

IAI

Quality and Innovation

HIGH-FUNCTION MULTI-AXES CONTROLLER

X-SEL



www.intelligentactuator.com

X-SEL

High-Function Multi-Axes Controller

Operating method	Program Operation
Number of Programs	64 Programs (6000 Steps)
Number of Positions	3000 Positions (4000 Positions for P/Q Type)



1 Features

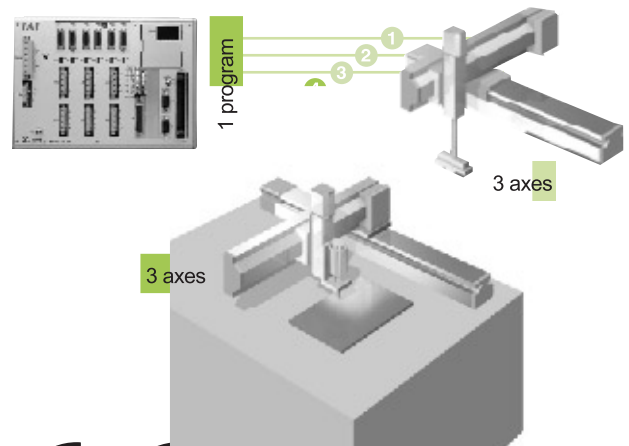
1 All-in-One Controller Featuring a Newly Developed, Fully Programmable Digital Servo Driver

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 Capable of Driving One to Six Axes/ Maximum Output of 2400W

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



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 features, etc.

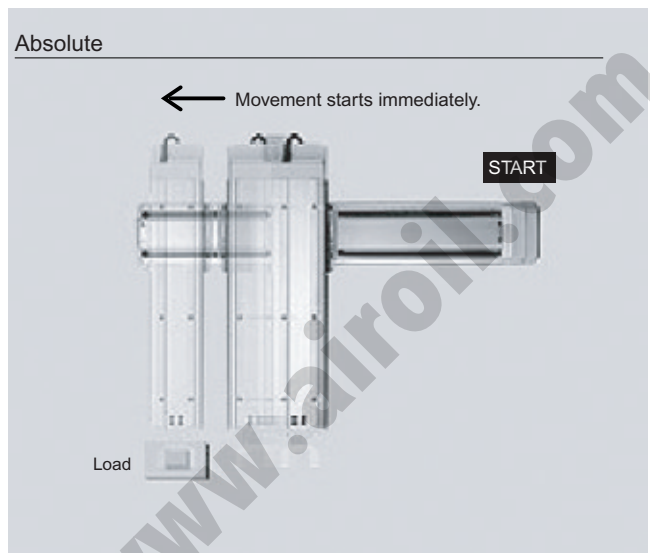
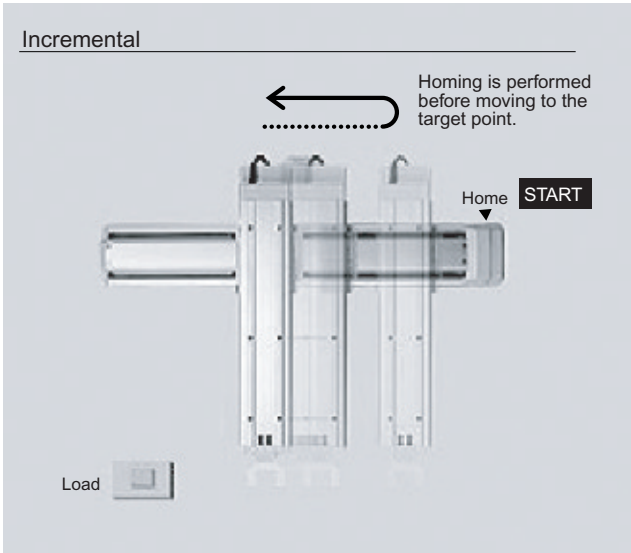
We offer models conforming to the "CE Mark" international safety standard. *



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

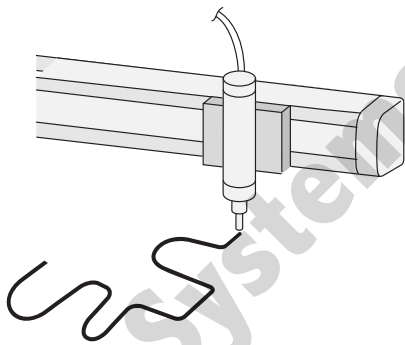
4 Greater Operating Efficiency with Support for Absolute Encoder

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.



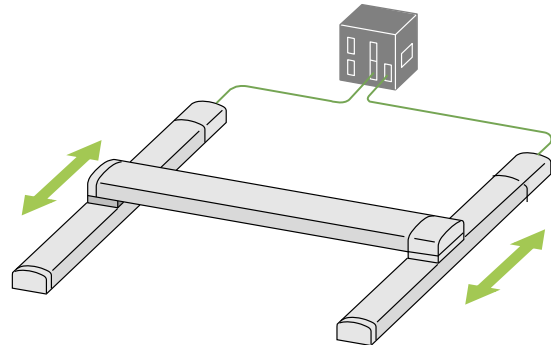
5 Significantly Higher Trace Accuracy

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

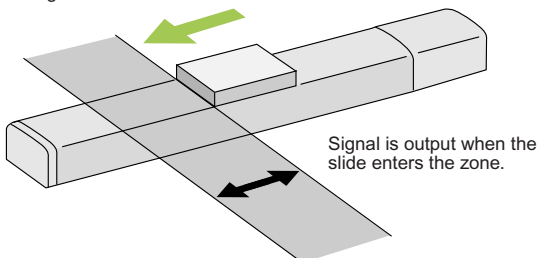
The operations of two actuators can be synchronized, allowing for the transfer of load weighing more than the load capacity of a single axis. The synchronized operation function is also useful when a gantry-type model is used with an extended Y-axis. (Certain conditions apply, so please consult with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



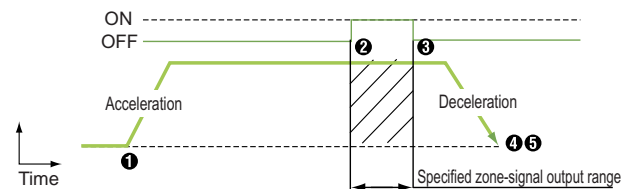
7 Zone Signal

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.

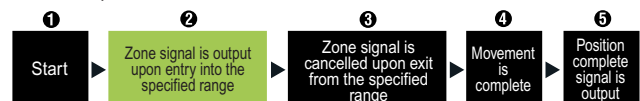
Zone Signal



Zone Signal Output

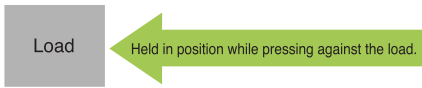


Zone Operation



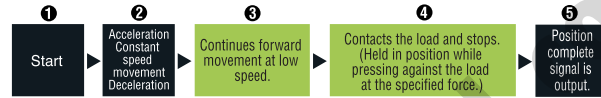
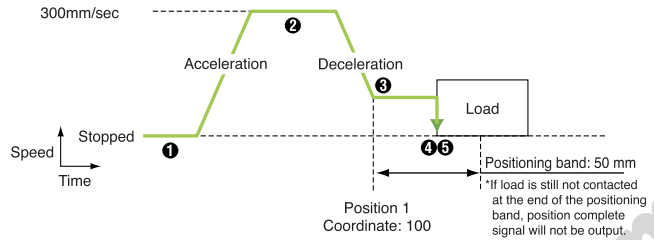
8 Push & Hold Operation

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

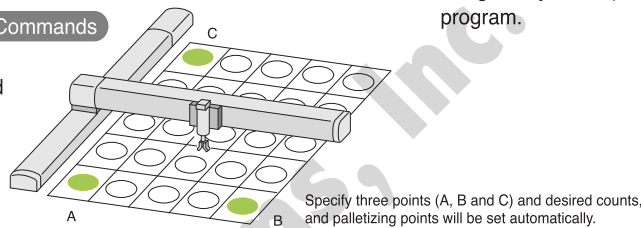
6000 programmable steps (largest in its class)
 3000 position points
 Additionally, up to 16 tasks can be executed simultaneously, easily accommodating complex controls and multi-variety work processes.

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



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.

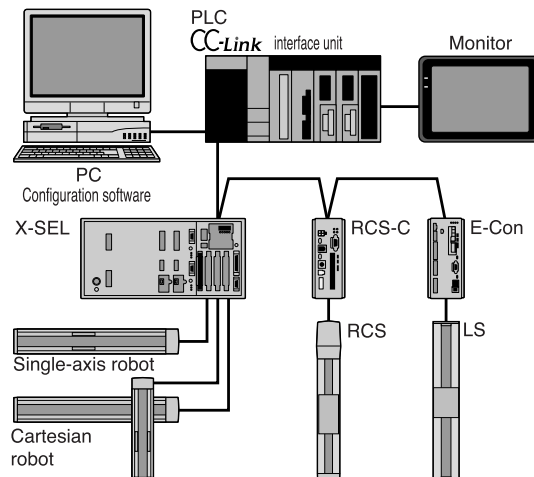
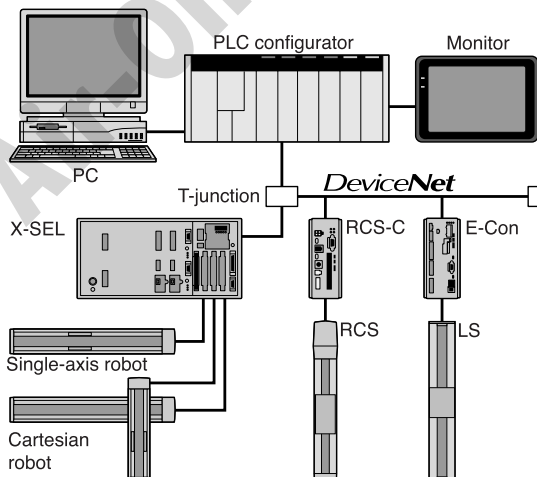
12 Variable Extension and Symbol Definition

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.



■ X-SEL Series Product Lineup

	XSEL-J	XSEL-K	XSEL-KE	XSEL-KT	XSEL-P	XSEL-Q
	Compact type	General-purpose type	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		
Field Network	Device Net, CC-Link, ProfiBus, Ethernet					
Maximum output	0.8 kw	1.6 kw	1.6 kw	1.6 kw	2.4 kw	2.4 kw
Power supply	Single-phase 100VAC / Single-phase 200VAC				Three-phase 200VAC	
Safety category	B			Corresponds to Category 4	B	Corresponds to Category 4
Safety standard	-	-	CE	ANSI (*1)	CE	CE, ANSI (*1)

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

2 Models

XSEL - K - 3 - 400A - 200ICL - 60IBL - N1 - EEE - 2 - 2
 ① ② ③ ④ (Axis 1) ④ (Axis 2) ④ (Axis 3) ⑥ ⑦ ⑧ ⑨

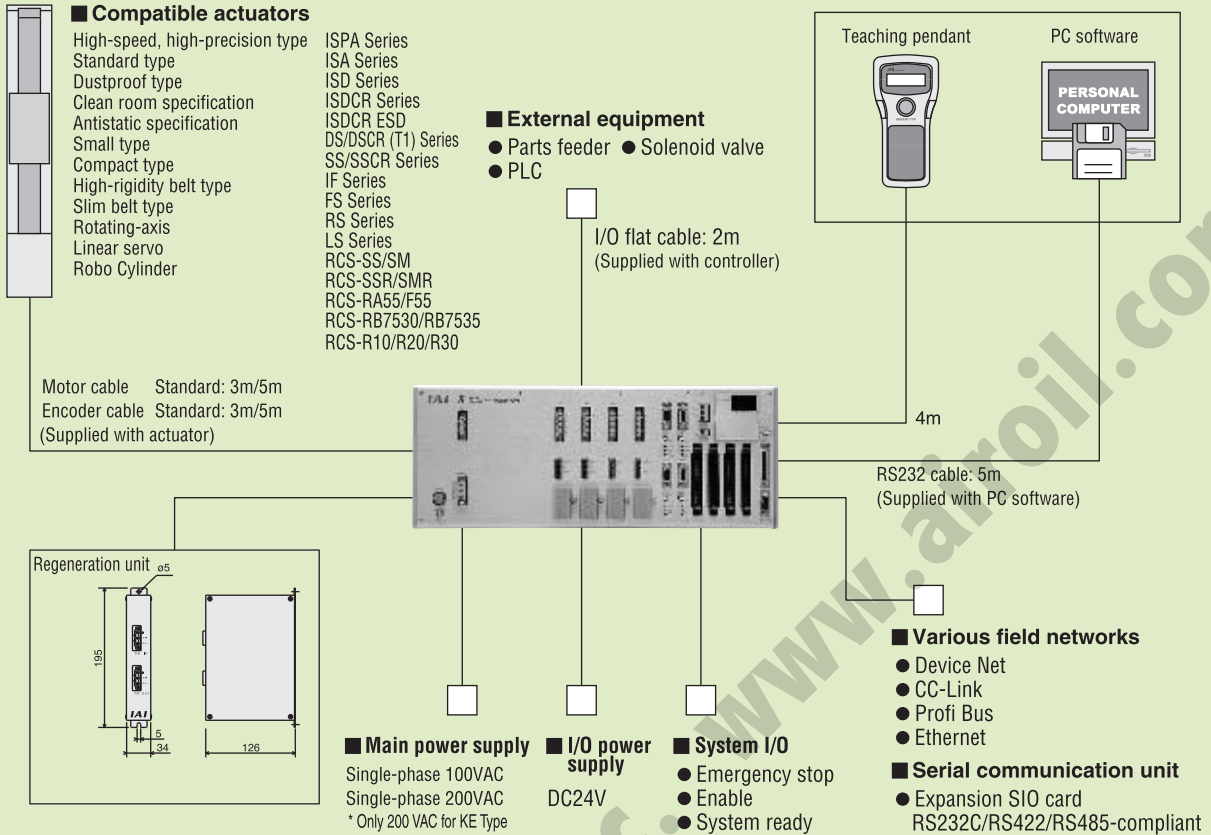
XSEL - P - 3 - 400A - 200ACL - 60ABL - DV - N1 - EEE - 2 - 3
 ① ② ③ ④ (Axis 1) ④ (Axis 2) ④ (Axis 3) ⑤ ⑥ ⑦ ⑧ ⑨

