Quality and Innovation

Controllers

E-Con
XSEL-KE/KET
XSEL-P/Q

Single-Axis Only	Dedicated Controller for Positioner Operation	Single-Axis Robot Controller	**E-Con**	227
1 - 4 Axes	General-Purpose Controller for Program Operation	Single-Axis/Cartesian Robot Controller	**XSEL-KE/KET**	234
1 - 6 Axes	General-Purpose Controller for Program Operation	Single-Axis/Cartesian Robot Controller	**XSEL-P/Q**	251

E-Con Position Controller for Single-Axis Robot

Operating method	Positioner operation
Number of storable positions	64 positions
Supply voltage	100/230 VAC, selectable

1 Features

1 Driving High-Performance Single-Axis Robot IA Series

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

■ Drivable Actuator Specifications

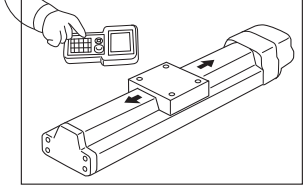
Stroke	Control output	Maximum speed	Maximum load capacity	Maximum load capacity
100 ~ 3000 mm	20W ~ 750W	2000 mm/sec	150 kg (horizontal)	60 kg (vertical)

2 Positioning to Maximum 64 Points with Easy Operation

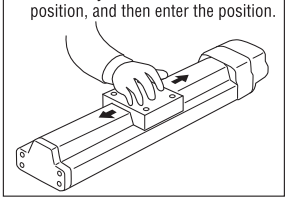
Operation is easy. Simply store the target positions as position data and specify the applicable position numbers from a PLC, etc. There is no need to create a complicated program.
Number of positioning points: 64
Positions can be entered in the following three ways:

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, and 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 incremental specification.

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	Speed variation	Serial communication

(Refer to the Robo Cylinder catalog for the details of each function.)

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 ProfiBus connection.

6 Conformance with the CE Mark

* Contact IAI for details.

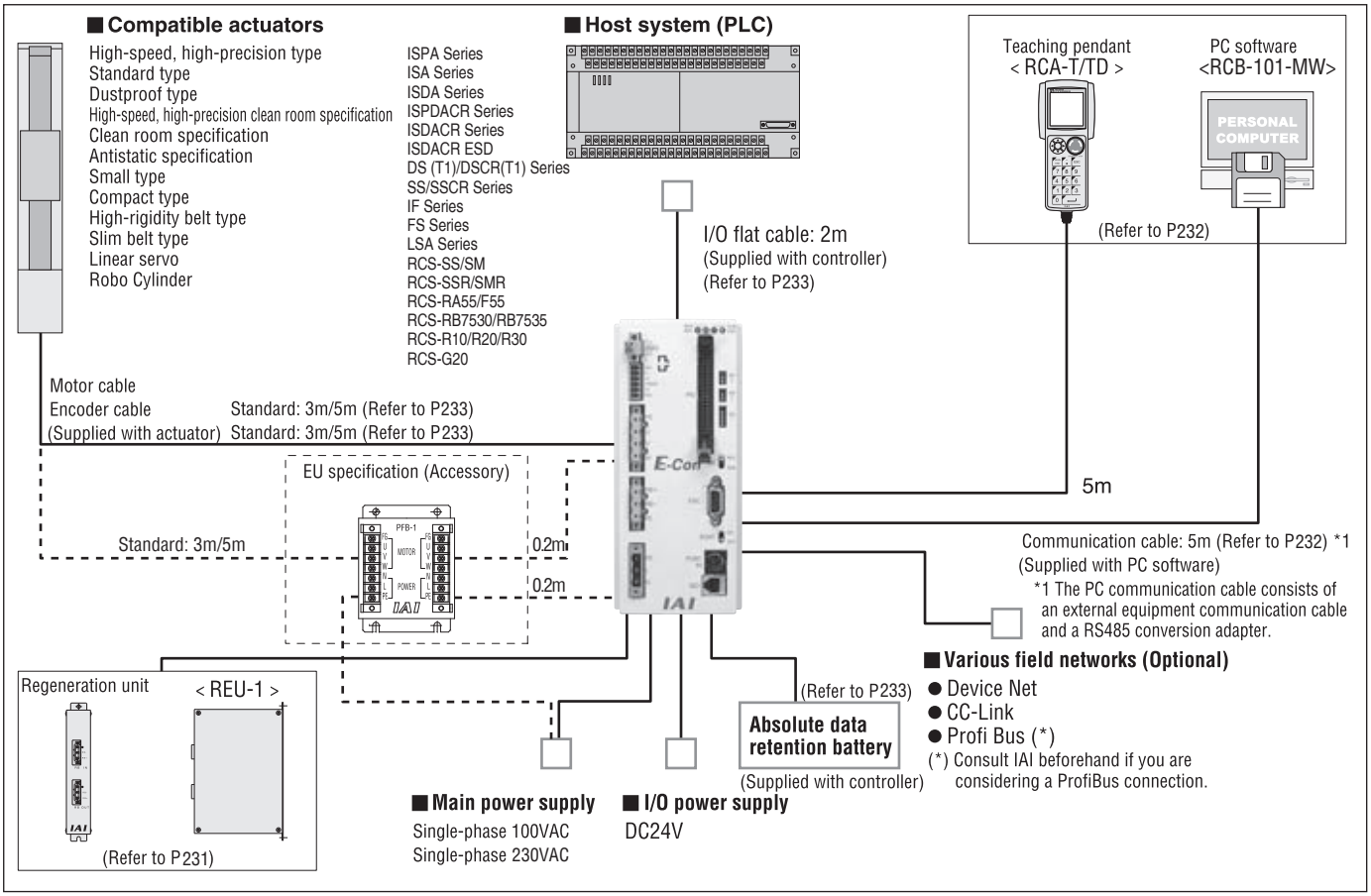
2 Model

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 (230V)	Not specified (Standard specification) EU (CE-compliant)	Not specified (NPN) P (PNP)

(Note 1) 20/30-watt specifications will be available from October 2003.
(Note 2) 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



EU Specification Details

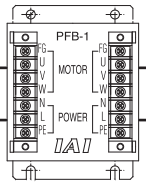
The E-Con's EU specification comes with the following filter box (model: PFB-1) and dedicated cable for noise elimination purposes.

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.

←To actuator
CB-PFB-MA□□□-PAS
CB-PFB-MA□□□-WAS

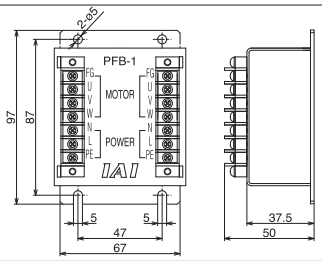
←To power supply
(Wired by the user)



To E-Con→
CB-PFB-MA□□□-CS

To E-Con→
CB-PFB-PW□□□-CS

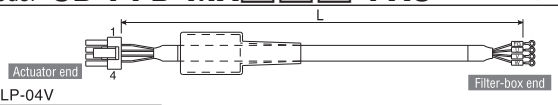
Filter Box Dimensions



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

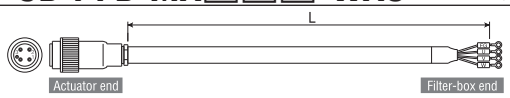
Wire	Color	Signal	No.	
0.75 sq (Crimp)	Red	U	1	Red
	White	V	2	White
	Black	W	3	Black
	Green	FG	4	Green

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

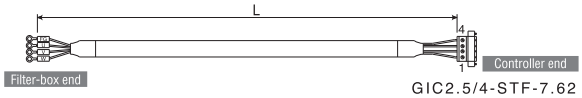
Wire	Color	Signal	No.	
0.75 sq (Crimp)	Green/Yellow	FG	⏚	Green/Yellow
	Black with "1" in white	U	1	Black with "1" in white
	Black with "2" in white	V	2	Black with "2" in white
	Black with "3" in white	W	3	Black with "3" in white

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

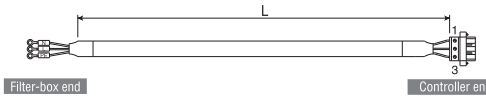
Terminals on filter-box end

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

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

Terminals on filter-box end

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

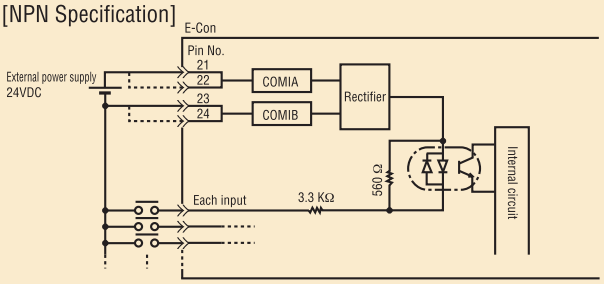
4 I/O Wiring

RCS-C Type (Insulated I/O Specification)

Input Part 24-V external I/O specification

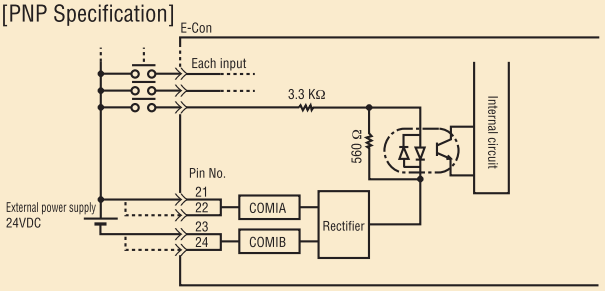
Item	Specification
Number of input points	10 points
Input voltage	24VDC ±20%
Input current	7mA/point
Operating voltage	ON voltage --- Min. 16V (4.5mA) OFF voltage --- Max. 6V (1.4mA)
Insulation method	Photocoupler

[NPN Specification]



• Supply 24 VDC to COMIA or COMIB. COMIA and COMIB have no polarity.
• 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]

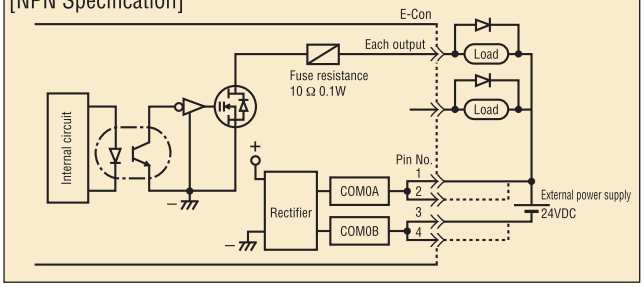


• Supply 24 VDC between COMOA and COMOB. COMOA and COMOB have no polarity.
• Connect the positive side of the external power supply to the common side of the input.
• Pin Nos. 21 and 22 of COMIA, and pin Nos. 23 and 24 of COMIB, are connected internally.

Output Part 100-mA output circuit by Power MOSFET

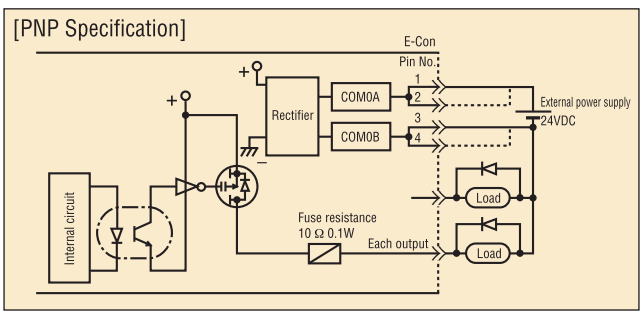
Item	Specification
Number of output points	13 points
Rated load voltage	24VDC/60V (peak) (No flywheel diode)
Maximum load current	100mA/point
Insulation method	Photocoupler
Leak current	Fuse resistance: 10Ω, 0.1W

[NPN Specification]



• Supply 24 VDC to COMIA or COMIB. COMIA and COMIB 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-back voltage inhibition measure using a diode, etc., for the load L of a relay, etc. (Inserting a diode in a position as close as possible to the coil is the most effective way to prevent spike noise.)

[PNP Specification]



5 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 (Do not connect anything)
6		NC	
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."

6 Specification Table

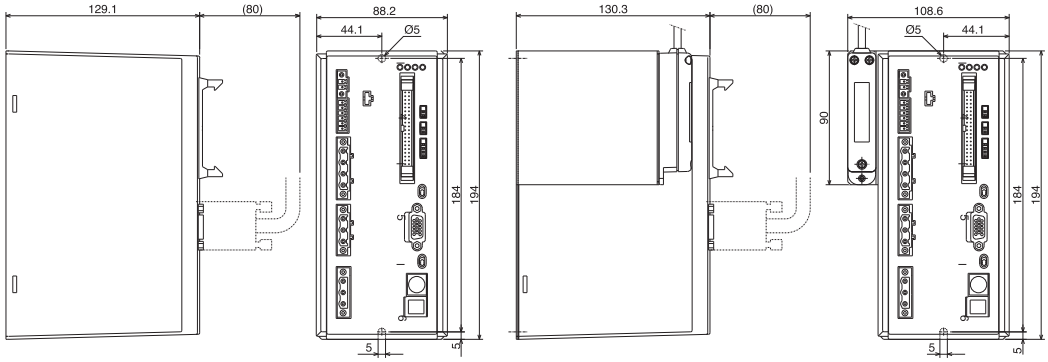
Item	Description							
Controller series/type	ECON							
Compatible actuators	ISA, ISPA, ISDA, ISDACR (ESD), ISPDACR, DS, DSCR, SS, SSCR, IF, FS, LSA RCS-SS/SSR/SM/SMR/RA55/F55/R10/R20/R30/G20							
Applicable motor capacity (W)	60	100	150	200	300	400	600	750
Number of controlled axis	1 axis only							
Maximum output of connected axis (W)	750							
Power supply	100-V specification: Single-phase 100~115VAC 230-V specification: Single-phase 200~230VAC				230-V specification: Single-phase 200~230VAC			
Power supply voltage range	±10%							
Power frequency	50/60Hz							
Power capacity (Note 1)	100W	150W	210W (290W)	270W	(410W)	520W	770W	1000W
	160VA	240VA	350VA (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: 85%RH or less							
Operating environment	Not subject to corrosive gases or significant 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 LSA type (linear servo actuator).

6 External Dimensions

Controller

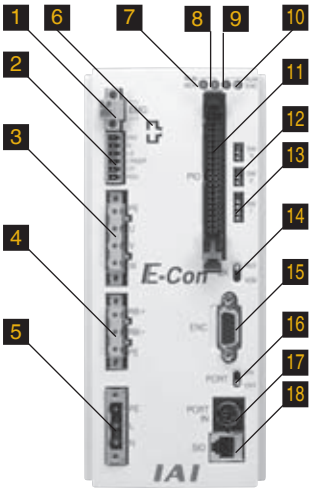
E-Con



External view of incremental specification

External view of absolute specification

7 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 RB+, RB- and PE 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.

8 Options

Regeneration Resistor Unit

Model **REU-1**

Description

This unit converts to heat the regenerative current generated when the motor decelerates. A regeneration resistor is provided inside the controller, but its capacity may not be sufficient when a large load is applied to the vertical axis. In this case, this optional unit is required. (Refer to the table at bottom right.)

