IAI
Quality and Innovation

NUT ROTATION ACTUATOR CARTESIAN SYSTEM
LINEAR MOTOR CARTESIAN SYSTEM

NS-ISPA
LSA-ISPA

Linear Motor Type ICSPA-BL

Nut Rotation Type ICSPA-BN

INTELLIGENT
ACTUATOR

www.linearachsensysteme.de
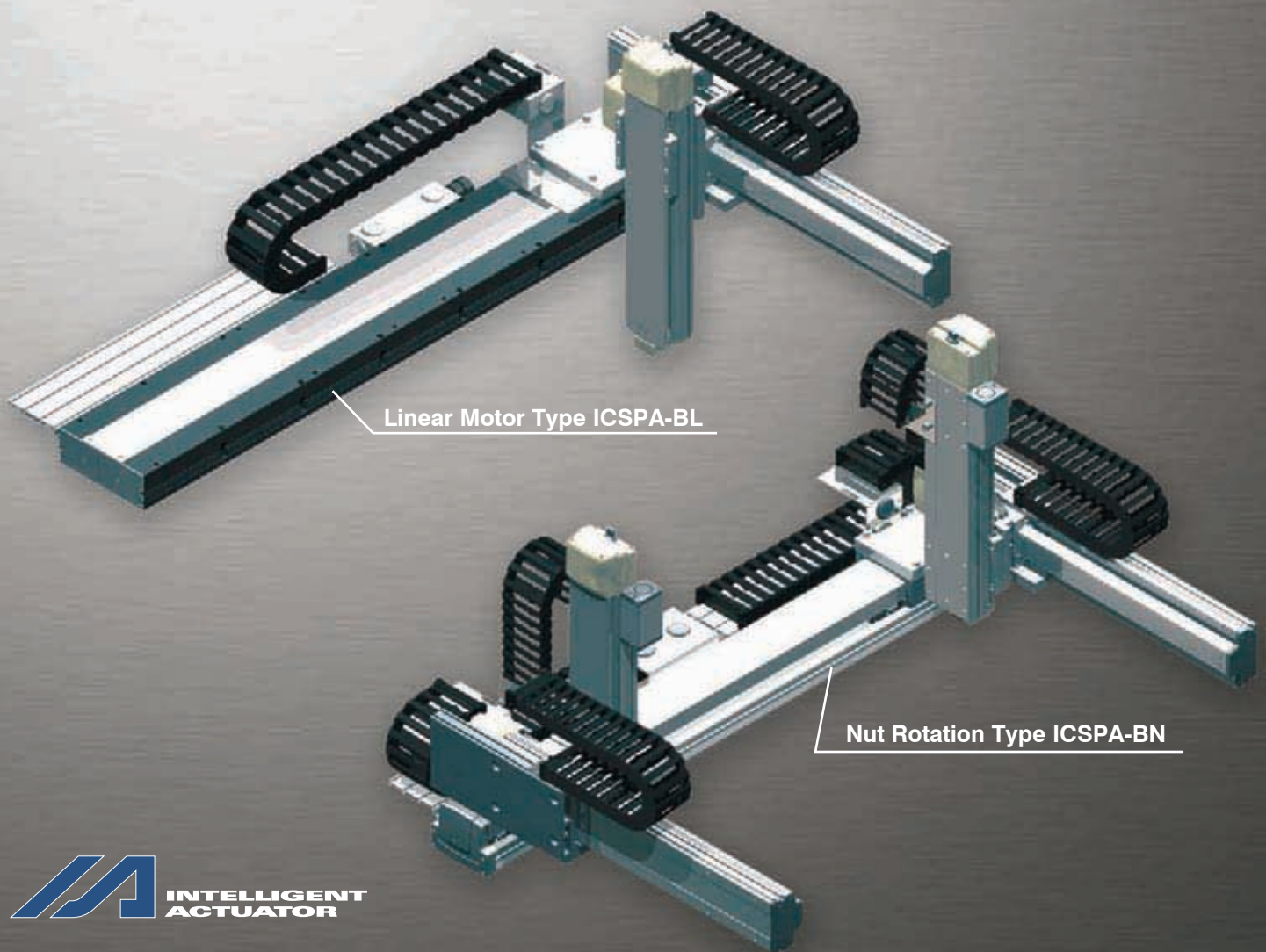
Introducing Two Multi-slider Type[1]
Cartesian Robots

*1   A multi-slider robot consists of two sliders installed in one axis, where both sliders can be operated independently.

Combined actuator units of nut rotation type offering excellent transfer capability

The built-in servo motor in the slider turns the nut to move the actuator. Accordingly, heavy loads can be operated at high speed even at a long stroke. A desired combination can be selected from 2-axis, 3-axis, 4-axis (2 axes + 2 axes) and 6-axis (3 axes + 3 axes) configurations.
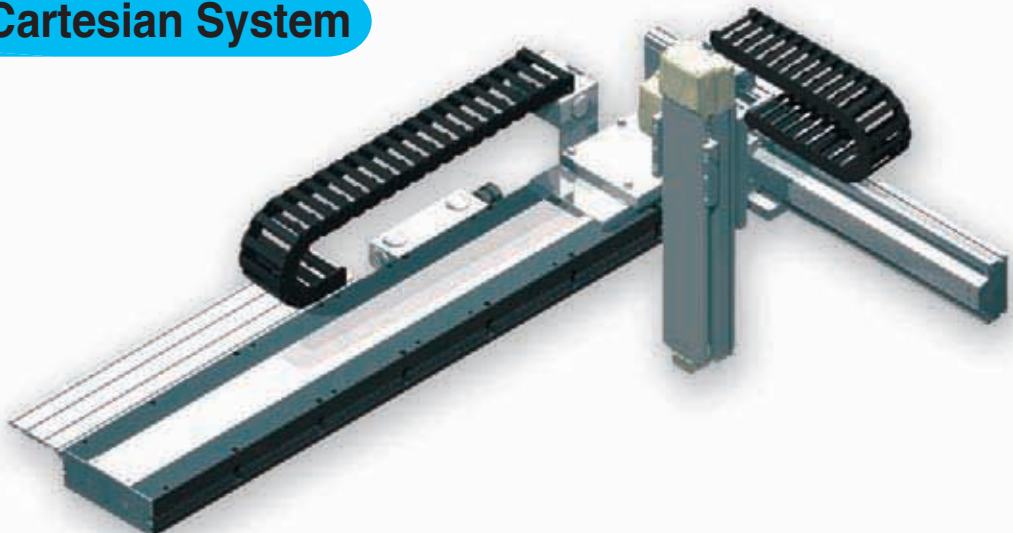
NS - ISPA Cartesian System
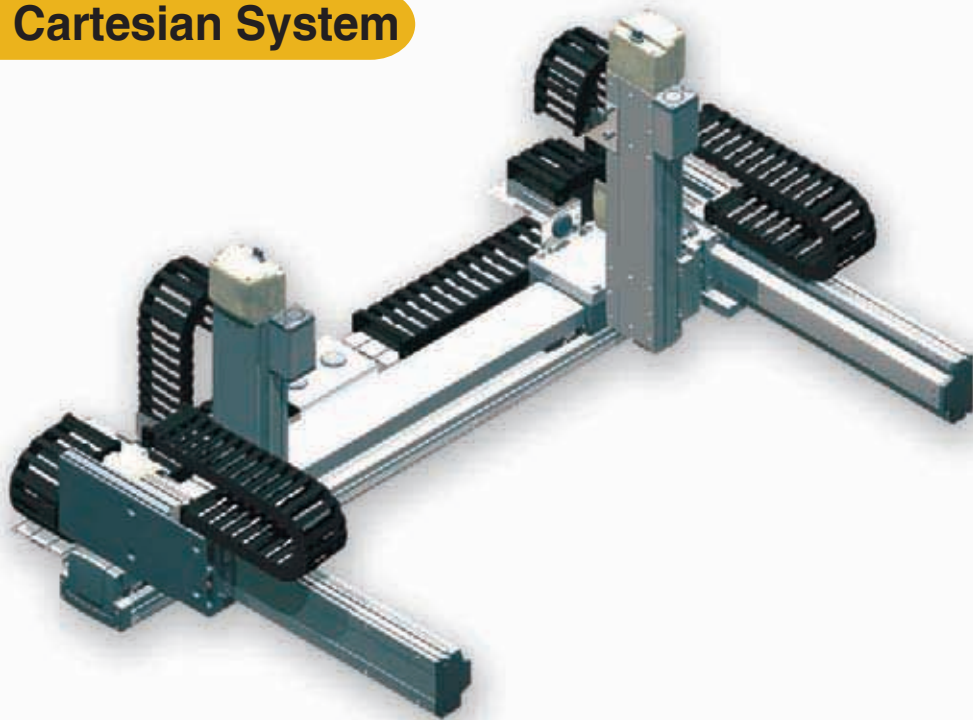
Combined actuator units of linear motor type offering excellent acceleration/deceleration performance

High-thrust linear motors enable operation requiring a long stroke (up to 4155 mm) and high acceleration/deceleration (rating: 1 G)
A desired combination can be selected from 2-axis, 3-axis, 4-axis (2 axes + 2 axes) and 6-axis (3 axes + 3 axes) configurations.
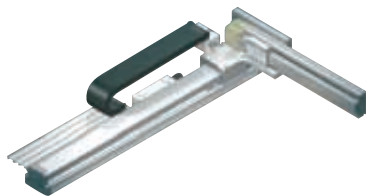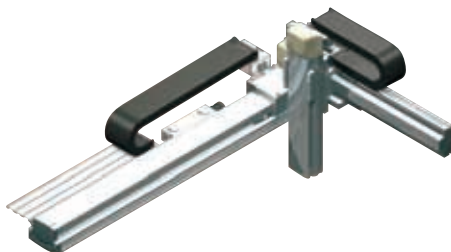
LSA - ISPA Cartesian System

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Cartesian Robots Using Nut Rotation Actuators / Large Linear Motors - Supporting Long Strokes, High-speed Moves and Multiple Sliders

NS (Nut Rotation Actuator) + ISPA

		2 axes				3 axes							
Number of combined axes													
Z-axis installation method		—				Z-axis base mount							
Series		ICSPA2				ICSPA3							
Type		B1N□H	B1N□M	B2N□H	B2N□M	B1N□HB3H	B1N□HB3M	B1N□MB3H	B1N□MB3M	B2N□HB3H	B2N□HB3M	B2N□MB3H	B2N□MB3M
Exterior View													
Stroke (mm)	X-axis	500~2200		2250~3000		500~2200				2250~3000			
	Y-axis	200~700				200~700							
	Z-axis	—				100~500							
Speed (mm/s)	X-axis	2400	1300	2400	1300	2400		1300		2400		1300	
	Y-axis	1200	1200	1200	1200	1200		1200		1200		1200	
	Z-axis	—	—	—	—	1200	600	1200	600	1200	600	1200	600
Maximum Load Capacity (kg) *1		21.2	40.0	21.2	40.0	9.0	11.2	9.0	19.0	9.0	11.2	9.0	19.0
Page		P.5	P.7	P.9	P.11	P.13		P.15		P.17		P.19	
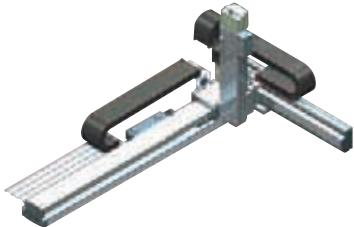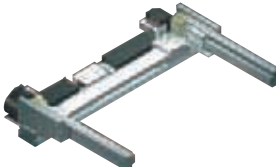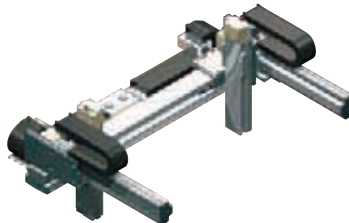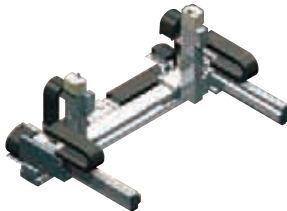
*1 : The load capacity changes according to the Y-axis stroke and Z-axis stroke. For details, check the page describing the type you are interested in.

LSA (Linear Motor) + ISPA

		2 axes	3 axes	
Number of combined axes				
Z-axis installation method		—	Z-axis base mount	
Series		ICSPA2	ICSPA3	
Type		B1L□H	B1L□HB3H	B1L□HB3M
Exterior View				
Stroke (mm)	X-axis	1050~4155	1050~4155	
	Y-axis	200~400	200~400	
	Z-axis	—	100~400	
Speed (mm/s)	X-axis	2500	2500	
	Y-axis	1200	1200	
	Z-axis	—	1200	600
Maximum Load Capacity (kg) *1		21.2	9.0	11.2
Page		P.41	P.43	

*1 : The load capacity changes according to the Y-axis stroke and Z-axis stroke. For details, check the page describing the type you are interested in.

3 axes / 4 axes / 6 axes (top)

3 axes				4 axes (2 axes + 2 axes)		6 axes (3 axes + 3 axes)					
Z-axis slider mount				—		Z-axis base mount				Z-axis slider mount	
ICSPA3				ICSPA4		ICSPA6					
B1N□HS3M	B1N□MS3M	B2N□HS3M	B2N□MS3M	B3N1H	B3N1M	B3N1HB3H	B3N1HB3M	B3N1MB3H	B3N1MB3M	B3N1HS3M	B3N1MS3M
500～2200		2250～3000		250～2250		250～2250					
200～700				200～700		200～700					
100～400				—		100～500				100～400	
2400	1300	2400	1300	2400	1300	2400		1300		2400	1300
1200	1200	1200	1200	1200	1200	1200		1200		1200	1200
600	600	600	600	—	—	1200	600	1200	600	600	600
11.5	13.0	11.5	13.0	21.2	40.0	9.0	11.2	9.0	19.0	11.5	13.0
P.21	P.23	P.25	P.27	P.29	P.31	P.33		P.35		P.37	P.39

3 axes / 4 axes / 6 axes (bottom)

3 axes	4 axes (2 axes + 2 axes)	6 axes (3 axes + 3 axes)		
Z-axis slider mount	—	Z-axis base mount		Z-axis slider mount
ICSPA3	ICSPA4	ICSPA6		
B1L□HS3M	B2L1H	B2L1HB3H	B2L1HB3M	B2L1HS3M
1050～4155	730～3835	730～3835		
200～400	200～400	200～400		
100～300	—	100～400		100～300
2500	2500	2500		
1200	1200	1200		
600	—	1200	600	
11.5	21.2	9.0	11.2	11.5
P.45	P.47	P.49		P.51

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ICSPA2-B1L□H

Cartesian robot / Large linear motor type + ISA (2 axes)
XYB (Y-axis base mount) / X-axis single-slider type

■ Model Designation

ICSPA2 — B1L□H — ☐ — ☐☐☐ — ☐☐☐ — T2 — ☐ — ☐

Series	Type	Encoder Type	X-axis stroke	Options	Y-axis stroke	Options	Applicable Controller	Cable Length	Y-axis cable wiring

Series: ICSPA2: High-precision, 2-axis specification

Type: Refer to the "Model Details" table below.