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	J (Compact type)	1 (1 axis)	20 (20W)	I (Incremental)	Not Specified (w/o brake)	Not Specified (w/o creep)	Not Specified (w/o home sensor)	Not Specified (No synchronization)	N/A	E (Not used)	E (Not used)	E (Not used)	2 : 2 m (Standard)	1: Single-phase 100V	
										C (Note 4)	C (Note 4)	C (Note 4)			
										N1 [32 inputs/16 outputs] NPN board	N1 [32 inputs/16 outputs] NPN board	N1 [32 inputs/16 outputs] NPN board			
										N3 (Note 3) [48 inputs/48 outputs] NPN board	N3 (Note 3) [48 inputs/48 outputs] NPN board	N3 (Note 3) [48 inputs/48 outputs] NPN board			
										P1 [32 inputs/16 outputs] PNP board	P1 [32 inputs/16 outputs] PNP board	P1 [32 inputs/16 outputs] PNP board			
										P3 (Note 3) [48 inputs/48 outputs] PNP board	P3 (Note 3) [48 inputs/48 outputs] PNP board	P3 (Note 3) [48 inputs/48 outputs] PNP board			
	K (General-purpose type)	2 (2 axes)	30D (30W for DS)	A (Absolute)	B (w/ brake)	C (w/ creep)	L (w/ home sensor)	M (Master-axis designation)	N/A	DV [DeviceNet 256/256 board]	DV [DeviceNet 256/256 board]	DV [DeviceNet 256/256 board]	3 : 3 m	2: Single-phase 200V	
										CC [CC-Link 256/256 board]	CC [CC-Link 256/256 board]	CC [CC-Link 256/256 board]			
										PR [ProfiBus 256/256 board]	PR [ProfiBus 256/256 board]	PR [ProfiBus 256/256 board]			
										ET [Ethernet Data communication board]	ET [Ethernet Data communication board]	ET [Ethernet Data communication board]			
										SA (Note 4) [Expansion SIO Type A]	SA (Note 4) [Expansion SIO Type A]	SA (Note 4) [Expansion SIO Type A]			
										SB (Note 4) [Expansion SIO Type B]	SB (Note 4) [Expansion SIO Type B]	SB (Note 4) [Expansion SIO Type B]			
KT (Global specification)	3 (3 axes)	30R (30W for RS)	A (Absolute)	B (w/ brake)	C (w/ creep)	L (w/ home sensor)	S (Slave-axis designation)	N/A	CC [CC-Link 256/256 board]	CC [CC-Link 256/256 board]	CC [CC-Link 256/256 board]	5 : 5 m	3: Three-phase 200V		
									P3 (Note 4) [Multipoint I/O PNP48/48]	P3 (Note 4) [Multipoint I/O PNP48/48]	P3 (Note 4) [Multipoint I/O PNP48/48]				
									SA (Note 4) [Expansion SIO Type A]	SA (Note 4) [Expansion SIO Type A]	SA (Note 4) [Expansion SIO Type A]				
									SB (Note 4) [Expansion SIO Type B]	SB (Note 4) [Expansion SIO Type B]	SB (Note 4) [Expansion SIO Type B]				
									SC (Note 4) [Expansion SIO Type C]	SC (Note 4) [Expansion SIO Type C]	SC (Note 4) [Expansion SIO Type C]				
									ET [Ethernet Data communication board]	ET [Ethernet Data communication board]	ET [Ethernet Data communication board]				
KET (CE-compliant Global specification)	4 (4 axes)	60 (60W)	A (Absolute)	B (w/ brake)	C (w/ creep)	L (w/ home sensor)	S (Slave-axis designation)	N/A	CC [CC-Link 256/256 board]	CC [CC-Link 256/256 board]	CC [CC-Link 256/256 board]	0 : None	3: Three-phase 200V		
									P3 (Note 4) [Multipoint I/O PNP48/48]	P3 (Note 4) [Multipoint I/O PNP48/48]	P3 (Note 4) [Multipoint I/O PNP48/48]				
									SA (Note 4) [Expansion SIO Type A]	SA (Note 4) [Expansion SIO Type A]	SA (Note 4) [Expansion SIO Type A]				
									SB (Note 4) [Expansion SIO Type B]	SB (Note 4) [Expansion SIO Type B]	SB (Note 4) [Expansion SIO Type B]				
									SC (Note 4) [Expansion SIO Type C]	SC (Note 4) [Expansion SIO Type C]	SC (Note 4) [Expansion SIO Type C]				
									ET [Ethernet Data communication board]	ET [Ethernet Data communication board]	ET [Ethernet Data communication board]				
P (Large capacity Standard type)	1 (1 axis)	400 (400W)	A (Absolute)	B (w/ brake)	C (w/ creep)	L (w/ home sensor)	S (Slave-axis designation)	Not Specified (No network)	E (Not used)	E (Not used)	E (Not used)	3: Three-phase 200V	3: Three-phase 200V		
									C (Not used)	C (Not used)	C (Not used)				
									N1 [Expansion I/O NPN 32/16]	N1 [Expansion I/O NPN 32/16]	N1 [Expansion I/O NPN 32/16]				
									N2 [Expansion I/O NPN 16/32]	N2 [Expansion I/O NPN 16/32]	N2 [Expansion I/O NPN 16/32]				
									N3 [Expansion I/O NPN 48/48]	N3 [Expansion I/O NPN 48/48]	N3 [Expansion I/O NPN 48/48]				
									P1 [Expansion I/O PNP 32/16]	P1 [Expansion I/O PNP 32/16]	P1 [Expansion I/O PNP 32/16]				
Q (Large capacity Global specification)	2 (2 axes)	600 (600W)	A (Absolute)	B (w/ brake)	C (w/ creep)	L (w/ home sensor)	S (Slave-axis designation)	Not Specified (No network)	E (Not used)	E (Not used)	E (Not used)	3: Three-phase 200V	3: Three-phase 200V		
									C (Not used)	C (Not used)	C (Not used)				
									N1 [Expansion I/O NPN 32/16]	N1 [Expansion I/O NPN 32/16]	N1 [Expansion I/O NPN 32/16]				
									N2 [Expansion I/O NPN 16/32]	N2 [Expansion I/O NPN 16/32]	N2 [Expansion I/O NPN 16/32]				
									N3 [Expansion I/O NPN 48/48]	N3 [Expansion I/O NPN 48/48]	N3 [Expansion I/O NPN 48/48]				
									P1 [Expansion I/O PNP 32/16]	P1 [Expansion I/O PNP 32/16]	P1 [Expansion I/O PNP 32/16]				

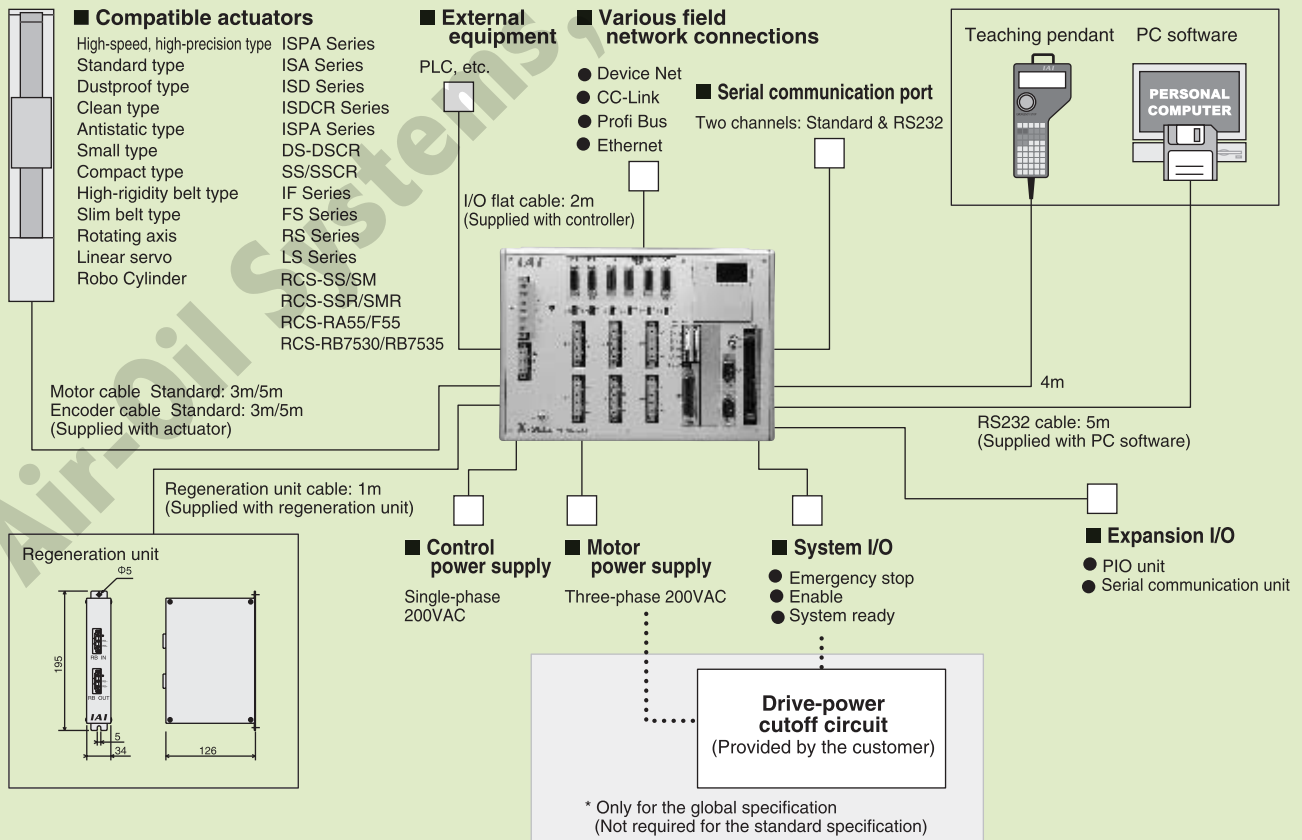
(Note 1) The J-type 1/2-axis models have no expansion slot, so enter EEE. Similarly, the J-type 3/4-axis models have only one expansion slot, so enter □EE.
 (Note 2) The standard I/O, expansion I/O (50-conductor type) and multipoint I/O (100-conductor type) boards come with an I/O flat cable. The standard 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.
 (Note 3) Used exclusively with the J (compact) type. Use an expansion N3 or P3 board for the K (general-purpose) type.
 (Note 4) Used exclusively with the K (general-purpose) type. C, SA, SB and SC cannot be specified for the J (compact) type.

3 System Configuration Diagram

J (Compact type) / K (General-purpose type) / KE (CE type)



KT (Global) / KET (CE compliant global) / P (Large capacity standard type) / Q (Large capacity global type)

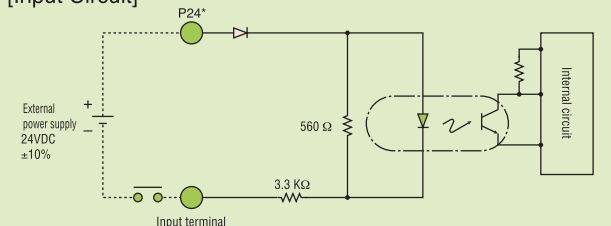


4 I/O Wiring

Input Part External input specification (NPN specification)

Item	Specification
Input power supply	DC24V ±10%
Input current	7mA/circuit
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]

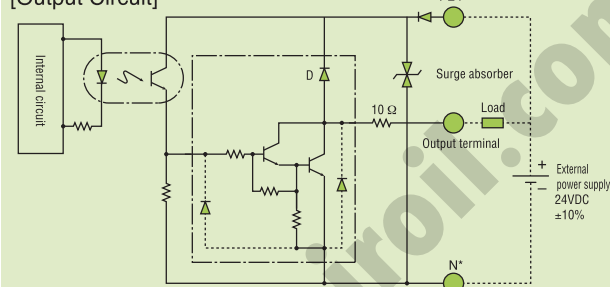


	K (general-purpose) type	J (compact) type
P24	I/O 24-V connector 24VIN	I/O interface pin No. 1

Output Part External output specification (NPN specification)

Item	Specification
Load voltage	DC24V
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]

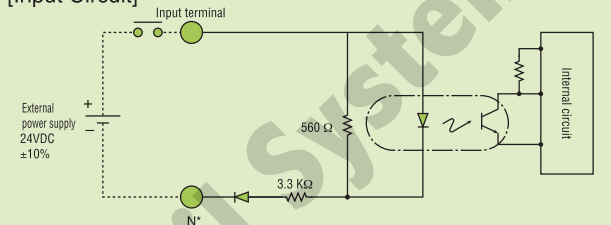


	K (general-purpose) type	J (compact) type
P24	I/O 24-V connector 24VIN	I/O interface pin No. 1
N	I/O 24-V connector 0V	I/O interface pin No. 50

Input Part External input specification (PNP specification)

Item	Specification
Input power supply	DC24V ±10%
Input current	7mA/circuit
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]



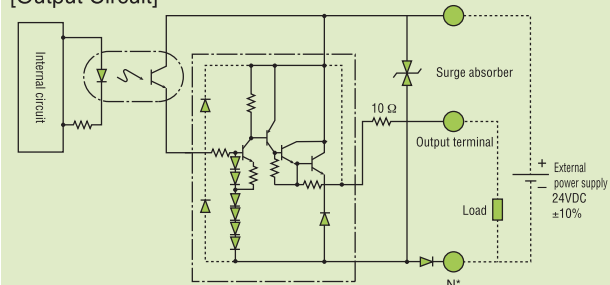
	K (general-purpose) type	J (compact) type
N	I/O 24-V connector 0VIN	I/O interface pin No. 50

Output Part External output specification (PNP specification)

Item	Specification
Load voltage	DC24V
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]



	K (general-purpose) type	J (compact) type
P24	I/O 24-V connector 24VIN	I/O interface pin No. 1
N	I/O 24-V connector 0VIN	I/O interface pin No. 50

