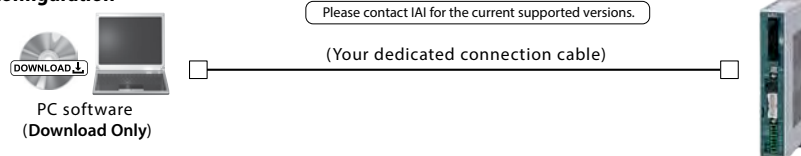
PC dedicated teaching software (Windows only)

■ **Features** This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

■ **Model** IA-OS (Software only, for customers who already own a dedicated connection cable)

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

■ **Configuration**



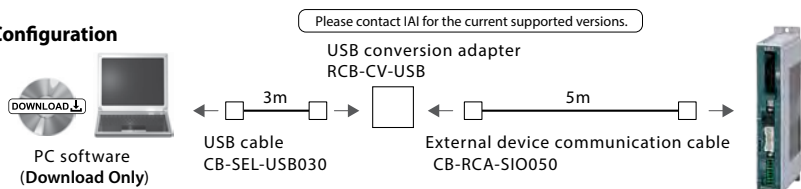
Supported Windows versions: 7/10



■ **Model** IA-OS-C (Software with an external device communication cable + USB conversion adapter + USB cable)

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

■ **Configuration**



Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

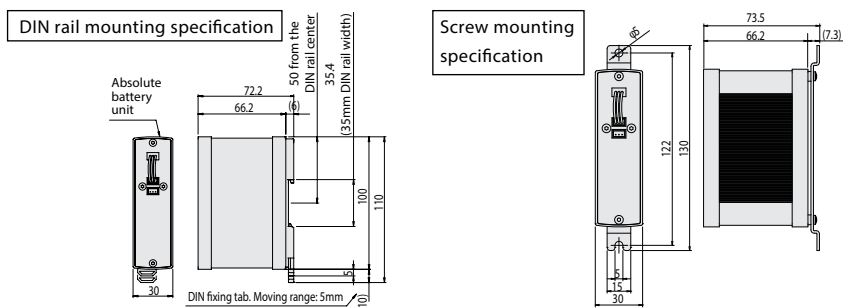
Maintenance parts

These parts are normally included in the controller. Please order individual parts if lost or need replacing.

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**



Fan for replacement

- Feature** Replacement fan for PCON-CFB/CGFB.
- Model** **PCON-FU**



Power connector

- Model** **FMC1.5/8-ST-3.5**



Network connector

for DeviceNet

- Model** **MSTB2.5/5-STF-5.08 AUM**



for CC-Link

Terminal resistor with 110Ω/130Ω

- Model** **MSTB2.5/5-STF-5.08 AU**

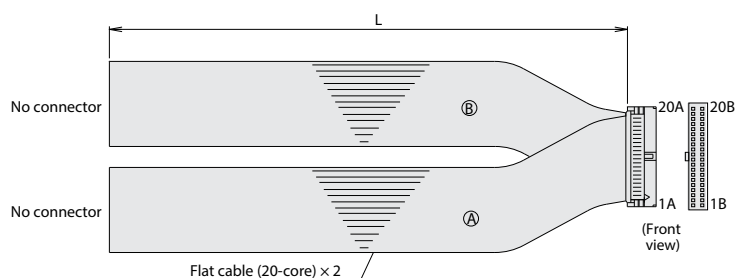


NPN/PNP specification PIO flat cable

* This cable is included in the actuator except when the I/O cable length of 0 (no cable) is selected.

Model **CB-PAC-PIO** ☐ ☐ ☐

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



HIF6-40D-1.27R(Hirose)

No.	Signal name	Cable color	Wiring	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	

Maintenance parts (cable)

These parts are normally included in each unit. Please order individual parts if lost or need replacing.
Refer to P1-89 for the details of cables.

Cable model search system is recommended!

URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>

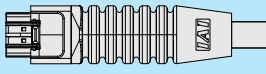
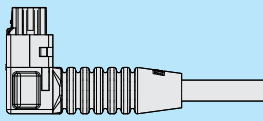


Table of Applicable Cables

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

*1 4-direction connector type can also be selected for the CB-CAN-MPA□□□(-RB) cable.

4-direction connector type

Standard connector type	4-direction connector type
	
CB-ADPC-MPA □□□ (-RB)	CB-ADPC2-MPA □□□ (-RB)

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

PCON-CBP

Special controller for pulse press



(*) CC-Link IE Field and MECHATROLINK-I/II connection specifications are not compliant with the CE marking.

Features

1 Supporting high-resolution battery-less absolute encoders

The pulse press specification actuator is equipped with a high-resolution battery-less absolute encoder. Because a battery is not needed to retain position data, space-saving of the controller is possible, contributing to cost reduction of the equipment.



2 Supporting force control using a load cell

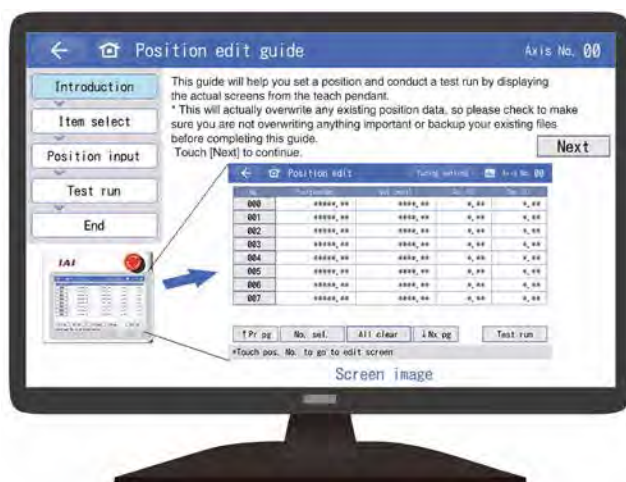
Present load value from the load cell can be monitored.

It supports both press-fitting and tensile directions, which can be switched over by specifying the position data easily.

3 Supporting display of target load in N units

It displays "Target Load (N)" after converted from the "Push Force (%)" of the position data. When the collision detecting function is disabled, "Threshold (%)" is also displayed in converted "N" value.

[PC compatible teaching software]




IA-OS: Position edit screen

[Teaching pendant]



TB-02: Position edit screen

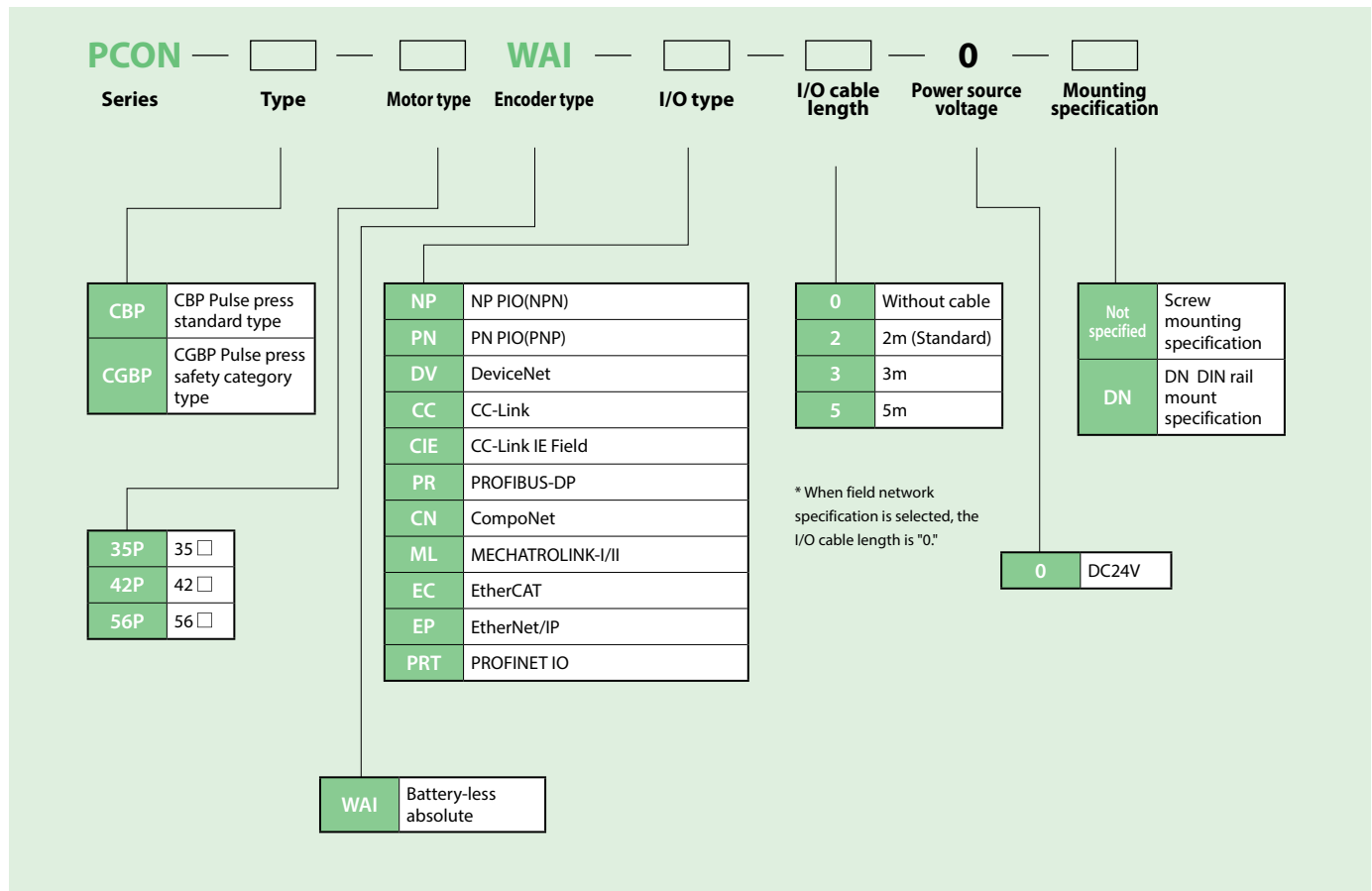
Table of models

Model	PCON-CBP/CGBP									
External view										
I/O type	Positioner type	Field network type								
		DeviceNet	CC-Link	CC-Link IE Field	PROFIBUS-DP	CompoNet	MECHATROLINK I/II*1	EtherCAT	EtherNet/IP	PROFINET IO
IO type code	NP/PN	DV	CC	CIE	PR	CN	ML	EC	EP	PRT
PCON-CBP/CGBP	○	○	○	○	○	○	○	○	○	○

*1: MECHATROLINK-I/II is treated as Intelligent I/O and supports only asynchronous communication commands.

Legend:
○ : Available

Model specification



Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

System configuration

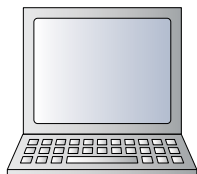
Controller

Option

PC dedicated teaching software

(See P8-215)
<Model: IA-OS>

Software only
Supplied dedicated connection cable
<Model: IA-OS-C>



Option

Touch panel teaching pendant

(See P8-215)
<Model: TB-02>

* Refer to our website for supporting versions.



5m

Dedicated connection cable



Field network

DeviceNet/CC-Link/PROFIBUS-DP/MECHATROLINK(I, II, III)
CompoNet/EtherCAT/EtherNet/IP/PROFINET IO

Supplied with any PIO spec. controller

PIO cable

(See P8-215)
<Model: CB-PAC-PIO020>
Standard: 2m



Option

24VDC power supply

(See P8-349)
<Model: PSA-24>



Controller

<Model: PCON-CBP/CGBP>

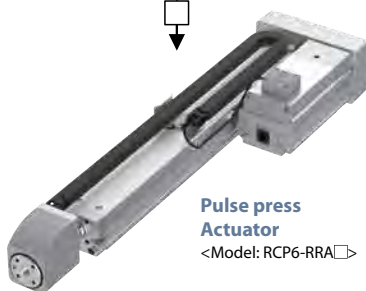
Supplied with actuator cable

Motor-encoder cable

Motor-encoder robot cable

Supplied when a cable length is specified at the actuator model.

See P8-216 for maintenance cables



Pulse press Actuator

<Model: RCP6-RRR>

Supplied with PCON-CGBP

Dummy plug

(See P8-215)
<Model: DP-5>



* To configure the system that complies with the safety category (ISO 13849-1), refer to P8-29.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

Specification list

Item		Details
		PCON-CBP/CGBP
Number of controlled axes		1 axis
Power supply voltage		DC24V±10%
Load current (including control side current consumption) (Note 1)		High-output setting disabled: 2.2A max. High-output setting enabled: 3.5A rated/4.2A max.
Electromagnetic brake power (for actuator with brake)		24VDC ±10% 0.15A (max.)
Inrush current (Note 2)		8.3A
Momentary power failure resistance		MAX.500μs
Compatible encoder		High-resolution battery-less absolute encoder: Resolution 8,192 pulses/rev
Actuator cable length		Max. 20m
External interface	PIO specification	DC24V dedicated signal input/output (NPN/PNP selectable) Input up to 16 points, Output up to 16 points, Cable length max. 10m
	Field network specification	DeviceNet,CC-Link,CC-Link IE,PROFIBUS-DP,CompoNet, MECHATROLINK- I / II,EtherCAT,EtherNet/IP,PROFINET IO
Data setting, input method		PC compatible teaching software, Touch panel teaching pendant
Data retention memory		Position data and parameters are saved in non-volatile memory. (No limit in writing)
Operating mode		Positioner mode
Number of positioner-mode positions		Up to 512 points for positioner type or up to 768 points for network type. *The total number of positioning points varies depending on which PIO pattern is selected.
Insulation resistance		DC500V, 10MΩ or higher
Electric shock protection mechanism		Class 1, basic insulation
Mass (Note 3)		Screw mounting type: Less than 250g, DIN rail mounting type: Less than 285g
Cooling method		Natural air cooling
Environment	Ambient operating temperature	0~40°C
	Ambient operating humidity	85%RH (non-condensing)
	Operating ambient	Free from corrosive gases
	Degree of protection	IP20

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

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

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

Models
not shown
hereModel
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

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

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

TB
-03/02

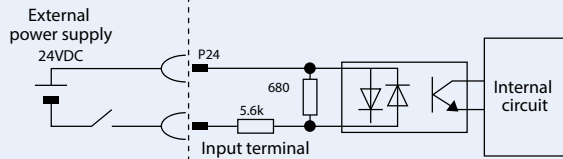
Software

PIO I/O Interface

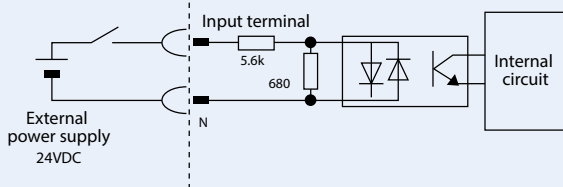
Input part External input specification

Item	Specification
Input voltage	24VDC $\pm 10\%$
Input current	5mA, 1 circuit
ON/OFF voltage	ON voltage Min. DC 18V OFF voltage Max. DC 6V

NPN specification



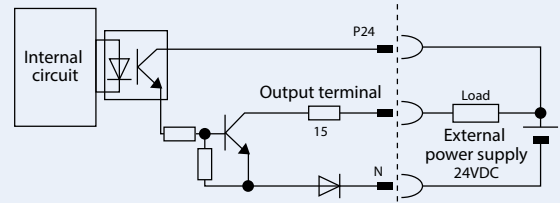
PNP specification



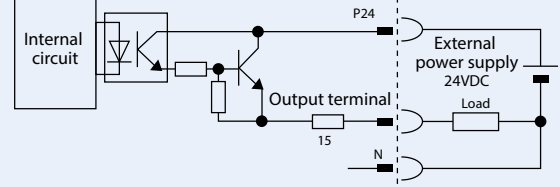
Output part External output specification

Item	Specification
Load voltage	24VDC
Max. load current	50mA, 1 circuit
Leak current	Max. 2mA/1 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 No. command: binary code 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 No. command: binary code Jog motion 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 No. command: binary code 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 code 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 No. command: individual No. signal ON Position zone signal output *2: 1 point
PIO Pattern 5	5	Solenoid valve mode 2 (3-point type)	<ul style="list-style-type: none"> Number of positioning points: 3 points Completion signal: LS (limit switch) or equivalent signals output is possible 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	6	Force control mode 1	<ul style="list-style-type: none"> Number of positions: 32 points Position zone signal output *2: 1 point 	<ul style="list-style-type: none"> Position No. command: binary code Load cell calibration command
PIO Pattern 7	7	Force control mode 2	<ul style="list-style-type: none"> Number of positions: 5 points Position zone signal output *2: 1 point 	<ul style="list-style-type: none"> Position No. command: individual No. signal ON Load cell calibration command

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

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

PIO patters and signal assignments

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

Legend:
○: Available
△: See note
x: Unavailable

Pin No.	Category	PIO function	Parameter No.25 "PIO pattern selection"							
			0	1	2	3	4	5	6	7
			Positioning mode	Teach mode	256 mode	512 mode	Solenoid valve mode 1	Solenoid valve mode 2	Force control mode 1	Force control mode 2
	Input	Number of positions	64 points	64 points	256 points	512 points	7 points	3 points	32 points	5 points
		Home return signal	○	○	○	○	○	x	○	○
		Jog signal	x	○	x	x	x	x	x	x
		Teaching signal (writing current positions)	x	○	x	x	x	x	x	x
		Brake release	○	x	○	○	○	○	○	○
	Output	Moving signal	○	○	x	x	x	x	x	x
		Zone signal	○	△ (Note 1)	△ (Note 1)	x	○	○	△ (Note 1)	△ (Note 1)
		Position zone signal	○	○	○	x	○	○	○	○
1A	24V	P24								
2A	24V	P24								
3A	—	—								
4A	—	—								
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0	PC1	ST0
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)	PC2	ST1
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (no function)	PC4	ST2
8A		IN3	PC8	PC8	PC8	PC8	ST3	—	PC8	ST3
9A		IN4	PC16	PC16	PC16	PC16	ST4	—	PC16	ST4
10A		IN5	PC32	PC32	PC32	PC32	ST5	—	—	—
11A		IN6	—	MODE	PC64	PC64	ST6	—	—	—
12A		IN7	—	JISL	PC128	PC128	—	—	—	—
13A		IN8	—	JOG+	—	PC256	—	—	CLBR	CLBR
14A		IN9	BKRL	JOG-	BKRL	BKRL	BKRL	BKRL	BKRL	BKRL
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD
16A		IN11	HOME	HOME	HOME	HOME	HOME	—	HOME	HOME
17A		IN12	*STP	*STP	*STP	*STP	*STP	—	*STP	*STP
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—	CSTR	—
19A		IN14	RES	RES	RES	RES	RES	RES	RES	RES
20A		IN15	SON	SON	SON	SON	SON	SON	SON	SON
1B	Output	OUT0	PM1 (ALM1)	PM1 (ALM1)	PM1 (ALM1)	PM1 (ALM1)	PE0	LSO	PM1	PE0
2B		OUT1	PM2 (ALM2)	PM2 (ALM2)	PM2 (ALM2)	PM2 (ALM2)	PE1	LS1 (TRQS)	PM2	PE1
3B		OUT2	PM4 (ALM4)	PM4 (ALM4)	PM4 (ALM4)	PM4 (ALM4)	PE2	LS2 (Note 2)	PM4	PE2
4B		OUT3	PM8 (ALM8)	PM8 (ALM8)	PM8 (ALM8)	PM8 (ALM8)	PE3	—	PM8	PE3
5B		OUT4	PM16	PM16	PM16	PM16	PE4	—	PM16	PE4
6B		OUT5	PM32	PM32	PM32	PM32	PE5	—	TRQS	TRQS
7B		OUT6	MOVE	MOVE	PM64	PM64	PE6	—	LOAD	LOAD
8B		OUT7	ZONE1	MODES	PM128	PM128	ZONE1	ZONE1	CEND	CEND
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1
10B		OUT9	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS	RMDS
11B		OUT10	HEND	HEND	HEND	HEND	HEND	HEND	HEND	HEND
12B		OUT11	PEND	PEND/WEND	PEND	PEND	PEND	—	PEND	PEND
13B		OUT12	SV	SV	SV	SV	SV	SV	SV	SV
14B		OUT13	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS	*EMGS
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM
16B		OUT15	LOAD/TRQS *ALML	*ALML	LOAD/TRQS *ALML	LOAD/TRQS *ALML	LOAD/TRQS *ALML	*ALML	*ALML	*ALML
17B	—	—								
18B	—	—								
19B	0V	N								
20B	0V	N								

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

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

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

(Reference) Negative logic signal

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

Field network specifications: Explanation of operation modes

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

Model description

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

Required Data Size for Each Network

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

(Note 1) Beware that MECHATROLINK does not support the full direct value mode.

Legend:
○: Available
△: See note
×: Unavailable

List of Functions by Operation Mode

Mode	Remote I/O mode	Position/Simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2	Position/Simple direct value mode 2	Half direct mode 2	Remote I/O mode 3
Number of positioning points	512	768	Unlimited	Unlimited	512	768	Unlimited	512
Operation by direct position data input	×	○	○	○	×	○	○	×
Direct speed/acceleration input	×	×	○	○	×	×	○	×
Push-motion operation	○	○	○	○	○	○	○	○
Current position read	×	○	○	○	○	○	○	○
Current speed read	×	×	○	○	×	×	○	×
Operation by position number input	○	○	×	×	○	○	×	○
Completed position number read	○	○	×	×	○	○	×	○
Forced control	△ (Note 2)	×	×	○	△ (Note 2)	○	○	△ (Note 2)
Current load data read	×	×	×	○	×	○	○	○

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

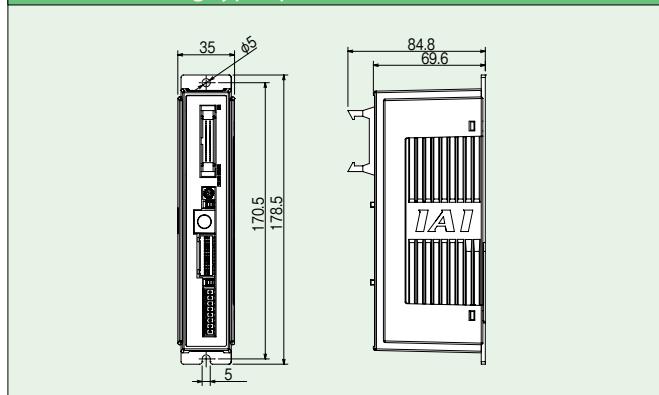
(Note 2) Available when PIO pattern is set to 6 or 7.

External dimensions

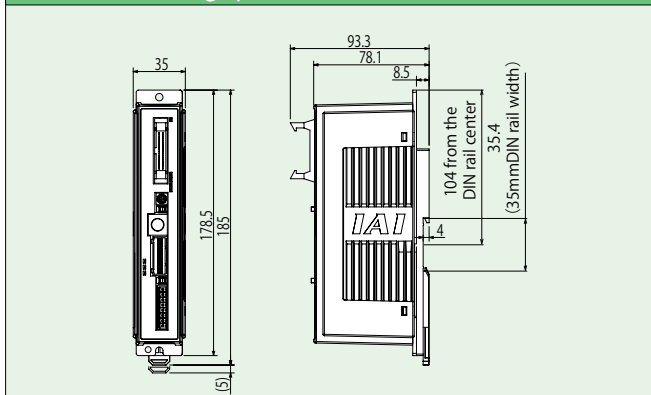
<PCON-CBP/CGBP>

CAD drawings can be downloaded from our website.
www.intelligentactuator.com2D
CAD3D
CAD

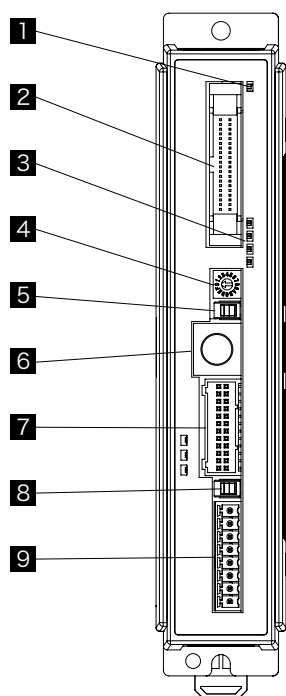
Screw mounting type specification



DIN rail mounting specification



Part names



1 Controller indicator LED

Indicates the controller status.

○ : Light-on, X: Light-off, ☆ : Flashing

LED		Operating status
SV (green)	ALM (red)	
X	X	Control power OFF
		Servo OFF
X	○	Alarm (over operation cancel level)
		Motor power source OFF
		Emergency stop
○	X	Servo ON
☆	X	Automatic servo OFF
○(Orange)		Initialization after power ON

2 PIO connector / field network connector

Cable connector for parallel connection with the peripheral equipment such as PLC.

3 LED for current / alarm monitor

Cable connector for parallel connection with the peripheral equipment such as PLC.

LED	Operating condition				
STS3(green)	Status display * While servo ON: displays the present command current ratio (ratio to the rated current)				
	STATUS				Command current ratio
	3	2	1	0	
STS2(green)	ALM8	ALM4	ALM2	ALM1	Simple alarm code
	X	X	X	X	0.00%~6.24%
	X	X	X	○	6.25%~24.99%
STS1(green)	X	X	○	○	25.00%~49.99%
	X	○	○	○	50.00%~74.99%
STS0(green)	○	○	○	○	75.00%~100.00% or more

* During alarm activated: displays a simple alarm code.

4 Axis number setting switch

This switch sets the axis number when multi axes are operated by serial communication and in the case of gateway operations.

5 Operation mode setting switch

This switch is for interlock.

Name	Description
MANU	Not receives commands from PIO
AUTO	Receives commands from PIO

* When connected, the emergency stop switch of the touch panel teaching pendant is enabled regardless of AUTO/MANU.
When detaching the touch panel teaching pendant and SIO communication cables, turn off the power.

6 SIO connector

For the touch panel teaching pendant or connector for PC communications.

7 Motor-encoder connector

Connector to connect the actuator motor and encoder cable.

8 Brake release switch (BK RLS/NOM)

This switch releases the actuator brake forcibly.
BK RLS ... Brake forced release
NOM ... Normal operation (brake enabled)

9 Power connector

This connector supplies power to each unit and for input of the emergency stop status signal.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

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

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/Q

XSEL (SCARA)

PSA-24

TB
-03/02

Software

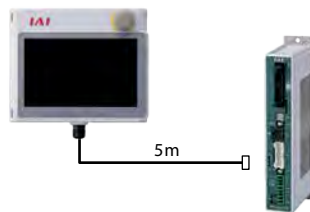
Option

Touch panel teaching pendant

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

■ **Model** TB-02(D)-□

■ **Configuration**



* To comply with the safety category, a TP adapter and a dummy plug are needed. Refer to P8-360 for details.

Specifications

Rated voltage	24VDC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Environmental resistance	IP20
Weight	470g (TB-02 unit only)

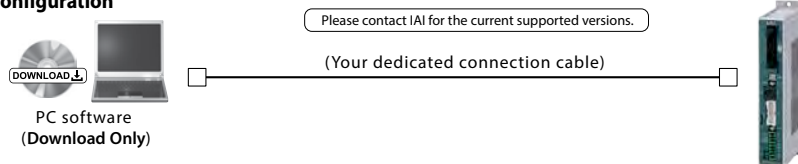
PC dedicated teaching software (Windows only)

■ **Features** This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

■ **Model** IA-OS (Software only, for customers who already own a dedicated connection cable)

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

■ **Configuration**



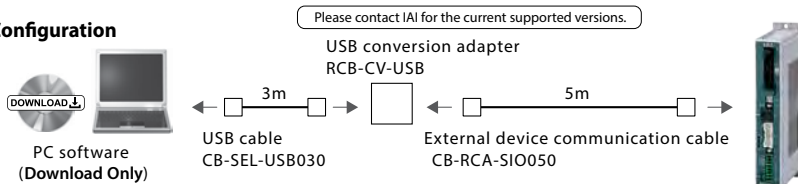
Supported Windows versions: 7/10



■ **Model** IA-OS-C (Software with an external device communication cable + USB conversion adapter)

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

■ **Configuration**



Maintenance parts

These parts are normally included in the controller. Please order individual parts if lost or need replacing.

Power connector

■ **Model** FMC1.5/8-ST-3.5



Dummy plug

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

■ **Model** DP-5



Network connector

for DeviceNet

■ **Model** MSTB2.5/5-STF-5.08 AUM



for CC-Link
Terminal resistor with 110Ω/130Ω

■ **Model** MSTB2.5/5-STF-5.08 AU

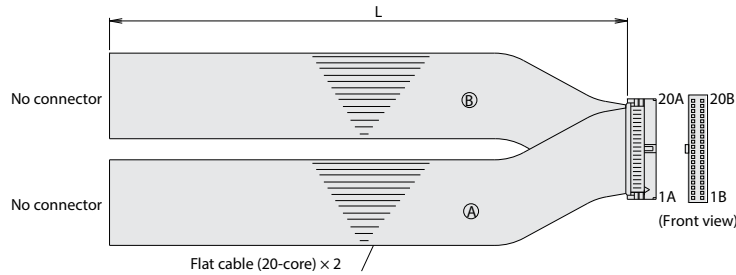


NPN/PNP specification PIO flat cable

* This cable is included in the actuator except when the I/O cable length of o (no cable) is selected.

Model **CB-PAC-PIO**□□□

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



HIF6-40D-1. 27R(Hirose)

No.	Signal	Color	Wiring	No.	Signal	Color	Wiring
1A	24V	Brown-1	Flat cable (A) (pressure-welded)	1B	OUT0	Brown-3	Flat cable (B) (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	

Maintenance parts (cable)

These parts are normally included in each unit. Please order individual parts if lost or need replacing.
Refer to P1-89 for the details of cables.

Table of Applicable Cables

Mode code	Motor-encoder cable	Motor-encoder robot cable
RCP6-RRR □ R-LCT	CB-CAN-MPA □□□ *1	CB-CAN-MPA □□□ -RB *1

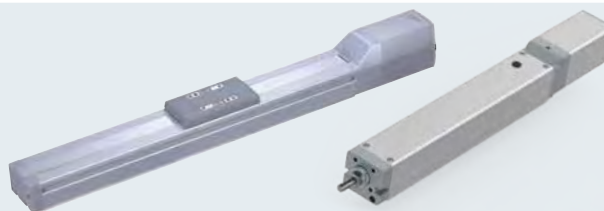
*1 4-direction connector type can also be selected.

4-direction connector type

Standard connector type	4-direction connector type
CB-ADPC-MPA □□□ (-RB)	CB-ADPC2-MPA □□□ (-RB)

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

2 Power CON® type

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

3 Equipped with Smart tuning function

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

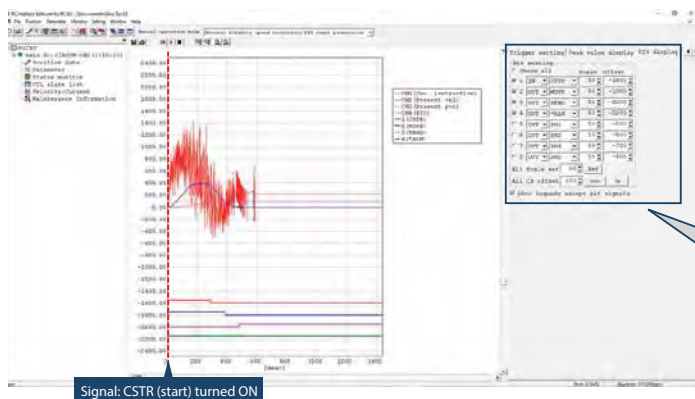
4 Enhanced Monitor Functions

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

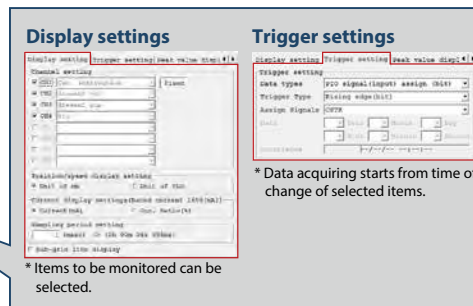
*Information that can be displayed: Command current value, current speed/position, and PIO signals (start, positioning completion, alarm, etc.)

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

Monitor function screen (example)



Signal: CSTR (start) turned ON



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

* Items to be monitored can be selected.

5 Low price


By limiting the functionality to frequently used functions, we have achieved a low price.

Legend:
○: Available
×: Unavailable

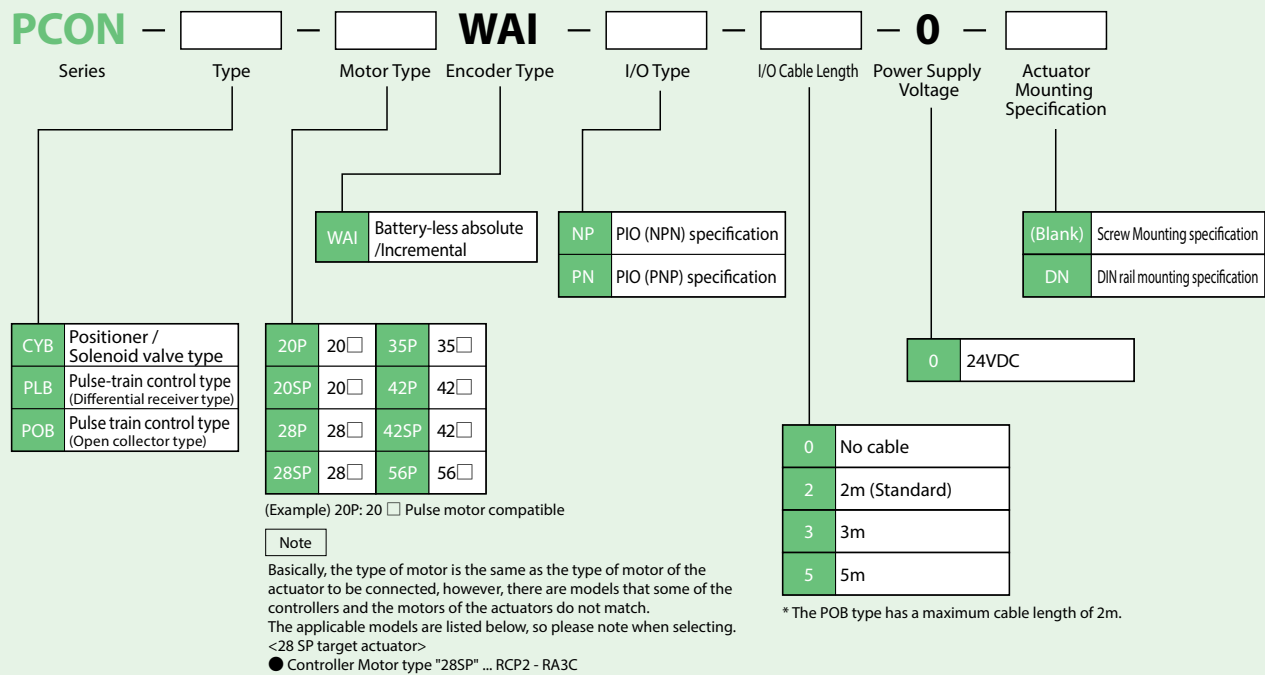
	Product model	PowerCon (High output driver)	High resolution battery-less absolute	Simple absolute	Calendar function	Maintenance function	I/O point	Positioning point	Field network
PCON	CYB/PLB/POB	○	○	×	×	○	Non insulated 8IN/8OUT	Standard 16 points Max. 64 points	×
	CB	○	○	○	○	○	Insulated 16IN/16OUT	Standard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

List of models/price

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

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

Model number



Controller

Models not shown here
Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB (Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL (SCARA)

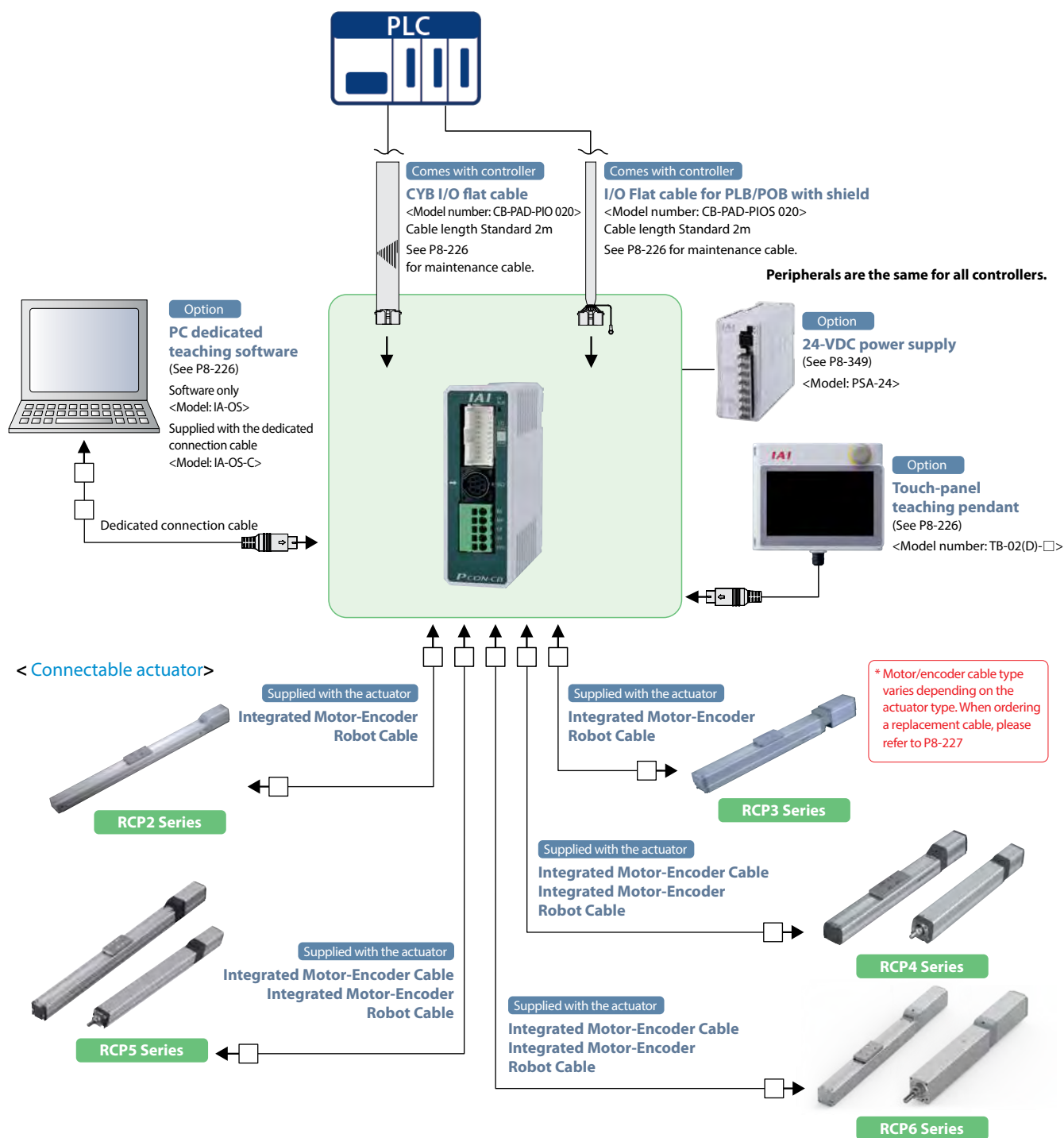
PSA-24

TB
-03/02

Software

System configuration

Controller



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	5%RH - 85%RH (non-condensing, no frost)		
Operating ambience	Not exposed to corrosive gases		
Degree of protection	IP20		
Mass	250g (DIN rail mounting specification 285g)		

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	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 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	Serial communication (Modbus) Refer to operation manual
		Position zone signal	△(Note 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	
5	Input	IN0	PC1	ST0	ST0	ST0	ST0	Any signal other than the command position No.,CSTR can be selected in the input.	
6		IN1	PC2	ST1	ST1 (JOG+)(Note 2)	-	ST1(-)(Note 2)		
7		IN2	PC4	ST2	ST2(-)	-	ASTR		
8		IN3	PC8	ST3	-	-	-		
9		IN4	HOME	ST4	SON	SON	SON		
10		IN5	*STP	ST5	-	*STP	*STP		
11		IN6	CSTR	ST6	-	-	-		
12	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(Note 2)	LS0/PE0(Note 3)		
14		OUT1	PM2(ALM2)	PE1	LS1(TRQS)(Note 2)	LS1/PE1 (Note 2)	LS1/PE1 (Note 3)		
15		OUT2	PM4(ALM4)	PE2	LS2(-)(Note 2)	PSFL	PSFL		
16		OUT3	PM8(ALM8)	PE3	HEND	HEND	HEND		
17		OUT4	HEND	PE4	SV	SV	SV		
18		OUT5	PZONE/ZONE1	PE5	PZONE/ZONE1	PZONE/ZONE1	PZONE/ZONE1		
19		OUT6	PEND	PE6	*ALML	*ALML	*ALML		
20		OUT7	*ALM	*ALM	*ALM	*ALM	*ALM		

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

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

(Note 2) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)

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

Legend:
×: Unavailable
△: Please see note

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 the 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 is generated..
	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 is generated. (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 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

Legend:
○: Available
×: Unavailable

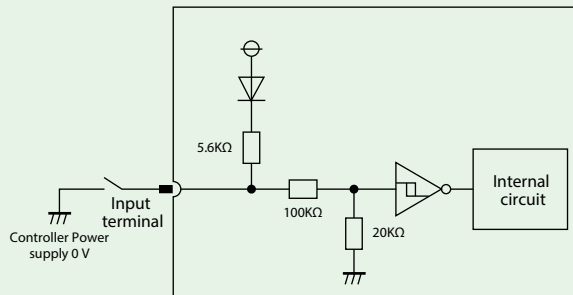
Model	CYB	PLB / POB	Summary
Name	Positioner / Solenoid valve type	Pulse-train control type	
Positioner mode	○	×	It is the basic operation mode that operates by specifying the position number and inputting the start signal.
Solenoid valve mode	○	×	It is possible to move just by turning ON/OFF the position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

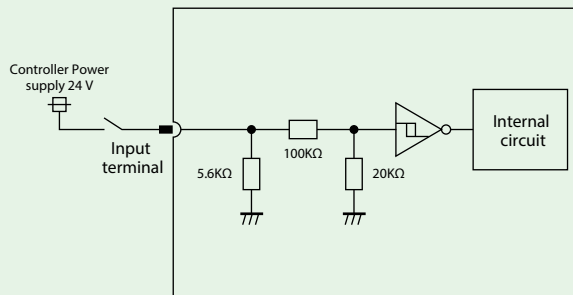
Input Part External Input Specifications

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



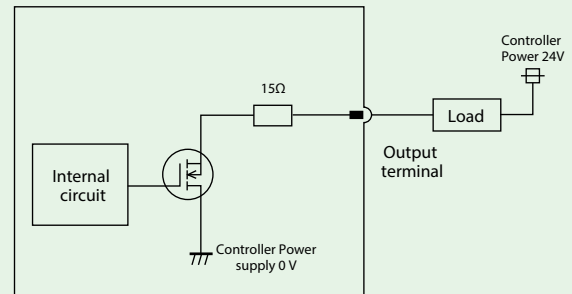
PNP Specification



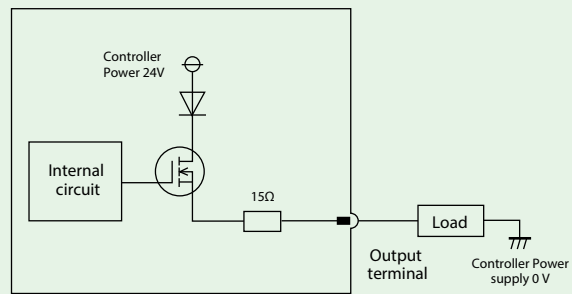
Output Part External Output Specifications

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



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	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 (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.
Output	RSTR	Reference position move command	Move to the position set to parameter No. 167 when signal turns ON. (PIO pattern 1 only)
	PWR	System ready	This signal turns ON when the controller becomes ready after the main power has been turned on.
	SV	Servo ON status	This signal turns ON when the servo is ON.
	INP	Positioning complete	This signal turns ON when the amount of remaining travel pulses in the deviation counter falls within the in-position band.
	HEND	Home return complete	This signal turns ON upon completion of home return.
	TLR	Torque limited	This signal turns ON upon reaching the torque limit while the torque is limited.
	ZONE1	Zone signal 1	This signal turns ON when the current position of the actuator falls within the parameter-set range.
	*ALML	Minor failure alarm	This signal is ON in normal conditions and turns OFF when a message-level alarm is generated. (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 is generated..

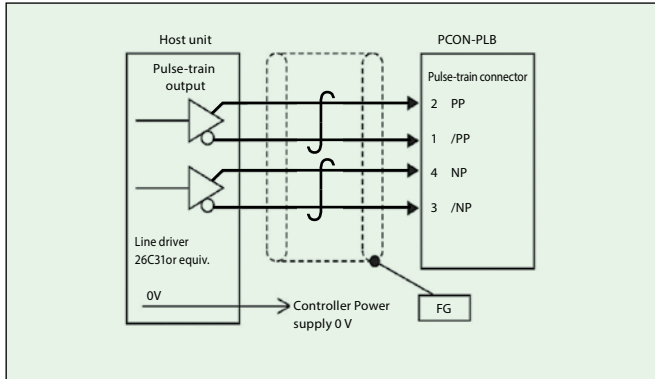
(Note) The above signals marked with (*) are normally ON and turn OFF at operation.

Pulse-train input circuit

Differential line driver

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

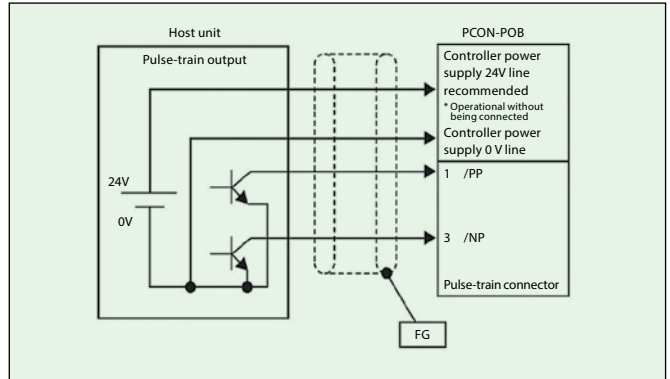
*The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



Open collector

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

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



Command pulse-train pattern

Command pulse-train pattern		Input terminal	Forward	Reverse
Reverse logic	Forward pulse-train	PP · /PP		
	Reverse pulse-train	NP · /NP		
	A forward pulse-train indicates the amount of motor rotation in the forward direction, while a reverse pulse-train indicates the amount of motor rotation in the reverse direction.			
	Pulse-train	PP · /PP		
	Sign	NP · /NP	Low	High
	The command pulses indicate the amount of motor rotation, while the sign indicates the rotating direction.			
Reverse logic	Phase A/B pulse-train	PP · /PP		
	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		
	Pulse-train	PP · /PP		
Reverse logic	Sign	NP · /NP	High	Low
	Phase A/B pulse-train	PP · /PP		
	Phase A/B pulse-train	NP · /NP		

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

RCP5 · RCP4 · RCP3 · RCP2 ... 800 pulse

RCP6 ... 8192 pulse

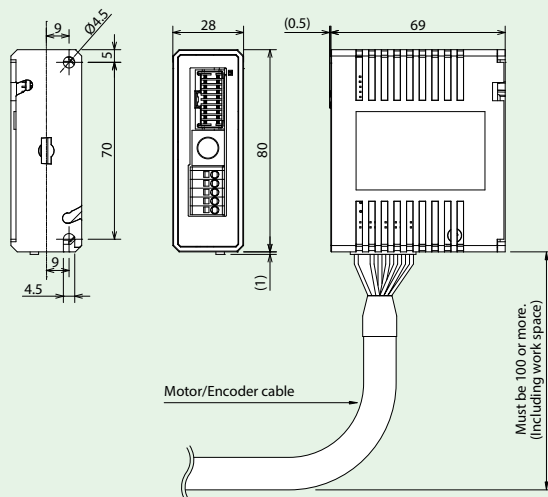
External dimensions

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

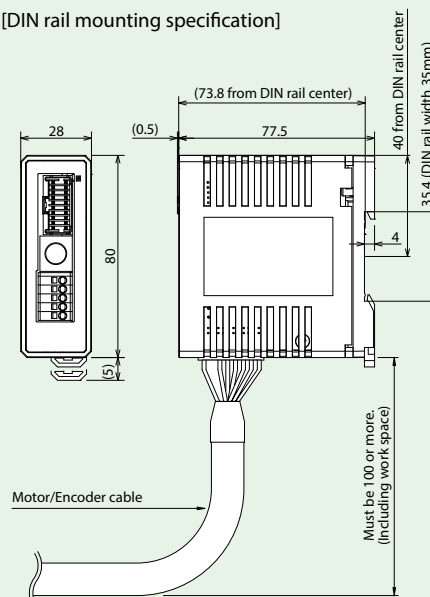
2D
CAD

3D
CAD

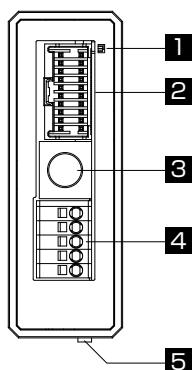
[Screw mounting specification]



[DIN rail mounting specification]



Names of each part



1 Controller status display LED

Displays the operation status of the controller.

○: ON ×: OFF ☆: Blinking

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

2 PIO connector

Connector for input/output signal connection for control.

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

3 SIO connector (SIO)

Connector for communication cable connection of teaching tool.

4 Power connector

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

5 Motor encoder connector

Connector for the actuator's motor and encoder cable.

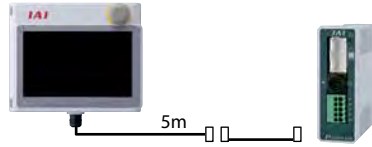
Option

Touch panel teaching box

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

■ **Model** **TB-02(D)**-□

■ **Configuration**



■ Specification

Rated voltage	24VDC
Power consumption	3.6 W or less (150 mA or less)
Ambient operating temperature	0 ~ 40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Degree of protection	IP20
Weight	470g (TB-02 only)

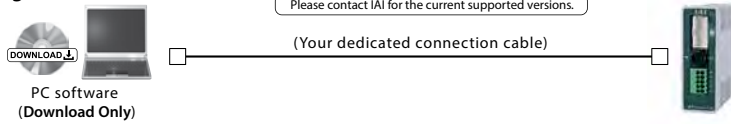
PC dedicated teaching software (Windows only)

■ **Features** This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

■ **Model** **IA-OS** (Software only, for customers who already own a dedicated connection cable)

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

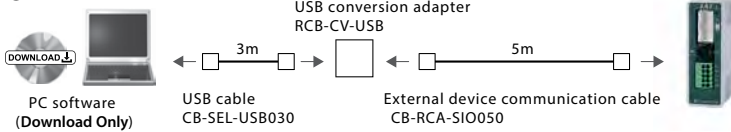
■ **Configuration**



■ **Model** **IA-OS-C** (Software with an external device communication cable + USB conversion adapter + USB cable)

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

■ **Configuration**



Supported Windows versions: 7/10



Maintenance parts (cable)

These parts are normally included in the controller. Please order individual parts if lost or need replacing.

NPN/PNP specification PIO flat cable

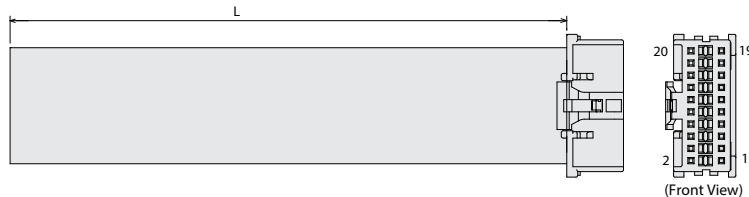
* This cable is included in the actuator except when the I/O cable length of 0 (no cable) is selected.

PCON-CYB CB-PAD-PIO□□□

PCON-PLB/POB CB-PAD-PIOS□□□

Model **CB-PAD-PIO** □□□

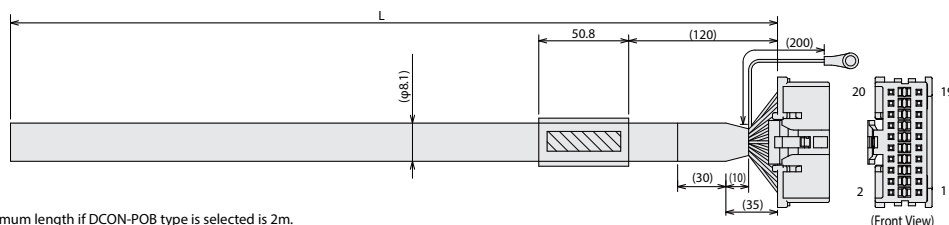
* Please indicate the cable length (L) in □□□, maximum 10m, e.g.) 080 = 8m



51353-2000(MOLEX)			
No.	Signal	Cable color	Wiring
1	—	Brown-1	Flat cable AWG28
2	—	Red-1	
3	—	Orange-1	
4	—	Yellow-1	
5	IN0	Green-1	
6	IN1	Blue-1	
7	IN2	Purple-1	
8	IN3	Gray-1	
9	IN4	White-1	
10	IN5	Black-1	
11	IN6	Brown-2	Flat cable AWG28
12	IN7	Red-2	
13	OUT0	Orange-2	
14	OUT1	Yellow-2	
15	OUT2	Green-2	
16	OUT3	Blue-2	
17	OUT4	Purple-2	
18	OUT5	Gray-2	
19	OUT6	White-2	
20	OUT7	Black-2	

Model **CB-PAD-PIOS** □□□

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



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

51353-2000(MOLEX)			
No.	Signal	Cable color	Wiring
1	IN0	Orange/Red	0.5-5(JST) Green AWG22
2	PP	Orange/Black	
3	IN5	Gray/Red	
4	INP	White/Red	
5	IN0	White/Black	
6	IN1	White/Black	
7	IN2	Yellow/Red	
8	IN3	Yellow/Black	
9	IN4	Pink/Red	
10	IN5	Pink/Black	
11	IN6	Orange/Red	0.2sq
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	

Controller
Models not shown here
Model selection
RCON
RSEL
REC
RSEL (Cartesian 6-axis)
RCP6S
PCON -CB/CFB
PCON -CBP (Pulse press)
PCON
ACON-CB DCON-CB
ACON DCON
SCON -CB
SCON -CB (Servo press)
SSEL
MSEL
XSEL -RA/SA
XSEL -P/Q
XSEL (SCARA)
PSA-24
TB -03/02
Software

Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.
Refer to P1-89 for the details of cables.

Cable model search system is recommended!
URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>

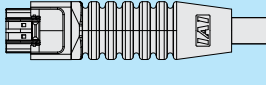
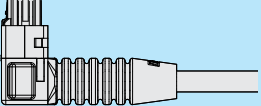


Table of Applicable Cables

Model Number			Integrated Motor-encoder cable	Integrated Motor-encoder Robot Cable
①	RCP6/RCP6CR/RCP6W/RCP5/RCP5CR/RCP5W		CB-CAN-MPA □□□ *1	CB-CAN-MPA □□□ -RB *1
②	RCP4	SA3/RA3/GR/ST		
③	RCP4/RCP4CR/RCP4W (Models other than ②)		CB-CA-MPA □□□	CB-CA-MPA □□□ -RB
④	RCP3		-	CB-APSEP-MPA □□□
⑤	RCP2	GR5S/GRLS/GRST/GRHM/GRHB/SRA4R/ SRG54R/SRGD4R		
⑥		RTBS/RTBSL RTCS/RTCSL	-	CB-RPSEP-MPA □□□
⑦	RCP2CR RCP2W	GR5/GRM GR35S/GR3SM	CB-CAN-MPA □□□ *1	CB-CAN-MPA □□□ -RB *1
⑧		RTBS/RTBSL RTCS/RTCSL/RTB/RTBL/RTC/RTCL/RTBB/ RTBBL/RTCB/RTCBL		
⑨	RCP2 (Models other than ⑤ ~ ⑧)		-	CB-PSEP-MPA □□□

*1 4-direction connector type can also be selected.

4-direction connector type

Standard connector type	4-direction connector type
	
CB-ADPC-MPA □□□ (-RB)	CB-ADPC2-MPA □□□ (-RB)

MEMO

Controller

Models
not shown
here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

ACON-CB

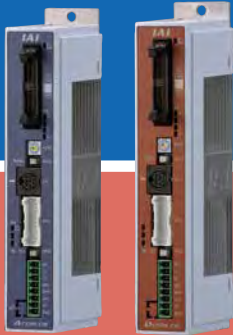
Position Controller for RCA/RCA2

CE^(*) RoHS 10 C-PA US

DCON-CB

Position Controller for RCD

CE^(*) RoHS 10 C-PA US



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

Features

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

RCA equipped with a battery-less absolute encoder is supported. Since no battery is needed to retain position data, less space is required in the control panel, which in turn leads to lower both initial and maintenance costs of your equipment.