Encoder Type: I: Incremental specification

X-axis stroke: 105:1050 mm ～ 415:4155 mm (135 mm increments)

Options: Refer to the "Options" table below

Y-axis stroke: 20:200 mm ～ 40:400 mm (50 mm increments)

Options: Refer to the "Options" table below

Applicable Controller: T2:SCON SSEL XSEL-P/Q

Cable Length: 3L: 3 m 5L: 5 m □L: Specified length

Y-axis cable wiring: CT: Cable track

Model Details

Encoder Type	XY combination direction (*)	Model**
Incremental	1	ICSPA2-B1L1H-I- ①L-②AQ-T2- ③-④
	2	ICSPA2-B1L2H-I- ①L-②AQ-T2- ③-④
	3	ICSPA2-B1L3H-I- ①L-②AQ-T2- ③-④
	4	ICSPA2-B1L4H-I- ①L-②AQ-T2- ③-④

* Refer to the figure below for the XY combination directions.
** Refer to the table on the right for the details of ① to ④ in the model names shown above.

Explanation of Model Codes

No.	Description	Meaning
①	X-axis stroke (Note 1)	105 : 1050mm ～ 415 : 4155mm
②	Y-axis stroke (Note 1)	20 : 200mm ～ 40 : 400mm
③	Cable Length (Note 2)	3L : 3m 5L : 5m □L : □m
④	Y-axis cable wiring	CT : Cable track

* The above explains the details of ① to ④ in the model names shown to the left.

XY Combination Direction

Component Axes

Component Axes	Model
X-axis	LSA-W21SS-I-400 - (Stroke) -T2-L-①
Y-axis	ISPA-MYM-I-200-20- (Stroke) -T2-AQ

※ Enter NT1 or NT2 into ① above.
NT1: Enter for cartesian combination direction 1 or 3
NT2: Enter for cartesian combination direction 2 or 4

Note) Nut rotation and large linear motor type require a cable track even for single-axis use, but when combined with cartesian robot, they use a different cable track. In this case, the specification will be for no cable track (NT1 or NT2).

Options

Specify each applicable option code after the stroke of each axis.
If you are selecting multiple options, specify them in an alphabetical order.

Name	Model	Reference page	Remarks
AQ seal	AQ	P53	Standard Feature on Y-axis
Brake	B	P53	Limited to Y-axis
Creep sensor	C	P53	Limited to Y-axis
Home limit switch	L	P53	Standard Feature on X-axis
Opposite home specification	NM	P53	Limited to Y-axis

Common Specifications

Drive method	X-axis: Linear servo motor
	Y-axis: Ball screw, rolled, C5 equivalent
Positioning repeatability	X-axis: ±0.005 mm
	Y-axis: ±0.01 mm
Lost motion	0.02 mm or less
Guide	X-axis: Linear guide
	Y-axis: Guide integrated with the base
Base	X-axis: Material: Aluminum with black alumite treatment
	Y-axis: Material: Aluminum with white alumite treatment
X-axis motor output/lead	Equivalent to 400 W/(none)
Y-axis motor output/lead	200 W/20 mm

Maximum Speed by Stroke (mm/s)

	200	300	400	1050～4155
X-axis	–	–	–	2500
Y-axis	1200			–

Load Capacity by Acceleration (kg) (note 3)

		Y-axis stroke				
		200	250	300	350	400
Acceleration	X-axis 1.0 G Y-axis 0.3 G	21.2	20.0	20.0	17.4	15.2

⚠ Caution

(Note 1) Strokes are indicated in cm (centimeters) in model names.
(Note 2) The cable length indicates the length from the X-axis connector box to the controller. Although the standard cable is 3 m or 5 m long, other lengths can be specified in units of meters. The maximum cable length is 20 m.
(Note 3) The rated acceleration is 1 G for the X-axis and 0.3 G for the Y-axis. Although the Y-axis can operate at accelerations of up to 1G, increasing the acceleration decreases the load capacity. (Contact IAI for load capacities at higher accelerations.)

ICSPA2-B1L□H

Dimensions

You can download CAD drawings from our website.

2D CAD

ME: Mechanical end
SE: Stroke end

Detail view of Y-axis slider

90 (Tolerance for reamed hole pitch: ±0.02)

2-φ8 H7, reamed depth 10

4-M6 depth 20
4-M8 depth 20

Y:STROKE+537.5
Y:STROKE+404
Y:STROKE

5 (Y: between ME and SE)

7 (X: between ME and SE)

X:STROKE
X:STROKE+360

Section view of cable track
※ The dimensions in parentheses apply to the cable track between Y and Z.

User space

C-φ9 through, depth 16, counterbored (from opposite side)

φ8 H7, reamed depth 10 (standard installation)

F-M8, depth 20

Ex200P
G

Bx200P
A

C-φ9, through
(refer to the detail view of base mounting hole)

slot

Detail view of X-axis base mounting hole

Detail view of slot in X-axis base

Slot, depth 10

X Stroke	1050	1185	1320	1455	1590	1725	1860	1995	2130	2265	2400	2535
A	205	72.5	140	207.5	75	142.5	210	77.5	145	212.5	80	147.5
B	5	7	7	7	9	9	9	11	11	11	13	13
C	12	16	16	16	20	20	20	24	24	24	28	28
D	105	172.5	40	107.5	175	42.5	110	177.5	45	112.5	180	47.5
E	6	6	8	8	8	10	10	10	12	12	12	14
F	14	14	18	18	18	22	22	22	26	26	26	30
G	1200	1200	1600	1600	1600	2000	2000	2000	2400	2400	2400	2800

X Stroke	2670	2805	2940	3075	3210	3345	3480	3615	3750	3885	4020	4155
A	215	82.5	150	217.5	85	152.5	220	87.5	155	222.5	90	157.5
B	13	15	15	15	17	17	17	19	19	19	21	21
C	28	32	32	32	36	36	36	40	40	40	44	44
D	115	182.5	50	117.5	185	52.5	120	187.5	55	122.5	190	57.5
E	14	14	16	16	16	18	18	18	20	20	20	22
F	30	30	34	34	34	38	38	38	42	42	42	46
G	2800	2800	3200	3200	3200	3600	3600	3600	4000	4000	4000	4400

ICSPA3-B1 L □HB3□

Cartesian robot/Large linear motor type + ISA (3 axes)
X-axis single-slider type. Z-axis base mount type

■ Model Designation **ICSPA3**– **B1L□HB3□** – □ – □ – □ – □ – **T2** – □ – □ – □

Series	Type	Encoder Type	X-axis stroke	Options	Y-1/Y-2 axis stroke	Options	Z-1/Z-2 axis stroke	Options	Applicable Controller	Cable Length	Y/Z axis cable wiring	Z-axis cable wiring
ICSPA3: High-precision, 3-axis specification	Refer to the "Model Details" table below.	I: Incremental specification	105:1050 mm ～ 415:4155 mm (135 mm increments)	Refer to the "Options" table below	20:200 mm ～ 40:400 mm (50 mm increments)	Refer to the "Options" table below	10:100mm ～ 40:400mm (50 mm increments)	Refer to the "Options" table below	T2:SCON SSEL XSEL-P/Q	3L: 3 m 5L: 5 m □L: Specified length	CT: Cable track (standard)	

Model Details

Encoder Type	XY combination direction (*)	Z-axis speed type	Model**
Incremental	1	H	ICSPA3-B1L1HB3H-I- ①L-②AQ- ③AQB-T2- ④-⑤
		M	ICSPA3-B1L1HB3M-I- ①L-②AQ- ③AQB-T2- ④-⑤
	2	H	ICSPA3-B1L2HB3H-I- ①L-②AQ- ③AQB-T2- ④-⑤
		M	ICSPA3-B1L2HB3M-I- ①L-②AQ- ③AQB-T2- ④-⑤
	3	H	ICSPA3-B1L3HB3H-I- ①L-②AQ- ③AQB-T2- ④-⑤
		M	ICSPA3-B1L3HB3M-I- ①L-②AQ- ③AQB-T2- ④-⑤
	4	H	ICSPA3-B1L4HB3H-I- ①L-②AQ- ③AQB-T2- ④-⑤
		M	ICSPA3-B1L4HB3M-I- ①L-②AQ- ③AQB-T2- ④-⑤

* Refer to the figure below for the XY combination directions.
** Refer to the table on the right for the details of ① to ⑤ in the model names shown above.

Explanation of Model Codes

No.	Description	Meaning
①	X-axis stroke (Note 1)	105 : 1050mm ～ 415 : 4155mm
②	Y-axis stroke (Note 1)	20 : 200mm ～ 40 : 400mm
③	Z-axis stroke (Note 1)	10 : 100mm ～ 40 : 400mm
④	Cable Length (Note 2)	3L : 3m 5L : 5m □L : □m
⑤	Y/Z-axis cable wiring	CT : Cable track

* The above explains the details of ① to ⑤ in the model names shown to the left.

XY Combination Direction

Combination direction: 1
(Range of operation)

Combination direction: 2
(Opposite direction of 1)
(Range of operation)

Combination direction: 3
(Y-axis installed in reverse direction)
(Range of operation)

Combination direction: 4
(Opposite direction of 3)
(Range of operation)

Options

Specify each applicable option code after the stroke of each axis.
If you are selecting multiple options, specify them in an alphabetical order.

Name	Model	Reference page	Remarks
AQ seal	AQ	P53	Standard Feature on Y/Z-axes
Brake	B	P53	Limited to Y/Z-axes (Z standard)
Creep sensor	C	P53	Limited to Y/Z-axes
Home limit switch	L	P53	Standard Feature on X-axis
Opposite home specification	NM	P53	Limited to Y/Z-axes

Common Specifications

Drive method	X-axis: Linear servo motor
	Y-axis: Ball screw, rolled, C5 equivalent
Positioning repeatability	X-axis: ±0.005 mm
	Y-axis: ±0.01 mm
Lost motion	0.02 mm or less
Guide	X-axis: Linear guide
	Y/Z-axis: Guide integrated with the base
Base	X-axis: Material: Aluminum with black alumite treatment
	Y/Z-axis: Material: Aluminum with white alumite treatment
X-axis motor output/lead	Equivalent to 400 W/(none)
Y-axis motor output/lead	200 W/20 mm
Z-axis motor output/lead	200 W/20 mm (10 mm)

* The value in parentheses applies to the Z-axis medium-speed specification.

Component Axes

Component Axes	Model
X-axis	LSA-W21SS-I-400 - (Stroke) -T2-L- ①
Y-axis	ISPA-MYM-I-200-20- (Stroke) -T2-AQ
Z-axis	ISPA-MXM-I-200-20 (10)-(Stroke) -T2-AQ-B

* Enter NT1 or NT2 into ① above.
NT1: Enter for cartesian combination direction 1 or 3
NT2: Enter for cartesian combination direction 2 or 4
Note) Nut rotation and large linear motor type require a cable track even for single-axis use, but when combined with cartesian robot, they use a different cable track. In this case, the specification will be for no cable track (NT1 or NT2).
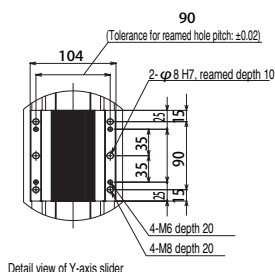
⚠ **Caution**

(Note 1) Strokes are indicated in cm (centimeters) in model names.
(Note 2) The cable length indicates the length from the X-axis connector box to the controller. Although the standard cable is 3 m or 5 m long, other lengths can be specified in units of meters. The maximum cable length is 20 m.
(Note 3) The rated acceleration is 1 G for the X-axis and 0.3 G for the Y-axis and Z-axis.. Although the Y-axis can operate at accelerations of up to 1 G, increasing the acceleration decreases the load capacity. (Contact IAI for load capacities at higher accelerations.)
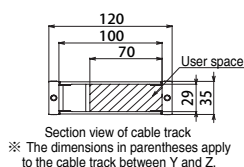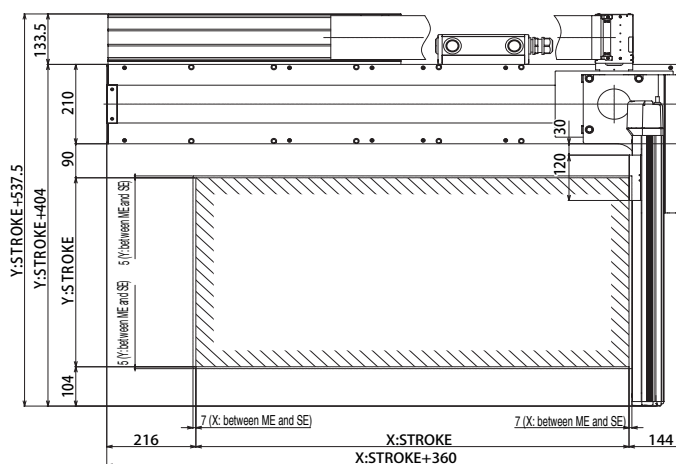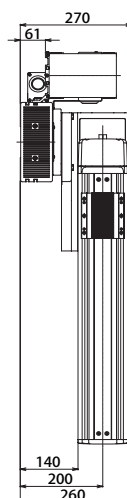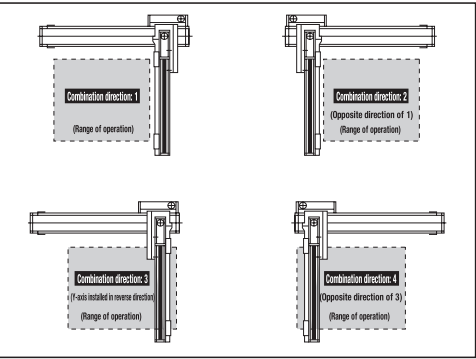
ICSPA3-B1L□HB3□

Load Capacity (kg)

■B1L□HB3H

		Y-axis Stroke				
		200	250	300	350	400
Z-axis Stroke	100	9.0			7.2	5.0
	~200	9.0	8.9		6.3	4.0
	~300	9.0	7.9		5.3	3.0
	~400	8.2	6.9		4.3	2.0

■B1L□HB3M

		Y-axis Stroke				
		200	250	300	350	400
Z-axis Stroke	100	11.2	9.0		7.2	5.0
	~200	10.2	8.9		6.3	4.0
	~300	9.2	7.9		5.3	3.0
	~400	8.2	6.9		4.3	2.0

Maximum Speed by Stroke (mm/s)

■B1L□HB3H

	Stroke				
	100	200	300	400	1050~4155
X-axis	–	–	–	–	2500
Y-axis	–	1200			–
Z-axis	1200				–

■B1L□HB3M

	Stroke				
	100	200	300	400	1050~4155
X-axis	–	–	–	–	2500
Y-axis	–	1200			–
Z-axis	600				–

Dimensions

You can download CAD drawings from our website.