5 I/O Signal Table

Standard I/O Signal Table

Pin No.	Category	Port No.	Standard setting
1			(J type: Connected to 24V / K type: 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	Input	014	General-purpose input
17		015	General-purpose input
18		016	General-purpose input
19		017	General-purpose input
20		018	General-purpose input
21		019	General-purpose input
22		020	General-purpose input
23		021	General-purpose input
24		022	General-purpose input
25		023	General-purpose input
26	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	Output	300	Alarm output
35		301	Ready output
36		302	Emergency-stop output
37		303	General-purpose output
38		304	General-purpose output
39		305	General-purpose output
40		306	General-purpose output
41		307	General-purpose output
42		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			-

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

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

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

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

6 Specifications

Item	Description							
Controller series/type	J (compact) type				K (general-purpose) type/KE (CE-compliant) type			
Compatible actuators	DS/DSCR/SS/ISA/ISPA/ISD/ISDCR/SPDCR/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	1 axis	2 axes	3 axes	4 axes
Maximum output of connected axis (W)	Max 800 (Supply voltage: 200V) Max 400 (Supply voltage: 100V)				Max 800	Max 1600 (Supply voltage: 200V) Max 800 (Supply voltage: 100V)		
Power supply	100-V specification: Single-phase 100~115VAC 200-V specification: Single-phase 200~230VAC							
Power supply voltage range	±10%							
Power frequency	50Hz/60Hz							
Power capacity	Max 830VA	Max 1690VA	Max 1750VA	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	None	48 points/unit (1 unit can be added)			48 points/unit (Maximum of 3 units can be added)			
Serial communication function	RS232 port (D-sub, 25 pins) is installed as standard.				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	2.6kg	3.3kg	5.0kg		6.0kg		7.0kg	
Accessory	I/O flat cable							

7 Specifications

Item	Description			
Controller series/type	KT (Global) type / KET (CE compliance global) type			
Compatible actuators	DS/ DSCR/ SS/ SSCR/ ISA/ ISPA/ ISP/ ISD/ ISDCR/ ISPCDR/ IF/ FS/ RS/ RCS (some)/ 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	
Power supply	KT: Single-phase 200~230VAC / KET: Single-phase 230 VAC			
Power supply voltage range	± 10%			
Power frequency	50 Hz/ 60Hz			
Insulation resistance	10MΩ min. (measured at 500 VDC between the power terminal and I/O terminals, and between the external terminals (together) and case)			
Withstand voltage	1500VAC for 1 min. (Note 1)			
Power capacity	Max 830VA	Max 1570VA	Max 2310VA	Max 3050VA
Position detection method	17-bit incremental encoder (wire-saving type), 17-bit rotation data backup absolute encoder (wire-saving type) (Both have a control resolution of 14 bits)			
Speed setting	1 mm/sec ~ Maximum setting varies depending on the actuator's specifications			
Acceleration setting	0.01G ~ Maximum setting varies depending on the actuator's specifications			
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 (total)			
Data storage device	FLASH ROM + SRAM battery backup			
Data input method	Teaching pendant or PC software			
Standard I/Os	32 points (total of dedicated input + general input) / 16 points (total of dedicated output + general output)			
Expanded I/Os	48 points per unit (A maximum of 3 units can be added)			
Serial communication function	Standard RS232 port + Expanded 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	6.0 kg		7.0 kg	
Accessory	Connector terminal, connector terminal cable, connector terminal dummy plug, noise filter for motor supply, I/O flat cable			

Note: The withstand voltage of the actuator motor is 1000 V for 1 minute.

When performing a withstand voltage test with the controller and actuator connected, make sure the test voltage and duration will not exceed 1000 V and 1 minute, respectively.

Item	Description												
Controller series/type	P (Standard) type						Q (Global) type						
Compatible actuators	DS/ DSCR/ SS/ SSCR/ ISA/ ISPA/ ISP/ ISD/ ISDCR/ ISPCDR/ IF/ FS/ RS/ RCS (some)/ 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	5 axes	6 axes	1 axis	2 axes	3 axes	4 axes	5 axes	6 axes	
Maximum output of connected axis (W)	Max 2400												
Controlled power input (W)	Single-phase 200/ 230VAC -15%, +10%						Single-phase 200/ 230VAC -15%, +10%						
Motor power input (W)	Three-phase 200/300VAC ± 10%						Three-phase 200/300VAC ± 10%						
Power frequency	50 Hz/ 60Hz												
Insulation resistance	10MΩ min. (measured at 500 VDC between the power terminal and I/O terminals, and between the external terminals (together) and case)												
Withstand voltage	2500VAC /min.						1500VAC /min.						
Power capacity (*1)	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA	Max 1744VA	Max 3266VA	Max 4787VA	Max 4878VA	Max 4931VA	Max 4998VA	
Position detection method	17-bit incremental encoder (wire-saving type), 17-bit rotation data backup absolute encoder (wire-saving type) (Both have a control resolution of 14 bits)												
Complete circuit structure	Not capable for redundant						Compatible for redundant						
Drive-source cutoff method	Internal relay cutoff						External safety circuit						
Enable input	Contact-B input (Internal power-supply type)						Contact-B input (External power-supply type, redundant)						
Speed setting	1 mm/sec ~ Maximum setting varies depending on the actuator's specifications												
Acceleration setting	0.01G ~ Maximum setting varies depending on the actuator's specifications												
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	4000 positions (total)												
Data storage device	FLASH ROM + SRAM battery backup												
Data input method	Teaching pendant or PC software												
Standard I/Os	I/O 48 points PIO board (NPN/PNP), I/O 96 points PIO board (NPN/PNP)- 1 board can be installed.												
Expanded I/Os	I/O 48 points PIO board (NPN/PNP), I/O 96 points PIO board (NPN/PNP)- Up to 3 boards can be installed.												
Serial communication function	Teaching port (D-sub 25-pin,) + 2chRS232C port (D-sub 9-pin x 2)- Standard equipment.												
Protective functions	Motor overcurrent, overload, motor-driver temperature check, overload check, encoder-open detection, soft limit over, system error, battery error, etc.												
Operating environment	Temperature: 0~40°C, Humidity: 30~85%, Not subject to corrosive gases or significant dust.												
Weight (*2)	5.2 kg				5.7 kg				4.5 kg				5.0 kg
Accessory	I/O flat cable												

*1 Based on the maximum wattage of each connected axis.

*2 Including the absolute battery, brake mechanism and expansion I/O box.

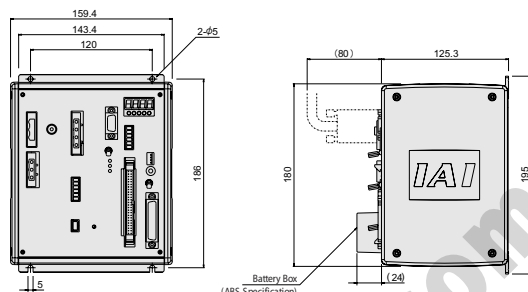
8 External Dimensions

J (Compact) type / K (General) type / KE (CE Compliant) type / KT (Global Specification) type / KET (CE Compliant Global Specification) type

■ Compact Type 1 Axis

XSEL-J-1-□-(Standard I/O)-(Expanded I/O)
 -(I/O Cable Length)-(Power Supply Voltage)

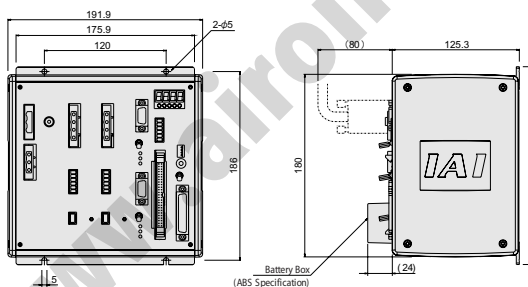
Axis 1 (Motor capacity) (Encoder type) (Option code)



■ Compact Type 2 Axes

XSEL-J-2-□□-(Same as the above)

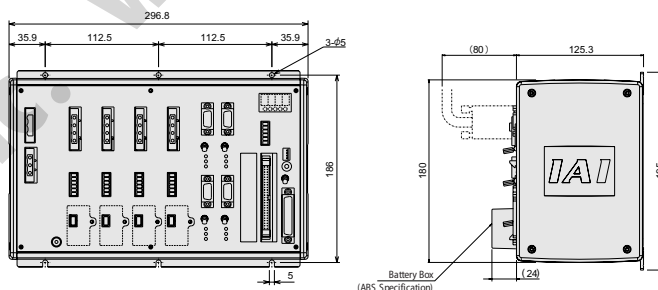
Axis 1, 2 (Motor capacity) (Encoder type) (Option code)



■ Compact Type 3 Axes (4 Axes)

XSEL-J-3(4)-□□□-(□)-(Same as the above)

Axis 1,2,3,(4) (Motor capacity) (Encoder type) (Option)



■ General Type 1 Axis (2 Axes)

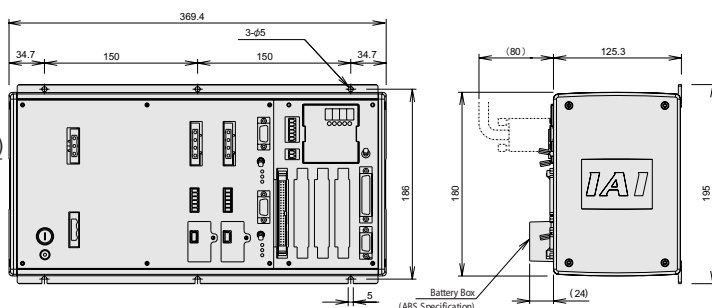
XSEL-K-□-1(2)-□-(□)-(Same as the above)

Axis 1,(2) (Motor capacity) (Encoder type) (Option)

XSEL-KE-□-1(2)-□-(□)-(Same as the above)

XSEL-KT-□-1(2)-□-(□)-(Same as the above)

XSEL-KET-□-1(2)-□-(□)-(Same as the above)



■ General Type 3 Axes (4 Axes)

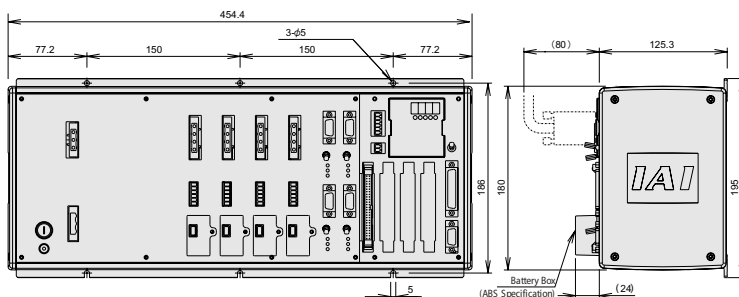
XSEL-K-□-3(4)-□□□-(□)

Axis 1,2,3,(4) (Motor capacity) (Encoder type) (Option)

XSEL-KE-□-3(4)-□□□-(□)-(Same as the above)

XSEL-KT-□-3(4)-□□□-(□)-(Same as the above)

XSEL-KET-□-3(4)-□□□-(□)-(Same as the above)



P (Large Capacity) type / Q (Large Capacity Global) type

The shapes and external dimensions of the XSEL-P/Q type vary depending on the controller's specifications (encoder type, with or without brake, with or without I/O expansion). The desired type and the number of axis can be selected among the following 4 types of shape.

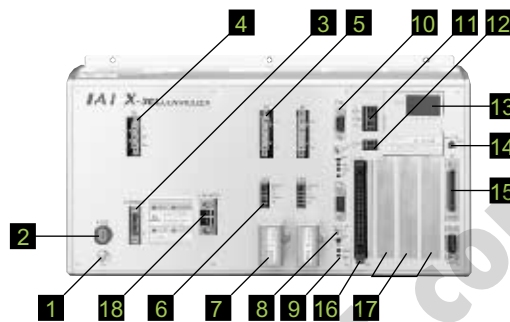
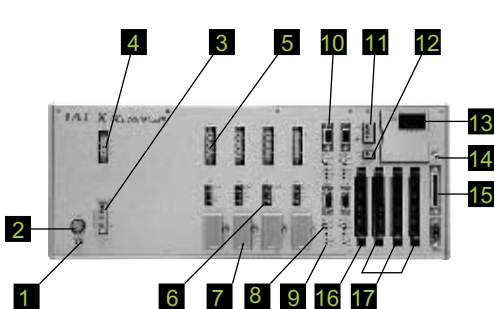
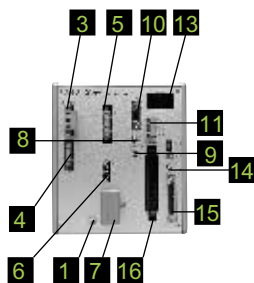
		Base (Incremental Specification)	With Brake and Absolute Unit	With I/O Expansion Base	With Brake, Absolute Unit + I/O Expansion Base
Controller Specification	Encoder	Incremental	Absolute	Incremental	Absolute
	Brake	Without Brake	With Brake	Without Brake	With Brake
	I/O	Standard Only	Standard Only	Standard + Expansion	Standard + Expansion
Standard Type	1-4 Axes Type				
	5-6 Axes Type				
Global Type	1-4 Axes Type				
	5-6 Axes Type				

9 Name of the Parts

J Type (Compact)

K Type (General)

KT Type (General)



1 FG 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 (K type only)

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

3 Main power input connector

A connector for 100/200-VAC single-phase input.
(A plug is attached on the cable end. Refer to page 12.)

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 (K type only)

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.

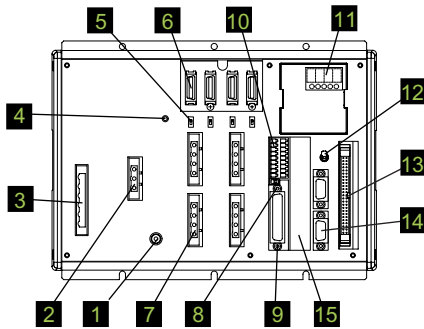
17 Expansion I/O slots (Slots 2, 3 and 4)

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

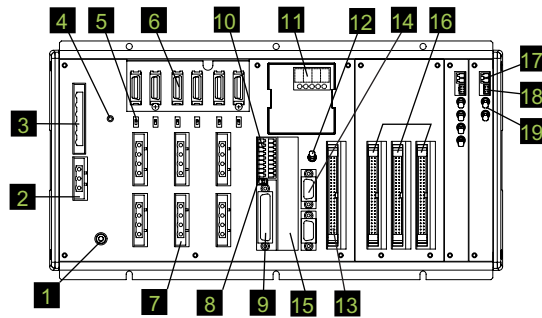
18 Motor drive power AC input connector

Motor drive power 230VAC Single-phase Input connector.