2 Compatible with Many Major Field Networks

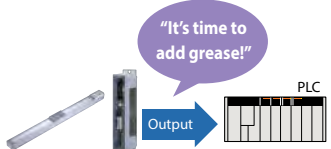
Compatible with DeviceNet, CC-Link, CC-Link IE Field, PROFIBUS-DP, PROFINET IO, CompoNet, MECHATROLINK, EtherCAT and EtherNet/IP. Field network connection allows for less-wiring, direct numerical commands, position number commands, current position reading, and more.



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

The total distance traveled by the actuator is calculated and recorded in the controller. If the preset distance is exceeded, a signal is output from the controller. This function can be used to check when to add grease or perform the next periodic inspection.

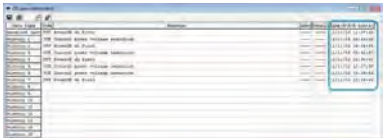
<Maintenance information>



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

4 The Calendar Function Can Retain Alarm Timestamps

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



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

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

Models
not shown
here

Model selection

RCON

DCEI

(Cartesian
6-axis)

RCP6S

PCON
CB/CERPCON
CDB

DCON-CB

DCON

SCON
CB

SCON
CB

-RA/SA

XSEL
B/O

XSEL

-03/02

Software

DCON — — — — —

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

Series: CB (Standard), CGB (Safety category compliant type)

Type: 3 (3W)

Motor Type: I (Incremental)

Encoder 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)

I/O Type: 0 (No cable), 2 (2m), 3 (3m), 5 (5m)

I/O Cable Length: 0 (24VDC)

Controller Mounting Specification: (Blank) (Screw Mounting specification), DN (DIN rail mounting specification)

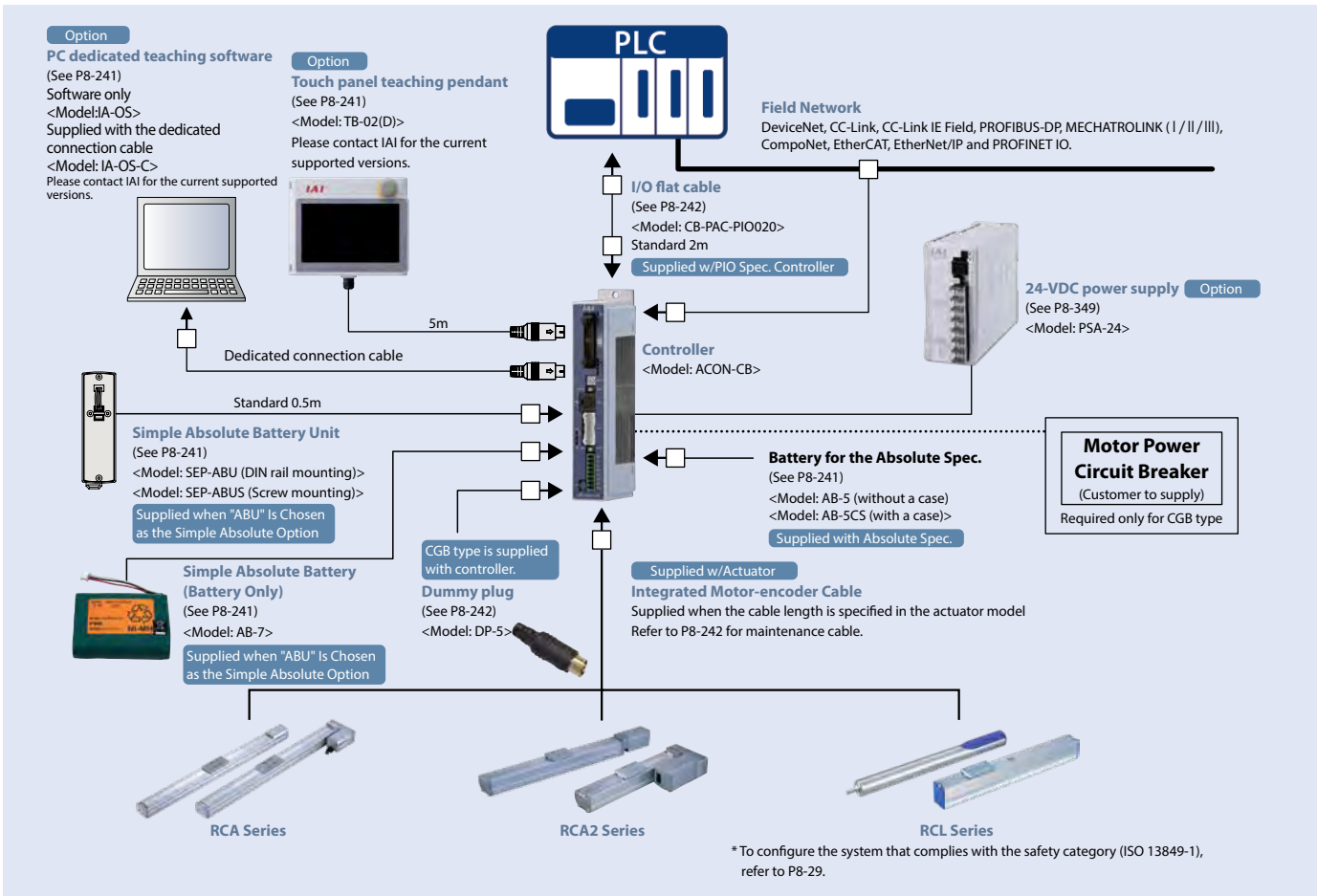
* If you choose a field network specification, the length of I/O cable will be "0"

(Note 1) Please be sure to check P8-18 for the caution when selecting.

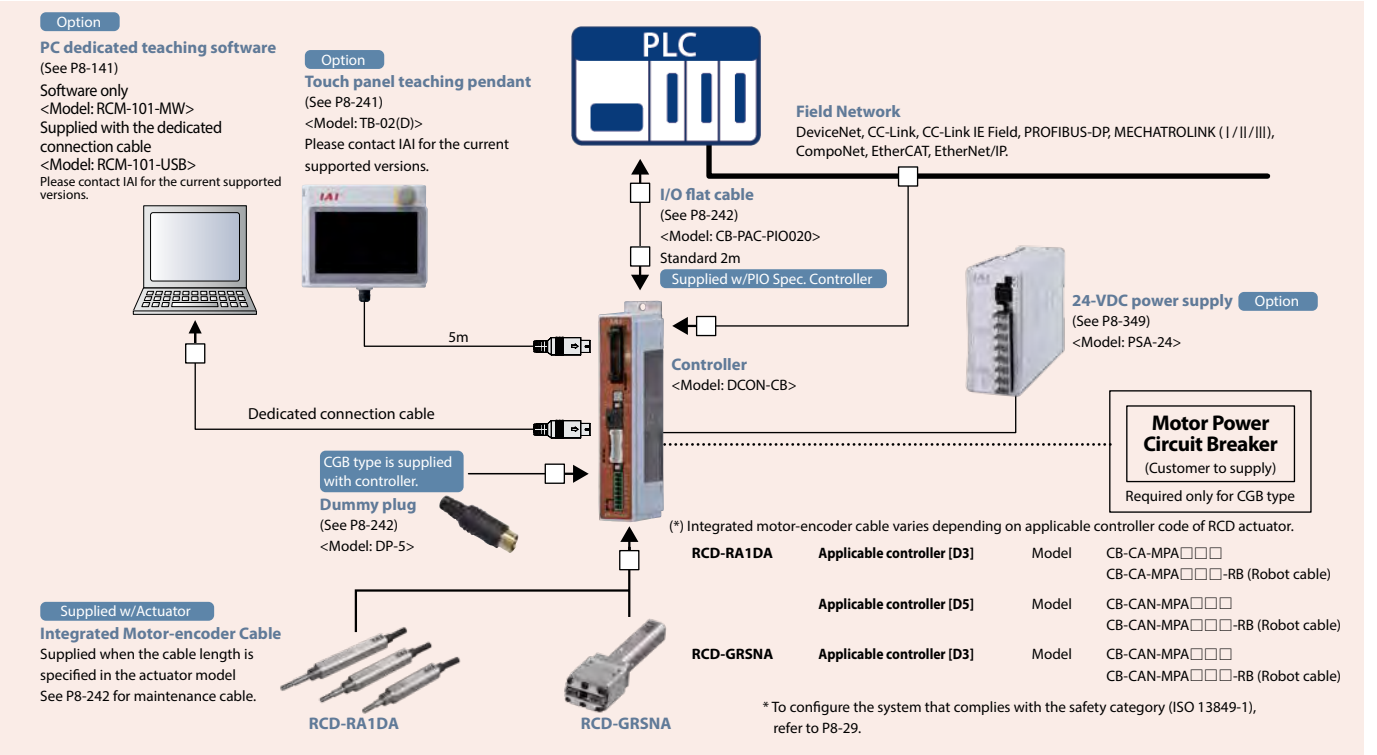
(Note 1) Please be sure to check P8-18 for the caution when selecting.

System Configuration

<ACON-CB/CGB>



<DCON-CB/CGB>



Basic specifications

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 (differential type only: AK-04 is used for the open-collector type)	
Fieldbus specification	Available	
Serial communication	RS485: 1 channel (conforming to Modbus protocol)	
Ambient operating temperature	0 to 40°C	
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)	
Protection degree	IP20	
Mass	Battery-less absolute/Incremental spec.: 230g, simple absolute spec.: 240g (incl. battery: 430g)	Incremental specification: 230g
	Absolute spec.: 240g (incl. battery: 260g)	—

Motor Power Capacity

		Motor type	Standard / High-accel/decel		Power-saving	
			Rated [A]	Max. [A]	Rated [A]	Max. [A]
ACON-CB	RCA/RCA2	5W	1.0	3.3	—	—
		10W	1.3	4.4	1.3	2.5
		20W	1.3	4.4	1.3	2.5
		30W	1.3	4	1.3	2.2
		20W(20S)	1.7	5.1	1.7	3.4
DCON-CB	RCL	2W	0.8	4.6	—	—
		5W	1	6.4	—	—
	RCD	10W	1.3	6.4	—	—
		3W	0.7	1.5	—	—

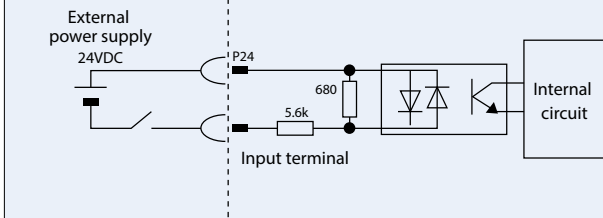
PIO I/O Interface (Common to ACON-CB / DCON-CB)

Input part

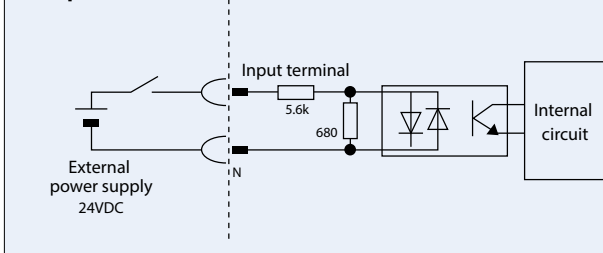
External input specification

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

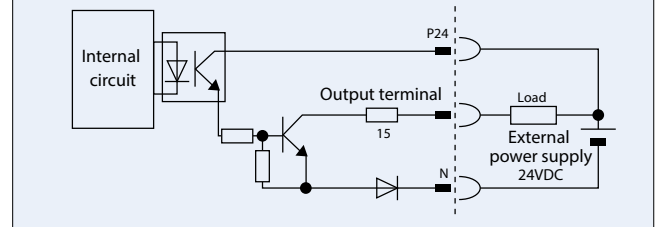


Output part

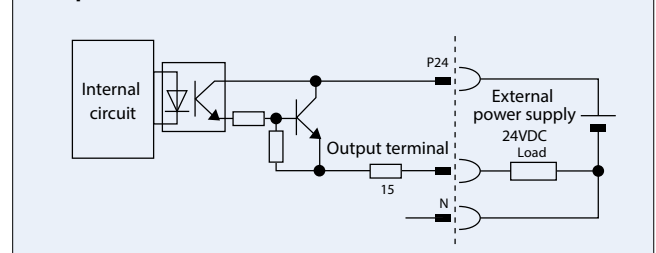
External output specification

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 Zone signal output*: 1 point 	<ul style="list-style-type: none"> Position number command: Binary Coded Decimal (BCD) 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 zone signal output*: 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*: 1 point 	
PIO Pattern 3	3	512-point mode (512 positioning points)	<ul style="list-style-type: none"> Number of positioning points: 512points Position number command: Binary Coded Decimal (BCD) No zone signal output 	
PIO Pattern 4	4	Solenoid valve mode 1 (7-point type)	<ul style="list-style-type: none"> Number of positioning points: 7 points Zone signal output*: 1 point 	<ul style="list-style-type: none"> Position number command: Individual number signal ON 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 Completion signal: A signal equivalent to a LS (limit switch) signal can be output. Zone signal output*: 1 point 	<ul style="list-style-type: none"> Position number command: Individual number signal ON 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.) Zone signal output*: 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 incremental	<ul style="list-style-type: none"> Reference point setting (1 point) Home return function No feedback pulse output 	<ul style="list-style-type: none"> Differential pulse input (200 kpps max.) Zone signal output*: 2 point

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

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

(Note 1) Pulse train control mode is available only when 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.

○ : Available
× : Unavailable
△ : See notes

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	RMD5	RMD5	RMD5	RMD5	RMD5	RMD5
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 is generated.
(Note 1) In all PIO patterns other than 3, this signal can be switched with PZONE by setting Parameter No. 149 accordingly.
(Note 2) The setting will not become effective until the home return is completed.

Reference) Negative logic signal

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

Explanation of I/O signal functions of ACON-CB

Available signals differ depending on the controller setting
Refer to the table of signals for available functions.

Category	Signal code	Signal name	Description of function
Input	CSTR	PTP strobe (start signal)	Start moving to the position set in the command position.
	PC1~PC256	Command position No.	To enter the position No. (binary) of the desired position.
	BKRL	Forced brake release	Releases the brake forcibly.
	RMOD	Switching operation mode	Enables to switch over the operation mode when the controller MODE switch is AUTO. (AUTO for signal OFF, MANU for signal ON)
	*STP	Temporary pause	Slows down to stop when this signal is OFF while moving. While the operation is paused with the rest of motions suspended, it resumes the operation when this signal is ON.
	RES	Reset	Resets the alarm by an ON signal. Cancels the rest of motions by ON while temporarily stopping (*STP is OFF).
	SON	Servo ON	Servo is ON while the signal is ON, Servo is OFF while the signal is OFF.
	HOME	Home return	Performs a home return by an ON signal.
	MODE	Teach mode	Switches to the teach mode by an ON signal. The mode will not be switched unless all of CSTR, JOG+ and JOG- are OFF and the actuator is stopping.
	JISL	Jog/Inching switch	Performs jog motions by JOG+ and JOG- while this signal is OFF. Performs inching motion by JOG+ and JOG- while this signal is ON.
	JOG+ JOG-	Jog	Performs jog motions in the + (plus) direction for JOG+ signal ON edge detection and JOG- signal in the - (minus) direction when JISL is OFF. Slows down to stop when the OFF edge is detected while operating. It becomes an inching motion when the JISL signal is ON.
	PWRT	Writing of current position	In the teaching mode, the current position is written in the designated position when this signal is ON for more than 26ms with the writing position being designated.
	ST0~ST6	Start signal	Moves to the designated position when this signal is ON in the solenoid valve mode.
	PEND/INP	Positioning complete	This signal is ON when the positioning width range is reached after moving. PEND will not become OFF, even when the positioning width is exceeded. INP becomes Off. PEND and INP can be switched over by parameter.
Output	PM1~PM256	Complete position No.	Outputs the position No. (binary output) reached after positioning is complete.
	HEND	Home return complete	This signal is ON when the home return is completed. This signal remains ON unless the home position is lost.
	ZONE1 ZONE2	Zone	This signal becomes ON when the actuator current position is within the designated zone of the parameter.
	PZONE	Position zone	This signal turns ON while moving positions when actuator current position is within the designated zone specified by the position data. It can be used together with ZONE1. However, PZONE is enabled during operations with the selected position No.
	RMDS	Output of operation mode	Outputs the status of operation mode. Turns ON when the controller is in manual mode.
	*ALM	Alarm	Turns ON when the controller is in a normal condition. Turns OFF when the alarm is activated.
	ALM1~ALM8	Alarm code	Outputs the alarm details in a binary code when an alarm is activated because the operation cancellation level is reached.
	MOVE	In motion	Turns ON when the actuator is in motion (including home return and push motion).
	SV	Servo ON	Turns ON when the servo is ON.
	*EMGS	Emergency stop output	Turns ON when the controller is in an emergency stop release condition, and turns OFF in the emergency stop condition. (regardless of the alarm)
	MODES	Teach mode output	Turns ON in the teach mode by a MODE signal input. Turns OFF in a normal mode.
	WEND	Writing complete	This signal turns OFF in the teach mode, and turns ON when writing is completed by the PWRT signal. The signal turns OFF when PWRT signal is OFF.
	PE0~PE6	Current position No.	Turns ON when travel to the target position is completed in the solenoid valve mode.
	LS0~LS2	Limit switch output	Turns ON when the actuator's current position is within the positioning width range (\pm) of the target position. In the Home return complete condition, this signal will be output even before the travel command or in a servo OFF status.
	*ALML	Minor failure output	This signal is output when the message level alarm occurs. (Parameter setting is needed)
	*BALM	Warning for low absolute battery voltage	This signal is ON when the voltage of the battery of the serial absolute actuator is in the normal range. For incremental actuators, this signal is always ON. It is also possible to turn OFF by setting parameter No. 151 when the message level alarm has occurred.
	TRQS	Torque level status	In the solenoid valve mode 2, when a motion is performed in the + direction by JOG+ before a Home return, the motion becomes impossible due to an obstacle or the stroke end. In this case, the signal becomes ON when the motor current value exceeds the limit for home return current value.

An asterisk (*) shows a negative logic signal. Negative logic input signals are processed when turned OFF. Negative logic output signals normally remain ON while the power is supplied, and turn OFF when the signal is output.

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 is generated.
7B		OUT6	*EMGS	Emergency stop status	This signal turns ON when the emergency stop of the controller is canceled, 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 manual mode.
9B		OUT8	ALM1	Alarm code output signal	An alarm code is output when an alarm is generated. 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.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

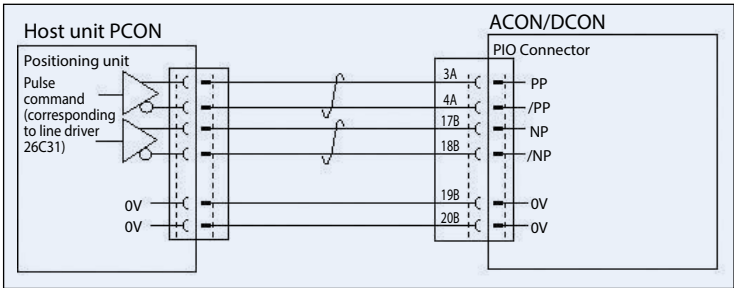
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TB -03/02

Software

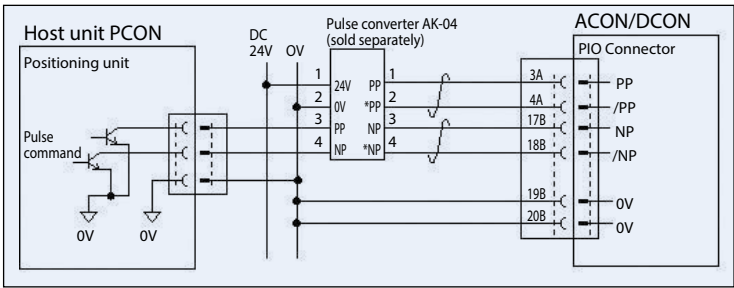
Pulse-train control circuit (Common to ACON-CB/DCON-CB)

Host Unit = Differential Type



Host Unit = Open Collector Type

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

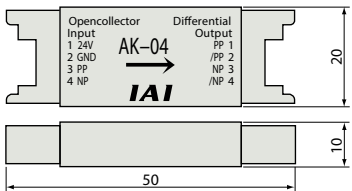


Pulse Converter: AK-04

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

Specification

Item	Specification
Input power	24VDC ±10% (max. 50mA)
Input pulse	Open-collector (Collector current: max. 12mA)
Input frequency	200kHz or less
Output pulse	Differential output (Max.10mA) (26C31 or equiv.)
Mass	10g or less (excluding cable connectors)
Accessories	37104-3122-000L (3M) (e-CON connector) x 2 Applic. wire: AWG No. 24~26



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

Command pulse input patterns

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

Field network specification: Explanation of operation modes (Common to ACON-CB/DCON-CB)* Except for MECHATROLINK-III

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

Mode Description

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

Required Data Size for Each Network

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

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

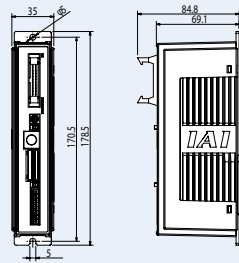
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.

List of Functions by Operation Mode

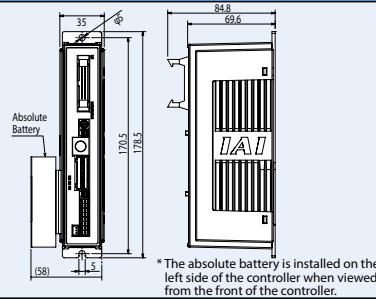
	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2
Number of positioning points	512	768	Unlimited	Unlimited	512
Operation by direct position data input	X	○	○	○	X
Direct speed/acceleration input	X	X	○	○	X
Push-motion operation	○	○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

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

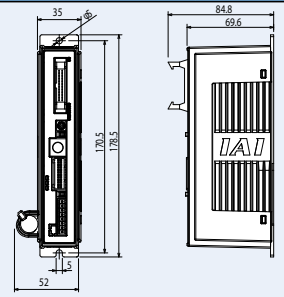
(Note 1) Please note that the MECHATROLINK specification does not support the full direct value mode.



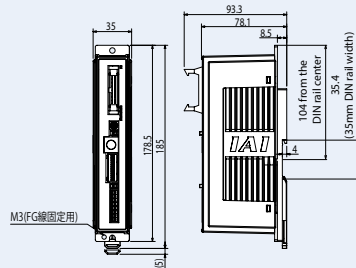
Simple Absolute Specification (Screw Mounting Type)



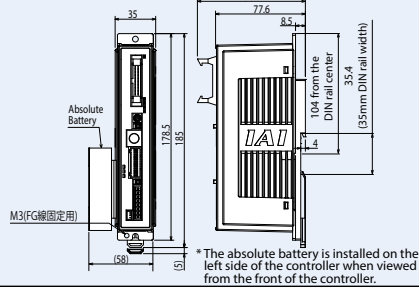
Absolute Specification (Screw Mounting Type)



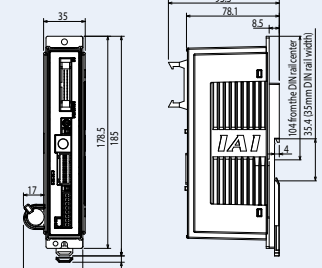
Battery-less Absolute/Incremental Specifications (DIN Rail Mounting)



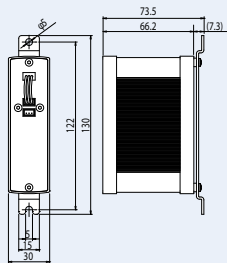
Simple Absolute Specification (DIN Rail Mounting)



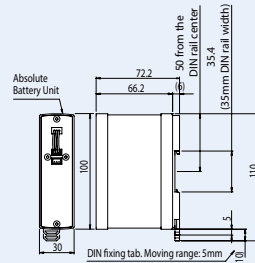
Absolute Specification (DIN Rail Mounting)



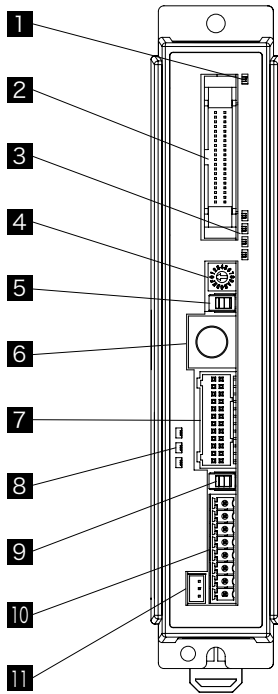
Absolute Battery Unit (Screw Mounting Type)



Absolute Battery Unit (DIN Rail Mounting)



Names of parts (common in ACON-CB/DCON-CB)



1 Controller indicator LED

Indicates the controller status.

○ : Light-on, X: Light-off, ☆ : Flashing

LED		Operating status
SV (green)	ALM (red)	
X	X	Control power OFF
		Servo OFF
X	○	Alarm (over operation cancel level)
		Motor power source OFF
		Emergency stop
○	X	Servo ON
☆	X	Automatic servo OFF
○(Orange)		Initialization after power ON

2 PIO connector / field network connector

Cable connector for parallel connection with the peripheral equipment such as PLC.

3 LED for current / alarm monitor

Cable connector for parallel connection with the peripheral equipment such as PLC.

LED	Operating condition				
ST53(green)	Status display * While servo ON: displays the present command current ratio (ratio to the rated current)				
ST52(green)	STATUS				Command current ratio
	3	2	1	0	
ST51(green)	ALM8	ALM4	ALM2	ALM1	Simple alarm code
	X	X	X	X	0.00%~6.24%
ST50(green)	X	X	X	○	6.25%~24.99%
	X	X	○	○	25.00%~49.99%
	X	○	○	○	50.00%~74.99%
	○	○	○	○	75.00%~100.00% or more

* During alarm activated: displays a simple alarm code.

4 Axis number setting switch

This switch sets the axis number when multi axes are operated by serial communication and in the case of gateway operations.

5 Operation mode setting switch

This switch is for interlock.

Name	Description
MANU	Not receives commands from PIO
AUTO	Receives commands from PIO

* When connected, the emergency stop switch of the touch panel teaching pendant is enabled regardless of AUTO/MANU.
When detaching the touch panel teaching pendant and SIO communication cables, turn off the power.

6 SIO connector

For the touch panel teaching pendant or connector for PC communications.

7 Motor-encoder connector

Connector to connect the actuator motor and encoder cable.

8 Absolute battery status indicator LED

Installed in the simple absolute specification (optional). Charging status and alarm activation, etc. are indicated.

○ : Light-on, X: Light-off

LED			Operation status
RDY (green)/ALM (red)	11 (green/red)	0 (green/orange/red)	
X	X	X	Control power OFF
○ (green)	○ (green)	○ (either color)	Absolute reset complete
○ (green)	○ (red)	○ (either color)	Absolute reset not complete
○ (red)	○ (red)	○ (either color)	Error activated
○ (either color)	○ (either color)	○ (green)	Battery fully charged
○ (either color)	○ (either color)	○ (orange)	Battery charging
○ (either color)	○ (either color)	○ (red)	Battery not connected

9 Brake release switch (BK RLS/NOM)

This switch releases the actuator brake forcibly.
BK RLS ... Brake forced release
NOM ... Normal operation (brake enabled)

10 Power connector

This connector supplies power and manages the input of the emergency stop status signal for the unit.

11 Absolute battery connector

Connects the supplied battery in case of the simple absolute spec (option).

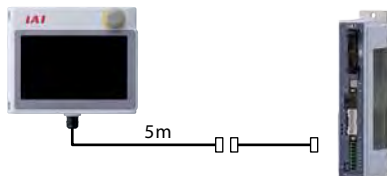
Option (Common to ACON-CB/DCON-CB)

Touch panel teaching pendant

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

Model **TB-02(D)**-□

Configuration



Specifications

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

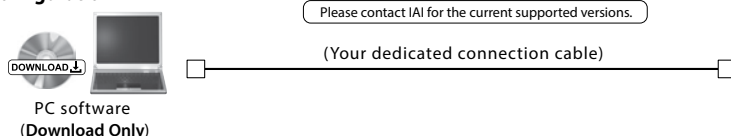
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model **IA-OS** (Software only, for customers who already own a dedicated connection cable)

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

Configuration



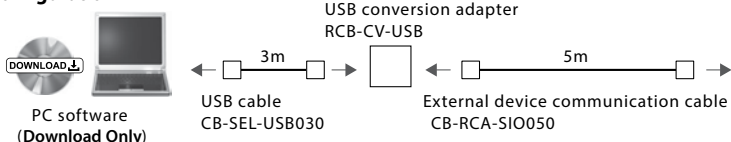
Supported Windows versions: 7/10



Model **IA-OS-C** (Software with an external device communication cable + USB conversion adapter)

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

Configuration



Maintenance parts (for ACON/CB)

Absolute battery unit

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

Model **SEP-ABU** (DIN rail mounting specification)
SEP-ABUS (Screw mounting specification)

Specification

Item	Specification
Ambient operating temp. & humidity	0~40°C (around 20°C is desirable), 95% RH or less (non-condensing)
Operating ambience	Free from corrosive gases
Absolute battery	Model: AB-7 (Ni-MH battery/Life: approx. 3 years)
Absolute battery unit connecting cable	Model: CB-APSEP-AB005 (length: 0.5m)
Weight	Battery box: 140 g or less, Battery: 140 g or less

Replacement battery (Simple absolute specification)

Overview Replacement battery used with the absolute battery box.

Model **AB-7**



Replacement battery (Absolute specification)

Overview Replacement battery used with the absolute battery box.

Model **AB-5** (Battery)
AB-5-CS (Battery with case)



Maintenance parts (common in ACON-DB/DCON-CB)

These parts are normally included in the controller. Please order individual parts if lost or need replacing.

Power connector

■ **Model** FMC1.5/8-ST-3.5



Dummy plug

■ **Feature** This plug is necessary when operating the safety category compliant specification (ACON/DCON-CGB).

■ **Model** DP-5



Network connector

for DeviceNet

■ **Model** MSTB2.5/5-STF-5.08 AUM



for CC-Link
Terminal resistor with 110Ω/130Ω

■ **Model** MSTB2.5/5-STF-5.08 AU

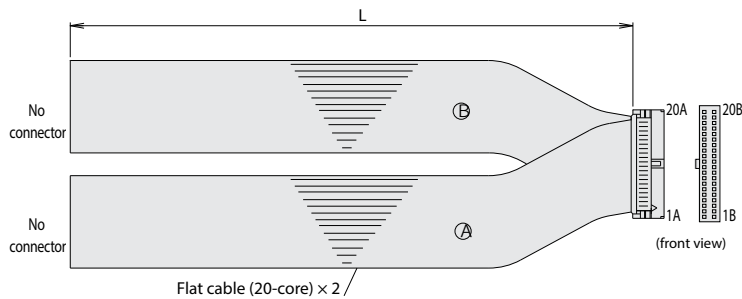


NPN/PNP specification PIO flat cable

* This cable is included in the controller except when cable 0 (no cable) is selected at the model (I/O cable length).

Model number CB-PAC-PIO

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



HIF6-40D-1.27R(Hirose)

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

Flat cable A (pressure-welded)

Flat cable B (pressure-welded)

AWG28

Maintenance parts (cable)

These parts are normally included in each unit. Please order individual parts if lost or need replacing.
Refer to P1-89 for the details of cables.

■ Table of Applicable Cables

● ACON-CB

	Model Number	Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCA2/RCA2CR/RCA2W	—	CB-APSEP-MPA <input type="text"/> <input type="text"/> <input type="text"/>
②	RCA2/RCA2CR/RCA2W (when selecting CNS)	CB-CAN-MPA <input type="text"/> <input type="text"/> <input type="text"/> *1	CB-CAN-MPA <input type="text"/> <input type="text"/> <input type="text"/> -RB *1
③	RCA/RCA2R	—	CB-APSEP-MPA <input type="text"/> <input type="text"/> <input type="text"/>
④	RCAR	—	CB-ASEP2-MPA <input type="text"/> <input type="text"/> <input type="text"/>
⑤	RCL	—	CB-APSEP-MPA <input type="text"/> <input type="text"/> <input type="text"/>

* 4-direction connector type can also be selected.

● DCON-CB

	Model Number	Integrated Motor-encoder Cable	Integrated Motor-encoder Robot Cable
①	RCD	—	—
②	RA1DA	CB-CAN-MPA <input type="text"/> <input type="text"/> <input type="text"/> *1	CB-CAN-MPA <input type="text"/> <input type="text"/> <input type="text"/> -RB *1
	GRSNA	—	—

* 4-direction connector type can also be selected.

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




● 4-direction connector type




Standard connector type	4-direction connector type
CB-ADPC-MPA <input type="text"/> <input type="text"/> <input type="text"/> (-RB)	CB-ADPC2-MPA <input type="text"/> <input type="text"/> <input type="text"/> (-RB)

ACON-CYB/PLB/POB

DCON-CYB/PLB/POB

Position Controller for RoboCylinder






Features

1 For products with battery-less absolute encoder (ACON only)

Battery maintenance is not required, since it does not need a battery. Home return is not required during the initial setting, after emergency stop output, or when the device is restarted after failure.

Down time can be shortened, and manufacturing costs can be reduced.



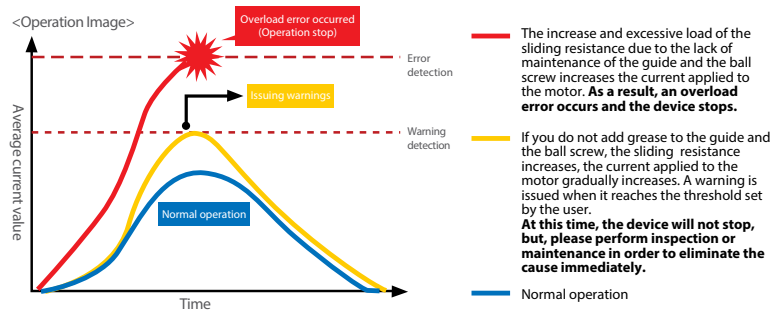
Battery-less Absolute Encoder

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


By limiting the functionality to frequently used functions, we have achieved a low price.

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	○

○ : Compatible
× : Incompatible

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 specification item

ACON — [] — [] **WAI** [] — [] — [] — **0** — []

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

CYB Positioner / Solenoid valve type

PLB Pulse-train control type (Differential receiver type)

POB Pulse-train control type (Open collector type)

2 2W **20** 20W

5 5W **20S** 20W

5S 5W **30** 30W

10 10W

WAI Battery-less absolute/Incremental

* Absolute specification of RCA actuator can not be operated. Please use ACON-CB or ASEL to operate the Absolute specification.

(Blank) Standard specification

HA Hi-accel./decel. supported *

LA Energy saver *

* When "HA/LA" is selected in the actuator option.

NP PIO(NPN) specification

PN PIO(PNP) specification

(Blank) Screw Mounting specification

DN DIN rail mounting specification

0 24VDC

0 No cable

2 2m

3 3m

5 5m

(Example) 2: 2W 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.

<SS/20S target actuator>

- Controller Motor type "SS" ... RCA2 - RA2A□, RCA2 - SA2A□
- Controller Motor type "20S" ... RCA2 - SA4□, RCA2 - TA5□, RCA - RG□3□, RCAW - RA3□

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

DCON — [] — **3** **I** — [] — [] — **0** — []

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

CYB Positioner / Solenoid valve type

PLB Pulse-train control type (Differential receiver type)

POB Pulse-train control type (Open collector type)

3 3W

I Incremental

NP PIO(NPN) specification

PN PIO(PNP) specification

(Blank) Screw Mounting specification

DN DIN rail mounting specification

0 24VDC

0 No cable

2 2m

3 3m

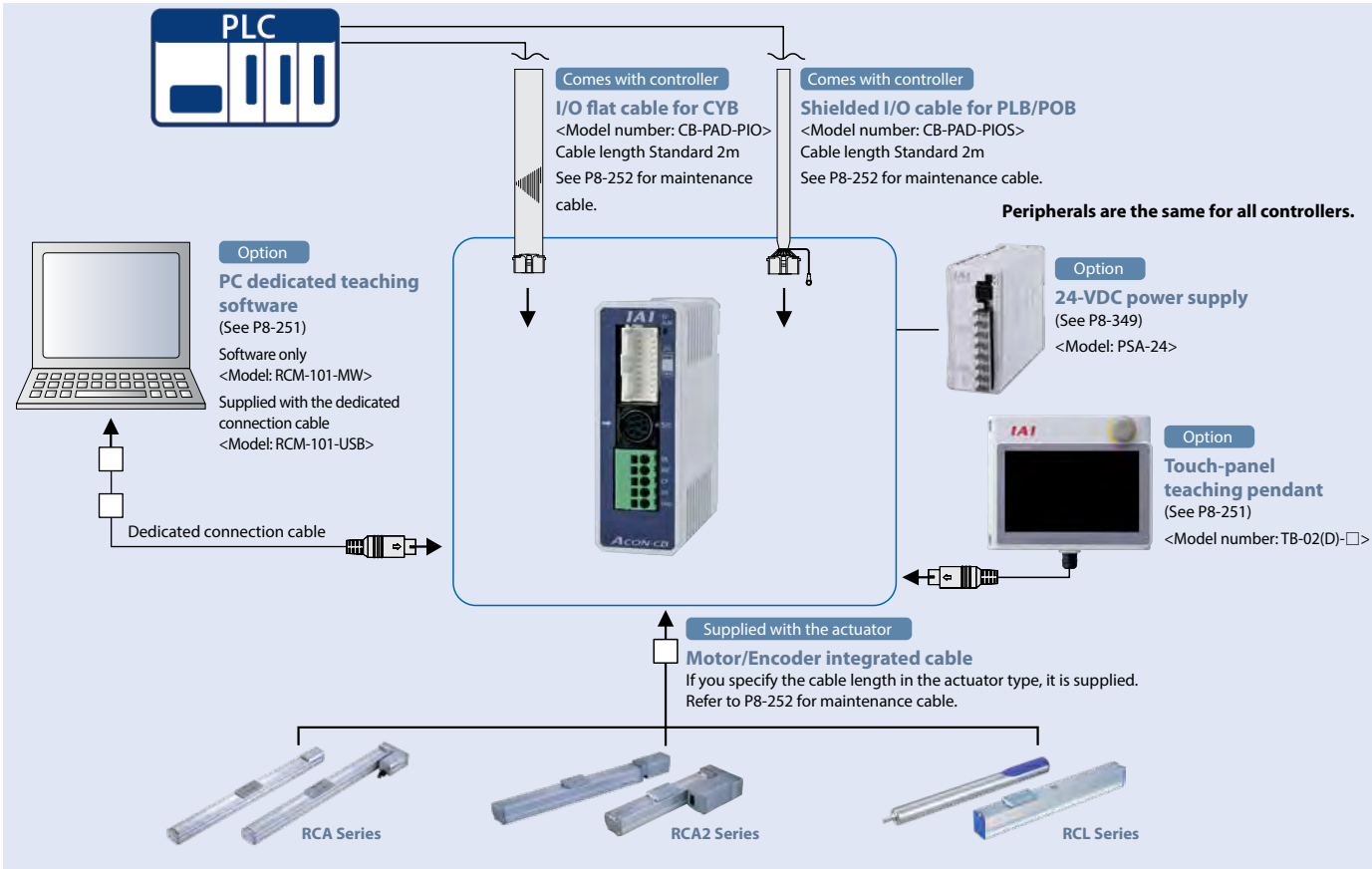
5 5m

* DC Brushless motor compatible

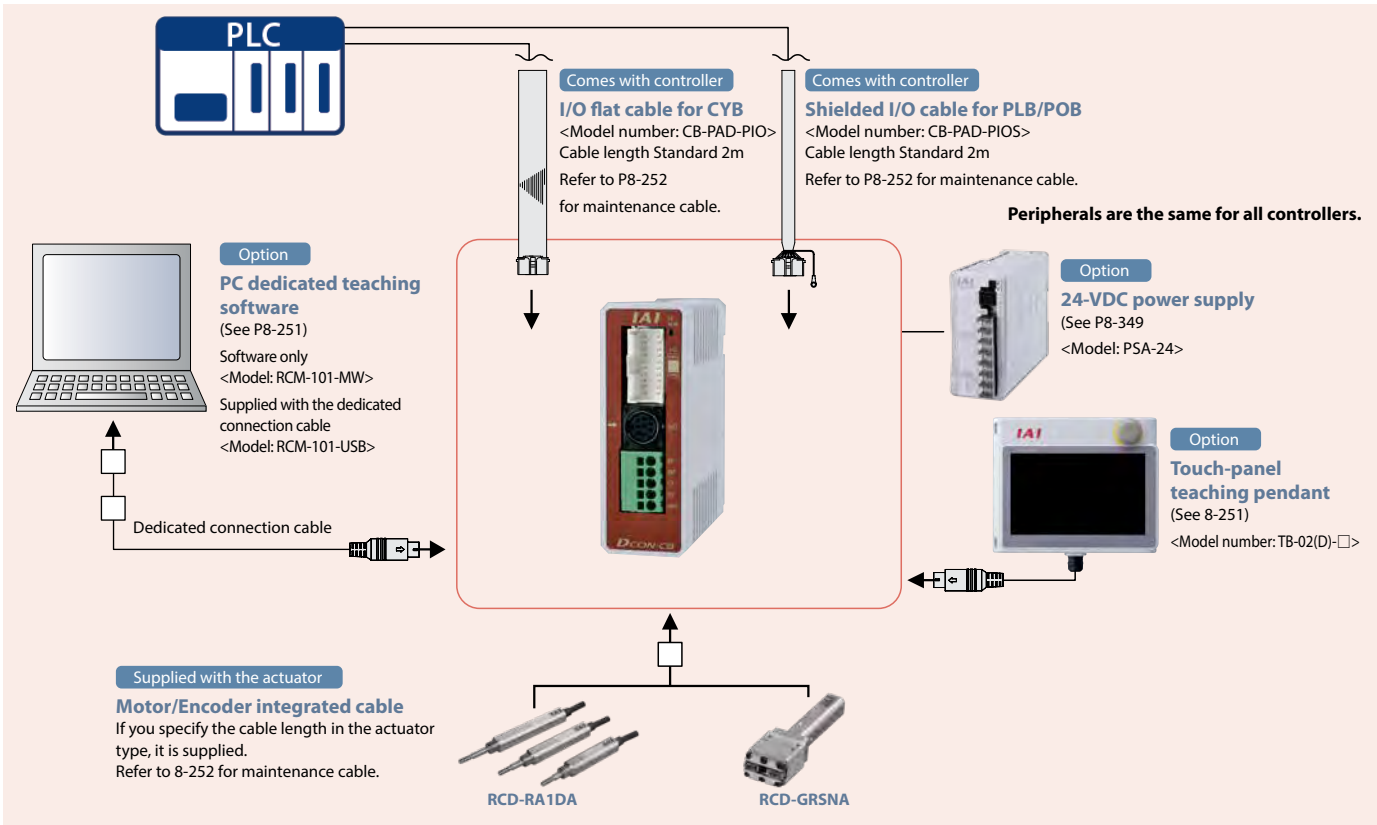
* The POB type has a maximum cable length of 2m.

System configuration

<ACON-CYB/PLB/POB>



<DCON-CYB/PLB/POB>



Basic specifications

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	5%RH - 85%RH (non-condensing, no frost)		
Operating ambience	Not exposed to corrosive gases		
Degree of protection	IP20		
Mass	230g (DIN rail mounting specification 265g)		

Motor power capacity

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

Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

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 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	Serial communication (Modbus) Refer to operation manual
		Position zone signal	△(Note 1)	×	△(Note 1)	△(Note 1)	△(Note 1)	△	
5	Input	IN0	PC1	ST0	ST0	ST0	ST0	Any signal other than the command position No.,CSTR can be selected in the input.	
6		IN1	PC2	ST1	ST1(JOG+)(Note 2)	-	ST1 -(Note 2)		
7		IN2	PC4	ST2	ST2 -(Note 2)	-	ASTR		
8		IN3	PC8	ST3	-	-	-		
9		IN4	HOME	ST4	SON	SON	SON		
10		IN5	*STP	ST5	-	*STP	*STP		
11		IN6	CSTR	ST6	-	-	-		
12	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(Note 3)	LS0/PE0(Note 3)		
14		OUT1	PM2(ALM2)	PE1	LS1(TRQS)(Note 2)	LS1/PE1(Note 3)	LS1/PE1(Note 3)		
15		OUT2	PM4(ALM4)	PE2	LS2 -(Note 2)	PSFL	PSFL		
16		OUT3	PM8(ALM8)	PE3	HEND	HEND	HEND		
17		OUT4	HEND	PE4	SV	SV	SV		
18		OUT5	PZONE/ZONE1	PE5	PZONE/ZONE1	PZONE/ZONE1	PZONE/ZONE1		
19		OUT6	PEND	PE6	*ALML	*ALML	*ALML		
20		OUT7	*ALM	*ALM	*ALM	*ALM	*ALM		

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

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

(Note 2) Signals in () are effective before home return complete when set to increment specification. (ALM 1 to 8 are excluded.)

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

△ : See notes
× : Unavailable

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

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

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

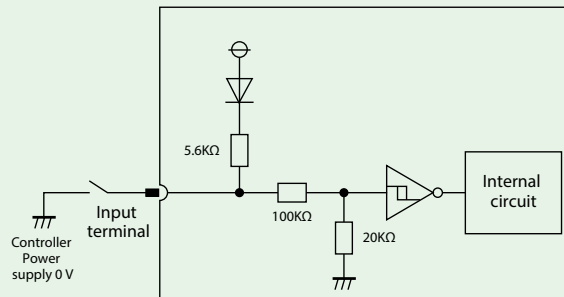
○ : Available
× : Unavailable

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

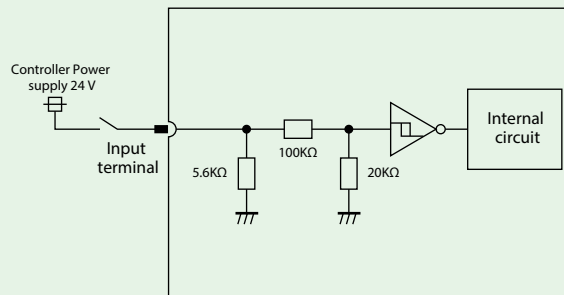
Input Part External Input Specifications

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



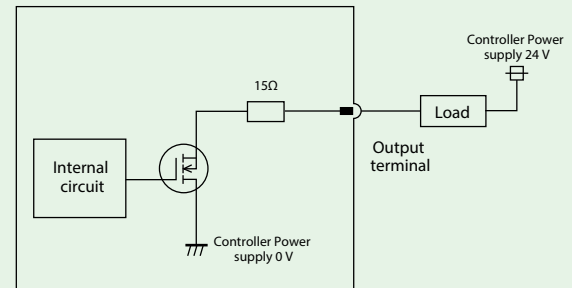
PNP Specification



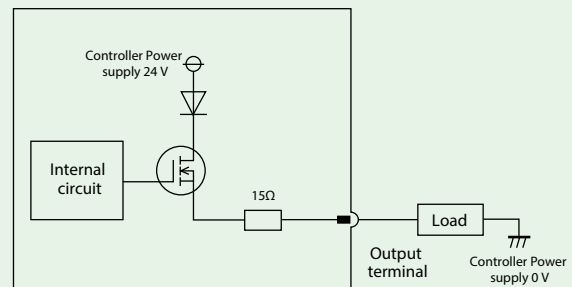
Output Part External Output Specifications

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



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 is generated. (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 is generated.

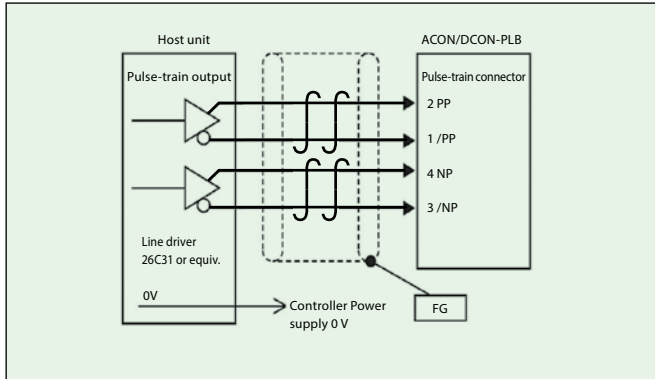
(Note) The above signals marked with (*) are normally ON and turn OFF at operation.

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

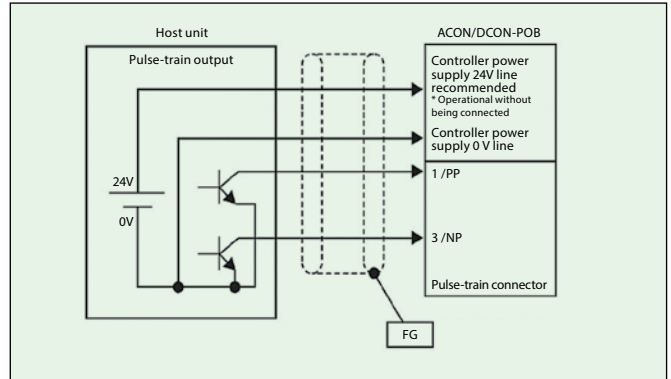
* The power supply of the pulse train output unit on the PLC side and the control power supply of the controller or the GND line must be the same.



■ 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.

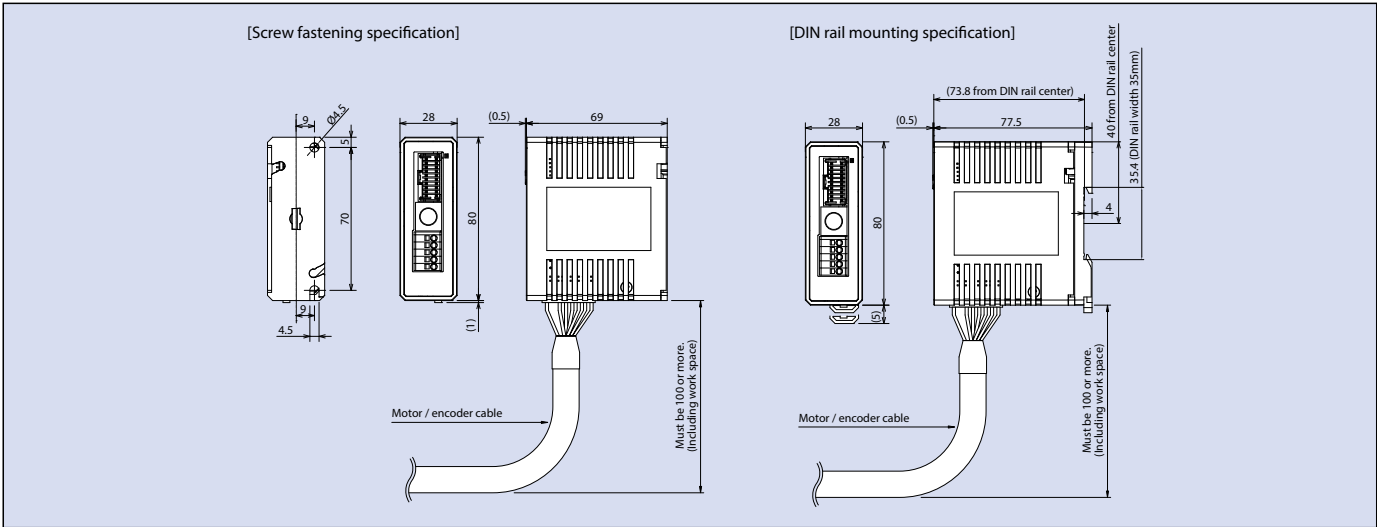


Command pulse-train pattern

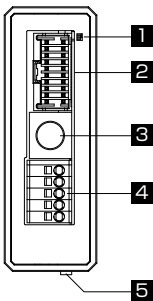
Command pulse-train pattern		Input terminal	Forward	Reverse
Positive logic	Forward pulse-train	PP · /PP		
	Reverse pulse-train	NP · /NP		
	A forward pulse-train indicates the amount of motor rotation in the forward direction, while a reverse pulse-train indicates the amount of motor rotation in the reverse 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		
	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		
	Pulse-train	PP · /PP		
Positive logic	Sign	NP · /NP	High	Low
	Phase A/B pulse-train	PP · /PP		
	Phase A/B pulse-train	NP · /NP		

External Dimensions

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



Names of each part



1 Controller status display LED

Displays the operation status of the controller.

○: ON ×: OFF ☆: Blinking

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

2 PIO connector

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

3 SIO connector (SIO)

Connector for communication cable connection of teaching tool.

4 Power connector

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

5 Motor encoder connector

Connector for the actuator's motor and encoder cable.

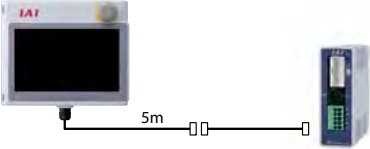
Option

Touch panel teaching box

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

Model TB-02(D)-□

Configuration



Specification

Rated voltage	24V DC
Power consumption	3.6 W or less (150 mA or less)
Ambient operating temperature	0 ~ 40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Degree of protection	IP20
Weight	470g (TB-02 only)

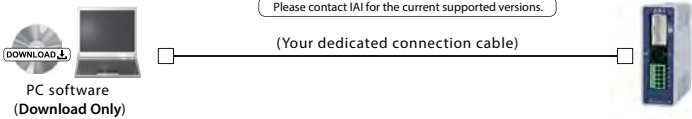
PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model IA-OS (Software only, for customers who already own a dedicated connection cable)

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

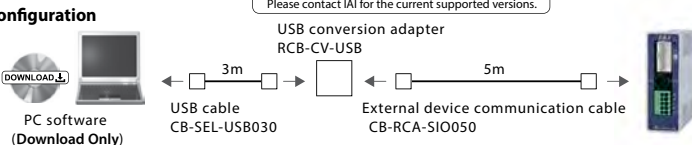
Configuration



Model IA-OS-C (Software with an external device communication cable + USB conversion adapter + USB cable)

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

Configuration



Supported Windows versions: 7/10



Maintenance parts

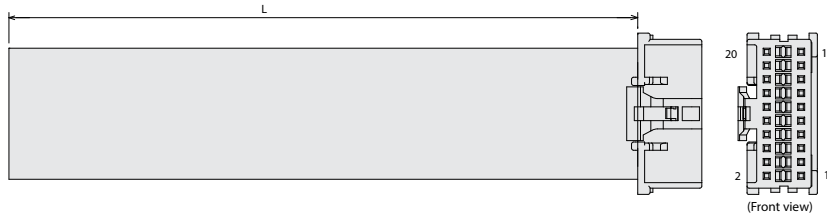
These parts are normally included in each unit. Please order individual parts if lost or need replacing.

* This cable is included in the actuator except when the I/O cable length of 0 (no cable) is selected.

ACON/DCON-CYB CB-PAD-PIO□□□
ACON/DCON-PLB/POB CB-PAD-PIOS□□□

Model **CB-PAD-PIO** □□□

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

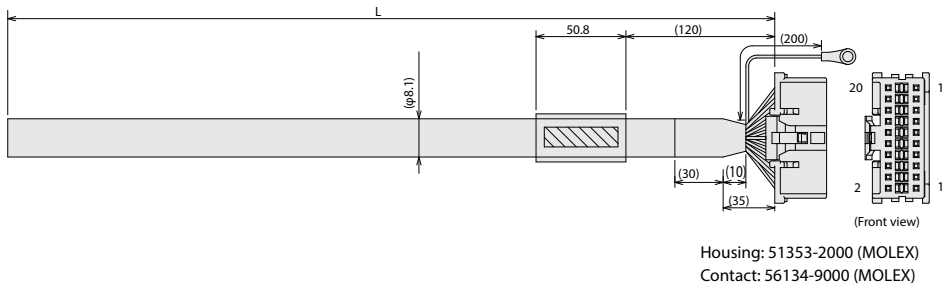


51353-2000(MOLEX)

No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
1	—	Brown-1	Flat cable AWG28	11	IN6	Brown-2	Flat cable AWG28
2	—	Red-1		12	IN7	Red-2	
3	—	Orange-1		13	OUT0	Orange-2	
4	—	Yellow-1		14	OUT1	Yellow-2	
5	IN0	Green-1		15	OUT2	Green-2	
6	IN1	Blue-1		16	OUT3	Blue-2	
7	IN2	Purple-1		17	OUT4	Purple-2	
8	IN3	Gray-1		18	OUT5	Gray-2	
9	IN4	White-1		19	OUT6	White-2	
10	IN5	Black-1		20	OUT7	Black-2	

Model **CB-PAD-PIOS** □□□

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



No.	Signal	Color	Wiring
1	/PP	Orange/Red	0.2sq AWG22
2	PP	Orange/Black	
3	/NP	Gray/Red	
4	NP	Gray/Black	
5	IN0	White/Red	
6	IN1	White/Black	
7	IN2	Yellow/Red	
8	IN3	Yellow/Black	
9	IN4	Pink/Red	
10	IN5	Pink/Black	
11	IN6	Orange/Red	
12	IN7	Orange/Black	
13	OUT0	Gray/Red	
14	OUT1	Gray/Black	
15	OUT2	White/Red	
16	OUT3	White/Black	
17	OUT4	Yellow/Red	
18	OUT5	Yellow/Black	
19	OUT6	Pink/Red	
20	OUT7	Pink/Black	

Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

Refer to P1-89 for the details of cables.

