IAI
Quality and Innovation

Economical/Easy to use E-Con

www.intelligentactuator.com

E-Con

Economical / Easy to use

1. Driving High-Performance Single-Axis Robot IA Series

The E-Con is able to drive the various actuators in the IA Seeries.

■ Drivable Actuator Specifications

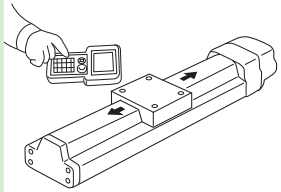
Stroke	Control Output	Maximum Speed	Maximum Payload	Maximum Payload
100 mm ~ 3000 mm	20 W~ 750 W	2000 mm/ sec	150 kg (horizontal)	60 kg (vertical)

2. Positioning to Maximum 64 Points with Easy Operation

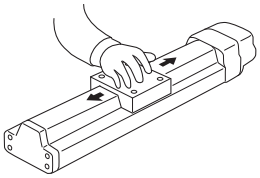
Operation is easy. Simply store the target position data and specify the applicable position numbers from a PLC, etc.
There is no need to create a complicated program. Number of positioning points: 64
Positions can be entered in the following three ways:

1) Enter coordinates (mm) directly.

2) Jog the actuator to a desired position, and then enter the position.



3) Turn off the servo and move the actuator by hand to a desired position, then enter the position.



3. Incremental / Absolute Specifications

The E-Con supports the absolute specification that will retain the current position even after the power is turned off.
Your equipment can therefore be operated immediately after startup or upon reset following an emergency stop.
You can also select the conventional incrementalspecification.

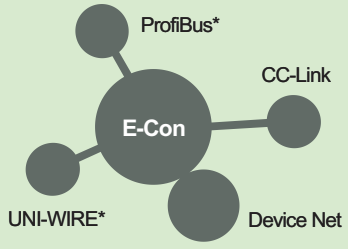
4. Wide-Ranging Functions

The E-Con provides a range of functions beyond normal positioning.
The desired functions can be combined to accommodate various applications.

E-Con Function	E-Con Function	E-Con Function	E-Con Function	E-Con Function	E-Con Function	E-Con Function
Incremental moves	Pause	Zone output	Acceleration only MAX	Positioning band	Variable speed	Serial communication

5. Supporting Various Field Networks

The E-Con, with its wire-saving design, can connect to many different field networks for communication with equipment from various manufacturers without the need for cumbersome wiring.
* Consult IAI beforehand if you are considering a UNI-WIRE or ProfiBus connection.

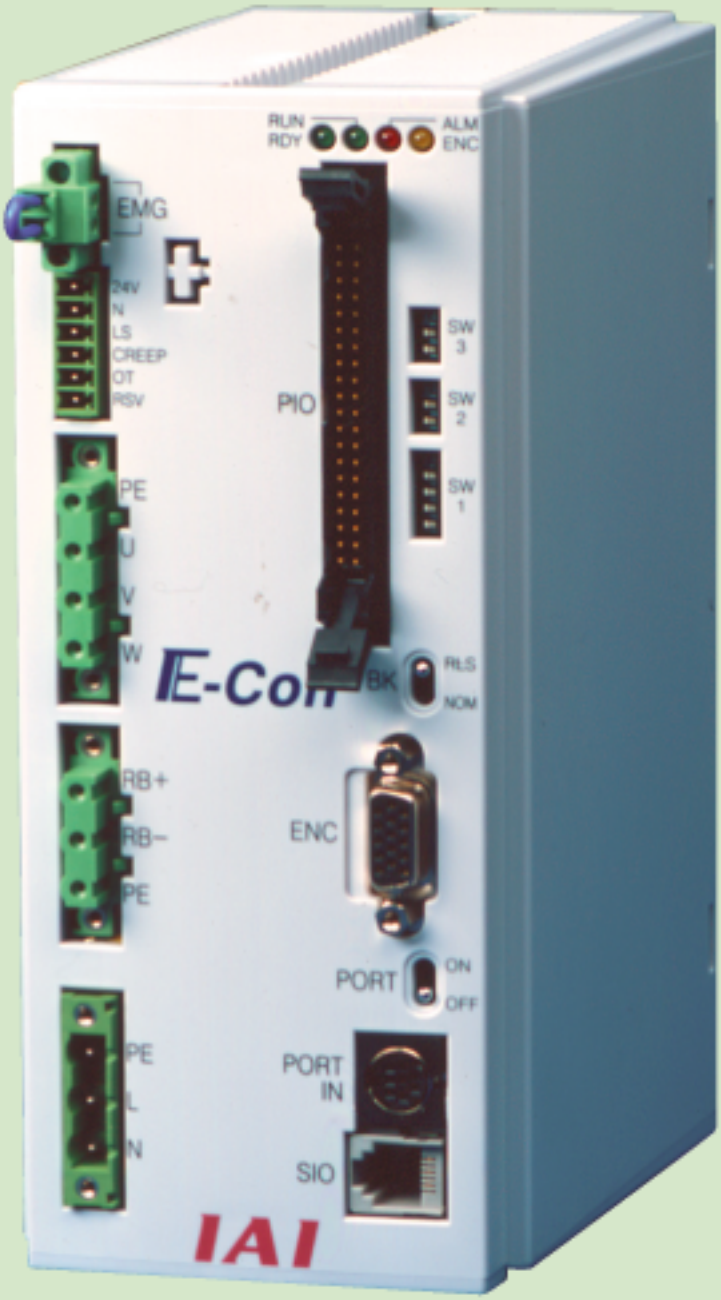


Note:
Device net: Trade mark of ODVA.
CC-Link: Trade mark of Mitsubishi Electronics, Inc.