P Type (4-Axis Standard)



Q Type (6-Axis with Absolute Brake Unit + Expansion Base)



1 FG terminal

This terminal is used to ground FG on the enclosure. The enclosure is connected to PE in the AC input part inside the controller.

2 External regenerative unit connector

A connector used to connect a regenerative resistance unit that may be required when the controller is used in a high-speed/ high-load environment, etc., and the built-in regenerative resistance capacity is not sufficient. Whether or not an external regenerative resistance is necessary will be determined by the specific application such as axis configuration.

3 AC-power input connector

A 200-VAC, three-phase input connector consisting of six terminals including motor power terminals, control power terminals and a PE terminal. The standard type only comes with a terminal block. Caution To prevent electric shock, do not touch this connector when the controller is receiving power.

4 Control-power monitor LED

A green light illuminates when the control power supply is generating the controller's internal power correctly.

5 Absolute-data backup battery enable/disable switch

This switch is used to enable or disable encoder data backup using the absolute-data backup battery. The backup is disabled before shipment. Set the switch to the top position after connecting the encoder/ axis-sensor cables and turning on the power.

6 Encoder/axis-sensor connector

This connector is used to connect the actuator encoder and axis sensors such as LS, CREEP and OT. * LS, CREEP and OT sensors are optional.

7 Motor connector

This connector is used to drive the motor inside the actuator.

8 Teaching-pendant type switch

This switch is used to change the type of the teaching pendant connected to the teaching-pendant connector (9). It switches between "IAI's standard teaching pendant" and "ANSI teaching pendant." The switch is located on the front side of the board. Select the applicable setting in accordance with the teaching pendant used.

9 Teaching-pendant connector

The teaching interface connects IAI's teaching pendant or a PC (PC software) to enable operation and setting of your equipment from the teaching pendant/ PC.

10 System I/O connector

This I/O connector is used to control the safety actions of the controller. With the global specification, a safety circuit conforming to a desired safety category of up to level 4 can be configured using this connector and an external safety circuit.

11 Panel window

This window consists of a 4-digit, 7-segment LED display and five LED lamps that indicate the status of the equipment.

Meanings of 5 LEDs

Name	Status when the LED is lit
RDY	CPU ready (program can be run)
ALM	CPU alarm (system-down level error), CPU hardware error
EMG	Emergency stop has been actuated, CPU hardware error, power-system hardware error
PSE	Power-system hardware error
CLK	System clock error

12 Mode switch

This alternate switch with lock is used to command a controller operation mode. To operate the switch, pull it toward you and tilt. Tilting the switch upward will select MANU (manual mode), while tilting it downward will select AUTO (auto mode). Teaching can be performed only in the MANU mode, but auto program start is not enabled in the MANU mode.

13 Standard I/O connector

This connector consists of a 50-pin flat connector and comprises 32-input/16-output DIOs.

Overview of Standard I/O Interface Specifications

Item	Description
Connector name	I/O
Connector	Flat connector, 50-pin
Power supply	Supplied from connector pin Nos. 1 and 50
Input	32 points (including general-purpose and dedicated inputs)
Output	16 points (including general-purpose and dedicated outputs)
Connected to	External PLC, sensor, etc

14 General RS232C port connector

General RS232C port provided for connection of general RS232C equipment.

15 Installation position of field network board

This is where a Fieldbus interface module is installed.

16 Expansion I/O board (optional)

Optional expansion I/O boards are installed in the example.

17 Brake-power input connector

This connector is used to input the drive power for the actuator brake. 24 VDC must be supplied externally. If the specified brake power is not supplied, the actuator brake cannot be released. Be sure to supply the brake power for axes equipped with brake. As for the brake power cable, use a shielded cable and connect the shield on the 24-V power side.

18 Brake-release switch connector

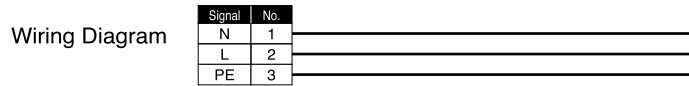
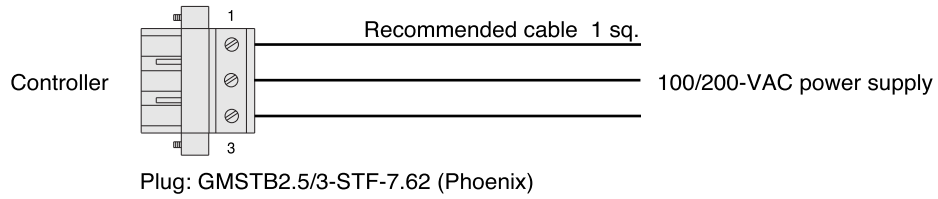
This connector accepts a switch that releases the actuator brake externally from the controller. Shorting the COM and BKMR* terminals of this connector will release the brake. Use this connector if you want to operate the actuator manually in the event of a power failure or error in the controller.

19 Brake switch

This alternate switch with lock is used to release the axis brake. To operate the switch, pull it toward you and tilt. Tilting the switch upward (RLS side) will release the brake forcibly, while tilting it downward (NOM) will enable an automatic brake control by the controller.

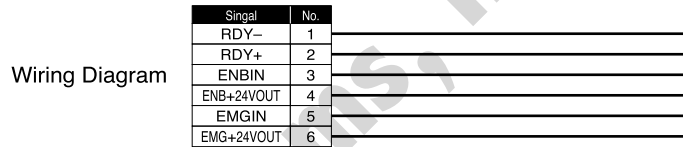
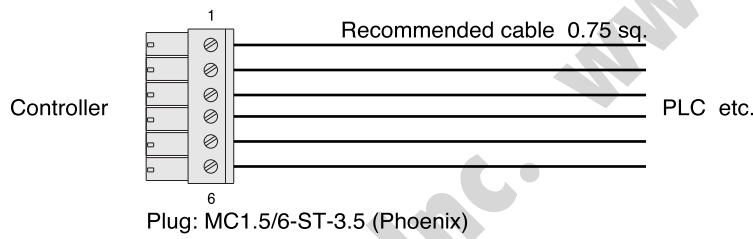
Main Power Input Connector (XSEL-J/ K/ KE/ KT/ KET)

This connector is used to connect 100/200 VAC operating power.
(Cable is provided by the user.)



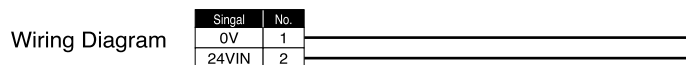
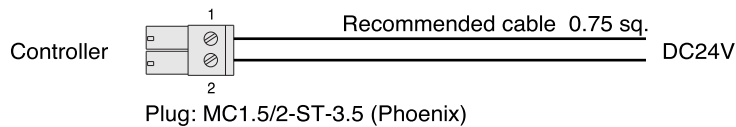
System I/O Connector (XSEL-J/ K/ KE/ KT/ KET)

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.)



I/O 24-V Power Connector (XSEL-K/ KE/ KT/ KET)

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



X-SEL Controller Options Table

			Compatibility/ Controller Models								
			General Type				Compact Type		Large Capacity Type		
			K	KE	KT	KX	J	JX	P/Q		
Item	Details	Option Models	Standard	CE	Global	SCARA	1-2 axis	3-4 axis	SCARA	No Ex.Slot	With Expansion Slot
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			○				○		○
	ANSI version	IA-101-XA-MW	-	-	○	-	-	-	-	-	○
Expansion I/O Board	PIO Board	Expansion PIO (32 inputs/ 16 outputs, NPN Specification)	IA-103-X-32	XSEL-K-□□□□N1-N1EE-□□□□Expansion Slot 1) XSEL-K-□□□□N1-N1N1E-□□□□Expansion Slot 1,2) XSEL-K-□□□□N1-N1N1N1-□□□□Expansion Slot 1,2,3)					XSEL-J-□□□□(3(4)-□□N1-N1EE-□□□□(Expansion Slot 1)		XSEL-P(Q)-□□□□N1-N1EE-□□□□Expansion Slot 1) XSEL-P(Q)-□□□□N1-N1N1E-□□□□Expansion Slot 1,2) XSEL-P(Q)-□□□□N1-N1N1N1-□□□□Expansion Slot 1,2,3)
		Expansion PIO (32 inputs/ 16 outputs, PNP Specification)	IA-103-X-32-P	XSEL-K-□□□□P1-P1EE-□□□□Expansion Slot 1) XSEL-K-□□□□P1-P1P1E-□□□□Expansion Slot 1,2) XSEL-K-□□□□P1-P1P1P1-□□□□Expansion Slot 1,2,3)				XSEL-J-□□□□(3(4)-□□P1-P1EE-□□□□(Expansion Slot 1)		XSEL-P(Q)-□□□□P1-P1EE-□□□□Expansion Slot 1) XSEL-P(Q)-□□□□P1-P1P1E-□□□□Expansion Slot 1,2) XSEL-P(Q)-□□□□P1-P1P1P1-□□□□Expansion Slot 1,2,3)	
		Expansion PIO (16 inputs/ 32 outputs, NPN Specification)	IA-103-X-16	XSEL-K-□□□□N1-N2EE-□□□□Expansion Slot 1) XSEL-K-□□□□N1-N2N2E-□□□□Expansion Slot 1,2) XSEL-K-□□□□N1-N2N2N2-□□□□Expansion Slot 1,2,3)				XSEL-J-□□□□(3(4)-□□N1-N2EE-□□□□(Expansion Slot 1)		XSEL-P(Q)-□□□□N1-N2EE-□□□□Expansion Slot 1) XSEL-P(Q)-□□□□N1-N2N2E-□□□□Expansion Slot 1,2) XSEL-P(Q)-□□□□N1-N2N2N2-□□□□Expansion Slot 1,2,3)	
		Expansion PIO (16 inputs/ 32 outputs, PNP Specification)	IA-103-X-16-P	XSEL-K-□□□□P1-P2EE-□□□□Expansion Slot 1) XSEL-K-□□□□P1-P2P2E-□□□□Expansion Slot 1,2) XSEL-K-□□□□P1-P2P2P2-□□□□Expansion Slot 1,2,3)				XSEL-J-□□□□(3(4)-□□P1-P2EE-□□□□(Expansion Slot 1)		XSEL-P(Q)-□□□□P1-P2EE-□□□□Expansion Slot 1) XSEL-P(Q)-□□□□P1-P2P2E-□□□□Expansion Slot 1,2) XSEL-P(Q)-□□□□P1-P2P2P2-□□□□Expansion Slot 1,2,3)	
SIO Board	Expansion SIO A type (RS232C)	IA-105-X-MW-A	XSEL-K-□□□□N1-SAAE-□□□□								
	Expansion SIO B type (RS422)	IA-105-X-MW-B	XSEL-K-□□□□N1-SBEE-□□□□								
	Expansion SIO C type (RS485)	IA-105-X-MW-C	XSEL-K-□□□□N1-SCEE-□□□□								
Network Board	DeviceNet (256 Inputs/ 256 Outputs General type)	IA-NT-3204-DV	XSEL-K-□□□□DV-EEE-□□□□								
	DeviceNet (256 Inputs/ 256 Outputs Compact type)	IA-NT-3206-DV	-				XSEL-J-□□□□DV-EEE-□□□□				
	DeviceNet (256 Inputs/ 256 Outputs Large Capacity)	-	-				-			XSEL-P(Q)-□□□□DV-E-EEE-□□□□	
	CC-Link (256 Inputs/ 256 Outputs General type)	IA-NT-3204-CC256	XSEL-K-□□□□CC-EEE-□□□□								
	CC-Link (256 Inputs/ 256 Outputs Compact type)	IA-NT-3206-CC256	-				XSEL-J-□□□□CC-EEE-□□□□				
	CC-Link (256 Inputs/ 256 Outputs Large Capacity)	-	-				-			XSEL-P(Q)-□□□□CC-E-EEE-□□□□	
	CC-Link (16 Inputs/ 16 Outputs For installation of Expansion Slot)	IA-NT-3204-CC16	XSEL-K-□□□□N1-ECC-□□□□(1 Slot Installed) XSEL-K-□□□□N1-ECC-□□□□(2 Slots Installed) XSEL-K-□□□□N1-CCC-□□□□(3 Slots Installed)								
	Profibus (256 Inputs/ 256 Outputs General type)	IA-NT-3204-PB	XSEL-K-□□□□PR-EEE-□□□□								
	Profibus (256 Inputs/ 256 Outputs Compact type)	IA-NT-3206-PB	-				XSEL-J-□□□□PR-EEE-□□□□				
	Profibus (256 Inputs/ 256 Outputs Large Capacity)	-	-				-			XSEL-P(Q)-□□□□PR-E-EEE-□□□□	
Ethernet	Ethernet (General type)	IA-NT-3204-ET	XSEL-K-□□□□ET-EEE-□□□□								
	Ethernet (Compact type)	IA-NT-3206-ET	-				XSEL-J-□□□□ET-EEE-□□□□				
	Ethernet (Large Capacity type)	-	-				-			XSEL-P(Q)-□□□□ET-E-EEE-□□□□	
Multi I/O Board	Multi-Point I/O Board (48 inputs/ 48 outputs, NPN Specification)	IA-IO-3204-NP	XSEL-K-□□□□N1-N3EE-□□□□Expansion Slot 1) XSEL-K-□□□□N1-N3N3E-□□□□Expansion Slot 1,2) XSEL-K-□□□□N1-N3N3N3-□□□□Expansion Slot 1,2,3)							XSEL-P(Q)-□□□□N3-EEE-□□□□(Standard Slot) XSEL-P(Q)-□□□□N3-EEE-□□□□(Standard Slot, Expansion Slot 1) XSEL-P(Q)-□□□□N3-N3N3E-□□□□(Standard Slot, Expansion Slot 1,2) XSEL-P(Q)-□□□□N3-N3N3N3-□□□□(Standard Slot, Expansion Slot 1,2,3)	
	Multi-Point I/O Board (48 inputs/ 48 outputs, PNP Specification)	IA-IO-3205-NP	-				XSEL-J-□□□□N3-EEE-□□□□(Standard Slot)				
	Multi-Point I/O Board (48 inputs/ 48 outputs, PNP Specification)	IA-IO-3204-PN	XSEL-K-□□□□P3-P3EE-□□□□Expansion Slot 1) XSEL-K-□□□□P3-P3P3E-□□□□Expansion Slot 1,2) XSEL-K-□□□□P3-P3P3P3-□□□□Expansion Slot 1,2,3)							XSEL-P(Q)-□□□□P3-EEE-□□□□(Standard Slot) XSEL-P(Q)-□□□□P3-EEE-□□□□(Standard Slot, Expansion Slot 1) XSEL-P(Q)-□□□□P3-P3P3E-□□□□(Standard Slot, Expansion Slot 1,2) XSEL-P(Q)-□□□□P3-P3P3P3-□□□□(Standard Slot, Expansion Slot 1,2,3)	
	Multi-Point I/O Board (48 inputs/ 48 outputs, PNP Specification)	IA-IO-3205-PN	-				XSEL-J-□□□□P3-EEE-□□□□(Standard Slot)				
	Terminal Block for Multi-Point I/O Board (NPN Specification)	TU-MA96	○		○						
	Terminal Block for Multi-Point I/O Board (PNP Specification)	TU-MA96-P	○		○						
Regeneration Resistor Unit	REU-1		○		N/A		○	○	N/A		○
External Brake Box	IA-110-X-0		○		N/A		○	○	N/A		N/A

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.)