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 □□□ *1	CB-CAN-MPA □□□ -RB *1
③ RCA RCACR RCW	SRA4R SRGS4R SRGD4R	—
④ (Models other than ②)	—	CB-ASEP2-MPA □□□
⑤ RCL	—	CB-APSEP-MPA □□□

*1 4-direction connector type can also be selected.

DCON

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

*1 4-direction connector type can also be selected.

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

4-direction connector type

Standard connector type	4-direction connector type
CB-ADPC-MPA □□□ (-RB)	CB-ADPC2-MPA □□□ (-RB)

Cable model search system is recommended!

URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



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, ISDB, NSA and IFA equipped with a battery-less absolute encoder can be operated. Since no battery is needed to retain position data, less space is required in the control panel, which contributes to saving initial and maintenance costs.



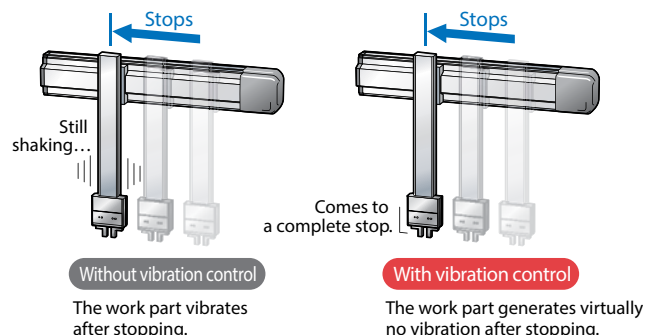
2 Supporting Major Field Networks <Optional Function>

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.



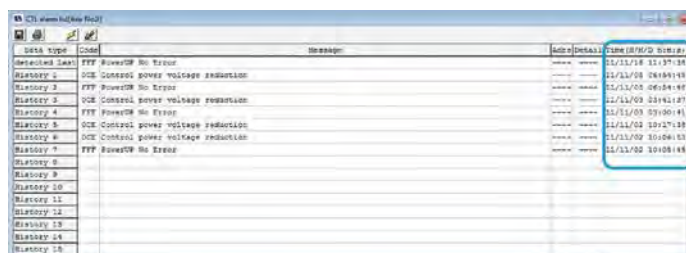
4 Capable of Predictive Maintenance <Optional Function>

- Equipped with a feature to detect motor overload and issue warning.
By monitoring the motor temperature, abnormal changes can be detected before a malfunction or failure occurs.
- Fully equipped with a monitoring function.
Like an oscilloscope, waveforms of position and speed can be acquired from the moment that the condition of a selected signal is changed. Signal status of positioning complete, alarm and so on can also be acquired.
- With smart tuning and o -board tuning, it is possible to adjust the acceleration/deceleration and gain depending on the payload.
- Using the counter function, the exact number of actuator movements and total distance traveled are calculated.
This function can be used to output a signal when maintenance is required.
- The calendar function enables to retain the history of alarm occurrence.

<Maintenance information>



<Calendar function>



5 Supports the Safety Function STO/SS1-t <Optional function>

Supports the STO (Safe Torque Off) / SS1-t (Safe Stop 1 - time controlled) function.

The STO / SS1-t function is to shut off the energy supply to the motor by electric circuit in the controller.

For the SCON-CB, two specifications are available; STO and SS1-t specification. For applications of the vertical axis, SS1-t specification that has a long reaction time can prevent workpiece from dropping due to the time lag of brake operation when the safety torque shut off function is activated.



Specification	Description	Remarks
STO	Reacting to input signals, the energy supply to the motor is shut off after a reaction time (8ms or shorter) by shut-off circuit in the controller.	
SS1-t	Reacting to input signals, brake is applied and the energy supply to the motor is shut off after a reaction time (500ms or shorter) by shut-off circuit in the controller.	This braking operation is not included in the safety function.

The energy supply to the servo motor can be shut off safely by connecting an external safety-related device and the I/O connector for safety function.

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



In addition, the STO/SS1-t function is compliant with the following safety standards:

- ISO/EN ISO 13849-1 category 3 PLe
- IEC 61508 SIL3
- IEC/EN61800-5-2
- IEC/EN62061 SIL CL3

(Note) An engineer with expert knowledge in relevant safety standards should read and understand the descriptions stated in the instruction manual before designing a safety system using this function.

List of Models

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

(Note) The index absolute type can not be used in the pulse-train control, MECHATROLINK-III and EtherCAT Motion control. (See P6-38)

○ : Available

(*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.

Not specified	Standard type
HA	Hi-accel./decel. specification

* In case of selecting "HA" in the actuator option.
<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
ECM	EtherCAT Motion
EP	EtherNet/IP
PRT	PROFINET IO
RC	RCON connection specification

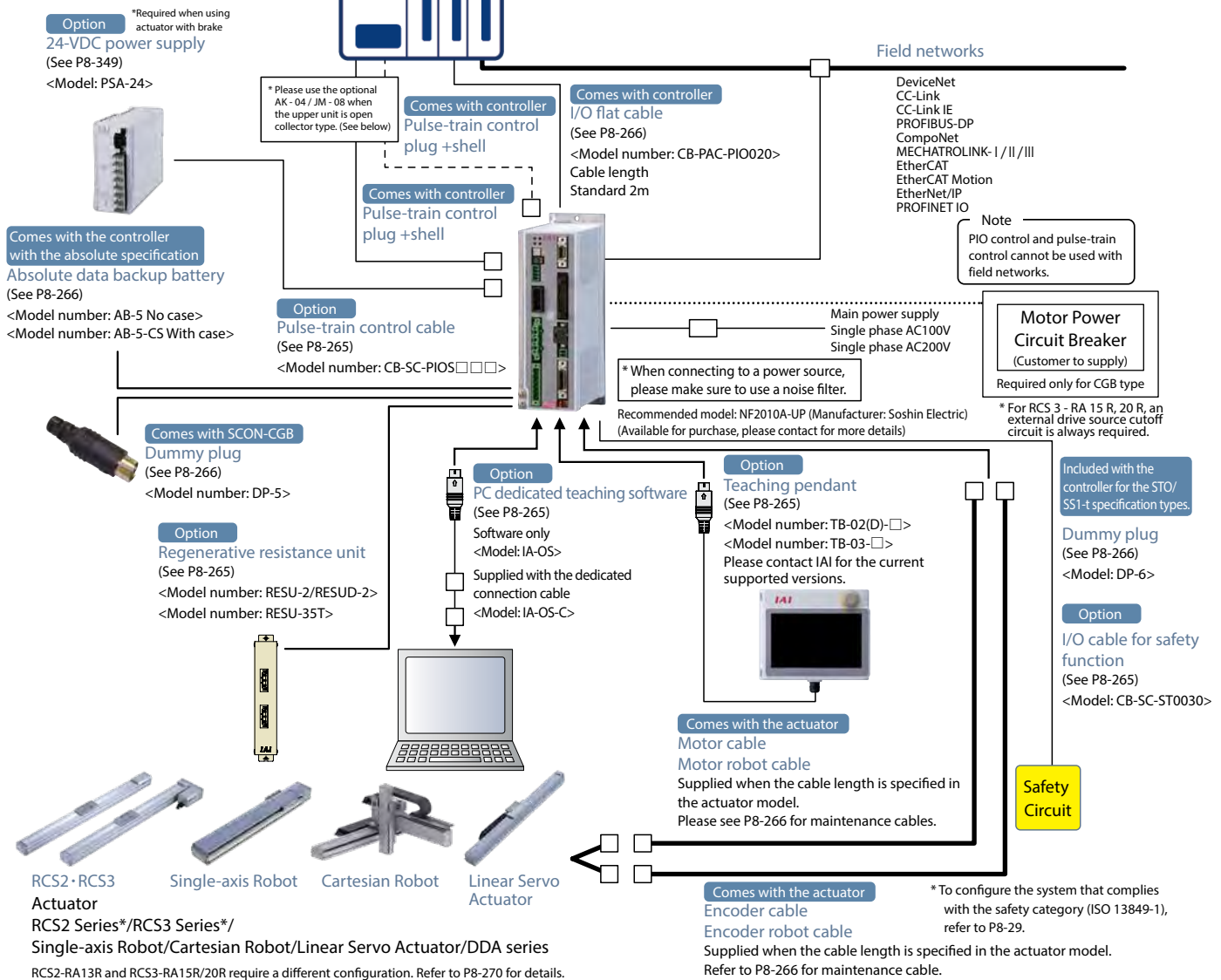
(Note 1) Please be sure to check P8-18 for the caution when selecting.

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>

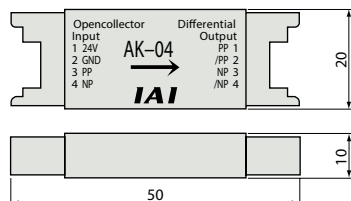


■ Pulse Converter: Model number AK-04

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

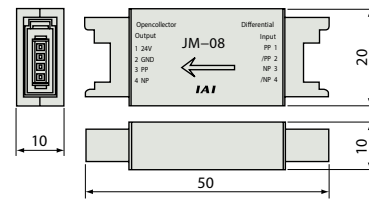


■ Pulse Converter: Model number JM-08

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



I/O connector for safety function

	Model	Manufacturer
Controller side	2294417-1	Tyco Electronics
Cable side	2013595-1 (*1)	

(*1) Customer's supply. Cable with connector (CB-SC-ST0030) is sold separately.

■ Signals of I/O connector for safety function

Pin No.	Signal name	Name	Description
1	NC	—	Do not connect.
2	NC	—	Do not connect.
3	/SRI1-	Safety request input signal 1	Input for the safety request input signal. ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function.
4	/SRI1+		
5	/SRI2-	Safety request input signal 2	Input the safety request input signal ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function.
6	/SRI2+		
7	EDM-	Output signal for monitoring external device	Output signal to monitor the safety function is functioning without failure.
8	EDM+		

Specification table

Item		Specification		
Applicable motor capacity		Less than 400W	400~750W 3000W・3300W	
Number of controlled axes		1 axis		
Operation method		Positioner type/pulse-train type	Positioner type	
Number of positioning points		512 points (PIO specification), 768 points (Fieldbus specification)		
Backup memory		Non-volatile memory (FRAM)		
I/O connector		40-pin connector		
Number of I/O points		16 input points/16 output points		
I/O power supply		External supply 24VDC ±10%		
Serial communication		RS485 1ch	RS48 2ch	
Command pulse-train input method (Note 1)		Differential line driver output supported	—	
Maximum input pulse frequency (Note 1)		Differential line driver method: 2.5Mpps max./ Open-collector method (pulse converter used): 200kpps max.	—	
Feedback pulse (Note 2) (Except for field network specification)		Differential line driver method: Max. 2.5Mpps	—	
Position detection method		Incremental encoder / Absolute encoder / Quasi-absolute serial encoder	Battery-less absolute encoder	
Driving power shut-off function		CB: Available (built-in relay) CGB: Unavailable	Unavailable	
Forced electromagnetic brake release		Brake release switch ON/OFF		
Input power supply		Single-phase AC100~115V±10% Single-phase AC200~230V±10%	Single-phase AC200~230V±10% Three-phase AC200V~230V±10%	
Power-supply capacity (Note 3)		12W/89VA 20W/74VA 30W(other than RS)/94VA 30W(RS)/186VA 60W(other than RCS3-CTZ5C)/186VA 60W(RCS3-CTZ5C)/245VA 100W/282VA 150W/376VA 200W/469VA	1005W(LSA/LSAS-N10)(*)/331VA 2005W(LSA-S10H, LSA/LSAS-N155)(*)/534VA 2005W(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°C		
Ambient operating humidity		5%RH - 85%RH (non-condensing, no frost)		
Operating atmosphere		Free from corrosive gases		
Protection degree		IP20		
Mass		Approx. 900g (+ 25g for the absolute specification)	Approx. 1.2kg (+ 25g for the absolute specification) Approx. 2.8kg	
External dimensions		58mm(W)×194mm(H)×121mm(D)	72mm(W)×194mm(H)×121mm(D) 92.7mm(W)×300mm(H)×172mm(D)	

(Note 1) When the master unit is of the open-collector method, convert the pulse to the pulse differential method by AK-04 (see P8-218). The maximum input pulse frequency of AK-04 is 200kpps.

(Note 2) When the master unit is of the open-collector method, convert the pulse to the pulse differential method by JM-08 (see P8-218). The maximum input pulse frequency of JM-08 is 500kpps.

(Note 3) Controllers operating any of the actuator models denoted by (*) shall conform to the external dimensions of controllers for 400W or more, even when the output is less than 400W.

* The number of encoder pulses for the actuators operable with SCON-CB is 1600 pulses for RCS2-SRA7BD/SGS7BD, 1600 pulses for RCS2-□□5N (incremental), 1048576 pulses for DD(A)-□18P: 20bit, 131072 pulses for DD(A)-□18S: 17bit, 2400 pulses for NS-S□□□ (incremental), 131072 pulses for ISB (battery-less absolute) and 16384 pulses for all the rest.

Operation modes

With this controller, you can select a desired control method from the two modes of positioner mode and pulse-train control mode. In the positioner mode, you can enter position data (target position, speed, acceleration, etc.) in the controller under the desired numbers and then specify each number externally via a I/O (input/output signal) to operate the actuator. Also, in the positioner mode, you can select the desired operation mode from the eight modes using the parameter. In the pulse-train control mode, you can control the travel, speed, acceleration, etc., by sending pulses from an external pulse generator.

Mode		Type	Number of positioning points	Features
Positioner mode	Positioning mode	PIO Patterns 0	64	Standard factory-set mode. Specify externally a number corresponding to the position you want to move to, to operate the actuator.
	Teaching mode	PIO Patterns 1	64	In this mode, you can move the slider (rod) via an external signal and register the stopped position in the position data table.
	256-point mode	PIO Patterns 2	256	In this mode, the number of positioning points available in the positioning mode has been increased to 256 points.
	512-point mode	PIO Patterns 3	512	In this mode, the number of positioning points available in the positioning mode has been increased to 512 points.
	Solenoid valve mode 1	PIO Patterns 4	7	Like the solenoid valve of the air cylinder, the actuator can be moved only by turning signals ON/OFF.
	Solenoid valve mode 2	PIO Patterns 5	3	In this mode, the output signal is set to the same as the air cylinder auto switch in the solenoid valve mode.
	Force mode 1 (Note1)	PIO Patterns 6	32	In this mode, you can move to positions under force control in the positioning mode. (Up to 32 positioning points are available.)
	Force mode 2 (Note1)	PIO Patterns 7	5	In this mode, you can move to positions under force control in the solenoid valve mode. (Up to five positioning points are available.)
Pulse-train control mode	Pulse-train control mode for incremental (Note1)	PIO Patterns 0	—	Position data input to the controller is not necessary, and movement is made according to the sent pulse.
	Pulse-train control mode for absolute (Note1)	PIO Patterns 1		

Note 1 3000 W / 3300 W can not be used.

I/O Signal table * You can select one of nine types of I/O signal assignments.

Pin No	Category		Parameter (PIO Pattern) Selection								
			0	1	2	3	4	5	6 (Note 1)	7 (Note 1)	0/1 (Note 1)
		Positioning point	Positioning mode	Teaching mode	256-point mode	512-point mode	Solenoid valve mode 1	Solenoid valve mode 2	Force mode 1	Force mode 2	Pluse-train mode
1A	24V		64	64	256	512	7	3	32	5	—
2A	24V										P24
3A	—										NC
4A	—										NC
5A	Input	IN0	PC1	PC1	PC1	PC1	ST0	ST0	PC1	ST0	SON
6A		IN1	PC2	PC2	PC2	PC2	ST1	ST1 (JOG+)	PC2	ST1	RES
7A		IN2	PC4	PC4	PC4	PC4	ST2	ST2 (—)	PC4	ST2	HOME
8A		IN3	PC8	PC8	PC8	PC8	ST3	—	PC8	ST3	TL
9A		IN4	PC16	PC16	PC16	PC16	ST4	—	PC16	ST4	CSTP
10A		IN5	PC32	PC32	PC32	PC32	ST5	—	—	—	DCLR
11A		IN6	—	MODE	PC64	PC64	ST6	—	—	—	BKRL
12A		IN7	—	JISL	PC128	PC128	—	—	—	—	RMOD
13A		IN8	—	JOG+	—	PC256	—	—	CLBR	CLBR	RSTR (Note 2)
14A		IN9	BKRL	JOG—	BKRL	BKRL	BKRL	BKRL	BKRL	BKRL	—
15A		IN10	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	RMOD	—
16A		IN11	HOME	HOME	HOME	HOME	HOME	—	HOME	HOME	—
17A		IN12	*STP	*STP	*STP	*STP	*STP	—	*STP	*STP	—
18A		IN13	CSTR	CSTR/PWRT	CSTR	CSTR	—	—	CSTR	—	—
19A		IN14	RES	RES	RES	RES	RES	RES	RES	RES	—
20A		IN15	SON	SON	SON	SON	SON	SON	SON	SON	—
1B	Output	OUT0	PM1	PM1	PM1	PM1	PE0	LSO	PM1	PE0	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	RMD5
9B		OUT8	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	PM256	PZONE/ZONE2	PZONE/ZONE2	PZONE/ZONE1	PZONE/ZONE1	ALM1
10B		OUT9	RMD5	RMD5	RMD5	RMD5	RMD5	RMD5	RMD5	RMD5	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 2)
15B		OUT14	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	*ALM	ZONE1
16B		OUT15	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM	*BALM	ZONE2
17B	—										—
18B	—										—
19B	0V						N				N
20B	0V						N				N

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

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

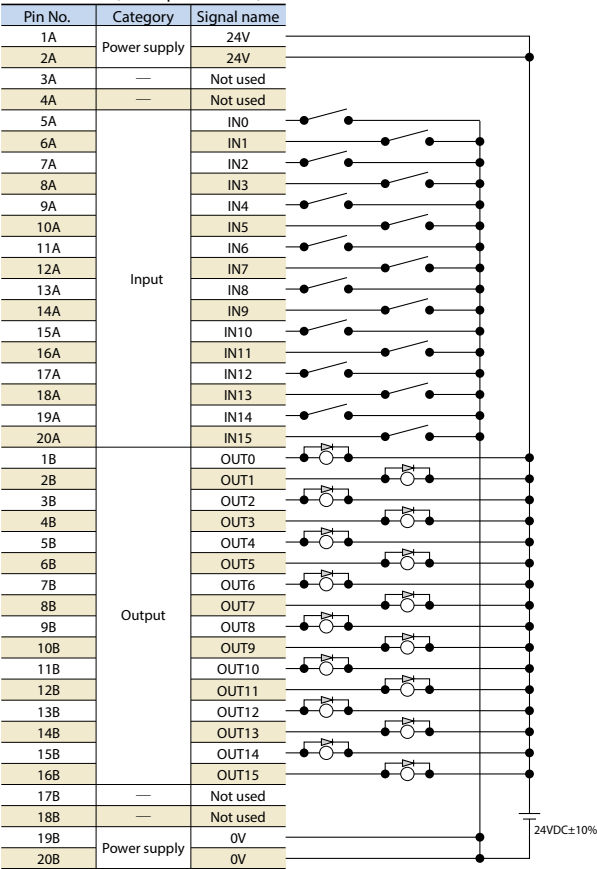
Note 1 3000 W / 3300 W can not be used.

Note 2: It is available to use only in Pulse-Train Control Mode PIO Pattern 1.

I/O Wiring diagrams

Positioning Mode/Teaching Mode/Solenoid Valve Mode

PIO connector (NPN specification)

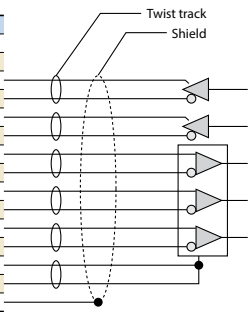


* Connect Pins 1A and 2A to 24V, and Pins 19B and 20B to 0V.

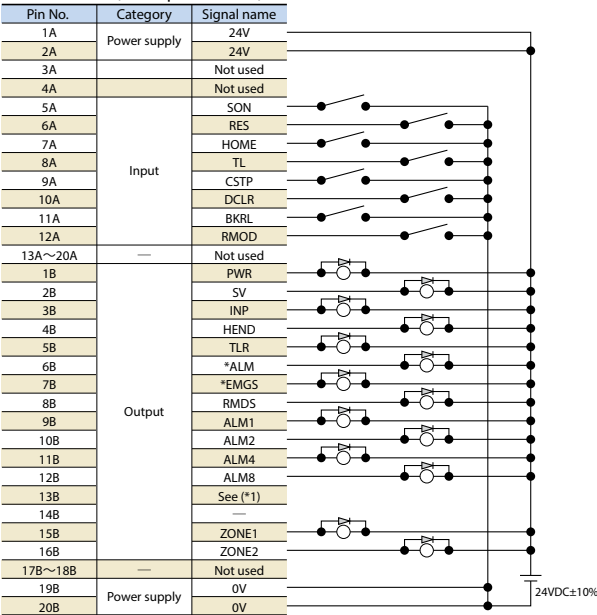
Pulse-train Mode (Differential Output)

Pulse connector

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



PIO connector (NPN specification)



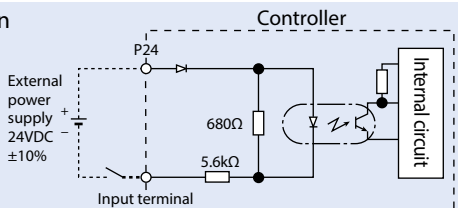
* Please make sure to connect the Shield of the twisted pair cable, which connects to the Pulse connector, to the Shell. Also keep the cable length to 10m or less.
* Connect Pins 1A and 2A to 24V, and Pins 19B and 20B to 0V
(*1) —/*ALML/*OVLW/*BALM (switchable with parameters)

PIO input and output interface

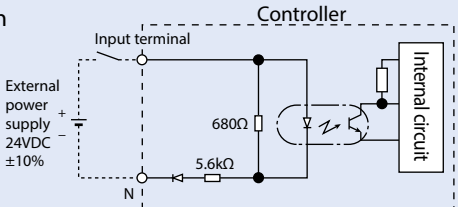
Input Part External Input Specifications

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



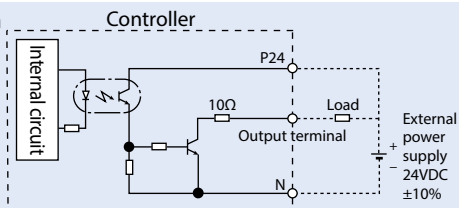
PNP specification



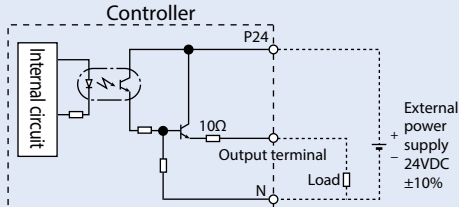
Output Part External Output Specifications

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 control mode I/O signals

The signal assignments of the flat cable in the pulse-train control mode is as shown in the table below.

Connect external equipment (such as PLC) according to this table.

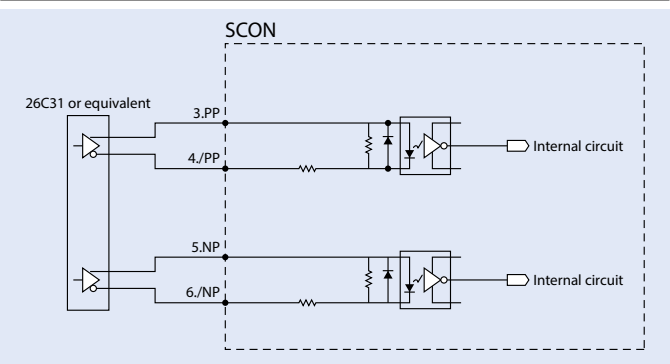
Pin No.	Classification	I/O No.	Signal code	Signal name	Parameter No. 25 "PIO pattern 6/7"
1A	24V		P24	Power	Power for I/O +24V
2A	24V		P24	Power	Power for I/O +24V
3A	Pulse input		PP	Differential pulse-train input (+)	Input differential pulses from host. Possible up to 200kpps.
4A			/PP	Differential pulse-train input (-)	
5A	Input	IN0	SON	Servo ON	Servo ON while ON, Servo OFF while OFF.
6A		IN1	RES	Reset	Alarm is reset by signal ON
7A		IN2	HOME	Home return	Home return motion by signal ON
8A		IN3	TL	Torque limit selection	The motor torque is limited to the parameter set value by signal ON.
9A		IN4	CSTP	Forced stop	The actuator is stopped forcibly by continuous ON over 16ms. It is decelerated to a stop and the servo is turned OFF according to the torque set by inside the controller.
10A		IN5	DCLR	Deviation counter clear	This signal clears the deviation counter
11A		IN6	BKRL	Brake forced release	Releases the brake forcibly
12A		IN7	RMOD	Operation mode switch	Possible to switch the operation mode when the controller Mode switch is AUTO. (AUTO by OFF signal and MANU by ON signal)
13A		IN8	RSTR※1	Reference position move command	*1: Usable 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 standby complete	Turns ON when the control power is ready after turning the main power on.
2B		OUT1	SV	Servo ON status	Turns ON when the servo is ON.
3B		OUT2	INP	Positioning complete	Turns ON when the remaining pulse amount in the deviation counter is within the positioning width range.
4B		OUT3	HEND	Home return complete	Turns ON when the home return is complete.
5B		OUT4	TLR	Torque limited	Turns ON when the torque reaches the limit while torque is limited.
6B		OUT5	*ALM	Controller alarm status	Turns ON when the controller is in the normal state, and turns OFF at the emergency stop status.
7B		OUT6	*EMGS	Emergency stop status	Turns ON when the controller is in the emergency stop canceled status, and turns OFF in the emergency stop status.
8B		OUT7	RMDS	Operation mode status	Outputs the operation mode status. Turns ON when the controller is in manual mode.
9B		OUT8	ALM1	Alarm code output signal	Outputs the alarm code when the alarm is activated. Refer to the instruction manual for details.
10B		OUT9	ALM2		
11B		OUT10	ALM4		
12B		OUT11	ALM8		
13B		OUT12	*ALML	Minor failure alarm	Outputs when a message level alarm is activated. Turns OFF for alarm activation.
14B		OUT13	REND※1	Reference position movement complete	Turns ON when the movement to the reference position that is set in Parameter No.167 is complete.
15B		OUT14	ZONE1	Zone signal 1	Turns ON when the actuator's current position is within the range set by the parameter.
16B		OUT15	ZONE2	Zone signal 2	
17B	Pulse input		NP	Movement pulse-train input (+)	Inputs differential pulses from the host. Possible to input up to 200kpps.
18B			/NP	Movement pulse-train input (-)	
19B	0V		N	Power source	Power source 0V for I/O
20B	0V		N	Power source	Power source 0V for I/O

Note) The asterisk (*) indicates negative logic signals. Normally it is ON when the power is on, OFF when the signal is output.

Pulse-train type I/O specification (differential line driver specification) * Except for the field network specification.

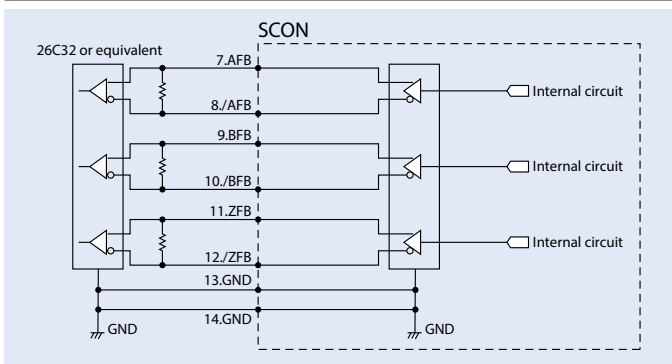
Input Part

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



Output Part

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

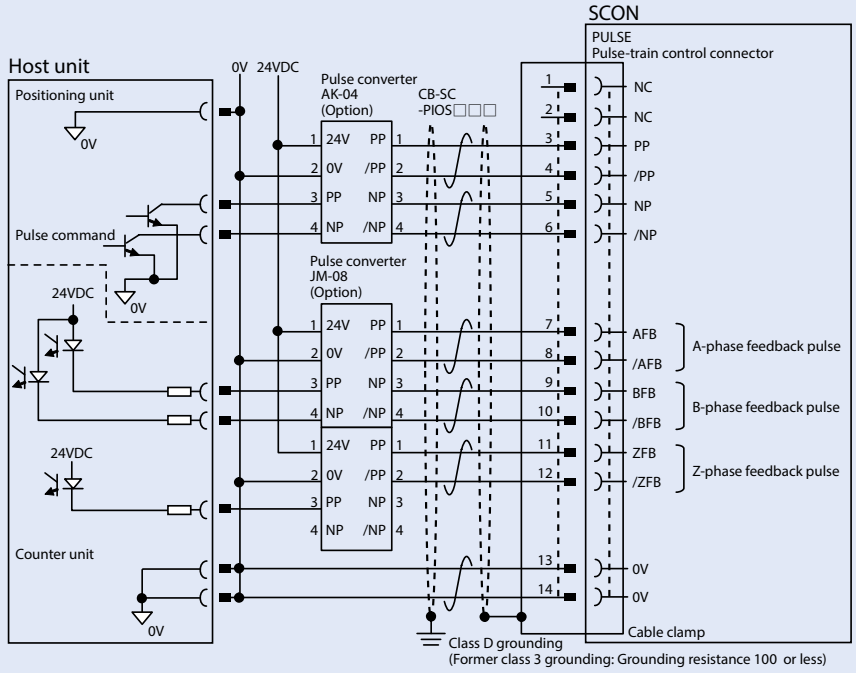


Pulse-train type I/O specification (open-collector specification)

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)





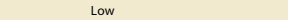
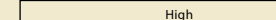
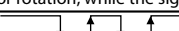
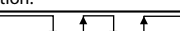


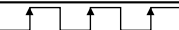
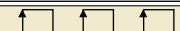

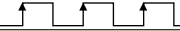
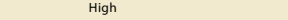



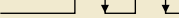

* The 24VDC power supply connected to the AK-04 must be shared with the PIO interface.
* Keep the length of the cable connecting the pulse output unit (PLC) and AK-04/JM-08 as short as possible.
Also keep the cable between the AK-04/JM-08 and PULSE connector to 2m or less.



Note

Use the same power supply for open collector 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		
	The command pulse is used for the amount of motor rotation, while the sign indicates the rotating direction.			
	Phase A/B pulse-train	PP•/PP		
NP•/NP				
Command phases A and B having a 90° phase difference (multiplier is 4) indicate the amount of rotation and the rotating direction.				
Positive logic	Forward pulse-train	PP•/PP		
	Reverse pulse-train	NP•/NP		
	Pulse-train	PP•/PP		
	Sign	NP•/NP		
	Phase A/B pulse-train	PP•/PP		
		NP•/NP		

Field network specification Operation mode Description (Except for MECHATROLINK-III and EtherCAT Motion)

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

■ Mode Description

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

■ Required Data Size for Each Network

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

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

■ List of Functions by Operation Mode

	Remote I/O mode	Position/simple direct value mode	Half direct value mode	Full direct value mode (Note 1)	Remote I/O mode 2	Position/simple direct value mode 2	Half direct value mode 2	Remote I/O mode 3	Half direct value mode 3
Number of positioning points	512	768	(No limit)	(No limit)	512	768	(No limit)	512	(No limit)
Operation by direct position data input	×	○	○	○	×	○	○	×	○
Direct speed/acceleration input	×	×	○	○	×	×	○	×	○
Push-motion operation	○	○	○	○	○	○	○	○	○
Current position read	×	○	○	○	○	○	○	○	○
Current speed read	×	×	○	○	×	×	○	×	○
Operation by position number input	○	○	×	×	○	○	×	○	×
Completed position number read	○	○	×	×	○	○	×	○	×
Force control	△(Note 2)	×	×	○	△(Note 2)	○	○	△(Note 2)	×
Damping control	○	○	×	○	○	○	×	○	○
Servo gain switching	○	○	○	○	○	○	×	○	○

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

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

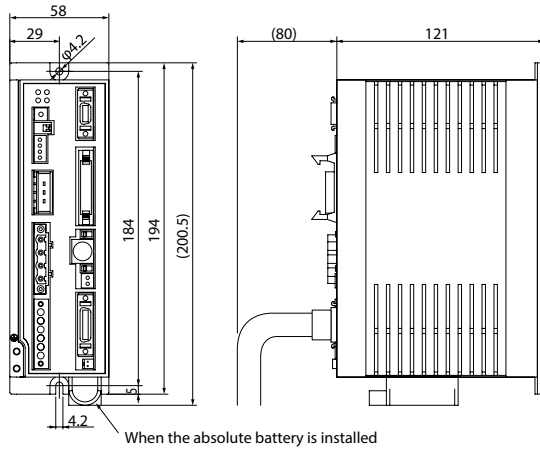
(Note 2): It can be used when the PIO pattern is set to 6 or 7.

External Dimensions

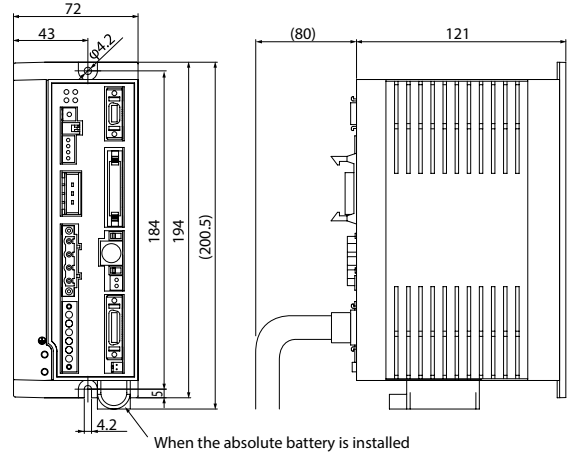
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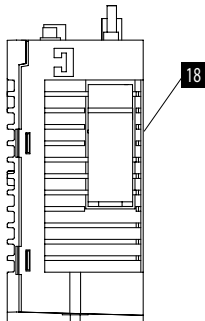
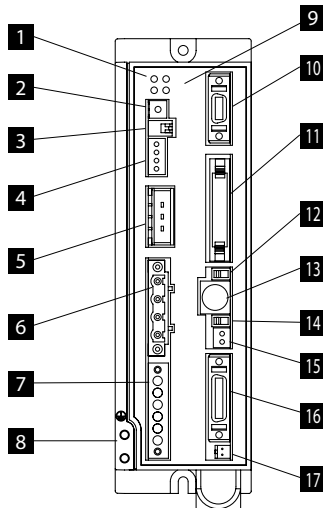
Less than 400W



400~750W



Name of each part



1 LED display

It displays the controller status.

Name	Color	Function description
PWR	Green	Turns on when system is ready (after power turned on, CPU in normal function).
SV	Green	Turns on when servo is on
ALM	Orange	Turns on when alarm issued
EMG	Red	Turns on while in emergency stop

2 Rotary switch

The address setting switch for identifying each controller when they are linked.

3 Piano switch

The controller systems switch.

Name	Function description
1	Operation mode changeover switch OFF: Positioner mode ON: Pulse-train control mode * Valid when power is turned on
2	For manufacturer tuning, always off

4 System I/O connector

The connector for the emergency stop switch etc.

5 Regenerative unit connector

The connector for regenerative units which absorb the regenerative current generated when the actuator decelerates and stops.

6 Motor connector

The actuator motor cable connector.

7 Power supply connector

The AC power connector. Divided into controller power input and motor power input.

8 Grounding terminal

The protective grounding screw. Please make sure to secure grounding.

9 I/O connector for safety function

Connector to enable STO/SSI-t function.

10 Connector for pulse-train control

It is a connector used in the operation in Pulse-Train Control Mode. Feedback pulse is valid also in Positioner Mode.

11 PIO connector

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

12 Operation mode selection switch

Name	Function description
MANU	Does not accept PIO commands
AUTO	Accepts PIO commands

* The emergency stop switch on the touch panel teaching pendant becomes effective as soon as it is connected regardless of AUTO or MANU. Also, turn the power off before disconnecting the touch panel teaching pendant and SIO communication cable.

13 SIO connector

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

14 Brake release switch

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

* It is necessary that 24V DC power supply for brake drive is connected.

15 Brake power supply connector

The connector for supplying 24VDC power to the brake. (necessary only when brake-equipped actuator is connected).

16 Encoder / Sensor connector

The encoder/sensor cable connector.

17 Absolute battery connector

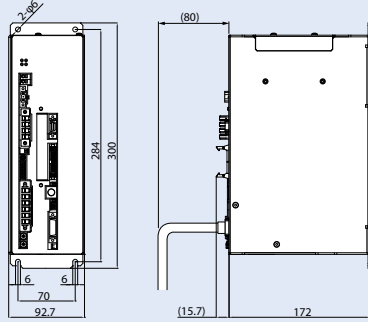
The connector for the absolute data backup battery (necessary only for absolute encoder type).

18 Absolute battery holder

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

External dimensions

For 3000W, 3300W

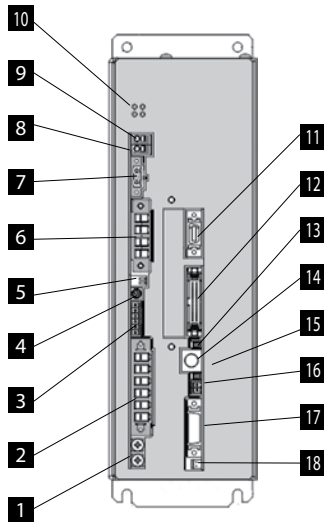


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Name of each part

[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.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

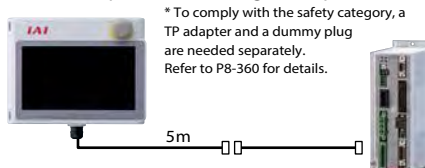
Software

Options

Touch panel teaching pendant

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

Model TB-02(D)-□ **Configuration**



Specification

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

PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model IA-OS (Software only, for customers who already own a dedicated connection cable)

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

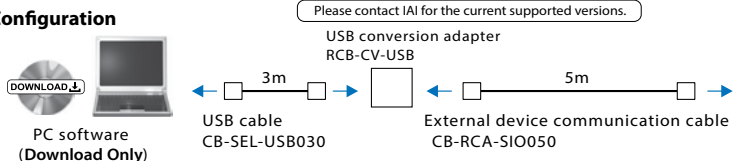
Configuration



Model IA-OS-C (Software with an external device communication cable + USB conversion adapter + USB cable)

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

Configuration



Supported Windows versions: 7/10



CAD drawings can be downloaded from our website.

www.intelligentactuator.com

2D CAD

3D CAD

* When two regenerative units are required, please use one RESU-2 and one RESU-1 (Please refer to P8-316).

Regenerative Resistance Unit

Features This unit converts the regenerative current, which is generated when the motor decelerates, into heat. Please refer to the tables below to confirm the total wattage of the actuators, and use the regenerative unit as necessary.

<For ~750W>

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

Specification

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

Necessary 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 / LSA5-N10S type is required.

Necessary Amount Guideline (RCS2-RA13R)

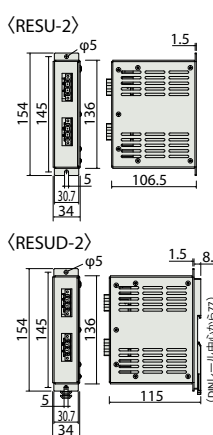
	Lead 2.5	Lead 1.25
Horizontal	1	0
Vertical	1	1

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

Necessary Amount Guideline (DD/DDA)

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

External dimensions



Specification

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

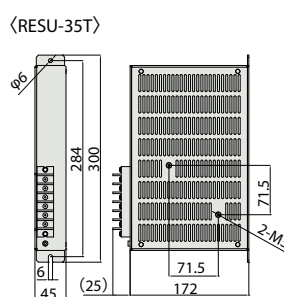
* The cable is required to be prepared by the customer.

Necessary Amount Guideline

● 3000W, 3300W

Number of connected units
2

External dimensions

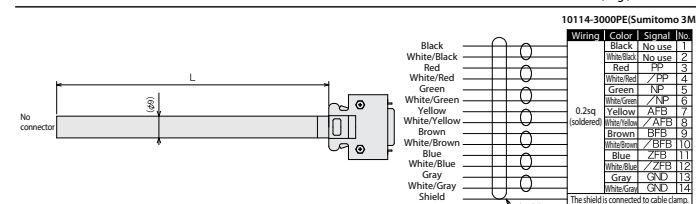


Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

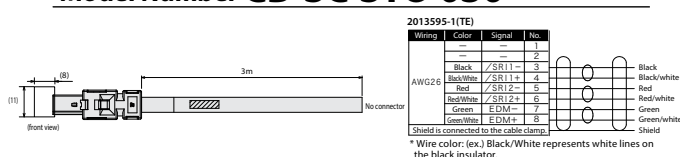
Cable for pulse-train control

Model Number CB-SC-PIOS□□□□ *Please indicate the cable length (L) in □□□, maximum 10m, e.g.) 080 = 8m



I/O cable for safety functions

Model Number CB-SC-STO 030



Absolute data backup battery

- **Features** This is an absolute data backup battery for an actuator with absolute specification.
- **Model** **Model AB-5(battery only)**
AB-5-CS(with a case)



Dummy plug (Safety category specification)

- **Features** This plug is required when the safety category specification (SCON-CGB) is used.
- **Model** **DP-5**



Dummy plug (STO/SS1-t specification)

- **Features** Necessary when STO/SS1-t function is not used.
- **Model** **DP-6**



Service connector for pulse-train control

- **Model** **Plug:**
10114-3000PE
Shell:
10314-52F0-008



System I/O connector (for under 750W type)

- **Model** **FMC1.5/4-ST-3.5**



System I/O connector (for over 3000W type)

- **Model** **FMC1.5/6-ST-3.5**



Connector for brake power

- **Model** **MC1.5/**
2-ST-3.5



AC power connector (for under 750W type)

- **Model** **MSTB2.5/**
6-STF-
5.08



AC power connector (for over 3000W type)

- **Model** **PC5/**
6-STF-
7.62



External regenerative resistance unit connector (for over 3000W type)

- **Model** **GIC2.5/**
2-STF-
7.62

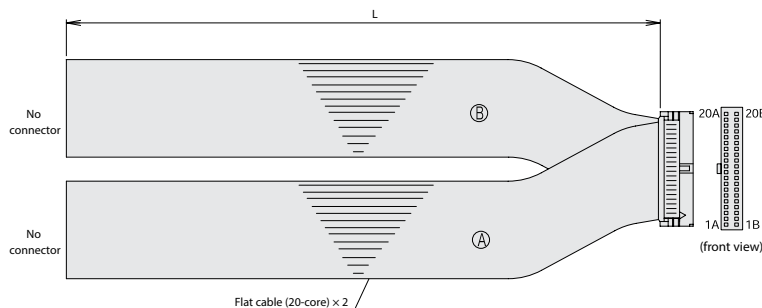


PIO flat cable

* This cable is included in the controller except when cable 0 (no cable) is selected at the model (I/O cable length).

Model Number **CB-PAC-PIO**

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



HIF6-40D-1.27R(Hirose)

No.	Signal name	Cable Color	Wiring	No.	Signal name	Cable Color	Wiring
1A	24V	Brown-1	Flat cable 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	

Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

Maintenance parts (cable)

These parts are normally included in each unit. Please order individual parts if lost or need replacing. Refer to P1-89 for the details of cables.

■ Table of Applicable Cables

Cable model search system is recommended!
URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



	Model Number	Motor Cable	Motor Robot Cable	Encoder Cable	Encoder Robot Cable
①	RCS2(CR/W)	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS3(CR)			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③	Models other than ② - ⑥			CB-RCS2-PLA□□□	CB-X2-PLA□□□
④	RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
⑤	RA13R (Standard)			CB-RCS2-PLA□□□	CB-X2-PLA□□□
⑥	RA13R (With brake)			* Between controller and brake CB-RCS2-PLA□□□	* Between controller and brake CB-RCS2-PLA□□□
⑦	CTZ5C/CT8C	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	—	CB-X1-PA□□□
⑧	RCS3			—	CB-RCS3-PLA□□□-RB
⑨	RA15R/RA20R			—	CB-X1-PA□□□
⑩	RCS4(CR)			—	CB-X3-PA□□□
⑪	No LS			—	CB-X2-PLA□□□
⑫	NS	CB-X-MA□□□	CB-X-MA□□□	—	CB-X1-PA□□□
⑬	With LS			—	CB-X3-PA□□□
⑭	LSAS			—	CB-X2-PLA□□□
⑮	N			—	CB-X1-PA□□□
⑯	S/H/L/N			—	CB-X3-PA□□□
⑰	W	CB-XMC-MA□□□	CB-XMC-MA□□□	—	CB-X2-PLA□□□
⑱	LT18□			—	CB-X3-PA□□□
⑲	LH18□			—	CB-X3-PA□□□
⑳	DDA DDACR DDW			—	CB-X3-PA□□□
㉑	LT18□			—	CB-X3-PA□□□
㉒	LH18□	CB-XEU-MA□□□	CB-XEU-MA□□□	—	CB-X3-PA□□□
㉓	DDA DDACR (with brake)			—	CB-X3-PA□□□
㉔	S/M/L			—	CB-X3-PA□□□
㉕	Models other than ① - ⑱			—	CB-X3-PA□□□
㉖	Models with LS other than ① - ⑱			—	CB-X3-PA□□□

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

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

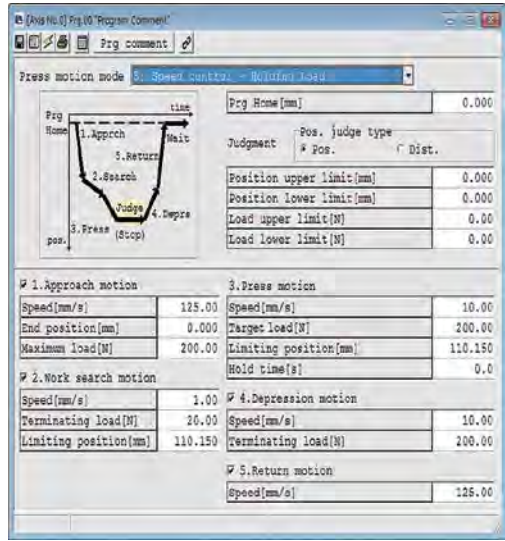
Speed control After arriving at the target position, stops while maintaining the position at the time of arrival.	Position stop
	Distance stop
	Load stop
	Incremental load stop
Force control After arriving at the target position, stops while maintaining the force at the time of arrival.	Position stop/Position 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 specified 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 an electric circuit in the controller.

For the SCON-CB, two specifications 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 Pl_e
- IEC 61508 SIL3
- IEC/EN61800-5-2
- IEC/EN62061 SIL CL3

(Note) An engineer with expert knowledge in relevant safety standards should read and understand the descriptions stated in the instruction manual before designing a safety system using this function. Beware of potential injuries and failures.

List of Models

Model number	SCON-CB/CGB									
External view										
I/O type	Standard specification	Network connection specification (option) (*2)								
	PIO connection specification (*1)	 DeviceNet connection specification	 CC-Link connection specification	 CC-Link IE Field connection specification	 PROFIBUS-DP connection specification	 CompoNet connection specification	 MECHATROLINK-1/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.

○ : 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)
---	-------------------------------

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

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

30D	30W	400	400W
60	60W	750S	750W
100	100W	3000	3000W
200	200W	3300	3300W

(Example) 60: 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

WAI	Battery-less absolute
-----	-----------------------

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.

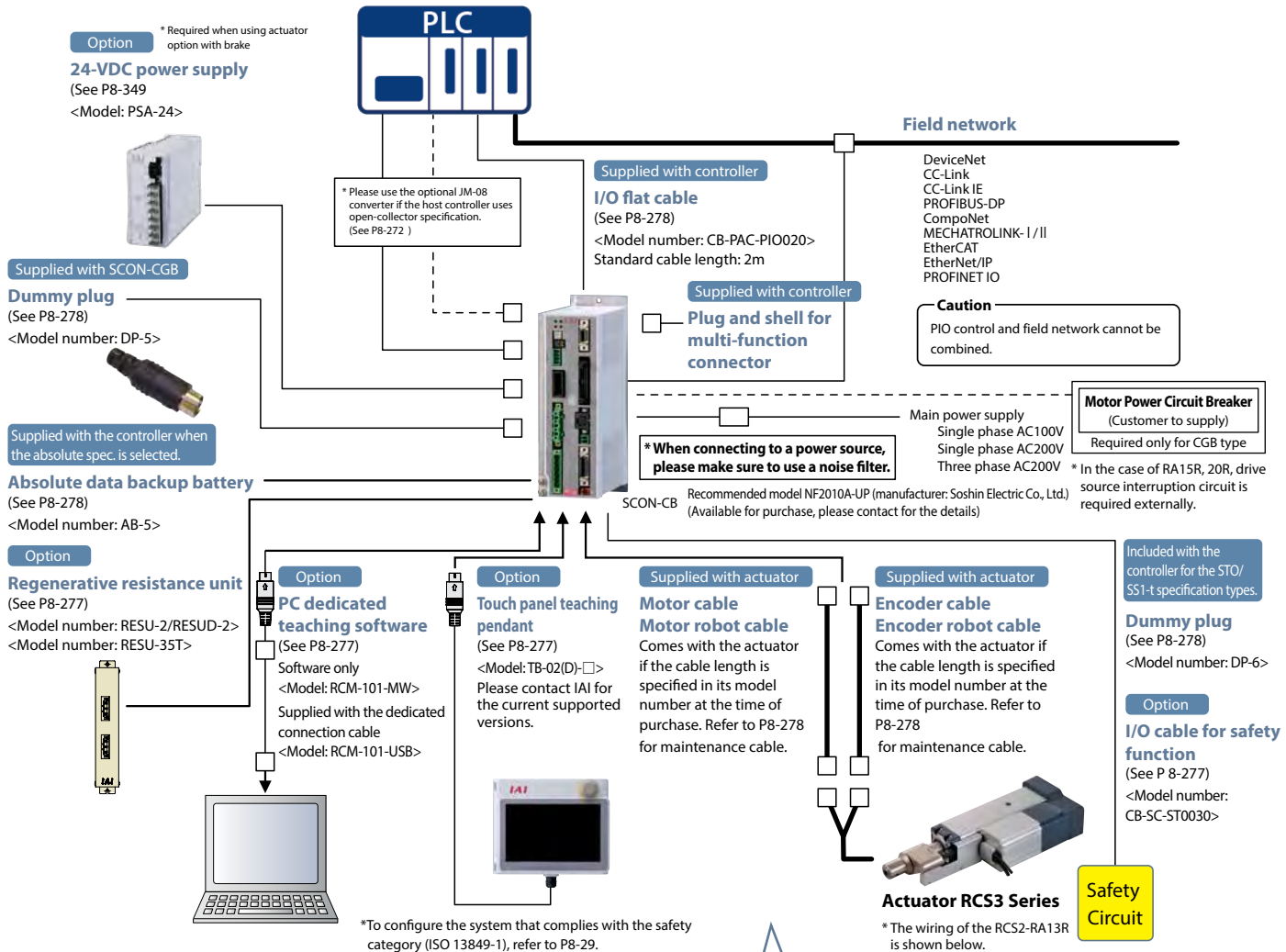
NP	PIO NPN (standard)
PN	PIO PNP
DV	DeviceNet connection
CN	CompoNet connection
CC	CC-Link connection
CIE	CC-Link IE Field connection specification
ML	MECHATROLINK-I/II (Note 1)
PR	PROFIBUS-DP
EC	EtherCAT
EP	EtherNet/IP
PRT	PROFINET IO

(Note 1) Please be sure to check P8-18 for the caution when selecting.

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

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

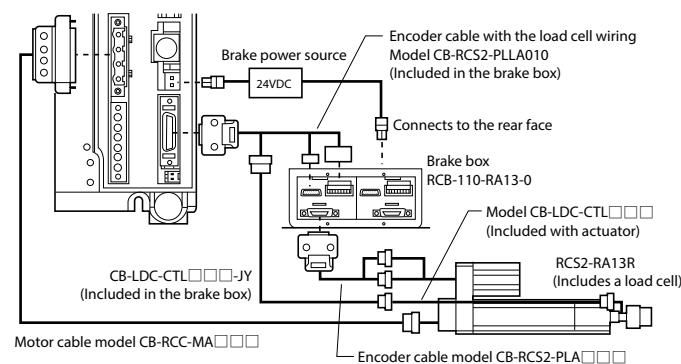
System configuration



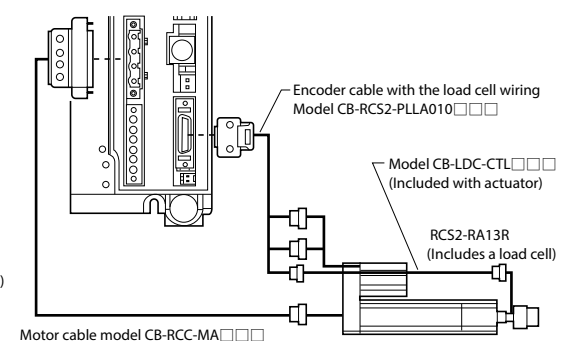
RCS2-RA13R wiring

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



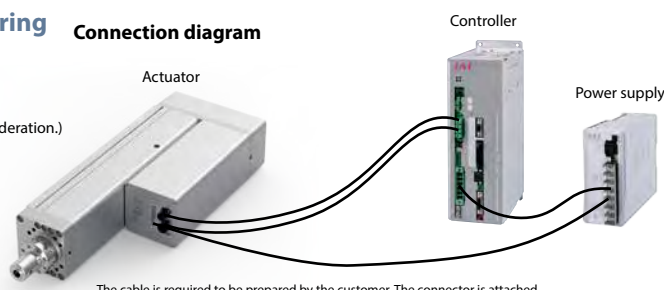
Without a Brake



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.

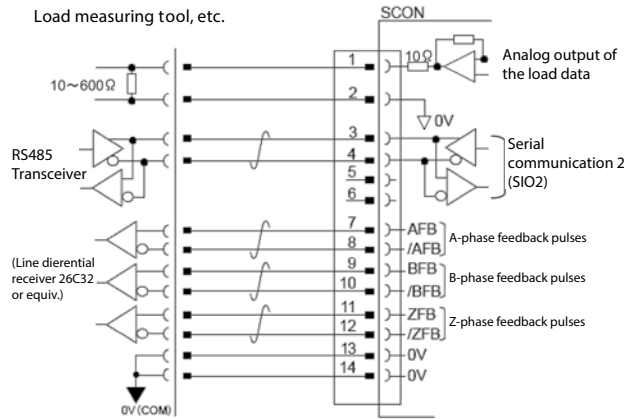
Connection diagram



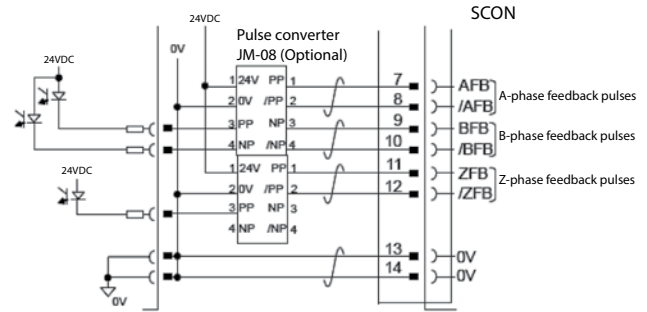
The cable is required to be prepared by the customer. The connector is attached.
* Please check the instruction manual for details.

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.