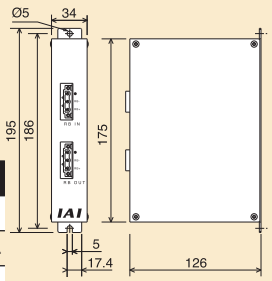
Specification

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.
200~600W	Not required.	1 unit is required.
750W		2 units are required.

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



9 Options

Teaching Pendant

Model

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

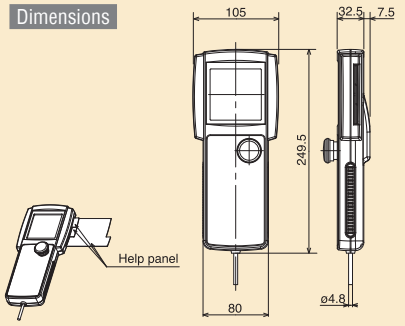
Features

- 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: 85%RH or less
Operating environment	Not subject to 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

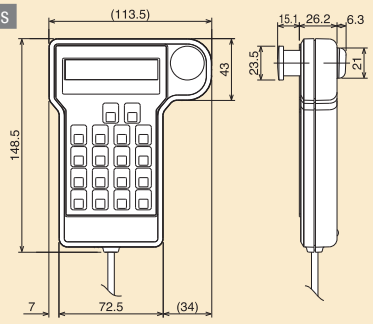
Features

- 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: 85%RH or less
Operating environment	Not subject to 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

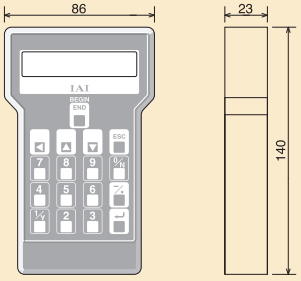
An affordable data setting unit offering edit functions, except for operations involving axis movement.

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: 85%RH or less
Operating environment	Not subject to corrosive gases or significant dust.
Weight	Approx. 360g
Cable length	5m
Display	16 characters x 2 lines, LCD

Dimensions



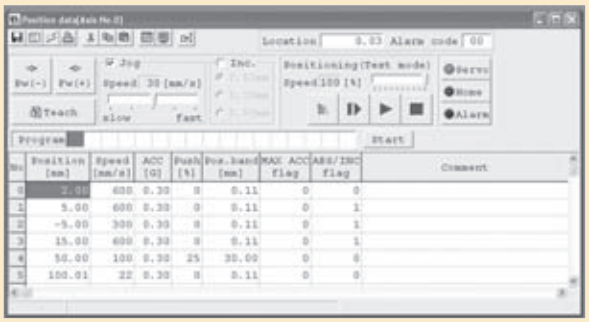
PC Software

Model

RCB-101-MW (DOS/V, Windows version)
[Content] Floppy disk, PC communication cable (5m) (*1)

Features

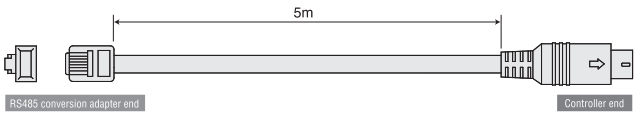
- A support software for position data input and test operation.
- This software significantly improves the equipment debugging operations by offering wide-ranging functions such as jogging, inching, step operation and continuous operation, and also by allowing easy operation via a large PC screen.



(*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**



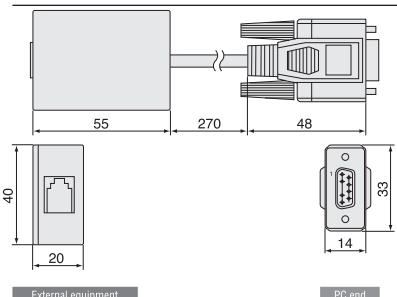
Color	Signal	No.
Brown	5V	1
Yellow	SGA	2
Red	GND	3
Orange	SGB	4
Blue	GND	5
Green	5V	6

Shorting wire: UL1007 AWG28 (black)
Shielded, not connected

No.	Signal	Color
1	SGA	Yellow
2	SGB	Orange
3	5V	Brown/Green
4	EMGS	-
5	EMGA	Black
6	24V	-
7	GND	Red/Blue
8	EMGB	Black
	FG	Shielded

RS485 Conversion Adapter

Model **RCB-CV-MW**



D-sub, 9 pins

Signal	No.
CD(DCD)	1
SD(TXD)	2
RD(RXD)	3
ER(DTR)	4
SG(GND)	5
DR(DSR)	6
RS(RTS)	7
CS(CTS)RI	8
	9

GND

RD: Receive data
SD: Send data
SG: Signal ground
CD: Carrier detection
CTS: Clear to send

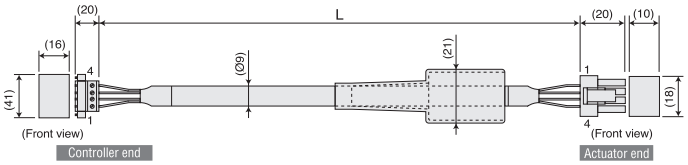
9 Service Parts

Motor Cable (Single-Axis Robot Connection)

Model **CB-X-MA□□□**

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).

Compatible actuators: DS/DSCR/ISA/ISDA/IF/FS/SS/SSCR/ISDACR/ISDACR-ESD



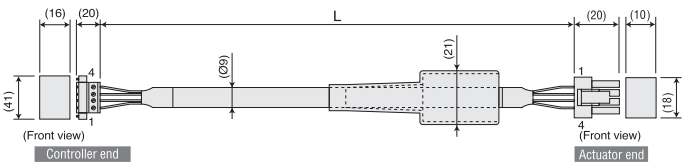
Wire	Color	Signal	No.		No.	Signal	Color	Wire
0.75 sq	Green	PE	1		1	U	Red	0.75 sq (Crimp)
	Red	U	2		2	V	White	
	White	V	3		3	W	Black	
	Black	W	4		4	PE	Green	

Motor Cable (Robo Cylinder/Linear Connection)

Model **CB-RCC-MA□□□**
Model **CB-RCC-MA□□□-RB** (Linear Servo)

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).

Compatible actuators: RCS-SS/SM/SSR/SMR/RA55/RB-7530/RB-7535/F55/G20/R10/R20/R30/LS



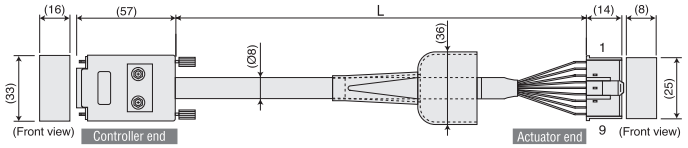
Wire	Color	Signal	No.		No.	Signal	Color	Wire
0.75 sq	Green	PE	1		1	U	Red	0.75 sq (Crimp)
	Red	U	2		2	V	White	
	White	V	3		3	W	Black	
	Black	W	4		4	PE	Green	

Encoder Cable (Single-Axis Robot Connection)

Model **CB-X-PA□□□**

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).

Compatible actuators: DS/DSCR/ISA/ISDA/IF/FS/SS/SSCR/ISDACR/ISDACR-ESD



Wire	Color	Signal	No.		No.	Signal	Color	Wire
0.15 sq (Crimp)	-	-	1		1	BAT+	Black	0.15 sq (Crimp)
	-	-	2		2	BAT-	Yellow	
	-	-	3		3	SD	Blue	
	-	-	4		4	$\overline{SD}$	Orange	
	-	-	5		5	VCC	Green	
	-	-	6		6	GND	Brown	
	Blue	SD	7		7	FG	Ground	
	Orange	$\overline{SD}$	8		8	BK-	Gray	
	Black	BAT+	9		9	BK+	Red	
	Yellow	BAT-	10					
	Green	VCC	11					
	Brown	GND	12					
	Gray	BK-	13					
	Red	BK+	14					
	-	-	15					

Connect the shielded wire to the hood using a clamp.

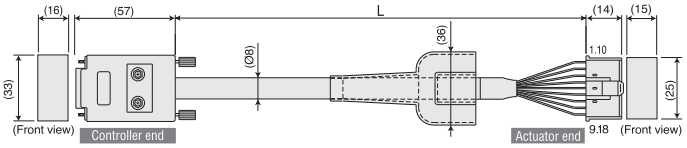
Ground wire and shielded wire, braided

Encoder Cable (Robo Cylinder/Linear Connection)

Model **CB-RCBC-PA□□□**
Model **CB-RCBC-PA□□□-RB** (Linear Servo)

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).

Compatible actuators: RCS-SS/SM/SSR/SMR/RA55/RB-7530/RB-7535/F55/G20/R10/R20/R30/LS



Wire	Color	Signal	No.		No.	Signal	Color	Wire
0.15 sq (Crimp)	Pink	A/U	1		1	A/U	Pink	0.15 sq (Crimp)
	Purple	$\overline{A/U}$	2		2	$\overline{A/U}$	Purple	
	White	B/V	3		3	B/V	White	
	Blue/Red	$\overline{B/V}$	4		4	$\overline{B/V}$	Blue/Red	
	Orange/White	Z/W	5		5	Z/W	Orange/White	
	Green/White	$\overline{Z/W}$	6		6	$\overline{Z/W}$	Green/White	
	Blue	SD	7		7	-	-	
	Orange	$\overline{SD}$	8		8	-	-	
	Black	BAT+	9		9	FG	Ground	
	Yellow	BAT-	10		10	SD	Blue	
	Green	VCC	11		11	$\overline{SD}$	Orange	
	Brown	GND	12		12	BAT+	Black	
	Gray	BK-	13		13	BAT-	Yellow	
	Red	BK+	14		14	VCC	Green	
	-	-	15		15	GND	Brown	
					16	-	-	
					17	BK-	Gray	
					18	BK+	Red	

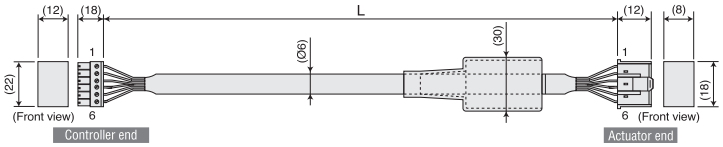
Connect the shielded wire to the hood using a clamp.

Ground wire and shielded wire, braided

Limit Switch Cable (Single-Axis Robot Connection)

Model **CB-X-LC□□□**

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).

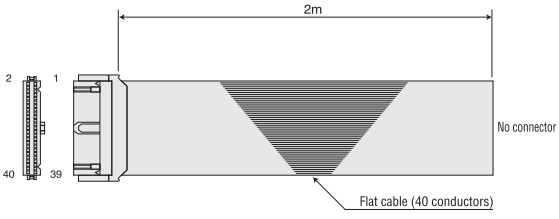


Wire	Color	Signal	No.		No.	Signal	Color	Wire
AWG24	Light Blue	24VOUT	6		1	24VOUT	Light Blue	AWG24 (Crimp)
	Pink	N	5		2	N	Pink	
	Grass	LS	4		3	LS	Grass	
	Orange	CREEP	3		4	CREEP	Orange	
	Gray	OT	2		5	OT	Gray	
	1B/Light Blue	RSV	1		6	RSV	1B/Light Blue	

Note) "1B" indicates one black dot mark.

I/O Flat Cable (E-Con)

Model **CB-RCBC-PIO020**



No.	Color	Signal name	No.	Color	Signal name	No.	Color	Signal name	No.	Color	Signal name
1	Brown-1	COM-0A	11	Brown-2	/EMG	21	Brown-3	COM-IA	31	Brown-4	NC
2	Red-1	COM-0A	12	Red-2	PM16	22	Red-3	COM-IA	32	Red-4	PC16
3	Orange-1	COM-0B	13	Orange-2	/ALM	23	Orange-3	COM-IB	33	Orange-4	/ILK
4	Yellow-1	COM-0B	14	Yellow-2	PM8	24	Yellow-3	COM-IB	34	Yellow-4	PC8
5	Green-1	NC	15	Green-2	ZONE	25	Green-3	NC	35	Green-4	SVON
6	Blue-1	NC	16	Blue-2	PM4	26	Blue-3	NC	36	Blue-4	PC4
7	Purple-1	NC	17	Purple-2	ZFIN	27	Purple-3	NC	37	Purple-4	RESET
8	Gray-1	Battery alarm	18	Gray-2	PM2	28	Gray-3	NC	38	Gray-4	PC2
9	White-1	Moving	19	White-2	PFIN	29	White-3	NC	39	White-4	CSTR
10	Black-1	PM32	20	Black-2	PM1	30	Black-3	PC32	40	Black-4	PC1

Absolute Data Retention Battery

Model **AB-1**

* Case is not included.

Compatible controllers: RCS-C/E-Con

■ Specification

Item	Description
Battery type	Lithium battery
Battery capacity	2000mAh
Data retention time	Approx. 20,000 hours
Nominal voltage	3.6V

4-Axes Controller X-SEL-KE/KET

■ X-SEL-KE: Standard version according to european CE safety standard with single-phase power supply 115/230 VAC (max. 1600 W)

■ X-SEL-KET: Global version according to european CE and american ANSI safety standard with single-phase power supply 115/230 VAC (max. 1600 W)

X-SEL High-Function Multi-Axes Controller

Operating method programs	Program operation
Number of storable programs	64 programs (6000 steps)
Number of storable positions	3000 positions selectable
Supply voltage	AC100V/230V, selectable

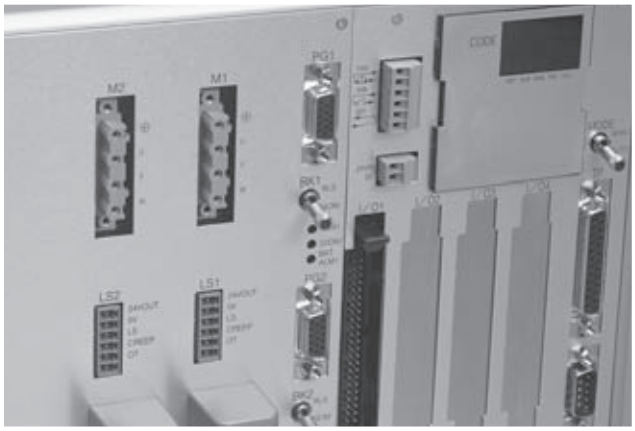
1 Features

1 All-in-One Controller Featuring a Newly Developed, Fully Programmable Digital Servo Driver

The driver is equipped with a newly developed, fully programmable digital servo driver supporting a 17-bit serial encoder.

Acceleration/deceleration performance, which is significantly higher than the conventional model (E/G type), reduces tact time.

This all-in-one controller with a built-in driver requires no driver connection, making installation easier.



2 Easy Maintenance

All boards can be replaced simply by removing the front panel.

The X-SEL ensures prompt, thorough maintenance and service.

3 Enhanced Safety Function Backed by CE Mark

The X-SEL controller system protects your equipment with various RAS functions.

Safety is enhanced by a function that cuts off the motor drive power upon an emergency stop or error, a noise elimination feature, etc.