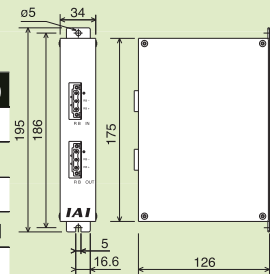
Specification

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

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

Total Z-axis motor capacity	K Type (General-Purpose)	J Type (Compact)
0 ~ 200W	Not required	Not required
~ 400W	Not required	1 unit is required
~ 600W	1 unit is required	1 unit is required
~ 800W	1 unit is required	2 units are required
~ 1200W	2 units are required	—
~ 1600W	To be discussed separately	—



Absolute Data Retention Battery (XSEL-J/ K/ KE/ KT/ KET)

Model **IA-XAB-BT**

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

One battery is required per axis. Please provide the batteries in accordance with the number of axes.

Absolute Data Retention Battery (XSEL-P/Q)

Model **AB-5**

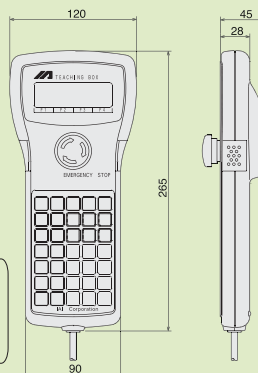
This battery is used with an absolute encoder for storing data. Replace the battery when a controller battery alarm is output.

One battery is required per axis. Please provide the batteries in accordance with the number of axes.

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

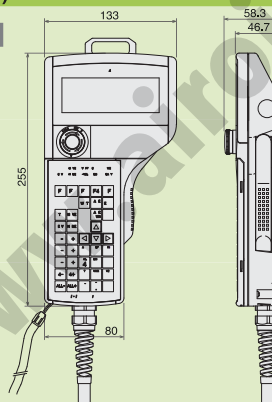
Caution

* A product older than ver.1.13 cannot be used with XSEL-P/Q type.
* A product older than ver.1.08 cannot be used with SCARA robot.

Teaching Pendant Conforming to ANSI/CE Mark Standards (General-Purpose Type Only)

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-MW (DOS/V version)
IA-101-X-CW (PC98 version)

Caution
A product older than Ver. 2.0.0.0 cannot be used with the SCARA robot.

Features A support software with program/position data input, test operation and monitoring functions. It offers significantly improved debugging functions to help reduce the development time for your equipment.

Description

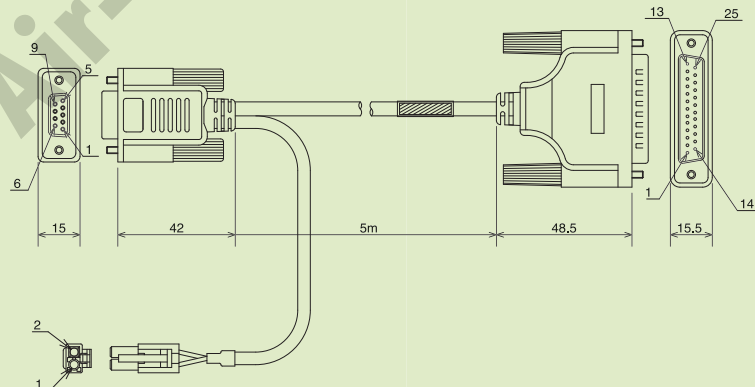
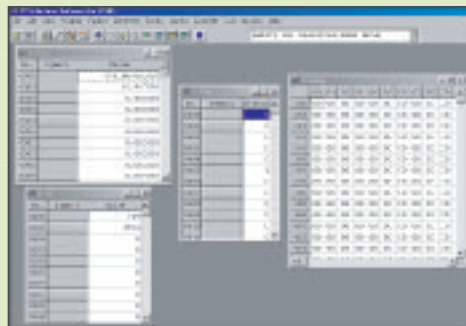
- Software (floppy disk) (Windows 95, 98, NT, 2000 and ME are supported)
- PC connection cable (5m) + Emergency-stop box (Model: CB-ST-E1MW050-EB)

Dimensions

PC connection cable (Model: CB-ST-E1MW050)

Caution

If you are ordering a PC connection cable separately for maintenance purposes, specify CB-ST-E1MW050. If you are ordering the cable together with an emergency-stop box, specify CB-ST-E1MW050-EB.



D-sub, 9-pin socket		Wiring Diagram		D-sub, 25-pin plug	
Connector hood FG				Connector hood FG	
BROWN	2		2	BROWN	2
BROWN/BLACK	3		3	BROWN/BLACK	3
ORANGE	5		7	ORANGE	7
ORANGE/BLACK	7		5	ORANGE/BLACK	5
	4		4		4
	6		6		6
	7		7		7
	8		20		20
			18		18
			19		19
ELP-02V			13	RED	13
RED	1		12	RED/BLACK	12
BLACK	2		1	Shielded FG	1

(Shielded)

PC Software Conforming to Safety Category 4

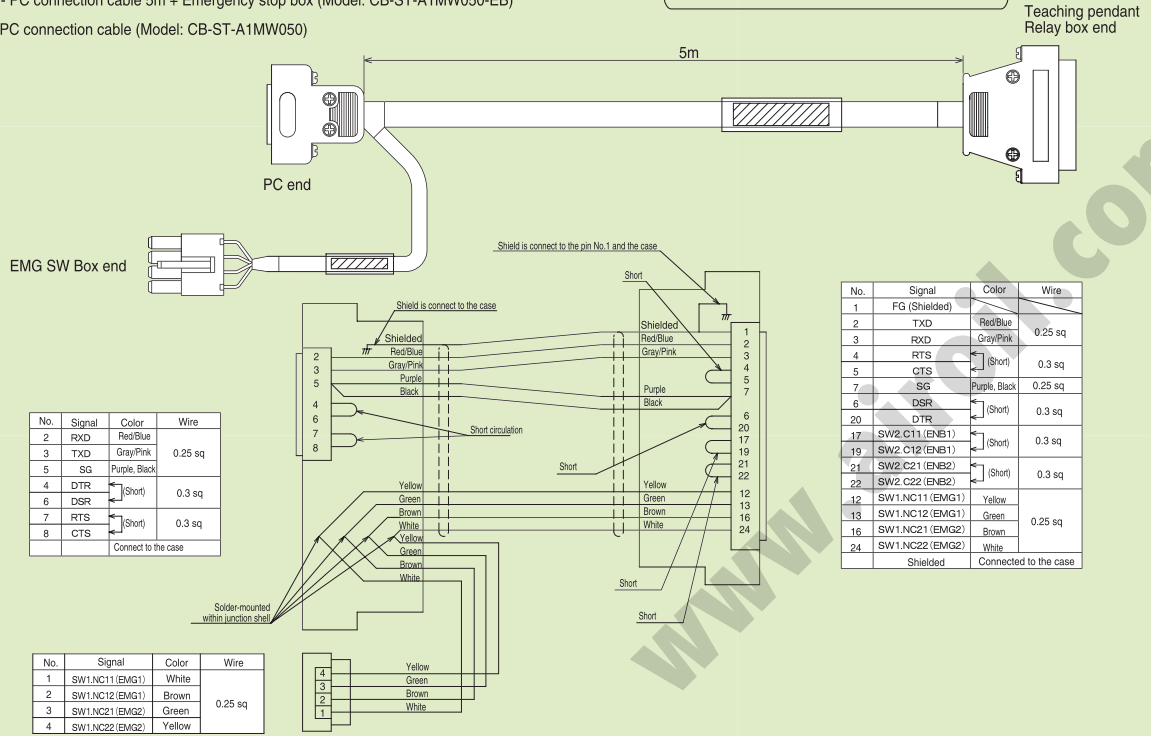
Model IA-101-XA-MW (DOS/V version)

Features A support software with program/ position data input, test operation and monitoring functions. It offers significantly improved debugging functions to help reduce the development time for your equipment. The redundant emergency stop circuits conform to the safety category 4.

Description (Accessories) - Software (Floppy disc)
 (Windows 95, 98, NT, 2000 and ME are supported).
 - PC connection cable 5m + Emergency stop box (Model: CB-ST-A1MW050-EB)

Dimensions PC connection cable (Model: CB-ST-A1MW050)

Caution
 If you are ordering a PC connection cable separately for maintenance purposes, specify CB-ST-A1MW050. If you are ordering the cable together with an emergency-stop box, specify CB-ST-A1MW050-EB.



Expansion PIO Board

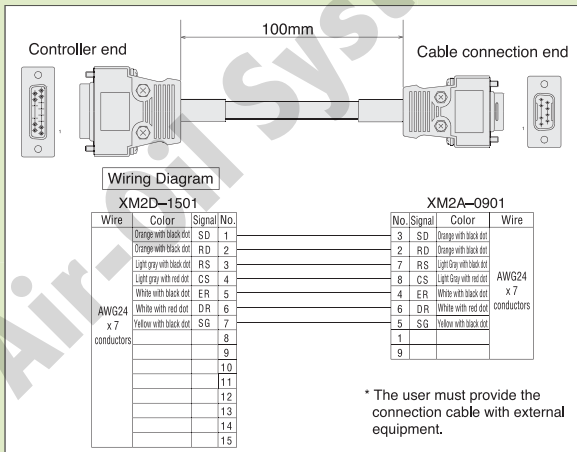
Description An optional board for providing additional I/O points. With a general-purpose controller, a maximum of three expansion PIO boards can be installed in its expansion slots. (With a compact controller, one expansion PIO board can be installed, but only for the 3/4-axes type.)

Expansion PIO Board (General type only)

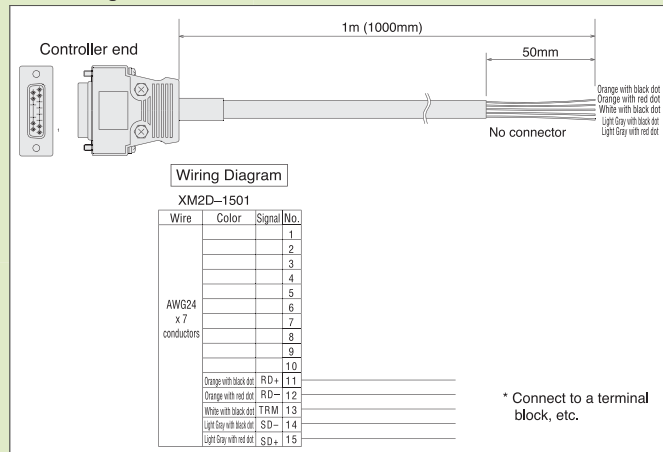
Specification IA-105-X-MW-A (board + joint cable ① x 2)
 IA-105-X-MW-B (board + joint cable ② x 1)
 IA-105-X-MW-C (board + joint cable ② x 1)

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).

Joint cable ① Model: CB-ST-232J001



Joint cable ② Model: CB-ST-422J010



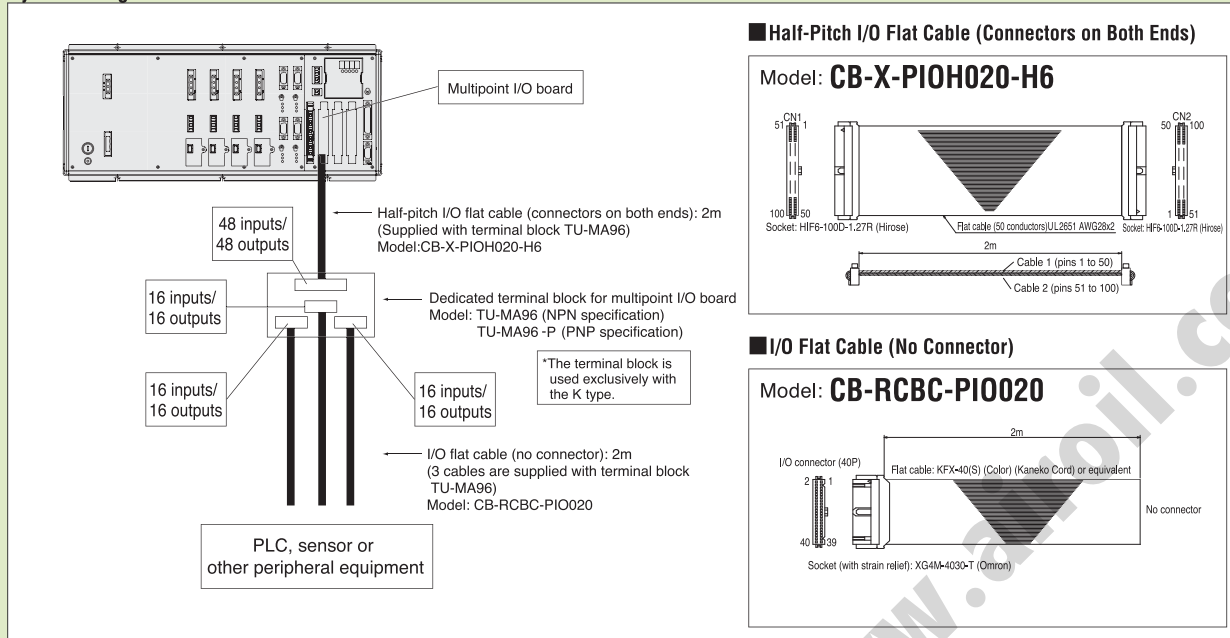
Network Board

Description A communication board for connection to a field network.