6. Conformance with the CE Mark

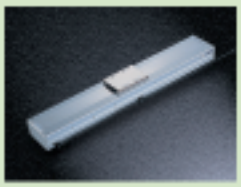
Contact IAI for details.

CE



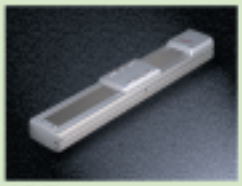
Corresponding Actuators


ISA / ISPA

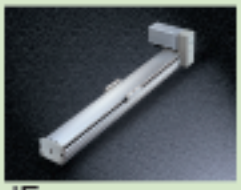

ISPD-CR


IS


ISD-CR


ISD

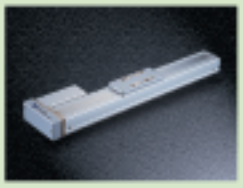

ISD-CR ESD

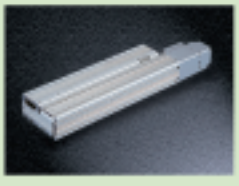

IF


FS


SS / SSCR


RCS-RA55


RCS-SS / SM
RCS- SSR /SMR

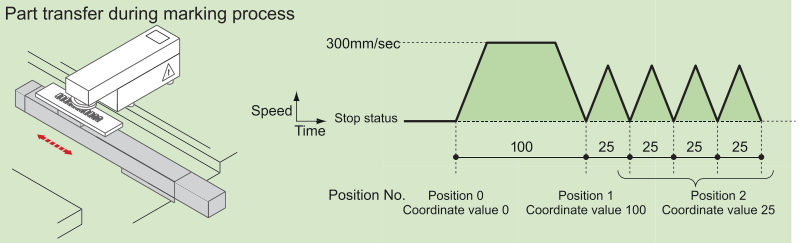

RCS-F55

RCS-RB7530 / RB7535
RCS-R10 / R20 / R30
RCS-G20
ISP / ISP-W
DS / DSCR
LS

1 E-Con Main Functions

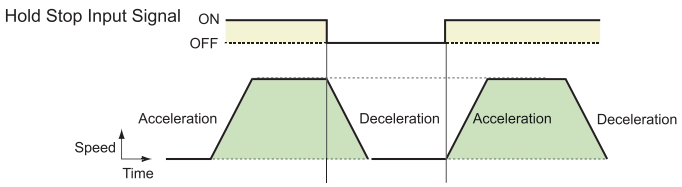
1. Incremental

This function allows positioning based on coordinates specified with respect to the current position. This movement can be repeated without entering position data.



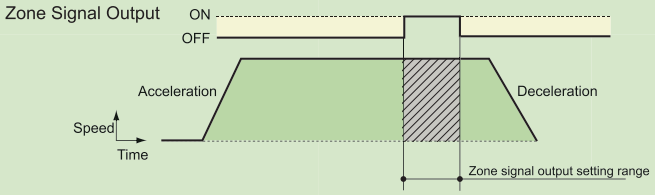
2. Pause

You can set an interlock with peripheral equipment to cause the slider to decelerate and stop upon the input of an external signal.



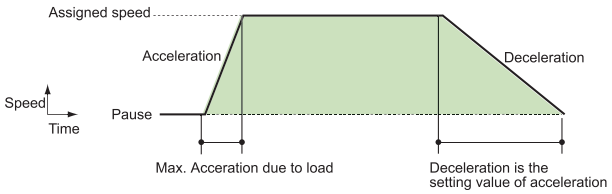
3. Zone

A signal can be output when the slider enters a specified range. This can be used to set a danger area, shorten cycle time, etc.



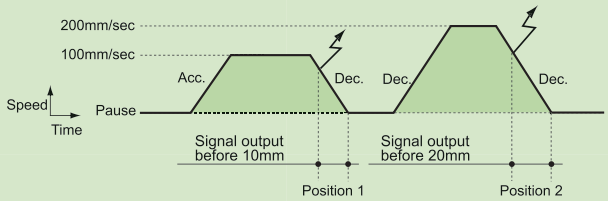
4. Acceleration Only MAX

The actuator normally accelerates and decelerates at a specified rate. This function enables quick acceleration and gradual deceleration.



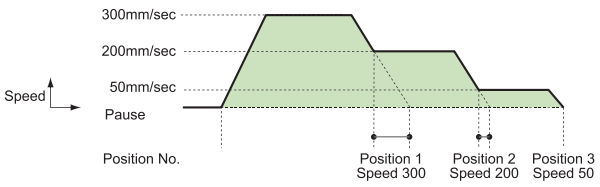
5. Positioning Range

A position-complete signal can be output at an arbitrary position before a specified position. This is useful for shortening cycle times.



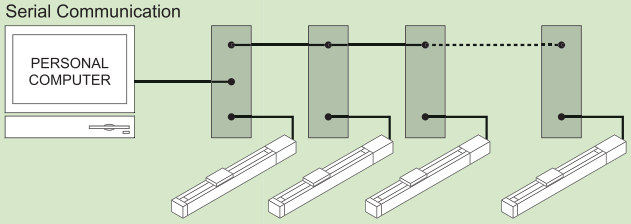
6. Speed Changes

This function allows you to change speed during movement without stopping. This helps to cut down cycle time.



7. Link (Serial Communication)

A maximum of 16 axes can be operated from a PC via serial communication. You can also make data modifications from a PC in this way.