2D CAD

ME: Mechanical end
SE: Stroke end

Detail view of Z-axis slider

Section view of cable track
※ The dimensions in parentheses apply to the cable track between Y and Z.

Detail view of X-axis base mounting hole

Detail view of slot in X-axis base

φ8 H7, reamed depth 10 (standard installation)

F-M8, depth 20

Slot

C-φ9, through
(refer to the detail view of base mounting hole)

X Stroke	1050	1185	1320	1455	1590	1725	1860	1995	2130	2265	2400	2535
A	205	72.5	140	207.5	75	142.5	210	77.5	145	212.5	80	147.5
B	5	7	7	7	9	9	9	11	11	11	13	13
C	12	16	16	16	20	20	20	24	24	24	28	28
D	105	172.5	40	107.5	175	42.5	110	177.5	45	112.5	180	47.5
E	6	6	8	8	8	10	10	10	12	12	12	14
F	14	14	18	18	18	22	22	22	26	26	26	30
G	1200	1200	1600	1600	1600	2000	2000	2000	2400	2400	2400	2800

X Stroke	2670	2805	2940	3075	3210	3345	3480	3615	3750	3885	4020	4155
A	215	82.5	150	217.5	85	152.5	220	87.5	155	222.5	90	157.5
B	13	15	15	15	17	17	17	19	19	19	21	21
C	28	32	32	32	36	36	36	40	40	40	44	44
D	115	182.5	50	117.5	185	52.5	120	187.5	55	122.5	190	57.5
E	14	14	16	16	16	18	18	18	20	20	20	22
F	30	30	34	34	34	38	38	38	42	42	42	46
G	2800	2800	3200	3200	3200	3600	3600	3600	4000	4000	4000	4400

ICSPA3-B1 L□HS3M

Cartesian robot / Large linear motor type + ISA (3 axes)
X-axis single-slider type Z-axis slider mount

■Model Designation **ICSPA3**– **B1L□HS3M** – □ – □□ – □□ – □□ – **T2** – □ – □ – □

Series	—	Type	—Encoder Type	—X-axis stroke	Options	—Y-1/Y-2 axis stroke	Options	—Z-1/Z-2 axis stroke	Options	—Applicable Controller	— Cable Length	—Y-axis cable wiring	—Z-axis cable wiring

ICSPA3: High-precision, 3-axis specification | Refer to the "Model Details" table below. | I: Incremental specification | 105:1050 mm ~ 415:4155 mm (135 mm increments) | Refer to the "Options" table below | 20:200 mm ~ 40:400 mm (50 mm increments) | Refer to the "Options" table below | 10:100mm ~ 30:300mm (50 mm increments) | Refer to the "Options" table below | T2:SCON SSEL XSEL-P/Q | 3L : 3 m 5L : 5 m □L : Specified length | CT: Cable track (standard)

Model Details

Encoder Type	XY combination direction (*)	Z-axis speed type	Model**
Incremental	1	M	ICSPA3-B1L1HS3M-I- ①L-②AQ-③AQBNM-T2-④-⑤
	2	M	ICSPA3-B1L2HS3M-I- ①L-②AQ-③AQBNM-T2-④-⑤
	3	M	ICSPA3-B1L3HS3M-I- ①L-②AQ-③AQBNM-T2-④-⑤
	4	M	ICSPA3-B1L4HS3M-I- ①L-②AQ-③AQBNM-T2-④-⑤

* Refer to the figure below for the XY combination directions.
** Refer to the table on the right for the details of ① to ⑤ in the model names shown above.

Explanation of Model Codes

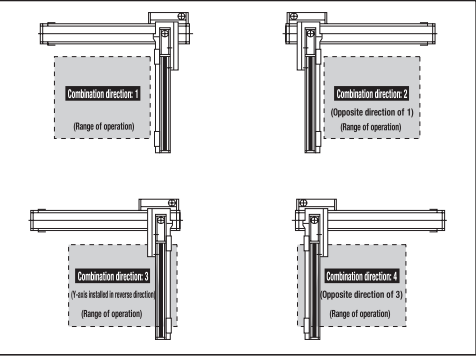| No.	Description	Meaning
①	X-axis stroke (Note 1)	105 : 1050mm ~ 415 : 4155mm
②	Y-axis stroke (Note 1)	20 : 200mm ~ 40 : 400mm
③	Z-axis stroke (Note 1)	10 : 100mm ~ 30 : 300mm
④	Cable Length (Note 2)	3L : 3m 5L : 5m □L : □m
⑤	Y/Z-axis cable wiring	CT : Cable track

* The above explains the details of ① to ⑤ in the model names shown to the left.

XY Combination Direction

Combination direction: 1 (Range of operation)

Combination direction: 2 (Opposite direction of 1) (Range of operation)

Combination direction: 3 (Y-axis installed in reverse direction) (Range of operation)

Combination direction: 4 (Opposite direction of 3) (Range of operation)

Options

Specify each applicable option code after the stroke of each axis.
If you are selecting multiple options, specify them in an alphabetical order.

Name	Model	Reference page	Remarks
AQ seal	AQ	P53	Standard Feature on Y/Z-axes
Brake	B	P53	Limited to Y/Z-axes (Z standard)
Creep sensor	C	P53	Limited to Y/Z-axes
Home limit switch	L	P53	Standard Feature on X-axis
Opposite home specification	NM	P53	Limited to Y/Z-axes (Z standard)

Common Specifications

Drive method	X-axis: Linear servo motor
	Y-axis: Ball screw, rolled, C5 equivalent
Positioning repeatability	X-axis: ±0.005 mm
	Y-axis: ±0.01 mm
Lost motion	0.02 mm or less
Guide	X-axis: Linear guide
	Y/Z-axis: Guide integrated with the base
Base	X-axis: Material: Aluminum with black alumite treatment
	Y/Z-axis: Material: Aluminum with white alumite treatment
X-axis motor output/lead	Equivalent to 400 W/(none)
Y-axis motor output/lead	200 W/20 mm
Z-axis motor output/lead	200 W/10 mm

Component Axes

Component Axes	Model
X-axis	LSA-W21SS-I-400 - (Stroke) -T2-L-①
Y-axis	ISPA-MYM-I-200-20-(Stroke)-T2-AQ
Z-axis	ISPA-MXM-I-200-10-(Stroke)-T2-AQ-B-NM

* Enter NT1 or NT2 into ① above.
  NT1: Enter for cartesian combination direction 1 or 3
  NT2: Enter for cartesian combination direction 2 or 4
Note) Nut rotation and large linear motor type require a cable track even for single-axis use, but when combined with cartesian robot, they use a different cable track. In this case, the specification will be for no cable track (NT1 or NT2).

⚠ **Caution**
(Note 1) Strokes are indicated in cm (centimeters) in model names.
(Note 2) The cable length indicates the length from the X-axis connector box to the controller. Although the standard cable is 3 m or 5 m long, other lengths can be specified in units of meters. The maximum cable length is 20 m.
(Note 3) The rated acceleration is 1 G for the X-axis and 0.3 G for the Y-axis and Z-axis. Although the Y-axis can operate at accelerations of up to 1 G, increasing the acceleration decreases the load capacity. (Contact IAI for load capacities at higher accelerations.)

ICSPA3-B1L□HS3M

Load Capacity (kg)

■B1L□HS3M

		Y-axis Stroke				
		200	250	300	350	400
Z-axis Stroke	100	11.5	10.2		7.6	5.3
	~200	10.5	9.2		6.6	4.3
	~300	9.5	8.2		5.5	3.3

Maximum Speed by Stroke (mm/s)

■B1L□HS3M

	Stroke				
	100	200	300	400	1050~4155
X-axis	–	–	–	–	2500
Y-axis	–	1200			–
Z-axis	600			–	–

Dimensions

You can download CAD drawings from our website.

2D CAD

ME: Mechanical end
SE: Stroke end

6-M8, depth 20
2-8φH7 reamed
100±0.02

Z-axis base detail

Section view of cable track
※ The dimensions in parentheses apply to the cable track between Y and Z.

Detail view of X-axis base mounting hole   Detail view of slot in X-axis base

Slot, depth5

φ8H7, reamed depth 10 (standard installation)
F-M8, depth 20

X Stroke	1050	1185	1320	1455	1590	1725	1860	1995	2130	2265	2400	2535
A	205	72.5	140	207.5	75	142.5	210	77.5	145	212.5	80	147.5
B	5	7	7	7	9	9	9	11	11	11	13	13
C	12	16	16	16	20	20	20	24	24	24	28	28
D	105	172.5	40	107.5	175	42.5	110	177.5	45	112.5	180	47.5
E	6	6	8	8	8	10	10	10	12	12	12	14
F	14	14	18	18	18	22	22	22	26	26	26	30
G	1200	1200	1600	1600	1600	2000	2000	2000	2400	2400	2400	2800

X Stroke	2670	2805	2940	3075	3210	3345	3480	3615	3750	3885	4020	4155
A	215	82.5	150	217.5	85	152.5	220	87.5	155	222.5	90	157.5
B	13	15	15	15	17	17	17	19	19	19	21	21
C	28	32	32	32	36	36	36	40	40	40	44	44
D	115	182.5	50	117.5	185	52.5	120	187.5	55	122.5	190	57.5
E	14	14	16	16	16	18	18	18	20	20	20	22
F	30	30	34	34	34	38	38	38	42	42	42	46
G	2800	2800	3200	3200	3200	3600	3600	3600	4000	4000	4000	4400

ICSPA4-B2L1H
Cartesian robot/Large linear motor type + ISA (4 axes: 2 axes + 2 axes)
XYB (Y-axis base mount) / X-axis multi-slider type

■ Model Designation ICSPA4 — B2L1H — ☐ — ☐ ☐ — T2 — ☐ — ☐

Series	Type	Encoder Type	X-axis stroke	Options	Y-axis stroke	Options	Applicable Controller	Cable Length	Y-axis cable wiring
ICSPA4: High-precision, 4-axis (2 axes + 2 axes) specification	Refer to the "Model Details" table below.	I: Incremental specification	73:730 mm ∫ 383:3835 mm (135 mm increments)	Refer to the "Options" table below	20:200 mm ∫ 40:400 mm (50 mm increments)	Refer to the "Options" table below	T2:SCON SSEL XSEL-P/Q	3L: 3 m 5L: 5 m ☐L: Specified length	CT: Cable track
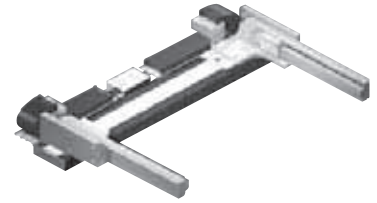
Model Details

Encoder Type	XY combination direction (*)	Model**
Incremental	1	ICSPA4-B2L1H-I- ①L-②AQ-T2- ③-④

* Refer to the figure below for the XY combination directions.
** Refer to the table on the right for the details of ① to ④ in the model names shown above.

Explanation of Model Codes

No.	Description	Meaning
①	X-axis stroke (Note 1)	73 : 730mm ∫ 383 : 3835mm
②	Y-axis stroke (Note 1)	20 : 200mm ∫ 40 : 400mm
③	Cable Length (Note 2)	3L : 3m 5L : 5m ☐L : ☐m
④	Y-axis cable wiring	CT : Cable track

* The above explains the details of ① to ④ in the model names shown to the left.

XY Combination Direction

Combination direction: 1
(Range of operation)

Component Axes

Component Axes	Model
X-axis	LSA-W21SM-I-400 - (Stroke) -T2-L-NT-1
Y1-axis	ISPA-MYM-I-200-20- (Stroke) -T2-AQ
Y2-axis	ISPA-MYM-I-200-20- (Stroke) -T2-AQ

Note) Nut rotation and large linear motor type require a cable track even for single-axis use, but when combined with cartesian robot, they use a different cable track. In this case, the specification will be for no cable track (NT1 or NT2).

Options

Specify each applicable option code after the stroke of each axis.
If you are selecting multiple options, specify them in an alphabetical order.