Multi 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 *K (General) type only. Not compatible for compact type.

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 is difficult to wire. Use a dedicated terminal block for connection with external equipment.

<Dedicated Terminal Block for Multipoint I/O Board>

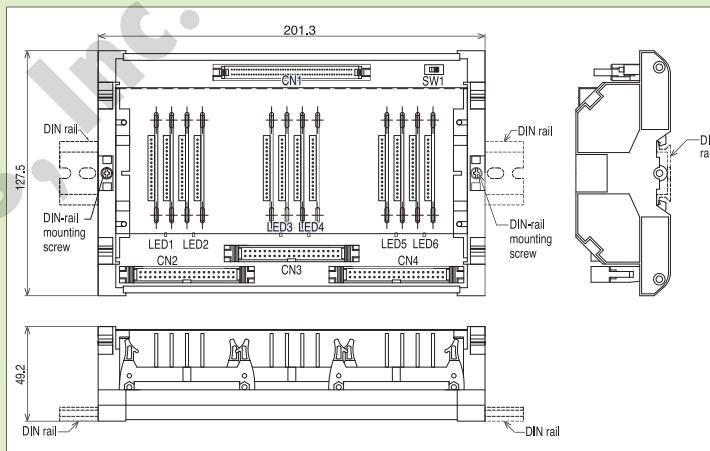
Model **TU-MA96** (NPN specification)

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.



Standard Multi-point I/O Signal Table

J (Compact) type

Pin No.	Category	Port No.	Standard Setting
1	-	-	External power supply (24VDC) Pin No.2-25/51-74
2	Input	000	Program start
3		001	General-purpose input
4		002	General-purpose input
5		003	General-purpose input
6		004	General-purpose input
7		005	General-purpose input
8		006	General-purpose input
9		007	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		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		-	-
27	Input	024	General-purpose input
28		025	General-purpose input
29		026	General-purpose input
30		027	General-purpose input
31		028	General-purpose input
32		029	General-purpose input
33		030	General-purpose input
34		031	General-purpose input
35		032	General-purpose input
36		033	General-purpose input
37		034	General-purpose input
38		035	General-purpose input
39		036	General-purpose input
40		037	General-purpose input
41		038	General-purpose input
42		039	General-purpose input
43		040	General-purpose input
44		041	General-purpose input
45		042	General-purpose input
46		043	General-purpose input
47		044	General-purpose input
48		045	General-purpose input
49		046	General-purpose input
50		047	General-purpose input
51		Output	300
52	301		Ready output
53	302		Emergency stop output
54	303		General-purpose output
55	304		General-purpose output
56	305		General-purpose output
57	306		General-purpose output
58	307		General-purpose output
59	308		General-purpose output
60	309		General-purpose output
61	310		General-purpose output
62	311		General-purpose output
63	312		General-purpose output
64	313		General-purpose output
65	314		General-purpose output
66	315		General-purpose output
67	316		General-purpose output
68	317		General-purpose output
69	318		General-purpose output
70	319		General-purpose output
71	320		General-purpose output
72	321		General-purpose output
73	322		General-purpose output
74	323		General-purpose output
75	-		-
76	Output	324	General-purpose output
77		325	General-purpose output
78		326	General-purpose output
79		327	General-purpose output
80		328	General-purpose output
81		329	General-purpose output
82		330	General-purpose output
83		331	General-purpose output
84		332	General-purpose output
85		333	General-purpose output
86		334	General-purpose output
87		335	General-purpose output
88		336	General-purpose output
89		337	General-purpose output
90		338	General-purpose output
91		339	General-purpose output
92		340	General-purpose output
93		341	General-purpose output
94		342	General-purpose output
95		343	General-purpose output
96		344	General-purpose output
97		345	General-purpose output
98		346	General-purpose output
99		347	General-purpose output
100		-	-

Standard Multi-point I/O Signal Table

K (General) type

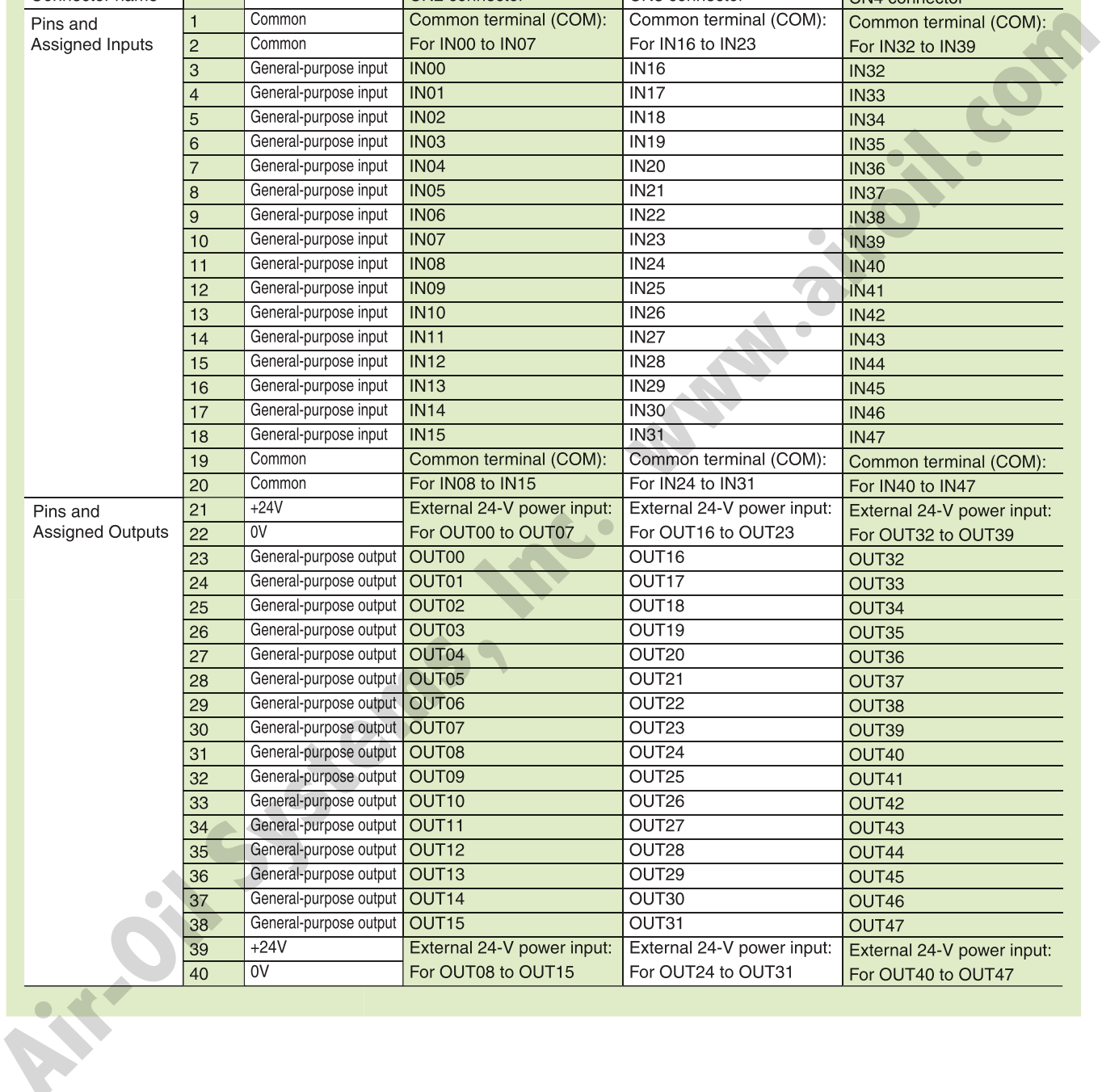
Pin No.	Category	Port No.	Standard Setting	
1	-	-	External power supply (24VDC) Pin No.2-25/51-74	
2	Input	-	General-purpose input	
3		-	General-purpose input	
4		-	General-purpose input	
5		-	General-purpose input	
6		-	General-purpose input	
7		-	General-purpose input	
8		-	General-purpose input	
9		-	General-purpose input	
10		-	General-purpose input	
11		-	General-purpose input	
12		-	General-purpose input	
13		-	General-purpose input	
14		-	General-purpose input	
15		-	General-purpose input	
16		-	General-purpose input	
17		-	General-purpose input	
18		-	General-purpose input	
19		-	General-purpose input	
20		-	General-purpose input	
21		-	General-purpose input	
22		-	General-purpose input	
23		-	General-purpose input	
24		-	General-purpose input	
25		-	-	General-purpose input
26		-	-	External power supply (24VDC) Pin No.27-50/76-99
27	Input	-	General-purpose input	
28		-	General-purpose input	
29		-	General-purpose input	
30		-	General-purpose input	
31		-	General-purpose input	
32		-	General-purpose input	
33		-	General-purpose input	
34		-	General-purpose input	
35		-	General-purpose input	
36		-	General-purpose input	
37		-	General-purpose input	
38		-	General-purpose input	
39		-	General-purpose input	
40		-	General-purpose input	
41		-	General-purpose input	
42		-	General-purpose input	
43		-	General-purpose input	
44		-	General-purpose input	
45		-	General-purpose input	
46		-	General-purpose input	
47		-	General-purpose input	
48		-	General-purpose input	
49		-	General-purpose input	
50		-	-	General-purpose input
51		Output	-	General-purpose output
52	-		General-purpose output	
53	-		General-purpose output	
54	-		General-purpose output	
55	-		General-purpose output	
56	-		General-purpose output	
57	-		General-purpose output	
58	-		General-purpose output	
59	-		General-purpose output	
60	-		General-purpose output	
61	-		General-purpose output	
62	-		General-purpose output	
63	-		General-purpose output	
64	-		General-purpose output	
65	-		General-purpose output	
66	-		General-purpose output	
67	-		General-purpose output	
68	-		General-purpose output	
69	-		General-purpose output	
70	-		General-purpose output	
71	-		General-purpose output	
72	-		General-purpose output	
73	-		General-purpose output	
74	-		-	General-purpose output
75	-		-	External power supply (0V) Pin No.2-25/ 51-74
76	Output	-	General-purpose output	
77		-	General-purpose output	
78		-	General-purpose output	
79		-	General-purpose output	
80		-	General-purpose output	
81		-	General-purpose output	
82		-	General-purpose output	
83		-	General-purpose output	
84		-	General-purpose output	
85		-	General-purpose output	
86		-	General-purpose output	
87		-	General-purpose output	
88		-	General-purpose output	
89		-	General-purpose output	
90		-	General-purpose output	
91		-	General-purpose output	
92		-	General-purpose output	
93		-	General-purpose output	
94		-	General-purpose output	
95		-	General-purpose output	
96		-	General-purpose output	
97		-	General-purpose output	
98		-	General-purpose output	
99		-	-	General-purpose output
100		-	-	External power supply (0V) Pin No.27-50/ 76-99

Dedicated Terminal Block for Multipoint I/O Board Connector 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

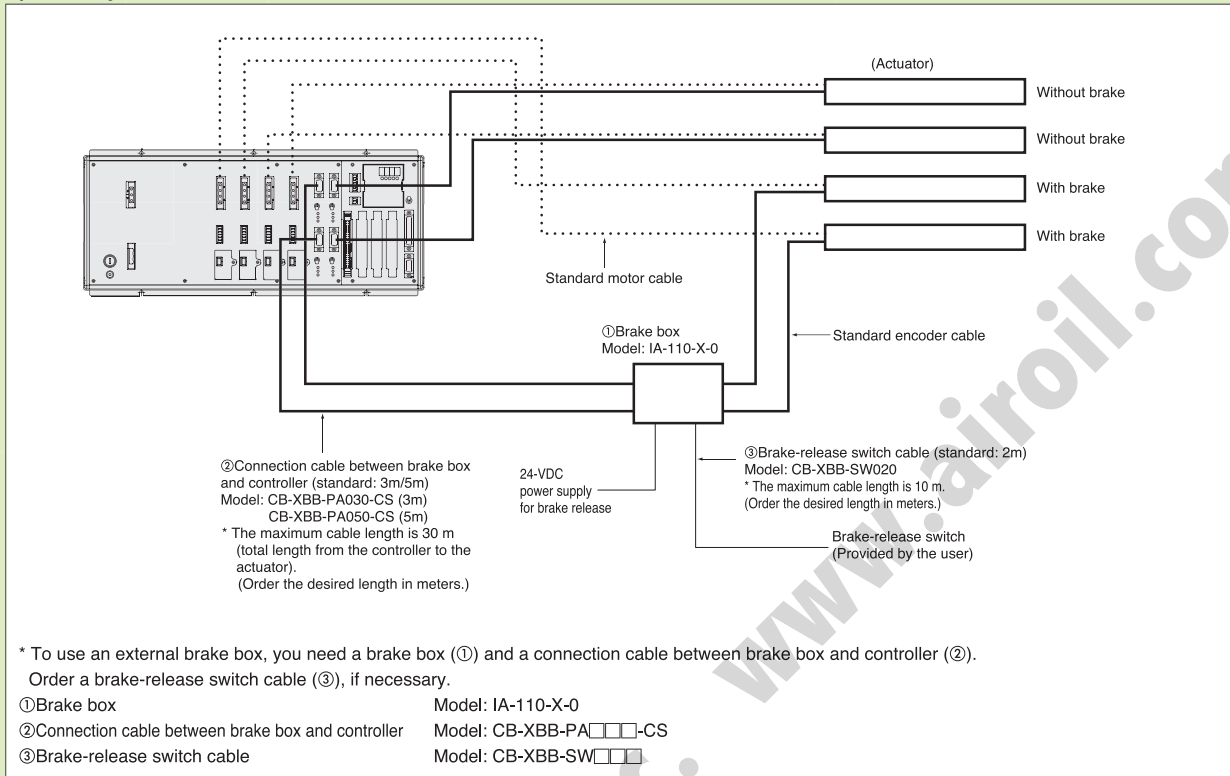
Item	Description					
Applicable connector	XG4A-4031(OMRON) 40-pin, MIL flat connector					
DI	48 points					
DO	48 points					
Connected unit	External I/O device					
Connector name			CN2 connector	CN3 connector	CN4 connector	
Pins and Assigned Inputs	1	Common	Common terminal (COM): For IN00 to IN07	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	
	Pins and Assigned Outputs	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			
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