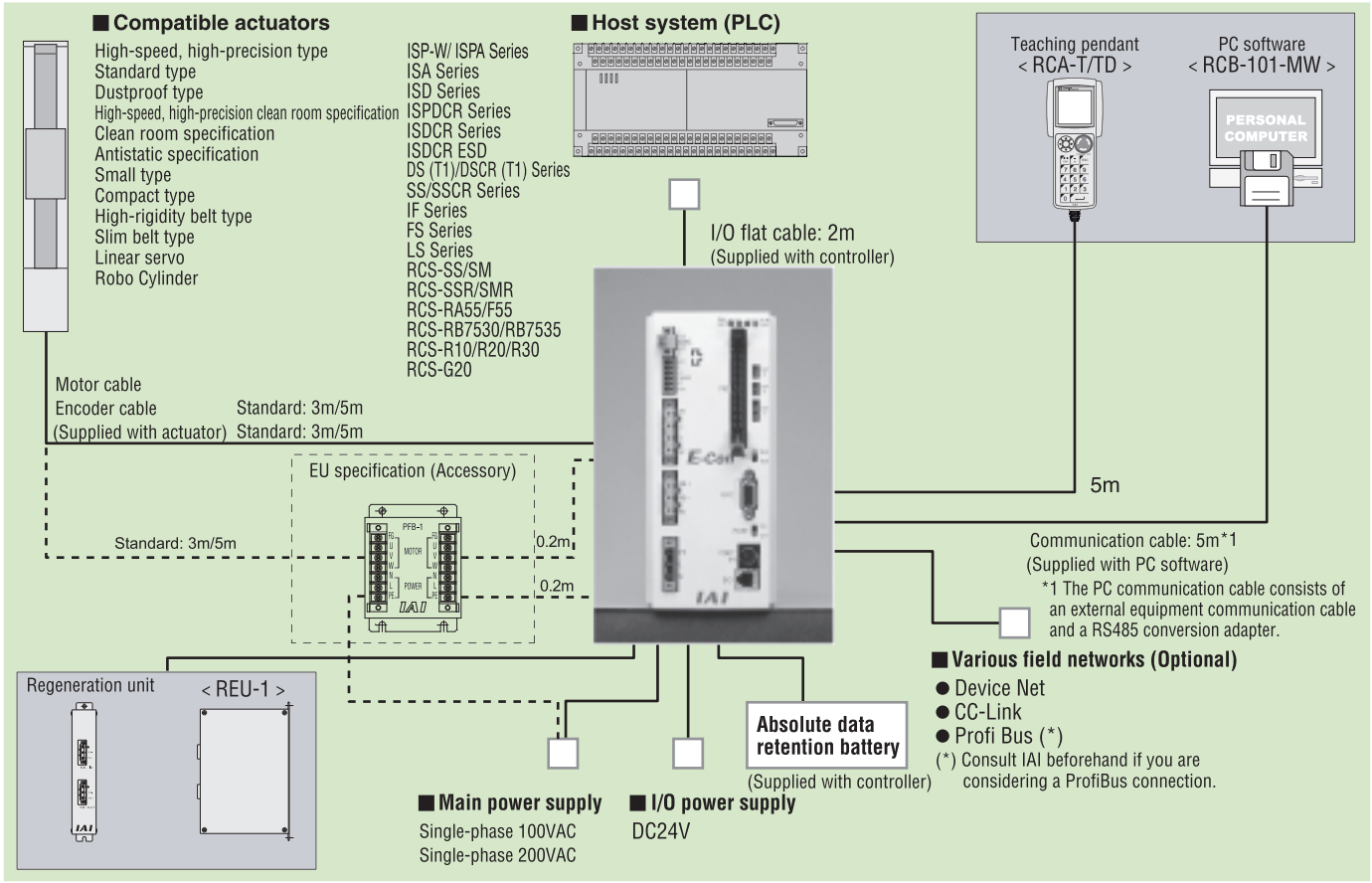
2 Model

ECON - I - 750BL - DV - 2 - EU - P
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Series	❷ Encoder type	❸ Connected axis details (1 axis only)				❹ Network	❺ Supply voltage	❻ CE compliance	❼ I/O signal type (Note 2)
		Motor capacity (Note 1)	Brake	Creep	Limit switch				
ECON	I (Incremental) A (Absolute)	20 (20W) 30 (30W) 60 (60W) 100 (100W) 150 (150W) 200 (200W) 300 (300W) 400 (400W) 600 (600W) 750 (750W)	Not specified (Without brake) B (With brake)	Not specified (Without creep sensor) C (With creep sensor)	Not specified (Without limit switch) L (With limit switch)	Not specified (Network not supported) DV (DeviceNet specification) CC (CC-Link specification) PR (ProfiBus specification)	1 (100V) 2 (200V)	Not specified (Standard specification) EU (CE-compliant)	Not specified (NPN) P (PNP)

(Note) Even when you have selected a CE-compliant specification, be sure to specify NPN or PNP as the I/O signal type.

3 System Configuration Diagram

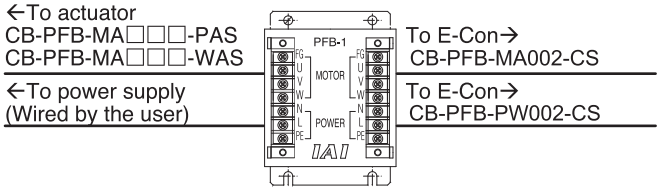


4 EU Specification Details

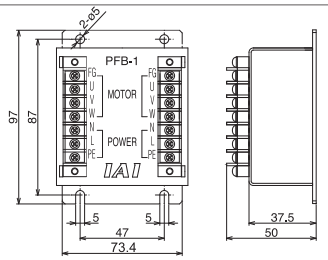
The E-Con's EU specification comes with the following filter box (model: PFB-1) and dedicated cable for noise elimination purposes.

Filter Box Wiring

* The total length of the motor cable on the actuator side and that on the controller (E-Con) side must not exceed 30 m.