Name	Model	Reference page	Remarks
AQ seal	AQ	P53	Standard Feature on Y-axis
Brake	B	P53	Limited to Y-axis
Creep sensor	C	P53	Limited to Y-axis
Home limit switch	L	P53	Standard Feature on X-axis
Opposite home specification	NM	P53	Limited to Y-axis

Common Specifications

Drive method	X-axis: Linear servo motor
	Y-axis: Ball screw, rolled, C5 equivalent
Positioning repeatability	X-axis: ±0.005 mm
	Y-axis: ±0.01 mm
Lost motion	0.02 mm or less
Guide	X-axis: Linear guide
	Y-axis: Guide integrated with the base
Base	X-axis: Material: Aluminum with black alumite treatment
	Y-axis: Material: Aluminum with white alumite treatment
X-axis motor output/lead	Equivalent to 400 W/(none)
Y-axis motor output/lead	200 W/20 mm

Maximum Speed by Stroke (mm/s)

	200	300	400	730~3835
X-axis	—	—	—	2500
Y-axis	1200			—

Load Capacity by Acceleration (kg) (note 3)

		Y-axis stroke				
		200	250	300	350	400
Acceleration	X-axis 1.0 G Y-axis 0.3 G	21.2	20.0	20.0	17.4	15.2

⚠ **Caution**
(Note 1) Strokes are indicated in cm (centimeters) in model names.
(Note 2) The cable length indicates the length from the X-axis connector box to the controller. Although the standard cable is 3 m or 5 m long, other lengths can be specified in units of meters. The maximum cable length is 20 m.
(Note 3) The rated acceleration is 1 G for the X-axis and 0.3 G for the Y-axis. Although the Y-axis can operate at accelerations of up to 1 G, increasing the acceleration decreases the load capacity. (Contact IAI for load capacities at higher accelerations.)
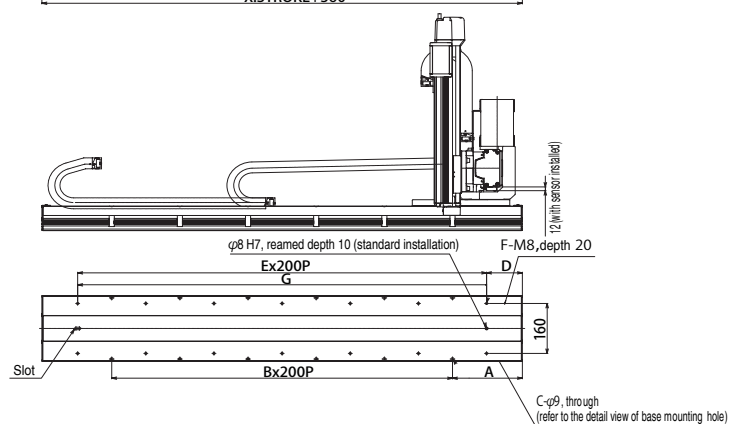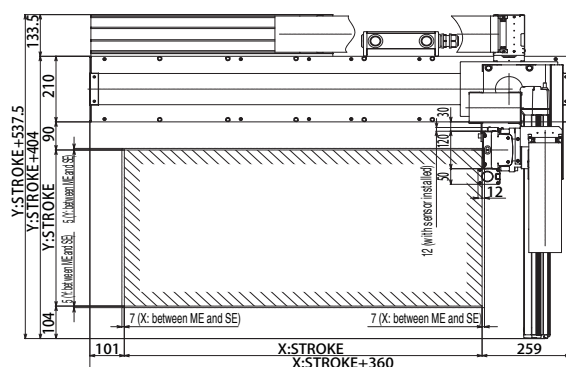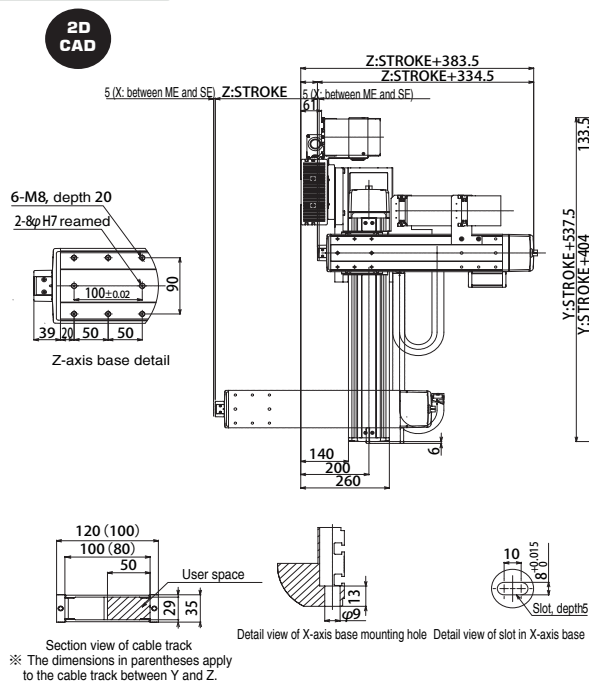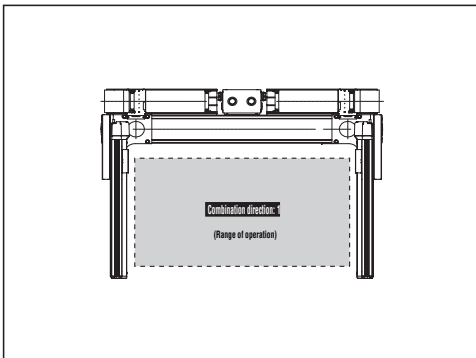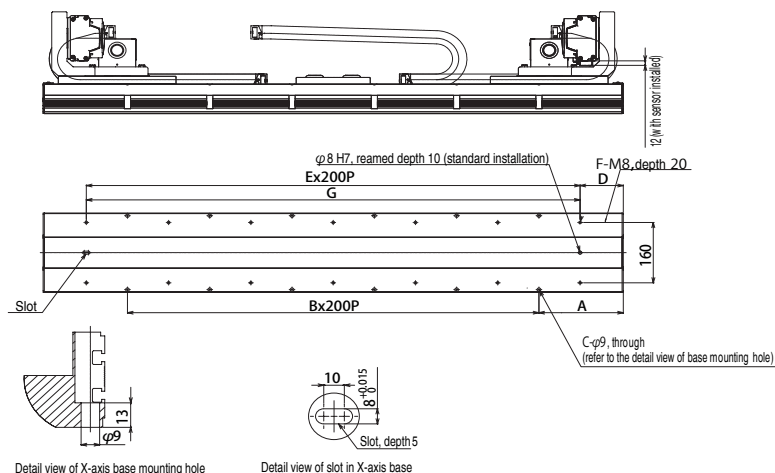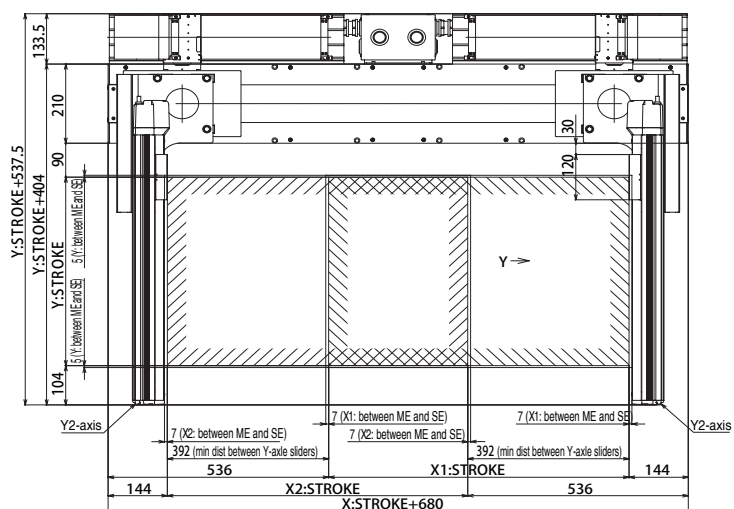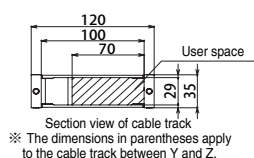
ICSPA4-B2L☐H

Dimensions

You can download CAD drawings from our website.

2D CAD

ME: Mechanical end
SE: Stroke end

270
61

90
(Tolerance for reamed hole pitch: ±0.02)
104
2- φ 8 H7, reamed depth 10
4-M6 depth 20
4-M8 depth 20

Detail view of Y-axis slider

120
100
70
User space
29
35

Section view of cable track
※ The dimensions in parentheses apply to the cable track between Y and Z.

Y:STROKE+537.5
Y:STROKE+404
Y:STROKE
133.5
210
90
104
5 (Y: between ME and SE)
5 (Y: between ME and SE)
30
120

Y →

Y2-axis
7 (X2: between ME and SE)
392 (min dist between Y-axle sliders)
536
7 (X1: between ME and SE)
7 (X2: between ME and SE)
7 (X1: between ME and SE)
392 (min dist between Y-axle sliders)
536
Y2-axis
144
X2:STROKE
X1:STROKE
144
X:STROKE+680

φ 8 H7, reamed depth 10 (standard installation)
Ex200P
G
F-M8,depth 20
D
160
Slot
Bx200P
A
C-φ9, through
(refer to the detail view of base mounting hole)
2 (w ith sensor installed)

13
φ9
Detail view of X-axis base mounting hole

10
8 +0.015
0
Slot, depth 5
Detail view of slot in X-axis base

X Stroke	730	865	1000	1135	1270	1405	1540	1675	1810	1945	2080	2215
A	205	72.5	140	207.5	75	142.5	210	77.5	145	212.5	80	147.5
B	5	7	7	7	9	9	9	11	11	11	13	13
C	12	16	16	16	20	20	20	24	24	24	28	28
D	105	172.5	40	107.5	175	42.5	110	177.5	45	112.5	180	47.5
E	6	6	8	8	8	10	10	10	12	12	12	14
F	14	14	18	18	18	22	22	22	26	26	26	30
G	1200	1200	1600	1600	1600	2000	2000	2000	2400	2400	2400	2800

X Stroke	2350	2485	2620	2755	2890	3025	3160	3295	3430	3565	3700	3835
A	215	82.5	150	217.5	85	152.5	220	87.5	155	222.5	90	157.5
B	13	15	15	15	17	17	17	19	19	19	21	21
C	28	32	32	32	36	36	36	40	40	40	44	44
D	115	182.5	50	117.5	185	52.5	120	187.5	55	122.5	190	57.5
E	14	14	16	16	16	18	18	18	20	20	20	22
F	30	30	34	34	34	38	38	38	42	42	42	46
G	2800	2800	3200	3200	3200	3600	3600	3600	4000	4000	4000	4400

ICSPA6-B2L1HB3□

Cartesian robot/Large linear motor type + ISA (6 axes: 3 axes + 3 axes)
X-axis multi-slider type Z-axis base mount type

■ **Model Designation** **ICSPA6**– **B2L1HB3□** – □ – □ – □□□ – □□ – **T2** – □□ – □□ – □

Series	Type	Encoder Type	X-axis stroke	Options	Y-1/Y-2 axis stroke	Options	Z-1/Z-2 axis stroke	Options	Applicable Controller	Cable Length	Y-axis cable wiring	Z-axis cable wiring

ICSPA3: High-precision, 3-axis specification

I: Incremental specification

Refer to the "Model Details" table below.

73:730mm ～ 385:3835 mm (135 mm increments)

Refer to the "Options" table below

20:200 mm ～ 40:400 mm (50 mm increments)

Refer to the "Options" table below

10:100mm ～ 40:400mm (50 mm increments)

Refer to the "Options" table below

T2:SCON SSEL XSEL-P/Q

3L: 3 m
5L: 5 m
□L: Specified length

CT: Cable track (standard)

Model Details

Encoder Type	XY combination direction (*)	Z-axis speed type	Model**
Incremental	1	H	ICSPA6-B2L1HB3H-I- ①L- ②AQ- ③AQB-T2- ④- ⑤
		M	ICSPA6-B2L1HB3M-I- ①L- ②AQ- ③AQB-T2- ④- ⑤

* Refer to the figure below for the XY combination directions.
** Refer to the table on the right for the details of ① to ⑤ in the model names shown above.

Explanation of Model Codes

No.	Description	Meaning
①	X-axis stroke (Note 1)	73 : 730mm ～ 383 : 3835mm
②	Y-axis stroke (Note 1)	20 : 200mm ～ 40 : 400mm
③	Z-axis stroke (Note 1)	10 : 100mm ～ 40 : 400mm
④	Cable Length (Note 2)	3L : 3m 5L : 5m □L : □m
⑤	Y/Z-axis cable wiring	CT : Cable track

* The above explains the details of ① to ⑤ in the model names shown to the left.

XY Combination Direction

Combination direction: 1
(Range of operation)

Options

Specify each applicable option code after the stroke of each axis.
If you are selecting multiple options, specify them in an alphabetical order.

Name	Model	Reference page	Remarks
AQ seal	AQ	P53	Standard Feature on Y/Z-axes
Brake	B	P53	Limited to Y/Z-axes (Z standard)
Creep sensor	C	P53	Limited to Y/Z-axes
Home limit switch	L	P53	Standard Feature on X-axis
Opposite home specification	NM	P53	Limited to Y/Z-axes (Z standard)

Common Specifications

Drive method	X-axis: Linear servo motor	
	Y-axis: Ball screw, rolled, C5 equivalent	
Positioning repeatability	X-axis: ±0.005 mm	
	Y-axis: ±0.01 mm	
Lost motion	0.02 mm or less	
Guide	X-axis: Linear guide	
	Y/Z-axis: Guide integrated with the base	
Base	X-axis: Material: Aluminum with black alumite treatment	
	Y/Z-axis: Material: Aluminum with white alumite treatment	
X-axis motor output/lead	Equivalent to 400 W/(none)	
Y-axis motor output/lead	200 W/20 mm	
Z-axis motor output/lead	200 W/20 mm (10 mm)	

* The value in parentheses applies to the Z-axis medium-speed specification.

Component Axes

Component Axes	Model
X-axis	LSA-W21SM-I-400- (Stroke)-T2-L-NT1
Y1-axis	ISPA-MYM-I-200-20- (Stroke)-T2-AQ
Y2-axis	ISPA-MYM-I-200-20- (Stroke)-T2-AQ
Z1-axis	ISPA-MXM-I-200-20 (10)-(Stroke)-T2-AQ-B
Z2-axis	ISPA-MXM-I-200-20 (10)-(Stroke)-T2-AQ-B

Note) Nut rotation and large linear motor type require a cable track even for single-axis use, but when combined with cartesian robot, they use a different cable track. In this case, the specification will be for no cable track (NT1 or NT2).