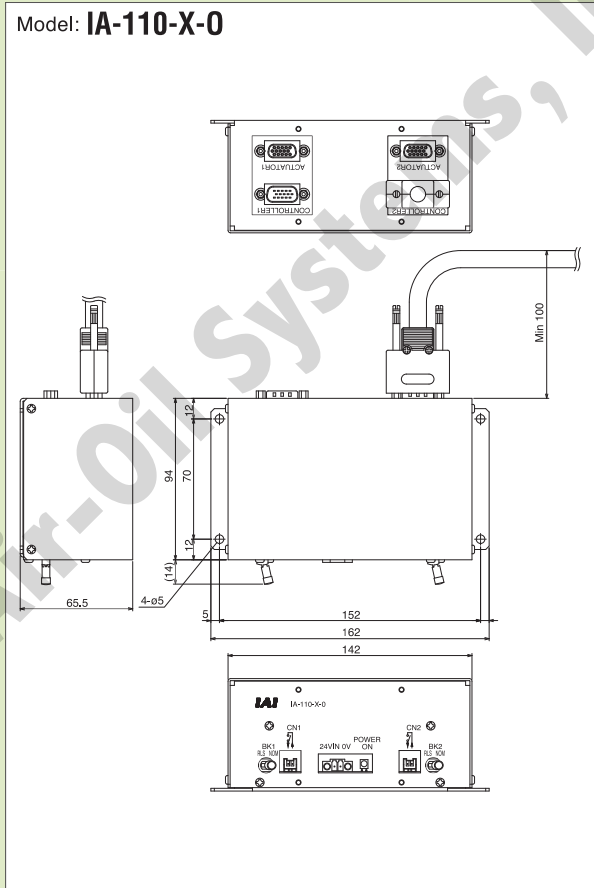
Description This force-release brake box can release the actuator brake even when the controller power is turned off. (Note 1)
 The brake can be released using the switch on the brake box or by connecting an external switch (supplied with a dedicated cable). When ordering, specify the models and quantities 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



External Dimensions of Brake Box

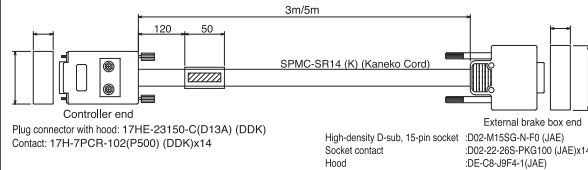
Model: IA-110-X-0



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.)



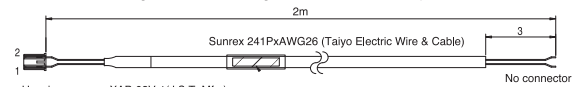
Wiring Diagram Note 1: Twisted pair cable
 Note 2: Fold back the shielded, braided wire, wrap a shield tape around the folded section, and fix with a cable clamp.

Wire	Color	Signal	No.	Wire	Color	Signal	No.
Pink	A/U	1	1	Pink	A/U	1	1
Purple	A/U	2	2	Purple	A/U	2	2
White	B/V	3	3	White	B/V	3	3
Blue/Red	B/V	4	4	Blue/Red	B/V	4	4
Crimpin	Z/W	5	5	Crimpin	Z/W	5	5
Orange	Z/W	6	6	Orange	Z/W	6	6
Blue	SD	7	7	Blue	SD	7	7
Orange	SD	8	8	Orange	SD	8	8
Black	BATT+	9	9	Black	BATT+	9	9
Yellow	BATT-	10	10	Yellow	BATT-	10	10
Green	ENC0	11	11	Green	ENC0	11	11
Brown	GND	12	12	Brown	GND	12	12
Gray	BK-	13	13	Gray	BK-	13	13
Red	BK+	14	14	Red	BK+	14	14
-	-	15	15	-	-	15	15

Brake-release switch cable

Model: CB-XBB-SW020 (2m)

* 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	Orange/red	BKM/RL	1
X1P	Orange/red	COM	2

No connector

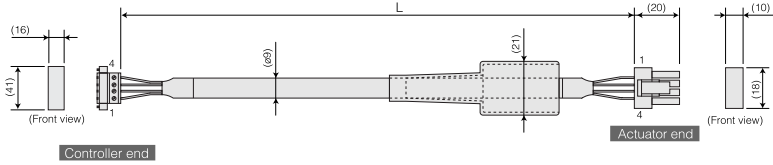
10 Service Parts

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

Motor Cable (XSEL-J/ K/ KE Type - 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).

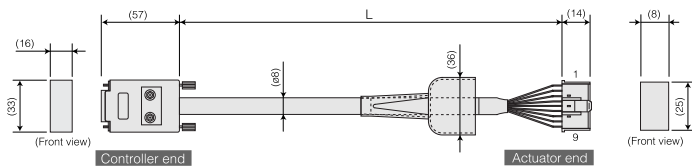


Wire	Color	Signal	No.	No.	Signal	Color	Wire
0.75sq	Green	PE	1	1	U	Red	0.75sq (Crimp)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Encoder Cable (XSEL-J/ K/ KE Type - 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).



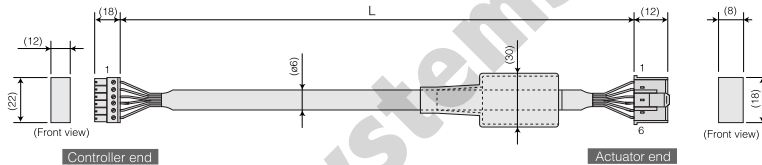
Wire	Color	Signal	No.	No.	Signal	Color	Wire
0.15sq (Crimp)	-	-	1	1	BAT+	Black	0.15sq (Crimp)
	-	-	2	2	BAT-	Yellow	
	-	-	3	3	SD	Blue	
	-	-	4	4	SD	Orange	
	-	-	5	5	VCC	Green	
	-	-	6	6	GND	Brown	
	Blue	SD	7	7	FG	Gray	
	Orange	SD	8	8	BK-	Gray	
	Black	BAT+	9	9	BK+	Red	
	Yellow	BAT-	10				
	Green	VCC	11				
	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

Limit Switch Cable (XSEL-J/ K/ KE Type - 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	
	Pink	CREEP	3	4	CREEP	Pink	
	Gray	OT	2	5	OT	Gray	
	1B/Light Blue	RSV	1	6	RSV	1B/Light Blue	

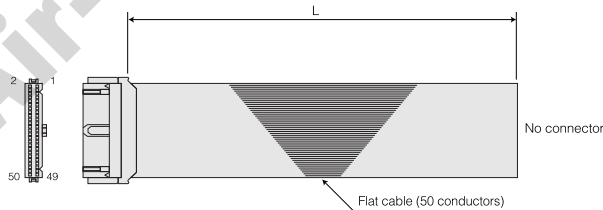
Note) "1B" indicates one black dot mark.

I/O Flat Cable (X-SEL)

I/O Flat Cable (X-SEL Connection)

Model **CB-X-PIO** □□□

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

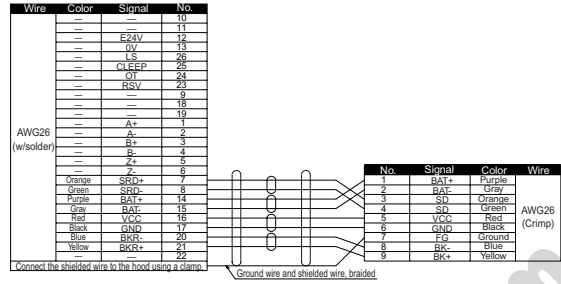
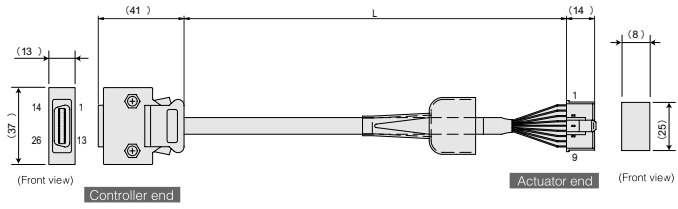


No.	Color	Wire	No.	Color	Wire	No.	Color	Wire
1	Brown1	Flat cable	18	Gray2	Flat cable	35	Green4	Flat cable
2	Red1		19	White2		36	Blue4	
3	Orange1		20	Black2		37	Purple4	
4	Yellow1		21	Brown-3		38	Gray4	
5	Green1		22	Red3		39	White4	
6	Blue1		23	Orange3		40	Black4	
7	Purple1		24	Yellow3		41	Brown-5	
8	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				

Encoder Cable (XSEL-P/Q Type - Single-Axis Robot Connection)

Model **CB-X1-PA**

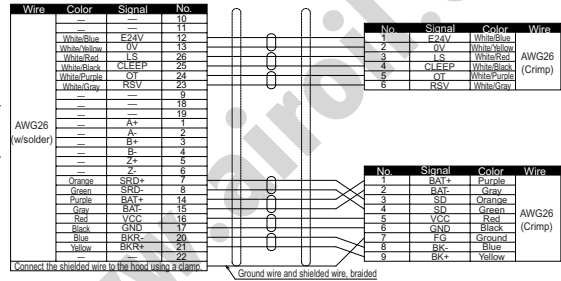
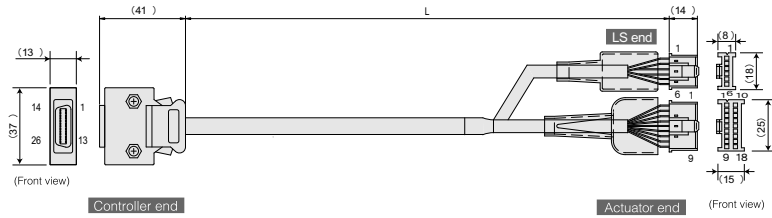
* Indicate the desired cable length (L) of up to 30 m in (e.g., 080 = 8 m).



Encoder Cable (XSEL-P/Q Type - Single-Axis Robot with LS Specification Connection)

Model **CB-X1-PLA**

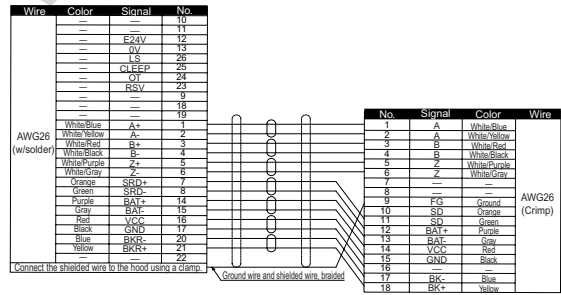
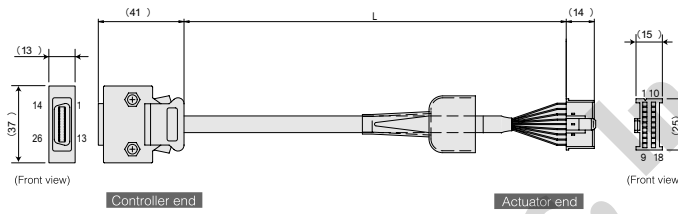
* Indicate the desired cable length (L) of up to 30 m in (e.g., 080 = 8 m).



Encoder Cable (XSEL-P/Q Type - ROBO Cylinder RCS Type Connection)

Model **CB-X2-PA**

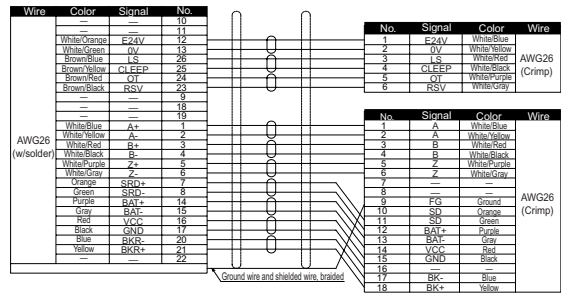
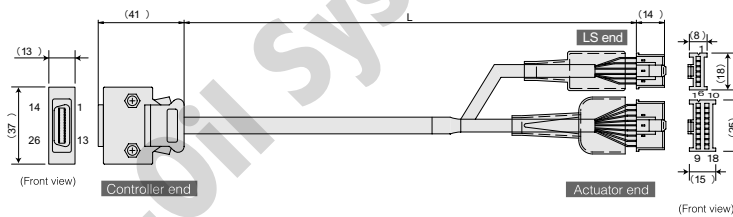
* Indicate the desired cable length (L) of up to 30 m in (e.g., 080 = 8 m).



Encoder Cable (XSEL-P/Q Type - ROBO Rotary Connection)

Model **CB-X2-PLA**

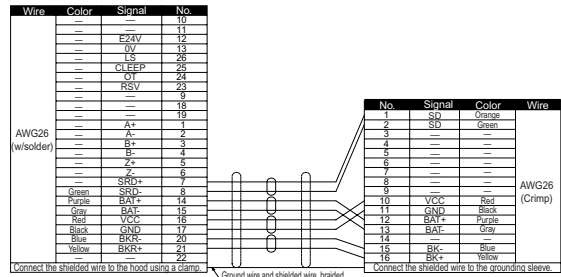
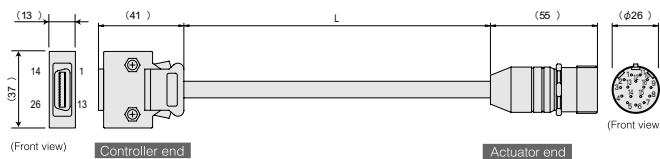
* Indicate the desired cable length (L) of up to 30 m in (e.g., 080 = 8 m).



Encoder Cable (XSEL-P/Q Type - Water Splash-proof ISWA Connection)

Model **CB-X1-PA** -WC

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



XSEL-JX/KX/KETX

Dedicated IX Controller

Operating method	Program operation
Number of programs	64 programs (6000 steps)
Number of positions	3000 positions
Power source voltage	200VAC



1 Features

The JX/KX controller is a high-performance X-SEL controller customized exclusively for use with the IX Series. It combines the useful functions of the X-SEL controller with the dedicated IX Series commands to achieve a substantial improvement in utility.