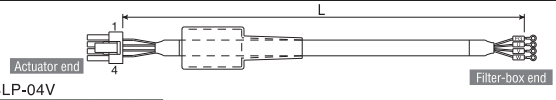


Filter Box Dimensions



Actuator Motor Cable (ROBO Cylinder)

Model **CB-PFB-MA□□□-PAS** * Indicate the desired cable length (L) of up to 30 m in □ □ (e.g., 080 = 8 m).



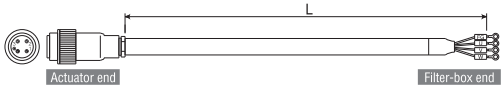
SLP-04V

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

Terminals on filter-box end

Actuator Motor Cable (Single-Axis Robot)

Model **CB-PFB-MA□□□-WAS** * Indicate the desired cable length (L) of up to 30 m in □ □ (e.g., 080 = 8 m).



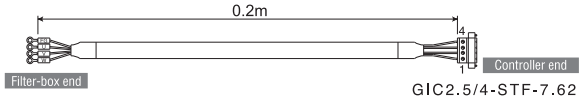
99-4222-00-04

Wire	Color	Signal	No.	
0.75 sq (Crimp)	Green/Yellow	FG	⏚	Green/Yellow
	Black with "1" in white	U	1	Black with "1" in white
	Black with "2" in white	V	2	Black with "2" in white
	Black with "3" in white	W	3	Black with "3" in white

Terminals on filter-box end

Controller Motor Cable (Common to All Models)

Model **CB-PFB-MA002-CS** * Indicate the desired cable length (L) of up to 30 m in □ □ (e.g., 080 = 8 m).



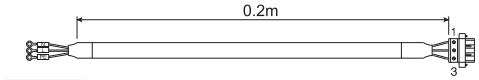
GIC2.5/4-STF-7.62

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

Terminals on filter-box end

Controller Power Cable (Common to All Models)

Model **CB-PFB-PW002-CS** * Indicate the desired cable length (L) of up to 30 m in □ □ (e.g., 080 = 8 m).



GMSTB2.5/3-STF-7.62

No.	Signal	Color	Wire	
1	N	Light Blue	1 sq	Light Blue
2	L	Brown		Brown
3	PE	Green/Yellow		Green/Yellow

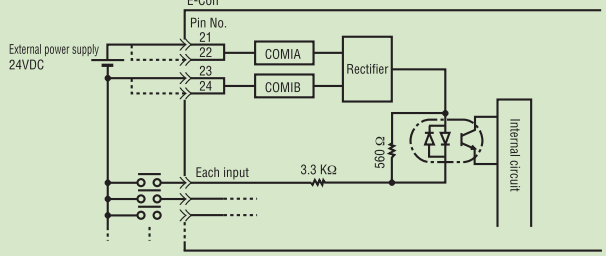
Terminals on filter-box end

5 I/O Wiring

Input Part 24-V external I/O specification

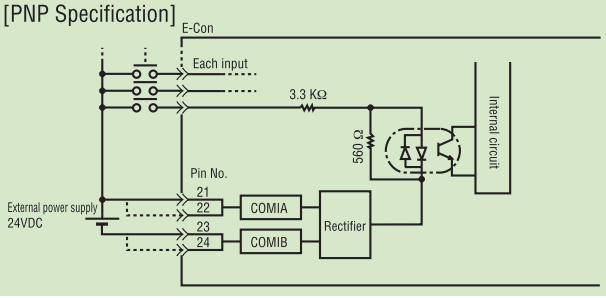
Item	Specification
Number of input points	10 points
Input voltage	24VDC ±20%
Input current	7mA/ circuit
Operating voltage	ON voltage --- Min. 16V (4.5mA) OFF voltage --- Max. 6V (1.4mA)
Insulation method	Photocoupler

[NPN Specification]



- Supply 24 VDC between COMIA and COMIB.
- Connect the negative side of the external power supply to the common side of the input.
- Pin Nos. 21 and 22 of COMIA, and pin Nos. 23 and 24 of COMIB, are connected internally.

[PNP Specification]

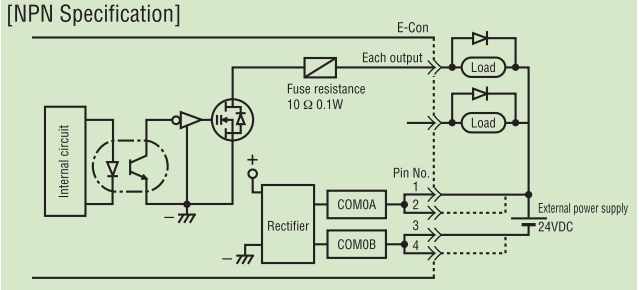


- Supply 24 VDC between COMIA and COMIB.
- Connect the positive side of the external power supply to the common side of the input.
- Pin Nos. 21 and 22 of COMIA, and pin Nos. 23 and 24 of COMIB, are connected internally.

Output Part 100-mA output circuit by Power MOSFET

Item	Specification
Number of output points	12 points
Rated load voltage	24VDC/60V (peak) (No flywheel diode)
Maximum load current	100mA/ point
Insulation method	Photocoupler
Leak current	Fuse resistance: 10 Ω, 0.1W

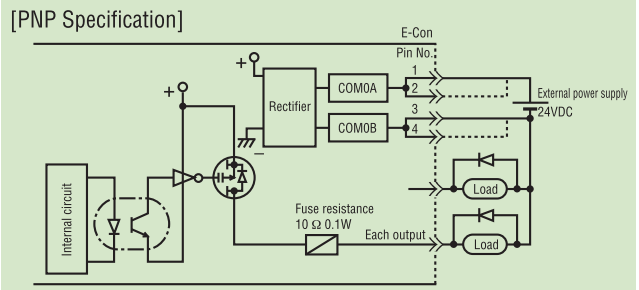
[NPN Specification]



- Supply 24 VDC between COMOA and COMOB. COMOA and COMOB have no polarity.
- Pin Nos. 1 and 2, and pin Nos. 3 and 4, are connected internally.