Basic specifications

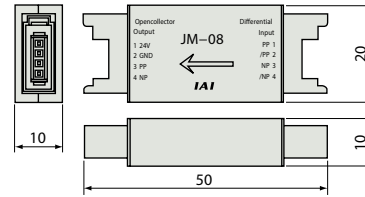
Item			Specifications	
Supported motor capacity			Less than 400W	400W~750W 3000W•3300W
Connected actuator			RCS2/RCS3 series actuator (with load cell)	
Number of controlled axes			1 axis	
Operation method			Press program type	
Backup memory			Non-volatile memory (FRAM)	
I/O connector			40-pin connector	
Number of I/O points			Input 16 points/ output 16 points	
I/O power			External supply 24VDC ±10%	
Brake supply power			External supply 24VDC ±10% (Max1A)	External supply 24VDC ±10% (Max0.1A) *Max 1.5 A must be separately supplied for Actuator
Serial communication			RS485 2ch	
Position detection methods			Incremental encoder / Absolute encoder	
Driving power shut-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°C	
Ambient operating humidity			5%RH - 85%RH (non-condensing, no frost)	
Ambient operating atmosphere			Free from corrosive gases	
Protection class			IP20	
Mass			Approx. 900g (an absolute specification is 25g heavier)	Approx. 1.2kg (an absolute specification is 25g heavier) Approx. 2.8kg (an absolute specification is 25g heavier)
External dimensions			58mm(W)×194mm(H)×121mm(D)	72mm(W)×194mm(H)×121mm(D) 92.7mm(W)×300mm(H)×172mm(D)

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



Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

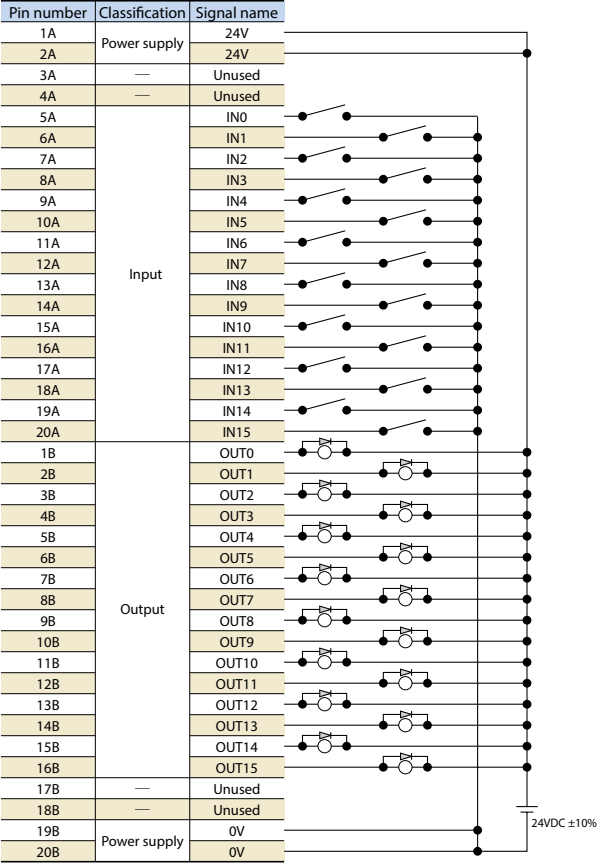
Software

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

I/O Wiring diagram

PIO connector (NPN specification)



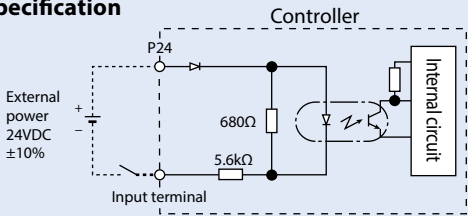
* Connect pin numbers 1A and 2A to 24V, and connect pin numbers 19B and 20B to 0V.

PIO Input/Output interface

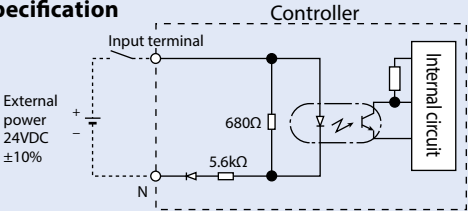
Input part External Input Specification

Item	Specification
Input voltage	24VDC $\pm 10\%$
Input current	4mA, 1 circuit
ON/OFF voltage	ON voltage, 18VDC min. OFF voltage, 60VDC max.
Isolation method	Photo-coupler

NPN specification



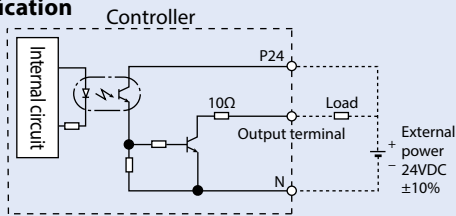
PNP specification



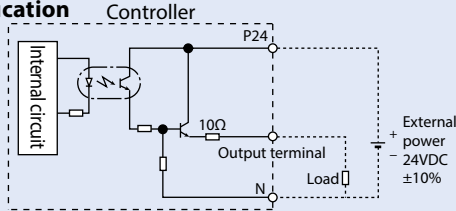
Output part Part External Output Specifications

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



Field network specification operation mode description

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

Mode Description

	Mode	Description
0	Remote I/O mode	Similar to the PIO specification, this mode operates by directing bytes to ON/OFF via a network. The number of positioning points and functions will vary depending on the operation patterns (PIO patterns) set by the controller's parameters.
1	Full direct value mode	In addition to servo press functions such as start of press program and determination result reading, it supports all functions such as direct numerical movement and current load data reading.
2	Press direct value mode	This is an operation mode that designates the "press stage" of a press program by direct value. Press direct value motions and positioning direct value motions are possible.

Required Data Size for Each Network

	Mode	DeviceNet	CompoNet	CC-Link	CC-Link IE Field	MECHATROLINK I, II	PROFIBUS-DP	EtherCAT	EtherNet/IP	PROFINET IO
0	Remote I/O mode	2 byte	2 byte	1 station	4 words	2 byte	2 byte	2 byte	2 byte	2 byte
1	Full direct value mode	32 byte	32 byte	4 stations	16 words	× (Note 1)	32 byte	32 byte	32 byte	32 byte
2	Press direct value mode	32 byte	32 byte	4 stations	16 words	× (Note 1)	32 byte	32 byte	32 byte	32 byte

(Note 1) Please 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)	Press direct value mode (Note 1)
Operation by position data input	×	○	○
Direct speed/acceleration input	×	○	○
Press load direct command	×	×	○
Current position reading	×	○	○
Current speed reading	×	○	○
Operation by program No. input	○	○	○
Judgment result reading	○	○	○
Current speed read	×	○	○
Overload level monitor	×	○	○
Servo gain switching	○ (*1)	○ (*1)	○

(*1) One servo gain can be registered in one press program.

(Note 1) MECHATROLINK does not support the full function mode and press direct value mode.

○ : Available
× : Unavailable

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

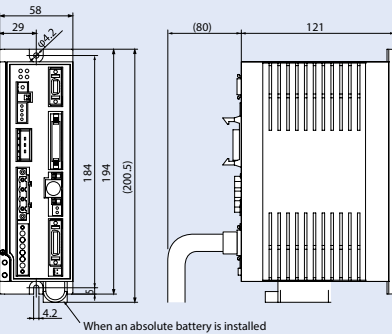
Pin No.	Signal name	Name	Description
1	NC	—	Do not connect.
2	NC	—	Do not connect.
3	/SRI1-	Safety request input signal 1	Input the safety request input signal 1 ON (conduction): Release of the request for operating safety function. OFF (release): Request for operating safety function
4	/SRI1+		
5	/SRI2-	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+		

External Dimensions

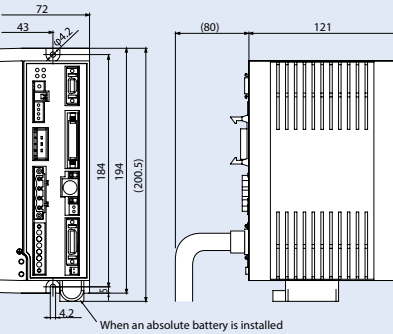
CAD drawings can be downloaded from our website.
www.intelligentactuator.com



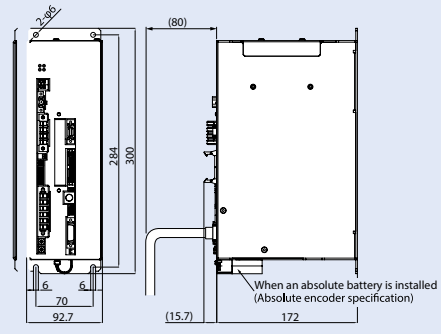
Less than 400W



400W~750W

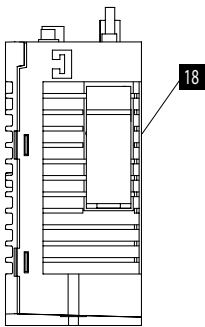
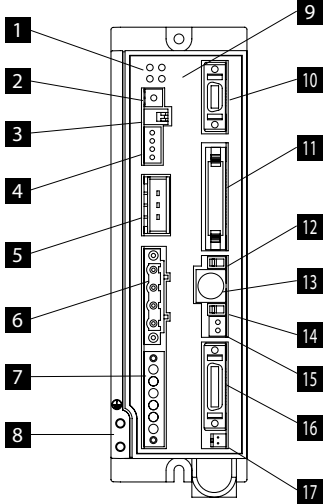


For 3000W, 3300W



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).

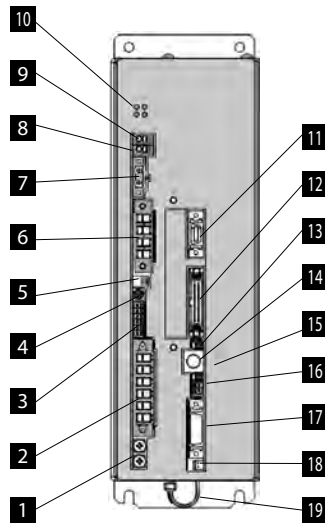
18 Absolute battery holder

(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 Absolute battery holder (comes with absolute specifications)

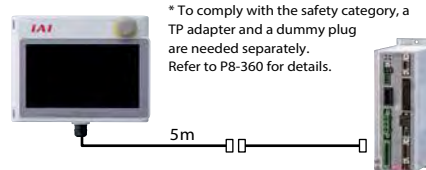
Battery holder used to hold the absolute data backup battery.

Options

Touch panel teaching pendant

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

Model TB-02(D)-□ **Configuration**



Specification

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

PC dedicated teaching software (Windows only)

Features This start-up support software provides functions such as position teaching, trial operation, and monitoring. It provides a complete range of functions required to make adjustments, to help reduce start-up time.

Model IA-OS (Software only, for customers who already own a dedicated connection cable)

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

Configuration



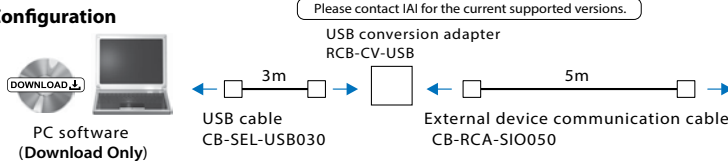
Supported Windows versions: 7/10



Model IA-OS-C (Software with an external device communication cable + USB conversion adapter + USB cable)

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

Configuration



Regenerative Resistance Unit

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

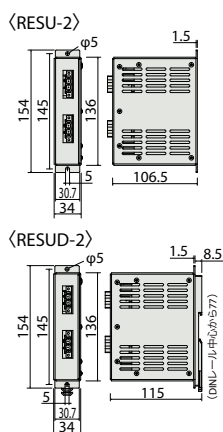
* The required regenerative resistance may be more than as specified above depending on the operating conditions.
* The guide of the linear servo actuator is same as the above table. However, one LSA / LSAS-N10S type is required.

Necessary Amount Guideline (RCS2-RA13R)

	Lead 2.5	Lead 1.25
Horizontal	1	0
Vertical	1	1

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

External dimensions



<For 3000W ~ 3300W>

Model RESU-35T

Specification

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

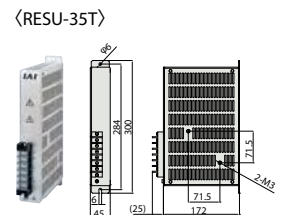
* The cable is required to prepare by the customer.

Necessary Amount Guideline

● For 3000W		● For 3300W	
Cycle time	Number of connected units	Cycle time	Number of connected units
12sec or more	No need	2.5sec or more	No need
6~12sec	1	Less than 2.5sec	1
3.5~6sec	2		
3.5sec or less	(Note)		

* The required number varies depending on operating conditions.
(Note) Please inquire when a cycle time of 3.5 sec or less is assumed.

External dimensions

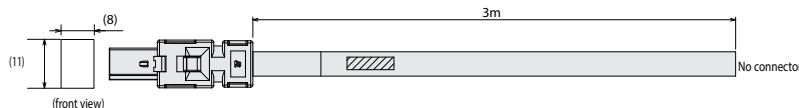


Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

I/O cable for safety functions

Model CB-SC-STO 030



2013595-1(TE)

Wiring	Color	Signal	No.
—	—	—	1
—	—	—	2
Black	/SR11-	3	
Black/White	/SR11+	4	
Red	/SR12-	5	
Red/White	/SR12+	6	
Green	EDM-	7	
Green/White	EDM+	8	

* Wire color: (ex.) Black/White represents white lines on the black insulator.

Absolute data backup battery

- **Features** This is an absolute data backup battery for an actuator with absolute specification.
- **Model** **Model AB-5(battery only)**
AB-5-CS(with a case)



Dummy plug (Safety category specification)

- **Features** This plug is required when the safety category specification (SCON-CGB) is used.
- **Model** **DP-5**



Dummy plug (STO/SS1-t specification)

- **Features** Necessary when STO/SS1-t function is not used.
- **Model** **DP-6**



Service connector for pulse-train control

- **Model** **Plug:**
10114-3000PE
Shell:
10314-52F0-008



System I/O connector (for under 750W type)

- **Model** **FMC1.5/4-ST-3.5**



System I/O connector (for over 3000W type)

- **Model** **FMC1.5/6-ST-3.5**



Connector for brake power

- **Model** **MC1.5/**
2-ST-3.5



AC power connector (for under 750W type)

- **Model** **MSTB2.5/**
6-STF-
5.08



AC power connector (for over 3000W type)

- **Model** **PC5/**
6-STF-
7.62



External regenerative resistance unit connector (for over 3000W type)

- **Model** **GIC2.5/**
2-STF-
7.62

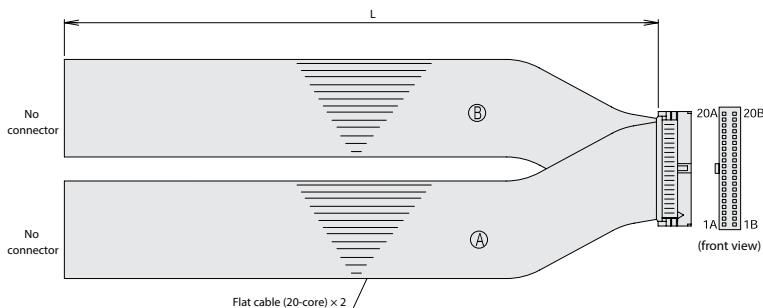


PIO flat cable

* This cable is included in the controller except when cable 0 (no cable) is selected at the model (I/O cable length).

Model Number **CB-PAC-PIO**

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



HIF6-40D-1.27R(Hirose)

No.	Signal name	Cable Color	Wiring	No.	Signal name	Cable Color	Wiring
1A	24V	Brown-1	Flat cable ① (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	

Maintenance parts (cable)

These parts are normally included in each unit. Please order individual parts if lost or need replacing.
Refer to P1-89 for the details of cables.

Cable model search system is recommended!

URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



Table of Applicable Cables

	Model Number	Motor Cable	Motor Robot Cable	Encoder cable	Encoder robot cable
RCS3	RA4R	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PLDA□□□□	CB-RCS2-PLDA□□□□-RB
	RA6R				
	RA7R				
	RA8R				
	RA10R				
	RA15R	—	CB-RCS3-MA□□□□-RB	—	CB-RCS3-PLA□□□□-RB
	RA20R				
RCS2	RA13R (With brake / load cell specification)	CB-RCC-MA□□□□	CB-RCC-MA□□□□-RB	CB-RCS2-PLA□□□□ * Between controller and brake CB-RCS2-PLLA □□□□ * Between the load cell and controller: CB-LDC-CTL□□□□-JY	CB-X2-PLA□□□□ * Between controller and brake CB-RCS2-PLLA□□□□-RB
	RA13R (No brake / Load cell specification)			CB-RCS2-PLLA□□□□	CB-RCS2-PLLA□□□□-RB

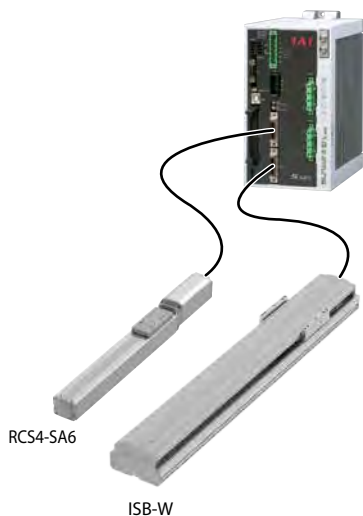
SSEL

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



1 Compact size

Small program controller to which 200V servo actuators can be connected up to 2 axes.

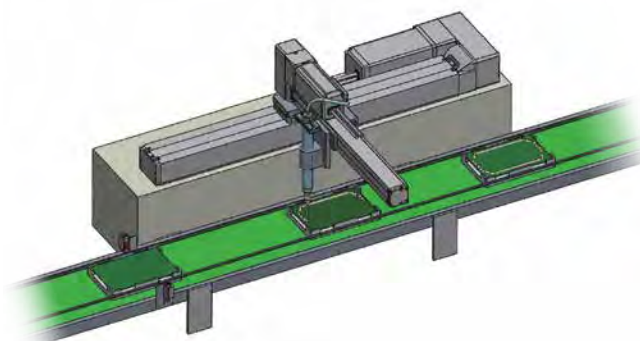


Models equipped with a 200V motor



2 High-accuracy function

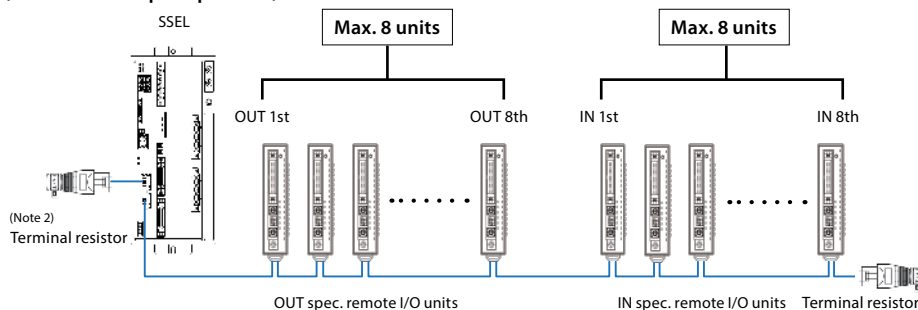
Interpolation and synchronized motions are possible when positioning.



3 Connection with the external expansion I/O slots

Possible to connect with the remote I/O unit.

A total of 16 units can be added: up to 8 units for input (max.256 input points) and up to 8 units for output (max. 256 input points).



Program controller for operating 200V servo actuators. One unit can handle various controls.

○ : Available

Models
not shown
here

RCON

RSEL

REC

RSEL

BCON

PCON

ACON CB

ACON

SCON

SCON

YSEI

YSEI

YCEI

TR

(Ex.) 12: compatible with servomotor

System configuration

Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL

(Cartesian 6-axis)

RCP6S

PCON

-CB/CFB

PCON

-CBP

(Pulse press)

PCON

ACON-CB

DCON-CB

ACON

DCON

SCON

-CB

SCON

-CB

(Servo press)

SSEL

MSEL

XSEL

-RA/SA

XSEL

-P/Q

XSEL

(SCARA)

PSA-24

TB

-03/02

Software

Option

Touch panel teaching pendant

(See P8-289)

<Model: TB-02(D)-□-□ >



Option

Dummy plug

(See P8-290)

<Model number: DP-4S>

Supplied with IA-101-X-USBS



Option

Adapter cable

(See P8-254)

<Model: CB-SEL-SJS002>

(Supplied with TB-02-SJ/IA-101-X-MW-JS)



Included in the controller

AC power connector

(See P8-290)

<Model: MSTB2.5/6-STF-5.08>



Included in the controller

System I/O short circuit connector

(See P8-290)

<Model: FMC1.5/4-ST-3.5(SSEL-EMG)>



Included in the controller

ENA/BK connector

(See P8-290)

<Model: FMC1.5/4-ST-3.5(SSEL-ENB)>



Option *1

System Memory Backup Battery

(See P8-290)

<Model: AB-5-CS (with case)>

<Model: AB-5 (stand-alone battery)>

*1 The system memory backup battery is a required feature if you wish to retain data such as flags used in programs even after the power has been shut off.



ROBO Cylinder RCS2/RCS3/RCS4 series / Single-axis robot / Cartesian robot / Linear servo actuator



Supplied with controller

I/O flat cable

(See P8-290)

<Model: CB-DS-PIO020>

2m

Field Network

DeviceNet,CC-Link,
PROFIBUS-DP,EtherNet/IP

Option

Regenerative resistor unit

(See P8-289)

<Model: RESU-2/RESUD-2>



Option

Panel Unit

(See P8-289)

<Model: PU-1>



1m

Cable for regenerative resistor unit

<Model: CB-SC-REU010>

Supplied with the regenerative resistor unit

3m

Option

Remote I/O Unit

(See P8-289)

<Model: EIOU-1-□-□>



Main power supply
Single-phase AC100V
Single-phase AC200V

*** Always use a noise filter when connecting power.**

Recommended: NF2010A-UP (manufacturer: Soshin Electric)
(Available through IAI. Please inquire for details.)

Included with absolute type controller

Absolute Data Backup Battery

(See P8-290)

<Model: AB-5>

Supplied with the actuator

Motor Cable

Motor Robot Cable

The cable will be supplied if the cable length is specified at the actuator model.
For a replacement cable, see P8-290.

Supplied with the actuator

Encoder Cable

Encoder Robot Cable

The cable will be supplied if the cable length is specified at the actuator model.
Refer to P8-290 for maintenance cable.

(Note) To configure the system that complies with the safety category (ISO 13849-1), refer to P8-29.

Basic specifications

Item		Specification	
Input power		Single-phase 100V input spec.	Single-phase 200V input spec.
Number of controlled axes		1 axis / 2 axes	
Supported motor capacity		20W~750W	
Total connectable wattage		400W	800W
Control power voltage		Single-phase AC100V ~ 115V±10%	Single-phase AC200V ~ 230V±10%
Motor driving power voltage		Single-phase AC100V ~ 115V±10%	Single-phase AC200V ~ 230V±10%
Power frequency		50Hz/60Hz±5%	
Rush current	Control power	15A	30A
	Motor driving power	37.5A	75A
Leak current		1.0mA or less	
PIO power		DC24V ±10% (supplied from external)	
Power capacity for electromagnetic brake (actuator with brake)		DC24V ±10% rated 0.5A, Max. 1A	DC24V ±10% rated 1A, Max. 2A
Heat quantity for electromagnetic brake (actuator with brake)		12W	24W
Momentary power failure resistance		10ms (power frequency 50Hz), 8ms (power frequency 60Hz)	
Motor control method		AC servo	
Supported encoders		Incremental encoder, absolute encoder, battery-less absolute encoder	
Serial communication interface		RS-232C Dedicated protocol (AUTO mode) or teaching tool connector	
USB interface		Dedicated protocol (AUTO mode) or teaching tool connector	
Communication cable length	RS-232C	15m or less	
	USB	5m or less	
External interface	PIO spec.	DC24V dedicated signal input/output (I/O points or NPN/PNP selectable) Input 24 points (total of dedicated inputs + general inputs) Output 8 points (total of dedicated outputs + general outputs)	
	Field network spec.	DeviceNet, CC-Link, PROFIBUS-DP, EtherNet/IP	
Data setting and input method		PC-compatible teaching software or teaching pendant	
Program language		SEL language	
Maximum number of program steps		9999 steps (2000 steps when memory capacity not expanded)	
Maximum number of positions		20000 positions (1500 positions when memory capacity not expanded)	
Maximum number of programs		128 programs (64 programs when memory capacity not expanded)	
Maximum number of multi-task programs		8 programs	
Data storage memory		Flash ROM, System memory backup (optional)	
System I/O		Emergency stop input, safety gate input, brake power input	
Safety circuit configuration	Driving power shutoff method	Internal relay	
	Emergency stop input	B-contact (normally closed), input (internal power supply)	
	Enable input	B-contact (normally closed), input (internal power supply)	
Protective functions		Motor over current, motor over load, motor driver temperature check, encoder disconnection detection, software limit over, system abnormal, battery abnormal	
Regenerative resistance		kW/20W built-in regenerative resistance, expandable by external regenerative resistance.	
Insulation resistor		100MΩ or more (DC500V between power connector and input/output connector, and between external connectors in bulk and case)	
Dielectric strength voltage		AC1500V, one minute	
Cooling method		Forced air cooling	
Environment	Ambient operating temperature	0 - 40°C	
	Ambient operating humidity	10%RH - 95%RH (non-condensing)	
	Vibration resistance	Each of XYZ directions 10-57Hz, one-side width 0.035mm (cont.), 0.075mm (intermittent), 57-150Hz 4.9m/s ² (cont.), 9.8m/s ² (intermittent)	
	Degree of protection	IP20	
Mass		1380g	

Power capacity and heat quantity

Calculate the power capacity and heat quantity using the formula below.

Rated power capacity [VA] = 1st axis rated motor power capacity [VA] + 2nd axis rated motor power capacity [VA] + control power capacity [VA]

Momentary maximum power capacity [VA] = 1st axis momentary maximum motor power capacity [VA] + 2nd axis momentary maximum motor power capacity [VA] + control power capacity [VA]

Rated heat quantity [W] = 1st axis motor rated heat quantity [W] + 2nd axis motor rated heat quantity [W] + control power heat quantity [W]

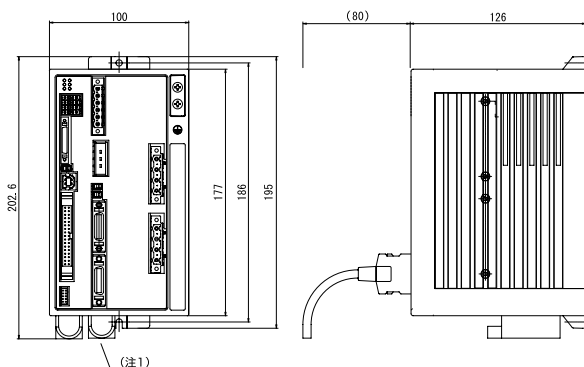
Power capacity and heat quantity of actuators

Actuator motor wattage [W]	Motor power capacity [VA]	Momentary maximum motor Power capacity [VA]	Motor power Rated heat quantity [W]
20	26	78	1.6
30	46	138	2.1
60	138	415	3.9
100	234	701	6.1
150	328	984	8.3
200	421	1263	9.1
400	796	2388	19.8
600	1164	3492	27.2
750	1521	4564	29.8
100 (Linear actuator S6SS)	101	303	3.7
100 (Linear actuator S8SS)	159	477	4.1
100 (Linear actuator S8HS)	216	648	3.8
100 (Linear actuator N10SS)	379	1137	4.5
200 (Linear actuator S10SS)	343	1029	5.3
200 (Linear actuator S10HS)	417	1251	5.0
200 (Linear actuator H8SS)	189	567	5.4
200 (Linear actuator H8HS)	379	1137	5.4
200 (Linear actuator L15SS)	189	567	5.4
200 (Linear actuator N15SS)	486	1458	4.4
200 (Linear actuator N15HS)	773	2319	6.4
300 (Linear actuator N19SS)	662	1986	11.6
400 (Linear actuator W21SS)	920	2760	16.7

Control power capacity and heat quantity of the actuator

Controller power capacity [VA]	Control power capacity heat quantity [W]
60	36

External dimensions

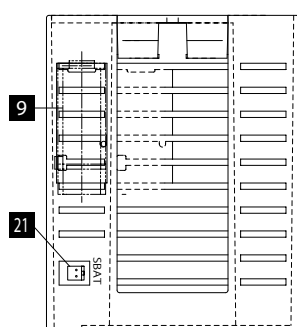
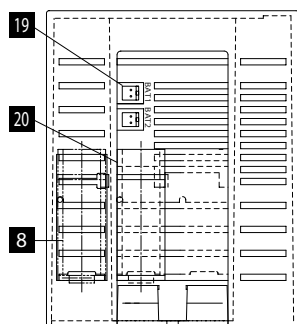
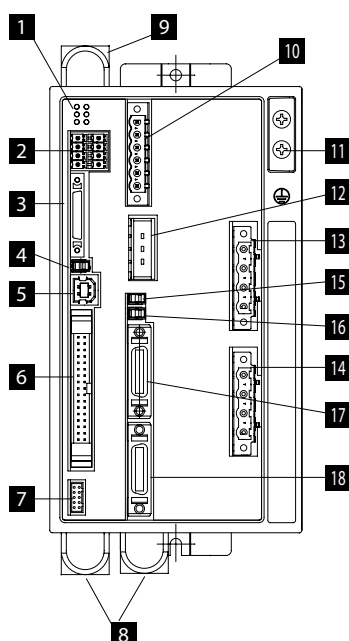


(Note 1) Absolute data back-up battery.
Not installed with incremental specification.

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



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

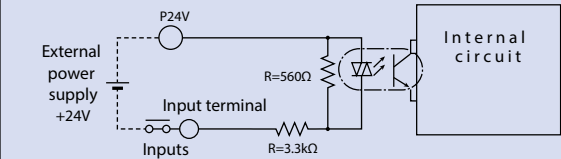
A connector for the system-memory backup battery.

I/O Specifications

Input Section External input specifications

Item	Specifications
Input voltage	24VDC ±10%
Input current	7mA / circuit
ON/OFF voltage	ON voltage (min.) OFF voltage (max.)
Isolation method	Photocoupler

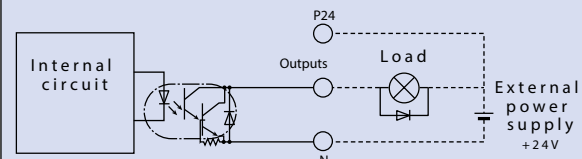
NPN Specifications



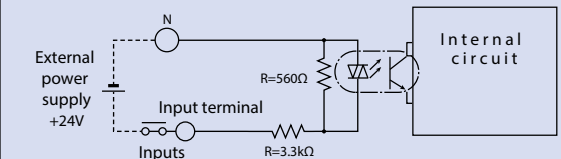
Output Section

Item	Specifications
Load voltage	24VDC
Max. load current	100mA / point, 400mA / 8 points total
Leakage current (max.)	Max. 0.1mA / point
Isolation method	Photocoupler

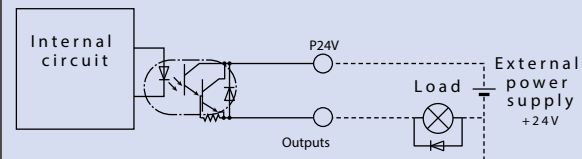
NPN Specifications



PNP Specifications



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.	

Positioner standard mode

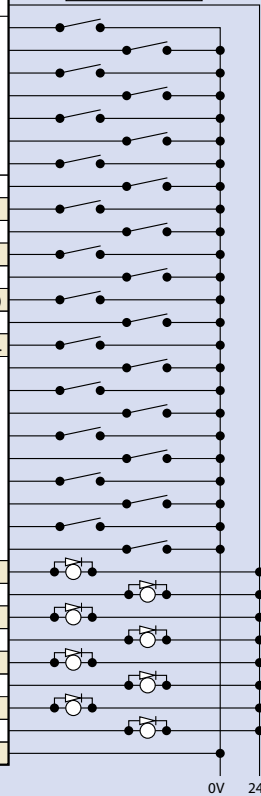
Pin No.	Category	Port No.	Positioner Standard Mode	Functions	Wiring diagram
1A	Input		24V input	Connect 24V.	

Explanation of I/O signal functions

Positioner, Product-Type Change Mode

Pin No.	Category	Port No.	Program mode	Functions
1A	P24		24V Input	Connect 24V.
1B	Input	016	Position/product Type Input 10	Specifies the position numbers to move to, and the product type numbers, using port 007 to 022. The position and product type numbers are assigned by parameter settings. The number can be specified either as BCD or binary.
2A		017	Position/product Type Input 11	
2B		018	Position/product Type Input 12	
3A		019	Position/product Type Input 13	
3B		020	Position/product Type Input 14	
4A		021	Position/product Type Input 15	Resets minor errors. (Severe errors require a restart.)
4B		022	Position/product Type Input 16	
5A		023	Error reset	Starts moving to selected position.
5B		000	Start	Performs a home return.
6A		001	Home return	Switches between Servo ON and OFF.
6B		002	Servo ON	Performs a push motion.
7A		003	Pushing	Pauses the motion when turned OFF, and resumes motion when turned ON. (Contact B)
7B		004	Pause	Stops the motion when turned OFF. The remaining motion is cancelled. (Contact B)
8A		005	Cancel	When this signal is turned ON for a 2-axis model, the actuator moves by linear interpolation.
8B		006	Interpolation setting	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.
9A		007	Position/product Type Input 1	
9B		008	Position/product Type Input 2	
10A		009	Position/product Type Input 3	
10B		010	Position/product Type Input 4	
11A	Output	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	Turns on when the controller starts up normally and is in an operable state.
12B		014	Position/product Type Input 8	Turns on when moving to the specified position is completed.
13A		015	Position/product Type Input 9	Turns on when returning to the home position is completed.
13B		300	Alarm	Turns on when servo is ON.
14A		301	Ready	Turns on when push motion is complete.
14B		302	Positioning complete	Turns on the alarm level when the system battery runs low.
15A		303	Home position complete	Turns on the alarm level when the absolute battery runs low (warning level).
15B		304	Servo ON output	Connect 0V.
16A		305	Pushing complete	
16B		306	System battery error	
17A	N	307	Absolute battery error	
17B			0V Input	

Wiring diagram

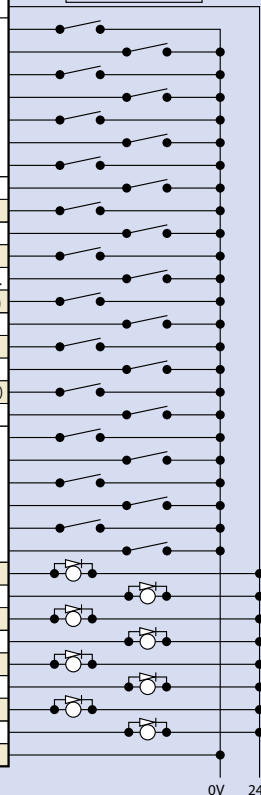


0V 24

Positioner, 2-axis Independent Mode

Pin No.	Category	Port No.	Program mode	Functions
1A	P24		24V Input	Connect 24V.
1B	Input	016	Position Input 7	Specifies the position numbers to move to, using port 010 to 022. The position numbers on the 1st and 2nd axes are assigned by parameter settings. The number can be specified either as BCD or binary.
2A		017	Position Input 8	
2B		018	Position Input 9	
3A		019	Position Input 10	
3B		020	Position Input 11	
4A		021	Position Input 12	Resets minor errors. (Severe errors require a restart.)
4B		022	Position Input 13	
5A		023	Error reset	Starts moving to selected position on the first axis.
5B		000	Start 1	Performs a home return on the 1st axis.
6A		001	Home return 1	Switches over the servo ON/OFF for the 1st axis.
6B		002	Servo ON 1	Performs a push motion on 1st axis and resumes motion when turned ON (B contact).
7A		003	Pause 1	Stops the motion on the 1st axis when turned OFF. The remaining motion is cancelled. (Contact B)
7B		004	Cancel 1	Starts the movement to the selected position number on the 2nd axis.
8A	Output	005	Start 2	Performs home return on the 2nd axis.
8B		006	Home return 2	Switches between servo ON and OFF for the 2nd axis.
9A		007	Servo On 2	Pauses the motion on 2nd axis when turned OFF, and resumes when turned ON. (Contact B)
9B		008	Pause 2	Cancels the movement on the 2nd axis. (Contact B)
10A		009	Cancel 2	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.
10B		010	Position input 1	
11A		011	Position input 2	
11B		012	Position input 3	
12A		013	Position input 4	
12B		014	Position input 5	Turns on when an alarm occurs. (Contact B)
13A		015	Position input 6	
13B	Output	300	Alarm	Turns on when the controller starts up normally and is in an operable state.
14A		301	Ready	Turns on when the movement to the specified position on the 1st axis is complete.
14B		302	Positioning complete 1	Turns on when home return on the 1st axis is complete.
15A		303	Home position complete 1	Turns on when the 1st axis is in a servo ON state.
15B		304	Servo ON output 1	Turns on when the movement to the specified position on the 2nd axis is complete.
16A		305	Positioning complete 2	Turns on when home return on the 2nd axis is complete.
16B		306	Home return complete 2	Turns on when the 2nd axis is in a servo ON state.
17A		307	Servo On output 2	Connect 0V.
17B	N		0V Input	

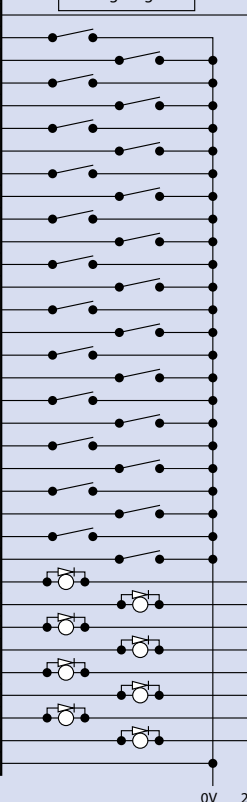
Wiring diagram



0V 24

Positioner, Teaching Mode

Wiring diagram



Models
not shown
here

Model selection

RCON

RSEL

RFC

RSEL

RCP6S

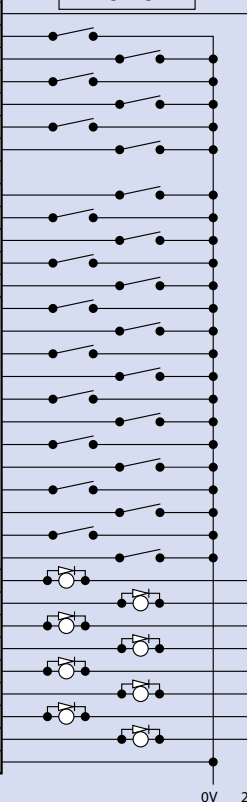
PCON
-CB/CFB

-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

Wiring diagram



ACON
DCON

SCON

SCON

(SCARA)

FSA-24

-03/02

Software

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

Options

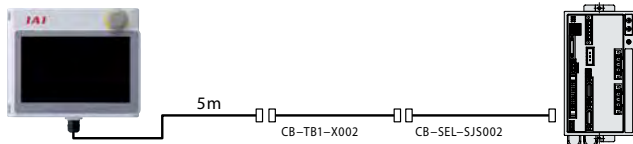
Touch Panel Teaching Pendant

Features This is a teaching device that provides information on functions such as position input, test run

Model TB-02(D)-□

* To comply with the safety category, a TP adapter and a dummy plug are needed separately. Refer to P8-360 for details.

Configuration



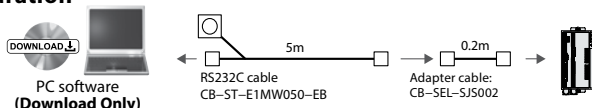
PC dedicated teaching software (Windows only)

Features A startup support software for entering programs/positions, performing test runs, and monitoring. More functions have been added for debugging, and improvements have been made to shorten the start-up time.

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

Model IA-101-X-MW-JS (including RS232C cable + adapter cable)

Configuration



Note
The CB-SEL-SJS002 cannot be used for SSEL-C (old controller).

Supported Windows: 7/8/8.1/10

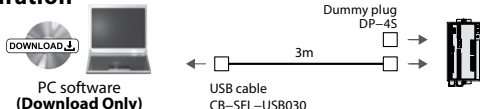


Supported Windows: 7/8/8.1/10



Model IA-101-X-USBS (including USB cable + Dummy plug)

Configuration



Note
Dummy plug DP-4S cannot be used for SSEL-C (old 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

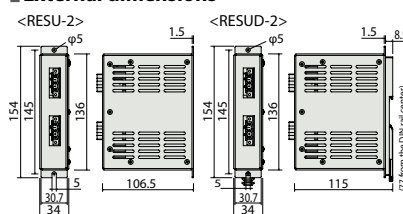
Required number of units

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

* Depending on the operating conditions, more regenerative resistors may be needed.

* When two regenerative units are required, please use one RESU-2 and one RESU-1. (See Page 8-316)

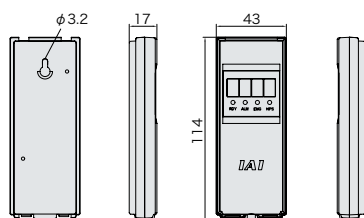
External dimensions



Panel Unit

Features Display device that shows the error code from the controller or the currently running program number.

Model PU-1 (cable length: 3m)



Remote I/O unit

Features This unit expands the number of I/O points.

Model EIOU - 1 -

Series

Type

I/O type

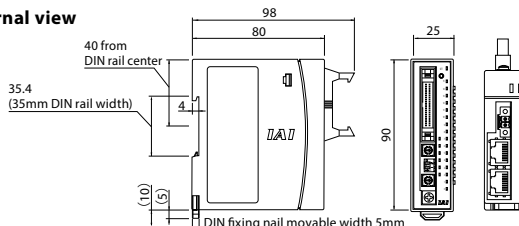
I/O cable length

N4	Input 32/NPN
N5	Output 32/NPN
P4	Input 32/PNP
P5	Output 32/PNP

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



External view



Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

AC power connector

■ Model MSTB2.5/
6-STF-5.08



*cannot be used
for SSEL-C.

System I/O short circuit connector

■ Model FMC1.5/
4-ST-3.5(SSEL-EMG)



■ Model FMC1.5/
4-ST-3.5(SSEL-ENB)



Dummy plug

■ Model DP-4S



Network connector

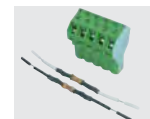
for DeviceNet

■ Model SMSTB2.5/
5-ST-5.08AU(DV)



for CC-Link
Terminal resistor with 110Ω/130Ω

■ Model SMSTB2.5/
5-ST-5.08AU(CC)



Absolute data retention battery

■ Model AB-5



System memory backup battery

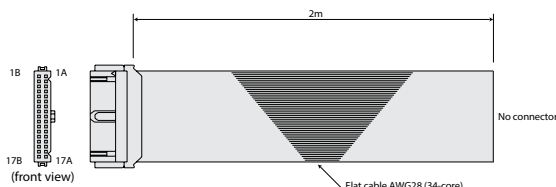
■ Model AB-5-CS (with case)
AB-5 (battery only)



NPN/PNP specification PIO flat cable

Model **CB-DS-PIO**

* Specify the cable length in .
Maximum length is 10m. Ex: 080=8m



HIF3BA-34D-2.54R(Hirose)					
No.	Color	Wire	No.	Color	Wire
1A	Brown 1	Flat cable crimped	9B	Gray 2	Flat cable crimped
1B	Red 1		10A	White 2	
2A	Orange 1		10B	Black 2	
2B	Yellow 1		11A	Brown-3	
3A	Green 1		11B	Red 3	
3B	Blue 1		12A	Orange 3	
4A	Purple 1		12B	Yellow 3	
4B	Gray 1		13A	Green 3	
5A	White 1		13B	Blue 3	
5B	Black 1		14A	Purple 3	
6A	Brown 2		14B	Gray 3	
6B	Red 2		15A	White 3	
7A	Orange 2		15B	Black 3	
7B	Yellow 2		16A	Brown-4	
8A	Green 2		16B	Red 4	
8B	Blue 2		17A	Orange 4	
9A	Purple 2		17B	Yellow 4	

Maintenance parts (cable)

After purchasing the product, when ordering replacement cables, use the model code below.

Refer to P1-89 for the details of cables.

The cable model search system is recommended!

URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



■ 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 <input type="text"/> <input type="text"/> <input type="text"/>	CB-RCC-MA <input type="text"/> <input type="text"/> <input type="text"/> -RB	CB-RCS2-PA <input type="text"/> <input type="text"/> <input type="text"/>	CB-X3-PA <input type="text"/> <input type="text"/> <input type="text"/>
②	RCS3(CR)	RT			CB-RCS2-PLA <input type="text"/> <input type="text"/> <input type="text"/>	CB-X2-PLA <input type="text"/> <input type="text"/> <input type="text"/>
③	RCS2	RA13R (without load cell/ without brake) *2			CB-RCS2-PLA <input type="text"/> <input type="text"/> <input type="text"/>	CB-X2-PLA <input type="text"/> <input type="text"/> <input type="text"/>
④		RA13R (without load cell/ with brake) *2			CB-RCS2-PLA <input type="text"/> <input type="text"/> <input type="text"/> * Between controller and brake is CB-RCS2-PLA <input type="text"/> <input type="text"/> <input type="text"/>	CB-X2-PLA <input type="text"/> <input type="text"/> <input type="text"/> * Between controller and brake is CB-X2-PLA <input type="text"/> <input type="text"/> <input type="text"/>
⑤	RCS4(CR)		CB-RCC-MA <input type="text"/> <input type="text"/> <input type="text"/>	CB-RCC-MA <input type="text"/> <input type="text"/> <input type="text"/> -RB	—	CB-X1-PA <input type="text"/> <input type="text"/> <input type="text"/>
⑥	NS	without LS	—	CB-X-MA <input type="text"/> <input type="text"/> <input type="text"/>	—	CB-X3-PA <input type="text"/> <input type="text"/> <input type="text"/>
⑦		with LS	—		—	CB-X2-PLA <input type="text"/> <input type="text"/> <input type="text"/>
⑧	LSAS	N	—		—	CB-X1-PA <input type="text"/> <input type="text"/> <input type="text"/>
⑨	LSA	S/H/L/N	—	CB-XMC-MA <input type="text"/> <input type="text"/> <input type="text"/>	—	CB-X3-PA <input type="text"/> <input type="text"/> <input type="text"/>
⑩		W	—		—	CB-X2-PLA <input type="text"/> <input type="text"/> <input type="text"/>
⑪	IS(P)WA	S/M/L	—	CB-XEU-MA <input type="text"/> <input type="text"/> <input type="text"/>	—	CB-X1-PA <input type="text"/> <input type="text"/> <input type="text"/> -WC
⑫	Models other than ① - ⑪ .		—	CB-X-MA <input type="text"/> <input type="text"/> <input type="text"/>	—	CB-X1-PA <input type="text"/> <input type="text"/> <input type="text"/> * When the cable length is over 21m, use the cable below CB-X1-PA <input type="text"/> <input type="text"/> <input type="text"/> -AWG24
⑬	Models other than ① - ⑪ with LS specification		—		—	CB-X1-PLA <input type="text"/> <input type="text"/> <input type="text"/> * When the cable length is over 21m, use the cable below CB-X1-PLA <input type="text"/> <input type="text"/> <input type="text"/> -AWG24

MSEL

Program Controller
for RCP6/RCP5/RCP4/RCP3/RCP2/IXP
Wrist Unit WU

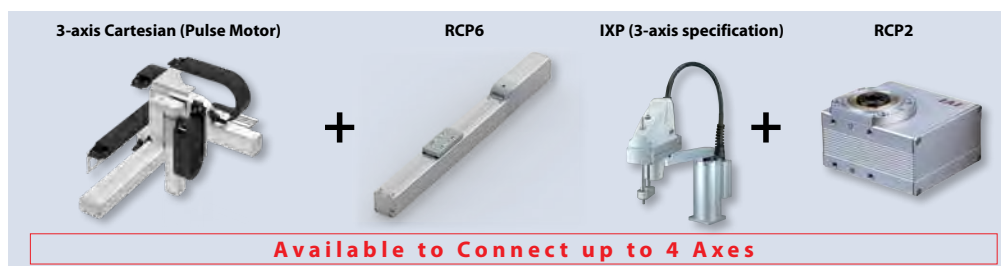


Features

1 Control Maximum of 4 Axes Available with Pulse Motor Mounted ROBO Cylinder

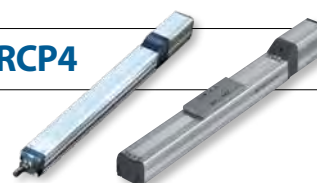
By using MSEL, four axes will be available for control. It is also available for interpolation operations, which enhances the ways of use.

Examples of Combinations



2 Available to Connect ROBO Cylinders RCP6, RCP5 and RCP4

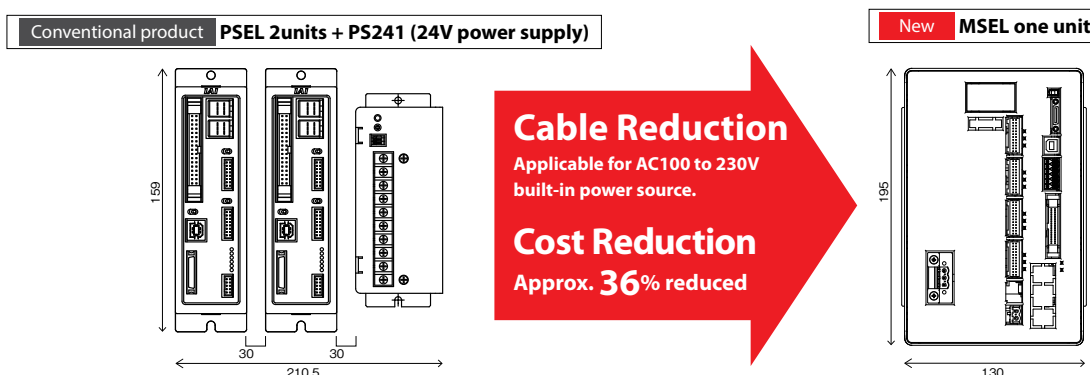
By applying to PowerCON, it is now possible to perform interpolation operations with ROBO Cylinders RCP6, RCP5 and RCP4, which are applicable for high-output driver, but were not feasible with the program controller PSEL in the past.



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.

For Connecting to Actuators with 56SP, 60P and 86P motors.

List of models

Type	PCF	PGF
Name	56SP/60P/86P Motor Type	Safety Category 56SP/60P/86P Motor Type
External view		
Number of maximum controllable axes	4	
Number of positions	30,000 points	
Power supply	Single phase AC100-230V	
Safety category	B	3 ¹¹

*1: Compliance with the Safety Category requires the customer to install a safety circuit externally to the controller.

Model specification items

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

56SP 56□

60P 60□

86P 86□

(Ex) 20P: 20□ pulse motor compatible

NOTE

One WU can be connected to one MSEL.

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.

Motor

Encoder

Option

E Not used

NP Expansion P/O board (NPN)

PN Expansion P/O board (PNP)

DV DeviceNet board

DV2 DeviceNet board (with 2-way connector)

CC CC-Link board

CC2 CC-Link board (with 2-way connector)

PR PROFIBUS-DP board

EP EtherNet/IP board

EC EtherCAT communication

PRT PROFINET IO

SE1 RS232C

SE2 RS485

IA IA Net

* If CC2 or DV2 is selected, a 2-way connector is supplied for branch wiring.

* When using the remote I/O unit (EIOU), select the IA (IA net connection board).

* When selecting SE1 and SE2, the following cables are necessary.

for SE1: CB-TTA-232□□□

for SE2: CB-TTA-485□□□(T-ERM)

Refer to P8-301 for details.

4 AC100~230

Blank Screw fixation

DN DIN rail mount

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

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

WUM WU-M

(Ex) 20P: 20□ Pulse motor compatible

* WUS and WUM use 2 axes.

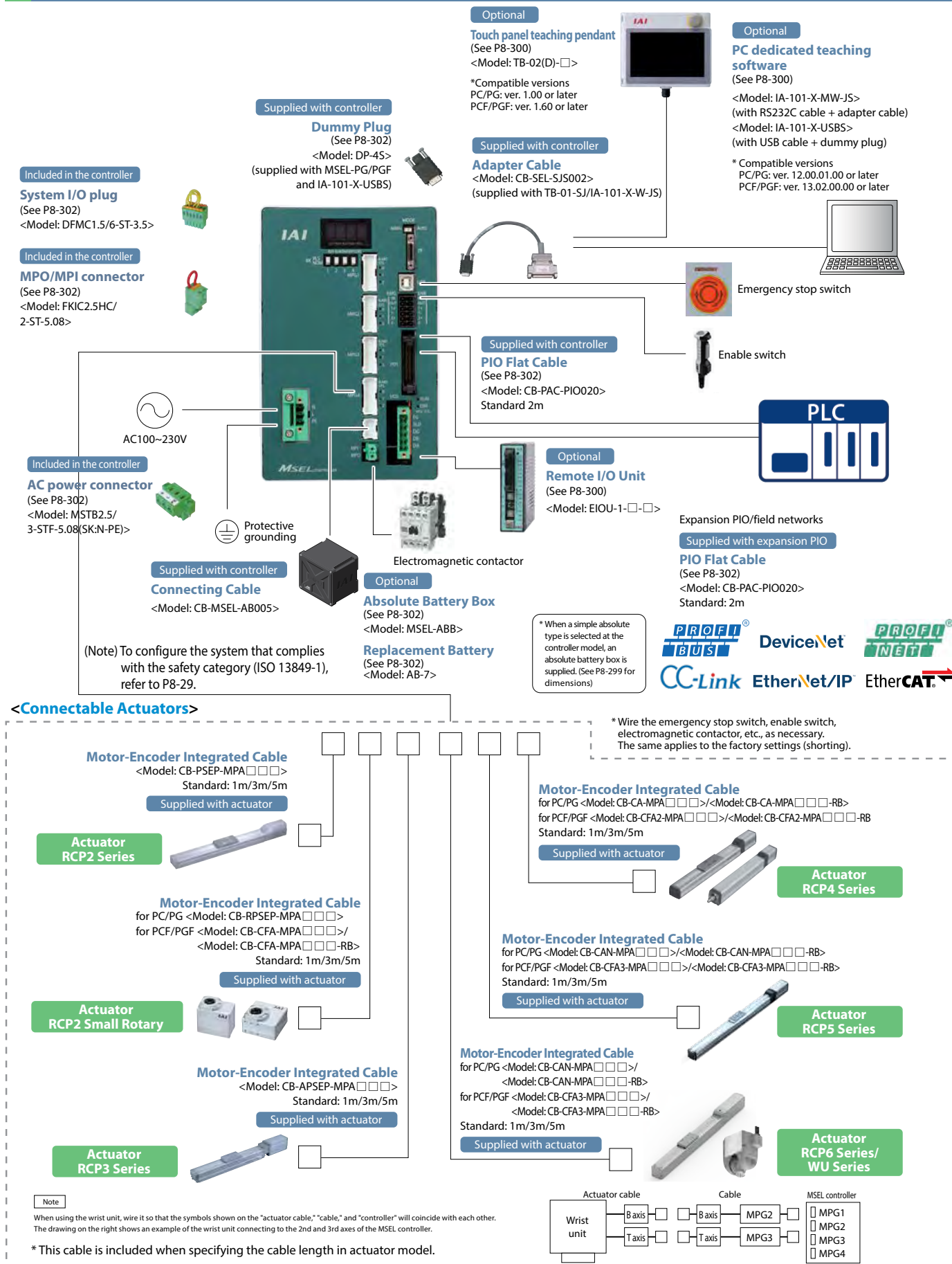
No need to specify encoder and options.

(Ex) 20P: 20□ Pulse motor compatible

* WUS and WUM use 2 axes.

No need to specify encoder and options.

System configuration



Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)


PSA-24

TB
-03/02

Software

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 specification items

MSEL — **WAI** — **WAI** — **4**

Controller type SCARA type Encoder Option Motor Encoder Option Standard I/O Expansion I/O PIO Cable Power voltage Mounting specification

Specs of SCARA **Specs of additional axes** * The additional axis can be selected only when the controller type is a 4-axis, and the SCARA type is a 3-axis (without gripper).

PCX3	3-axis standard
PGX3	3-axis safety category compliant
PCX4	4-axis standard
PGX4	4-axis safety category compliant

Encoder

B Brake

* An arm length of 550 and 650 can only be selected. Make sure to select it when the workpiece is 4 kg or larger.

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

(EX) 20P: 20□ pulse motor compatible

Note

Basically, the motor has the same alphanumeric sign as the connecting actuator motor, though some controllers and actuator motors have different signs. When ordering, please pay attention to such types listed below: (Actuators for 28SP)

● Controller motor type "28SP"
...RCP2-RA3C

Blank	No option
B	Brake

Standard I/O

NP	NPN
PN	PNP

Expansion I/O

E	Not used
NP	Expansion PIO board (NPN)
PN	Expansion PIO board (PNP)
DV	DeviceNet board
DV2	DeviceNet board (with 2-way connector)
CC	CC-Link board
CC2	CC-Link board (with 2-way connector)
PR	PROFIBUS-DP board
EP	EtherNet/IP board
EC	EtherCAT
PRT	PROFINET IO
SE1	RS232C
SE2	RS485C
IA	IA Net communication board

* If CC2 or DV2 is selected, a 2-way connector is supplied for branch wiring.
* When using the remote I/O unit (EIOU), select the IA (IA net connection board).
* When selecting SE1 and SE2, the following cables are necessary.
for SE1: CB-TTA-232□□□
for SE2: CB-TTA-485□□□(TERM)
Refer to PB-301 for details.