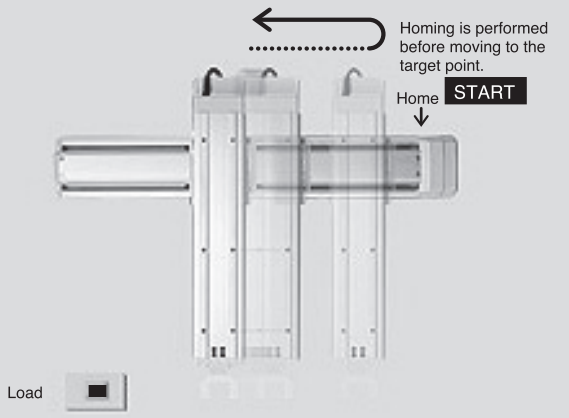
We offer models conforming to the “CE Mark” international safety standard. *

* Please contact IAI if you require a CE-compliant specification.

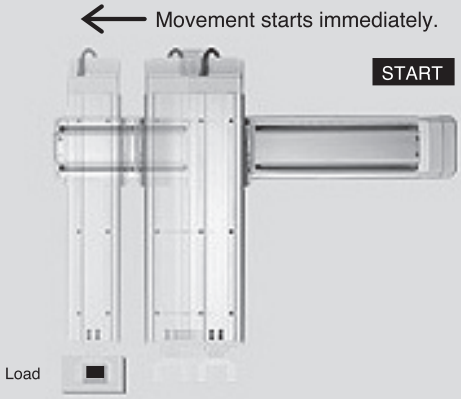
4 Greater Operating Efficiency with Support for Absolute Encoder

The X-SEL supports a 17-bit absolute encoder for rotation data backup, so homing is no longer required when starting your equipment or upon reset following an emergency stop.
The X-SEL saves setup time in the morning or reset time in operations requiring frequent stops, thereby improving efficiency.

Incremental

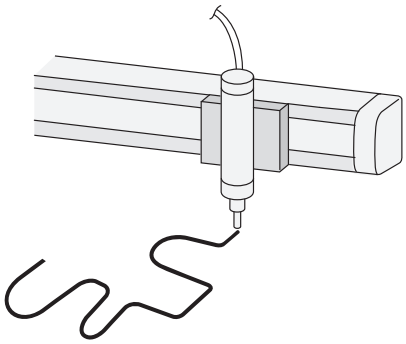


Absolute



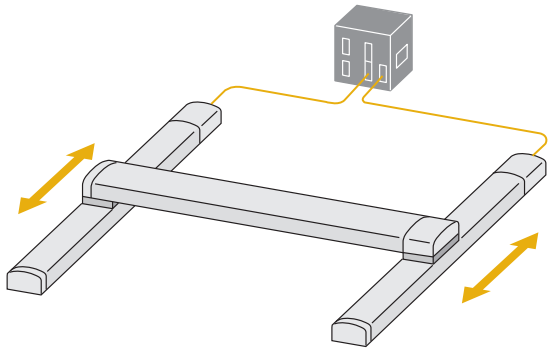
5 Significantly Higher Trace Accuracy

The higher processing speed of the X-SEL controller facilitates a significant improvement in trace accuracy.
The speed of path and arc movement has also increased, allowing for faster, more accurate coating operation.



6 Synchronized Operation

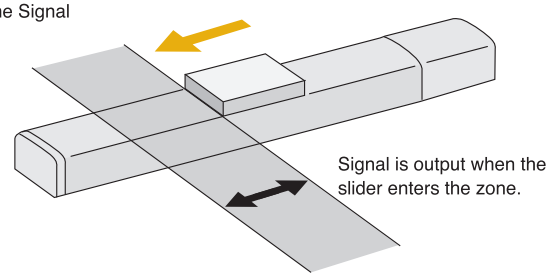
The operations of two actuators can be synchronized, allowing for the transfer of load weighing more than the load capacity of a single axis. The synchronized operation function is also useful when a gantry-type model is used with an extended Y-axis. (Certain conditions apply, so please consult with IAI.)



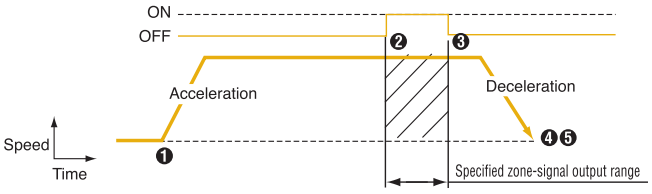
7 Zone Signal

The zone signal function lets you set a desired range (zone) between the stroke limits and cause a signal to be output when the slider enters the specified range. Use this function to provide an interlock, or to synchronize operation, with peripheral equipment. A maximum of four ranges (zones) can be set.

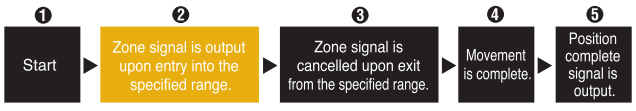
■Zone Signal



■Zone Signal Output

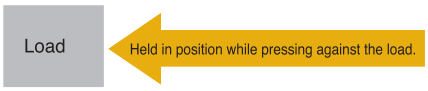


■Zone Operation



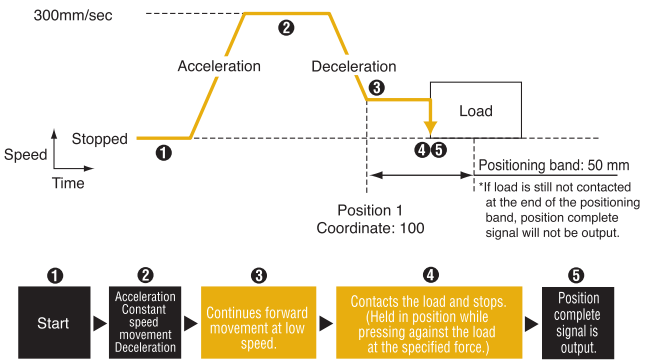
8 Push & Hold Operation

The slider can be held in position while pressing against the load, as in similar operations achieved with an air cylinder.
This function lets the user easily handle various operations such as applying pressure, clamping and press-fitting works.



The presence/absence of load is detected by setting the controller in such a way that a signal will be output upon contact with a load.

■Example of Push & Hold Operation



9 Significantly Larger Program Data Capacity

6000 programmable steps (largest in its class)
3000 position points
Additionally, up to 16 tasks can be executed simultaneously, easily accommodating complex controls and multi-variety work processes.

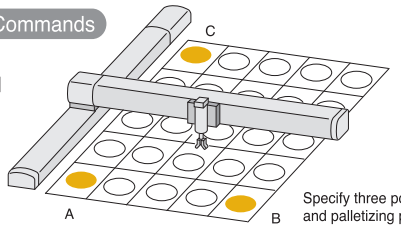
10 Supporting Pseudo-Ladder Task

Ladder tasks, similar to those generated by a PLC, can be constructed in a program (ladder mnemonic).
Since the extended conditions of AND and OR blocks are supported not only in ladder tasks but in all programs as well, so that even complex conditions are handled easily.

11 Many New Program Commands
E/G Type 111 Commands → X-SEL 183 Commands

Many new commands have been added to the Super SEL language, which is known for its ability to generate complex control programs with ease.

Examples of Additional Commands
- Palletizing command
- Arch motion command
- Spline command, and many more



Specify three points (A, B and C) and desired counts, and palletizing points will be set automatically.

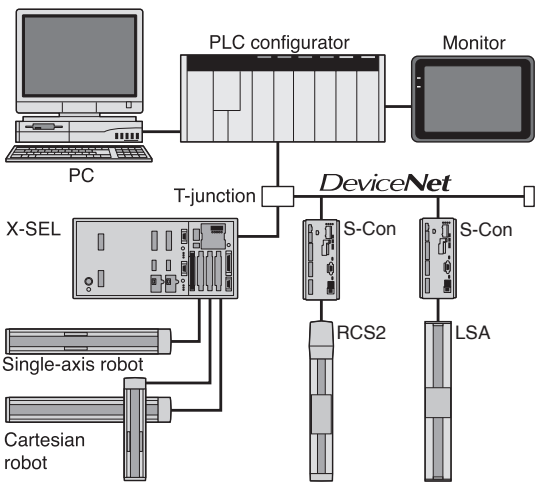
12 Variable Extension and Symbol Definition

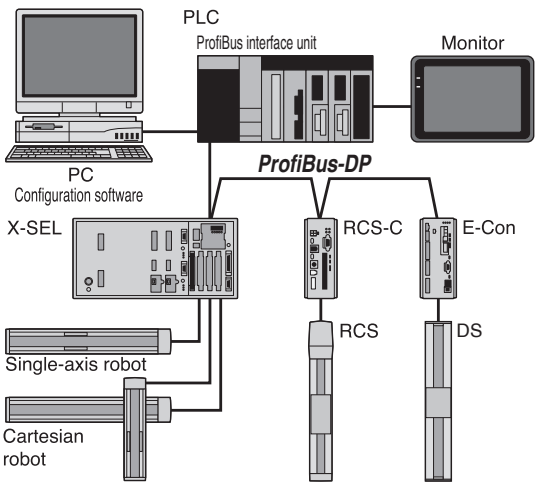
The number of variables that can be used in a program has been doubled from 100 to 200.
Additionally, variables, I/O ports, flags and points can now be assigned symbols (names), making it much easier to review the program.

13 Supporting Various Field Networks

The X-SEL supports leading field networks such as DeviceNet, CC-Link, ProfiBus and Ethernet.

(Note) DeviceNet is a registered trademark of ODVA.
CC-Link is a registered trademark of Mitsubishi Electric Corporation.





2 Features

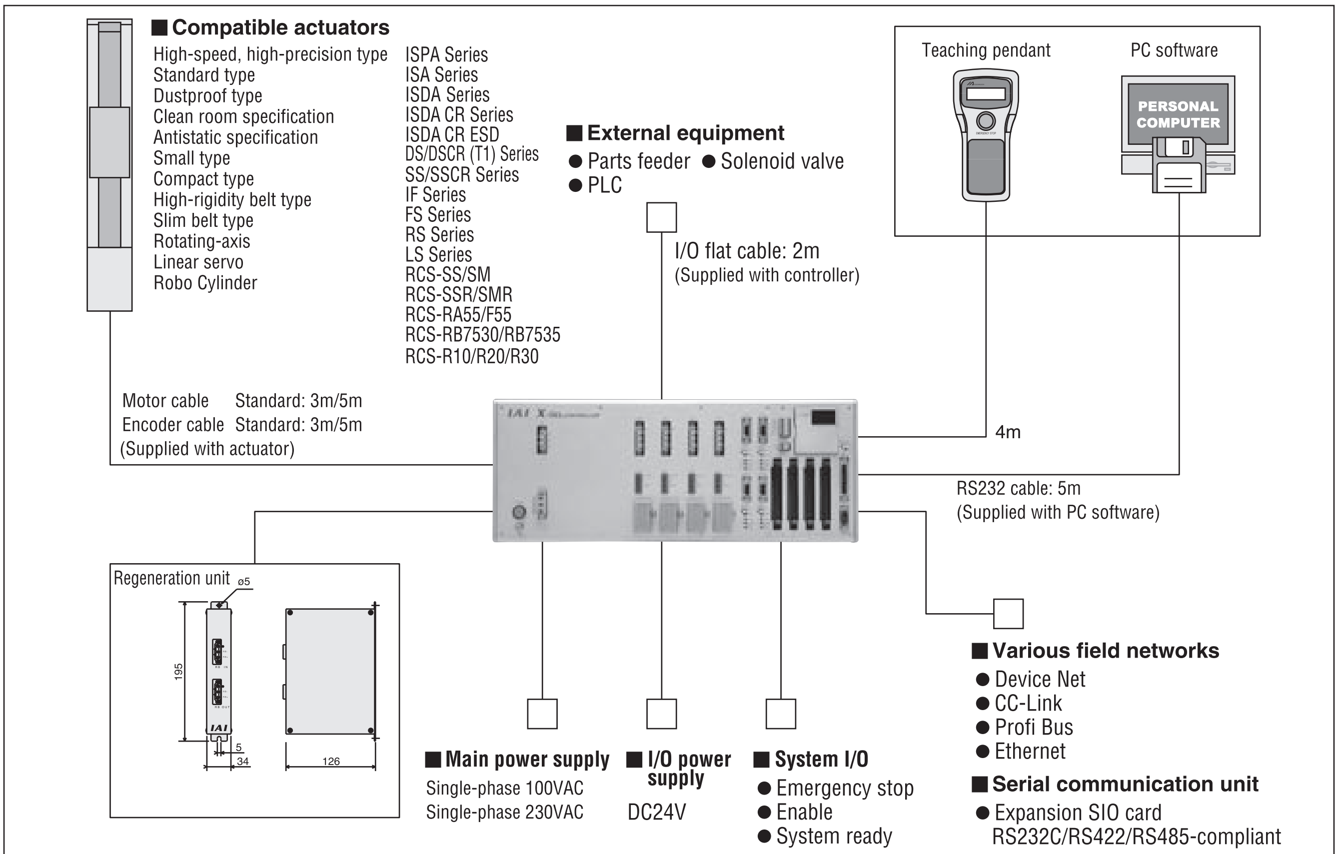
XSEL - KE - 3 - 400A - 200ICL - 60IBL - N1 - EEE - 2 - 2

XSEL	KE	3	400A	200ICL	60IBL	N1	EEE	2	2
❶	❷	❸	❹ (Axis 1)	❹ (Axis 2)	❹ (Axis 3)	❺	❻	❼	❽

❶ Series	❷ Controller type	❸ Number of axes	❹ Axis 1 to Axis 4 details						❺ Standard I/O details	❻ Expansion I/O slots			❼ I/O flat cable length (Note)	❽ Supply voltage
			Motor output	Encoder type	Brake	Creep	Home sensor (LS)	Synchronization designation	Slot 1	Slot 1	Slot 2	Slot 3		
XSEL	KE (CE-compliant) KET (ANSI/CE-compliant)	1 (1 axis) 2 (2 axes) 3 (3 axes) 4 (4 axes)	20 (20W) 30D (30W for DS) 30R (RS for 30W) 60 (60W) 100 (100W) 150 (150W) 200 (200W) 300 (300W) 400 (400W) 600 (600W) 750 (750W)	I (Incremental) A (Absolute)	Not specified (Without brake) B (With brake)	Not specified (Without creep sensor) C (With creep sensor)	Not specified (Without home sensor) L (With home sensor)	Not specified (No synchronization) M (Master-axis designation) S (Slave-axis designation)	N1 [32 inputs/16 outputs NPN board] P1 [32 inputs/16 outputs PNP board] DV [DeviceNet 256/256 board] CC [CC-Link 256/256 board] PR [ProfiBus 256/256 board] ET [Ethernet Data communication board]	E (Not used) N1 [Expansion I/O NPN32/16] N2 [Expansion I/O NPN16/32] P1 [Expansion I/O PNP32/16] P2 [Expansion I/O PNP16/32] SA [Expansion SIO Type A] SB [Expansion SIO Type B] SC [Expansion SIO Type C]	E (Not used) N1 [Expansion I/O NPN32/16] N2 [Expansion I/O NPN16/32] P1 [Expansion I/O PNP32/16] P2 [Expansion I/O PNP16/32] SA [Expansion SIO Type A] SB [Expansion SIO Type B] SC [Expansion SIO Type C]	E (Not used) N1 [Expansion I/O NPN32/16] N2 [Expansion I/O NPN16/32] P1 [Expansion I/O PNP32/16] P2 [Expansion I/O PNP16/32] SA [Expansion SIO Type A] SB [Expansion SIO Type B] SC [Expansion SIO Type C]	2:2m (Standard) 3:3m 5:5m 0: None	1:100V 2:230V

(Note) The standard I/O, expansion I/O (50-conductor type) and multipoint I/O (100-conductor type) boards come with an I/O flat cable. The standard cable length for standard and expansion I/O boards is 2 m, but you can also specify 3 or 5 m.
The maximum cable length is 10 m, but if you need a cable of any length other than 2, 3 or 5 m, enter "0 (None)" here and order an optional I/O flat cable by specifying a length.
If you have selected a board other than the standard I/O, expansion I/O and multipoint I/O boards, enter "0 (None)" here.