Note 1) The output circuit uses a Power MOSFET open drain and has no flywheel diode. Be sure to provide a fly-backvoltage inhibition measure using a diode, etc., for the load L of a relay, etc. (Inserting a diode in a position asclose as possible to the coil is the most effective way to prevent spike noise.)

[PNP Specification]



6 I/O Signal Table

E-Con

Pin No.	Category	Signal name	Description
1	-	COM-0A	Output port power (Note 1)
2		COM-0A	
3		COM-0B	
4		COM-0B	
5		NC	Not used
6		NC	(Do not connect anything)
7	Output (Note 3)	*Battery alarm	Battery alarm (Contact B)
8		NC	Not used
9		Moving	Moving output
10		PM32	Position complete output 32
11		*EMG	Emergency-stop output (Contact B)
12		PM16	Position complete output 16
13		*ALM	Alarm output (Contact B)
14		PM8	Position complete output 8
15		ZONE	Zone
16		PM4	Position complete output 4
17		ZFIN	Home complete output
18		PM2	Position complete output 2
19		PFIN	Position complete output
20		PM1	Position complete output 1

Pin No.	Category	Signal name	Description
21	-	COM-IA	Input port power (Note 2)
22		COM-IA	
23		COM-IB	
24		COM-IB	
25		NC	Not used (Do not connect anything)
26		NC	
27		NC	
28		NC	
29		NC	
30	Input (Note 3)	PC32	Specified position input 32
31		NC	Not used (Do not connect anything)
32		PC16	Specified position input 16
33		*ILK	Pause input (Contact B)
34		PC8	Specified position input 8
35		SVON	Servo ON input
36		PC4	Specified position input 4
37		RESET	Reset input
38		PC2	Specified position input 2
39		CSTR	Start input
40		PC1	Specified position input 1

(Note 1) Connect the 24-VDC power supply between COM-OA and COM-OB. COM-OA and COM-OB have no polarity. Pin Nos. 1 and 2, and pin Nos. 3 and 4, are connected internally.
(Note 2) Connect the positive side of the 24-VDC power supply to either COM-IA or COM-IB (pin Nos. 21 through 24). COM-IA and COM-IB have no polarity. Pin Nos. 21 and 22, and pin Nos. 23 and 24, are connected internally.
(Note 3) The ports indicated by * conform to the contact B signal logic (always ON).
Never connect the ports denoted "Not used."

7 Specification Table

Item	Description									
Controller series/type	ECON									
Compatible actuators	ISA, ISPA, ISD, ISDCR (ESD), ISPDCR, DS, DSCR, SS, SSCR, IF, FS, LS RCS-SS/SSR/SM/SMR/RA55/F55/R10/R20/R30/G20									
Applicable motor capacity (W)	20	30	60	100	150	200	300	400	600	750
Number of controlled axis	1 axis only									
Maximum output of connected axis (W)	750									
Power supply	100-V specification: Single-phase 100~115VAC 200-V specification: Single-phase 200~230VAC						200-V specification: Single-phase 200~230VAC			
Power supply voltage range	±10%									
Power frequency	50/60Hz									
Power capacity (Note 1)	34W	42W	100W	150W	210W (290W)	270W	(410W)	520W	770W	1000W
	57VA	70VA	160VA	240VA	350V (490W)	450VA	(680VA)	870VA	1300VA	1600VA
Position detection method	Incremental encoder/absolute encoder									
Speed setting	1mm/s or more; upper limit determined by the actuator specification									
Acceleration setting	0.01G or more; upper limit determined by the actuator specification									
Program language	-									
Number of programs	-									
Number of program steps	-									
Number of multitask programs	-									
Number of positions	64									
Data storage device	EEPROM									
Data input method	Teaching pendant, PC software									
Standard I/Os	10 dedicated inputs/12 dedicated outputs									
Expanded I/Os	Not expandable									
Serial communication function	Comes standard with a RS485 port									
Other I/Os	Emergency-stop input (contact-B terminal block)									
Protective functions	Motor overvoltage, motor overcurrent, motor overload, driver temperature error, encoder error, etc.									
Operating temperature/humidity	Temperature: 0~40 °C, humidity: 30-85%RH									
Operating environment	No contact with corrosive gases or significant level of dust									
Weight	1.2kg <Incremental type> 1.5kg <Absolute type>									
Accessory	PIO flat cable (2m)									

(Note 1) The figures in parentheses apply only to the LS type (linear servo actuator).

Device Net※1 Compliance Type

※1 DeviceNet is a registered trademark of ODVA.

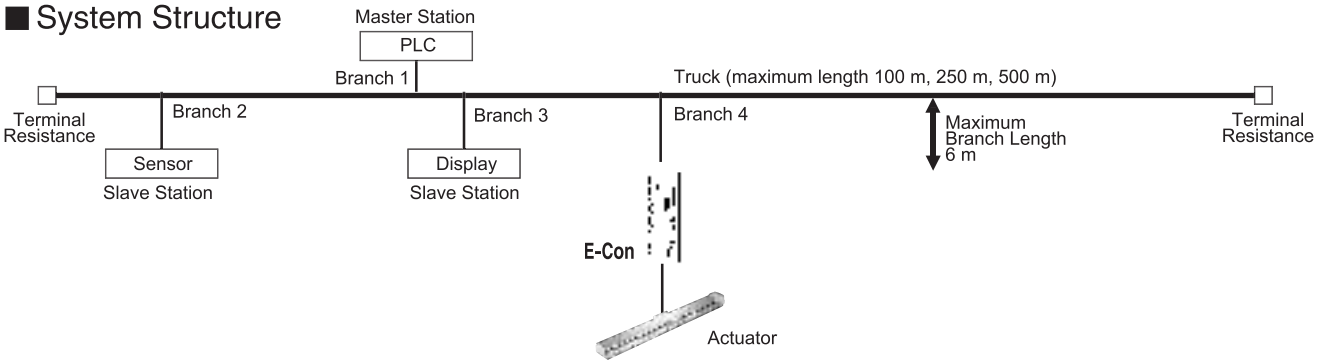
DeviceNet complicance type has become available for the E-Con controllers.