⚠ **Caution**
(Note 1) Strokes are indicated in cm (centimeters) in model names.
(Note 2) The cable length indicates the length from the X-axis connector box to the controller. Although the standard cable is 3 m or 5 m long, other lengths can be specified in units of meters. The maximum cable length is 20 m.
(Note 3) The rated acceleration is 1 G for the X-axis and 0.3 G for the Y-axis and Z-axis. Although the Y-axis can operate at accelerations of up to 1 G, increasing the acceleration decreases the load capacity. (Contact IAI for load capacities at higher accelerations.)
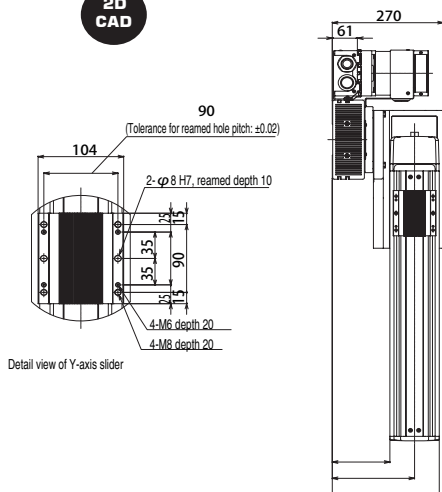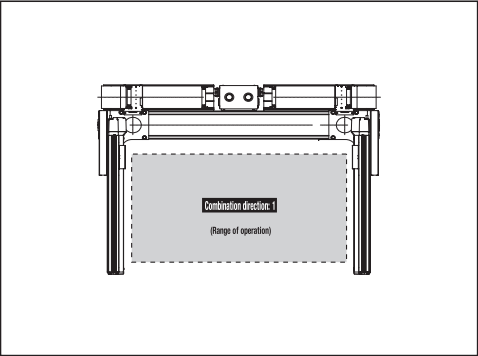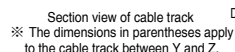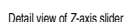
ICSPA6-B2L1HB3□

■ Load Capacity (kg)

■ B2L1HB3H

		Y-axis Stroke				
		200	250	300	350	400
Z-axis Stroke	100	9.0			7.2	5.0
	~200	9.0	8.9		6.3	4.0
	~300	9.0	7.9		5.3	3.0
	~400	8.2	6.9		4.3	2.0

■ B2L1HB3M

		Y-axis Stroke				
		200	250	300	350	400
Z-axis Stroke	100	11.2	9.0		7.2	5.0
	~200	10.2	8.9		6.3	4.0
	~300	9.2	7.9		5.3	3.0
	~400	8.2	6.9		4.3	2.0

■ Maximum Speed by Stroke (mm/s)

■ B2L1HB3H

	Stroke				
	100	200	300	400	730~3835
X-axis	–	–	–	–	2500
Y-axis	–	1200			–
Z-axis	1200				–

■ B2L1HB3M

	Stroke				
	100	200	300	400	730~3835
X-axis	–	–	–	–	2500
Y-axis	–	1200			–
Z-axis	600				–

■ Dimensions

You can download CAD drawings from our website.

2D CAD

ME: Mechanical end
SE: Stroke end

Detail view of Z-axis slider

Section view of cable track
※ The dimensions in parentheses apply to the cable track between Y and Z.

Detail view of X-axis base mounting hole

Detail view of slot in X-axis base

φ8 H7, reamed depth 10 (standard installation)

X Stroke	730	865	1000	1135	1270	1405	1540	1675	1810	1945	2080	2215
A	205	72.5	140	207.5	75	142.5	210	77.5	145	212.5	80	147.5
B	5	7	7	7	9	9	9	11	11	11	13	13
C	12	16	16	16	20	20	20	24	24	24	28	28
D	105	172.5	40	107.5	175	42.5	110	177.5	45	112.5	180	47.5
E	6	6	8	8	10	10	10	10	12	12	12	14
F	14	14	18	18	18	22	22	22	26	26	26	30
G	1200	1200	1600	1600	1600	2000	2000	2000	2400	2400	2400	2800

X Stroke	2350	2485	2620	2755	2890	3025	3160	3295	3430	3565	3700	3835
A	215	82.5	150	217.5	85	152.5	220	87.5	155	222.5	90	157.5
B	13	15	15	15	17	17	17	19	19	19	21	21
C	28	32	32	32	36	36	36	40	40	40	44	44
D	115	182.5	50	117.5	185	52.5	120	187.5	55	122.5	190	57.5
E	14	14	16	16	16	18	18	18	20	20	20	22
F	30	30	34	34	34	38	38	38	42	42	42	46
G	2800	2800	3200	3200	3200	3600	3600	3600	4000	4000	4000	4400

50

ICSPA6-B2L1HB3□

ICSPA6-B2L1HS3M

Cartesian robot / Large linear motor type + ISA (6 axes: 3 axes + 3 axes)
X-axis multi-slider type Z-axis slider mount

■Model Designation **ICSPA6**– **B2L1HS3M** – ☐ – ☐☐ – ☐☐☐ – ☐☐☐ – **T2** – ☐☐ – ☐ – ☐

Series –	Type	—Encoder Type—	X-axis stroke	Options—Y-1/Y-2 axis stroke	Options—Z-1/Z-2 axis stroke	Options—Applicable Controller—	Cable Length—Y-axis cable wiring—Z-axis cable wiring
ICSPA6: High-precision, 6-axis specification	Refer to the "Model Details" table below.	I: Incremental specification	73:730 mm ⌇ 385:3835 mm (135 mm increments)	20:200mm ⌇ 40:400 mm (50 mm increments) Refer to the "Options" table below	10:100mm ⌇ 30:300mm (50 mm increments) Refer to the "Options" table below	T2:SCON SSEL XSEL-P/Q	3L: 3 m 5L: 5 m ☐L: Specified length CT: Cable track (standard)

■ Model Details

Encoder Type	XY combination direction (*)	Z-axis speed type	Model**
Incremental	1	M	ICSPA6-B2L1HS3M-I- ①L-②AQ-③AQBNM-T2- ④-⑤

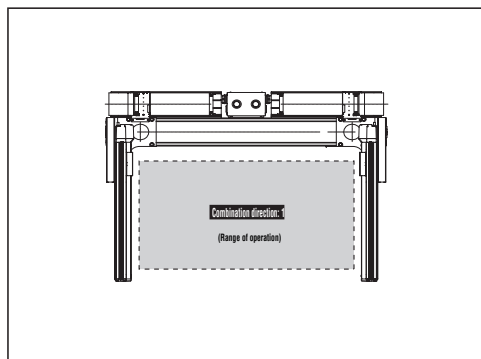* Refer to the figure below for the XY combination directions.
** Refer to the table on the right for the details of ① to ③ in the model names shown above.

■ Explanation of Model Codes

No.	Description	Meaning
①	X-axis stroke (Note 1)	73 : 730mm ⌇ 383 : 3835mm
②	Y-axis stroke (Note 1)	20 : 200mm ⌇ 40 : 400mm
③	Z-axis stroke (Note 1)	10 : 100mm ⌇ 30 : 300mm
④	Cable Length (Note 2)	3L : 3m 5L : 5m ☐L : ☐m
⑤	Y/Z-axis cable wiring	CT : Cable track

* The above explains the details of ① to ⑤ in the model names shown to the left.

■ XY Combination Direction

Combination direction: 1

(Range of operation)

■ Options

Specify each applicable option code after the stroke of each axis.
If you are selecting multiple options, specify them in an alphabetical order.

Name	Model	Reference page	Remarks
AQ seal	AQ	P53	Standard Feature on Y/Z-axes
Brake	B	P53	Limited to Y/Z-axes (Z standard)
Creep sensor	C	P53	Limited to Y/Z-axes
Home limit switch	L	P53	Standard Feature on X-axis
Opposite home specification	NM	P53	Limited to Y/Z-axes (Z standard)

■ Common Specifications

Drive method	X-axis: Linear servo motor
	Y-axis: Ball screw, rolled, C5 equivalent
Positioning repeatability	X-axis: ±0.005 mm
	Y-axis: ±0.01 mm
Lost motion	0.02 mm or less
Guide	X-axis: Linear guide
	Y/Z-axis: Guide integrated with the base
Base	X-axis: Material: Aluminum with black alumite treatment
	Y/Z-axis: Material: Aluminum with white alumite treatment
X-axis motor output/lead	Equivalent to 400 W/(none)
Y-axis motor output/lead	200 W/20 mm
Z-axis motor output/lead	200 W/10 mm

■ Component Axes

Component Axes	Model
X-axis	LSA-W21SM-I-400- (stroke) -T2-L-NT1
Y1-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Y2-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Z1-axis	ISPA-MZM-I-200-10- (stroke) -T2-AQ-B-NM
Z2-axis	ISPA-MZM-I-200-10- (stroke) -T2-AQ-B-NM

Note) Nut rotation and large linear motor type require a cable track even for single-axis use, but when combined with cartesian robot, they use a different cable track. In this case, the specification will be for no cable track (NT1 or NT2).

⚠ **Caution**

(Note 1) Strokes are indicated in cm (centimeters) in model names.
(Note 2) The cable length indicates the length from the X-axis connector box to the controller. Although the standard cable is 3 m or 5 m long, other lengths can be specified in units of meters. The maximum cable length is 20 m.
(Note 3) The rated acceleration is 1 G for the X-axis and 0.3 G for the Y-axis and Z-axis. Although the Y-axis can operate at accelerations of up to 1 G, increasing the acceleration decreases the load capacity. (Contact IAI for load capacities at higher accelerations.)
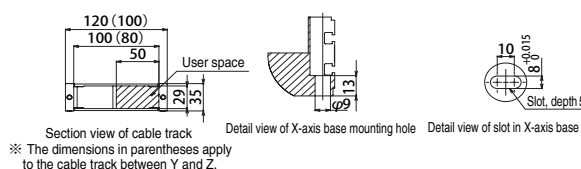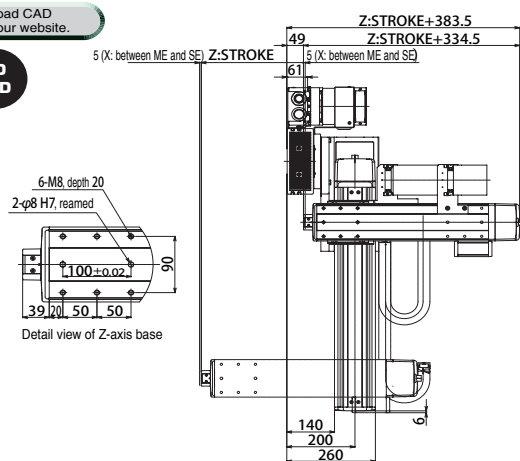
ICSPA6-B2L1HS3M

Load Capacity (kg)

■B2L1HS3M

		Y-axis Stroke				
		200	250	300	350	400
Z-axis Stroke	100	11.5	10.2		7.6	5.3
	~200	10.5	9.2		6.6	4.3
	~300	9.5	8.2		5.5	3.3

Maximum Speed by Stroke (mm/s)

■B2L1HS3M

	Stroke				
	100	200	300	400	730~3835
X-axis	–	–	–	–	2500
Y-axis	–	1200			–
Z-axis	600		–		–

Dimensions

You can download CAD drawings from our website.

2D CAD

ME: Mechanical end
SE: Stroke end

6-M8, depth 20
2-φ8 H7, reamed

Detail view of Z-axis base

Z:STROKE+383.5
Z:STROKE+334.5
5 (X: between ME and SE) Z:STROKE
5 (X: between ME and SE)

Y:STROKE+537.5
Y:STROKE+404
Y:STROKE

Section view of cable track
※ The dimensions in parentheses apply to the cable track between Y and Z.

Detail view of X-axis base mounting hole

Slot, depth 5
Detail view of slot in X-axis base

φ8 H7, reamed depth 10 (standard installation)
F-M8, depth 20
Ex200P
G
Slot
Bx200P
C-φ9, through
(refer to the detail view of base mounting hole)

X Stroke	730	865	1000	1135	1270	1405	1675	540	1810	1945	2080	2215
A	205	72.5	140	207.5	75	142.5	210	77.5	145	212.5	80	147.5
B	5	7	7	7	9	9	9	11	11	11	13	13
C	12	16	16	16	20	20	20	24	24	24	28	28
D	105	172.5	40	107.5	175	42.5	110	177.5	45	112.5	180	47.5
E	6	6	8	8	8	10	10	10	12	12	12	14
F	14	14	18	18	18	22	22	22	26	26	26	30
G	1200	1200	1600	1600	1600	2000	2000	2000	2400	2400	2400	2800

X Stroke	2350	2485	2620	2755	2890	3025	3160	3295	3430	3565	3700	3835
A	215	82.5	150	217.5	85	152.5	220	87.5	155	222.5	90	157.5
B	13	15	15	15	17	17	17	19	19	19	21	21
C	28	32	32	32	36	36	36	40	40	40	44	44
D	115	182.5	50	117.5	185	52.5	120	187.5	55	122.5	190	57.5
E	14	14	16	16	16	18	18	18	20	20	20	22
F	30	30	34	34	34	38	38	38	42	42	42	46
G	2800	2800	3200	3200	3200	3600	3600	3600	4000	4000	4000	4400

Explanation of Actuator Options

■AQ Seal [Standard Feature] *This option cannot be installed on large linear motors.

| Model | AQ |

| Explanation | The AQ seal is a lubrication unit that uses a lubricating member made by resin-hardened lubricating oil. As the AQ seal contacts the guide and ball screw, lubricating oil is supplied. This, combined with regular greasing, will keep the actuator maintenance-free for a long period. |

■Brake [Standard feature on Z-axes]   *This option cannot be installed on large linear motors.

| Model | B |

| Explanation | The brake is a holding mechanism that prevents the Z-axis slider or Z-axis itself from dropping to cause damage to the load when the power or servo is turned off. The Z-axis of each Cartesian robot comes standard with the brake. |

■Creep Sensor

| Model | C |

| Explanation | This sensor is used on actuators of incremental specifications to shorten the time of home return operation by allowing the slider to move at high speed during home return until just before the home, and then reduce the speed to the normal home return speed once the sensor is passed. The creep sensor is installed inside the actuator housing on NS actuators. It is installed on the side face of the housing on ISPA actuators. |

■Home Limit Switch [Standard feature on large linear motors]

| Model | L |

| Explanation | NS and ISPA actuators adopt the "push-motion method" for their home return operation, whereby the home is established upon sensing of phase Z after the slider has contacted the stopper and reversed. This optional home limit switch is used to reverse the slider during home return based on a proximity sensor signal, instead of slider contact with the stopper. Large linear motors come standard with the home limit switch. |

■Opposite Home Specification

| Model | NM |

| Explanation | On the standard specification, the home is set on the motor side (on the NS and LSA, the motor side means the side corresponding to the reamed holes in the base). However, you can specify the home to be set on the opposite side. (To change the home direction, the encoder must be adjusted. Accordingly, be sure to specify the opposite home option when placing your order. Note that multi-slider types do not support the opposite home specification.) |

■Guide with Ball Retention Mechanism [Standard feature] *This option cannot be installed on large linear motors.

| Model | RT |

| Explanation | This ball retention mechanism achieves a long period of maintenance-free operation and longer life, thanks to the spacers inserted between the balls (steel balls) in the guide to suppress collision between the balls. NS actuators come standard with the guide with ball retention mechanism. |

■List of Options by Axis   O: Installable   —: Not installable

	NS Actuator	ISPA Actuator	LSA Actuator
AQ seal	Standard feature	Standard feature	—
Brake	— (*1)	O	—
Creep sensor	O	O	—
Home limit switch	O	O	Standard feature
Opposite home specifikation	— (*2)	O	— (*2)
Guide with ball retention mechanism	Standard feature	O	—

(*1) Brake settings are available for vertical specification, but not for horizontal specification.
(*2) When using the X-axis in opposite home specification, follow instructions for the XY combined direction.