3 System Configuration Diagram

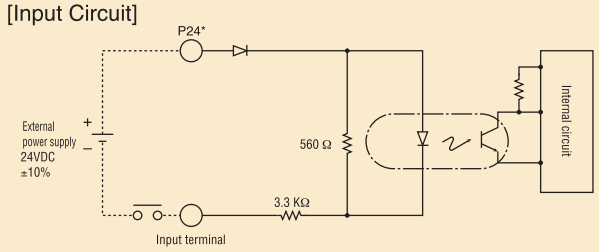


4 I/O Wiring

Input Part External input specification (NPN specification)

Item	Specification
Input power supply	DC24V ±10%
Input voltage	7mA/point
ON/OFF voltage	ON voltage --- Min DC16.0V OFF voltage --- Max DC5.0V
Insulation method	Photocoupler insulation
External equipment	①No-voltage contact (minimum load, approx. 5VDC/1mA) ②Photoelectric/proximity sensor (NPN type) ③Sequencer transistor output (open-collector type) ④Sequencer contact output (minimum load, approx. 5VDC/1mA)

[Input Circuit]



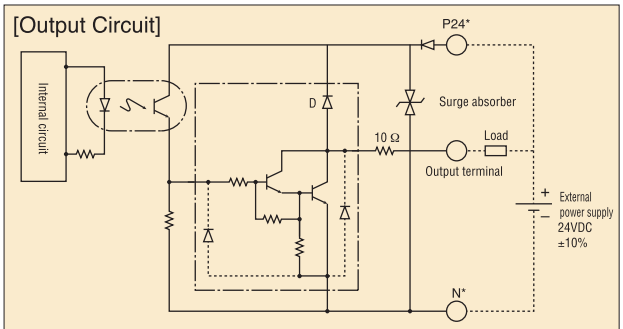
*

P24	I/O 24-V connector 24VIN	

Output Part External output specification (NPN specification)

Item	Specification	
Load voltage	DC24V	Use TD62084 (or equivalent)
Maximum load current	100mA/point, 400mA Peak (total current)	
Leak current	Max. 0.1mA/point	
Insulation method	Photocoupler insulation	
External equipment	①Miniature relay ②Sequencer input unit	

[Output Circuit]



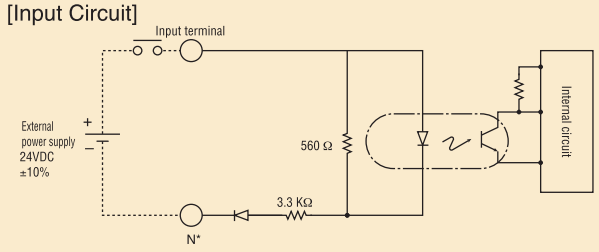
*

P24	I/O 24-V connector 24VIN	
N	I/O 24-V connector 0V	

Input Part External input specification (PNP specification)

Item	Specification
Input power supply	DC24V ±10%
Input voltage	7mA/point
ON/OFF voltage	ON voltage --- Max DC8V OFF voltage --- Min DC19V
Insulation method	Photocoupler insulation
External equipment	①No-voltage contact (minimum load, approx. 5VDC/1mA) ②Photoelectric/proximity sensor (PNP type) ③Sequencer transistor output (open-collector type) ④Sequencer contact output (minimum load, approx. 5VDC/1mA)

[Input Circuit]



*

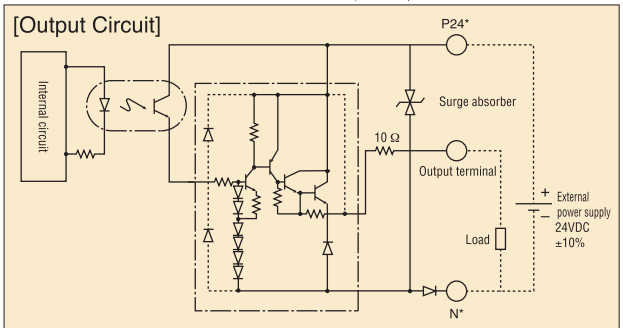
N	I/O 24-V connector 0VIN	

Output Part External output specification (PNP specification)

Item	Specification	
Load voltage	DC24V	Use TD62784 (or equivalent)
Maximum load current	100mA/point 400mA/8 ports Note)	
Leak current	Max. 0.1mA/point	
Insulation method	Photocoupler insulation	
External equipment	①Miniature relay ②Sequencer input unit	

Note) The maximum total load current for every eight ports from output port No. 300 is 400 mA. (The maximum sum of load currents for output port No. 300+n through No. 300+n+7 is 400 mA; where n = 0 or a multiple of 8.)

[Output Circuit]



*

P24	I/O 24-V connector 24VIN	
N	I/O 24-V connector 0VIN	

5 I/O Signal Table

Standard I/O Signal Table

Pin No.	Category	Port No.	Standard setting
1		–	NC
2		000	Program start
3		001	General-purpose input
4		002	General-purpose input
5		003	General-purpose input
6		004	General-purpose input
7		005	General-purpose input
8		006	General-purpose input
9		007	Program specification (PRG No. 1)
10		008	Program specification (PRG No. 2)
11		009	Program specification (PRG No. 4)
12		010	Program specification (PRG No. 8)
13		011	Program specification (PRG No. 10)
14		012	Program specification (PRG No. 20)
15		013	Program specification (PRG No. 40)
16		014	General-purpose input
17	Input	015	General-purpose input
18		016	General-purpose input
19		017	General-purpose input
20		018	General-purpose input
21		019	General-purpose input
22		020	General-purpose input
23		021	General-purpose input
24		022	General-purpose input
25		023	General-purpose input
26		024	General-purpose input
27		025	General-purpose input
28		026	General-purpose input
29		027	General-purpose input
30		028	General-purpose input
31		029	General-purpose input
32		030	General-purpose input
33		031	General-purpose input
34		300	Alarm output
35		301	Ready output
36		302	Emergency-stop output
37		303	General-purpose output
38		304	General-purpose output
39		305	General-purpose output
40		306	General-purpose output
41	Output	307	General-purpose output
42		308	General-purpose output
43		309	General-purpose output
44		310	General-purpose output
45		311	General-purpose output
46		312	General-purpose output
47		313	General-purpose output
48		314	General-purpose output
49		315	General-purpose output
50		–	NC

Expansion I/O Signal Table (IA-103-X-32)

Pin No.	Category	Port No.	Standard setting
1		–	NC
2			General-purpose input
3			General-purpose input
4			General-purpose input
5			General-purpose input
6			General-purpose input
7			General-purpose input
8			General-purpose input
9			General-purpose input
10			General-purpose input
11			General-purpose input
12			General-purpose input
13			General-purpose input
14			General-purpose input
15			General-purpose input
16			General-purpose input
17	Input		General-purpose input
18			General-purpose input
19			General-purpose input
20			General-purpose input
21			General-purpose input
22			General-purpose input
23			General-purpose input
24			General-purpose input
25			General-purpose input
26			General-purpose input
27			General-purpose input
28			General-purpose input
29			General-purpose input
30			General-purpose input
31			General-purpose input
32			General-purpose input
33			General-purpose input
34			General-purpose output
35			General-purpose output
36			General-purpose output
37			General-purpose output
38			General-purpose output
39			General-purpose output
40			General-purpose output
41			General-purpose output
42	Output		General-purpose output
43			General-purpose output
44			General-purpose output
45			General-purpose output
46			General-purpose output
47			General-purpose output
48			General-purpose output
49			General-purpose output
50		–	NC

Expansion I/O Signal Table (IA-103-X-16)

Pin No.	Category	Port No.	Standard setting
1		–	NC
2			General-purpose input
3			General-purpose input
4			General-purpose input
5			General-purpose input
6			General-purpose input
7			General-purpose input
8			General-purpose input
9	Input		General-purpose input
10			General-purpose input
11			General-purpose input
12			General-purpose input
13			General-purpose input
14			General-purpose input
15			General-purpose input
16			General-purpose input
17			General-purpose input
18			General-purpose output
19			General-purpose output
20			General-purpose output
21			General-purpose output
22			General-purpose output
23			General-purpose output
24			General-purpose output
25			General-purpose output
26			General-purpose output
27			General-purpose output
28			General-purpose output
29			General-purpose output
30			General-purpose output
31			General-purpose output
32			General-purpose output
33			General-purpose output
34	Output		General-purpose output
35			General-purpose output
36			General-purpose output
37			General-purpose output
38			General-purpose output
39			General-purpose output
40			General-purpose output
41			General-purpose output
42			General-purpose output
43			General-purpose output
44			General-purpose output
45			General-purpose output
46			General-purpose output
47			General-purpose output
48			General-purpose output
49			General-purpose output
50		–	NC

Multipoint I/O Signal Table (installed in expansion slot)

Cable 1

Pin No.	Category	Color	Port No.	Standard setting
1	–	Brown-1	–	Externally supplied 24-VDC power For pin Nos. 2 through 25 and 51 through 74
2	Input	Red-1	032	General-purpose input
3		Orange-1	033	General-purpose input
4		Yellow-1	034	General-purpose input
5		Green-1	035	General-purpose input
6		Blue-1	036	General-purpose input
7		Purple-1	037	General-purpose input
8		Gray-1	038	General-purpose input
9		White-1	039	General-purpose input
10		Black-1	040	General-purpose input
11		Brown-2	041	General-purpose input
12		Red-2	042	General-purpose input
13		Orange-2	043	General-purpose input
14		Yellow-2	044	General-purpose input
15		Green-2	045	General-purpose input
16		Blue-2	046	General-purpose input
17		Purple-2	047	General-purpose input
18		Gray-2	048	General-purpose input
19		White-2	049	General-purpose input
20		Black-2	050	General-purpose input
21		Brown-3	051	General-purpose input
22		Red-3	052	General-purpose input
23		Orange-3	053	General-purpose input
24		Yellow-3	054	General-purpose input
25		Green-3	055	General-purpose input
26	–	Blue-3	–	Note) (DC24V)
27	Input	Purple-3	056	General-purpose input
28		Gray-3	057	General-purpose input
29		White-3	058	General-purpose input
30		Black-3	059	General-purpose input
31		Brown-4	060	General-purpose input
32		Red-4	061	General-purpose input
33		Orange-4	062	General-purpose input
34		Yellow-4	063	General-purpose input
35		Green-4	064	General-purpose input
36		Blue-4	065	General-purpose input
37		Purple-4	066	General-purpose input
38		Gray-4	067	General-purpose input
39		White-4	068	General-purpose input
40		Black-4	069	General-purpose input
41		Brown-5	070	General-purpose input
42		Red-5	071	General-purpose input
43		Orange-5	072	General-purpose input
44		Yellow-5	073	General-purpose input
45		Green-5	074	General-purpose input
46		Blue-5	075	General-purpose input
47		Purple-5	076	General-purpose input
48		Gray-5	077	General-purpose input
49		White-5	078	General-purpose input
50		Black-5	079	General-purpose input

Cable 2

Pin No.	Category	Color	Port No.	Standard setting
51	Output	Brown-1	316	General-purpose output
52		Red-1	317	General-purpose output
53		Orange-1	318	General-purpose output
54		Yellow-1	319	General-purpose output
55		Green-1	320	General-purpose output
56		Blue-1	321	General-purpose output
57		Purple-1	322	General-purpose output
58		Gray-1	323	General-purpose output
59		White-1	324	General-purpose output
60		Black-1	325	General-purpose output
61		Brown-2	326	General-purpose output
62		Red-2	327	General-purpose output
63		Orange-2	328	General-purpose output
64		Yellow-2	329	General-purpose output
65		Green-2	330	General-purpose output
66		Blue-2	331	General-purpose output
67		Purple-2	332	General-purpose output
68		Gray-2	333	General-purpose output
69		White-2	334	General-purpose output
70		Black-2	335	General-purpose output
71		Brown-3	336	General-purpose output
72		Red-3	337	General-purpose output
73		Orange-3	338	General-purpose output
74		Yellow-3	339	General-purpose output
75	–	Green-3	–	Externally supplied 0-VDC power For pin Nos. 2 through 25 and 51 through 74
76	Output	Blue-3	340	General-purpose output
77		Purple-3	341	General-purpose output
78		Gray-3	342	General-purpose output
79		White-3	343	General-purpose output
80		Black-3	344	General-purpose output
81		Brown-4	345	General-purpose output
82		Red-4	346	General-purpose output
83		Orange-4	347	General-purpose output
84		Yellow-4	348	General-purpose output
85		Green-4	349	General-purpose output
86		Blue-4	350	General-purpose output
87		Purple-4	351	General-purpose output
88		Gray-4	352	General-purpose output
89		White-4	353	General-purpose output
90		Black-4	354	General-purpose output
91		Brown-5	355	General-purpose output
92		Red-5	356	General-purpose output
93		Orange-5	357	General-purpose output
94		Yellow-5	358	General-purpose output
95		Green-5	359	General-purpose output
96		Blue-5	360	General-purpose output
97		Purple-5	361	General-purpose output
98		Gray-5	362	General-purpose output
99		White-5	363	General-purpose output
100	–	Black-5	–	Note) (0V)

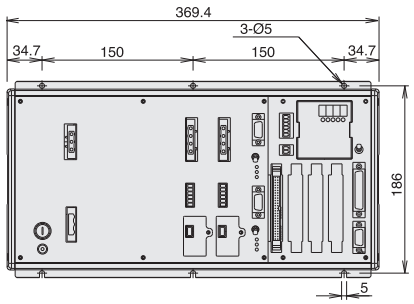
Note) Pin Nos. 26 (24 VDC) and 100 (0 V) are connected to the I/O 24-V power supply of the controller, so there is no need to supply power to these pins.