The controllers achieve I/O signal transmission to/ from the PLC via DeviceNet connection using a dedicated cable (1 cable, 5 leads), so you can design a system requiring less wiring.

Caution

The controllers are recognized as remote I/O terminals on DeviceNet. (The controllers cannot perform data communication).

System Structure



Interface Specifications

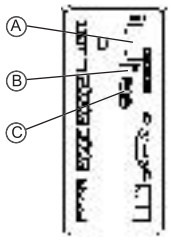
Items	Specifications			
Number of I/O Points	10 dedicated input points / 13 dedicated output points			
Communication Standard	DeviceNet 2.0 (*2)			
	Group 2 only server			
	Insulated node of network power operation type			
Communication Specification	Master-slave connection		Bit strobe	
			Polling	
Communication Speed	500k / 250k / 125kbps (Changeover via DIP Switch)			
Communication Cable Length	Communication Speed	Maximum Network Length	Maximum Branch Length	Total Branch Length
	500 kbps	100 m	6 m	39 m
	250 kbps	250 m		78 m
	125 kbps	500 m		156 m
	Note) When a large diameter cable for DeviceNet is used.			
Communication Power Supply	24VDC (Supplied from DeviceNet)			
Current Consumption of Power Supply	60mA or more			
Number of Occupied Node	1 node			
Connector	MSTBA2.5/5-G. 0.8AUM by Phoenix Contact (*3)			

(*1) 10 points if the input power supply is 24V, and 11 points if the input power supply is 100V/200V.
(*2) E-Con is scheduled to be certified.
(*3) Comes with a cable connector. SMSTB2.5/5-ST-5.08AU.

Controller View / Model

E-Con

Model **ECON-□-□-DV-□**
Number of I/O points: 10 dedicated input points / 13 dedicated output points



(100/200V specification)

Ⓐ Communication connector SMSTB2.5/5-ST-5.08AU by Phoenix Contact

Ⓑ Status LEDs
MS: Modular status
NS: Network status

Ⓒ DIP switches for various settings
Node address (MACID) setting
Communication transfer rate setting

CC-Link※1 Compliance Type

※1 CC-Link is a registered trademark of Mitsubishi Electric Corporation.

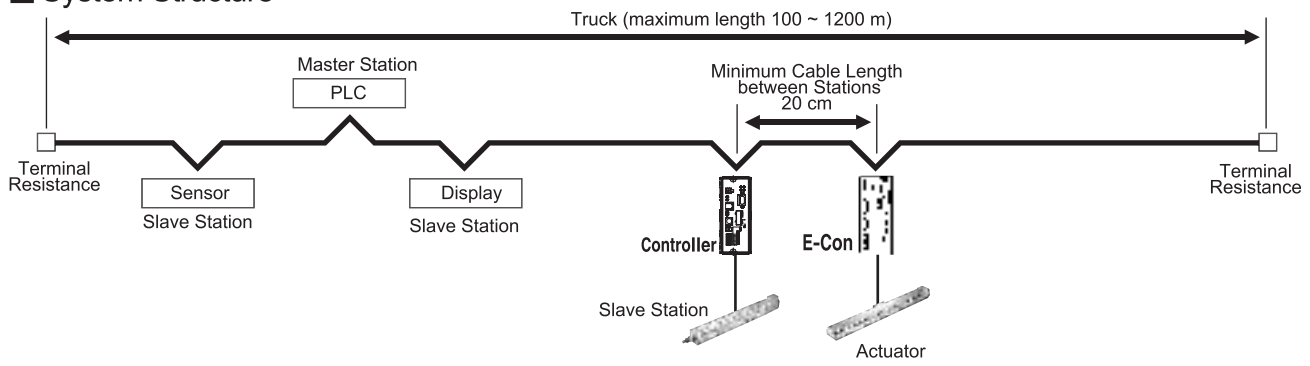
CC-Link complicance type has become available for the E-Con controllers.

The controllers achieve I/O signal transmission to/ from the PLC via CC-Link connection using a dedicated cable (1 cable, 4 leads), so you can design a system requiring less wiring.

Caution

The controllers are recognized as remote I/O terminals and as such able to perform I/O data communication.
(They cannot perform data communication.)

System Structure



Interface Specifications

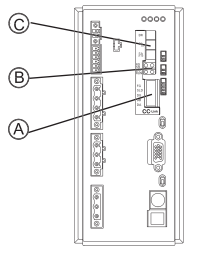
Items		Specifications					
Number of I/O Points	Remote Device	8 dedicated input points/ 10 (11) dedicated output points (*1)					
	Remote I/O	10 dedicated input points/ 13 dedicated output points					
Communication Standard		CC-Link Ver1.10 (Certified)					
Communication Speed		10M / 5M / 2.5M / 625k / 156kbps (Changeover via Rotary Switch)					
Communication Method		Broadcast polling method					
Synchronization Method		Frame synchronization method					
Coding Method		NRZI					
Transmission Path Format		Bus format (comforming to EIA RS485)					
Transmission Format		Comforming to HDLC					
Error Control Method		CRC ($X^{16} + X^{12} + X^5 + X1$)					
Number of Occupied Stations		1 station (remote I/O station)					
Communication Cable Length		Communication Speed (bps)	10M	5M	2.5M	625k	156k
		Cable Length (m)	100	160	400	900	1200
Connector (Controller side)		MC1.5/5-G-3.81 by Phoenix Contact (*2)					

(*1) 10 points if the input power supply is 24V, and 11 points if the input power supply is 100V/200V.
(*2) The cable connector is a standard accessory (MC1.5-ST-3.81 by Phoenix Contact).