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SSEL

**Program controller for
one or two axes**
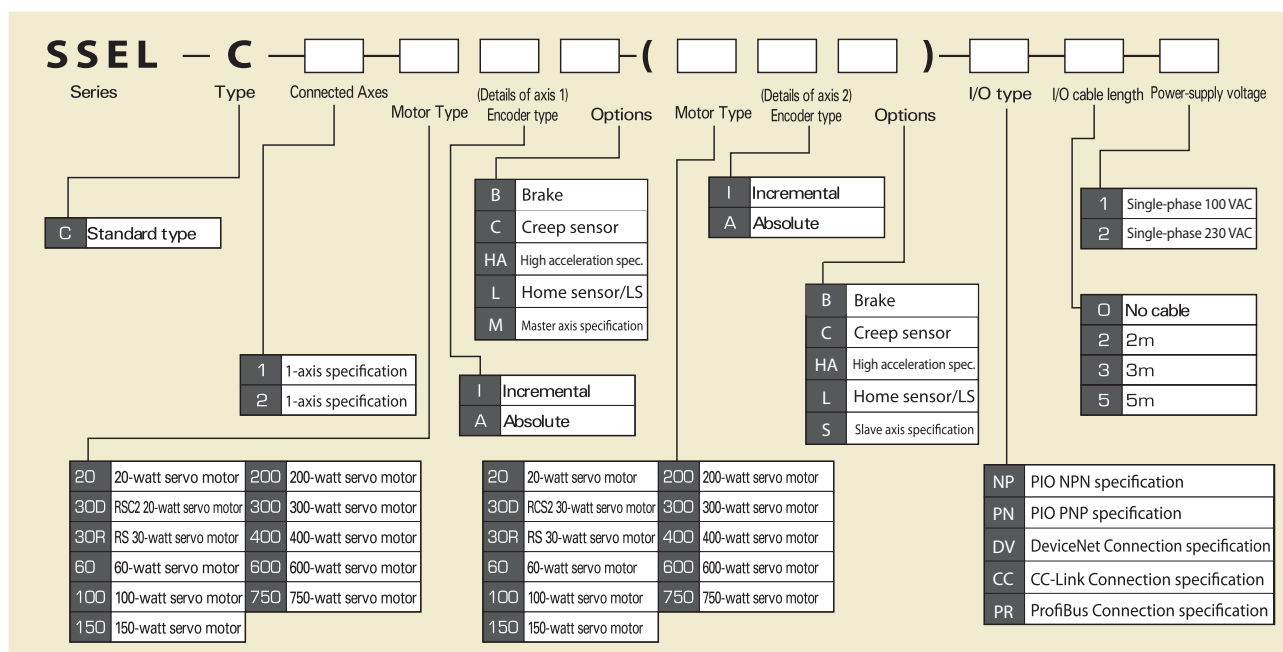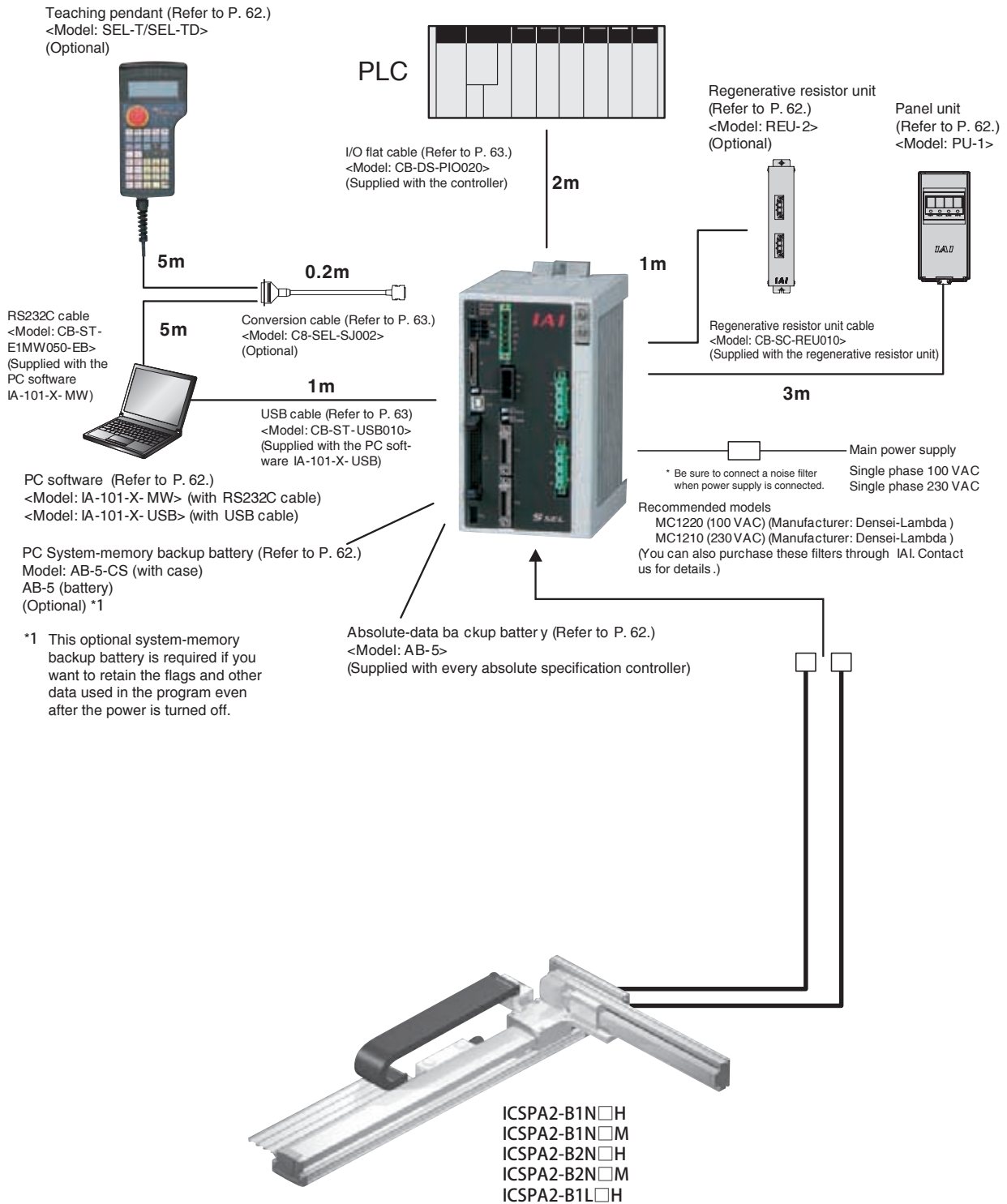
Model List/Prices

A program controller capable of operating linear axes. Various controls can be performed with a single unit.

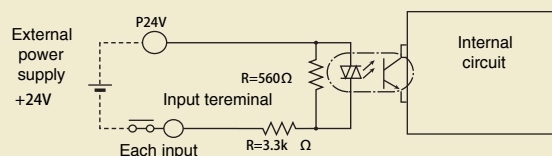| Type	C	
Name	Program mode	Positioner mode
Exterior View		
Description	The controller can communicate with the actuator and external devices without requiring any additional device. When two axes are operated, this controller lets you perform arc interpolation, path operation and synchronized operation.	Up to 20000 positioning points are supported. Push-motion operation and teaching operation are also possible.
Number of Positions	20000	

Explanation

SSEL – C ☐☐–☐☐ ☐☐ ☐☐–(☐☐ ☐☐ ☐☐)–☐☐ ☐☐ ☐☐

Series
Type
Connected Axes
Motor Type
(Details of axis 1) Encoder type
Options
Motor Type
(Details of axis 2) Encoder type
Options
I/O type
I/O cable length
Power-supply voltage

C	Standard type

1	1-axis specification
2	1-axis specification

B	Brake
C	Creep sensor
HA	High acceleration spec.
L	Home sensor/LS
M	Master axis specification

I	Incremental
A	Absolute

I	Incremental
A	Absolute

B	Brake
C	Creep sensor
HA	High acceleration spec.
L	Home sensor/LS
S	Slave axis specification

1	Single-phase 100 VAC
2	Single-phase 230 VAC

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

20	20-watt servo motor
30D	RSC2 20-watt servo motor
30R	RS 30-watt servo motor
60	60-watt servo motor
100	100-watt servo motor
150	150-watt servo motor

200	200-watt servo motor
300	300-watt servo motor
400	400-watt servo motor
600	600-watt servo motor
750	750-watt servo motor

20	20-watt servo motor
30D	RCS2 30-watt servo motor
30R	RS 30-watt servo motor
60	60-watt servo motor
100	100-watt servo motor
150	150-watt servo motor

200	200-watt servo motor
300	300-watt servo motor
400	400-watt servo motor
600	600-watt servo motor
750	750-watt servo motor

NP	PIO NPN specification
PN	PIO PNP specification
DV	DeviceNet Connection specification
CC	CC-Link Connection specification
PR	ProfiBus Connection specification

System Configuration

Teaching pendant (Refer to P. 62.)
<Model: SEL-T/SEL-TD>
(Optional)

PLC

Regenerative resistor unit
(Refer to P. 62.)
<Model: REU-2>
(Optional)

Panel unit
(Refer to P. 62.)
<Model: PU-1>

I/O flat cable (Refer to P. 63.)
<Model: CB-DS-PIO020>
(Supplied with the controller)

2m

1m

5m

0.2m

RS232C cable
<Model: CB-ST-E1MW050-EB>
(Supplied with the PC software IA-101-X-MW)

5m

Conversion cable (Refer to P. 63.)
<Model: C8-SEL-SJ002>
(Optional)

Regenerative resistor unit cable
<Model: CB-SC-REU010>
(Supplied with the regenerative resistor unit)

3m

1m

USB cable (Refer to P. 63)
<Model: CB-ST-USB010>
(Supplied with the PC software IA-101-X-USB)

PC software (Refer to P. 62.)
<Model: IA-101-X-MW> (with RS232C cable)
<Model: IA-101-X-USB> (with USB cable)

Main power supply
Single phase 100 VAC
Single phase 230 VAC

* Be sure to connect a noise filter when power supply is connected.

Recommended models
    MC1220 (100 VAC) (Manufacturer: Densei-Lambda)
    MC1210 (230 VAC) (Manufacturer: Densei-Lambda)
(You can also purchase these filters through IAI. Contact us for details .)

PC System-memory backup battery (Refer to P. 62.)
Model: AB-5-CS (with case)
AB-5 (battery)
(Optional) *1

*1   This optional system-memory backup battery is required if you want to retain the flags and other data used in the program even after the power is turned off.

Absolute-data ba ckup batter y (Refer to P. 62.)
<Model: AB-5>
(Supplied with every absolute specification controller)

ICSPA2-B1N□H
ICSPA2-B1N□M
ICSPA2-B2N□H
ICSPA2-B2N□M
ICSPA2-B1L□H

I/O Specifications

■Input External Input Specifications

Item	Specification
Input voltage	DC 24 V± V10%
Input current	7 mA per circuit
ON/OFF voltages	ON voltage (min.)
	OFF voltage (max.)
Insulation method	Photo coupler

■Output External Output Specifications

Item	Item
Load voltage	DC 24 V
Maximum load current	100 mA per point, total 400 mA for 8 points
Leak current (max.)	Max. 0.1 mA per point
Insulation method	Photo-coupler

NPN specification

External power supply +24V — P24V — R=560Ω — Input tereminal — Each input — R=3.3k Ω — Internal circuit

NPN specification

Internal circuit — P24 — Each output — Load — External power supply +24V — N

PNP specification

External power supply +24V — N — R=560Ω — Input tereminal — Each input — R=3.3k Ω — Internal circuit

PNP specification
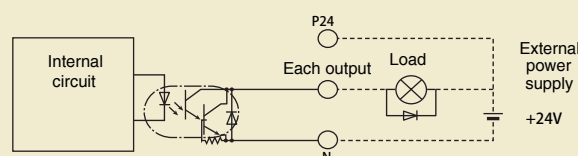
Internal circuit — P24V — Load — External power supply +24V — Each output — N
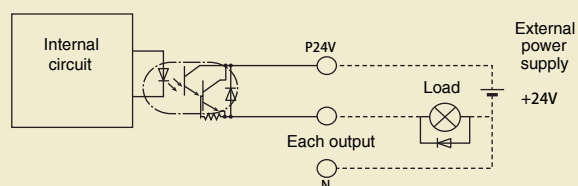
Explanation of I/O Functions

The SSEL controller can be operated in the "program mode" where the actuator is operated by a program input to the controller, or "positioner mode" where the actuator is moved to the positions specified by signals received from a host PLC.
The positioner mode includes the five input patterns shown below to support various applications.

■Functions by Controller Type

Operation mode		Features
Program mode		Super SEL, a language that enables programming of complex controls using simple commands, lets you perform linear/smooth interpolation operation, path movement operation ideal for coating application, etc., arch motion/palletizing operation, and many other operations with ease.
Positioner mode	Standard mode	The basic operation mode, where all you need is to a specify position number and input a start signal. Push-motion operation and 2-axis linear interpolation operation are also supported.
	Type-switching mode	In certain applications such as when multiple loads of the same shape but slightly different hole positions are handled, you can issue movement commands to the same position number by changing only the type number.
	2-axis independent mode	With a 2-axis controller, the two axes can be operated independently using separate commands.
	Teaching mode	The slider(rod) can be moved with an external signal to register the stopped position as position.data
	DS-S-C1 compatible mode	If you have been using a DS-S-C1 controller, you can replace it with an SSEL controller without having to change the host programs.* Compatibility with actuators is not assured.