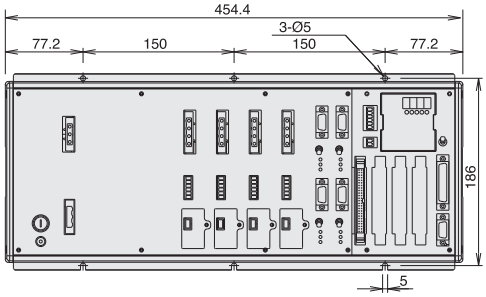
6 Specifications

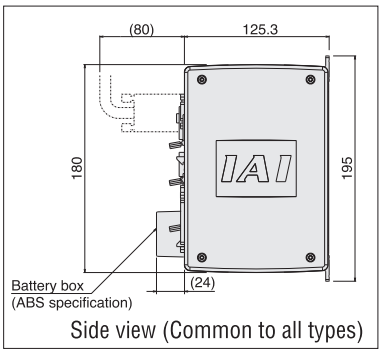
Item	Description				
Controller series/type	KE (CE-compliant) / KET (ANSI/CE-compliant)				
Compatible actuators	DS/DSCR/SS/ISA/ISPA/ISD/ISDCR/ISPDCR/SS/SSCR/IF/FS/RS/RCS(partial)/LS				
Applicable motor output (W)	20/30/60/100/150/200/300/400/600/750				
Number of controlled axis		1 axis	2 axes	3 axes	4 axes
Maximum output of connected axis (W)		Max 800	Max 1600 (Supply voltage: 230V) Max 800 (Supply voltage: 100V)		
Power supply	100-V specification: Single-phase 100~115VAC 230-V specification: Single-phase 200~230VAC				
Power supply voltage range	±10%				
Power frequency	50Hz/60Hz				
Power capacity		Max 830VA	Max 1570VA	Max 2310VA	Max 3050VA
Position detection method	17-bit incremental encoder (wire-saving type) 17-bit absolute encoder for rotation data backup (wire-saving type) (Control resolution: 14 bits for both encoders)				
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	Super SEL language				
Number of programs	64 programs				
Number of program steps	6000 steps (total)				
Number of multitask programs	16 programs				
Number of positions	3000 positions				
Data storage device	FLASH ROM + SRAM battery backup				
Data input method	Teaching pendant or PC software				
Standard I/Os	32 points (dedicated inputs + general-purpose inputs) / 16 points (dedicated outputs + general-purpose outputs)				
Expanded I/Os		48 points/unit (Maximum of 3 units can be added)			
Serial communication function		Standard RS232 port + Expansion SIO board can be installed (optional).			
Other I/Os	System I/O (emergency-stop input, enable input, system ready output)				
Protective functions	Motor overcurrent, overload, motor driver temperature check, overload check, encoder open detection, soft limit over, system error, battery error, etc.				
Operating temperature/humidity	Temperature: 0~40°C, humidity: 30~85%				
Operating environment	Not subject to corrosive gases or significant dust.				
Weight		6.0kg	7.0kg		
Accessory	I/O flat cable				

7 External Dimensions

XSEL-KE(T)-1 (1 axis)
XSEL-KE(T)-2 (2 axes)
XSEL-KE(T)-3 (3 axes)
XSEL-KE(T)-4 (4 axes)



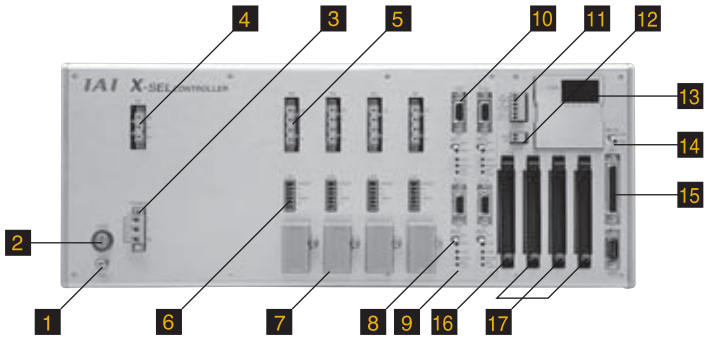




Side view (Common to all types)

8 Name of Each Part

KE(T) Type (General-Purpose)



1 FG connection terminal

A terminal for connecting the FG of the enclosure.
The PE of the AC input part is connected to the enclosure inside the controller.

2 Fuse holder

A half-cut fuse holder for overcurrent protection of the AC input part.

3 Main power input connector

A connector for 100/230-VAC single-phase input.
(A plug is attached on the cable end. Refer to page 139.)

4 Regeneration resistor unit connector

A connector for an optional regeneration resistor unit (REU-1), which will be used when the capacity of the built-in regeneration resistor is insufficient in high acceleration/high-load conditions, etc.

5 Motor cable connector

A connector for the actuator's motor power cable.

6 Actuator sensor input connector

A connector for the axis sensors such as LS, CREEP and OT.

7 Absolute data retention battery

A battery unit for encoder backup implemented when an absolute encoder is used. This connector is not used with a non-absolute axis.

8 Brake release switch (Brake specification only)

An alternate switch with lock for releasing the axis brake.
To operate the switch, pull it forward and then move.
Set the switch to RLS to forcibly release the brake, or set it to NOM to enable automatic control by the controller.

9 Axis driver status LEDs

These LEDs are used to monitor the operating status of the driver CPU that controls motor drive. The following three LEDs are available:

Name	Color	Meaning when the LED is lit
ALM	Orange	The driver has detected an error.
SVON	Green	The servo is ON and the motor is being driven.
BATT ALM	Orange	The absolute battery voltage is low.

10 Encoder cable connector

A 15-pin, D-sub connector for the actuator's encoder cable.

11 System I/O connector

A connector for three I/O signals including two controller-operation control inputs and one equipment status output. (A plug is attached on the cable end. Refer to page 139.)

Name		
EMG	Emergency-stop input	Operation is enabled when this signal is ON. An emergency stop will be actuated when the signal is turned OFF.
ENB	Safety gate input	Operation is enabled when this signal is ON. The servo will turn OFF when the signal is turned OFF.
RDY	System-ready relay output	Status output for this controller. Cascade connection is supported. Ready if shorted. Not ready if open.

12 I/O 24-V power connector

A connector for externally supplying I/O power when DI/DOs are installed in the I/O part of 16 and 17. (A plug is attached on the cable end. Refer to page 139.)

13 Panel window

The 4-digit, 7-segment LED and five LED lamps indicate the equipment status.

14 Mode switch

An alternate switch with lock for specifying the controller operation mode.
To operate the switch, pull it forward and then move.
Set the switch to MANU to enable the manual operation mode, or set it to AUTO to enable the automatic operation mode.
Teaching operation can only be performed in the MANU mode. In the MANU mode, automatic operation using external I/Os cannot be performed.

15 Teaching connector

A D-sub, 25-pin connector for inputting program positions from the connected teaching pendant or PC.

16 Standard I/O slot (Slot 1)

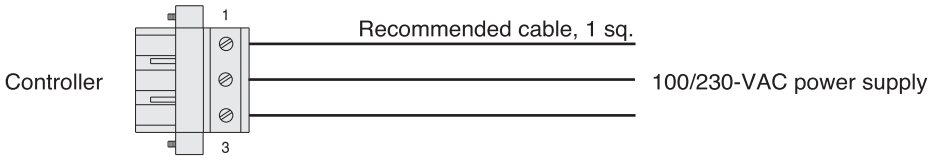
The controller comes standard with a 32-input/16-output PIO board.

17 Expansion I/O slots (Slots 2, 3 and 4)

Use these slots to install expansion I/O boards (optional).

Main Power Input Connector

This connector is used to connect 100/230 VAC operating power.
(Cable is provided by the user.)



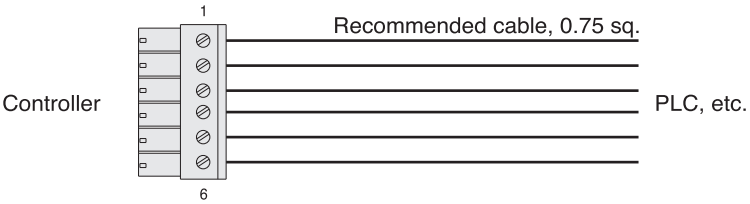
Plug: GMSTB2.5/3-STF-7.62 (Phoenix)

Wiring Diagram

Signal	No.
N	1
L	2
PE	3

System I/O Connector

This connector is used to connect the controller contacts for emergency stop, enable and system ready to a PLC, etc. (Cable is provided by the user.)



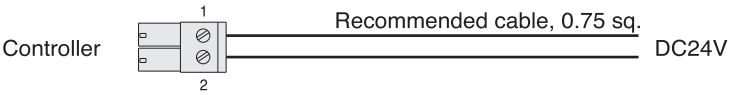
Plug: MC1.5/6-ST-3.5 (Phoenix)

Wiring Diagram

Singal	No.
RDY–	1
RDY+	2
ENBIN	3
ENB+24VOUT	4
EMGIN	5
EMG+24VOUT	6

I/O 24-V Power Connector

This connector is used to supply 24-V power when the controller's I/Os are used.
(Cable is provided by the user.)



Plug: MC1.5/2-ST-3.5 (Phoenix)

Wiring Diagram

Singal	No.
0V	1
24VIN	2

9 Options

X-SEL Controller Options Table

			General-purpose type X-SEL-KE(T)		
			KE	KET	
Item		Details	CE-compliant	ANSI/CE-compliant	
Teaching Pendant		Standard type	IA-T-X		
		With deadman switch	IA-T-XD		
		ANSI type	IA-T-XA		
PC Software		DOS/V version	IA-101-X-MW		
		PC-98 version	IA-101-X-CW		
Expansion I/O Board	PIO Board	Expansion PIO (32 inputs/16 outputs, NPN specification)	IA-103-X-32		
		Expansion PIO (32 inputs/16 outputs, PNP specification)	IA-103-X-32-P		
		Expansion PIO (16 inputs/32 outputs, NPN specification)	IA-103-X-16		
		Expansion PIO (16 inputs/32 outputs, PNP specification)	IA-103-X-16-P		
	SIO Board	Expansion SIO, type A (for RS232C)	IA-105-X-MW-A		
		Expansion SIO, type B (for RS422C)	IA-105-X-MW-B		
		Expansion SIO, type C (for RS485C)	IA-105-X-MW-C		
	Network Board	DeviceNet (256 inputs/256 outputs, for installation in standard slot)	IA-NT-3204-DV		
		CC-Link (256 inputs/256 outputs, for installation in standard slot)	IA-NT-3204-CC256		
		CC-Link (16 inputs/16 outputs, for installation in expansion slot)	IA-NT-3204-CC16		
		ProfiBus (256 inputs/256 outputs, for installation in standard slot)	IA-NT-3204-PB		
		Ethernet (Data communication specification, for installation in standard slot)	IA-NT-3204-ET		
	Multipoint I/O Board	Multipoint I/O board (48 inputs/48 outputs, NPN specification)	IA-IO-3204-NP (Note 1)		
		Multipoint I/O board (48 inputs/48 outputs, PNP specification)	IA-IO-3204-PN (Note 1)		
		Terminal block for multipoint I/O board (NPN specification)	TU-MA96		
		Terminal block for multipoint I/O board (PNP specification)	TU-MA96-P		
Regeneration Resistor Unit			REU-1		
External Brake Box			IA-110-X-0		
Absolute Data Retention Battery			IA-XAB-BT		

(Note 1) Installed only in an expansion slot

Regeneration Resistor Unit

Model **REU-1**

Description

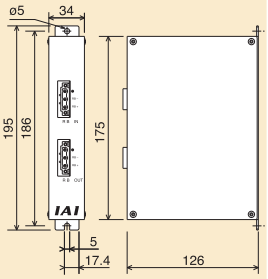
This unit converts to heat the regenerative current generated when the motor decelerates. A regeneration resistor is provided inside the controller, but its capacity may not be sufficient when a large load is applied to the vertical axis. In this case, this optional unit is required. (Refer to the table at bottom right.)

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 Determine the required number of units based on the total motor capacity for the connected vertical axes.

Total Z-axis motor capacity	
0 ~ 200W	Not required.
~ 400W	Not required.
~ 600W	1 unit is required.
~ 800W	1 unit is required.
~ 1200W	2 units are required.
~ 1600W	To be discussed separately.



Absolute Data Retention Battery

Model **IA-XAB-BT**

Features This battery is used with an absolute encoder for storing data. Replace the battery when a controller battery alarm is output.

Specification Integrated with case

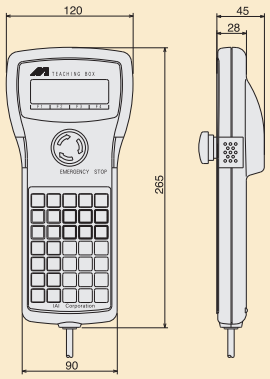
Simple Teaching Pendant

Model

IA-T-X (Standard)

IA-T-XD (With deadman switch)

Dimensions



Features

A teaching device with program/position input, test operation and monitoring functions.
The interactive-type panel ensures easy operation for anyone.
The deadman switch specification offering added safety is also available.

Specification

Items	Specification
Operating temperature, humidity	Temperature: 0~40°C, humidity: 85%RH or less
Operating environment	Not subject to corrosive gases or significant dust.
Weight	Approx. 650g
Cable length	4m
Display	20 characters x 4 lines, LCD

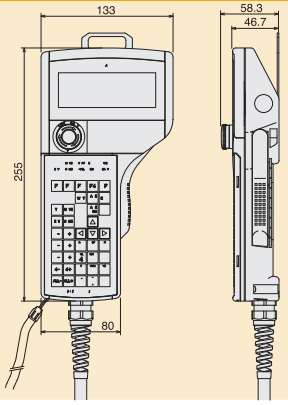
Caution
A product older than Ver. 1.08 cannot be used with the SCARA robot.

Teaching Pendant Conforming to ANSI/CE Mark Standards

Model

IA-T-XA

Dimensions



Features

This teaching pendant with a three-position enable switch conforms to the ANSI and CE Mark standards.
Using the large, interactive LCD screen, even a beginner can teach a robot easily and safely.

Specification

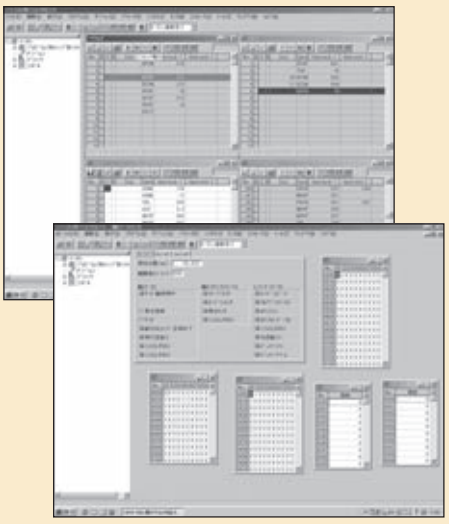
Items	Specification
Operating temperature, humidity	Temperature: 0~40°C, humidity: 30~85%RH or less (non-condensing)
Protection structure	IP54 (excluding cable connector)
Weight	600g or less (excluding cable)
Cable length	5m
Display	32 characters x 8 lines, LCD

PC Software (Windows Version Only)

Model

IA-101-X-CW(PC version)

Note
Software older than Ver. 2.0.0.0 cannot be used with a SCARA robot.



Features

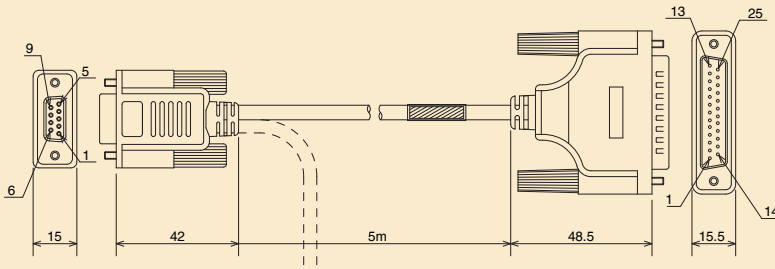
This startup assistance software provides functions for program/position input, test operation and monitoring.
It significantly enhances the debugging functions to help reduce the startup time.