PIO Cable

Blank	Screw fixation
DN	DIN rail mount

Power voltage

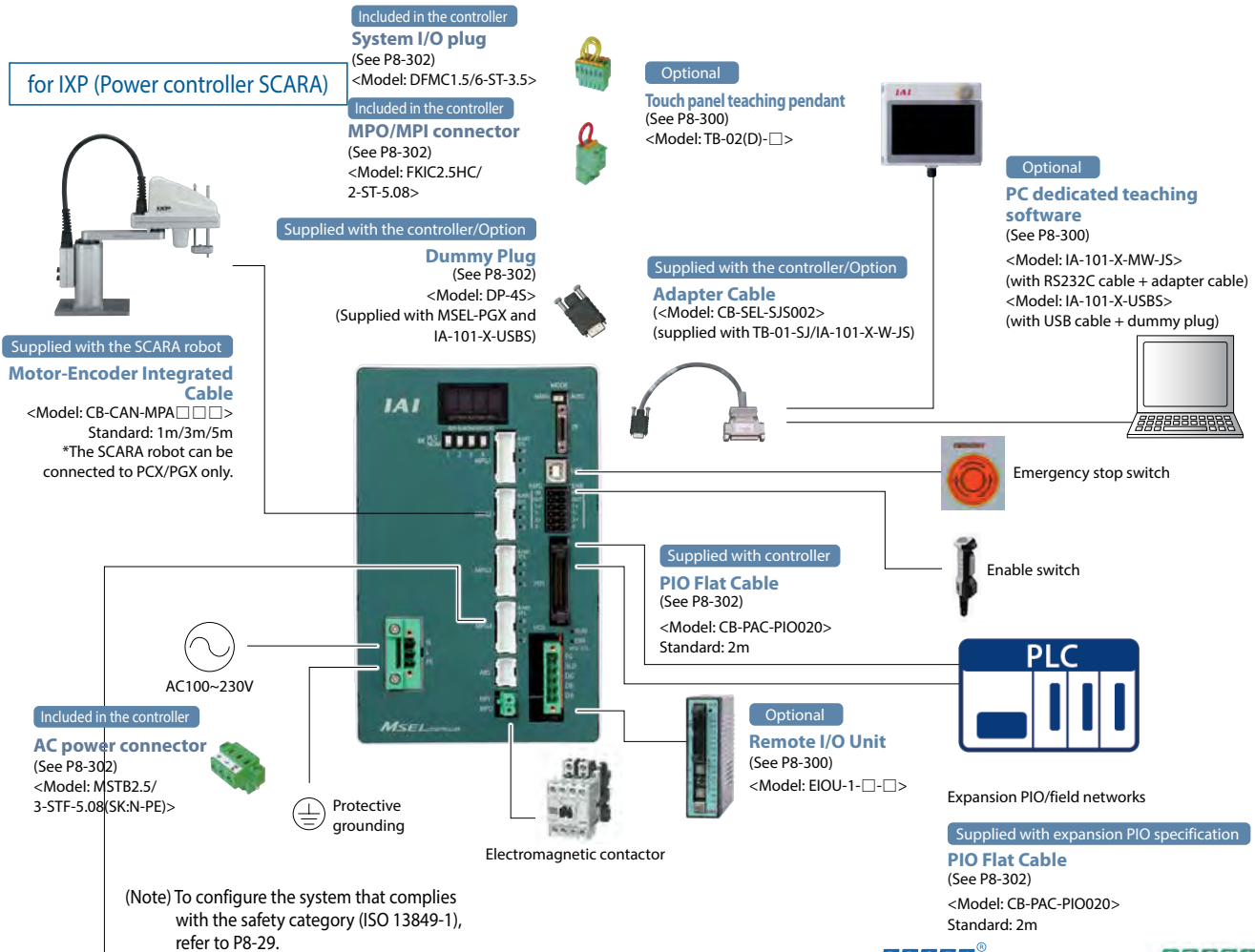
4	AC100~230V
---	------------

Mounting specification

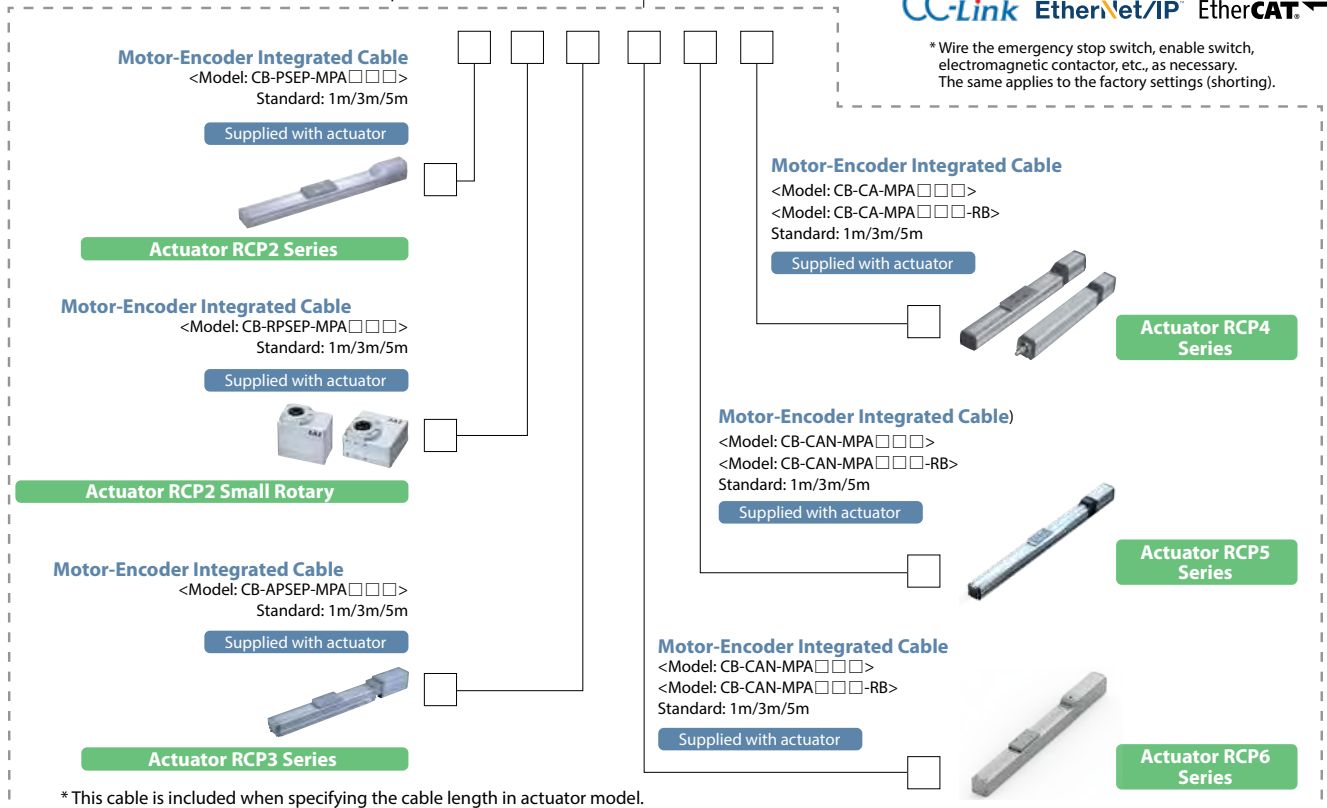
0	No cable
2	2m (standard)
3	3m
5	5m

The signs below are specified in the □:
N: Standard specification
C: Clean specification
W: Dust- & splash-proof

3N1808 IXP-3N1808
4N1808 IXP-4N1808
3N2508 IXP-3N2508
4N2508 IXP-4N2508
3N2508GM IXP-3N2508GM
3□3515 IXP-3□3515
4□3515 IXP-4□3515
3N3515GM IXP-3N3515GM
3N3510GL IXP-3N3510GL
3□4515 IXP-3□4515
4□4515 IXP-4□4515
3N4515GM IXP-3N4515GM
3N4510GL IXP-3N4510GL
3□5520 IXP-3□5520
4□5520 IXP-4□5520
3N5515GL IXP-3N5515GL
3N5515GW IXP-3N5515GW
3□6520 IXP-3□6520
4□6520 IXP-4□6520
3N6515GL IXP-3N6515GL
3N6515GW IXP-3N6515GW

**<Compatible Actuators>**

* MSEL-PCX/PGX can be connected to IXP with 3-axis specification.



* This cable is included when specifying the cable length in actuator model.

Basic specifications

Item		Specification
Number of controlled axes		1 - 4 axes (Up to 4 axes of RC axes or total of SCARA axes + RC axes)
Power voltage		Single-phase AC100V - 230V ±10%
Power current (type)		2.9A (AC100V), 1.4A (AC200V), 1.2A (230V)
Power frequency		50Hz/60Hz±5%
Rush current (type) (*Note 1)		15A (AC100V), 30A (AC200V) (ambient temperature 25°C, Measured by one time ON: in case ON/OFF is not repeated)
Leak current (* Note 2)		0.75mA or less
Momentary power failure resistance		20ms or more
Heat quantity		40W (AC100V), 35.2W (AC200V), 30.4W (AC230V)
PIO power source (Note 3)		DC24V ±10% (supplied from external)
Motor control method		Weak field magnet vector control
Supported encoder (Resolution varies according to actuator)		Battery-less absolute encoder, or incremental encoder Resolution: 800 pulses/rev. or 8192 pulses/rev.
Actuator cable length		Maximum 20m (simple absolute spec. Max. 10m)
Serial communication interface (SIO port or USB port)		Teaching tool dedicated connector (SIO port and USB port are exclusive use) X-SEL serial communication protocol (format B)
External interface	(Standard/Expansion) PIO	DC24V general signal input/output (NPN/PNP selectable) Max. 32 input points, max. 32 output points (total of standard and expansion) Cable length max.10m
	(Expansion) fieldbus	DeviceNet, CC-Link, PROFIBUS-DP, EtherCAT, PROFINET IO, EtherNet/IP (Note 4), RS-232C, RS-485
Data setting, input method		PC-compatible software or teaching pendant
Program language		SEL language
Maximum number of program steps		9999 steps
Maximum number of positions		30000 positions
Maximum number of programs		255 programs
Maximum number of multi-task programs		16 programs
Data retention memory		Flash ROM and FeRAM
Clock function		Retention time after power OFF: approx. 10 days Charging time after date data is erased: approx. 100 hours
System I/O		Emergency stop input, safety gate input
Safety circuit configuration	Driving power shutoff method	Semiconductor contact (in case of safety category compliant by PG/PGF/PGX types, connect the driving power shutoff relay, etc. externally)
	Emergency stop input	B-contact (Normal closed), input (internal power supply)
	Enable input	B-contact (Normal closed), input (internal power supply)
Protective function		Motor over current, over load, encoder disconnection detected, software limit over, system abnormal, battery abnormal, etc.
Absolute battery (simple absolute spec.)		AB-7
Electric shock protection mechanism		When grounded by earth terminal in addition to basic insulation for electric shock protection Class 1.
Over voltage category		Category II, Withstand voltage 2500V at input rated less than AC300V
Insulation resistance		10MΩ or more (DC500V between power terminal and output terminal, and between external terminals in bulk and case)
Withstand voltage		AC1500V, one minute (between primary and PE) AC3000v, one minute (between primary and secondary)
Protective conduction		10A, 1.0V or less (10 seconds)
Cooling method		Forced air cooling
Environment	Ambient operating temp.	0 - 40°C
	Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
	Operating altitude limit	1000m
	Vibrating resistance	Each of XYZ directions, 10 - 57Hz, amplitude 0.075mm 57 - 150Hz, acceleration 9.8m/s ²
	Degree of protection	IP20
Mass		Approx. 1.4kg

Note 1: Rush current flows for approx. 5ms after turning on the power. Be aware that the rush current varies according to the impedance of the power line.

Note 2: The leak current varies depending on the connected motor capacity, cable length and ambient environment. To protect leak current, measure the leakage at the location of the leakage breaker.

Note 3: When not using PIO, the power supply is not needed.

Note 4: The EtherNet/IP also enables Ethernet communications (non-procedure transmission).

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

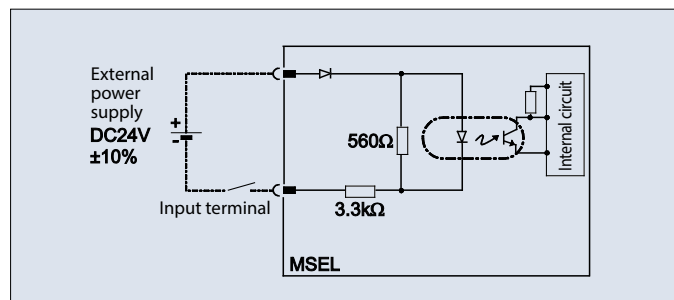
Internal circuits for standard I/O (NPN specifications)

[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.



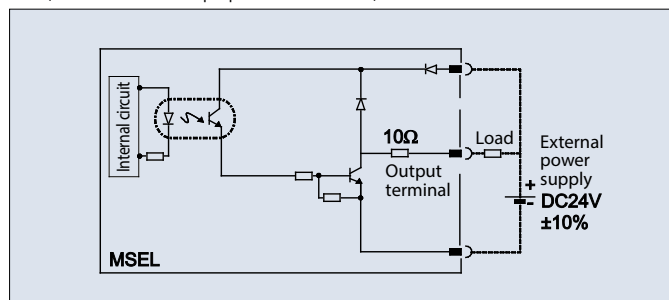
* For the standard IO (PNP specifications), refer to the operation manual.

[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.

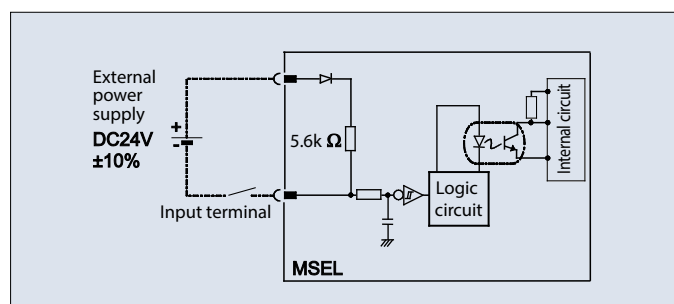
Note: The total load current shall be 400 mA for every eight points from standard I/O No. 316. (The maximum current per point shall be 100mA.)



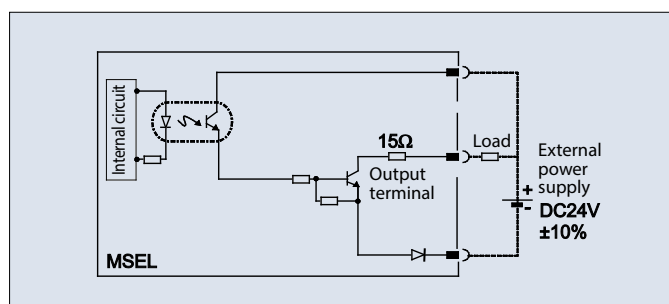
Internal circuits for standard I/Os (NPN specifications)

[Input Section] External input specifications

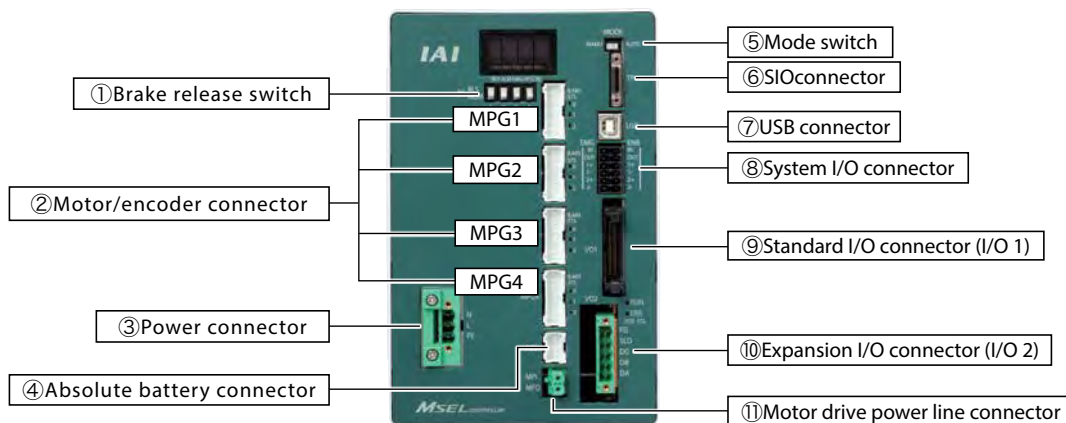
Item	Specifications
Number of input points	16 points
Input voltage	24VDC $\pm 10\%$
Input current	4mA / circuit
On/Off voltage	On voltage... Min. DC 18V (3.5mA) Off voltage... Max. DC 6V (1mA)
Insulation method	Photocoupler insulation

**[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 Brake release switch

A switch to release the actuator brake (actuator with brake) forcibly.

② Motor-encoder connector

Connects motor-encoder cable of the actuator. Do not connect a wrong motor to MPG1, MPG2, MPG3 and MPG4 connectors. It may cause a failure.

③ Power connector

Supplies AC100V - 230V single-phase power.

④ Absolute battery connector

This connector is included in the simple absolute specification. It connects the separately placed absolute battery box and the 4 axes with a single cable. The incremental spec/battery-less absolute specifications do not include this connector.

⑤ Operation mode switch

A switch for specifying the operation mode of the controller.

⑥ SIO connector

A connector for connecting the teaching tool.

⑦ USB connector

A connector for USB connection. It connects the teaching tool with USB.

⑧ System I/O connector

An output connector to control safety of the controller. The PG/PFG/PGX types (safety category compliance) support up to category 4 by connecting this connector to external safety circuit.

⑨ Standard I/O connector

A connector for PIO signal connection with general input/output of 16 points each.

⑩ Expansion I/O connector

This connector is supplied when selecting PIO or fieldbus as an expansion I/O. It becomes a general input/output signal connector in the PIO specification, and fieldbus connector in the fieldbus specification.

⑪ Motor driving power line connector

Usually, this connector is used with short circuit between the MPI and MPO. When the motor driving power is supplied or shutoff externally to configure a safety circuit, connect a contact between the MPI and MPO.

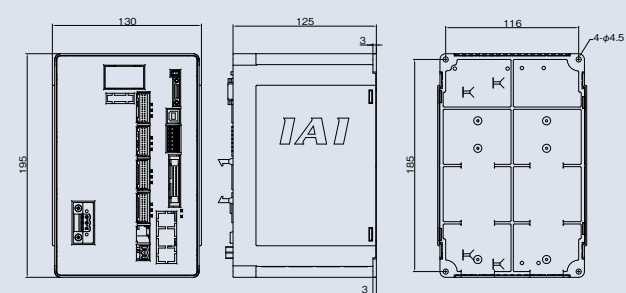
External dimensions

Controller

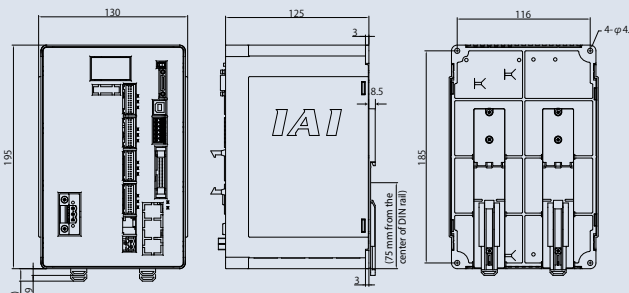
CAD drawings can be downloaded from our website.
www.intelligentactuator.com



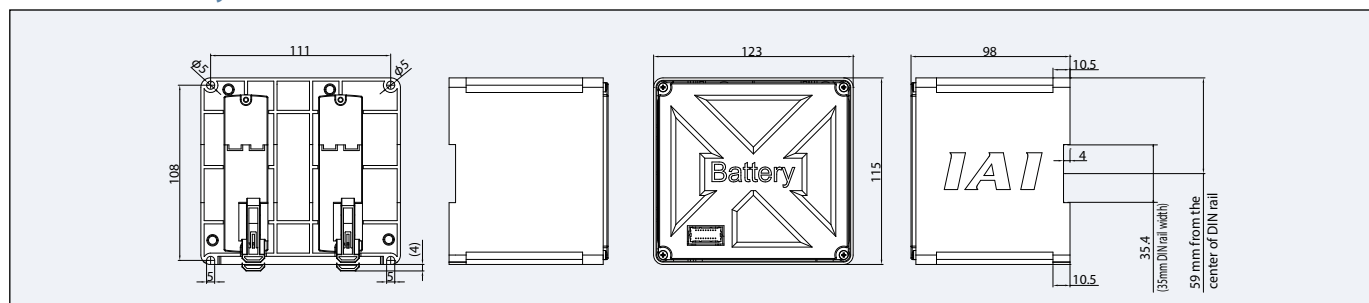
Screw fixing specification



DIN rail mounting specification



Absolute Battery Box

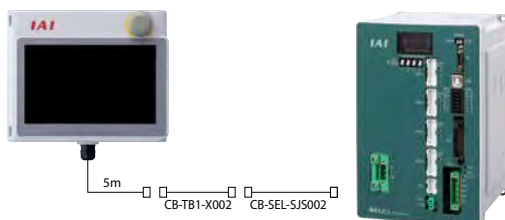


Options

Touch Panel Teaching Pendant

- Features** A teaching device offering program/position inputs, trial operations and monitoring functions. *To comply with the safety category, a TP adapter and a dummy plug are needed. Refer to P8-360 for details.
- Model number** **TB-02(D)-□** Visit IAI website for supported versions.

Configuration



Specifications

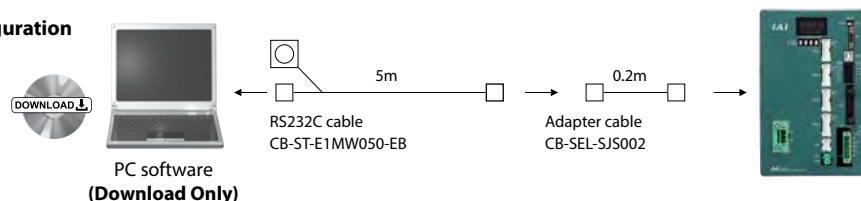
Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operating temperature	0~40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Protective structure	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

- Features** The startup support software provides program/position input, test operation and monitoring functions, among others. With its enhanced functions required for debugging, this software helps shorten the startup time. * Please purchase through your distributor and a download link will be sent to your valid email address.

- Model number** **IA-101-X-MW-JS** (including RS232C cable + Connector adapter cable) Visit IAI website for supported versions.

Configuration

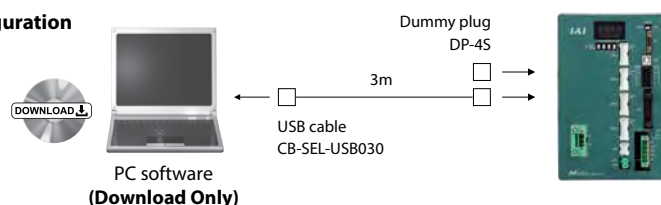


Supported Windows: 7/8/8.1/10



- Model number** **IA-101-X-USBS** (including USB cable + dummy plug) Visit IAI website for supported versions.

Configuration



Supported Windows: 7/8/8.1/10



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.)

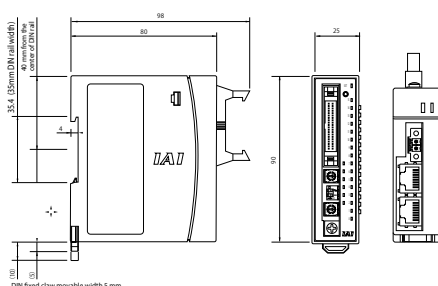
Remote I/O unit

- Features** This unit can expand I/O points.

- Model number** **EIOU** - **1** - **□** - **□**
- series Type I/O type I/O cable length
- | | | | |
|----|---------------|---|--------------|
| N4 | Input 32/NPN | 0 | No cable |
| N5 | Output 32/NPN | 2 | 2m(standard) |
| P4 | Input 32/PNP | 3 | 3m |
| P5 | Output 32/PNP | 5 | 5m |



External dimensions

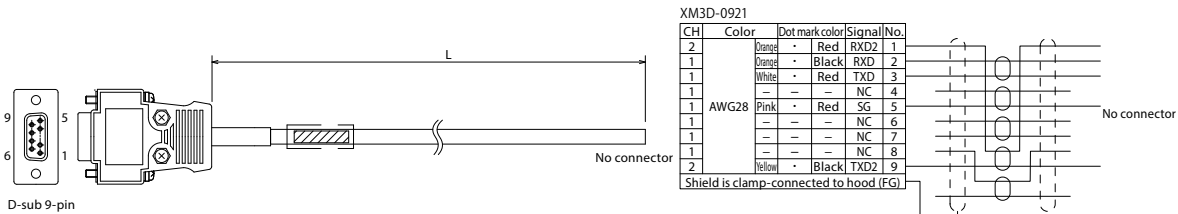


IAI

Communication cable for RS-232C connection board (SE1)

Model **CB-TTA-232**

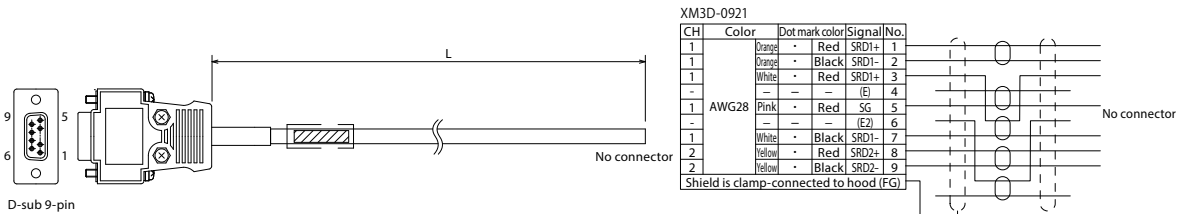
* Indicate the cable length (L) in
Maximum 10m, e.g.) 030=3m



Communication cable for RS-232C connection board (SE2)

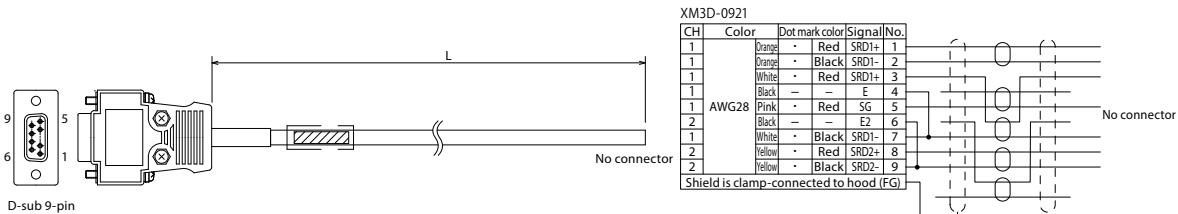
Model **CB-TTA-485** (without terminal processing)

* Indicate the cable length (L) in
Maximum 10m, e.g.) 030=3m



Model **CB-TTA-485** -TERM (with terminal processing)

* Indicate the cable length (L) in
Maximum 10m, e.g.) 030=3m



Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

AC power connector

■ Model MSTB2.5/3-STF-5.08(SK:N-PE)



System I/O plug

■ Model DFMC1.5/6-ST-3.5



MPO/MPI connector

■ Model FKIC2.5HC/2-ST-5.08



Dummy plug

■ Model DP-4S



Network connector

for DeviceNet

■ Model MSTB2.5/5-STF-5.08 AUM



for CC-Link

Terminal resistor with 110Ω/130Ω

■ Model MSTB2.5/5-STF-5.08 AU



for DeviceNet 2-way specification

■ Model TMSTBP2.5/5-STF-5.08 AUM



for CC-Link 2-way specification
Terminal resistor with 110Ω/130Ω

■ Model TMSTBP2.5/5-STF-5.08 AUBD-FG

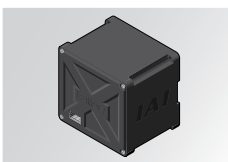


■ In the case of connecting an actuator with the simple absolute specification

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)



* The cable to connect the absolute battery box and MSEL (Model CB-MSEL-AB005) are supplied with the absolute battery box. Simple absolute type (Model: ABB) can be selected only for the MSEL-PC/PG/PCF/PGF.

Replacement Battery

■ **Features** The replacement battery for the absolute battery box.

■ **Model** AB-7

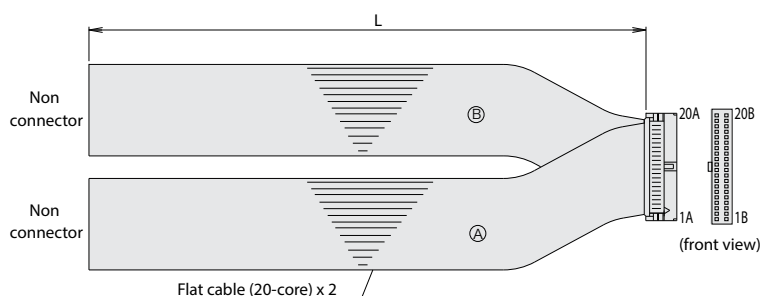
* Same quantity of absolute battery units is required as the number of axes.



NPN/PNP specification PIO flat cable

Model **CB-PAC-PIO** ☐ ☐ ☐

* Enter the cable length (L) into ☐☐☐. Compatible to a maximum of 10m.
Ex.: 080=8m



HIF6-40D-1.27R(Hirose)

No.	Signal	Cable color	Wiring
A1	24V	Brown-1	
A2	24V	Red-1	
A3	—	Orange-1	
A4	—	Yellow-1	
A5	IN0	Green-1	
A6	IN1	Blue-1	
A7	IN2	Purple-1	
A8	IN3	Gray-1	
A9	IN4	White-1	
A10	IN5	Black-1	
A11	IN6	Brown-2	
A12	IN7	Red-2	
A13	IN8	Orange-2	
A14	IN9	Yellow-2	
A15	IN10	Green-2	
A16	IN11	Blue-2	
A17	IN12	Purple-2	
A18	IN13	Gray-2	
A19	IN14	White-2	
A20	IN15	Black-2	

No.	Signal	Cable color	Wiring
B1	OUT0	Brown-3	
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	

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 P1-89 for the detail of cables.

The cable model search system is recommended!
URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>

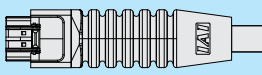
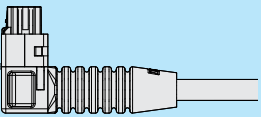


■ Table of Applicable Cables

Product Model			Motor-Encoder Integrated Cable	Motor-Encoder Integrated Cable
①	RCP6 RCP6CR RCP6W	SA8/WSA16 RA8/RRA8 WRA16	CB-CFA3-MPA□□□	CB-CFA3-MPA□□□-RB
②		Models other than the above	CB-CAN-MPA□□□ *1	CB-CAN-MPA□□□-RB *1
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□□□ *1	CB-CAN-MPA□□□-RB *1
⑤	RCP4 RCP4CR RCP4W	SA3/RA3 RCP4 Gripper RCP4 Stopper cylinder	CB-CAN-MPA□□□	CB-CAN-MPA□□□-RB
⑥		Models other than the above	CB-CA-MPA□□□ (for MSEL-PC/PG) CB-CFA2-MPA□□□ (for MSEL-PCF/PGF)	CB-CA-MPA□□□-RB (for MSEL-PC/PG) CB-CFA2-MPA□□□-RB (for MSEL-PCF/PGF)
⑦	RCP3		—	CB-APSEP-MPA□□□
⑧	RCP2	RTBS/RTBSL RTCS/RTCSL	—	CB-RPSEP-MPA□□□
⑨	RCP2CR RCP2W	GRS/GRM GR3SS/GR3SM RT8	CB-CAN-MPA□□□ *1	CB-CAN-MPA□□□-RB *1
⑩	RCP2 RCP2CR RCP2W	GRSS/GRLS/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□□□
⑬	WU		CB-CAN-MPA□□□ *1	CB-CAN-MPA□□□-RB *1

*1 The 4-direction connector type can also be selected for the CB-CAN-MPA □□□ (-RB) cable.

● 4-direction connector type

Standard connector type	4-direction connector type
	
CB-CAN-MPA □□□ (-RB)	CB-CAN2-MPA □□□ (-RB)

MEMO

Controller

Models
not shown
here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SAXSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

X-SEL (RA/SA)

Program Controller
for Single-axis robot / Cartesian robot / Linear servo /
RCS4/RCS3/RCS2 series.

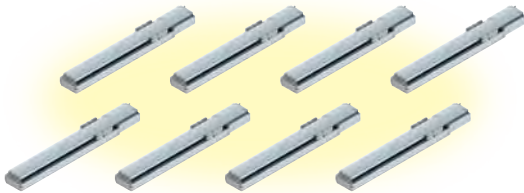


(*) UL supports only the SA type

1 Actuators equipped with a servo motor can be connected up to 8 axes. Interpolation motion is possible. Cabinet sizes that suit the maximum connectable units are available now.

Combination example Synchronized control of 8 single-axes

Synchronized control of two units of 4-axis Cartesian



Ex.)XSEL-RA (single-axis spec.)



4-axis specification



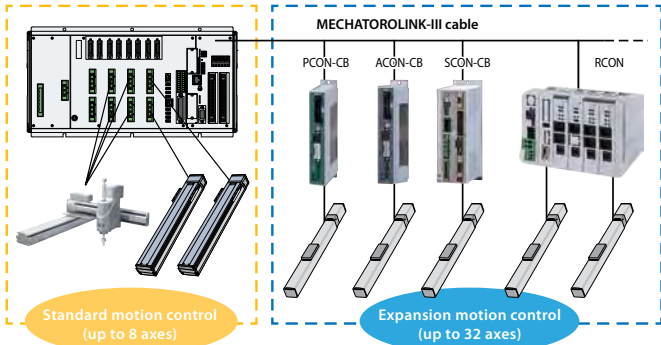
8-axis specification

2 Expansion motion control

Connection of the position controllers of MECHATROLINK-III specification up to 32 axes enables the SEL controller to program-control.

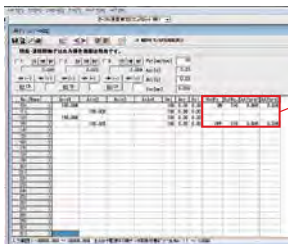
One controller can operate and control up to 40 axes, including the XSEL controller of up to 8 axes.

Operations with the positioner function and synchronized control function are possible.



3 Easy control of external equipment

An output operation data column is added to the position data. Signals to control external equipment can easily be output by target position. It is possible to save the time to create programs.



Position data edit screen

z1	OutFn	OutNo.	OutPara1	OutPara2
-30	ON	316	0.000	0.000
-30				
-30	OFF	316	0.000	0.000

Output operation data items

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



Model selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON

SCON

(servo press)

MSEL

XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

TB
-03/02

Software

Series	Type	Number of axes	Connected actuator motor wattage, encoder	Network dedicated slots 1	Slot 1/2	I/O cable length	Power voltage
			Motor wattage of connected actuators and encoder type	I/O slot description			

○ : Available

IAI

System configuration

Controller

XSEL-RA/SA

Optional

PC Software

(See P8-315) * (P)=PC side, (C)=Controller side for XSEL-RA

- (P)RS232C—(C)RS232C
<Model: IA-101-X-MW>
- (P)USB—(C)RS232C
<Model: IA-101-X-USBMW>
- (P)USB—(C)USB/Ethernet
<Model: IA-101-N>

for XSEL-SA

- (P)RS232C—(C)RS232C
<Model: IA-101-XA-MW>
- (P)USB—(C)USB/Ethernet
<Model: IA-101-N>

Optional

Touch panel teaching pendant

(See P8-315)
<Model: TB-02(D)-□>

Supplied with the controller

Dummy Plug

(See P8-317)
<Model: DP-2>

Supplied with the controller

PIO Cable

(See P8-317)
<Model: CB-X-PIO020>
Standard: 2m
(Supplied with the PIO controller)

Field network

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

(Emergency stop switch)

Included with PC dedicated teaching software

Communication cable

<Model: CB-ST-A2MW050-EB>

Supplied with the actuator

Motor cable

Motor robot cable

Encoder cable

Encoder robot cable

Supplied if the cable length is specified at the actuator specification.
(See P8-318)

Connectable Actuator

<Refer to the product page of each actuator>

Included in the controller

System I/O short circuit connector

(See P8-317)
<Model: FMC1.5/
10-ST-3.5(XSEL)>

Included in the controller

AC power connector

(See P8-317)
<Model: GMSTB2.56-
STF-7.62>

Supplied with the regenerative unit

Regenerative unit cable 1m

Regenerative Unit

Please refer to P8-316 for the necessary number of regenerative units.

Motor power supply

3-phase/single-phase

AC200V/230V

Control power supply

Single-phase

AC200V/230V

Brake release power

24VDC

Brake power connector

(See P8-317)
<Model: FMC1.5/
2-ST-3.5-RF>

Power for I/O

24VDC

* When connecting the power, make sure to mount the following filters or equivalent:

- Noise filter recommended model
3-phase TAC20-683 (maker: COSEL)
Single-phase NBH-20-432 (maker: COSEL)
- Ring core recommended model
ESD-R-25 (maker: NEC Tokin)
- Clamp filter recommended model
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)

* To configure the system that complies with the safety category (ISO 13849-1), refer to P8-29.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL

(Cartesian 6-axis)

RCP6S

PCON

-CB/CFB

PCON

-CBP

(Pulse press)

PCON

ACON

-CB

DCON

ACON

-CB

DCON

SCON

-CB

SCON

(Servo press)

SSEL

MSEL

XSEL

-RA/SA

XSEL

-P/Q

XSEL

(SCARA)

PSA-24

TB

-03/02

Software

Precautions on selection

■ Limitations on connection

Confirm and select actuators so that the total wattage of the single-axis/Cartesian robots connected to the XSEL-RA/SA does not exceed the maximum connectable axis wattage.

Some models need attention to the calculation method of wattage.

Item	Max. connectable wattage
Single-phase	1600W
Three-phase	2400W

● Calculation of the connectable actuator wattage for the connection to the LSAS

Calculate the wattage based on the following "Controller wattage calculation output values" for the LSAS (linear servo actuator) connected to single-phase power.

Select so that the total wattage of LSAS and other actuators is 1600W or less.

$$1600W \geq \text{total LSAS wattage (controller wattage calculation output value)} + \text{other actuator total wattage (motor wattage} \times \text{number of axes)}$$

Wattage conversion table for single-axis specification

Actuator	Supported driver output [W]	Number of sliders	Controller wattage calculation output value [W]
LSAS-N10SS	100	1	300
LSAS-N10SM	100	2	600
LSAS-N15SS	200	1	600
LSAS-N15SM	200	2	1200
LSAS-N15HS	200	1	600
LSAS-N15HM	200	2	1200

● Calculation of wattage and maximum connectable units when connecting the RCS3-CT8C and CTZ5C

Calculate the wattage based on the "Controller wattage calculation output value" for the following models.

Model	Supported driver output [W]	Max. connectable units	Controller wattage calculation output value [W]
RCS3-CT8C	400	3	800
RCS3-CTZ5C	60	(no limitation)	120

● Calculation of connectable actuator wattage when connecting the direct drive motor (DD/DDA)

When connecting the DD/DDA motor series, select the units so that the number of units is within the maximum connectable units, using the following "Controller wattage calculation output value."

Select so that the total wattage of DD/DDA series and other actuators is 1600W or less.

Motor wattage conversion table when connecting the single-phase specification

Actuator model	Supported driver output [W]	DD/DDA motor max. connectable unit	Controller wattage calculation output value [W]
DD/DDA-LT18S/LT18CS	200	2	600
DD/DDA-LH18S/LH18CS	600	1	1200

Motor wattage conversion table when connecting the three-phase specification

Actuator model	Supported driver output [W]	DD/DDA motor max. connectable unit	Controller wattage calculation output value [W]
DD/DDA-LT18S/LT18CS	200	8	200
DD/DDA-LH18S/LH18CS	600	2	600

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, CC-Link IE Field, EtherNet/IP, EtherCAT * EP and CIE cannot be connected at the same time	
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		0~40C°, 5%RH - 85%RH (non-condensing, no frost). Free from corrosive gases. In particular, there shall be no significant dust.	
Safety category		B	Compliant with 4 possible
International standard		CE	CE, UL

Power capacity and heat quantity

Calculate the power capacity and heat quantity using the formula below.

Rated power capacity [VA] = Total motor power capacity [VA] + Total power consumption of control part [VA]

Heat quantity [W] = Total output loss [W] + (Internal power consumption [VA] x 0.7 (efficiency) x 0.6 (power factor))

Power capacity and output loss of actuators

Actuator motor wattage [W]	Motor power capacity [VA]	Output loss = heat quantity [W]
20	26	1.58
30	46	2.07
60	138	3.39
100	234	6.12
150	328	8.3
200	421	9.12
400	796	19.76
600	1164	27.2
750	1521	29.77
100 (Linear actuator LSAS-N10SS)	379	4.48
200 (Linear actuator LSAS-N15SS)	486	4.37
200 (Linear actuator LSAS-N15HS)	773	6.42
DD/DDA(200W)	503	7.5
DD/DDA(600W)	1462	20.8
RCS3-CTZ5C(60W) ^(note 1)	197	3.6
RCS3-CT8C(400W) ^(note 1)	1230	18

Note 1: Calculate the power capacity, etc. based on 120W for the RCS3-CTZ5C and 800W for the RCS3-CT8C.

Power consumption of the control part

			Control power		External power (DC24V)		Quantity	
			Internal consumption [VA]	External consumption [VA]	Internal consumption [VA]	External consumption [VA]		
Basic part			46.64				1	
Driver	per 1 board		6.26				Refer to the "Quantity of the control part"	
Encoder part	per 1 axis		2.38	3.57				
Fan unit	per 1 fan		5.71					
Axis sensor	per 1 axis		4.57					
PIO board	DIO (48 points)	N1,N2 P1,P2	5.95		14.52		0~2	Number of substrates of I/O 1 and 2
	DIO (96 points)	N3,P3	8.33		26.81		0~2	
Network module	DeviceNet	DV	1.98		3.43		0~1	Number of substrates of the field network board 2
	CC-Link	CC	5.67				0~1	
	PROFIBUS-DP	PR	1.98				0~1	
	CC-Link IE Field	CIE	3.3				0~1	
	EtherNet/IP	EP	1.98				0~1	Number of substrates of the field network board 1
	EtherCAT	EC	3.93				0~1	
Teaching pendant	TB-01			8.57			0~1	
	TB-02			8.57			0~1	
	TB-03			8.57			0~1	
Brake	per 1 axis		0.12		2.5	7.5	Total number of actuators with brake 0 - 8	

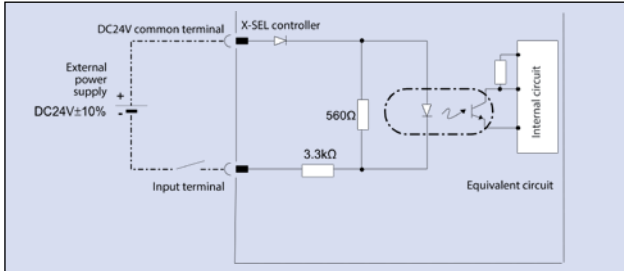
Quantity of the control part

	Number of axis							
	1st axis	2nd axis	3rd axis	4th axis	5th axis	6th axis	7th axis	8th axis
Driver	1	1	2	2	3	3	4	4
Encoder	1	2	3	4	5	6	7	8
Fan unit	4-axis spec cabinet				8-axis spec cabinet			
	XSEL-RA : 5 units				XSEL-RA : 6 units			
	XSEL-SA (three-phase) : 4 units				XSEL-SA (three-phase) : 5 units			
	XSEL-SA(single-phase) : 5 units				XSEL-SA(single-phase) : 6 units			
Axis sensor	1	2	3	4	5	6	7	8

I/O Wiring diagram

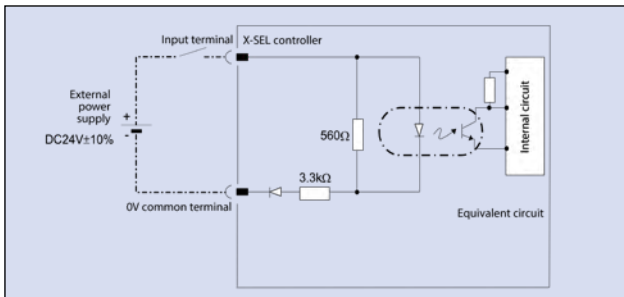
Input Section External input specification (NPN specification)

Item	Specifications
Input voltage	24VDC $\pm 10\%$
Input current	7mA / circuit
ON/OFF voltage	ON voltage...min. DC 16.0V / OFF voltage ... max. DC 5.0V
Isolation method	Photocoupler



Input Section External input specification (PNP specification)

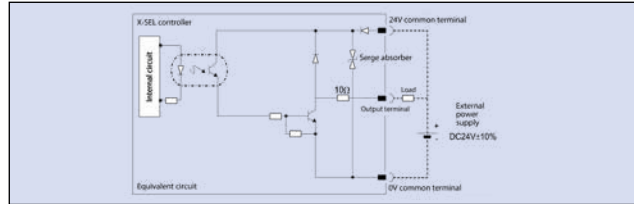
Item	Specifications
Input voltage	24VDC $\pm 10\%$
Input current	7mA / circuit
ON/OFF voltage	ON voltage...min. DC 8V / OFF voltage ... max. DC 19V
Isolation method	Photocoupler



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

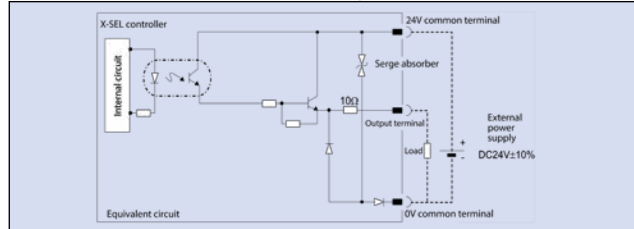
(Note) The maximum total load current for each set of the eight ports from output port No. 300 is 400mA. (The maximum total current output for output port No. 300+n to No. 300+n+7 must be 400mA, where n = 0 or a multiple of eight.)



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		Program start	
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		Select program (PRG No.1)	
10		Select program (PRG No.2)	
11		Select program (PRG No.4)	
12		Select program (PRG No.8)	
13		Select program (PRG No.10)	
14		Select program (PRG No.20)	
15		Select program (PRG No.40)	
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		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		Alarm output	
35		Ready output	
36		Emergency stop 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	

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		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		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		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		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

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

External dimensions

■ RA/SA (Safety Category Compliant Type)

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

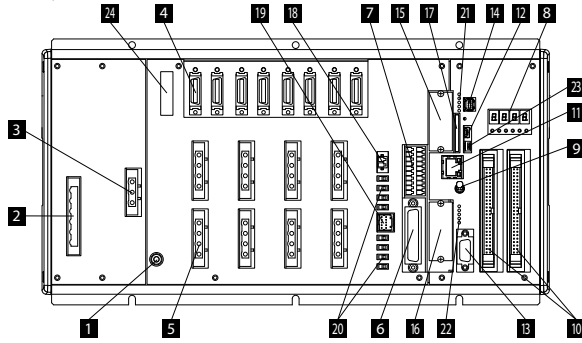


	Controller specifications		Front view		Side view
			Battery-less absolute specification/Incremental specification/ Quasi-absolute specification/Index absolute specification	Absolute specification/Multi-rotation absolute specification	
RA	Single-phase/ 3-phase specifications	1 to 4 axis specifications			
		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.

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.

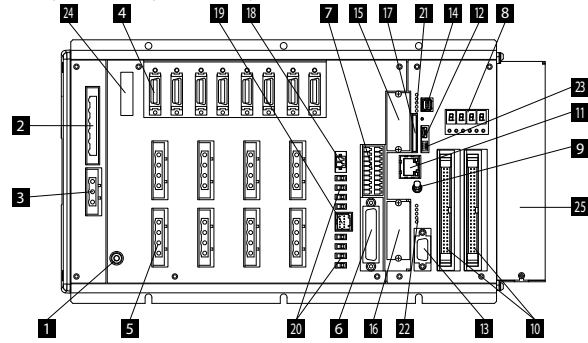
12 USB Connector

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

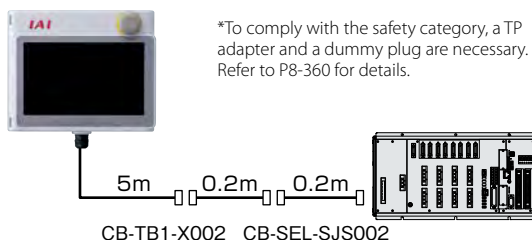
This unit comes with the absolute specification.

Options

Touch Panel Teaching Pendant

Model TB-02(D)-□

Features A teaching device offering program/position inputs, trial operations and monitoring functions.



Specifications

Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operating temperature	0~40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Protective structure	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

■ **for XSEL-RA/SA (software)** * Please purchase through your distributor and a download link will be sent to your valid email address.

Model IA-101-N

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

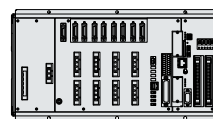
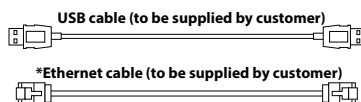
* Please purchase through your distributor and a download link will be sent to your valid email address.

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.

See IAI website for supported versions.

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



■ **for XSEL-RA (software + connection cable)** * Please purchase through your distributor and a download link will be sent to your valid email address.

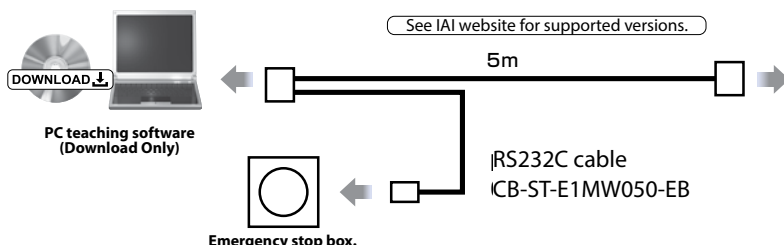
Model IA-101-X-MW

Features A start-up support software equipped with functions such as position input, trial operation, and monitoring.
It enhances functions necessary for debugging and greatly shortens start up time.

Content Software Download, Supported Windows: 7/8/8.1/10
(Accessories) PC connecting cable 5m + emergency stop box (Model: CB-ST-A2MW050-EB)

Note

- * Versions older than 3.0.0 cannot be used for the XSEL-P type.
- * Versions older than 2.0.0 cannot be used for the SCARA type.
- * Use IA-101-XA-MW if you use a safety category 4 compliant controller.
- * Cannot be used for the XSEL-Q/QX/S/SX/SXD types.
- * When you separately order a PC connecting cable for a maintenance purpose, beware that the cable single unit model is CB-ST-E1MW050, but when ordering it together with the emergency stop box, the model is CB-ST-E1MW050-EB.



Supported Windows: 7/8/8.1/10

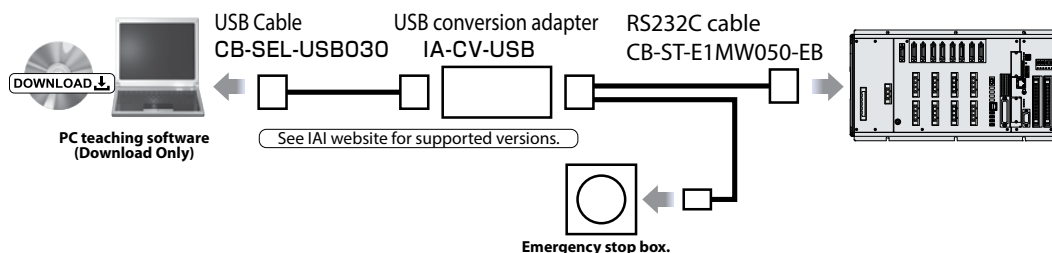


■ **for XSEL-RA (Software + connecting cable + USB cable + USB conversion adapter)**

Model IA-101-X-USBMW

Features Software available by PC's USB port by connecting a USB conversion adapter to a RS232C cable.

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



Supported Windows: 7/8/8.1/10



■ for XSEL-SA (software + connection cable) *Safety category 4 compliant

Model **IA-101-XA-MW**

Features

Teaching device equipped with functions such as position teaching, trial operation, and monitoring. It enhances functions necessary for debugging and greatly shortens start up time. The PC connection cable has an emergency stop with a duplex circuit and complies with th safety category 4.

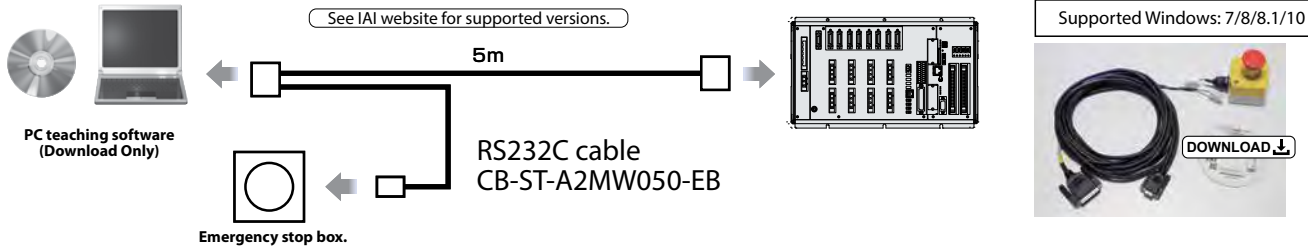
Content

Software (DVD-ROM)
Supported Windows: 7/8/8.1/10PC
(Accessories) PC connection cable 5m + emergency stop box (Model CB-ST-A2MW050-EB)

NOTE

When ordering a separate replacement PC cable the model number for the cable only is CB-ST-E1MW050, and for cable with the emergency stop box is CB-ST-E1MW050-EB. If a teaching tool is not used, connect the dummy plug DP-2 (supplied with the controller, to the teaching connector.

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



Regenerative resistance unit

Model **RESU-1** (standard specification)
RESUD-1 (DIN rail mount specification)

Installation Installation standard depends on the total motor capacity of the connected axes.

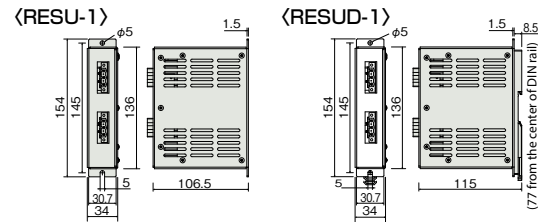
Overview

The regenerative resistance unit converts to heat the regenerative current generated when the motor decelerates. Although the controller is equipped with an internal regenerative resistance, an additional regenerative resistance unit may be needed when the load is too large on the vertical axis. (See the table right)

Specification

Model	RESU-1	RESUD-1
Mass	Approx. 0.4kg	
Built-in regenerative resistance value	235Ω 80W	
Mounting method	Screw mount	DIN rail mount
Attached cable	CB-ST-REU010	

Connected axes	Horizontal	Vertical
0 axis	~ 100W	~ 100W
1 axis	~ 600W	~ 600W
2 axis	~ 1200W	~ 1000W
3 axis	~ 1800W	~ 1400W
4 axis	~ 2400W	~ 2000W
5 個	—	~ 2400W



Expansion I/O board

A single part for replacement I/O slots

Name	Details	I/O slot code	Single part model code
PIO board	Input 32/Output 16 (NPN)	N1	IAIO3202-NP1
	Input 32/Output 16 (PNP)	P1	IAIO3202-PN1
	Input 16/Output 32 (NPN)	N2	IAIO3202-NP2
	Input 16/Output 32 (PNP)	P2	IAIO3202-PN2
Multi-point board	Input 48/Output 48 (NPN)	N3	IAIO3204-NP1
	Input 48/Output 48 (PNP)	P3	IAIO3204-PN1

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

AC power connector

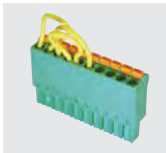
Model GMSTB2.56-STF-7.62



System I/O short circuit connector

Model FMC1.5/10-ST-3.5(XSEL)

Two sets are needed for the controller.



Brake power connector

Model FMC1.5/2-ST-3.5-RF



Dummy plug

Model DP-2



Network connector

for DeviceNet

Model SMSTB2.5/5-ST-5.08AU(DV)



for CC-Link

Terminal resistor with 110Ω/130Ω

Model MSTB2.5/5-STF-5.08AU



Absolute data retention battery

Model AB-5

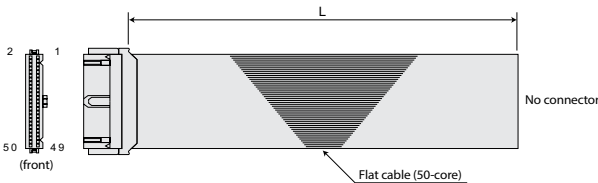
Needed when connecting the absolute actuator.