Controller View / Model

E-Con

Model **ECON-□-□-CC-□**
Number of I/O points: 10 dedicated input points / 13 dedicated output points



(100/200V specification)

Ⓐ Communication connector MC1.5-ST-3.81 by Phoenix Contact

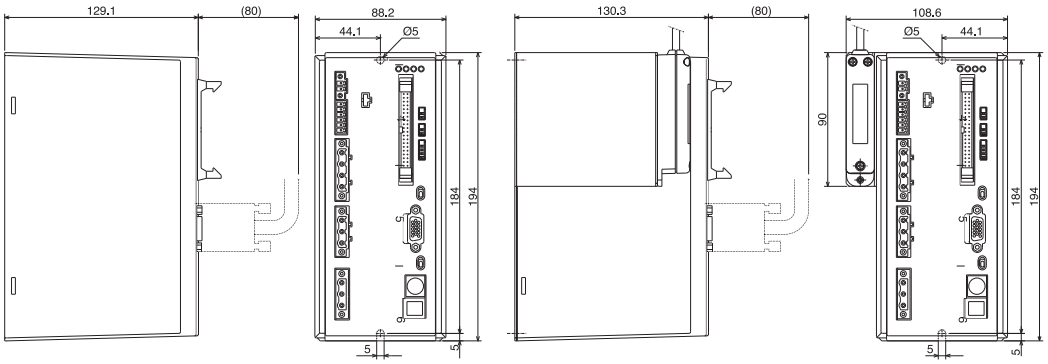
Ⓑ Status LEDs RUN/ SD/ RD/ ERR

Ⓒ Rotary switches for various settings Baud rate setting, station number setting

9 External Dimensions

Controller

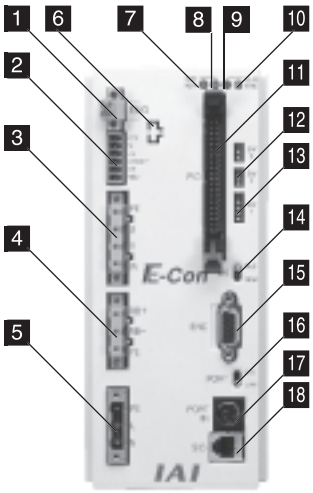
E-Con



External view of incremental specification

External view of absolute specification

10 Name and Function of Each Part



1 EMG terminal

A connector for the emergency-stop switch.
The controller will actuate an emergency stop when this connector becomes open.

2 Actuator-sensor input connector

An input terminal for the LS, CREEP or OT sensor, etc., installed on the actuator.
The pins are assigned to 24V, N, LS, CREEP and OT from the top. Use a dedicated cable for connection.

3 Motor cable connector

A connector for the actuator's motor power cable.
The pins are assigned to PE, U, V and W from the top.
Use a dedicated cable for connection.

4 Regeneration resistor unit connector

A connector for the regeneration resistor unit.
The pins are assigned to PE, RB+ and RB- from the top.

5 Main power input connector

A connector for the controller power.
The pins are assigned to PE, L and N from the top.

6 Absolute battery connector

A connector for the battery unit to be used with an ABS actuator.

7 ~ 10 Indicator LEDs

These LEDs indicate the controller condition.
The details of each LED are as follows:

7	RDY	(Green) Lit when the controller is operating normally.
8	RUN	(Green) Lit during movement.
9	ALM	(Red) Lit while an alarm is present.
10	ENC	(Orange) Lit if the encoder is open or cannot be recognized.

11 PIO connector

A 40-pin connector for parallel communication with a PLC, etc.

12 DIP switch (SW2)

A data setting switch for rotation data clear and remote update used on an ABS actuator.
Refer to the explanation below for the function/setting corresponding to each switch number:

SW2-1	ON to enable rotation data clear
SW2-2	ON to enable remote update

13 DIP switch (SW1)

An axis ID setting switch.

14 Brake release switch

RLS	Brake is forcibly released.
NOM	Brake is in use (normal setting).

15 Encoder cable connector

A connector for the actuator's encoder cable.

16 Port switch

A switch for enabling/disabling Termi-Bus communication with a teaching pendant or PC.

17 Main communication port connector

A connector for Termi-Bus communication with a teaching pendant or PC.
It also serves as a link cable connector when multiple controllers are connected.

18 SIO connector

A connector for linking multiple controllers.

11 Options

Regeneration Resistor Unit

Model **REU-1**

Description

Motor deceleration generates regenerative current. The regeneration resistor unit is prepared to convert the regenerative current to heat. Although a built-in regeneration resistor is provided with the controller, regeneration units may be required for vertical use that incurs larger loads. (Refer to the table for "Installation Standards" below.)

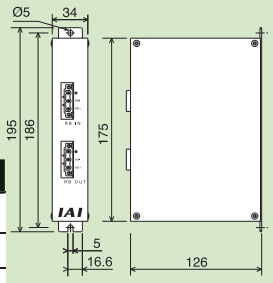
Specification

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

Installation Standards

Motor output	Horizontal use	Vertical use
0~150W	Not required	Not required
200~600W		1 unit required
750W		2 units required

* The above are reference settings assuming the rated conditions (load capacity, speed and acceleration).