Explanation of I/O Functions

Program Mode

PIN No.	Category	Port No.	Program mode	Function	Wiring diagram (NPN)*
1A	P24		24-V input	Connect 24-V.	
1B	Input	016	Program No.1 selection		
2A		017	Program No.2 selection		
2B		018	Program No.4 selection	Select the program number corresponding to the program you want to start. (Specify a desired port from 016 to 022 using a BCD code.)	
3A		019	Program No.8 selection		
3B		020	Program No.10 selection		
4A		021	Program No.20 selection		
4B		022	Program No.40 selection		
5A		023	CPU reset	The system is reset and enters the same state achieved when the power has been turned off and then turned back on.	
5B		000	Start	The program corresponding to the selected port between Nos. 016 and 022 is started.	
6A		001	General-purpose input		
6B		002	General-purpose input		
7A		003	General-purpose input		
7B		004	General-purpose input		
8A		005	General-purpose input		
8B		006	General-purpose input		
9A		007	General-purpose input		
9B		008	General-purpose input	The controller waits for an external input following each program command.	
10A		009	General-purpose input		
10B		010	General-purpose input		
11A		011	General-purpose input		
11B		012	General-purpose input		
12A		013	General-purpose input		
12B		014	General-purpose input		
13A		015	General-purpose input		
13B	Output	300	Alarm	This signal is output when an alarm has occurred. (Contact B)	
14A		301	Ready	This signal is output when the controller has started properly and become ready.	
14B		302	General-purpose input		
15A		303	General-purpose input		
15B		304	General-purpose input	These signals can be turned ON/OFF freely using program commands.	
16A		305	General-purpose input		
16B		306	General-purpose input		
17A		307	General-purpose input		
17B	N		0V input	Connect 0V.	

* With regard to PNP wiring diagram, please refer to SSEL manual.

0V   24

Standard Positioner Mode

PIN No.	Category	Port No.	Program mode	Function	Wiring diagram (NPN)*
1A	P24		24-V input	Connect 24 V.	
1B	Input	016	Position input 10		
2A		017	Position input 11	Use one of port Nos. 007 to 019 to specify the position number corresponding to the position to move the actuator to. The value can be specified by either a BCD code or binary code.	
2B		018	Position input 12		
3A		019	Position input 13		
3B		020	Position input 14	–	
4A		021	Position input 15	–	
4B		022	Position input 16	–	
5A		023	Error reset	This signal resets minor errors. (To reset major errors, the power must be reconnected.)	
5B		000	Start	The actuator starts moving to the position corresponding to the selected position number.	
6A		001	Home return	The actuator returns home.	
6B		002	Servo ON	The servo is turned ON/OFF.	
7A		003	Push motion	Push-motion operation is performed.	
7B		004	Pause	The actuator pauses when this signal turns OFF, and resumes operation when the signal is turned ON.	
8A		005	Cancel	The actuator stops when this signal turns OFF, and the remaining operation is cancelled.	
8B		006	Interpolation setting	With a 2-axis system, the axes move via linear interpolation when this signal is ON.	
9A		007	Position input 1		
9B		008	Position input 2		
10A		009	Position input 3		
10B		010	Position input 4	Use one of port Nos. 007 to 019 to specify the position number corresponding to the position to move the actuator to. The value can be specified by either a BCD code or binary code.	
11A		011	Position input 5		
11B		012	Position input 6		
12A		013	Position input 7		
12B		014	Position input 8		
13A		015	Position input 9		
13B	Output	300	Alarm	This signal is output when an alarm has occurred. (Contact B)	
14A		301	Ready	This signal is output when the controller has started properly and become ready.	
14B		302	Positioning complete	This signal is output when movement to the specified position is completed.	
15A		303	Home return complete	This signal is output when home return is completed.	
15B		304	Servo ON output	This signal is output while the servo is ON.	
16A		305	Push-motion complete	This signal is output when push-motion operation is completed.	
16B		306	System battery error	This signal is output when the system battery voltage has dropped (to the warning level).	
17A		307	Absolute battery error	This signal is output when the absolute battery voltage has dropped (to the warning level).	
17B	N		0V input	Connect 0V.	

* With regard to PNP wiring diagram, please refer to SSEL manual.
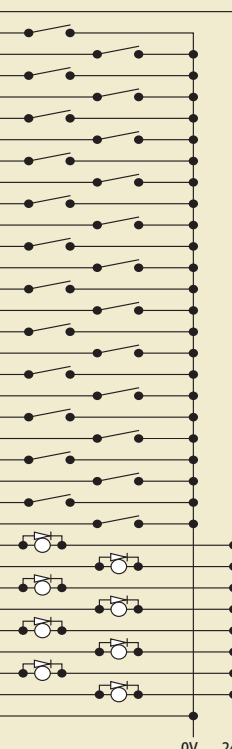
0V   24

Explanation of I/O Functions

Type-switching Positioner Mode

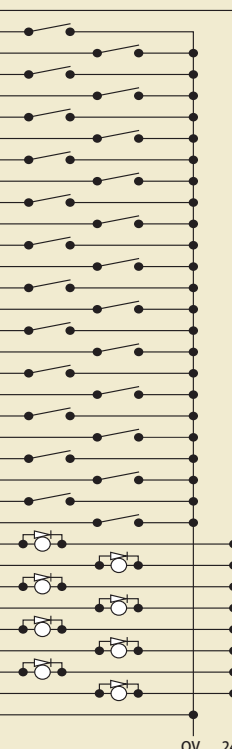| PIN No.	Category	Port No.	Program mode	Function	Wiring diagram (NPN)*
1A	P24		24-V input	Connect 24-V.	
1B		016	Position/type input 10	Use one of port Nos. 007 to 022 to specify the position number corresponding to the position to move the actuator to, and another to specify the type number. Position numbers and type numbers are assigned using parameters. The value can be specified by either a BCD code or binary code.	
2A		017	Position/type input 11		
2B		018	Position/type input 12		
3A		019	Position/type input 13		
3B		020	Position/type input 14		
4A		021	Position/type input 15		
4B		022	Position/type input 16		
5A		023	Error reset	This signal resets minor errors. (To reset major errors, the power must be reconnected.)	
5B		000	Start	The actuator starts moving to the position corresponding to the selected position number.	
6A		001	Home return	The actuator returns home .	
6B		002	Servo ON	The servo is turned ON/OFF.	
7A	Input	003	Push motion	Push-motion operation is performed .	
7B		004	Pause	The actuator pauses when this signal turns OFF, and resumes operation when the signal is turned ON.	
8A		005	Cancel	The actuator stops when this signal turns OFF, and the remaining operation is cancelled.	
8B		006	Interpolation setting	With a 2-axis system, the axes move via linear interpolation when this signal is ON.	
9A		007	Position/type input 1	Use one of port Nos. 007 to 022 to specify the position number corresponding to the position to move the actuator to, and another to specify the type number. Position numbers and type numbers are assigned using parameters. The value can be specified by either a BCD code or binary code.	
9B		008	Position/type input 2		
10A		009	Position/type input 3		
10B		010	Position/type input 4		
11A		011	Position/type input 5		
11B		012	Position/type input 6		
12A		013	Position/type input 7		
12B		014	Position/type input 8		
13A		015	Position/type input 9		
13B		300	Alarm	This signal is output when an alarm has occurred. (Contact B)	
14A		301	Ready	This signal is output when the controller has started properly and become ready.	
14B		302	Positioning complete	This signal is output when movement to the specified position is completed.	
15A	Output	303	Home return complete	This signal is output when home return is completed.	
15B		304	Servo ON output	This signal is output while the servo is ON.	
16A		305	Push-motion complete	This signal is output when push-motion operation is completed.	
16B		306	System battery error	This signal is output when the system battery voltage has dropped (to the warning level).	
17A		307	Absolute battery error	This signal is output when the absolute battery voltage has dropped (to the warning level).	
17B	N		0V input	Connect 0V.	

* With regard to PNP wiring diagram, please refer to SSEL manual.

0V   24

2-axis Independent Positioner Mode

PIN No.	Category	Port No.	Program mode	Function	Wiring diagram (NPN)*
1A	P24		24-V input	Connect 24-V.	
1B		016	Position/type input 7	Use any of port Nos. 010 to 022 to specify the position number corresponding to the position to move the actuator to. Assignment of position numbers for axes 1 and 2 is set using parameters. The value can be specified by either a BCD code or binary code.	
2A		017	Position/type input 8		
2B		018	Position/type input 9		
3A		019	Position/type input 10		
3B		020	Position/type input 11		
4A		021	Position/type input 12		
4B		022	Position/type input 13		
5A		023	Error reset	This signal resets minor errors. (To reset major errors, the power must be reconnected.)	
5B		000	Start 1	Axis 1 starts moving to the position corresponding to the selected position number.	
6A		001	Home return 1	Axis 1 returns home .	
6B		002	Servo ON 1	The servo of axis 1 is turned ON/OFF.	
7A		003	Pause 1	Axis 1 pauses when this signal turns OFF, and resumes the remaining operation when the signal turns ON.	
7B	Input	004	Cancel 1	The movement of axis 1 is cancelled.	
8A		005	Start 2	Axis 2 starts moving to the position corresponding to the selected position number.	
8B		006	Home return 2	Axis 2 returns home .	
9A		007	Servo ON 2	The servo of axis 2 is turned ON/OFF.	
9B		008	Pause 2	Axis 2 pauses when this signal turns OFF, and resumes the remaining operation when the signal turns ON.	
10A		009	Cancel 2	The movement of axis 2 is cancelled.	
10B		010	Position input 1	Use any of port Nos. 010 to 022 to specify the position number corresponding to the position to move the actuator to. Assignment of position numbers for axes 1 and 2 is set using parameters. The value can be specified by either a BCD code or binary code.	
11A		011	Position input 2		
11B		012	Position input 3		
12A		013	Position input 4		
12B		014	Position input 5		
13A		015	Position input 6		
13B		300	Alarm	This signal is output when an alarm has occurred. (Contact B)	
14A		301	Ready	This signal is output when the controller has started properly and become ready.	
14B		302	Positioning complete 1	This signal is output when axis 1 completes its movement to the specified position.	
15A	Output	303	Home return complete 1	This signal is output when axis 1 completes its home return.	
15B		304	Servo ON output 1	This signal is output while the servo of axis 1 is ON.	
16A		305	Positioning complete 2	This signal is output when axis 2 completes its movement to the specifited position.	
16B		306	Home return complete 2	This signal is output when axis 2 completes its home return.	
17A		307	Servo ON output 2	This signal is output while the servo of axis 2 is ON.	
17B	N		0V input	Connect 0V.	

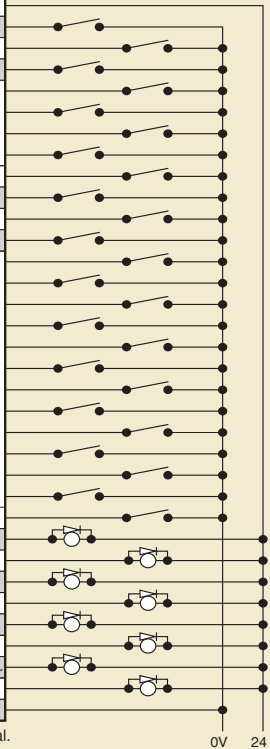* With regard to PNP wiring diagram, please refer to SSEL manual.

0V   24

Explanation of I/O Functions

Teaching Positioner Mode

PIN No.	Category	Port No.	Program mode	Function	Wiring diagram (NPN)*
1A	P24		24-V input	Connect 24 V	
1B		016	Axis 1 JOG -	Axis 1 moves in the negative direction while this signal is input.	
2A		017	Axis 2 JOG +	Axis 2 moves in the positive direction while this signal is input.	
2B		018	Axis 2 JOG -	Axis 2 moves in the negative direction while this signal is input.	
3A		019	Inching specification (0.01 mm)		
3B		020	Inching specification (0.1 mm)	Specify the distance to be traveled by inching.	
4A		021	Inching specification (0.5 mm)	(The travel represents the sum of values specified for port Nos. 019 to 022.)	
4B		022	Inching specification (1 mm)		
5A		023	Error reset	This signal resets minor errors. (To reset major errors, the power must be reconnected.)	
5B		000	Start	The actuator starts moving to the position corresponding to the selected position number.	
6A		001	Servo ON	The servo is turned ON/OFF.	
6B		002	Pause	The actuator pauses when this signal turns OFF, and resumes operation when the signal is turned ON.	
7A	Input	003	Position/type input 1		
7B		004	Position/type input 2		
8A		005	Position/type input 3		
8B		006	Position/type input 4	Use any of port Nos. 003 to 013 to specify the position number	
9A		007	Position/type input 5	corresponding to the position to move the actuator to, and another to	
9B		008	Position/type input 6	specify the position number under which to input the current position.	
10A		009	Position/type input 7	When port No. 014 for teaching mode specification is ON, turning ON	
10B		010	Position/type input 8	port No. 000 for start signal writes the current value to the specified	
11A		011	Position/type input 9	position number.	
11B		012	Position/type input 10		
12A		013	Position/type input 11		
12B		014	Teaching mode specification		
13A		015	Axis 1 JOG +	Axis 1 moves in the positive direction while this signal is input.	
13B		300	Alarm	This signal is output when an alarm has occurred. (Contact B)	
14A		301	Ready	This signal is output when the controller has started properly and become ready	
14B		302	Positioning complete	This signal is output when movement to the specified position is completed.	
15A		303	Home return complete	This signal is output when home return is completed.	
15B	Output	304	Servo ON output	Servo ON output	
16A		305	–	–	
16B		306	System battery error	This signal is output when the system battery voltage has dropped (to the warning level).	
17A		307	Absolute battery error	This signal is output when the absolute battery voltage has dropped (to the warning level).	
17B	N		0V input	Connect 0V.	

* With regard to PNP wiring diagram, please refer to SSEL manual.

0V 24

DS-S-C1 Compatible Positioner Mode

PIN No.	Category	Port No.	Program mode	Function	Wiring diagram (NPN)*
1A	P24		24-V input	Connect 24 V.	
1B		016	Position No. 1000	(Same with port No. 004 to 015)	
2A		017	Position No. 2000	-	
2B		018	Position No. 4000	-	
3A		019	Position No. 8000	-	
3B		020	Position No. 10000	-	
4A		021	Position No. 20000	-	
4B		022	NC *1)		
5A		023	CPU reset	The system is reset and enters the same state achieved when the power has been turned off and then turned back on.	
5B		000	Start	The actuator starts moving to the position corresponding to the selected position.	
6A		001	Hold (pause)	The actuator pauses when the moving signal turns ON and resumes operation when the signal is turned OFF.	
6B		002	Cancel	The actuator stops when the moving signal turns ON, and the remaining operation is cancelled.	
7A		003	Interpolation setting	With a 2-axis system, the axes move via linear interpolation when this signal is ON.	
7B	Input	004	Position No. 1		
8A		005	Position No. 2		
8B		006	Position No. 4		
9A		007	Position No. 8		
9B		008	Position No. 10	Use any of port Nos. 004 to 016 to specify the position number corre-	
10A		009	Position No. 20	sponding to the position to move the actuator to. The value is specified	
10B		010	Position No. 40	by a BCD code.	
11A		011	Position No. 80		
11B		012	Position No. 100		
12A		013	Position No. 200		
12B		014	Position No. 400		
13A		015	Position No. 800		
13B		300	Alarm	This signal is output when an alarm has occurred. (Contact B)	
14A		301	Ready	This signal is output when the controller has started properly and become ready	
14B		302	Positioning complete	This signal is output when movement to the specified position is completed.	
15A		303	–	-	
15B	Output	304	-	-	
16A		305	-	-	
16B		306	System battery error	This signal is output when the system battery voltage has dropped (to the warning level).	
17A		307	Absolute battery error	This signal is output when the absolute battery voltage has dropped (to the warning level).	
17B	N		0V input	Connect 0V.	