NPN/PNP specification PIO flat cable

Model CB-X-PIO

* Indicate the cable length (L) in , Max. 10m, e.g.)080=8m



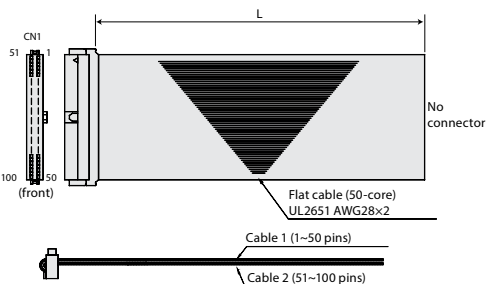
XG4M-5030-T (Omron)

No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown-1		18	Gray-2		35	Purple-4	General-purpose output
2	Red-1		19	White-2		36	Blue-4	General-purpose output
3	Orange-1		20	Black-2		37	Purple-4	General-purpose output
4	Yellow-1		21	Brown-3		38	Gray-4	General-purpose output
5	Green-1		22	Red-3		39	White-4	General-purpose output
6	Blue-1		23	Orange-3		40	Black-4	General-purpose output
7	Purple-1		24	Yellow-3		41	Brown-5	General-purpose output
8	Gray-1		25	Green-3		42	Red-5	General-purpose output
9	White-1		26	Blue-3		43	Orange-5	General-purpose output
10	Black-1		27	Purple-3		44	Yellow-5	General-purpose output
11	Brown-2		28	Gray-3		45	Green-5	General-purpose output
12	Red-2		29	White-3		46	Blue-5	General-purpose output
13	Orange-2		30	Black-3		47	Purple-5	General-purpose output
14	Yellow-2		31	Brown-4		48	Gray-5	General-purpose output
15	Green-2		32	Red-4		49	White-5	General-purpose output
16	Blue-2		33	Orange-4		50	Black-5	General-purpose output
17	Purple-2		34	Yellow-4				

NPN/PNP specification Multi-point PIO flat cable

Model CB-X-PIOH

* Indicate the cable length (L) in , Max. 10m, e.g.)080=8m



HIF6-100D1.27R (Hirose)

Cable 1								Cable 2											
Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function					
Input	1	Brown-1	000	External power supply (24VDC) for the pin No. 2-25, 51-74	Input	26	Blue-3	026	External power supply (24VDC) for the pin No. 27-50, 76-99	Output	51	Brown-1	300	Alarm output	Output	76	Blue-3	324	General-purpose output
	2	Red-1	000	Program start		27	Purple-3	024	General-purpose input		52	Red-1	301	Ready output		77	Purple-3	325	General-purpose output
	3	Orange-1	001	General-purpose input		28	Gray-3	025	General-purpose input		53	Orange-1	302	Emergency stop output		78	Gray-3	326	General-purpose output
	4	Yellow-1	002	General-purpose input		29	White-3	026	General-purpose input		54	Yellow-1	303	General-purpose output		79	White-3	327	General-purpose output
	5	Green-1	003	General-purpose input		30	Black-3	027	General-purpose input		55	Green-1	304	General-purpose output		80	Black-3	328	General-purpose output
	6	Blue-1	004	General-purpose input		31	Brown-4	028	General-purpose input		56	Blue-1	305	General-purpose output		81	Brown-4	329	General-purpose output
	7	Purple-1	005	General-purpose input		32	Red-4	029	General-purpose input		57	Purple-1	306	General-purpose output		82	Red-4	330	General-purpose output
	8	Gray-1	006	General-purpose input		33	Orange-4	030	General-purpose input		58	Gray-1	307	General-purpose output		83	Orange-4	331	General-purpose output
	9	White-1	007	Program No.(PG No.1)		34	Yellow-4	031	General-purpose input		59	White-1	308	General-purpose output		84	Yellow-4	332	General-purpose output
	10	Black-1	008	Program No.(PG No.2)		35	Green-4	032	General-purpose input		60	Black-1	309	General-purpose output		85	Green-4	333	General-purpose output
	11	Brown-2	009	Program No.(PG No.4)		36	Blue-4	033	General-purpose input		61	Brown-2	310	General-purpose output		86	Blue-4	334	General-purpose output
	12	Red-2	010	Program No.(PG No.8)		37	Purple-4	034	General-purpose input		62	Red-2	311	General-purpose output		87	Purple-4	335	General-purpose output
	13	Orange-2	011	Program No.(PG No.10)		38	Gray-4	035	General-purpose input		63	Orange-2	312	General-purpose output		88	Gray-4	336	General-purpose output
	14	Yellow-2	012	Program No.(PG No.20)		39	White-4	036	General-purpose input		64	Yellow-2	313	General-purpose output		89	White-4	337	General-purpose output
	15	Green-2	013	Program No.(PG No.40)		40	Black-4	037	General-purpose input		65	Green-2	314	General-purpose output		90	Black-4	338	General-purpose output
	16	Blue-2	014	General-purpose input		41	Brown-5	038	General-purpose input		66	Blue-2	315	General-purpose output		91	Brown-5	339	General-purpose output
	17	Purple-2	015	General-purpose input		42	Red-5	039	General-purpose input		67	Purple-2	316	General-purpose output		92	Purple-2	340	General-purpose output
	18	Gray-2	016	General-purpose input		43	Orange-5	040	General-purpose input		68	Gray-2	317	General-purpose output		93	Orange-5	341	General-purpose output
	19	White-2	017	General-purpose input		44	Yellow-5	041	General-purpose input		69	White-2	318	General-purpose output		94	Yellow-5	342	General-purpose output
	20	Black-2	018	General-purpose input		45	Green-5	042	General-purpose input		70	Black-2	319	General-purpose output		95	Green-5	343	General-purpose output
	21	Brown-3	019	General-purpose input		46	Blue-5	043	General-purpose input		71	Brown-3	320	General-purpose output		96	Blue-5	344	General-purpose output
	22	Red-3	020	General-purpose input		47	Purple-5	044	General-purpose input		72	Red-3	321	General-purpose output		97	Purple-5	345	General-purpose output
	23	Orange-3	021	General-purpose input		48	Gray-5	045	General-purpose input		73	Orange-3	322	General-purpose output		98	Gray-5	346	General-purpose output
	24	Yellow-3	022	General-purpose input		49	White-5	046	General-purpose input		74	Yellow-3	323	General-purpose output		99	White-5	347	General-purpose output
	25	Green-3	023	General-purpose input		50	Black-5	047	General-purpose input		75	Green-3	324	External power supply (24V) for the pin No. 2-25, 51-74		100	Black-5	348	External power supply (24V) for the pin No. 27-50, 76-99

Maintenance parts (cable)

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below.

Refer to P1-89 for the detail of cables.

The cable model search system is recommended!
URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



■ Table of compatible cables

Model number			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W) RCS3(CR)	Models other than ② ~ ④	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS2	RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③		RA13R (without load cell/ without brake)			CB-RCS2-PLA□□□	CB-X2-PLA□□□
④		RA13R ((without load cell/with brake)			CB-RCS2-PLA□□□ *Between the controller and brake CB-RCS2-PLA□□□	CB-X2-PLA□□□ *Between the controller and brake CB-X2-PLA□□□
⑤	RCS3	CTZ5C/CT8C			—	CB-X1-PA□□□
⑥	RCS4(CR)				—	CB-X1-PA□□□
⑦	NS	Without LS	—	CB-X-MA□□□	—	CB-X3-PA□□□
⑧		With LS	—		—	CB-X2-PLA□□□
⑨	LSAS	N	—		—	CB-X1-PA□□□
⑩	DDA	LT18□	—	CB-X-MA□□□	—	CB-X3-PA□□□
⑪	DDACR DDW	LH18□	—	CB-XMC-MA□□□	—	
⑫	DDA	LT18□	—	CB-X-MA□□□	—	CB-X3-PA□□□ *Between the controller and brake CB-DDB-BK□□□
⑬	DDACR (with brake)	LH18□	—	CB-XMC-MA□□□	—	
⑭	IS(P)WA	S/M/L	—	CB-XEU-MA□□□	—	CB-X1-PA□□□-WC
⑮	ZR		—	CB-X-MA□□□	—	Z-axis: CB-X1-PA□□□ R-axis: CB-X1-PLA□□□ *Between the controller and brake CB-RCS2-PLA□□□
⑯	Models other than with LS specification ① ~ ⑪		—	CB-X-MA□□□	—	CB-X1-PA□□□
					—	CB-X1-PA□□□-AWG24 (For 21m or more)
⑰	Models other than ① ~ ⑪		—		—	CB-X1-PLA□□□
					—	CB-X1-PLA□□□-AWG24 (For 21m or more)

Controller

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

X-SEL (P/Q)

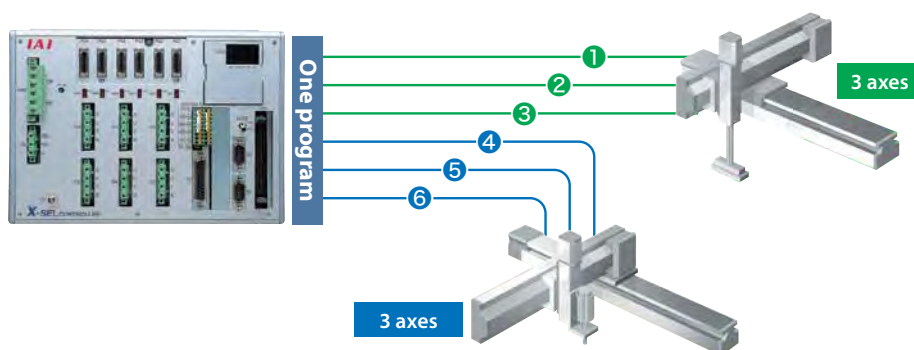
Program Controller

for Single-axis robot / Cartesian robot / Linear servo /
RCS4/RCS3/RCS2 series.



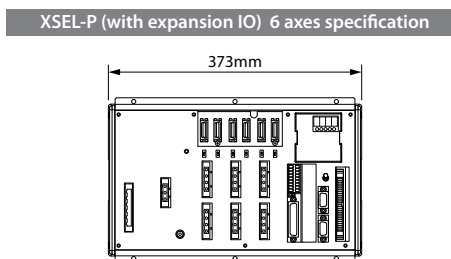
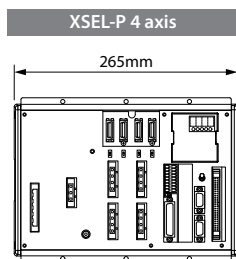
(*) Only SA, Q types are compliant with UL.

- It is possible to connect actuators equipped with a servo motor up to 6 axes.
Setup is easy because a single program can operate 6 axes.



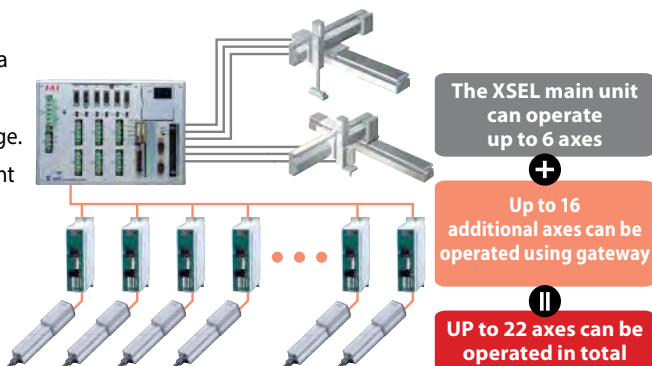
2 Compact size

Compact enclosures according to the number of axes.



3 ROBO Cylinder gateway function

- Operation of up to 16 axes of ROBO Cylinders via serial communication.
- ROBO Cylinder can be operated by the SEL language.
Changing of positioning data and reading of current positions are also possible.



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



XSEL - P - 4 - 200WAI-100WAI-60A-30A - CC - N1 - N1N1E - 2 - 3

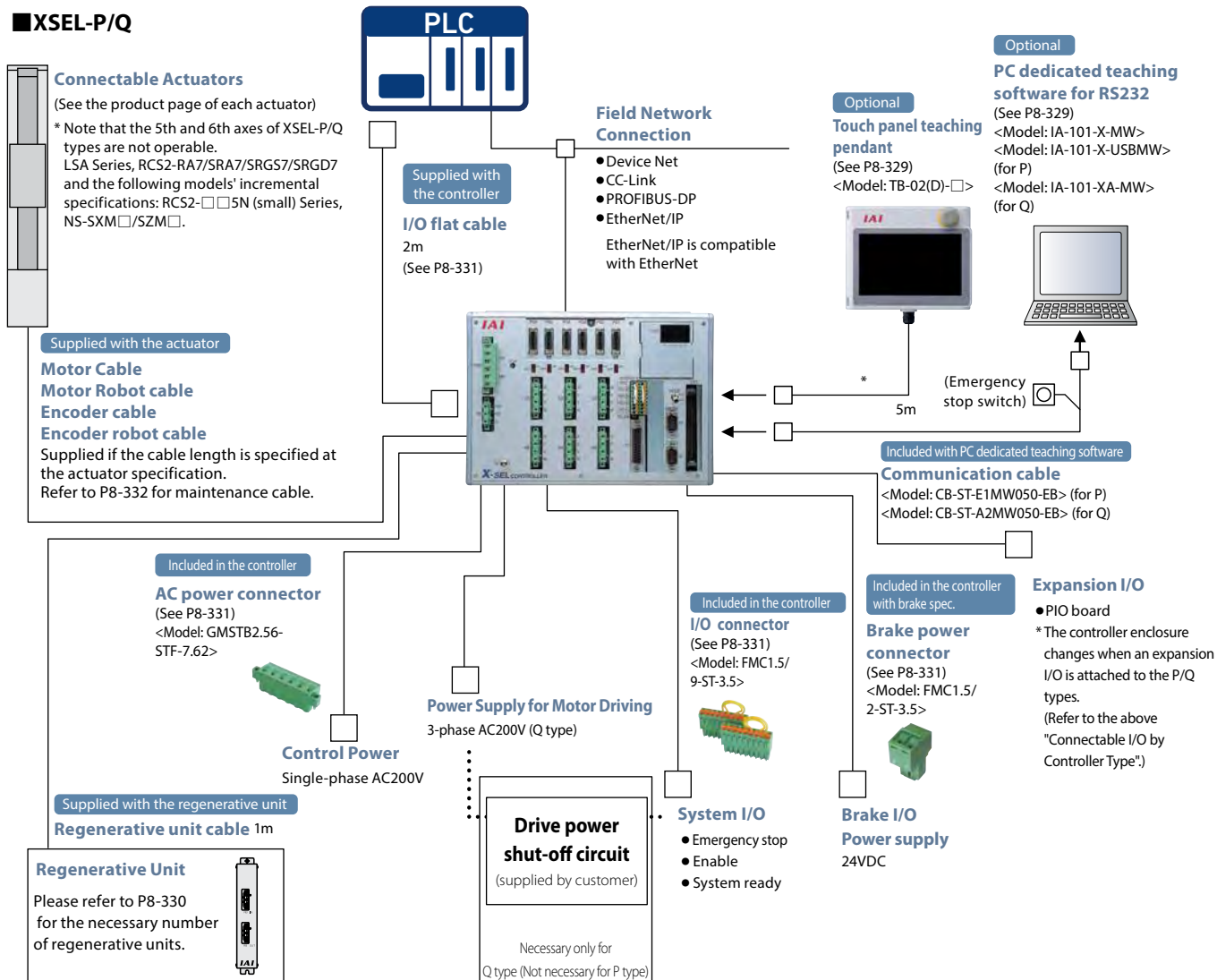
<p>Controller configured equipment</p> <p>Connected actuator: 200W battery-less absolute actuator x 4 axes</p> <p>Power voltage: Single-phase 200V, Option: Input 32/Output 16 (NPN) with I/O, without brake spec.</p>	
XSEL-P	XSEL-Q
<input type="radio"/>	<input type="radio"/>

○ : Available

- Nut rotation type actuator: NS-SXM□/SZM□ (incremental)

System configuration

■ XSEL-P/Q



*When connecting the power, make sure to mount the following filters or equivalent:

- Noise filter recommended model 3-phase TAC-20-683 (maker: COSEL)
Single-phase NBH-20-432 (maker: COSEL)
- Ring core recommended model ESD-R-25 (maker: NEC Tokin)
- Clamp filter recommended model Control power: ZCAT3035-1330 (maker TDK)
Motor power RFC-H13 (maker: Kitagawa Industry)
- Surge protector recommended model 3-phase RAV-781BXZ-4
Single-phase RAV-781BWZ-2A (maker: Okaya Electric)

*To configure the system that complies with the safety category (ISO 13849-1) for the XSEL-Q, refer to p8-29.

Precautions on selection

Limitations on connection

Confirm and select so that the total wattage of the single-axis/Cartesian robots that can be connected to the XSEL-P/Q does not exceed the maximum connectable axis wattage.

Some models need attention to the calculation method of wattage.

Item	Max. connectable wattage
Single-phase	1600W
Three-phase	2400W

Calculation of the connectable actuator wattage for the connection of the LSA/LSAS

Calculate the wattage based on the following "Controller wattage calculation output values" for the LSA/LSAS (linear servo actuator) connected to single-phase power.

Select so that the total wattage of LSA/LSAS and other actuators is 1600W or less.

$$1600W \geq \text{total LSA/LSAS wattage (controller wattage calculation output value)} + \text{other actuator total wattage (motor wattage} \times \text{number of axes)}$$

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)
LSA-S6SS	100	1	300	LSA-H8SM/L15SM	200	2	1200
LSA-S6SM	100	2	600	LSA-H8HS	200	1	600
LSA-S8SS	100	1	300	LSA-H8HM	200	2	1200
LSA-S8SM	100	2	600	LSA-N15SS	200	1	600
LSA-S8HS	100	1	300	LSA-N15SM	200	2	1200
LSA-S8HM	100	2	600	LSA-N15HS	200	1	600
LSA-N10SS	100	1	300	LSA-N15HM	200	2	1200
LSA-N10SM	100	2	600	LSA-N19SS	300	1	600
LSA-S10SS	200	1	600	LSA-N19SM	300	2	1200
LSA-S10SM	200	2	1200	LSA-W21SS	400	1	800
LSA-S10HS	200	1	600	LSA-W21SM	400	2	1600
LSA-S10HM	200	2	1200	LSA-W21HS	1000	1	1500
LSA-H8SS/L15SS	200	1	600	LSA-W21HM (*)	1000	2	3000

(*) Not operable with single-phase specification.

Calculation of wattage and maximum connectable units when connecting the RCS3-CT8C and CTZ5C.

Calculate the wattage based on the "Controller wattage calculation output value" for the following models.

Actuator Model	Driver output (W)	Number of max. connectable motors	Controller Wattage Calculation Output (W)
RCS3-CT8C	400	3	800
RCS3-CTZ5C	60	(no limitation)	120

Calculation of connectable actuator wattage when connecting the direct drive motor (DD/DDA)

When connecting the DD/DDA motor series, select the units so that the number of units is within the maximum connectable units, based on the following "Controller wattage calculation output value."

Select so that the total wattage of DD/DDA series and other actuators is 1600W or less.

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)
DD/DDA-LT18S/LT18CS	200	2	600
DD/DDA-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)
DD/DDA-LT18S/LT18CS	200	8	200
DD/DDA-LH18S/LH18CS	600	2	600

Table of specifications

■ P/Q (Safety Category Compliant Type)

Item		Description												
Controller type		P						Q						
Connecting actuator		RCS3/RCS2/IS(P)B/IS(P)A/IS(P)DB/IS(P)DBCR/IS(P)DACR/IF/FS/RS/LSA(S)												
Compatible motor output (W)		20/30/60/100/150/200/300/400/600/750/1000												
Number of controlled axes		1-axis	2-axis	2-axis	4-axis	5-axis	6-axis	1-axis	2-axis	2-axis	4-axis	5-axis	6-axis	
Maximum connected axes		Max2400W (single-phase AC200V specification is 1600W)												
Control power input		AC200/230 Single-phase ±10%						AC200/230 Single-phase ±10%						
Motor power input		AC200/230 Single-phase/3-phase ±10%						AC200/230 Single-phase/3-phase ±10%						
Power supply frequency		50/60Hz												
Insulation resistance		10MΩ or more (between the power-supply terminal and I/O terminals, and between all external terminals and case, at 500VDC)												
Withstand voltage		AC1500V (one minute)						AC1500V (one minute)						
Power supply capacity (*1)	P/Q	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA	
Position detection method		Battery-less absolute encoder/incremental encoder (wiring-saving type) Multi-rotation data backup absolute encoder (wiring-saving type)												
Safety circuit configuration		Redundancy not supported						Redundancy supported						
Drive power shut-off system		Internal cutoff relay						External safety circuit						
Enable input		B contact input (internal power supply model)						B contact input (external power supply, double redundant)						
Speed setting		1 mm/sec and up, the maximum depends on actuator specifications												
Acceleration/deceleration setting		0.01G and up, the maximum depends on actuator specifications												
Programming language		Super SEL language												
Number of programs		128 programs												
Number of program steps		9999 steps (total)												
Number of multi-tasking programs		16 programs												
Number of positions		20000 positions (total)												
Data memory device		Flash ROM + SRAM (battery backup)												
Data input method		By touch panel teaching pendant or PC dedicated teaching software												
Standard input/output		Input/Output 48-point PIO board (NPN/PNP), input/output 96-point PIO board (NPN/PNP), 1 board can be installed												
Extended input/output		Input/output 48-point PIO board (NPN/PNP), input/output 96-point PIO board (NPN/PNP), Up to 3 boards can be installed												
Serial communications function		Teaching Pendant (25-pin D-sub) Port + 2ch RS232C Port (9-pin D-sub x 2) included as standard												
Protective function		Motor overcurrent, overload, motor driver temperature check, overload check, encoder open-circuit check, soft limit over, system error, battery error.												
RC gateway 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												
Safety category		B						Compliant with 4 possible						
International standard		CE						CE,UL						

*1: When the connected axes represent the maximum wattage.

*2 Including the absolute battery, brake mechanism and expansion I/O box.

Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

Power capacity and heat quantity

Calculate the power capacity and heat quantity using the formula below.

Rated power capacity [VA] = Total motor power capacity [VA] + Total power consumption of control part [VA]

Heat quantity [W] = Total output loss [W] + (Internal power consumption [VA] x 0.7 (efficiency) x 0.6 (power factor))

Power capacity and output loss of actuators

Actuator motor wattage [W]	Motor power capacity [VA]	Output loss = heat quantity [W]
20	26	1.58
30D (except RS)	46	2.07
30R (for RS)	138	3.93
60	138	3.93
60(RCS3-CTZ5C- □ -60)	197	3.6
100	234	6.12
150	328	8.3
200	421	9.12
400	796	19.76
400 RCS3-CT8C- □ -400)	1230	18
600	1164	27.2 0
750	1521	29.77
100(LSA-S6S)	101	3.74
100(LSA-S8S)	159	4.07
100(LSA-S8H)	216	3.84
100S(LSA-N10S)	284	4.48
200(LSA-S10S)	343	5.35
200(LSA-H8S,L15S)	189	5.38
200(LSA-H8H)	379	5.38
200S(LSA-S10H)	417	5.01
200S(LSA-N15S)	486	4.37
200S(LSA-N15H)	773	6.42
300S(LSA-N19S)	662	11.58
400(LSA-W21S)	920	16.68
1000(LSA-W21H)	1843	37.77
DD motor(LT18S,T18S)	503	7.5
DD motor(LH18S,H18S)	1462	20.8

* Calculate the power capacity, etc. based on 120W for the RCS3-CTZ5C and 800W for the RCS3-CT8C.

Power consumption of the control part

		Control power		External power		Quantity
		Internal consumption [VA]	External consumption [VA]	Internal consumption [VA]	External consumption [VA]	
Basic part		31.4				1
Driver	per 1 board	6.26				1 ~ 3
Encoder	per 1 axis	2.38	3.57			1 ~ 6
Axis sensor	per 1 axis	5.71				0 ~ 6
Fan unit	per 1 unit	4.57				3 ~ 6
DIO card	DIO (48 points)	5.95		14.52		0 ~ 4
	DIO (96 points)	8.33		26.81		0 ~ 4
Network module	DeviceNet	2.38		1.71		0 ~ 1
	CC-Link	2.38		1.19		0 ~ 1
	Profibus-DP	4.17				0 ~ 1
	Ethernet	5.36				0 ~ 1
Teaching pendant	IA-T-X, XD		3.57			0 ~ 1
	SEL-T, TD		6.67			0 ~ 1
Brake	per 1 axis			5.95	13.81	0 ~ 1
Actuator driving source	CT4 pick & Rotary axis			5.95	max4	1

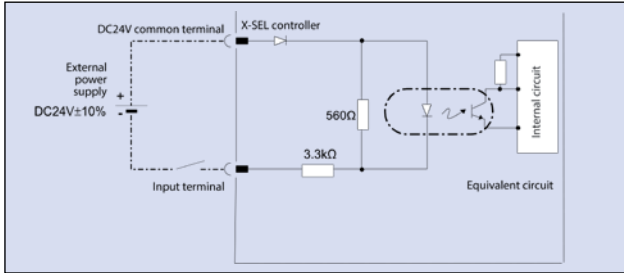
Number of fans

		P type quantity	Q type quantity
1-4 axes	without expansion I/O	4	3
	with expansion I/O	5	4
5 and 6 axes	without expansion I/O	5	4
	with expansion I/O	6	5

I/O Wiring diagram

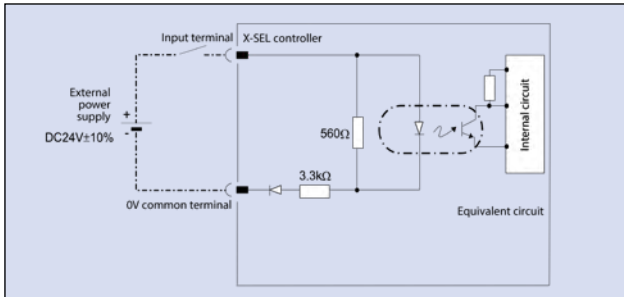
Input Section External input specification (NPN specification)

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)

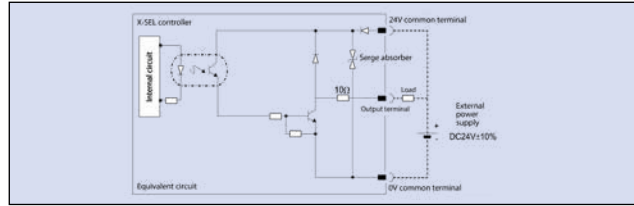
Item	Specifications
Input voltage	24VDC $\pm 10\%$
Input current	7mA / circuit
ON/OFF voltage	ON voltage...min. DC 8V / OFF voltage ... max. DC19V
Isolation method	Photocoupler



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

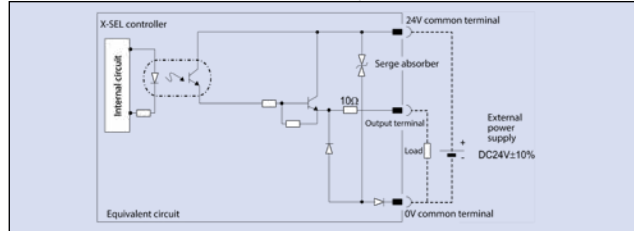
(Note) The maximum total load current for each set of the eight ports from output port No. 300 is 400mA. (The maximum total current output for output port No. 300+n to No. 300+n+7 must be 400mA, where n = 0 or a multiple of eight.)



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		Program start	
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		Select program (PRG No.1)	
10		Select program (PRG No.2)	
11		Select program (PRG No.4)	
12		Select program (PRG No.8)	
13		Select program (PRG No.10)	
14		Select program (PRG No.20)	
15		Select program (PRG No.40)	
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		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		Alarm output	
35		Ready output	
36		Emergency stop 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	

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		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		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		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		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

Models
not shown
here

Model
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

PSA-24

TB
-03/02

Software

External Dimensions

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

2D
CAD

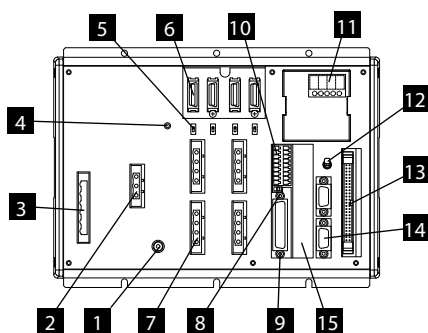
3D
CAD

■ P/O (Safety category compliant type)

			Basic layout (incremental specification)	With brake/absolute unit	With I/O expansion base	With Brake, absolute unit + I/O expansion ba	Side view
Type	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	
P	Single-phase / 3-phase specifications	1 to 4 axis specifications					
		5 to 6 axis specifications					
	Single-phase specifications	1 to 4 axis specifications					
		5 to 6 axis specifications					
Q	Single-phase specifications	1 to 4 axis specifications					
		5 to 6 axis specifications					
	3-phase specifications	1 to 4 axis specifications					
		5 to 6 axis specifications					

Part Names

P types



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.

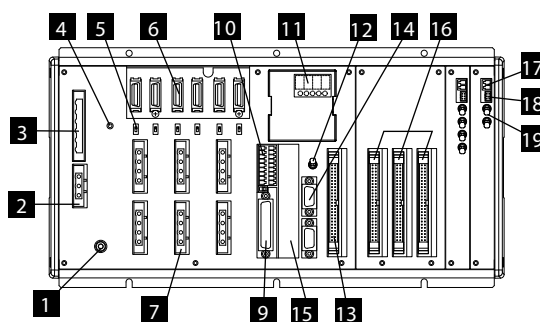
10 System I/O Connector

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 type (safety category compliant, with absolute unit+ expansion 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

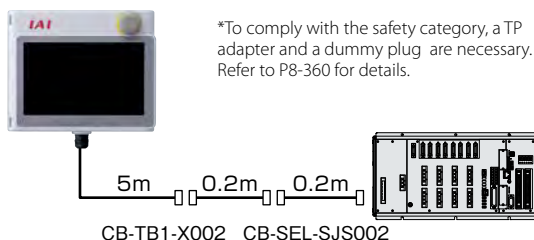
Locking toggle switch for releasing the axis brake. Pull the switch forward to use. Setting it to the top position (RLS side) forcibly releases the brake, while setting it to the bottom position (NOM side) causes the controller to automatically control the brake.

Options

Touch Panel Teaching Pendant

Model TB-02(D)-□

Features A teaching device offering program/position inputs, trial operations and monitoring functions.



Specifications

Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operating temperature	0~40℃
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Protective structure	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

■for XSEL-P (software + connection cable)

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

Model IA-101-X-MW

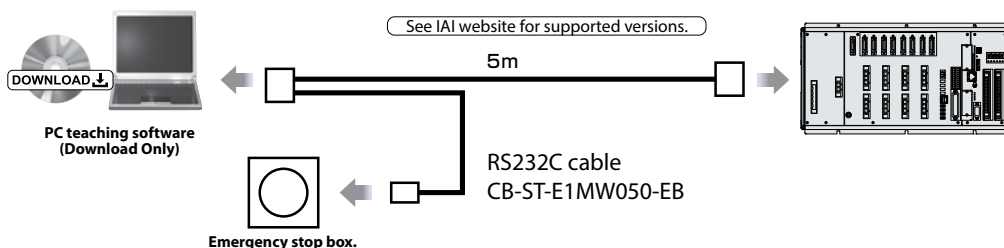
Features A start-up support software equipped with functions such as position input, trial operation, and monitoring. It enhances functions necessary for debugging and greatly shortens start up time.

Content Software Download, Supported Windows: 7/8/8.1/10

(Accessories) PC connecting cable 5m + emergency stop box (Model: CB-ST-A2MW050-EB)

Note

- * Versions older than 3.0.0 cannot be used for the XSEL-P type.
- * Versions older than 2.0.0 cannot be used for the SCARA type.
- * Use IA-101-XA-MW if you use a safety category 4 compliant controller.
- * Cannot be used for the XSEL-Q/OX/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.



Supported Windows: 7/8/8.1/10

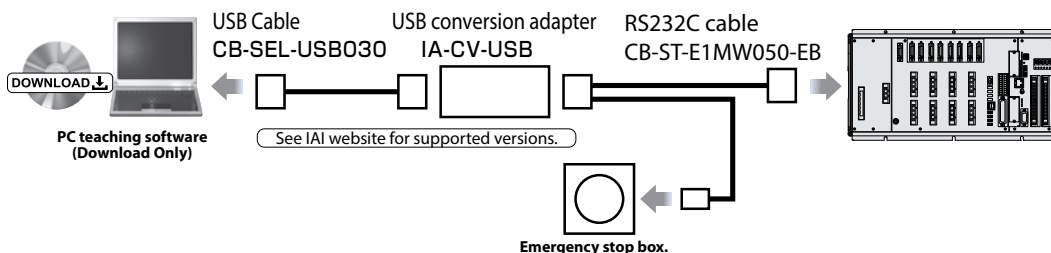


■for XSEL-P (Software + connecting cable + USB cable + USB conversion adapter)

Model IA-101-X-USBW

Features Software available by PC's USB port by connecting a USB conversion adapter to a RS232C cable.

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



Supported Windows: 7/8/8.1/10



■for XSEL-Q (software + connection cable) *Safety category 4 compliant

Model IA-101-XA-MW

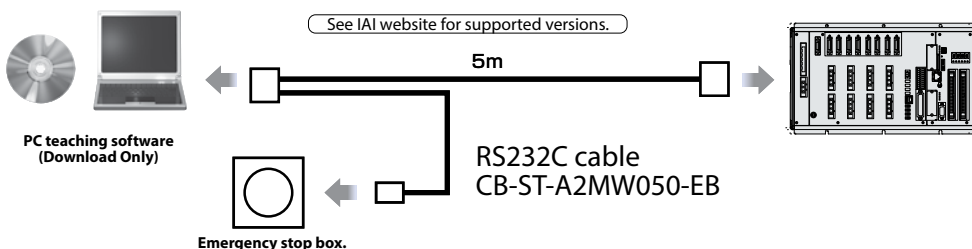
Features Teaching device equipped with functions such as position teaching, trial operation, and monitoring. It enhances functions necessary for debugging and greatly shortens start up time. The PC connection cable has an emergency stop with a duplex circuit and complies with the safety category 4.

Content Software (DVD-ROM)
Supported Windows: 7/8/8.1/10PC
(Accessories) PC connection cable 5m + emergency stop box (Model CB-ST-A2MW050-EB)

NOTE

When ordering a separate replacement PC cable the model number for the cable only is CB-ST-E1MW050, and for cable with the emergency stop box is CB-ST-E1MW050-EB. If a teaching tool is not used, connect the dummy plug DP-2 (supplied with the controller, to the teaching connector).

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



Supported Windows: 7/8/8.1/10



Regenerative resistance unit

Model **RESU-1** (standard specification)
RESUD-1 (DIN rail mount specification)

Overview

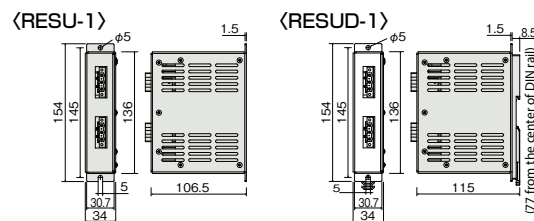
The regenerative resistance unit converts to heat the regenerative current generated when the motor decelerates. Although the controller is equipped with an internal regenerative resistance, an additional regenerative resistance unit may be needed when the load is too large on the vertical axis. (See the table right)

Specification

Model	RESU-1	RESUD-1
Mass	Approx. 0.4kg	
Built-in regenerative resistance value	235Ω 80W	
Mounting method	Screw mount	DIN rail mount
Attached cable	CB-ST-REU010	

Installation Installation standard depends on the total motor capacity of the connected axes.

Connected axes	Horizontal	Vertical
0 axis	~ 100W	~ 100W
1 axis	~ 600W	~ 600W
2 axis	~ 1200W	~ 1000W
3 axis	~ 1800W	~ 1400W
4 axis	~ 2400W	~ 2000W
5 個	—	~ 2400W



Expansion I/O board

A single part for replacement I/O slots

Name	Details	I/O slot code	Single part model code
PIO board	Input 32/Output 16 (NPN)	N1	IAIO3202-NP1
	Input 32/Output 16 (PNP)	P1	IAIO3202-PN1
	Input 16/Output 32 (NPN)	N2	IAIO3202-NP2
	Input 16/Output 32 (PNP)	P2	IAIO3202-PN2
Multi-point board	Input 48/Output 48 (NPN)	N3	IAIO3204-NP1
	Input 48/Output 48 (PNP)	P3	IAIO3204-PN1

Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need replacing.

AC power connector

Model GMSTB2.56-STF-7.62



Brake power connector

Model FMC1.5/2-ST-3.5



Used for the with-brake specification.

Network connector

for DeviceNet
Terminal resistor with 121Ω

Model MSTB2.5/5-ST-5.08ABGYAU(DV)



I/O connector

Model FMC1.5/9-ST-3.5

Two sets are needed for the controller.



Dummy plug

Model DP-2



Absolute data retention battery

Model AB-5

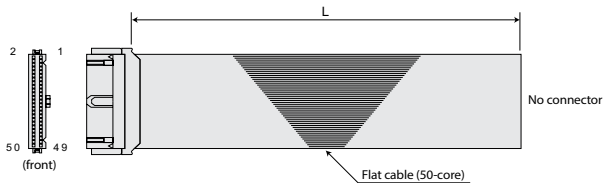
Needed when connecting the absolute actuator.



NPN/PNP specification PIO flat cable

Model CB-X-PIO

* Indicate the cable length (L) in □□□, Max. 10m, e.g. 080=8m



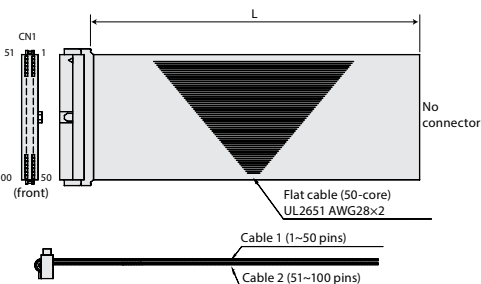
YG4M-5030-T (Omron)

No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown-1	Flat cable (crimped)	18	Gray-2	Flat cable (crimped)	35	Green-4	Flat cable (crimped)
2	Red-1		19	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				

NPN/PNP specification Multi-point PIO flat cable

Model CB-X-PIOH

* Indicate the cable length (L) in □□□, Max. 10m, e.g. 080=8m



HIF6-100D1.27R (Hirose)

Cable 1										Cable 2									
Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function	Category	Pin	Color	Port No.	No. Function
Input	—	1	Brown-1	—	External power supply (24VDC) for the pin No. 2-25, 51-74	—	26	Blue-3	—	External power supply (24VDC) for the pin No. 27-50, 76-99	51	Brown-1	300	Alarm output	76	Blue-3	324	General-purpose output	
	2	Red-1	000	Program start	27	Purple-3	024	General-purpose input	52	Red-1	301	Ready output	77	Purple-3	325	General-purpose output			
	3	Orange-1	001	General-purpose input	28	Gray-3	025	General-purpose input	53	Orange-1	302	Emergency stop output	78	Gray-3	326	General-purpose output			
	4	Yellow-1	002	General-purpose input	29	White-3	026	General-purpose input	54	Yellow-1	303	General-purpose output	79	White-3	327	General-purpose output			
	5	Green-1	003	General-purpose input	30	Black-3	027	General-purpose input	55	Green-1	304	General-purpose output	80	Black-3	328	General-purpose output			
	6	Blue-1	004	General-purpose input	31	Brown-4	028	General-purpose input	56	Blue-1	305	General-purpose output	81	Brown-4	329	General-purpose output			
	7	Purple-1	005	General-purpose input	32	Red-4	029	General-purpose input	57	Purple-1	306	General-purpose output	82	Red-4	330	General-purpose output			
	8	Gray-1	006	General-purpose input	33	Orange-4	030	General-purpose input	58	Gray-1	307	General-purpose output	83	Orange-4	331	General-purpose output			
	9	White-1	007	Program No. (PIG No.1)	34	Yellow-4	031	General-purpose input	59	White-1	308	General-purpose output	84	Yellow-4	332	General-purpose output			
	10	Black-1	008	Program No. (PIG No.2)	35	Green-4	032	General-purpose input	60	Black-1	309	General-purpose output	85	Green-4	333	General-purpose output			
	11	Brown-2	009	Program No. (PIG No.4)	36	Blue-4	033	General-purpose input	61	Brown-2	310	General-purpose output	86	Blue-4	334	General-purpose output			
	12	Red-2	010	Program No. (PIG No.8)	37	Purple-4	034	General-purpose input	62	Red-2	311	General-purpose output	87	Purple-4	335	General-purpose output			
	13	Orange-2	011	Program No. (PIG No.10)	38	Gray-4	035	General-purpose input	63	Orange-2	312	General-purpose output	88	Gray-4	336	General-purpose output			
	14	Yellow-2	012	Program No. (PIG No.20)	39	White-4	036	General-purpose input	64	Yellow-2	313	General-purpose output	89	White-4	337	General-purpose output			
	15	Green-2	013	Program No. (PIG No.40)	40	Black-4	037	General-purpose input	65	Green-2	314	General-purpose output	90	Black-4	338	General-purpose output			
	16	Blue-2	014	General-purpose input	41	Brown-5	038	General-purpose input	66	Blue-2	315	General-purpose output	91	Brown-5	339	General-purpose output			
	17	Purple-2	015	General-purpose input	42	Red-5	039	General-purpose input	67	Purple-2	316	General-purpose output	92	Red-5	340	General-purpose output			
	18	Gray-2	016	General-purpose input	43	Orange-5	040	General-purpose input	68	Gray-2	317	General-purpose output	93	Orange-5	341	General-purpose output			
	19	White-2	017	General-purpose input	44	Yellow-5	041	General-purpose input	69	White-2	318	General-purpose output	94	Yellow-5	342	General-purpose output			
	20	Black-2	018	General-purpose input	45	Green-5	042	General-purpose input	70	Black-2	319	General-purpose output	95	Green-5	343	General-purpose output			
	21	Brown-3	019	General-purpose input	46	Blue-5	043	General-purpose input	71	Brown-3	320	General-purpose output	96	Blue-5	344	General-purpose output			
	22	Red-3	020	General-purpose input	47	Purple-5	044	General-purpose input	72	Red-3	321	General-purpose output	97	Purple-5	345	General-purpose output			
	23	Orange-3	021	General-purpose input	48	Gray-5	045	General-purpose input	73	Orange-3	322	General-purpose output	98	Gray-5	346	General-purpose output			
	24	Yellow-3	022	General-purpose input	49	White-5	046	General-purpose input	74	Yellow-3	323	General-purpose output	99	White-5	347	General-purpose output			
	25	Green-3	023	General-purpose input	50	Black-5	047	General-purpose input	75	Green-3	—	External power supply (24V) for the pin No. 2-25, 51-74	100	Black-5	—	External power supply (24V) for the pin No. 27-50, 76-99			

Maintenance parts (cable)

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below.

Refer to P1-89 for the detail of cables.

The cable model search system is recommended!
URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



■ Table of compatible cables

Model number			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W) RCS3(CR)	Models other than ② ~ ④	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS2	RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③		RA13R (without load cell/ without brake)			CB-RCS2-PLA□□□	CB-X2-PLA□□□
④		RA13R ((without load cell/with brake)			CB-RCS2-PLA□□□ *Between the controller and brake CB-RCS2-PLA□□□	CB-X2-PLA□□□ *Between the controller and brake CB-X2-PLA□□□
⑤	RCS3	CTZ5C/CT8C			—	CB-X1-PA□□□
⑥	RCS4(CR)				—	CB-X1-PA□□□
⑦	NS	Without LS	—	CB-X-MA□□□	CB-X3-PA□□□	
⑧		With LS	—		CB-X2-PLA□□□	
⑨	LSAS	N	—		CB-X1-PA□□□	
⑩	LSA	S/H/L/N	—		CB-X3-PA□□□	
⑪		W	—	CB-X2-PLA□□□		
⑫	DDA	LT18□	—	CB-X-MA□□□	CB-X3-PA□□□	
⑬	DDACR DDW	LH18□	—	CB-XMC-MA□□□		
⑭	DDA	LT18□	—	CB-X-MA□□□	CB-X3-PA□□□ *Between the controller and brake CB-DDB-BK□□□	
⑮	DDACR (with brake)	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□□□
			—		—	CB-X1-PA□□□-AWG24 (For 21m or more)
⑲	Models other than ① ~ ⑪		—		—	CB-X1-PLA□□□
			—		—	CB-X1-PLA□□□-AWG24 (For 21m or more)

X-SEL

SCARA Robot Program Controller



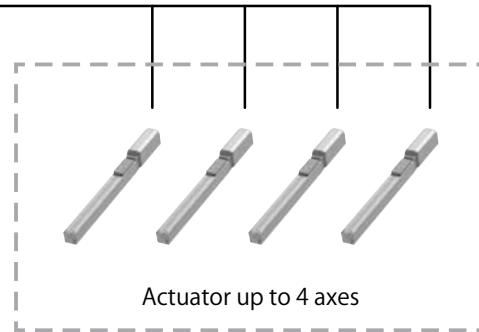
(*1) Not compliant when connected to IX-NNN10040/12040.

1

Allows for connecting actuators with a servo motor up to 8 axes including SCARA robots.



SCARA robot



Actuator up to 4 axes

2

Control functions of the SCARA robot

■ Compliance control

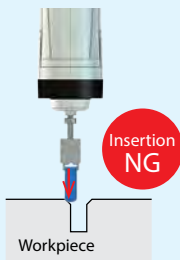
It controls the robot softly without applying external forces and reduces contact force with workpieces, assisting and supporting workpiece fitting.

* Arm length 180/800/1000, high-payload type and dust- & splash-proof specifications are not supported.

<Example> In case of positioning deviation at the time of inserting a pin into a part (workpiece)

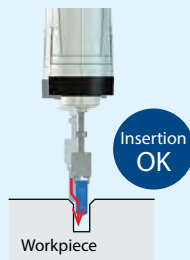
Normal control

The pin makes a contact with the chamfer and cannot be inserted.



Compliance control

Pin insertion is supported, along the chamfer side wall, assisting the insertion of the pin.



[Caution]

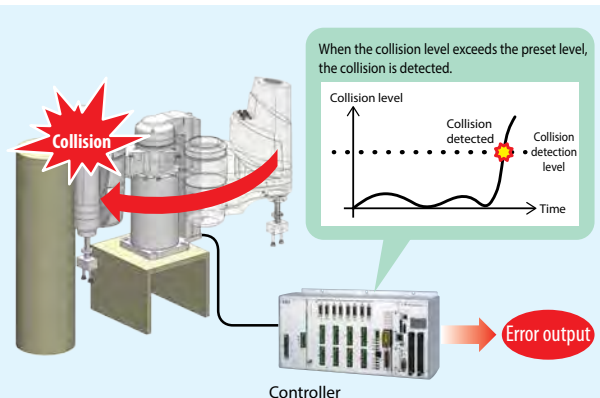
- * Insertion could be impossible on some conditions.
- * It is not possible to follow inclination to the Z-axis.
- * Depending on the workpiece or material of the hole, it could be damaged.

■ Collision detection function

When the SCARA robot detects collision with other objects, it stops operations quickly.

It alleviates damages on the gripper, workpiece and robot at the time of collision.

* Arm length 180 and dust- & splash-proof specifications are not supported.



[Caution]

- * The collision detection function will not guarantee safety of the human body.
- * It is a function to alleviate damages on the peripheral equipment, etc. It will not prevent 100% of damages.

Model

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

RAX3	3-axis SCARA	WAI	Battery-less absolute incremental	E	Not used	E	Not used
RAX4	[3-axis SCARA+1-axis] or [4-axis SCARA]	A	Absolute	DV	DeviceNet	N1	Input 32/Output 16 (NPN)
RAX5	[3-axis SCARA+2-axis] or [4-axis SCARA+ 1-axis]	G	Quasi absolute	CC	CC-Link	N2	Input 16/Output 32 (NPN)
RAX6	[3-axis SCARA+3-axis] or [4-axis SCARA +2-axis]	AI	Index absolute	CIE	CC-Link IE Field	N3	Input 48/Output 48 (NPN)
RAX7	[3-axis SCARA+4-axis] or [4-axis SCARA +3-axis]	AM	Absolute multi-rotation	PR	PROFIBUS-DP	P1	Input 32/Output 16 (PNP)
RAX8	4-axis SCARA+4-axis					P2	Input 16/Output 32 (PNP)
SAX3	3-axis SCARA Safety category specification	B	Brake equipped specification	E	Not used	P3	Input 48/Output 48 (PNP)
SAX4	[3-axis SCARA+1-axis] or [4-axis SCARA] Safety category specification	C	Creep sensor specification	EP	EtherNet/IP		
SAX5	[3-axis SCARA+2-axis] or [4-axis SCARA+ 1-axis] Safety category specification	HA	Hi-accel/decel. specification	EC	EtherCAT		
SAX6	[3-axis SCARA+3-axis] or [4-axis SCARA +2-axis] Safety category specification	L	Home sensor/LS compatible				
SAX7	[3-axis SCARA+4-axis] or [4-axis SCARA +3-axis] Safety category specification	M	Master axis specified				
SAX8	4-axis SCARA+4-axis Safety category specification	S	Slave axis specified				

* EP and CIE cannot be connected at the same time.

(*) 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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* The case size varies depending on the type of SCARA robot to be connected and the additional axes connected. For details, refer to the external dimensions on each product page(p8-342).

3NNN1805	IXA-3N□N1805	3N□N6018	IXA-3N□N6018
4NNN1805	IXA-4N□N1805	3N□N6033	IXA-3N□N6033
3N□N3105	IXA-3N□N3105	4N□N6018	IXA-4N□N6018
3N□N3105	IXA-3N□N3105	4N□N6033	IXA-4N□N6033
4N□N4518	IXA-4N□N4518	4N□N8020	IXA-4N□N8020
4N□N4533	IXA-4N□N4533	4N□N8040	IXA-4N□N8040
3N□N4518	IXA-3N□N4518	4N□N10020	IXA-4N□N10020
4N□N4533	IXA-4N□N4533	4N□N10040	IXA-4N□N10040
		4NHN10040	IXA-4NHN10040
		4NHN12040	IXA-4NHN12040
		4NSW3515	IXA-4NSW3015
		4NSW4518	IXA-4NSW4518
		4NSW4533	IXA-4NSW4533
		4NSW6018	IXA-4NSW6018
		4NSW6033	IXA-4NSW6033
		4NSC3515	IXA-4NSW3015
		4NSC4518	IXA-4NSW4518
		4NSC4533	IXA-4NSW4533
		4NSC6018	IXA-4NSW6018
		4NSC6033	IXA-4NSW6033

* □ is contains a symbol.
N: Standard type
S: High-speed type

* Refer to P8-335 for cautions on selection.

Software

Non-connectable actuators (additional axes)

Linear servo actuator (other than LSAS series), RCS2-□□5N (incremental specification), RCS2-SRA7BD/SRGS7BD/SRGD7BD, NS-SXM□/SZM□ (both incremental specification only), RCS3-CT□, RCS2-RA13R (with load cell), RCS3-RA□□, DD/DDA (High-resolution specification)

Limitations on additional axis connection

For SCARA controllers, there is a limit to the total motor wattage of the additional axis actuator motor that can be connected besides SCARA robots. Make sure that it does not exceed the "total wattage and max. number of connectable axes" specified in the table below.

SCARA robot model		Total wattage that can be connected to XSEL-RAX/SAX and the number of connectable axes .	
		Total wattage	Number of connectable axes
Standard type	IXA-3NNN1805	Total 1500W or less (Max. 750W for one axis)	Max. 4 axes (from 5 to 8th axes)
	IXA-3NNN3015		
	IXA-3NNN45□□	Total 600W or less (Max. 700W for one axis)	
	IXA-3NNN60□□		
	IXA-4NNN1805	Total 600W or less (Max. 600W for one axis)	Max. 3 axes (from 6 to 8th axes)
	IXA-4NNN3015		
	IXA-4NNN45□□		
	IXA-4NNN60□□		
IXA-4NNN80□□	Not connectable		
IXA-4NNN100□□			
High-speed type		IXA-3NSN3015 / 4NSN3015	
IXA-3NSN45□□ / 4NSN45□□			
IXA-3NSN60□□ / 4NSN60□□			
IXA-4NSN80□□			
IXA-4NSN100□□			
High-payload type		IXA-4NHN10040	
IXA-4NHN12040			
Dust- and splash-proof specification high-speed type		IXA-4NSW3015	
		IXA-4NSW45□□	
		IXA-4NSW60□□	
Cleanroom specification High-speed type		IXA-4NSC3015	
		IXA-4NSC4518	
		IXA-4NSC4533	
		IXA-4NSC6018	
		IXA-4NSC6033	

Note

- The high-speed type SCARA robot (including dust- and splash-proof spec.) cannot be connected with an additional axis.
- When using additional axes to the standard type, the controller will always be a cabinet for 8 axes. An additional axis cannot be added to the 3-axis SCARA robot (IXA-3NNN□□□□) as the 4th axis. It can be connected to the XSEL controller as the 5th to 8th axes.

■ Calculation of the connectable actuator wattage in which a direct drive motor (DD/DDA) is connected to an additional axis.

When connecting the DD/DDA series, calculate the maximum number of connectable units based on the "Controller wattage calculation output value" and select so that the quantity is less than the maximum number of connectable units.

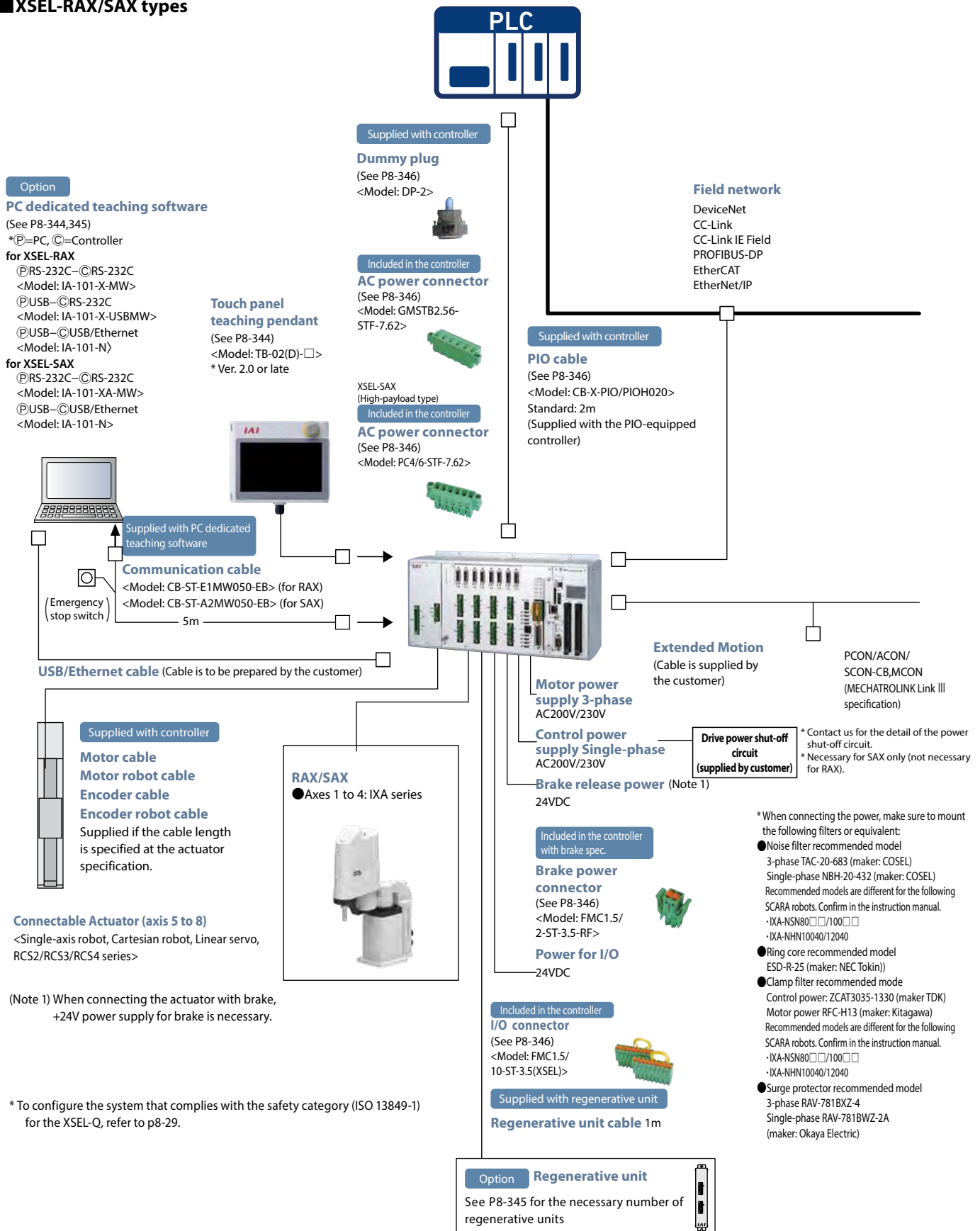
Conversion table of the DD/DDA motor wattage

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

● 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.

* To configure the system that complies with the safety category (ISO 13849-1) for the XSEL-Q, refer to p8-29.