1 Super SEL Language

The JX/KX controller adopts Super SEL Language, the same language used for our single-axis/ Cartesian robots. Therefore, you can create programs just as easily as you do for your existing IAI controller, the simple language structure will let you learn the necessary programming steps in no time.

2 Network Ready

The JX/KX controller supports DeviceNet (*1), CC-Link (*2), ProfiBus (*3), and Ethernet.

- *1 DeviceNet is a registered trademark of ODVA.
- *2 CC-Link is a registered trademark of Mitsubishi Electric Corporation.
- *3 ProfiBus is a registered trademark of Siemens AG.

2 Model

XSEL - KX - NNN5020 - N1 - EEE - 2 - 2

① ② ③ ④ ⑤ ⑥ ⑦

① Series	② Controller Type	③ IX Robot Model	④ Standard I/O				⑤ Expansion I/O (Note 1)				⑥ I/O Flat Cable Length (Note 3)	⑦ Power Supply Voltage
			Slot 1	Slot 2	Slot 3	Slot 4	Slot 1	Slot 2	Slot 3	Slot 4		
XSEL	JX (Compact type) KX (General-purpose type) KETX (General-purpose Global CE compliant type)	NNN2515~8040 (Standard type)	N1 [32 input/ 16 output NPN board]	E (Not used)	E (Not used)	E (Not used)	E (Not used)	2: 2m 3: 3m 5: 5m 0: None	2: 200-V			
		NSN5016~6016 (High-speed type)	N3 (Note 3) [48 input/ 48 output NPN board]	C (Note 4) [CC-Link connection 16/16 board]	C (Note 4) [CC-Link connection 16/16 board]	C (Note 4) [CC-Link connection 16/16 board]						
		NNW2515~6030 (Dustproof/Splash-proof type)	N1 [Expansion I/O NPN 32/16]	N2 [Expansion I/O NPN 16/32]	N2 [Expansion I/O NPN 16/32]	N1 [Expansion I/O NPN 32/16]						
		TNN3015~3515 (Wall-mount type)	P1 [32 input/ 16 output PNP board]	N3 (Note 4) [Multipoint I/O NPN 48/48]	N3 (Note 4) [Multipoint I/O NPN 48/48]	N2 [Expansion I/O NPN 16/32]						
		UNN3015~3515 (Wall-mount Inverse type)	P3 (Note 3) [48 input/ 48 output PNP board]	P1 [Expansion I/O PNP 32/16]	P2 [Expansion I/O PNP 16/32]	P1 [Expansion I/O PNP 32/16]						
		HNN5020~6020 (Ceiling-mount type)	DV [DeviceNet 256/256 board]	P2 [Expansion I/O PNP 16/32]	P3 (Note 4) [Multipoint I/O PNP 48/48]	P2 [Expansion I/O PNP 16/32]						
		INN5020~6020 (Ceiling-mount Inverse type)	CC [CC-Link 256/256 board]	P3 (Note 4) [Multipoint I/O PNP 48/48]	SA (Note 4) [Expansion SIO type A]	P3 (Note 4) [Multipoint I/O PNP 48/48]						
		NNC2515~8040 (Cleanroom type)	PR [Profibus 256/256 board]	SA (Note 4) [Expansion SIO type A]	SB (Note 4) [Expansion SIO type B]	SA (Note 4) [Expansion SIO type A]						
			ET [Ethernet Data communication board]	SB (Note 4) [Expansion SIO type B]	SC (Note 4) [Expansion SIO type C]	SB (Note 4) [Expansion SIO type B]						
				SC (Note 4) [Expansion SIO type C]		SC (Note 4) [Expansion SIO type C]						

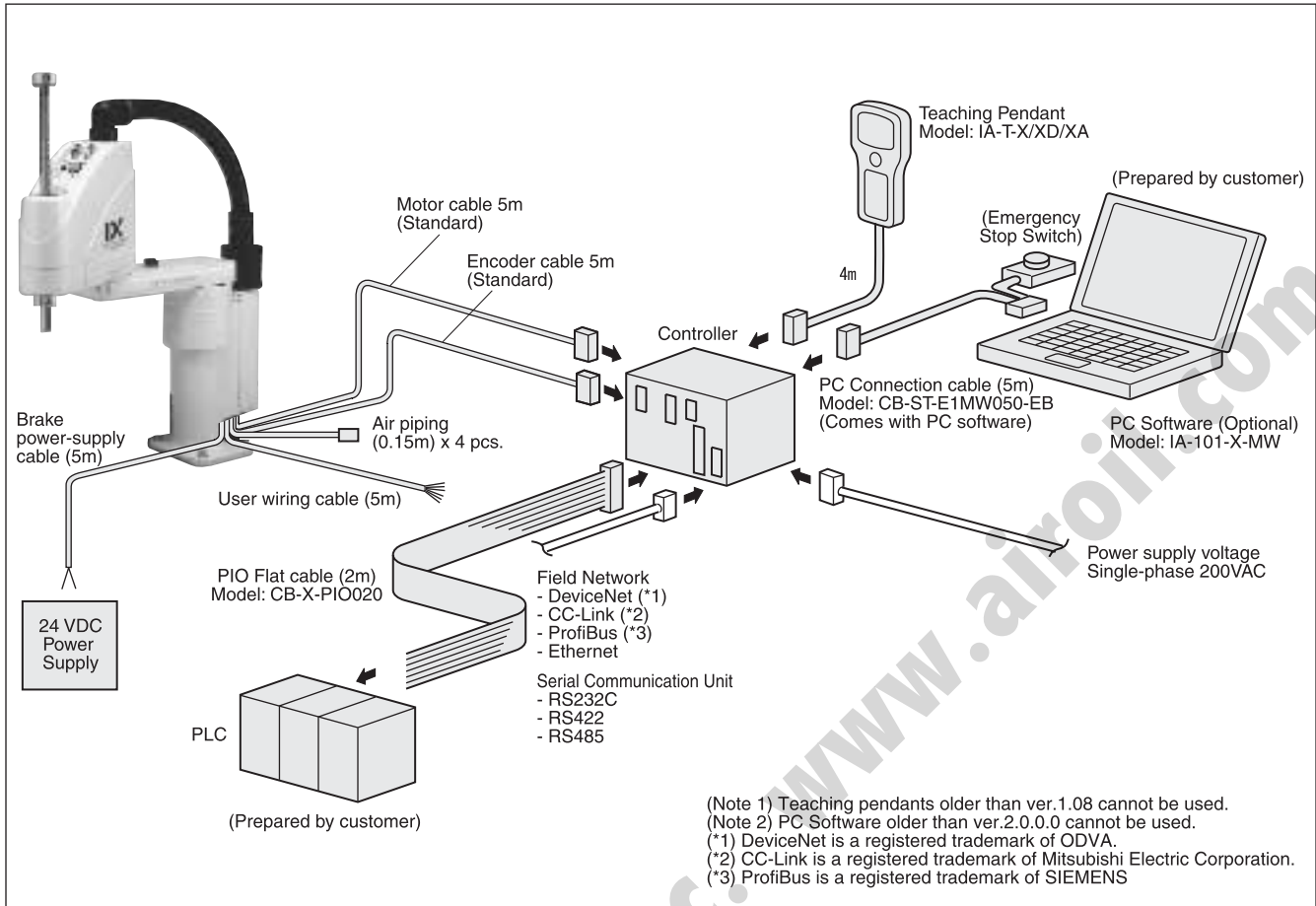
(Note 1) Use a three-digit code (EEE) to specify the expansion slot type. In the case of the JX controller having only one expansion slot, specify the slot (slot 2) using the leftmost digit and leave "E" in the remaining two digits (e.g., N1EE).

(Note 2) An I/O flat cable is supplied with each standard I/O board (50-conductor type) or multipoint I/O board (100-conductor type). The standard cable for standard cable/ expansion I/O board is 2m long, but you can also specify 3m or 5m. A cable of any length up to 10m can be fabricated, but a length other than 2, 3, or 5m will require a special order. If you require a length other than 2, 3, or 5m, select "0 (None)" and place a separate order by specifying the I/O cable model. If you have selected a board other than standard, expansion or multipoint I/O board, select "0" for the I/O flat cable length.

(Note 3) This is a dedicated option for the JX controller. Use an expansion N3/P3 board for the KX controller.

(Note 4) This is a dedicated option for the KX controller. C, N3, P3, SA, SB, and SC cannot be specified for the JX controller.

3 System Configuration Diagram



4 Options

Controller Options

Name	Model	Remarks
Teaching Pendant (Standard)	IA-T-X	(See page 15)
Teaching Pendant (With deadman switch)	IA-T-XD	
Teaching Pendant (ANSI/ CE-compliant)	IA-T-XA	
PC Software (DOS/ V version)	IA-101-X-MW	
PC Software (PC 98 version)	IA-101-X-CW	

Expansion I/O Related (Unit Models)

*Units may be individually arranged by the model names below. When arranged together with the controller, please arrange by the controller's model name.

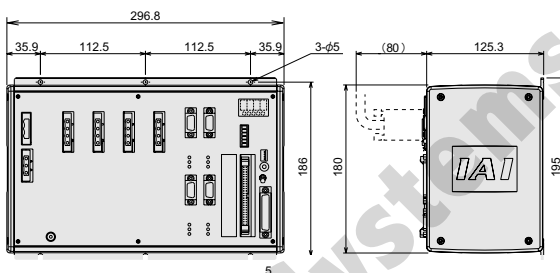
Name	Model	Remarks
Expanded PIO Board (32 input/ 16 output NPN Specification)	IA-103-X-32	(See page 14)
Expanded PIO Board (32 input/ 16 output PNP Specification)	IA-103-X-32-P	
Expanded PIO Board (16 input/ 32 output NPN Specification)	IA-103-X-16	
Expanded PIO Board (16 input/ 32 output PNP Specification)	IA-103-X-16-P	
Expanded SIO Board A Type (RS232C Connection)	IA-103-X-MW-A	
Expanded SIO Board B Type (RS422 Connection)	IA-103-X-MW-B	
Expanded SIO Board C Type (RS485 Connection)	IA-103-X-MW-C	
DeviceNet Board (256 input/ 256 output Standard Slot Installation)	IA-NT-3204-DV	
CC-Link Board (256 input/ 256 output Standard Slot Installation)	IA-NT-3204-CC256	
CC-Link Board (16 input/ 16 output Expanded Slot Installation)	IA-NT-3204-CC16	
ProfiBus Board (256 input/ 256 output Standard Slot Installation)	IA-NT-3204-PB	
Multi-point I/O Board (48 input/ 48 output NPN Spec., KX Controller)	IA-IO-3204-NP	
Multi-point I/O Board (48 input/ 48 output PNP Spec., KX Controller)	IA-IO-3204-PN	
Multi-point I/O Board (48 input/ 48 output NPN Spec., JX Controller)	IA-IO-3205-NP	
Multi-point I/O Board (48 input/ 48 output PNP Spec., JX Controller)	IA-IO-3205-PN	
Multi-point I/O Board Terminal (NPN Specification)	TU-MA96	
Multi-point I/O Board Terminal (PNP Specification)	TU-MA96P	

5 Specifications

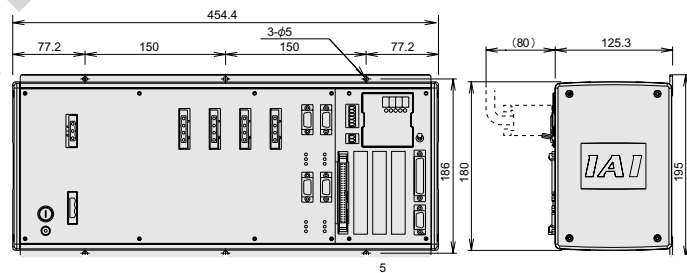
Item	Description	
Controller Series / Type	JX	KX / KETX
Number of Controlled Axes	4 Axes	
Maximum Connection Axis Output	MAX 450 W	MAX 1750 W
Weight	5.0 kg	7.0 kg
Power-Supply Voltage	Single-phase 200~230 VAC (Factory Setting)	
Operating Voltage Range	± 10%	
Power Frequency	50/60 Hz	
Power Capacity	MAX 1750 VA	MAX 3050 VA
Operating Temperature	0 °C ~ 40 °C	
Operating Humidity	30% ~ 85%	
Storage Temperature	-10 °C ~ 65 °C	
Axis Control Method	AC Full -digital Servo	
Position Detection Method	17-bit Incremental Encoder (Wire-saving type)	
Programming Language	Super SEL Language	
Program Steps	6000 Steps (Total)	
Number of Positions	3000 Positions (Total)	
Number of Programs	64 Programs	
Multitasking	16 Programs	
Storage Device	FLASH ROM + SRAM Battery Backup	
Data Input Method	Teaching Pendant or PC Software	
Standard Inputs	32 Points (Total of dedicated inputs + general-purpose inputs)	
Standard Outputs	16 Points (Total of dedicated outputs + general-purpose outputs)	
Expansion Inputs/ Outputs	A maximum of 144 input/ output points in total using an expansion PIO board(s)	A maximum of 336 input/ output points in total using an expansion PIO board(s)
Serial Communication	Not Possible	Possible if an expansion SIO board is used (optional)
Other Inputs/ Outputs	Emergency Stop Input, Safety Gate Input, System Ready Output	
Protection Functions	Motor Overcurrent, Overload, Motor Driver Temperature Check, Overload Check, Encoder Open-circuit Detection, Soft Limit Over, System Error, Battery Error	
Accessory	I/O Flat Cable	
Options	Teaching Pendant, PC Software, Expansion I/O Board, Expansion SIO Board	

6 External Dimensions

Controller
JX



Controller
KX/ KETX





IAI America, Inc.

Head Office 2690W 237th Street Torrance CA 90505

TEL: 1-800-736-1712

Chicago Office: 1261 Hamilton Parkway Itasca, IL 60143

TEL: 1-800-944-0333

New Jersey Office: 7 South Main Street, Suite-F, Marlboro, NJ 07746

TEL: 1-877-683-4500

IAI Industriroboter GmbH

Ober der Rsth 4, D-65824 Schwalbach am Taunus, Germany