11 Options

Teaching Pendant

Model

RCA-T (Standard) **RCA-TD** (With deadman switch)

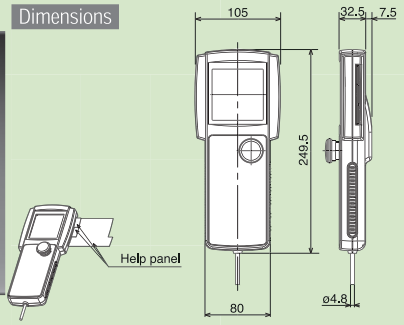
Features

- A teaching device that provides all of the functions needed for test operation/adjustment, such as position-data input, test operation and monitoring of the current axis position and I/O signals.
- The interactive-type panel ensures easy operation. All you need is to enter values in the required fields, so you won't need the operation manual for basic operations.

Specification

Items	Specification
Operating temperature, humidity	Temperature: 0~40°C, humidity: 30-85%RH
Operating environment	No contact with corrosive gases or significant dust.
Weight	Approx. 550g (including cable)
Cable length	5m
Display	21 characters x 16 lines, LCD

Dimensions



Simple Teaching Pendant

Model

RCA-E

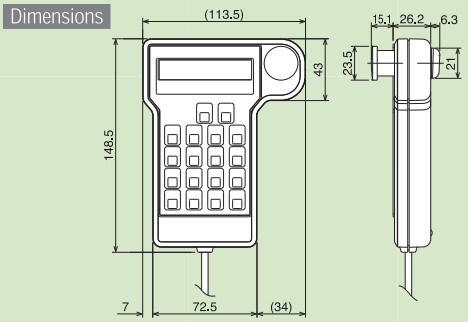
Features

- A highly cost-effective teaching pendant that provides the same functions as the RCA-T at a significantly lower price.
- The unit size has been reduced through the use of a two-line display.

Specification

Items	Specification
Operating temperature, humidity	Temperature: 0~40°C, humidity: 30-85%RH
Operating environment	No contact with corrosive gases or significant dust.
Weight	Approx. 400g (including cable)
Cable length	5m
Display	16 characters x 2 lines, LCD

Dimensions



Data Setting Unit

Model

RCA-P *Operations involving axis movement cannot be performed.

Features

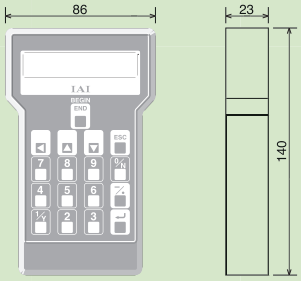
An affordable data setting unit offering edit functions, except for operations involving axis movement.

Edit functions ● Position data input ● Confirmation of current axis position ● I/O signal monitoring, etc.

Specification

Items	Specification
Operating temperature, humidity	Temperature: 0~40°C, humidity: 30-85%RH
Operating environment	No contact with corrosive gases or significant dust.
Weight	Approx. 360g
Cable length	5m
Display	16 characters x 2 lines, LCD

Dimensions



PC Software

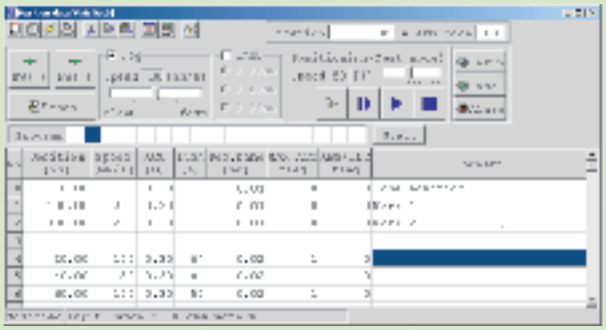
Model

RCB-101-MW (DOS/V, Windows version)

[Content] Floppy disk, PC communication cable (5m) (*1)

Features

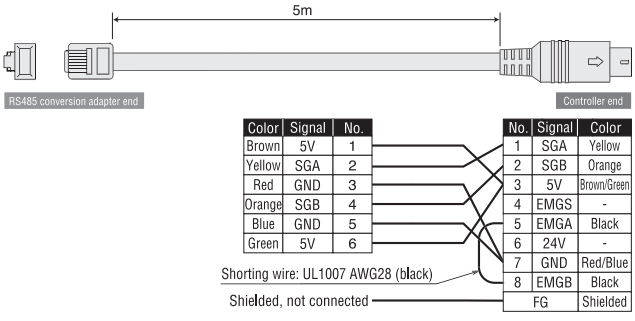
- A support software for position data input and test operation.
- This software significantly improves the equipment debugging operations by offering wide-ranging functions such as jogging, inching, step operation and continuous operation, and also by allowing easy operation via a large PC screen.



(*1) The PC communication cable consists of CB-RCA-SIO050 and RCB-CV-MW (refer to the drawing below).

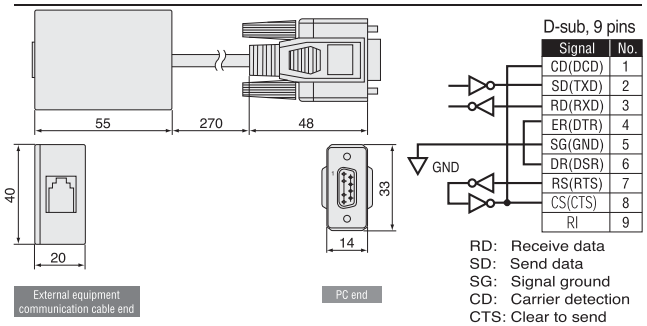
External Equipment Communication Cable

Model **CB-RCA-SIO050**



RS485 Conversion Adapter

Model **RCB-CV-MW**



Catalog No. ECON-CJ30102-3A-Sep3005-1

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