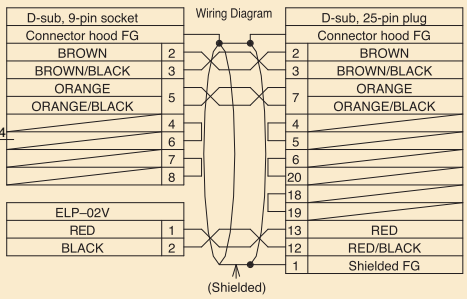
- Software (floppy disk)
  (The software runs on Windows 95, 98, NT, 2000, ME and XP.)
- PC connection cable 5 m (type: CB-ST-9-25)
  (Optional with emergency stop connector, type: CB-ST-E1MW050.)

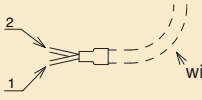
Dimensions

PC connector cable (type: CB-ST-9-25)

Note
If you are ordering a PC connection cable for maintenance purpose, specify CB-ST-9-25.
For an additional emergency stop wiring to connect an emergency stop box, specify CB-ST-E1MW050.







with emergency stop connector (type: CB-ST-E1MW050)

Expansion PIO Board

Description: An optional board for providing additional I/O points.
With a general-purpose controller, a maximum of three expansion PIO boards can be installed in its expansion slots.
(With a compact controller, one expansion PIO board can be installed, but only for the 3/4-axes type.)

Description	Expansion I/O board model	Ordering model (controller model)	Expansion I/O board slot	Total standard + expansion I/O points
32 inputs/16 outputs NPN specification	IA-103-X-32	XSEL-K-□-□-N1-N1EE-□-□	Expansion slot 1	64 inputs/32 outputs
		XSEL-K-□-□-N1-N1N1E-□-□	Expansion slot 1,2	96 inputs/48 outputs
		XSEL-K-□-□-N1-N1N1N1-□-□	Expansion slot 1,2,3	128 inputs/64 outputs
32 inputs/16 outputs PNP specification	IA-103-X-32-P	XSEL-K-□-□-P1-P1EE-□-□	Expansion slot 1	64 inputs/32 outputs
		XSEL-K-□-□-P1-P1P1E-□-□	Expansion slot 1,2	96 inputs/48 outputs
		XSEL-K-□-□-P1-P1P1P1-□-□	Expansion slot 1,2,3	128 inputs/64 outputs
16 inputs/32 outputs NPN specification	IA-103-X-16	XSEL-K-□-□-N1-N2EE-□-□	Expansion slot 1	48 inputs/48 outputs
		XSEL-K-□-□-N1-N2N2E-□-□	Expansion slot 1,2	64 inputs/80 outputs
		XSEL-K-□-□-N1-N2N2N2-□-□	Expansion slot 1,2,3	80 inputs/112 outputs
16 inputs/32 outputs PNP specification	IA-103-X-16-P	XSEL-K-□-□-P1-P2EE-□-□	Expansion slot 1	48 inputs/48 outputs
		XSEL-K-□-□-P1-P2P2E-□-□	Expansion slot 1,2	64 inputs/80 outputs
		XSEL-K-□-□-P1-P2P2P2-□-□	Expansion slot 1,2,3	80 inputs/112 outputs

Expansion SIO Board

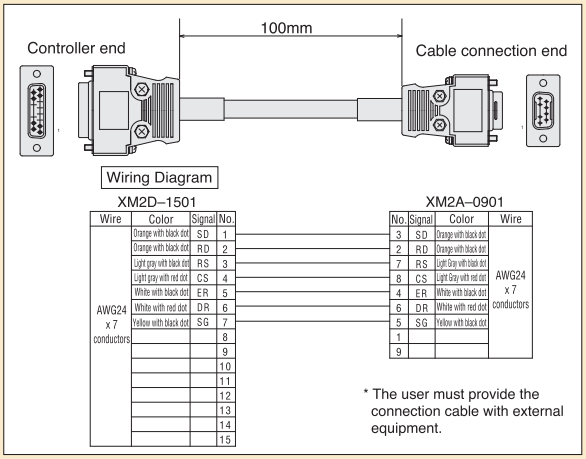
Description: A board for establishing serial communication with external equipment. It has two channel ports and supports one of three communication formats depending on the supplied joint cable(s).

Specification:
IA-105-X-MW-A (board + joint cable ① x 2)
IA-105-X-MW-B (board + joint cable ② x 1)
IA-105-X-MW-C (board + joint cable ② x 1)

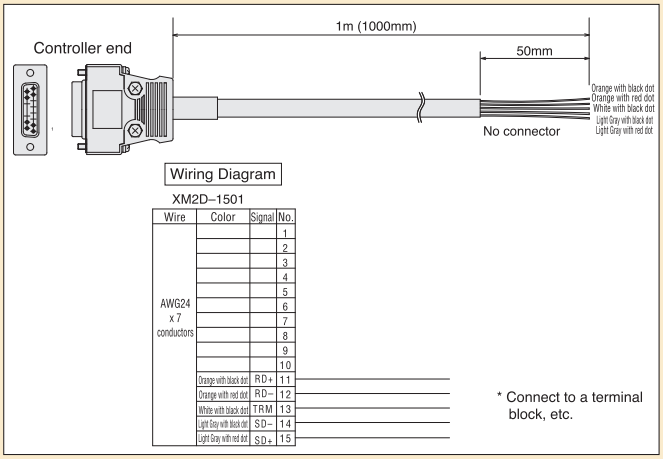
Communication format	Expansion SIO board model	Ordering model (controller model)	Network board slot	Remarks
RS232C	IA-105-X-MW-A	XSEL-K-□-□-N1-SAEE-□-□	Expansion slot 1	
RS422	IA-105-X-MW-B	XSEL-K-□-□-N1-SBEE-□-□	Expansion slot 1	A maximum of three boards can be installed. (Note 1)
RS485	IA-105-X-MW-C	XSEL-K-□-□-N1-SCEE-□-□	Expansion slot 1	

(Note 1) The current capacity may not be sufficient depending on the board installed in the standard slot. Consult IAI beforehand if you are planning to install three expansion SIO boards.

Joint cable ① Model: CB-ST-232J001



Joint cable ② Model: CB-ST-422J010



Network Board

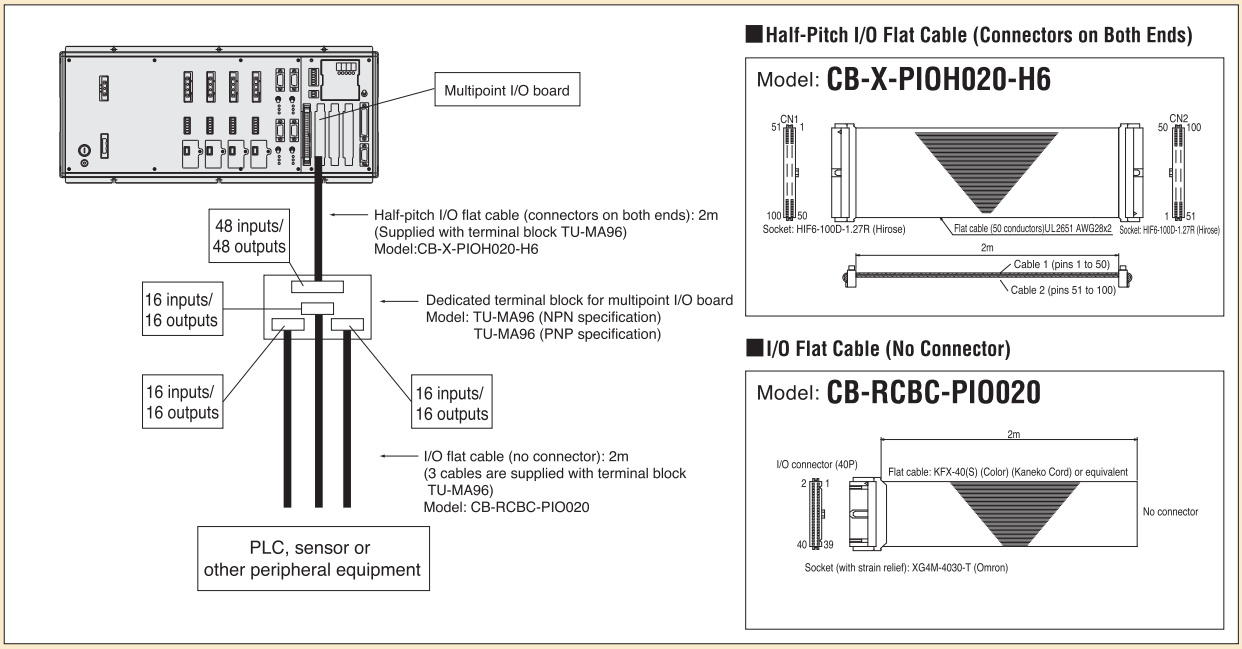
Description: A communication board for connection to a field network.

Network type	Network board model	Ordering model (controller model)	Network board slot	Number of I/O points
DeviceNet	IA-NT-3204-DV	XSEL-K-□-□-DV-EEE-□-□	Standard slot	256 inputs/256 outputs
CC-Link	IA-NT-3204-CC256	XSEL-K-□-□-CC-EEE-□-□	Standard slot	256 inputs/256 outputs
	IA-NT-3204-CC16	XSEL-K-□-□-N1-EEC-□-□	Expansion slot 3	16 inputs/16 outputs
		XSEL-K-□-□-N1-ECC-□-□	Expansion slot 2,3	16 inputs x 2/16 outputs x 2
		XSEL-K-□-□-N1-CCC-□-□	Expansion slot 1,2,3	16 inputs x 3/16 outputs x 3
ProfiBus	IA-NT-3204-PB	XSEL-K-□-□-PR-EEE-□-□	Standard slot	256 inputs/256 outputs
Ethernet	IA-NT-3204-ET	XSEL-K-□-□-ET-EEE-□-□	Standard slot	Message communication

■ Multipoint I/O Board & Terminal Block

A set of board and terminal block used when many PIO points are required for the controller.

System Configuration



Multipoint I/O Board

Description

This I/O board uses a half-pitch connector to provide 48 inputs and 48 outputs on a single board.
The supplied half-pitch flat cable has thin wires and thus difficult to wire. Use a dedicated terminal block for connection with external equipment.

Description	Multipoint I/O board model	Ordering model (controller model)	Multipoint I/O board slot	Total number of I/O points
48 inputs/48 outputs NPN specification	IA-IO-3204-NP	XSEL-K-□-□-N1-N3EE-□-2	Expansion slot 1	80 inputs/64 outputs
		XSEL-K-□-□-N1-N3N3E-□-2	Expansion slot 1,2	128 inputs/112 outputs
		XSEL-K-□-□-N1-N3N3N3-□-2	Expansion slot 1,2,3	176 inputs/160 outputs
48 inputs/48 outputs PNP specification	IA-IO-3204-PN	XSEL-K-c-c-P1-P3EE-c-2	Expansion slot 1	80 inputs/64 outputs
		XSEL-K-c-c-P1-P3P3E-□-2	Expansion slot 1,2	128 inputs/112 outputs
		XSEL-K-□-□-P1-P3P3P3-□-2	Expansion slot 1,2,3	176 inputs/160 outputs

<Dedicated terminal block for multipoint I/O board>

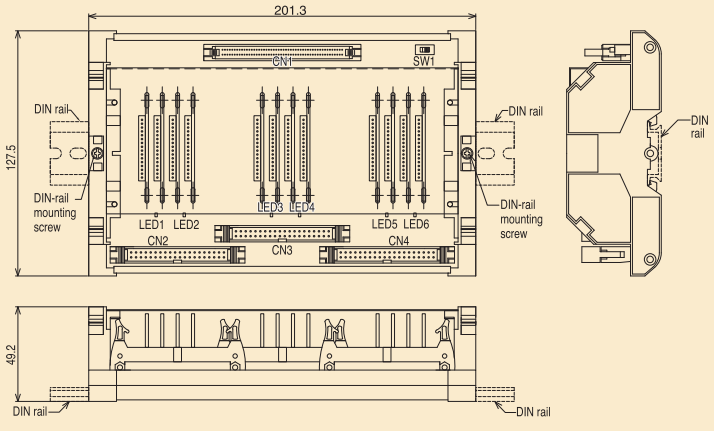
Model

TU-MA96 (NPN specification)
TU-MA96-P (PNP specification)

Description

A terminal block for wiring a multipoint I/O board.
This terminal block not only simplifies wiring, but it also offers the following functions:

1. The built-in transistor buffer circuit ensures output of 500 mA per point (0.8 A per eight points).
2. The power circuit can be divided into six input systems (each comprising eight inputs) and six output systems (each comprising eight outputs).
3. LEDs are provided for checking the power supply for output signal circuit.
   Six LEDs are provided, each corresponding to one output system (each system comprises eight outputs). The LED will turn off when the power is cut off or a fuse on the board is blown.



Caution

If you are using a terminal block, be sure to use a multipoint I/O board of NPN specification.
(The terminal block has been set to NPN, so a PNP board cannot be used.)

Dedicated Terminal Block for Multipoint I/O BoardÐConnector Pin Assignment

This connector is used for connection with an external I/O device. One connector can connect 16 DI points and 16 DO points.