Specifications table

Controller type		RAX type	SAX type
Compatible motor output		12W~1000W	
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	
Max. output of connected axes		Three-phase 2400W	Three-phase 2400W/Three-phase 3600W (only IXA-800/1000/1200)
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)		See p.8-338	
Position detection method		Incremental, absolute, battery-less absolute	
Safety circuit configuration		Redundancy not possible	Redundancy possible
Drive-source cutoff method		Internal relay cut-off	External safety circuit
Emergency stop input		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)
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	
Number of program steps		20,000 steps (total)	
No. of multi-tasking programs		16 programs	
Number of positions		Varies by the number of controlled axes 3-axes: 41250, 4-axis: 36,666, 5-axis: 33,000, 6-axis: 30,000, 7-axis: 27,500, 8-axis: 25,384	
Data recording element		Flash ROM + non-volatile RAM (FRAM): system battery (button battery) not required	
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	
Expansion I/O		None	
Serial communication function		Teaching port (D-sub25 pin), USB port (Mini-B) 1ch RS232C port (D-sub 9 pin), Ethernet (RJ-45)	
RC gateway function		None	
Fieldbus communication function		DeviceNet, CC-Link, CC-Link IE Field, PROFIBUS-DP, EtherNet/IP, EtherCAT * EP and CIE cannot be connected at the same time.	
Clock function		Retention time: about 10 days Charging time: about 100 hours	
Regenerative resistor		Built-in 1kΩ/20W regenerative resistor (Can be expanded by external regenerative resistance unit connection)	
Absolute battery		(1st-4th axes SCARA robot) Not used because of the battery-less absolute. (5th-8th additional axes) For absolute specification: AB-5	
Protection function		Motor overcurrent, overload, motor driver temperature check, overload check, encoder disconnection detection, soft limit over, system malfunction, absolute battery error, etc.	
Ambient operating temperature, humidity and ambience		0 - 40°C, 5%RH - 85%RH(non-condensing), avoid corrosive gas and excessive dust	
Safety category		B	Compliant to category 4 possible
International standard		CE	CE,UL

Power capacity and heat quantity

Calculate the power capacity and heat quantity using the formula below.

Rated power capacity [VA] = Total motor power capacity [VA] + Total power consumption of control part [VA]

Heat quantity [W] = Total output loss [W] + (Internal power consumption [VA] x 0.7 (efficiency) x 0.6 (power factor))

Motor power capacity and output loss of the SCARA robots

SCARA robot model		Actuator motor wattage [W]	Motor power capacity [VA]	Output loss = heat quantity [W]
Standard type	IXA-3NNN3015	1330.4	2217.3	34
	IXA-3NNN45□□	1178.8	1964.7	33.3
	IXA-3NNN60□□	1469.1	2448.5	43.6
	IXA-4NNN1805	356	593.4	14.3
	IXA-4NNN3015	1582.3	2637.1	40.3
	IXA-4NNN45□□	1370.6	2284.3	38.6
	IXA-4NNN60□□	1660.9	2768.1	48.9
	IXA-4NNN80□□	3468.5	5780.8	82.3
	IXA-4NNN100□□	3398.3	5663.8	82.3
	IXA-3NSN3015	2343	3905.1	54
High-speed type	IXA-3NSN45□□	2533.6	4222.7	55.3
	IXA-3NSN60□□	2413.5	4022.6	56.3
	IXA-4NSN3015	2594.9	4324.8	60.4
	IXA-4NSN45□□	2725.4	4542.3	60.5
	IXA-4NSN60□□	2605.3	4342.2	61.6
High-payload type	IXA-4NSN80□□	5589.1	9315.2	118.5
	IXA-4NSN100□□			
Dust- and splash-proof specification high-speed type	IXA-4NHN10040	5113.6	8522.6	118.5
	IXA-4NHN12040	5033.3	8388.8	118.5
	IXA-4NSW3015	2555.5	4259.1	61.6
Cleanroom specification High-speed type	IXA-4NSW45□□	2399.3	3998.9	60.5
	IXA-4NSW60□□	2496.2	4160.3	61.6
	IXA-4NSC3015	2616.5	4360.8	60.5
	IXA-4NSC45□□	2725.4	4542.3	60.5
	IXA-4NSC60□□	2656.5	4427.5	61.6

(Note 1) Calculated using the power factor of 0.6.

Motor power capacity and output loss of additional axis actuators

Actuator motor wattage [W]	Motor power capacity [VA]	Output loss = heat quantity [W]
20	26	1.58
30	46	2.07
60	138	3.39
100	234	6.12
150	328	8.3
200	421	9.12
400	796	19.76
600	1164	27.2
750	1521	29.77
100 (Linear actuator LSAS-N10SS)	379	4.48
200 (Linear actuator LSAS-N15SS)	486	4.37
200 (Linear actuator LSAS-N15HS)	773	6.42

Controller

Models not shown here

Model selection

RCON

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

TB -03/02

Software

Power consumption of the control part

			Control power		External power (DC24V)		Quantity	
			Internal consumption [VA]	External consumption [VA]	Internal consumption [VA]	External consumption [VA]		
Basic part			46.64	—	—	—	1	
Driver	per1 board		6.26	—	—	—	Refer to the "controller part quantity"	
Encoder	per 1 axis		2.38	3.57	—	—		
Fan unit	per 1 unit		5.71	—	—	—		
Axis sensor	per 1 axis		4.57	—	—	—		
PIO board	DIO (48 points)	N1,N2 P1,P2	5.95	—	14.52	—	0~2	Number of substrates of I/O slots 1 and 2
	DIO (96 points)	N3,P3	8.33	—	26.81	—	0~2	
Network module	DeviceNet	DV	1.98	—	3.43	—	0~1	Number of substrates of Field network board 2
	CC-Link	CC	5.67	—	—	—	0~1	
	PROFIBUS-DP	PR	1.98	—	—	—	0~1	
	CC-Link IE Field	CIE	3.3	—	—	—	0~1	
	EtherNet/IP	EP	1.98	—	—	—	0~1	Number of substrates of Field network board 1
	EtherCAT	EC	3.93	—	—	—	0~1	
Teaching pendant	TB-01		—	8.57	—	—	0~1	
	TB-02		—	8.57	—	—	0~1	
	TB-03		—	8.57	—	—	0~1	
Brake	per 1 axis		SCARA robot 0.28	—	2.5	SCARA robot 1.0	Total number of actuators with brake0~5	
			additional axis 0.12			additional axis 7.5		

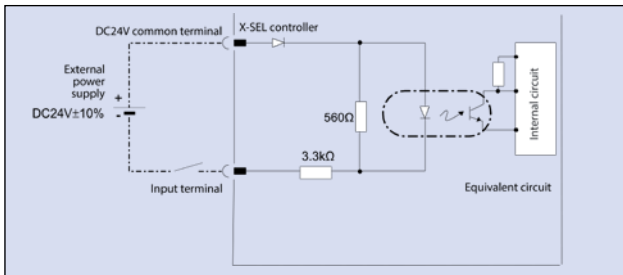
Quantity of control part

	Number of axes							
	1 axis	2 axes	3 axes	4 axes	5 axes	6 axes	7 axes	8 axes
Driver	1	1	2	2	3	3	4	4
Encoder	1	2	3	4	5	6	7	8
Fan unit	4-axis spec. cabinet				8-axis spec. cabinet			
	XSEL-RAX : 5 units XSEL-SAX (three-phase spec.) : 4units				XSEL-RAX : 6 units XSEL-SAX (three-phase spec.) : 5 units XSEL-SAX4 (IXA high-payload type) : 6 units			
Axis sensor	1	2	3	4	5	6	7	8

I/O Wiring diagram

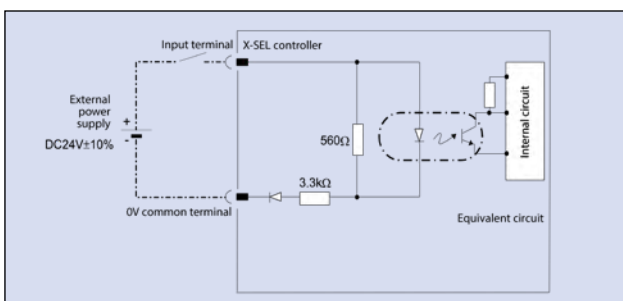
Input External input specification (NPN specification)

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)

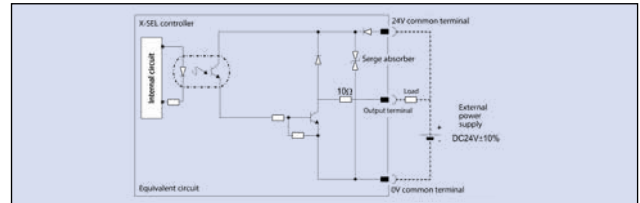
Item	Specification
Input voltage	24VDC \pm 10%
Input current	7mA, 1 circuit
ON/OFF voltage	ON voltage: min. 8VDC; OFF voltage: max. 19VDC
Isolation method	Photocoupler isolation



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

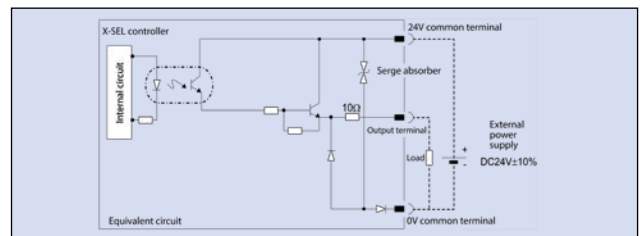
Note: The maximum load current will be 400mA per 8 ports from the output port No.300. (The maximum load current between the output port No.300 + n and No.300 + n + 7 is 400mA. n = 0 or multiple of 8.)



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

Expanded I/O signal table (When N1 or P1 is selected)

Pin No.	Category	Standard setting
1	Input	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		General-purpose input
18		General-purpose input
19		General-purpose input
20		General-purpose input
21	Output	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		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	Output	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

Expanded I/O signal table (When N2 or P2 is selected)

Pin No.	Category	Standard setting
1	Input	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		General-purpose input
18		General-purpose output
19		General-purpose output
20		General-purpose output
21	Output	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		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	Output	General-purpose output
42		General-purpose output
43		General-purpose output
44		General-purpose output
45		General-purpose output
46		General-purpose output
47		General-purpose output
48		General-purpose output
49		General-purpose output
50		0V connection

Standard multi-point I/O signal table (When N3 or P3 is selected)

Pin No.	Category	Port No.	Standard setting
1	—	—	External power supply (24VDC) for the pin No. 2~25, 51~74
2	Input	000	Program start
3		001	General-purpose input
4		002	General-purpose input
5		003	General-purpose input
6		004	General-purpose input
7		005	General-purpose input
8		006	General-purpose input
9		007	Program No. (PRG No 1)
10		008	Program No. (PRG No 2)
11		009	Program No. (PRG No 4)
12		010	Program No. (PRG No 8)
13		011	Program No. (PRG No 10)
14		012	Program No. (PRG No 20)
15		013	Program No. (PRG No 40)
16		014	General-purpose input
17		015	General-purpose input
18		016	General-purpose input
19		017	General-purpose input
20		018	General-purpose input
21		019	General-purpose input
22		020	General-purpose input
23		021	General-purpose input
24		022	General-purpose input
25		023	General-purpose input
26	—	—	External power supply (24VDC) for the pin No. 27~50/76~99
27	Input	024	General-purpose input
28		025	General-purpose input
29		026	General-purpose input
30		027	General-purpose input
31		028	General-purpose input
32		029	General-purpose input
33		030	General-purpose input
34		031	General-purpose input
35		032	General-purpose input
36		033	General-purpose input
37		034	General-purpose input
38		035	General-purpose input
39		036	General-purpose input
40		037	General-purpose input
41		038	General-purpose input
42		039	General-purpose input
43		040	General-purpose input
44		041	General-purpose input
45		042	General-purpose input
46		043	General-purpose input
47		044	General-purpose input
48		045	General-purpose input
49		046	General-purpose input
50		047	General-purpose input
51	Output	300	Alarm output
52		301	Ready output
53		302	Emergency stop output
54		303	General-purpose output
55		304	General-purpose output
56		305	General-purpose output
57		306	General-purpose output
58		307	General-purpose output
59		308	General-purpose output
60		309	General-purpose output
61		310	General-purpose output
62		311	General-purpose output
63		312	General-purpose output
64		313	General-purpose output
65		314	General-purpose output
66		315	General-purpose output
67		316	General-purpose output
68		317	General-purpose output
69		318	General-purpose output
70		319	General-purpose output
71		320	General-purpose output
72		321	General-purpose output
73		322	General-purpose output
74		323	General-purpose output
75	—	—	External power supply (0V) for the pin No. 2~25, 51~74
76	Output	324	General-purpose output
77		325	General-purpose output
78		326	General-purpose output
79		327	General-purpose output
80		328	General-purpose output
81		329	General-purpose output
82		330	General-purpose output
83		331	General-purpose output
84		332	General-purpose output
85		333	General-purpose output
86		334	General-purpose output
87		335	General-purpose output
88		336	General-purpose output
89		337	General-purpose output
90		338	General-purpose output
91		339	General-purpose output
92		340	General-purpose output
93		341	General-purpose output
94		342	General-purpose output
95		343	General-purpose output
96		344	General-purpose output
97		345	General-purpose output
98		346	General-purpose output
99		347	General-purpose output
100	—	—	External power supply (0V) for the pin No. 27~50, 76~99

Expanded multi-point I/O signal table (When N3 or P3 is selected)

Pin No.	Category	Port No.	Standard setting
1	—	—	External power supply (24VDC) for the pin No. 2~25, 51~74
2	Input	—	General-purpose input
3		—	General-purpose input
4		—	General-purpose input
5		—	General-purpose input
6		—	General-purpose input
7		—	General-purpose input
8		—	General-purpose input
9		—	General-purpose input
10		—	General-purpose input
11		—	General-purpose input
12		—	General-purpose input
13		—	General-purpose input
14		—	General-purpose input
15		—	General-purpose input
16		—	General-purpose input
17		—	General-purpose input
18		—	General-purpose input
19		—	General-purpose input
20		—	General-purpose input
21		—	General-purpose input
22		—	General-purpose input
23		—	General-purpose input
24		—	General-purpose input
25		—	General-purpose input
26	—	—	External power supply (24VDC) for the pin No. 27~50/76~99
27	Input	—	General-purpose input
28		—	General-purpose input
29		—	General-purpose input
30		—	General-purpose input
31		—	General-purpose input
32		—	General-purpose input
33		—	General-purpose input
34		—	General-purpose input
35		—	General-purpose input
36		—	General-purpose input
37		—	General-purpose input
38		—	General-purpose input
39		—	General-purpose input
40		—	General-purpose input
41		—	General-purpose input
42		—	General-purpose input
43		—	General-purpose input
44		—	General-purpose input
45		—	General-purpose input
46		—	General-purpose input
47		—	General-purpose input
48		—	General-purpose input
49		—	General-purpose input
50		—	General-purpose input
51	Output	—	General-purpose output
52		—	General-purpose output
53		—	General-purpose output
54		—	General-purpose output
55		—	General-purpose output
56		—	General-purpose output
57		—	General-purpose output
58		—	General-purpose output
59		—	General-purpose output
60		—	General-purpose output
61		—	General-purpose output
62		—	General-purpose output
63		—	General-purpose output
64		—	General-purpose output
65		—	General-purpose output
66		—	General-purpose output
67		—	General-purpose output
68		—	General-purpose output
69		—	General-purpose output
70		—	General-purpose output
71		—	General-purpose output
72		—	General-purpose output
73		—	General-purpose output
74		—	General-purpose output
75	—	—	External power supply (0V) for the pin No. 2~25, 51~74
76	Output	—	General-purpose output
77		—	General-purpose output
78		—	General-purpose output
79		—	General-purpose output
80		—	General-purpose output
81		—	General-purpose output
82		—	General-purpose output
83		—	General-purpose output
84		—	General-purpose output
85		—	General-purpose output
86		—	General-purpose output
87		—	General-purpose output
88		—	General-purpose output
89		—	General-purpose output
90		—	General-purpose output
91		—	General-purpose output
92		—	General-purpose output
93		—	General-purpose output
94		—	General-purpose output
95		—	General-purpose output
96		—	General-purpose output
97		—	General-purpose output
98		—	General-purpose output
99		—	General-purpose output
100	—	—	External power supply (0V) for the pin No. 27~50, 76~99

External dimensions

■ XSEL-RAX/SAX

Notes at the time of your order

The controller of the following IXA SCARA robots is that for an 8-axis specification enclosure.

- 3-axis and 4-axis high-speed type (NSN)
- 4-axis of the standard type IXA-4NNN60□□/4NNN80□□/4NN100□□
- 3-axis and 4-axis of the standard types (NNN) with additional axes.
- Dust- and splash proof spec (NSW)
- High-payload type (NHN)

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



	Controller Specification		Front View		Side View
			Battery-less absolute/Incremental specification/Quasi absolute specification/Index absolute specification	Absolute specification/Multi-rotational absolute specification	
RAX	Three-phase specification	4-axis specification			 (Battery-less absolute/ Incremental specification/ Quasi absolute specification/ Index absolute specification)
		5~8-axis specification			
SAX	Three-phase specification	4-axis specification			 (Absolute specification/ Absolute multi-rotation specification)
		4-axis spec (high-payload type)			
		5~8-axis specification			

* When at least one absolute specification is included in the connecting single-axis actuators, the external view will be that of an absolute specification.

Models not shown here

Model selection

RCON

RSEL

REC

RSEL
(Cartesian 6-axis)

RCP6S

PCON
-CB/CFB

PCON
-CBP
(Pulse press)

PCON

ACON-CB
DCON-CB

ACON
DCON

SCON
-CB

SCON
-CB
(Servo press)

SSEL

MSEL

XSEL
-RA/SA

XSEL
-P/Q

XSEL
(SCARA)

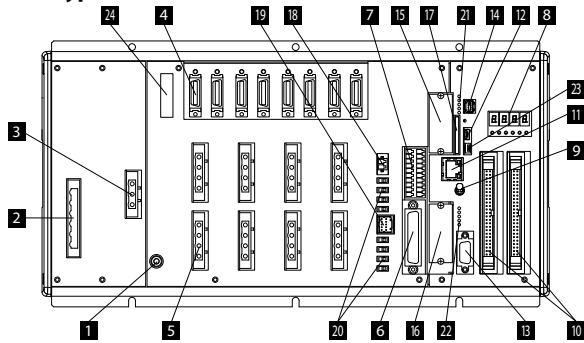
PSA-24

TB
-03/02

Software

Part Names

RAX 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.

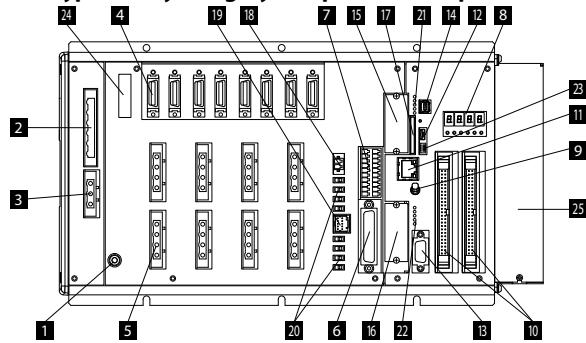
12 USB Connector

A USB device connector to connect to a PC.

13 General-purpose RS232C Port Connector

A port to connect general-purpose RS232C devices.

SAX 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

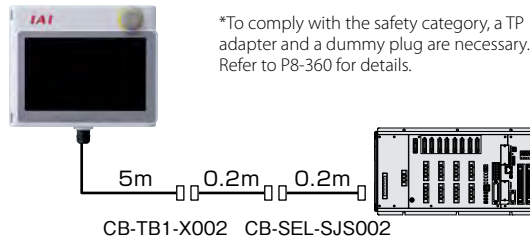
This unit comes with the absolute specification.

Options

Touch Panel Teaching Pendant

Model TB-02(D)-□

Features A teaching device offering program/position inputs, trial operations and monitoring functions.



Specifications

Rated voltage	24V DC
Power consumption	3.6W or smaller (150mA or smaller)
Ambient operating temperature	0~40°C
Ambient operating humidity	5%RH - 85%RH (non-condensing, no frost)
Protective structure	IP20
Weight	470g (TB-02 unit only)

PC dedicated teaching software (Windows only)

■for XSEL-RAX (software)

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

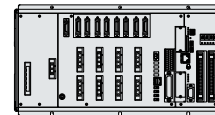
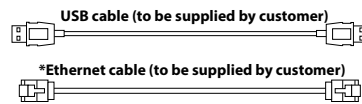
Model IA-101-N

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

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

See IAI website for supported versions.

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



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.

■for XSEL-RAX (software + connection cable)

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

Model IA-101-X-MW

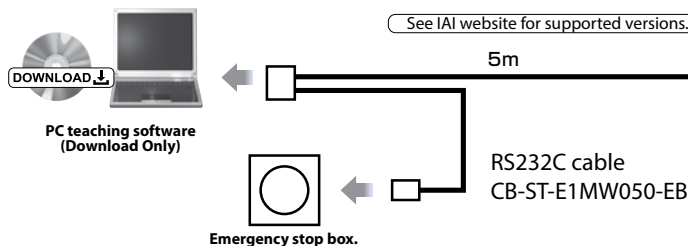
Features A start-up support software equipped with functions such as position input, trial operation, and monitoring.
It enhances functions necessary for debugging and greatly shortens start up time.

Content Software Download, Supported Windows: 7/8/8.1/10
(Accessories) PC connecting cable 5m + emergency stop box (Model: CB-ST-A2MW050-EB)

Note

- * Versions older than 3.0.0 cannot be used for the XSEL-P type.
- * Versions older than 2.0.0 cannot be used for the SCARA type.
- * Use IA-101-XA-MW if you use a safety category 4 compliant controller.
- * Cannot be used for the XSEL-Q/QX/S/SX/SXD types.
- * When you separately order a PC connecting cable for a maintenance purpose, beware that the cable single unit model is CB-ST-E1MW050-B, but when ordering it together with the emergency stop box, the model is CB-ST-E1MW050-EB.

See IAI website for supported versions.



Supported Windows: 7/8/8.1/10

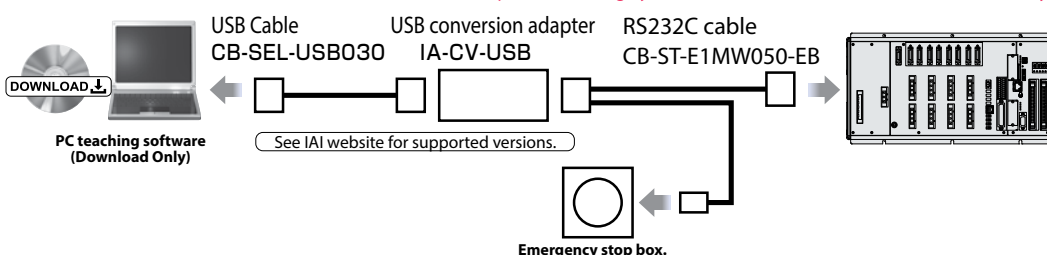


■for XSEL-RAX (Software + connecting cable + USB cable + USB conversion adapter)

Model IA-101-X-USBMW

Features Software available by PC's USB port by connecting a USB conversion adapter to a RS232C cable.

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



Supported Windows: 7/8/8.1/10



■for XSEL-Q (software + connection cable) *Safety category 4 compliant

Model IA-101-XA-MW

Features

Teaching device equipped with functions such as position teaching, trial operation, and monitoring. It enhances functions necessary for debugging and greatly shortens start up time. The PC connection cable has an emergency stop with a duplex circuit and complies with th safety category 4.

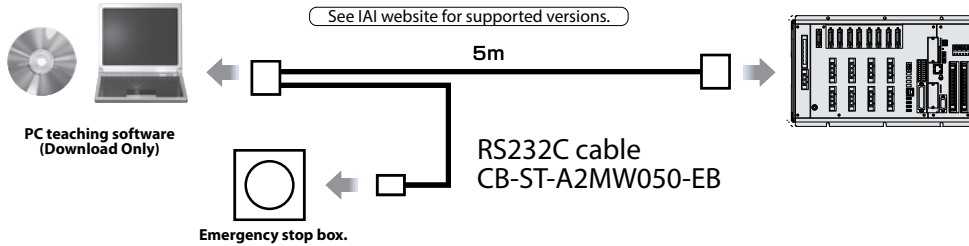
Content

Software (DVD-ROM)
Supported Windows: 7/8/8.1/10PC
(Accessories) PC connection cable 5m + emergency stop box (Model CB-ST-A2MW050-EB)

NOTE

When ordering a separate replacement PC cable the model number for the cable only is CB-ST-E1MW050, and for cable with the emergency stop box is CB-ST-E1MW050-EB. If a teaching tool is not used, connect the dummy plug DP-2 (supplied with the controller, to the teaching connector.

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



Supported Windows: 7/8/8.1/10



Regenerative resistance unit

Model RESU-1 (standard specification) RESUD-1 (DIN rail mount specification)

Specification

Model	RESU-1	RESUD-1
Mass	Approx. 0.4kg	
Built-in regenerative resistance value	235Ω 80W	
Mounting method	Screw mount	DIN rail mount
Attached cable	CB-ST-REU010	

Description

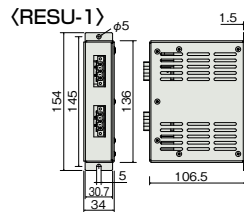
The regenerative resistance unit converts to heat the regenerative current generated when the motor decelerates. Although the controller is equipped with an internal regenerative resistance, an additional regenerative resistance unit may be needed when the load is too large on the vertical axis.

<In case of connecting a single-axis robot>

Installation Depends on the total motor capacity of connected axes.

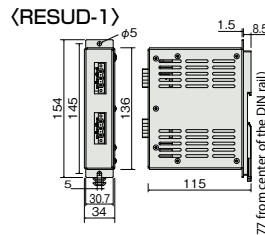
Horizontal

Total motor capacity	Required quantity of the regenerative resistance
100W	0 unit
~ 600W	1 unit
~ 1200W	2 units
~ 1800W	3 units
~ 2400W	4 units



Vertical

Total motor capacity	Required quantity of the regenerative resistance
100W	0 unit
~ 600W	1 unit
~ 1000W	2 units
~ 1400W	3 units
~ 2000W	4 units
~ 2400W	5 units



<In case of connecting a SCARA robot>

Installation

IXA connection

Model	required quantity of the regenerative resistance
1805	0 unit
3015	
45 □ □	2 units
60 □ □	
80 □ □	6 units
100 □ □	7 units
3015	
45 □ □	3 units
60 □ □	4 unit
80 □ □	
100 □ □	7 units
10040	10 units
12040	
3015	
45 □ □	3 units
60 □ □	4 unit
3015	
45 □ □	3 units
60 □ □	4 units

* The required quantities in the left table are for the SCARA robot main unit. When connecting single-axis robots as additional axes, add regenerative resistance units for the single-axis robots.

(Ex.) In case of operating IXA-3NNN3015 and ISB-MXM (200W), IXA-3NNN3015..... 2 units needed ISB-MXM (200W)... 1 unit needed As a result, three regenerative resistance units are needed.

Expansion I/O board

A single part for replacement I/O slots

Name	Details	I/O slot code	Single part model code
PIO board	Input 32/Output 16 (NPN)	N1	IAIO3202-NP1
	Input 32/Output 16 (PNP)	P1	IAIO3202-PN1
	Input 16/Output 32 (NPN)	N2	IAIO3202-NP2
	nput 16/Output 32 (PNP)	P2	IAIO3202-PN2
Multi-point board	nput 48/Output 48 (NPN)	N3	IAIO3204-NP1
	Input 48/Output 48 (PNP)	P3	IAIO3204-PN1

Maintenance parts

These parts are normally included in each unit. Please order individual parts if lost or need be.

AC power connector

■Model GMSTB2.56-STF-7.62



AC power connector

■Model PC4/6-STF-7.62



for XSEL-SAX (high-payload type) controller

Dummy plug

■Model DP-2



System I/O short circuit connector

■Model FMC1.5/10-ST-3.5(XSEL)



Two units are necessary for the controller

Brake power connector

■Model FMC1.5/2-ST-3.5-RF



Absolute data retention battery

■Model AB-5



Necessary when connecting absolute actuators.

Network connector

for DeviceNet

■Model SMSTB2.5/5-ST-5.08AU(DV)



for CC-Link

Terminal resistor with 110Ω/130Ω

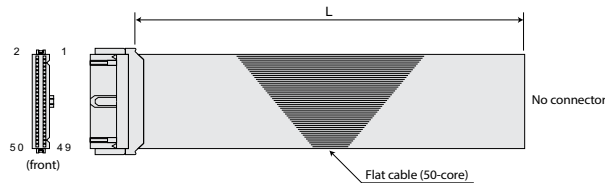
■Model MSTB2.5/5-STF-5.08AU



NPN/PNP specification PIO flat cable

Model **CB-X-PIO** ☐ ☐ ☐

* Indicate the cable length (L) in ☐☐☐, Max. 10m, e.g.) 080=8m



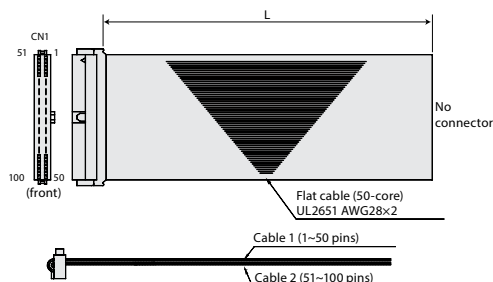
XG4M-5030-T (Omron)

No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown-1		18	Gray-2		35	Green-4	
2	Red-1		19	White-2		36	Blue-4	
3	Orange-1		20	Black-2		37	Purple-4	
4	Yellow-1		21	Brown-3		38	Gray-4	
5	Green-1		22	Red-3		39	White-4	
6	Blue-1		23	Orange-3		40	Black-4	
7	Purple-1		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				

NPN/PNP specification Multi-point PIO flat cable

Model **CB-X-PIOH** ☐ ☐ ☐

* Indicate the cable length (L) in ☐☐☐, Max. 10m, e.g.) 080=8m



HIF6-100D1.27R (Hirose)

Category				Category				Category				Category			
Pin	Color	Port No.	No. Function	Pin	Color	Port No.	No. Function	Pin	Color	Port No.	No. Function	Pin	Color	Port No.	No. Function
1	Brown-1	000	External power supply (DAVDC) for the pin No. 2-25, 51-74	26	Blue-3	024	General-purpose input	51	Brown-1	300	Alarm output	76	Blue-3	324	General-purpose output
2	Red-1	001	Program start	27	Purple-3	025	General-purpose input	52	Red-1	301	Ready output	77	Purple-3	325	General-purpose output
3	Orange-1	002	General-purpose input	28	Gray-3	026	General-purpose input	53	Orange-1	302	Emergency stop output	78	Gray-3	326	General-purpose output
4	Yellow-1	003	General-purpose input	29	White-3	027	General-purpose input	54	Yellow-1	303	General-purpose output	79	White-3	327	General-purpose output
5	Green-1	004	General-purpose input	30	Black-3	028	General-purpose input	55	Green-1	304	General-purpose output	80	Black-3	328	General-purpose output
6	Blue-1	005	General-purpose input	31	Brown-4	029	General-purpose input	56	Blue-1	305	General-purpose output	81	Brown-4	329	General-purpose output
7	Purple-1	006	General-purpose input	32	Red-4	030	General-purpose input	57	Purple-1	306	General-purpose output	82	Red-4	330	General-purpose output
8	Gray-1	007	Program No. (PRG No. 1)	33	Orange-4	031	General-purpose input	58	Gray-1	307	General-purpose output	83	Orange-4	331	General-purpose output
9	White-1	008	Program No. (PRG No. 2)	34	Yellow-4	032	General-purpose input	59	White-1	308	General-purpose output	84	Yellow-4	332	General-purpose output
10	Black-1	009	Program No. (PRG No. 3)	35	Green-4	033	General-purpose input	60	Black-1	309	General-purpose output	85	Green-4	333	General-purpose output
11	Brown-2	010	Program No. (PRG No. 4)	36	Blue-4	034	General-purpose input	61	Brown-2	310	General-purpose output	86	Blue-4	334	General-purpose output
12	Red-2	011	Program No. (PRG No. 5)	37	Purple-4	035	General-purpose input	62	Red-2	311	General-purpose output	87	Purple-4	335	General-purpose output
13	Orange-2	012	Program No. (PRG No. 6)	38	Gray-4	036	General-purpose input	63	Orange-2	312	General-purpose output	88	Gray-4	336	General-purpose output
14	Yellow-2	013	Program No. (PRG No. 7)	39	White-4	037	General-purpose input	64	Yellow-2	313	General-purpose output	89	White-4	337	General-purpose output
15	Green-2	014	Program No. (PRG No. 8)	40	Black-4	038	General-purpose input	65	Green-2	314	General-purpose output	90	Black-4	338	General-purpose output
16	Blue-2	015	General-purpose input	41	Brown-5	039	General-purpose input	66	Blue-2	315	General-purpose output	91	Brown-5	339	General-purpose output
17	Purple-2	016	General-purpose input	42	Red-5	040	General-purpose input	67	Purple-2	316	General-purpose output	92	Red-5	340	General-purpose output
18	Gray-2	017	General-purpose input	43	Orange-5	041	General-purpose input	68	Gray-2	317	General-purpose output	93	Orange-5	341	General-purpose output
19	White-2	018	General-purpose input	44	Yellow-5	042	General-purpose input	69	White-2	318	General-purpose output	94	Yellow-5	342	General-purpose output
20	Black-2	019	General-purpose input	45	Green-5	043	General-purpose input	70	Black-2	319	General-purpose output	95	Green-5	343	General-purpose output
21	Brown-3	020	General-purpose input	46	Blue-5	044	General-purpose input	71	Brown-3	320	General-purpose output	96	Blue-5	344	General-purpose output
22	Red-3	021	General-purpose input	47	Purple-5	045	General-purpose input	72	Red-3	321	General-purpose output	97	Purple-5	345	General-purpose output
23	Orange-3	022	General-purpose input	48	Gray-5	046	General-purpose input	73	Orange-3	322	General-purpose output	98	Gray-5	346	General-purpose output
24	Yellow-3	023	General-purpose input	49	White-5	047	General-purpose input	74	Yellow-3	323	General-purpose output	99	White-5	347	General-purpose output
25	Green-3	024	General-purpose input	50	Black-5	048	General-purpose input	75	Green-3	324	External power supply (DV) for the pin No. 2-25, 51-74	100	Black-5	348	External power supply (DV) for the pin No. 2-25, 51-74

Maintenance parts (cable)

When you need spare parts after purchasing the product, such as when replacing a cable, refer to the list of models below.

Refer to P1-89 for the detail of cables.

The cable model search system is recommended!
URL: <https://www.intelligentactuator.com/iai-cables-search-tool/>



■ Table of compatible cables

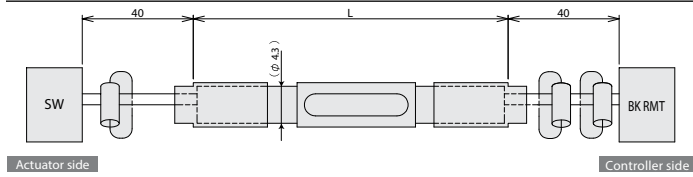
Model number			Motor cable	Motor robot cable	Encoder cable	Encoder robot cable
①	RCS2(CR/W) RCS3(CR)	Models other than ② ~ ④	CB-RCC-MA□□□	CB-RCC-MA□□□-RB	CB-RCS2-PA□□□	CB-X3-PA□□□
②	RCS2	RT			CB-RCS2-PLA□□□	CB-X2-PLA□□□
③		RA13R (without load cell/ without brake)			CB-RCS2-PLA□□□	CB-X2-PLA□□□
④		RA13R (without load cell/ with brake)			CB-RCS2-PLA□□□ *Between the controller and brake CB-RCS2-PLA□□□	CB-X2-PLA□□□ *Between the controller and brake CB-X2-PLA□□□
⑤	RCS4(CR)				—	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	DDA DDACR	LT18□	—	CB-X-MA□□□	CB-X3-PA□□□	
⑩	DDW	LH18□	—	CB-XMC-MA□□□		—
⑪	DDA DDACR (with brake)	LT18□	—	CB-X-MA□□□	—	CB-X3-PA□□□ *Between the controller and brake CB-DDB-BK□□□
⑫		LH18□	—	CB-XMC-MA□□□	—	
⑬	IS(P)WA	S/M/L	—	CB-XEU-MA□□□	—	CB-X1-PA□□□-WC
⑭	ZR		—	CB-X-MA□□□	—	Z-axis: CB-X1-PA□□□ R-axis: CB-X1-PLA□□□ *Between the controller and brake CB-RCS2-PLA□□□
⑮	Models other than ① ~ ⑧		—	CB-X-MA□□□	—	CB-X1-PA□□□
⑯			—		—	CB-X1-PA□□□-AWG24 (For 21m or more)
			—		—	CB-X1-PLA□□□
⑰	Models other than with LS specification ① ~ ⑧		—		—	CB-X1-PLA□□□-AWG24 (For 21m or more)
			IXA	—	CB-X-MA□□□	—

*Actuators without battery-less absolute encoders will still be CB-X1-PA□□□/CB-X1-PLA□□□ for over 20m.

Model		Brake cable for IXA		
⑲	XSEL-RAX/SAX	□NNN18/□NNN30/□NNN45	□NNN60	Other than left
		CB-IXA-BK□□□-1	CB-IXA-BK□□□-2	CB-IXA-BK□□□-3

Model CB-IXA-BK □□□ -1

* Please indicate the cable length (L) in □□□, maximum 15m,
E.g.) 050 = 5m



DF3-3S-2C (Hirose)

Connector	Color	Signal	Pin No.
SW	Red	BK3	1
	White	COM	2
	—	—	3

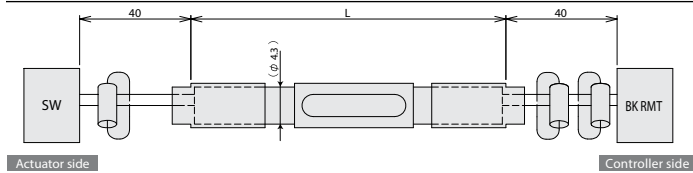
1-1827862-5(AMP)

Pin No.	Signal	Color	Connector
A2	BK3	Red	BK RMT
A3	COM	White	
Rest	—	—	

Sheath

Model CB-IXA-BK □□□ -2

* Please indicate the cable length (L) in □□□, maximum 15m,
E.g.) 050 = 5m



DF3-3S-2C (Hirose)

Connector	Color	Signal	Pin No.
SW	Red	BK4	1
	White	COM	2
	—	—	3

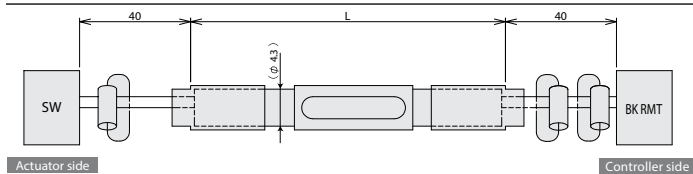
1-1827862-5(AMP)

Pin No.	Signal	Color	Connector
B2	BK4	Red	BK RMT
A3	COM	White	
Rest	—	—	

Sheath

Model CB-IXA-BK □□□ -3

* Please indicate the cable length (L) in □□□, maximum 15m,
E.g.) 050 = 5m



DF3-3S-2C (Hirose)

Connector	Color	Signal	Pin No.
SW	Red	BK5	1
	White	COM	2
	—	—	3

1-1827862-5(AMP)

Pin No.	Signal	Color	Connector
A4	BK5	Red	BK RMT
A3	COM	White	
Rest	—	—	

Sheath

PSA-24

Model PSA-24/PSA-24L

24VDC Power supply



Features

Compact

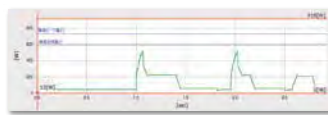
Compared with the conventional 24V power supply, it has a compact size, allowing a smaller installation space.



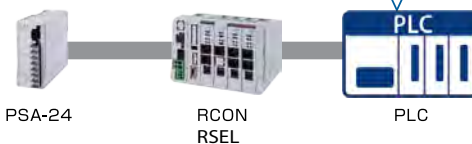
Output of internal data from the power supply

Possible to monitor the following data by connecting with R-unit:

- Output voltage
- Output current
- Load factor
- Cumulative energizing time
- Internal temperature
- Alarm for low fan rotational speed



* an image graph



Power supply calculator

*Calculator comes with IA-OS software.

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.

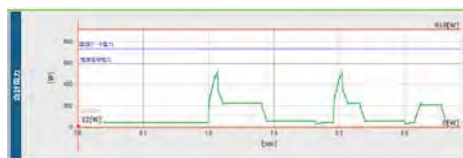
Calculation results are displayed.

動作パターン	計算結果	ピーク電力値	522.86 [W]	PSA-24必要台数	2 [台]
		平均電力	108.07 [W]	FAN有り	2 [台]
				FAN無し	2 [台]

Required number of power supply units

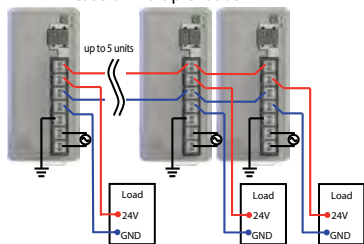


Current value graph

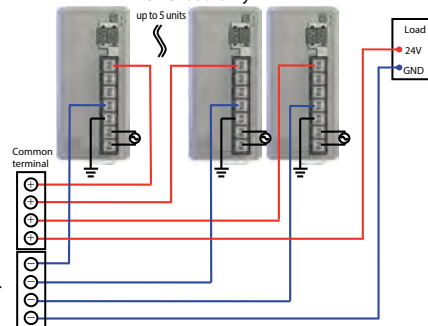


Parallel operation of up to 5 units is possible

In case of multiple loads



One load only



(Note) Parallel operations under the following conditions are not possible.

* Parallel connection of PSA-24 (without fan specification) and PSA-24L (with fan specification).

* Parallel connection with a power supply other than this unit.

* Parallel connection with PS-24.

Specifications

tem		Specifications		Conditions
		PSA-24 (without fan)	PSA-24L (with fan)	
Power source voltage range		AC100V ~ AC230V ±10%		
Power current	AC100V	2.5A or less	3.9A or less	Continuous rated output 204W
	AC200V	1.4A or less	1.9A or less	Continuous rated output 204W
Power frequency range		50/60 Hz± 5%		
Power supply capacity	AC100V	250VA	390VA	Continuous rated output 204W
	AC200V	280VA	380VA	Continuous rated output 204W
Inrush Current (Note 1)	AC100V	27.4A (typ)		When Cold-started (40°C)
	AC200V	54.8A (typ)		
Momentary power failure resistance	50Hz	20 ms		
	60Hz	16 ms		
Electric shock protection mechanism		Class I		
Efficiency	AC100V	86% or more		Continuous rated output 204W
	AC200V	90% or more		
Output voltage range (Note 2)		17A (408W)		
Continuous rated output		8.5A (204W)	13.8A (330W)	
Peak output		17A (408W)		
Protective function		Protection agaist over current, over heat and over load.		
		Protection agaist over voltage, input low voltage and fan rotation		
Ambient operating temperature		0°C ~ +55°C (derating)		
Ambient operating humidity		5%RH - 85%RH		No condensing
Ambient operating atmosphere		Not exposed to corrosive gases or dusts.		
Vibration resistance		Oscillation frequency: 10-57Hz / Amplitude: 0.075mm Oscillation frequency: 57-150Hz / Acceleration: 9.8m/s2 Sweepage time of XYZ each direction: 10 minutes Number of sweepages: 10 times		
Shock resistance		Drop height 800mm, one corner, 3 edges, 6 surfaces		
Electric shock protection mechanism		Class I		
Degree of protection		Not applicable		
Calorific value	AC100V	23W		Continuous rated output 204W
		37W		Continuous rated output 330W
	AC200V	33W		Continuous rated output 204W
		54W		Continuous rated output 330W
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 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.

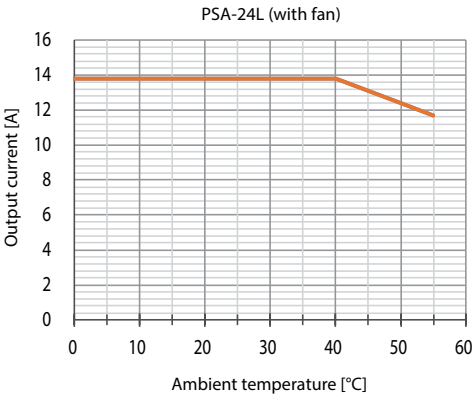
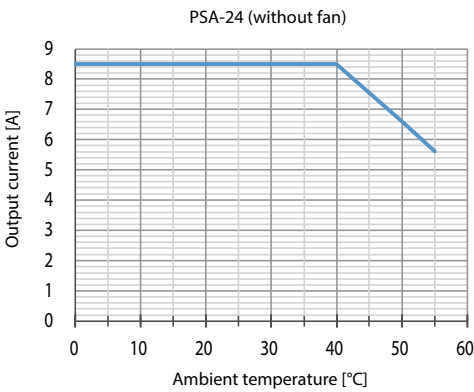


Caution

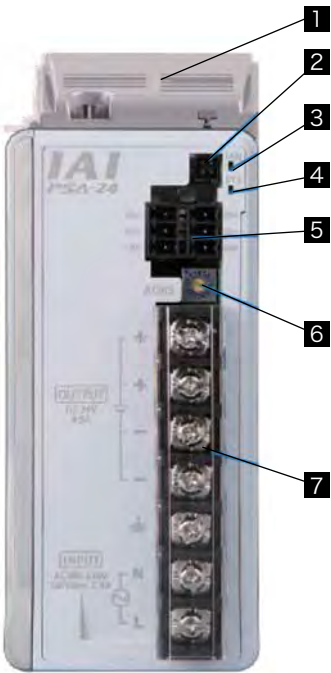
- **This power supply is not a constant voltage power supply. The output voltage changes with the load (voltage decreases according to the load percentage). Therefore, do not connect any equipment other than IAI actuators.**
- **Up to 5 units can be operated in parallel. Do not use any power supplies 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

Models
not shown
hereModel
selection

RCON

RSEL

REC

RSEL
(Cartesian
6-axis)

RCP6S

PCON
-CB/CFBPCON
-CBP
(Pulse press)

PCON

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

SSEL

MSEL

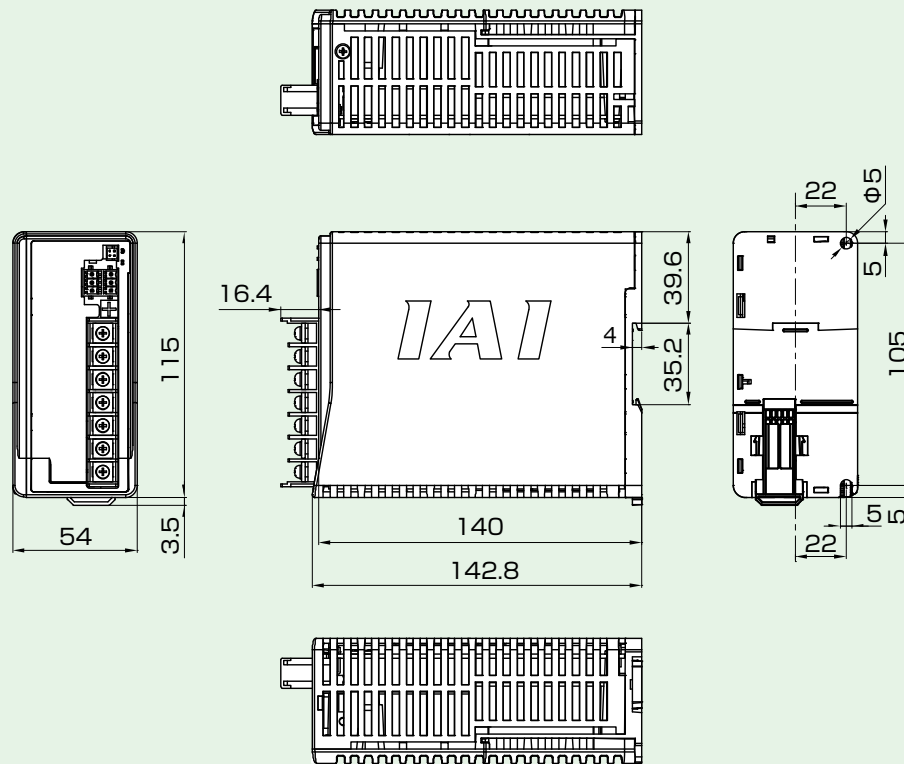
XSEL
-RA/SAXSEL
-P/QXSEL
(SCARA)

PSA-24

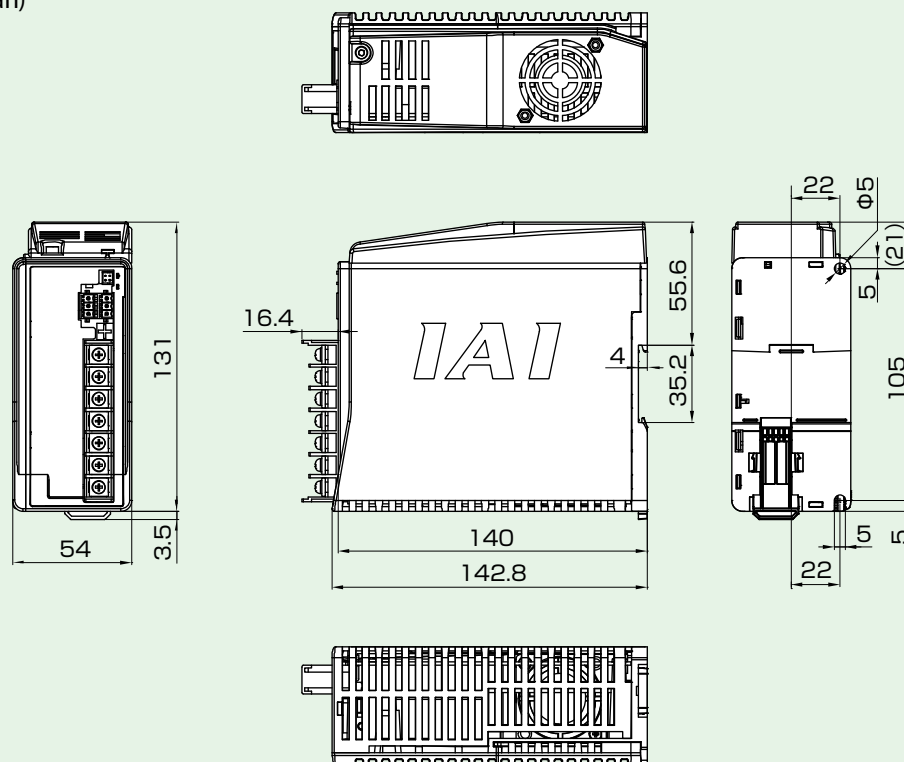
TB
-03/02

Software

PSA-24 (without fan)



PSA-24L (with fan)



TB-03

TB-02

Commonly used for the position controller and program controller

Touch panel teaching pendant



Features

Setting and trial runs can be done wirelessly even for actuators out of reach

Wireless connection (TB-03)

Operating conditions can be set wirelessly.

Without connecting with the ELECYLINDER main unit with a cable, positioning adjustments, setting of operating conditions and actuator motions are possible from outside of the equipment.

* The stop switch is enabled only for the "wired connection."

Note that it is disabled for the "wireless connection."

"The driving power source needs to be supplied by wire."



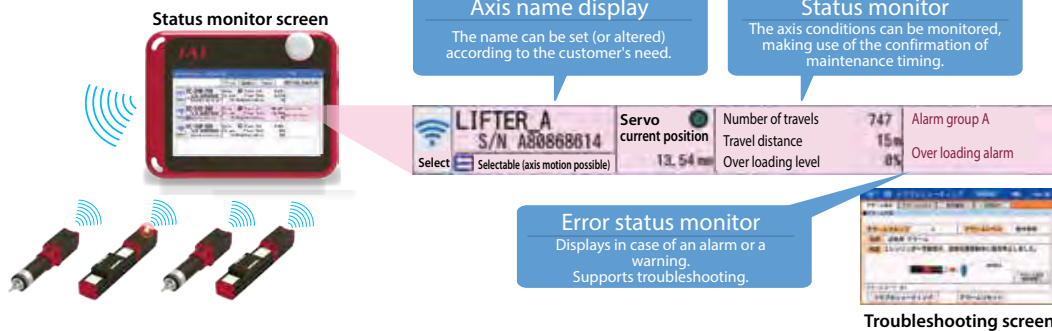
The functions of the ELECYLINDER that is operable with wireless connection differ depending on the specified item in the option.
"-WL" is for edit only, and "-WL2" is for edit and operation.



Connected axis status monitor (TB-03)

The operating conditions of up to 16 axes can be monitored by receiving wireless data that the ELECYLINDERS transmit all the time. Furthermore, in case of abnormality, troubleshooting can be done wirelessly, making the recovery time from the trouble shortened.

* The driving power source is only for one axis.



One unit can set up all types of controllers

For ELECYLINDER/Position controller/Program controller

Connectable with all types of controllers* by using the dedicated cable.

* All the controllers shown in the General Catalog 2018 or later.



Wired connection
(Cable connection)

Controller



Graphical easy support functions

Main menu

Use of icons for the menu makes selection much easier.



Easy data setting and program setting

A guide screen for position setting using pictures is provided for those who operate the actuator for the first time.

Easy data setting screen
(when connecting an ELECYLINDER)

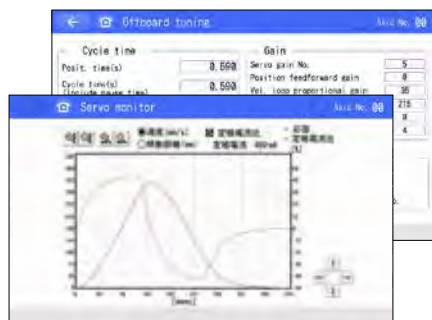


Easy program setting screen
(when connecting a position controller)



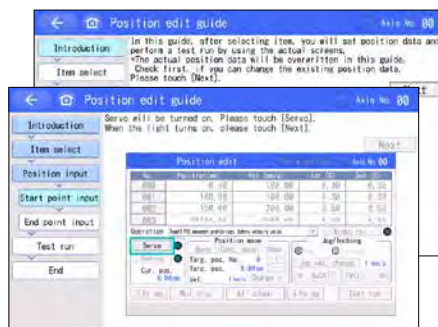
Off-board tuning

Optimal gain calculations and setting as well as cycle time calculations are possible by inputting operation conditions.



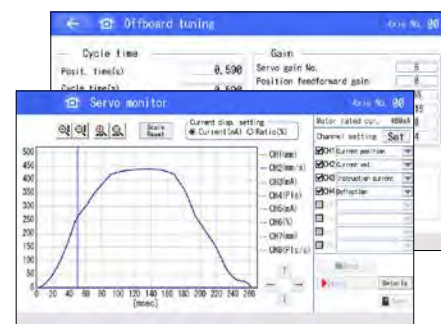
Position edit guide

Setting of position data is guided in an interactive method.



Servo monitor

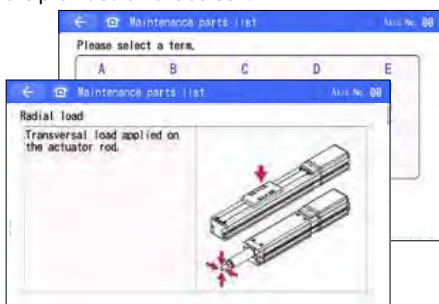
The current position, speed and current value deviation of the actuator are displayed in a graphical representation.



No problem even in case of a trouble! Full of functions for troubleshooting

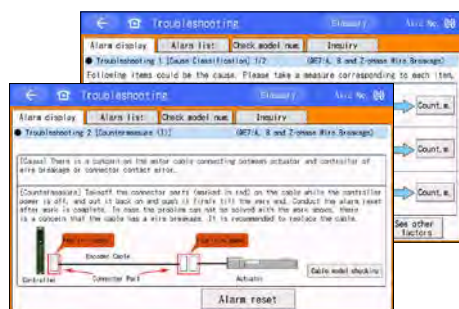
Description of terms

Descriptions of terms used in the general catalog and operations of the position controller are provided on the screen.



Troubleshooting

Shows troubleshooting by selecting only Yes/No about the trouble symptoms.



Maintenance part list

It is possible to confirm maintenance part list by entering the model.



There are many other functions!