External I/O Connector Specification Table

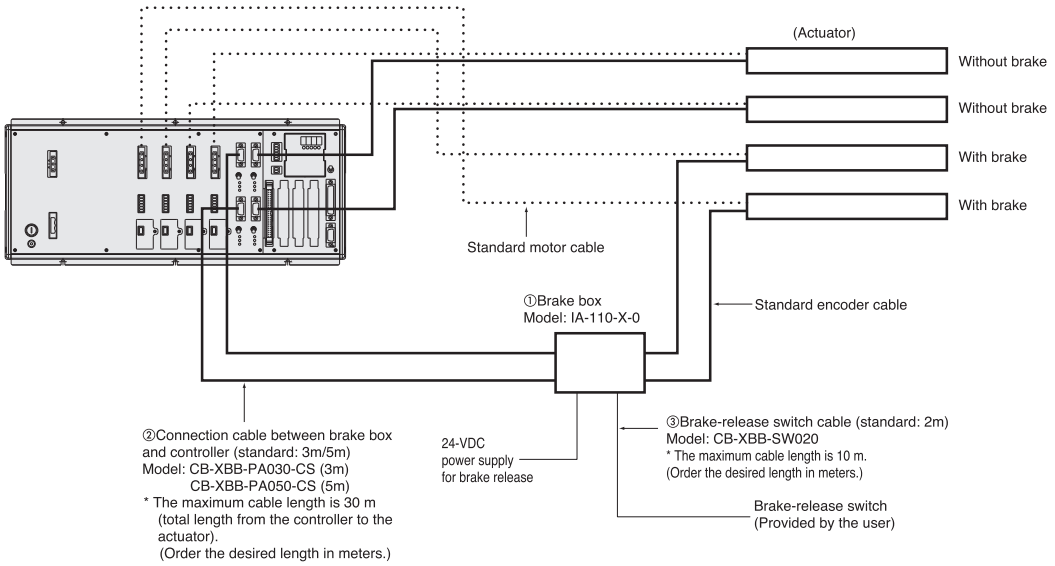
Item					
Applicable connector	XG4A-4031(OMRON) 40-pin, MIL flat connector				
DI	48 points				
DO	48 points				
Connected unit	External I/O device				
Connector name			CN2 connector	CN3 connector	CN4 connector
Pins and assigned inputs	1	Common	Common terminal (COM): For IN00 to IN07	Common terminal (COM): For IN16 to IN23	Common terminal (COM): For IN32 to IN39
	2	Common			
	3	General-purpose input	IN00	IN16	IN32
	4	General-purpose input	IN01	IN17	IN33
	5	General-purpose input	IN02	IN18	IN34
	6	General-purpose input	IN03	IN19	IN35
	7	General-purpose input	IN04	IN20	IN36
	8	General-purpose input	IN05	IN21	IN37
	9	General-purpose input	IN06	IN22	IN38
	10	General-purpose input	IN07	IN23	IN39
	11	General-purpose input	IN08	IN24	IN40
	12	General-purpose input	IN09	IN25	IN41
	13	General-purpose input	IN10	IN26	IN42
	14	General-purpose input	IN11	IN27	IN43
	15	General-purpose input	IN12	IN28	IN44
	16	General-purpose input	IN13	IN29	IN45
	17	General-purpose input	IN14	IN30	IN46
	18	General-purpose input	IN15	IN31	IN47
	19	Common	Common terminal (COM): For IN08 to IN15	Common terminal (COM): For IN24 to IN31	Common terminal (COM): For IN40 to IN47
	20	Common			
Pins and assigned outputs	21	+24V	External 24-V power input: For OUT00 to OUT07	External 24-V power input: For OUT16 to OUT23	External 24-V power input: For OUT32 to OUT39
	22	0V			
	23	General-purpose output	OUT00	OUT16	OUT32
	24	General-purpose output	OUT01	OUT17	OUT33
	25	General-purpose output	OUT02	OUT18	OUT34
	26	General-purpose output	OUT03	OUT19	OUT35
	27	General-purpose output	OUT04	OUT20	OUT36
	28	General-purpose output	OUT05	OUT21	OUT37
	29	General-purpose output	OUT06	OUT22	OUT38
	30	General-purpose output	OUT07	OUT23	OUT39
	31	General-purpose output	OUT08	OUT24	OUT40
	32	General-purpose output	OUT09	OUT25	OUT41
	33	General-purpose output	OUT10	OUT26	OUT42
	34	General-purpose output	OUT11	OUT27	OUT43
	35	General-purpose output	OUT12	OUT28	OUT44
	36	General-purpose output	OUT13	OUT29	OUT45
	37	General-purpose output	OUT14	OUT30	OUT46
	38	General-purpose output	OUT15	OUT31	OUT47
	39	+24V	External 24-V power input: For OUT08 to OUT15	External 24-V power input: For OUT24 to OUT31	External 24-V power input: For OUT40 to OUT47
	40	0V			

■ External Brake Box

Description

This force-release brake box can release the actuator brake even when the controller power is turned off. (Note 1)
The brake can be released using the switch on the brake box or by connecting an external switch (supplied with a dedicated cable).
When ordering, specify the models and quantities for the brake box and cable. (Up to two axes can be connected to one brake box.)
(Note 1) A dedicated 24-V power supply is required for releasing the brake.

System Configuration

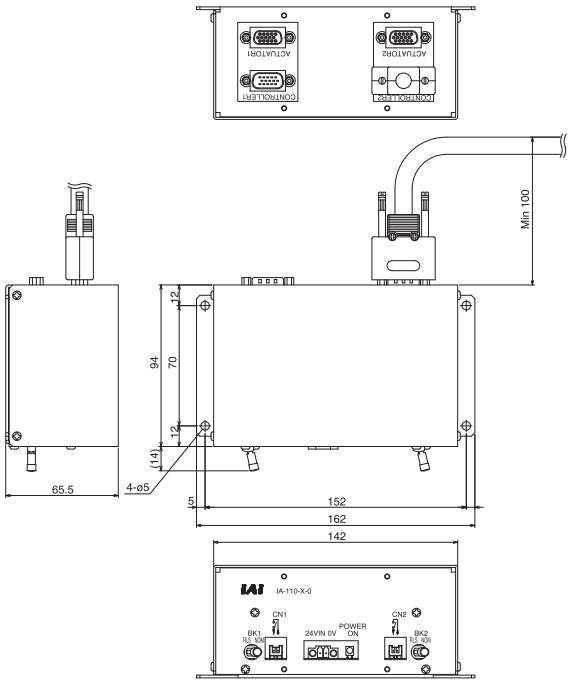


* To use an external brake box, you need a brake box (①) and a connection cable between brake box and controller (②).
Order a brake-release switch cable (③), if necessary.

①Brake box	Model: IA-110-X-0
②Connection cable between brake box and controller	Model: CB-XBB-PA□□□-CS
③Brake-release switch cable	Model: CB-XBB-SW□□□

■ External Dimensions of Brake Box

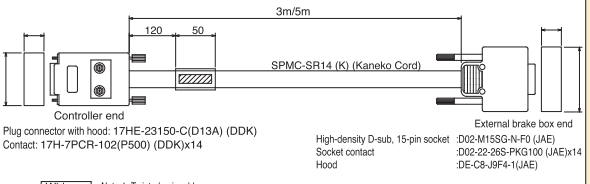
Model: **IA-110-X-0**



■ Connection cable between brake box and controller

Model: **CB-XBB-PA030-CS** (3m)
CB-XBB-PA050-CS (5m)

* The length can be changed. (Refer to the explanation above.)

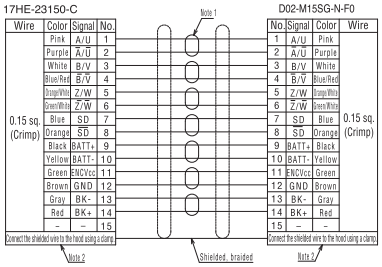


Plug connector with hood: 17HE-23150-C(D13A) (DDK)
Contact: 17H-7PCR-102(P500) (DDK)x14

High-density D-sub, 15-pin socket :D02-M15SG-N-F0 (JAE)
Socket contact :D02-22-26S-PKG100 (JAE)x14
Hood :DE-C8-J9F4-1(JAE)

Wiring Diagram

Note 1: Twisted pair cable
Note 2: Fold back the shielded, braided wire, wrap a shield tape around the folded section, and fix with a cable clamp.

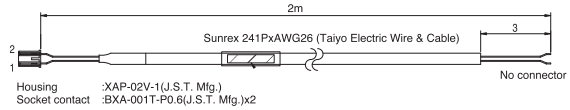


Wire	Color	Signal	No.	No.	Signal	Color	Wire
	Pink	A/U	1	1	A/U	Pink	
	Purple	A/U	2	2	A/U	Purple	
	White	B/V	3	3	B/V	White	
	Blue/Red	B/V	4	4	B/V	Blue/Red	
	Orange/White	Z/W	5	5	Z/W	Orange/White	
	Green/White	Z/W	6	6	Z/W	Green/White	
	Blue	SD	7	7	SD	Blue	
	Orange	SD	8	8	SD	Orange	
	Black	BATT+	9	9	BATT+	Black	
	Yellow	BATT-	10	10	BATT-	Yellow	
	Green	ENCVcc	11	11	ENCVcc	Green	
	Brown	GND	12	12	GND	Brown	
	Gray	BK-	13	13	BK-	Gray	
	Red	BK+	14	14	BK+	Red	
	–	–	15	15	–	–	

■ Brake-release switch cable

Model: **CB-XBB-SW020** (3m)

* The length can be changed. (Refer to the explanation above.)



Housing :XAP-02V-1(J.S.T. Mfg.)
Socket contact :BXA-001T-P0.6(J.S.T. Mfg.)x2

Wiring Diagram

Wire	Color	Signal	No.	
AWG26 X1P	Orange | black	BKMRL	1	No connector
	Orange | red	COM	2	

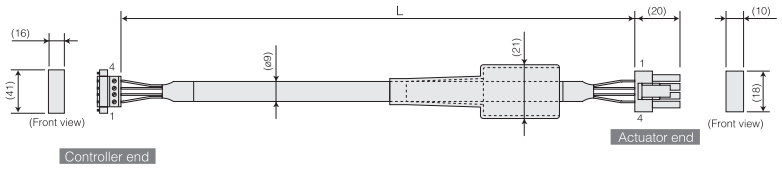
10 Service Parts

The following cables will be supplied with the actuator and controller you have purchased.
If you must replace the original cables or otherwise require additional cables, place an order by referencing the model names specified below.

Motor Cable (Single-Axis Robot Connection)

Model **CB-X-MA□□□**

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).



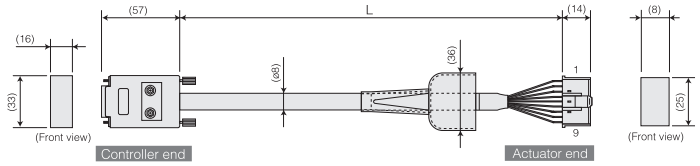
Wire	Color	Signal	No.
0.75sq	Green	PE	1
	Red	U	2
	White	V	3
	Black	W	4

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

Encoder Cable (Single-Axis Robot Connection)

Model **CB-X-PA□□□**

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).



Wire	Color	Signal	No.
0.15sq (Crimp)	-	-	1
	-	-	2
	-	-	3
	-	-	4
	-	-	5
	-	-	6
	Blue	SD	7
	Orange	$\overline{SD}$	8
	Black	BAT+	9
	Yellow	BAT-	10
	Green	VCC	11
	Brown	GND	12
	Gray	BK-	13
	Red	BK+	14
	-	-	15

Connect the shielded wire to the hood using a clamp.

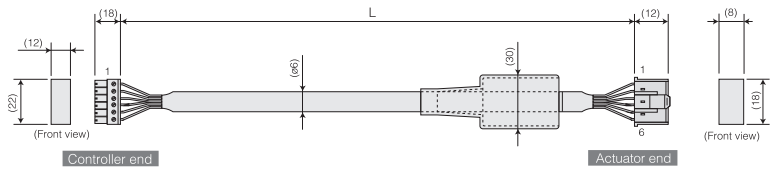
No.	Signal	Color	Wire
1	BAT+	Black	0.15sq (Crimp)
2	BAT-	Yellow	
3	SD	Blue	
4	$\overline{SD}$	Orange	
5	VCC	Green	
6	GND	Brown	
7	FG	Ground	
8	BK-	Gray	
9	BK+	Red	

Ground wire and shielded wire, braided

Limit Switch Cable (Single-Axis Robot Connection)

Model **CB-X-LC□□□**

* Indicate the desired cable length (L) of up to 30 m in □□□ (e.g., 080 = 8 m).



Wire	Color	Signal	No.
AWG24	Light Blue	24VOUT	6
	Pink	N	5
	Grass	LS	4
	Pink	CREEP	3
	Gray	OT	2
	1B/Light Blue	RSV	1

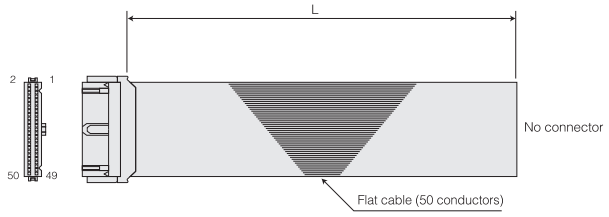
Note) "1B" indicates one black dot mark.

No.	Signal	Color	Wire
1	24VOUT	Light Blue	AWG24 (Crimp)
2	N	Pink	
3	LS	Grass	
4	CREEP	Pink	
5	OT	Gray	
6	RSV	1B/Light Blue	

I/O Flat Cable (X-SEL)

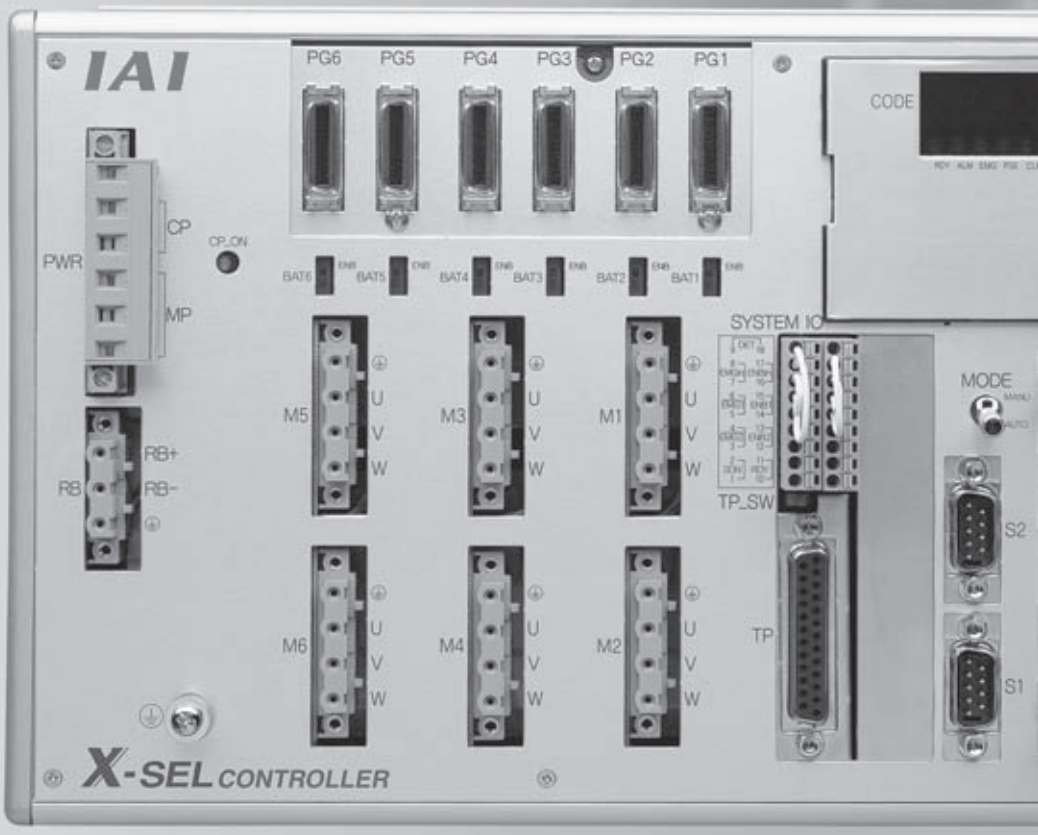
Model **CB-X-PIO□□□**

* Indicate the desired cable length (L) of up to 10 m in □□□ (e.g., 080 = 8 m).



No.	Color	Wire	No.	Color	Wire	No.	Color	Wire
1	Brown1	Flat cable	18	Gray2	Flat cable	35	Green4	Flat cable
2	Red1		19	White2		36	Blue4	
3	Orange1		20	Black2		37	Purple4	
4	Yellow1		21	Brown-3		38	Gray4	
5	Green1		22	Red3		39	White4	
6	Blue1		23	Orange3		40	Black4	
7	Purple1		24	Yellow3		41	Brown-5	
8	Gray1		25	Green3		42	Red5	
9	White1		26	Blue3		43	Orange5	
10	Black1		27	Purple3		44	Yellow5	
11	Brown-2		28	Gray3		45	Green5	
12	Red2		29	White3		46	Blue5	
13	Orange2		30	Black3		47	Purple5	
14	Yellow2		31	Brown-4		48	Gray5	
15	Green2		32	Red4		49	White5	
16	Blue2		33	Orange4		50	Black5	
17	Purple2		34	Yellow4				

6-Axes Controller X-SEL-P/Q



- X-SEL-P: Standard version
  with single-phase power supply 115/230 VAC (max. 1600 W)
  or three-phase power supply 230 VAC (max. 2400 W)
- X-SEL-Q: Global version up to safety category 4
  with single-phase power supply 115/230 VAC (max. 1600 W)
  or three-phase power supply 230 VAC (max. 2400 W)

A Compact Yet Powerful Controller with a Maximum Output of 2400 W

(3-phase 230 VAC)

A new high-performance controller series capable of controlling six axes

1 Maximum output of 2400 W

(Three-phase 230 VAC; max. output of single-phase type: 1600 W)

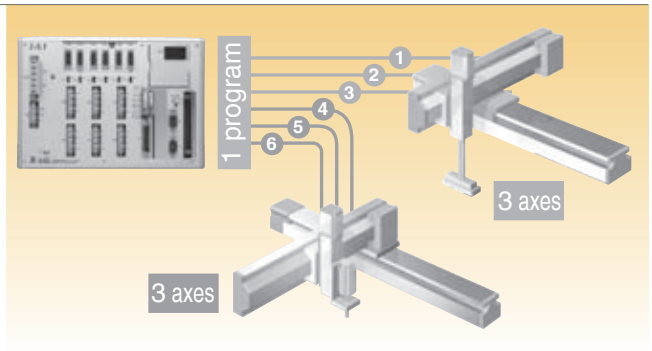
Six 400W single-axis robots or three 750W single-axis robots can be operated simultaneously (3-phase type).

2 "Global Specification" corresponding to Safety Category 4

The "Global Specification" provides an external safety circuit, instead of incorporating a drive-power cutoff circuit into the controller. This design ensures correspondence to Safety Category 4 under ISO 13849-1.

3 Capable of driving one to six axes

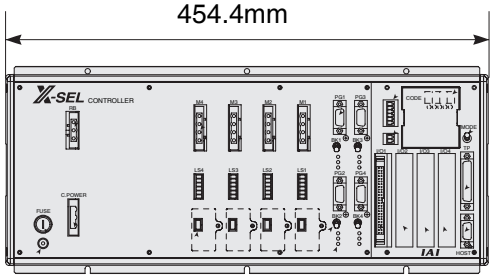
- A maximum of six axes can be operated complementarily using only one controller unit.
- Six axes are operated with a single program, allowing easy programming.



4 Compact and high performance

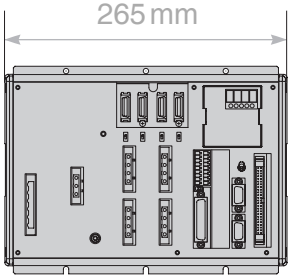
- A slim design of approx. 40% the volume of IAI's conventional controller (X-SEL-KE)
- Significantly higher speed compared with IAI's conventional controller (the command processing time is nearly half)
- Connectable to DeviceNet, CC-Link, ProfiBus and Ethernet

Conventional product



XSEL-KE: 4 axes, 1.6 Kw

New product



XSEL-P: 4 axes, 2.4 Kw

■ Models

XSEL	-	P	-	3	-	400AL	-	200AL	-	60ABL	-	DV	-	NI	-	EEE	-	2	-	2
①		②		③		④ (Axis 1)		④ (Axis 2)		④ (Axis 3)		⑤		⑥		⑦		⑧		⑨

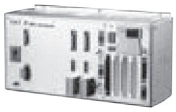
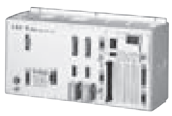
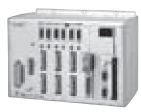
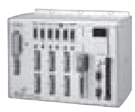
① Series	② Controller type	③ Number of axes	④ Details of axis 1 to axis 6						⑤ Network (dedicated slot)	⑥ Standard I/O (Slot 1)	⑦ Expansion I/O slots			⑧ Flat cable length	⑨ Power-supply voltage
			Motor Output	Encoder type	Brake	Creep	Home Sensor	Synchronization designation			Slot 2	Slot 3	Slot 4		
XSEL	P (Standard) Q (Global)	1 (1 axis) 2 (2 axes) 3 (3 axes) 4 (4 axes) 5 (5 axes) 6 (6 axes)	20 (20W) 30D (30W for DS) 30D (30W for RS) 60 (60W) 100 (100W) 150 (150W) 200 (200W) 30 (300W) 400 (400W) 600 (600W) 750 (750W)	I (Incremental) A (Absolute)	Not Specified (w/o brake) B (w/ brake)	Not Specified (w/o creep) C (w/ creep)	Not Specified (w/o home sensor) L (w/ home sensor)	Not Specified (No synchro-nization) M (Master-axis designation) S (Slave-axis designation)	Not Specified (No network) DV DeviceNet 256/256 board CC CC-Link 256/256 board PR ProfiBus 256/256 board ET Ethernet Data communication board	E (Not used) N1 Expansion I/O NPN 32/16 N2 Expansion I/O NPN 16/32 P1 Expansion I/O PNP 32/16 P2 Expansion I/O PNP 16/32	E (Not used) N1 Expansion I/O NPN 32/16 N2 Expansion I/O NPN 16/32 P1 Expansion I/O PNP 32/16 P2 Expansion I/O PNP 16/32	E (Not used) N1 Expansion I/O NPN 32/16 N2 Expansion I/O NPN 16/32 P1 Expansion I/O PNP 32/16 P2 Expansion I/O PNP 16/32	E (Not used) N1 Expansion I/O NPN 32/16 N2 Expansion I/O NPN 16/32 P1 Expansion I/O PNP 32/16 P2 Expansion I/O PNP 16/32	2 : 2 m (Standard) 3 : 3 m 5 : 5 m 0 : None	2: Single-phase 230V 3: Three-phase 230V

■ Main Specifications

	Standard		Global	
	Axis 1 to axis 4	Axis 5 to axis 6	Axis 1 to axis 4	Axis 5 to axis 6
Total output when maximum number of axes are connected	2400 W (three-phase 230 VAC) / 1600 W (single-phase 230 VAC)			
Control power input	Single-phase 200/230VAC (-15%, +10%)			
Motor power input	2.4 kw type: three-phase 200/230VAC (-10%, +10%) / 1.6 kw type: Single-phase 200/230VAC (-15%, +10%)			
Power capacity (*1)	MAX 4878VA (600W x 4 axes)	MAX 4998VA (400W x 6 axes)	MAX 4878VA (600W x 4 axes)	MAX 4998VA (400W x 6 axes)
Safety circuit configuration	Redundant design not supported		Redundant design supported	
Drive-power cutoff method	Internal relay cutoff		External safety circuit	
Enable input	Contact-B input (internal power supply)		Contact-B input (external power supply, redundancy)	
Position detection method	Incremental encoder/absolute encoder			
Speed setting (*2)	1 mm/sec ~ 2000 mm/sec			
Acceleration/deceleration setting (*2)	0.01 G ~ 1 G			
Program language	Super SEL language			
Number of program steps	6000 steps (total)			
Number of positions	4000 positions (total)			
Number of programs (multitasking)	64 programs (16 programs)			
Operating temperature/humidity	0~40°C, 10%~95% (non-condensing)			
Weight (*3)	5.2 kg	5.7 kg	4.5 kg	5 kg

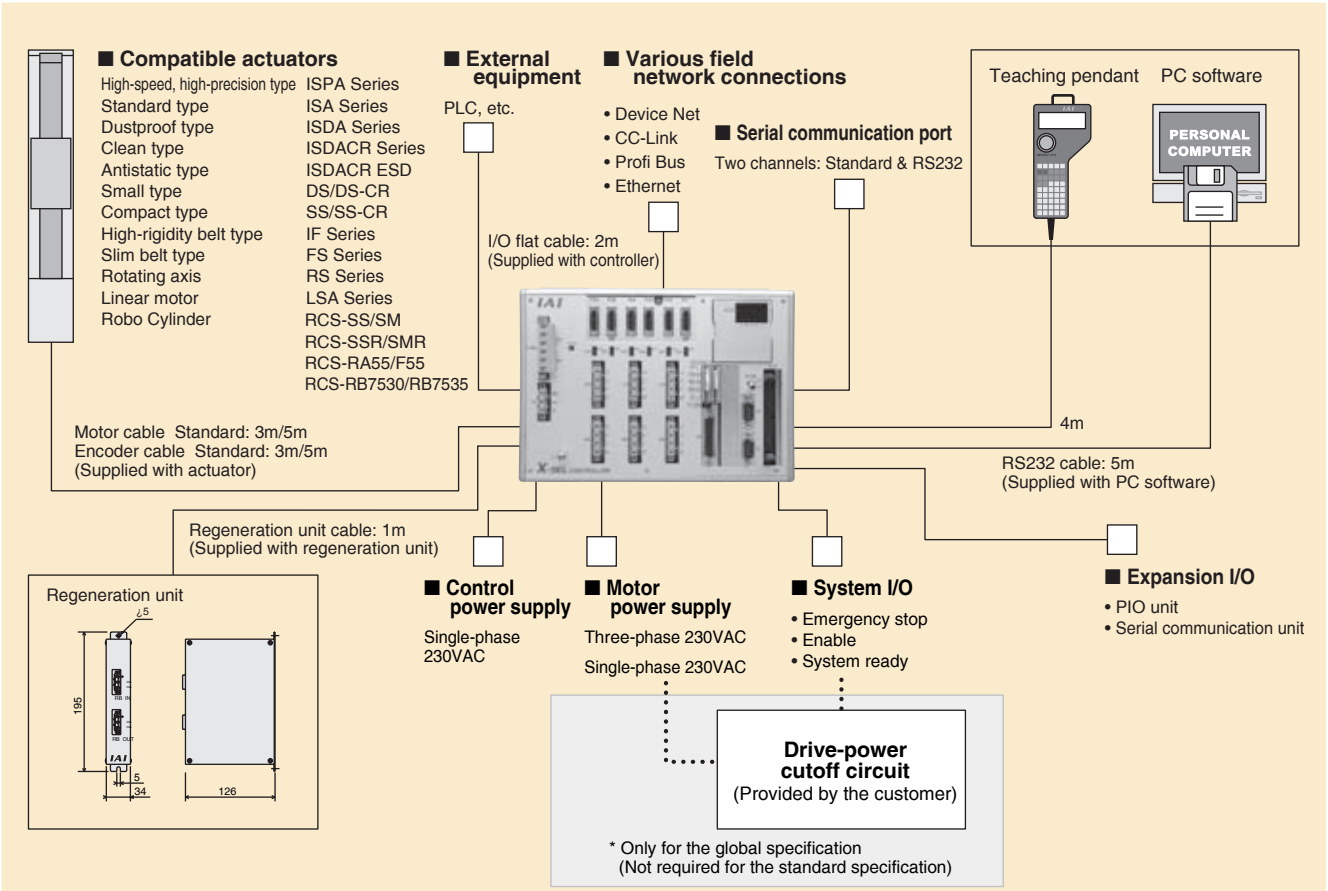
*1 Based on the maximum wattage of each connected axis.
*2 The maximum limit will vary depending on the actuator type.
*3 Including the absolute battery, brake mechanism and expansion I/O box.

■ X-SEL Series Product Lineup

			XSEL-KE	XSEL-KET	XSEL-P	XSEL-Q
			CE-compatible type	Global specification (Safety Category 4)	Large-capacity type, standard specification	Large-capacity type, global specification (Safety Category 4)
						
Operating method	Program operation					
Programs	64 programs (6000 steps)					
Number of positions	3000 positions				4000 positions	
Maximum number of connectable axes	4 axes				6 axes	
Maximum output			1.6 kw	1.6 kw	1.6/2.4 kw	1.6/2.4 kw
Power supply	Single-phase 100VAC / Single-phase 230VAC				Single-/Three-phase 230VAC	Single-/Three-phase 230VAC
Safety category			B	Corresponds to Category 4	B	Corresponds to Category 4
Safety standard			CE	CE, ANSI (*1)	CE	CE, ANSI (*1)

*1 To support ANSI, the ANSI-compatible teaching pendant (IA-T-XA) is required.

■ System Configuration

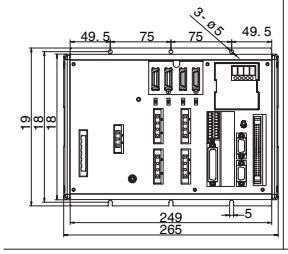


■ External Dimensions

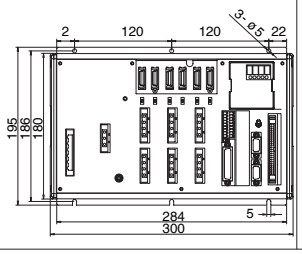
XSEL-P, XSEL-Q 1.6 KW Type

Standard 1-/3-phase, Global 1-phase

Axis 1 to axis 4



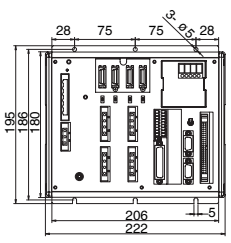
Axis 5 to axis 6



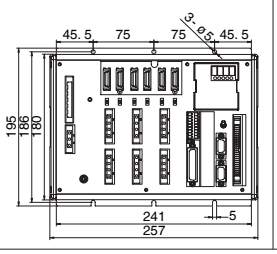
XSEL-Q 2.4 KW Type

Global 3-phase

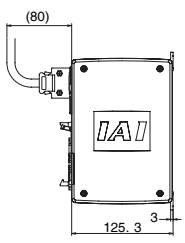
Axis 1 to axis 4



Axis 5 to axis 6



Side view (common to all types)



In the case of the following specifications, the overall width will follow the table below (mounting hole positions are the same).

	Standard 1-/3-ph., Global 1-ph.		Global 3-ph.	
	Axis 1 to axis 4	Axis 5 to axis 6	Axis 1 to axis 4	Axis 5 to axis 6
With absolute battery/brake unit *1	285	340	242	297
With I/O expansion base *2	338	373	295	330
With I/O expansion base + absolute battery/brake unit *3	358	413	315	370

*1 With absolute battery or brake, or absolute battery with brake.
*2 When expansion I/Os are added.
*3 With absolute battery or brake, or absolute battery with brake, plus expansion I/Os.

ISA Series
Catalogue No. 0806-E

The information contained in this catalog is subject to change without notice for the pupose of product inprovement

ISO 9001

Providing quality products since 1986

IAI
Quality and Innovation

IAI Industrieroboter GmbH
Ober der Röth 4
D-65824 Schwalbach am Taunus
Germany
Tel.:+49-6196-8895-0
Fax:+49-6196-8895-24
E-Mail: info@IAI-GmbH.de
Internet: http://www.eu.IAI-GmbH.de

IAI America Inc.
2690 W. 237th Street, Torrance, CA 90505, U.S.A
Tel.: +1-310-891-6015 Fax: +1-310-891-0815

IAI CORPORATION
645-1 Shimizu Hirose, Shizuoka 424-0102, Japan
Tel.: +81-543-64-5105 Fax: +81-543-64-5182