List of functions of TB-03/TB-02

1	Wireless connection	Without connecting with the ELECYLINDER main unit with a cable, positioning adjustments, and operating condition setting are possible from outside of the equipment.
2	Monitoring of connected axis conditions	The operating conditions of up to 16 axes can be monitored by receiving wireless data that the ELECYLINDERS transmit all the time.
3	Main menu	Menu screen using icons that is easy for visual selections.
4	Easy data setting (EC) Easy program setting (position controller)	Operating method, positioning, speed, acceleration and deceleration can be set by an interactive method.
5	Troubleshooting	Function to display detailed information of the alarm and indicate troubleshooting in an interactive method in case of troubles.
6	Maintenance part list	Function to show list of maintenance parts for the periodical maintenance and failure.
7	Setting of initial screen	Function not to show the guide function with icons or select the initial screen at the time of start up.
8	Description of terms	Function to display descriptions of terms used in the general catalog and operations of the position controller on the screen.
9	Easy programming function	Function to program a repeated motion of positions and setting of pause time
10	Position edit guide	Function to guide setting method of the position data in an interactive method.
11	I/O control guide	Function to guide the I/O operation method of the position controller in an interactive method.
12	Off-board tuning	Function to set optimal control parameters (various gains) and enable cycle time calculation.
13	Gateway setting and monitoring	Function to set up and monitor the gateway system of RCP6S, RCON and REC.
14	Servo monitor	Function to monitor actual operating conditions in a waveform display.
15	Network data	Shows input/output data of the upper level controller when connecting a single-axis controller of the network specification.
16	Press program function	Press program function
17	Teaching update	Function to support software version upgrade by the customer.
18	Screenshot	Function to save screenshots in the bmp file format to the SD card by pressing the right bottom corner of the screen.
19	Large screen display	To support a large 7-inch full color touch panel to display large letters and buttons for high operability.
20	Multi-language	Supports Japanese, English and Chinese languages.

* 1 and 2 are functions for wireless connection between TB-03 and an ELECYLINDER.

4 to 9 are for ELECYLINDERS and position controllers.

10-16 are for position controllers.

Model Number

One unit supports all controllers, although the cable must be selected in accordance with the controller to be connected.
Select the AC adapter for charging the main unit according to the operating environment.

Model **TB-03** - Cable - AC adapter

● Body + cable + AC adapter set model

Connected controller	Model		Cable	
	Body + cable	AC adapter	For ELECYLINDER/ position controller	For program controller
ELECYLINDER Position Controller	TB-03-C	(Blank)/C/E/K 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
	TB-03-SCN *1	(Blank)/C/E/K N *2	-	-

*1 No cable

*2 No AC adapter

*3 Note Conversion cable

● Connection cable model number

Connected controller	Model
ELECYLINDER Position Controller	① CB-TB3-C050
Program Controller	② CB-TB3-S050 ③ CB-SEL-SJS002 (conversion cable) *3

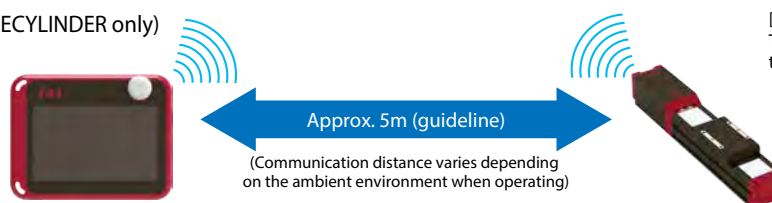
*3 Use with the ② cable when connecting to ASEL, PSEL, SSEL, or MSEL

● AC adapter single product model number

Connected controller	Model	Specification	Single product model number
ELECYLINDER Position Controller Program Controller	(Blank)	For Japan/North America/Thailand	UN318-5928
	C	For China	UNZ318-5928
	E	For Europe	UNE318-5928
	K	For Korea	UNR318-5928

Connection

● Wireless connection (ELECYLINDER only)



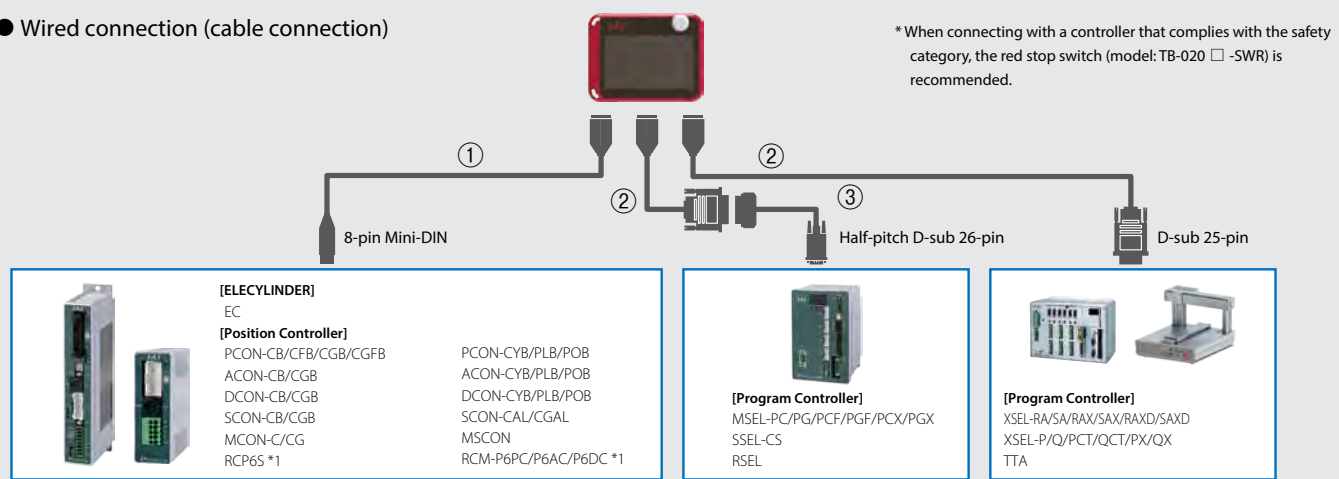
[ELECYLINDER model and wireless function]
The wireless function varies depending on the model option to be specified.

"-WL" = Edits by wirelessly

"-WL2" = Edits and Operation wirelessly.

Caution: Certification issues limit the countries in which wireless communication can be used. (See P8-358)

● 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

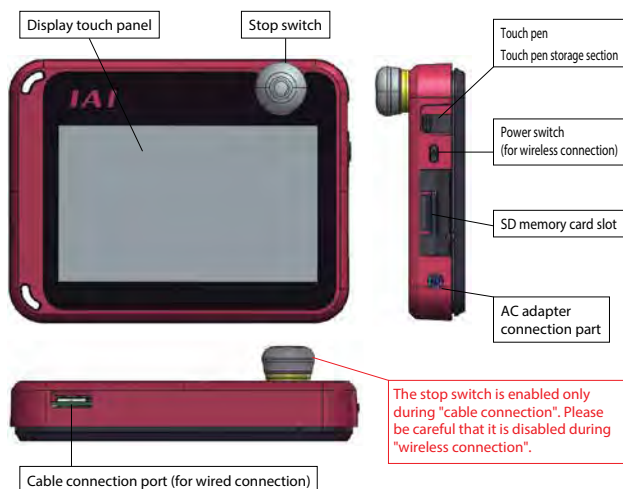
Wireless Function (when connected to ELECYLINDER only)

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-axes
Operation	Battery (AB-7) operation
Wireless operating time	Max. 4 hours (battery driven)
Battery life	Cycle durability 300 times

AC Adapter Common Specifications

Power input voltage range	Single-phase 100 to 240VAC $\pm 10\%$
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

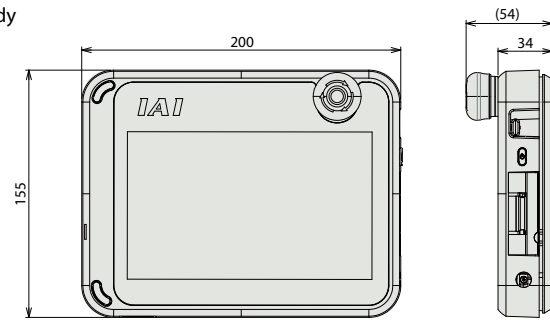


External Dimensions

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

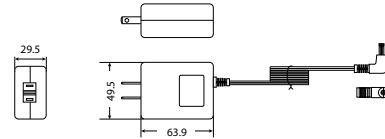
2D CAD 3D CAD

● Body

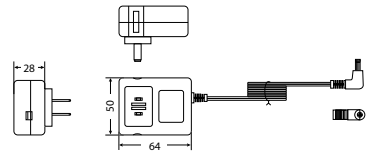


● AC adapter

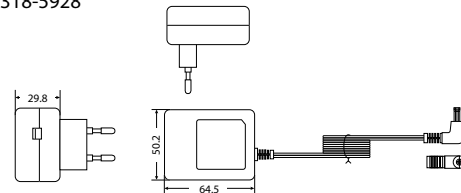
For Japan/North America/Thailand: UN318-5928



For China: UNZ318-5928



For Europe: UNE318-5928
For Korea: UNR318-5928



Options

● Strap: STR-1



● Spiral cable: SIC-1



● Grip belt: GRP-2



■ Maintenance Parts

Battery unit: AB-7



Controller
Models not shown here
Model selection
RCON
RSEL
REC
RSEL (Cartesian 6-axis)
RCP6S
PCON -CB/CFB
PCON -CBP (Pulse press)
PCON
ACON-CB DCON-CB
ACON DCON
SCON -CB
SCON -CB (Servo press)
SSEL
MSEL
XSEL -RA/SA
XSEL -P/Q
XSEL (SCARA)
PSA-24
TB -03/02
Software

Cautions on axis-operations using wireless connection

This device (V2.30 or later) is capable of operating the ELECYLINDER having option code: WL2 by wireless connection. For the operation, make sure to confirm the safety according to the following items.

- When connected wirelessly, **the stop switch of the main unit does not function.**
Prepare a device or circuit that stops the operation in case of emergency.



- In ELECYLINDER operations using wireless connection, there is a function to perform operation tests (moving to the forward and backward ends, jog and inching). However, **it is not for automatic operations.** Configure a system of the equipment according to risks of the operating environment.
- Make sure to conduct a risk assessment according to the requirements of the standard required for the built-in equipment.**
Dangerous operations, such that the machine has to be stopped automatically when control signals are not received including communication interruptions, are not allowed.
- A stop motion of axis operations via wireless connection cannot be used as the safety function of EN ISO 13849-1: 2015. It does not conform to the Safety Category B and 1 to 4 of EN ISO 13849-1: 2015.

Cautions on the use of wireless connections

- This product uses 2.4GHz band wave called an ISM band (radio frequency 2,400 to 2483.5MHz, wireless output +5dBm).
- Since this frequency band is used for various devices such as microwaves and wireless LANs, wireless communications may be interrupted due to radio disturbances.
- The use of this product is permitted in the following countries (regions) only.
In other countries (regions), it is necessary to acquire a certification in conformity with the concerned country (region).

Japan, USA, Canada, EU countries, China, South Korea, Thailand, Mexico

Models

The teaching pendant is compatible with every controller on P. 6, but please select the cable according to the controller.

* The recommended color of the emergency stop switch is gray when the controller is a standard specification, and is red (model: -SWR) when the controller is a safety category compliant specification.

●Teaching Pendant + Cable as a Set

Type	Model Number	Specification	Included Cable	
			For Position Controller	For Program Controller
Models universal for position and program controllers	TB-02-SC	Standard specification (Gray stop switch)	①CB-TB1-C002	②CB-TB1-X002 + ③CB-SEL-SJS002
	TB-02-SC-SWR	Standard specification (Red stop switch)		
	TB-02D-SC	Deadman switch specification (Gray stop switch)		
	TB-02D-SC-SWR	Deadman switch specification (Red stop switch)		
Models dedicated to position controllers	TB-02-C	Standard specification (Gray stop switch)	①CB-TB1-C002	
	TB-02-C-SWR	Standard specification (Red stop switch)		
	TB-02D-C	Deadman switch specification (Gray stop switch)		
	TB-02D-C-SWR	Deadman switch specification (Red stop switch)		
Models dedicated to program controllers	TB-02-S	Standard specification (Gray stop switch)	②CB-TB1-X002 + ③CB-SEL-SJS002	
	TB-02-S-SWR	Standard specification (Red stop switch)		
	TB-02D-S	Deadman switch specification (Gray stop switch)		
	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
	③CB-SEL-SJS002 (Adapter cable)*
TP adapter connection cable	④CB-TB1-GC002

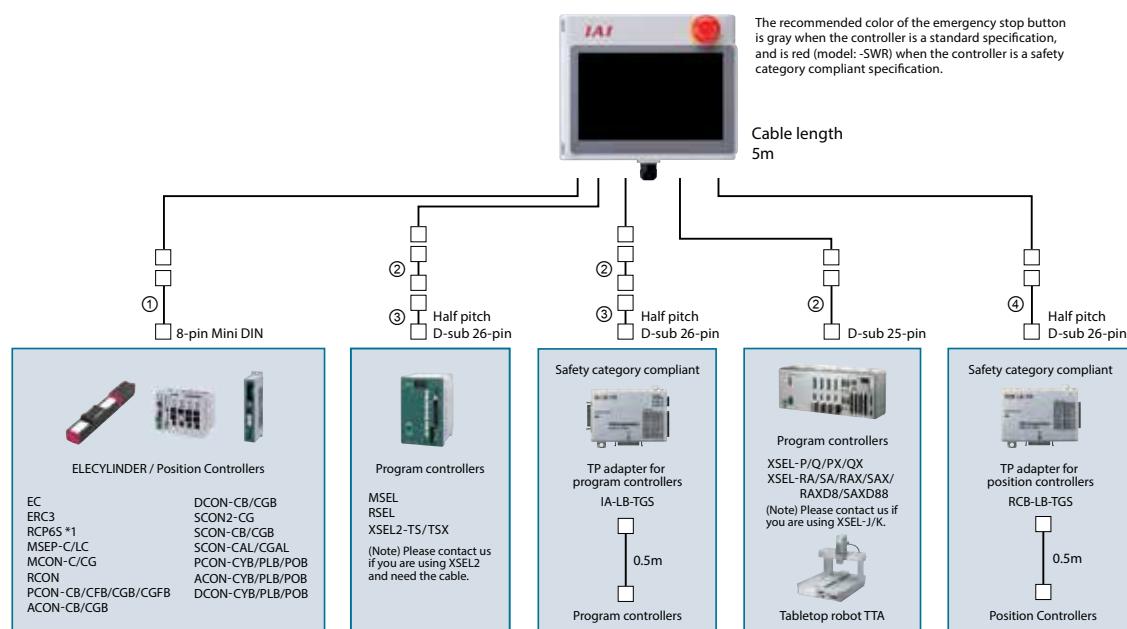
* Use with CB-TB1-X002 when connecting to ASEL, PSEL, SSEL, and MSEL.

●Options

Name	Model Number	Description
Strap	STR-1	Connected to the box.
Grip belt	GRP-1	Safety belt to hold the box by left hand.
Spiral cord	SIC-1	A cord which connects the box and the provided stylus.

(Note) Please contact us if you are using XSEL-J/K/JX/KX.

Applicable Controllers/Safety category compliant

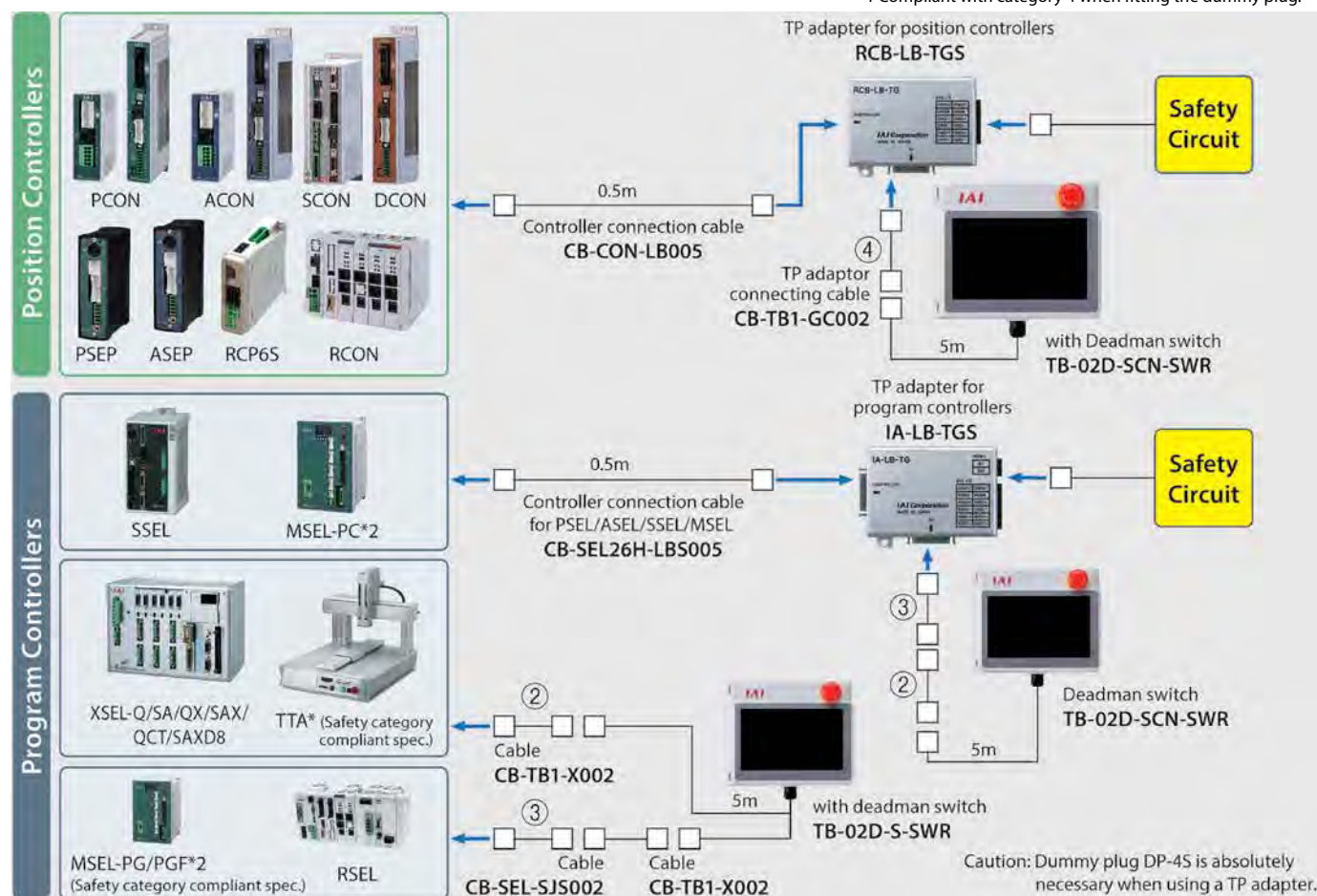


*1 A gateway unit or a PLC connection unit is necessary to operate RCP6S.

Models

■ Compatibility with safety category will be constituted as below. Compliant with up to Safety Category B~4. *1

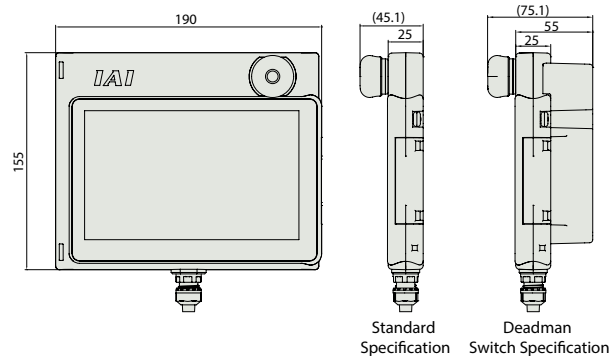
*1 Compliant with category 4 when fitting the dummy plug.



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

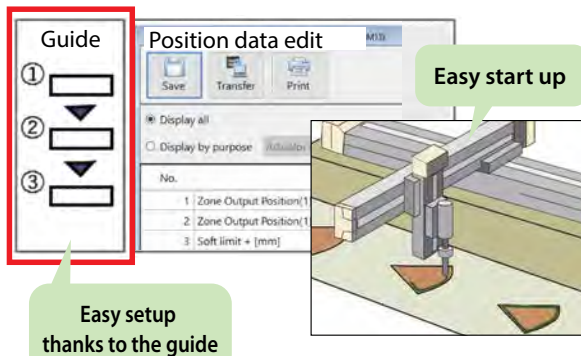


IAI's Useful Software Lineup

IAI's most highly recommended software
Leverage them in your design and startup process

1 IA-OS

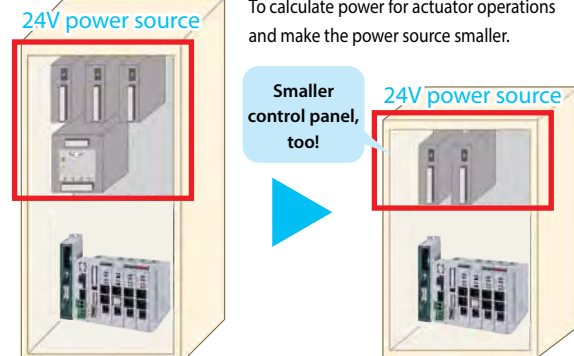
for actuator start up.



▶▶ 8-362

2 Calculator

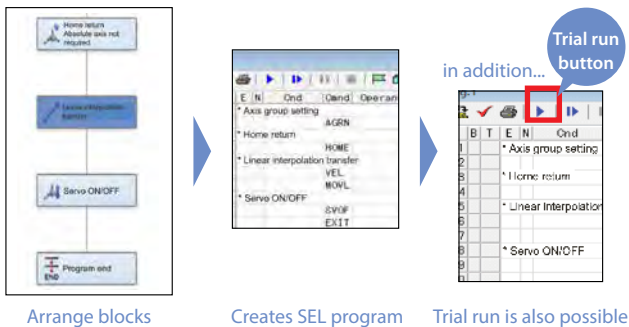
helps select the optimal power source.



▶▶ 8-367

3 SEL programming support tool

No programming experience is needed!
It supports your programming.

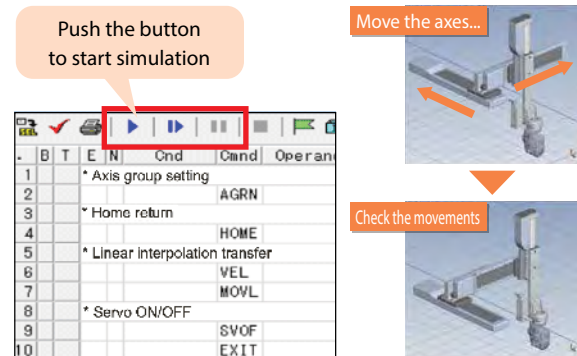


Easy for everybody!

▶▶ 8-368

4 Simulation software

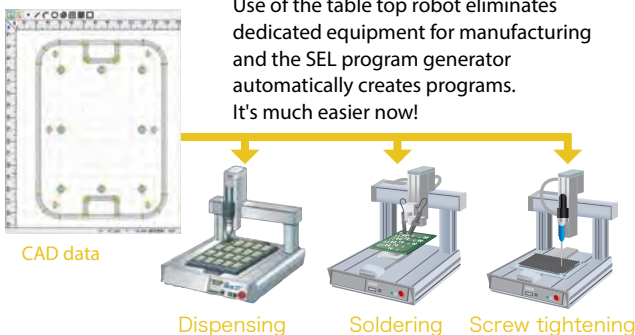
Previews motions without actual robots.



▶▶ 8-369

5 SEL program generator

With a single CAD data, programs for dispensing, soldering and screw tightening can easily be generated.



▶▶ 8-370

6 Useful IAI tools

Selection is easier by entering operating conditions only.



▶▶ 8-371



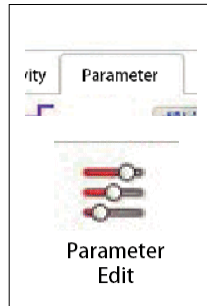
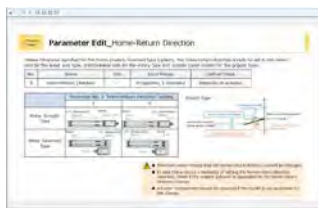
IA-OS PC-compatible teaching software

The IA-OS solves all the problems in startup, operations and the like!

Supported models: EC and CON controllers

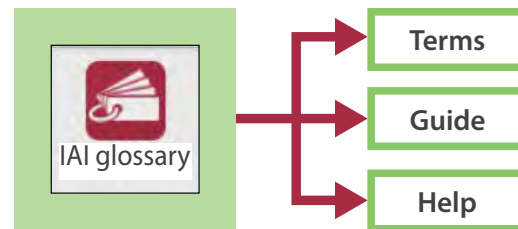
1 Parameter setting

Seemingly difficult parameter settings can be done thanks to the guidance.



2 Help function

Helps you check unknown terms and details of operating procedures and parameters.



3 Off-board tuning

An optimal gain can automatically be set according to the operating conditions.

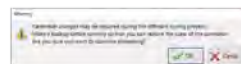
It is possible to enhance actuator's payload capability.

This function aims to calculate the optimum gain according to the transport load. There are four "gain sets" that can store six types of gain in the parameters, and the calculated gain can be written to the specified "gain set".

The following 6 types of gain are calculated.

- ① Servo gain selection
- ② Positional feedforward gain
- ③ Velocity loop proportional gain
- ④ Velocity loop integral gain
- ⑤ Torque filter time constant
- ⑥ Current control band number

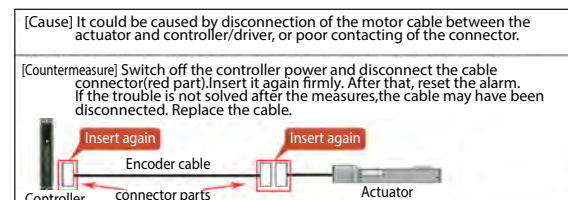
⚠ Be sure to check before executing.



⚠ Be sure to prepare a safety circuit for the offboard tuning function. Settings can be made without a safety circuit, but "System identification" and "test run" cannot be performed. Set a more suitable gain based on the data such as the actuator to be used and the transport load.

4 Troubleshooting

On the screen troubleshooting helps you recover from troubles quickly.



Easy connection and set up between the PC and the controller



Install IA-OS on PC



PC

Easy connection between the PC and the controller!
All the setting can be completed within the IA-OS.
Setting of the PC is not needed.



Controller



Controller

What IAI-OS can do

1 Parameter Setting

Easy parameter setting

Parameters can be found by object for changes.

Models not shown here
Model selection

RCOON
RSEL
REC
RSEL (Cartesian 6-axis)
RCP6S
PCON -CB/CFB
PCON -CBP (Pulse press)
PCON
ACON-CB
DCON-CB
ACON DCON
SCON -CB
SCON -CB (Servo press)
SSEL
MSEL
XSEL -RA/SA
XSEL -P/Q
XSEL (SCARA)
PSA-24
TB -03/02
Software

Display all
display by object
Easy gain adjustment
Setting value

"Easy set up" enables further narrow down of items is possible depending on the object.

No.	Name	Setting value
7	Servo gain No.	5
31	Speed loop proportion gain	188
32	Speed loop integral gain	766
33	Torque filter time constant	0
71	Position feed-forward gain	

Display objective items only

Easier set up

Easy gain adjustment

Gain adjustment

Object of adjustment: Make abnormal noise smaller

Speed loop proportion gain: 188

Speed loop integral gain: 766

Torque filter time constant: 0

Speed loop proportion gain: Lower (present value) in 10% increments.

Speed loop integral gain: Lower (present value) in 10% increments.

Torque filter time constant: Raise in 50 increments.

Back Next

2 Help function

What IA-OS can do

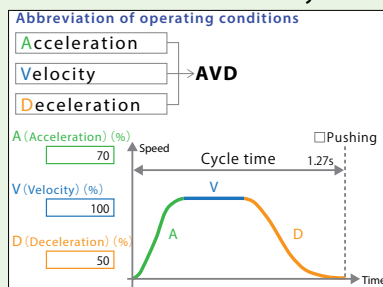


The help function provides descriptions of glossary and each function.

From the glossary contained in the IA-OS, details of each function and glossary can be confirmed.

Glossary

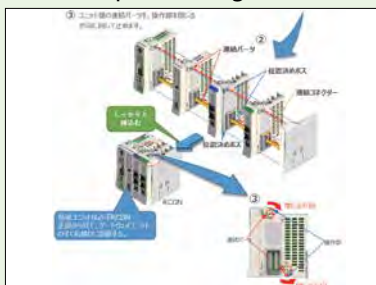
Unclear terms in the setting process can be checked easily.



Ex.) Description of speed and acceleration/deceleration.

Guidance

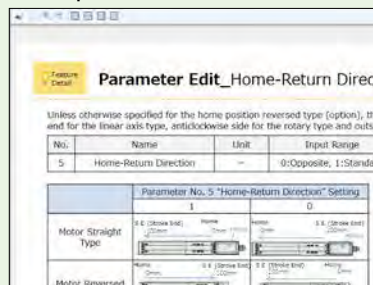
When you are not sure about star up, use this guidance.



Ex.) How to assemble the controller

Help

Unclear items such as trial operation and parameter can be checked.



Ex.) Editing of parameters

3 Off-board tuning

What IA-OS can do

Increases actuator's payload capacity

An optimal gain can be set automatically according to the payload.

More details ▶

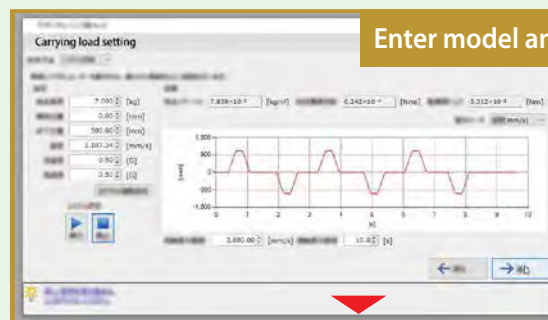
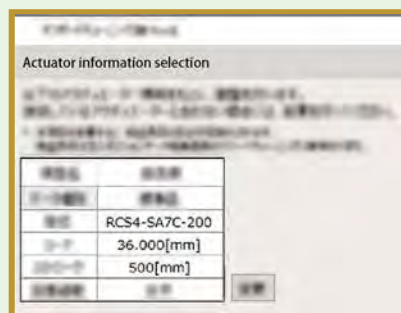
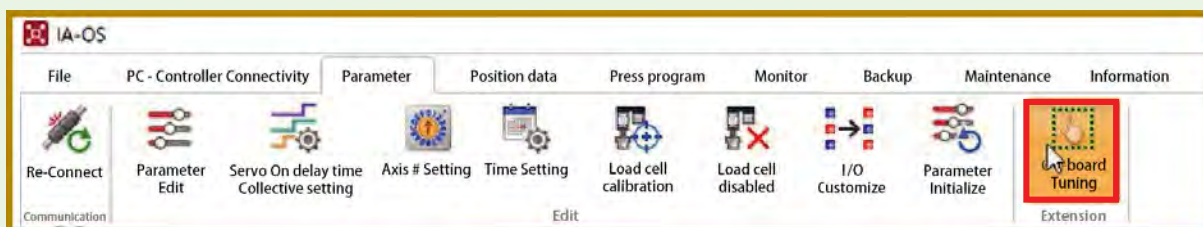
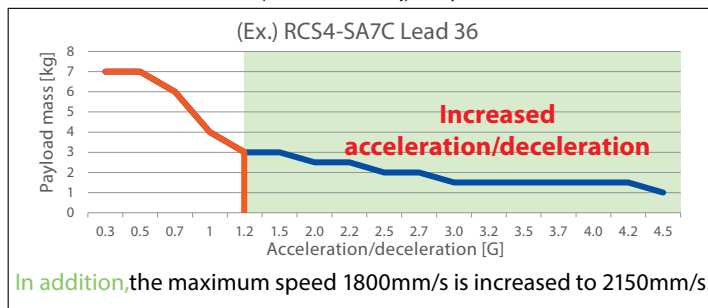
<https://www.iai-robot.co.jp/library/useful/index.html>



[Merits of the off-board tuning]

- ① Payload higher than the rated value is possible by setting the acceleration/deceleration lower.
- ② Acceleration/deceleration can be raised when the payload is smaller than the rated value.
- ③ The maximum speed can be increased.

* Effectiveness may vary depending on the model.



Enter model and conditions

Off-board tuning (Axis No.0)

Adjustment method selection

Select the adjustment method for the adjusting item.

Adjustment object gain set No.

* The gain set number 0 is also used for home return.
When changing it, confirm the effect on the home return.

Adjustment method

* Adjustment parameters

Gain set No.	0	1	2	3	Adjustment result
Servo gain No.	5	5	5	5	13
Position feed-forward gain	0	0	0	0	0
Speed loop proportion gain	1,157	1,157	1,157	1,157	641
Speed loop integral gain	4,264	4,264	4,264	4,264	5139
Torque filter time constant	250	250	250	250	120
Current control range No.	4	4	4	4	4

Automatic setting of gain

What IA-OS can do

4 Troubleshooting

No worries for errors

Even if errors occur, don't worry!

A comprehensive troubleshooting guide helps you resolve issues quickly.

Alarm information

Even if errors occur, you can confirm the countermeasures to troubleshoot.

According to the content of the error, the software shows options: startup or production. It shows an optimal countermeasure depending on the situation.

Alarm information [Axis No.]	
Alarm code	00E0
Detailed code	----
Date of failure	-
Alarm name	Overload
Alarm level	Controller cold start
Address	----
Contents The actuator operating condition has exceeded the rated value, or external force is applied on the actuator moving part, causing overloading of the motor.	
<input type="button" value="Trouble shooting"/> <input type="button" value="Alarm reset"/> <input type="button" value="Close"/>	

Is the facility during start up (start up and adjustment of the facility)? or during production after start up?

Start up

Production

Selection of countermeasures

Some countermeasures are displayed according to the content of the error.

Select one that is most suited for the situation of the error.

Alarm information [No.]	
Confirm the countermeasure that comes under the specific situation.	
(1) The actuator moving part does not interfere with the peripheral equipment.	<input checked="" type="checkbox"/> Yes <input type="button" value="No Confirmation method"/>
(2) The combination of the actuator and the controller/driver are correct.	<input checked="" type="checkbox"/> Yes <input type="button" value="No Confirmation method"/>
(3) The payload and acceleration/deceleration of the actuator are within the specification printed in the catalog.	<input checked="" type="checkbox"/> Yes <input type="button" value="No Confirmation method"/>
<input type="button" value="Previous screen"/> <input type="button" value="Alarm reset"/> <input type="button" value="Next"/>	

Specific countermeasure

The most suited countermeasure is shown from the data stored in the call center.

Alarm information [Axis No. 0]	
[Cause] The moving part of the actuator may be interfering with the customer's equipment, or an external force may be applied.	
[Remedy] Remove any interference or external force to the moving part.	
<input type="button" value="Return to previous screen"/> <input type="button" value="Alarm reset"/>	

Calculator



The IAI Calculator provides the optimal **24V power source** for the actuator operations. It also displays the number of the **regenerative resistance units**, the **cycle time calculation** and the **timing chart**.

1 24V Power source

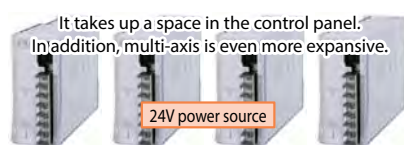
The most suitable capacity can be obtained by the operating conditions and the pattern of the axis.

For example... when using the RCP6-SA4C-WA-16-500 (high output) / Controller, PCON-CB, the power capacity is investigated.

RCP4	Kind of	28P, 35P, 42P,	High output setting disabled	Max 2.2A
RCP5	motor	42SP, 56P,	High output setting enabled	Rated 3.5A / Max 4.2A
RCP6		56SP, 60P, 86P		

Capacity is rated 3.5A / maximum 4.2A.

When selecting the power source according to the instruction manual, a large capacity is required for only one axis.



What is the result when calculating the capacity using the Calculator based on the following conditions?

Operating conditions

- Transfer of two points
(0 - 500mm reciprocating motion)
- Speed 500mm/s
- Payload 5kg
- Acceleration/deceleration 0.5G

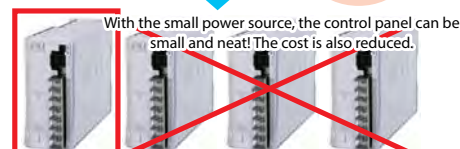
The capacity is 3.16A at the peak value of 75.9W.

The capacity is approx. 0.58A at the average power of 15.9W.

It is confirmed that the actual capacity is smaller.

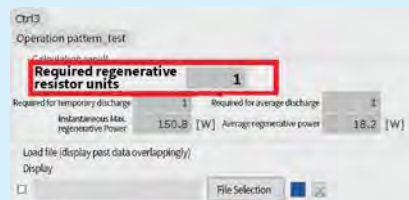
Operation pattern (2)	
Calculation result	PSA-24 Required
Peak power value	75.9 [W]
Average power	15.9 [W]
Power consumption	0.01 [Wh]

The power consumption can also be calculated!



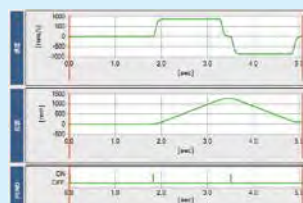
2 The quantity of regenerative resistance unit

The required quantity of the regenerative resistance units varies for each controller.



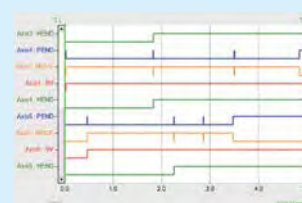
3 Cycle time

Speed, position and status are displayed clearly, showing their correlations



4 Timing Chart

The timing charts for each axis can also be display as many signals as required.



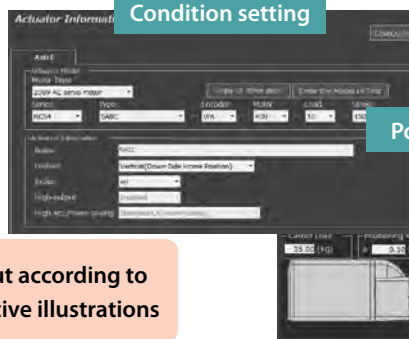
Easy condition input! Results can be obtained easily by conditions for each step.

Flow guide

- 1 Step Condition setting
- 2 Step Position setting
- 3 Step Motion pattern setting
- 4 Step Calculation execution
- 5 Step Calculation result

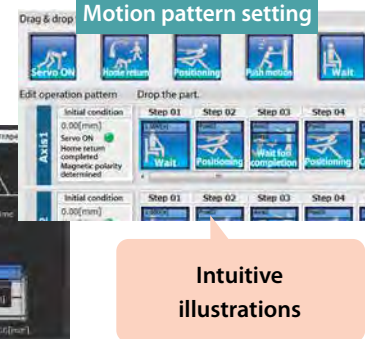
Input according to Intuitive illustrations

Condition setting



Position setting

Motion pattern setting



The calculator software comes with the IA-OS software.

SEL program support tool

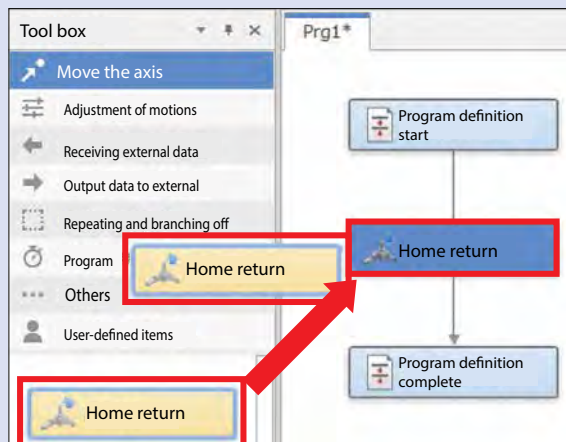
What is SEL support program?

Programs can be generated automatically by arranging required operations.

Programs can be created without special knowledge.

- Supported models: **RSEL** *Workpiece coordinate system and tool coordinate system are not supported.
- The software is included in the PC-compatible teaching software for XSEL (Ver.14.00.00.00) or later.

1 Program creation Programs can be created automatically by drag and drop of motion icons.



No.	B	T	E	N	Cnd	Cand	Operand 1	Operand 2
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

2 Tool box The tool box is a screen that contains items of program parts.

Move the axis

Receive external data

Repeat and branch off processes

Servo ON/OFF

Receive Transfer data

Start branch

Motion without interpolation

Receive Position data

Branch off end

Linear interpolation move

Receive accel./decel. data

Start selection branch

Program creation using these items.

3 Trial run / Monitoring functions

Trial run of the created program and monitoring are possible.

The trial run and monitoring functions are available on-line only.

No.	B	T	E	N	Cnd	Cand	Operand 1	Operand 2
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Press the execute button to start the trial run.

No.	B	T	E	N	Cnd	Cand	Operand 1	Operand 2
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Monitoring by input/output port.

This software enables the motion validation of Cartesian 6-axis robots (CRS) and SCARA robots (IXA) on the PC.
No actual robot is needed for the validation.

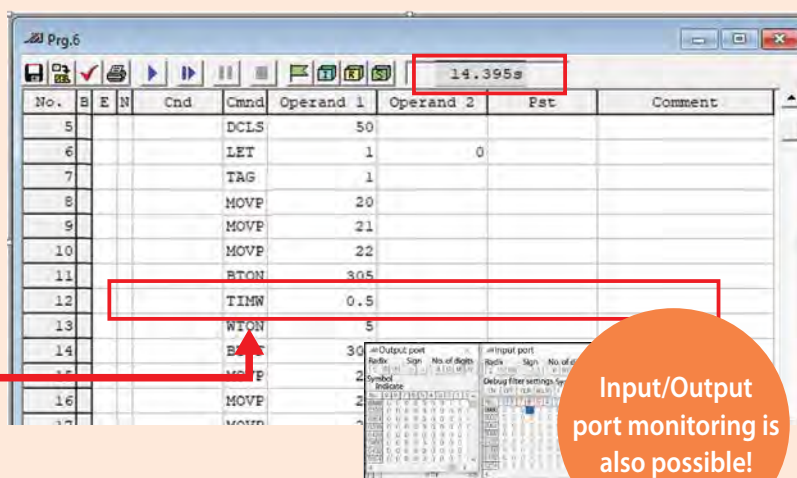


What the simulation can do

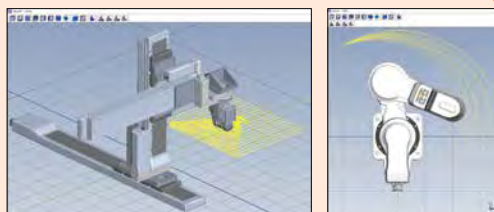
- 1 Program validation is possible.
- 2 Cycle time checking is possible.
- 3 Simulation of external input/output signals is possible.
- 4 Trajectory checking is possible.

5 Setting of a simple interference check zone is possible.

It is the area for checking interference between the robot and peripheral equipment.



Input/Output port monitoring is also possible!



Start up is easy thanks to the motion validation in advance!

IXA/CRS Simulator is included in the XSEL software (IA-101).

SEL program generator

What is the SEL program generator?

It assists soldering, dispensing and screw tightening motions using the table top robot (TTA). No specialized knowledge is needed!



Soldering



Dispensing



Screw tightening

Models not shown here

Model selection

RCOIN

RSEL

REC

RSEL (Cartesian 6-axis)

RCP6S

PCON -CB/CFB

PCON -CBP (Pulse press)

PCON

ACON-CB DCON-CB

ACON DCON

SCON -CB

SCON -CB (Servo press)

SSEL

MSEL

XSEL -RA/SA

XSEL -P/Q

XSEL (SCARA)

PSA-24

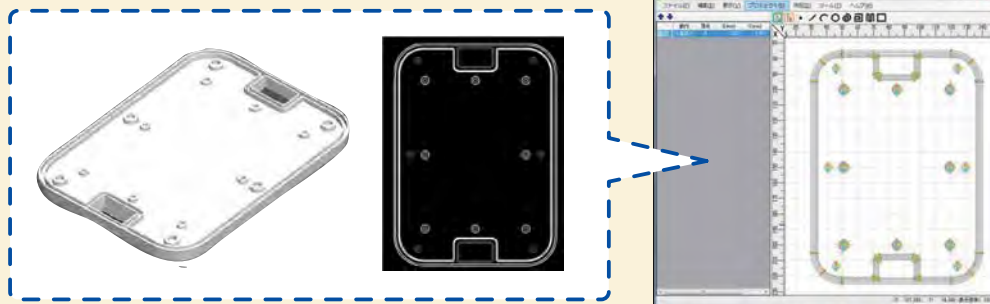
TB -03/02

Software

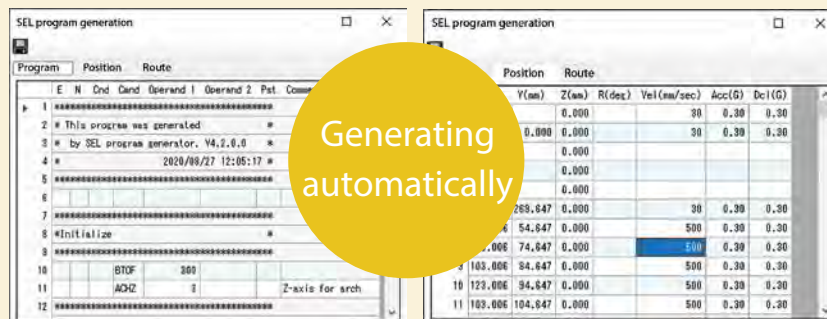
Basic two steps only

The SEL program generator can generate programs and position data automatically by setting CAD data (DXF data) and the retrieving condition.

1 Reading the DXF data of the workpiece into the software



2 Generating the program and position data



Actual motion validation is possible

By superimposing the drawing data and the actual motion trajectory, deviations can be confirmed on the screen.



Download the SEL program from here:

IAI website

<https://www.intelligentactuator.com/sel-pg/>



Selection assisting Software

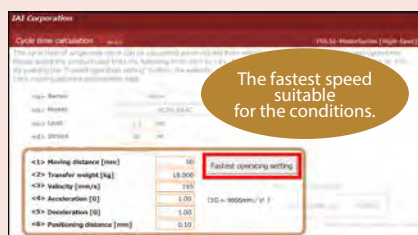
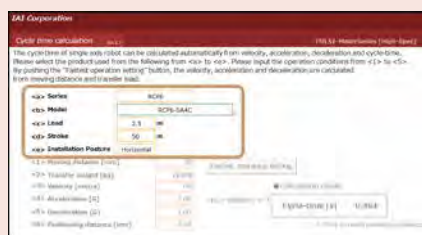
- Cycle time calculation software
- Direct drive motor spec. confirmation calculation tool
- Model selection software

The useful calculation software is on the IAI website.

The cycle time calculation software can calculate positioning time easily! Based on customer's actual operating conditions, cycle time (positioning time) can be calculated on the PC easily.

Cycle time calculation software

- 1 Select the actuator condition to be used.
- 2 After entering the transfer distance and payload and press the "Fastest operation setting" button, speed and acceleration/deceleration are input automatically.
- 3 When all the items of Steps 1 and 2, the "positioning time" will be calculated automatically.



The fastest speed suitable for the conditions.

Direct drive motor confirmation calculation tool

Confirmation of usability can be confirmed from both load and operating conditions!

Confirmation of load condition

- 1 Input of the operating condition.

Type used DD-LT18P(20bit)

- 2 Input of the information of attached objects.

Operating speed (Max.) (degrees/s) 800

- 3 Input of the location of the attached object and the direct drive motor rotation center.

Mass (kg)	Shape	Character (mm)
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20

[Judgment of load conditions]

Confirm that the total thrust load, moment load and load inertia are within the allowable values.

[Judgment of load conditions]

Check items	Calculated values	Tolerance values	Judgment
Total thrust load [N]	15.1	3100	OK
Total moment load [N·m]	0.4	80	OK
Total load inertia [kg·m ²]	0.0	0.6	OK

Confirmation of the operating conditions

- 4 Input in the checking columns.

3000							
800							
0.30							
1.00							
3							
5							
0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NG							
OK							
OK							
OK							

[Judgment of operating conditions]

Confirm that the operating motions, continuous operating torque and continuous motion speed are within the allowable values.

[Determination of operating conditions]

Check items	Calculated values	Tolerance values	Judgment
Driving action	—	—	NG
Continuous operation torque (N·m)	1.1	8.4	OK
Continuous operation speed (degrees/s)	239	1080	OK

Operation is possible if judgment① of the load condition and judgment② of the operating condition are both "OK."

For the Cycle Time Calculation software:

IAI website

<https://www.intelligentactuator.com/cycle-time-calculation-software/>



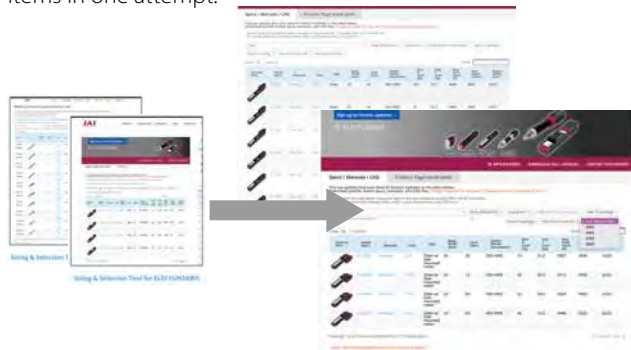
Model Selection Support

The IAI Website

Please take advantage of the useful tools on our website

Model Selection Software

The optimal model can be selected from approximately 1 million items in one attempt.



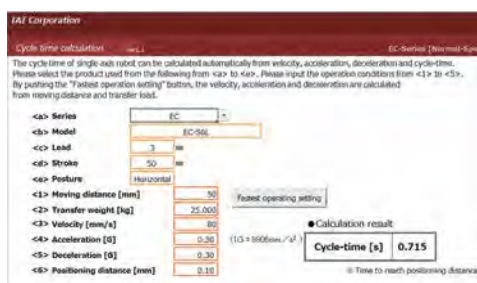
Catalog

Please refer to the catalog for dimensional drawings and specification details.



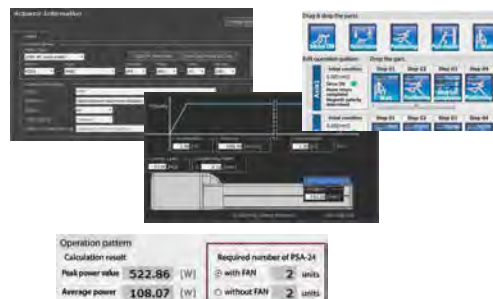
Cycle time calculation software

The cycle time can be checked in advance by entering the actuator under consideration and the operating conditions.



Calculator software

By entering the operating conditions of the 24V actuator under consideration, the 24V power supply capacity, cycle time, and timing chart can be confirmed.



Service

Provides support from consideration before introduction to maintenance and education after introduction.

Special specifications supported
(customization service for standard products)

We will make proposals and modify the standard product according to your request.

Trial seminar/Maintenance Various training sessions and on-site seminars

We actively conduct seminars for hands-on experience with ROBO Cylinders, as well as safety lectures and maintenance training.

Maintenance / Repair dedicated contact

A dedicated maintenance and repair contact will respond smoothly to any issues that may arise.

IAI website

<https://www.intelligentactuator.com/product-lineup-how-to-choose-size/>

→How to Choose/Size an Electric Actuator Model



List of models in the catalog <in alphabetical order>

Model	Content	Reference page
0-9		
4B	R-axis brake	5-699
5VC	With wrist unit air joint	5-699
5WCS	With wrist unit wiring color	5-699
A		
A0		6-321, 7-409, 7-710
A1		3-605, 4-583, 5-527, 6-321, 7-409, 7-710
A1E/A1S/A3E/A3S	Cable exit direction	3-605, 5-527, 7-409
A2		4-583, 6-321, 7-710
A3		3-605, 4-583, 5-527, 6-321, 7-710
A6	Cable exit opposite direction	3-605
AB-3	Absolute battery	7-417
AB-5	Battery for absolute data retention/ Replacement battery/ System memory backup battery	8-241, 8-266, 8-278, 8-290, 8-309, 8-317, 8-331
AB-5-CS	Battery for absolute data retention/ System memory backup battery (with case)	8-241, 8-266, 8-278, 8-290
AB-5-CS3	Battery for absolute data retention (with case)	8-278
AB-6	Absolute battery	7-417
AB-7	Replacement battery	8-97, 8-139, 8-205, 8-241, 8-302, 8-357
AB-8	Replacement battery	2-516
AC1/AC1.5/AC2/AC3	Actuator cable □m spec.	6-321
AC5	Actuator cable length change	2-477, 6-321, 7-710
AC10/AC15	Actuator cable length change (fluororubber cover spec.)	7-710
ACF2/ACF5	Actuator cable length change (fluororubber cover spec.)	2-477
ACON-CB/CGB	Controller	8-231
ACON-CYB/PLB/POB	Controller	8-245
ACR	RCON-EC connection spec.	2-477
ADTB	Actuator driving power unit for teaching pendant	2-557
AHT	Mounting hole for the main unit front panel (opposite of the motor side) = tap hole spec.	6-321
AK-04	Pulse conversion equipment	8-237, 8-256
AL	Alumite treatment added	7-710
AP	TTA support column option	5-647
APL/APR	Joint for air purge spec.	2-477
AQ	AQ seal	3-605, 5-527, 7-409
AR	Anti-corrosion black surface treatment	6-321
AT	Cable exit direction	7-710
B		
B	Brake (standard spec.)	3-605, 4-583, 5-647, 5-825, 6-107, 6-321, 7-409, 7-710
BE	Brake (wiring end side exit)	3-605, 6-321, 7-409
BL	Brake (wiring left side exit)	3-605, 6-321, 7-409
BN	Brake (without brake box)	4-583, 6-107
BR	Brake (wiring right side exit)	3-605, 6-321, 7-409
C		
C	Creep sensor	3-605, 5-527, 7-409
CB-ADPC-MPA□□□(-RB)	Motor-encoder integrated type (robot cable)	1-90
CB-ADPC2-MPA□□□(-RB)	Motor-encoder integrated type (robot cable)	1-90
CB-APSEP-AB005	Connection cable between controller and absolute battery unit	8-205, 8-241
CB-APSEP-MPA□□□		1-91
CB-ASEP2-MPA□□□	Motor-encoder integrated type robot cable	Motor-encoder integrated type (robot) cable
CB-CA-MPA□□□(-RB)	Conversion cable	1-91
CB-CAN-AJ002	Motor-encoder integrated type (robot cable)	1-104

Model	Content	Reference page
CB-CAN-MPA□□□(-RB)	Motor-encoder integrated type (robot) cable	1-92, 8-206, 8-227, 8-303
CB-CAN2-MPA□□□(-RB)		1-92
CB-CFA-MPA□□□(-RB)	Motor-encoder integrated type (robot) cable	1-92, 8-206
CB-CFA2-MPA□□□(-RB)	Motor-encoder integrated type (robot) cable	1-93, 8-206
CB-CFA3-MPA□□□(-RB)	Motor-encoder integrated type (robot) cable	1-93, 8-206
CB-CON-LB005	Controller connection cable (for position controller)	8-29, 8-360
CB-CVN-BJ002	Interface box conversion cable	2-504
CB-DS-PIO□□□	I/O cable	1-102
CB-EC-PW□□□-RB	Motor power cable for ELECYLINDER	1-99, 2-512
CB-EC-PWBIO□□□-RB	Power I/O cable for ELECYLINDER (user wiring spec.)	2-505, 2-512
CB-EC2-PWBIO□□□-RB	Power I/O cable for ELECYLINDER (user wiring spec., 4-direction connector)	2-505
CB-REC-PWBIO□□□-RB	Power I/O cable for ELECYLINDER(RCON-EC connection spec.)	2-505, 2-512, 2-542
CB-REC2-PWBIO□□□-RB	Power I/O cable for ELECYLINDER (RCON-EC connection spec., 4-direction connector)	2-505, 2-542
CB-IXA-BK□□□-1	Brake cable (IXA-□NNN30/□NNN45)	5-830, 8-348
CB-IXA-BK□□□-2	Brake cable (IXA-□NNN60)	5-830, 8-348
CB-IXA-BK□□□-3	Brake cable (IXA-□NSN30/□NSN45/□NSN60)	5-830, 8-348
CB-IXA-USR□□□-CS	User cable (used by connecting the D-sub connector for user wiring of the IXA back panel)	5-831
CB-IXP-USR□□□-AS	Tool side user cable (IXP-3/4N3515/4515/5520/6520)	5-831
CB-IXP-USR□□□-CS	Tool side user cable (IXP-3/4N3515/4515/5520/6520)	5-831
CB-LDC-CTL□□□-JY	Cable attached with the brake box	8-270
CB-MSEL-AB005	Connection cable for absolute battery box	8-302
CB-PAC-PIO□□□		1-102, 5-644
CB-PAD-PIO□□□	I/O flat cable	1-102
CB-PAD-PIOS□□□		1-102
CB-PSEP-MPA□□□	Motor-encoder integrated type robot cable	1-93, 8-206
CB-RCA-SIO050	External communication cable	2-504, 2-511, 8-95, 8-189, 8-204, 8-226, 8-241, 8-251, 8-265, 8-277
CB-RCAPC-MPA□□□(-RB)	Motor-encoder integrated robot cable	1-94
CB-RCC-MA□□□(-RB)	Motor (robot) cable	1-95, 8-266, 8-278
CB-RCP6S-PWBIO□□□(-RB)	Connection cable between RCP6S-gateway unit/hub unit	8-190
CB-RCP6S-PWBIO□□□-JY1(-RB)	Extension cable between RCP6S-gateway unit/hub unit	8-190
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