*1) PIN No. 4B: The input must be turned OFF. Make sure this signal is not connected.　　* With regard to PNP wiring diagram, please refer to SSEL manual.

0V 24
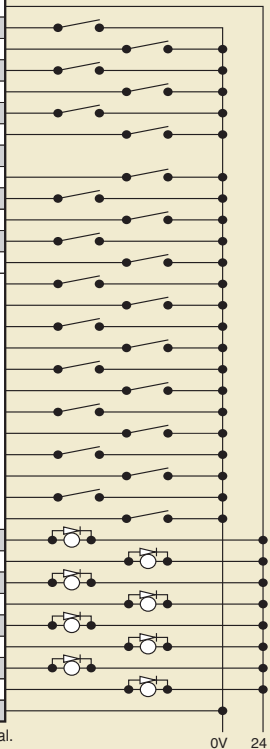
Specification Table

|	Item	Specification	
Base specifications	Connectable actuators	RCS2-series actuator, single-axis robot, linear motor	
	Input power supply	Single-phase 100-115 VAC ± 10%	Single-phase 200-230 VAC ± 10%
	Power-supply capacity	Max. 1660 VA (400 W, based on 2-axis operation)	
	Dielectric strength	500 VDC, 10 MΩ or more	
	Withstand voltage	500 VAC, 1 minute	
	Rush current	Controller 30 A / Motor 37.5 A	Controller 30 A / Motor 75 A
	Vibration resistance	XYZ directions: 10 to 57 Hz: (Single amplitude) 0.035 mm (continuous), 0.075 mm (intermittent) 58 to 150 Hz: 4.9 m/sec2 (continuous), 9.8 m/sec2 (intermittent)	
Control specifications	Number of controlled axes	1 axis/2 axes	
	Maximum total output of connected axes	400 W	800 W
	Position detection method	Incremental encoder/Absolute encoder	
	Speed setting	1 mm/sec ~ (The maximum limit varies depending on the actuator.)	
	Acceleration setting	0.01 G ~ (The maximum limit varies depending on the actuator.)	
	Operation method	Program operation/positioner operation (switchable)	
Program	Program language	Super SEL	
	Number of programs	128	
	Number of program steps	9999	
	Number of multi-tasking programs	8	
	Number of positioning points	20000	
	Data storage device	Flash ROM (An optional system-memory backup battery can be added.)	
	Data input method	Teaching pendant or PC software	
Communication	Number of I/O points	24 input points/8 output points (NPN/PNP selectable)	
	I/O power supply	24 VDC ± 10%, supplied externally	
	PIO cable	CB-DS-PIO □□□ (supplied with the controller)	
	Serial communication function	RS232C (D-sub, half-pitch connector)/USB connector	
	Field networks	Profibus, DeviceNet, CC-Link	
General specifications	Protective functions	Motor overcurrent, motor/driver temperature check, overload check, encoder open check, soft limit overtravel, system battery error, etc.	
	Surrounding air temperature / humidity	0 to 40°C, 10 to 95% (non-condensing	
	Surrounding ambience	Not subject to corrosive gases or significant dust.	
	Protection degree	IP20	
	Weight	1.4 kg	
	External dimensions	100 mm (W) x 202.6 mm (H) x 126 mm (D)	

External Dimensions

SSEL 1-axis controller
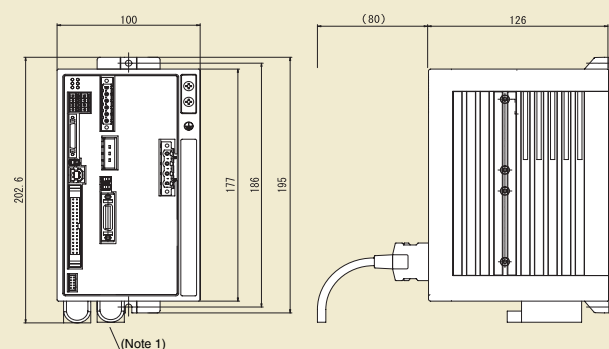
(Note 1) Absolute-data backup battery. This battery is not installed in incremental controllers.

SSEL 2-axis controller
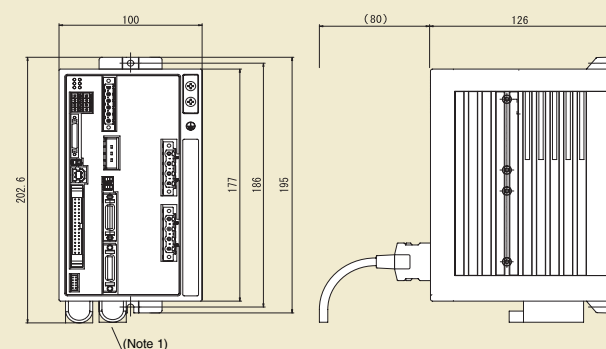
(Note 1) Absolute-data backup battery. This battery is not installed in incremental controllers.

Name of Each Part
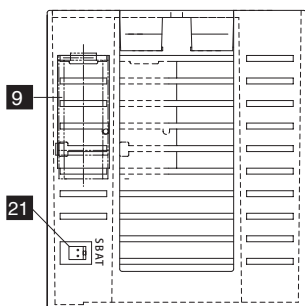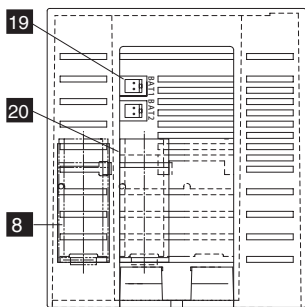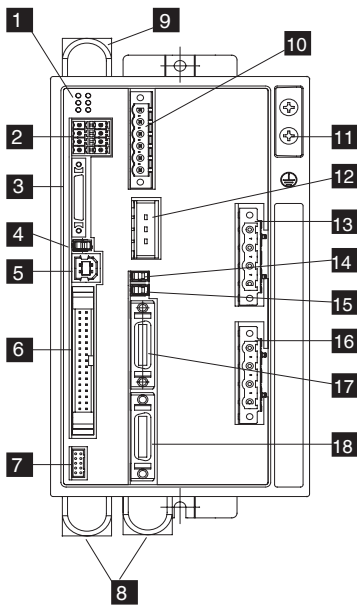
1 Status indicator LEDs

These LEDs indicate the operating condition of the controller.

Each LED and what it indicates are explained below:

PWR : The controller is receiving power.

RDY : The controller is ready to perform program operation.

ALM : The controller is abnormal.

EMG : An emergency stop has been actuated and the drive source is cut off.

SV1 : The servo of actuator axis 1 is ON.

SV2 : The servo of actuator axis 2 is ON.

2 System I/O connector

This connector is used to connect the emergency stop/enable input, brake power input, etc.

3 Teaching pendant connector

This half-pitch, IO26-pin connector is used to connect the teaching pendant when the operation mode is MANU. You need a dedicated conversion cable to connect a conventional D-sub, 25-pin connector.

4 Mode switch

This switch is used to specify the operation mode of the controller. The controller is in the MANU (manual operation) mode when the switch is in the left position, or AUTO (auto operation) mode when the switch is in the right position. Teaching operation can be performed only in the MANU mode. Also note that the controller cannot perform auto operation using external IOs in the MANU mode.

5 USB connector

This connector is used to establish USB connection with a PC. While the USB connector is in use, the TP connector cannot be used because communication via this connector is disconnected.

6 IO connector

This connector is used to connect the interface I/Os. If the DIO (24IN/8OUT) interface is specified, the I/O con-nector accepts a 34-pin flat cable. The I/O power is also supplied to the controller through this connector (pins 1 and 34).

7 Panel unit connector

This connector is used to connect the panel unit (optional) for displaying the controller status and error numbers.

8 Absolute-data backup battery

When an absolute axis is operated, this battery is used to retain the position data even after the power is cut off.

9 System-memory backup battery (optional)

This battery is required if you want to retain the various data stored in the built-in SRAM of the controller even after the power is cut off. This battery is optional. Order it separately if required.

10 Power-supply connector

A connector for AC power supply. The control power and motor power are input separately.

11 Grounding screw

A screw for protective grounding. Be sure to connect this screw to ground.

12 External regenerative resistor connector

This connector is used to connect an additional re-generative resistor that is connected when the built-in regenerative resistor is not enough due to high acceleration, high load, etc.

13 Axis 1 motor connector

The motor cable of actuator axis 1 is connected here.

14 Axis 2 motor connector

The motor cable of actuator axis 2 is connected here.

15 Axis 1 brake switch

This switch is used to release the axis brake. Setting the switch to the left (RLS) position forcibly releases the brake, while setting it to the right (NOM) position allows the controller to control the brake automatically.

16 Axis 2 brake switch

This switch is used to release the axis brake. Setting the switch to the left (RLS) position forcibly releases the brake, while setting it to the right (NOM) position allows the controller to control the brake automatically.

17 Axis 1 encoder connector

The encoder cable of actuator axis 1 is connected here.

18 Axis 2 encoder connector

The encoder cable of actuator axis 2 is connected here.

19 Axis 1 absolute battery connector

This connector is used to connect the absolute-data backup battery for axis 1 when the actuator is equipped with an absolute encoder.

20 Axis 2 absolute battery connector

This connector is used to connect the absolute-data backup battery for axis 2 when the actuator is equipped with an absolute encoder.

21 System-memory backup battery connector

This connector is used to connect the system-memory backup battery.

Options

Teaching Pendant

Features A teaching device offering functions for program/position input, test operation, monitoring, and more.

Models/Prices

Model	Description
SEL—T—J	Standard type with connector conversion cable
SEL—TD—J	Deadman switch type with connector conversion cable

Configuration

5m → 0.2m →

Conversion Cable: CB—SEL—SJ002

110.0
55.0
66.6
218.3
39.0
46.9
89.6
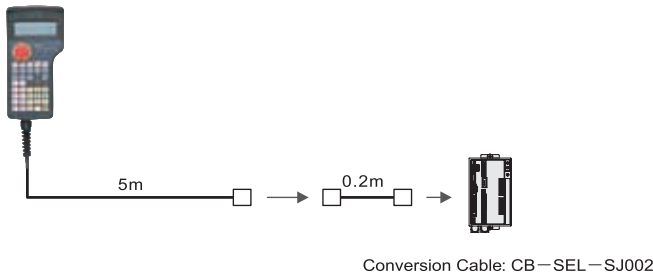
Specification

| Item	SEL—T—J	SEL—TD—J
3-position enable switch	Not equipped	Equipped
ANSI/UL standard	Not compliant	Compliant
CE Mark	Compliant	
Display	20 characters x4 lines	
Surrounding air temp / humidity	0-40 C, 10-90% RH (non-condensing)	
Protection structure	IP54	
Weight	Approx 0.4 kg (excluding cables)	
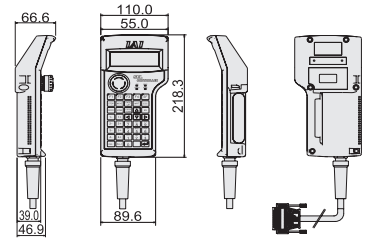
PC Software (Windows only)

Features A software application that assists you in the initial startup of your system by offering functions for program/position input, test operation, monitoring, and more. Enhanced debugging functions help reduce the startup time.
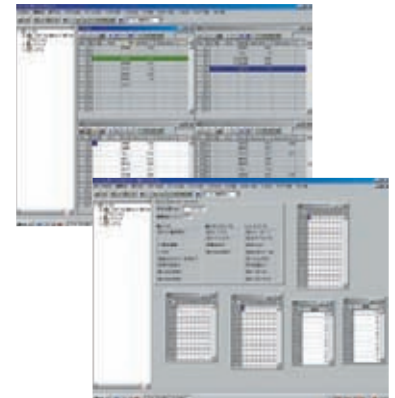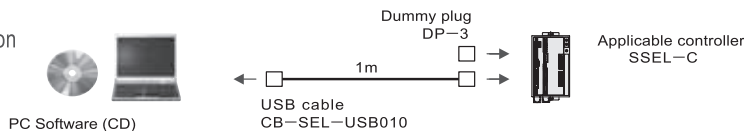
Models IA—101—X—MW—J (with RS232C cable + connector conversion cable)
IA—101—X—MW (with RS232C cable + connector conversion cable)

Configuration

PC Software (CD)

5m
RS232C Cable
CB—ST—E1MW050—EB

0.2m
Connector conversion cable
CB—SEL—SJ002
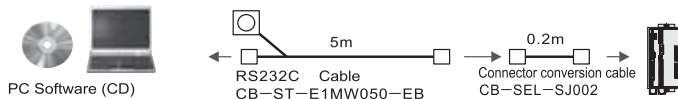
Model IA—101—X—USB (with USB cable)

Configuration

PC Software (CD)

Dummy plug
DP—3

1m

USB cable
CB—SEL—USB010

Applicable controller
SSEL—C

Note
SSEL controllers support only Version 6.0.0.0 or later.

Regenerative Resistor Unit

Features A unit for converting to heat the regenerative current produced when the motor decelerates. Check the total wattage of the operated actuators in the table on the right and provide a regenerative resistor or resistors if necessary.

Model REU—2 (for SCON/SSEL)

Specifications

Weight	0.9 kg
Built-in regenerative resistor	220 Ω 80 W
Unit-controller connection cable (accessory)	CB—SC—REU010 (for SSEL)

RRU Determination Guide

|	Horizontal	Vertical
0 units	～800 W	～200
1 unit		W～600
2 units		W～800

□Depending on the operating conditions, the required number of regenerative resistor(s) may become more than the applicable number shown.

□If two regenerative units are required, order one REU-2 and one REU-1 (refer to P. 70).

External Dimensions

φ5 34
195
186
175
5
16.6 126
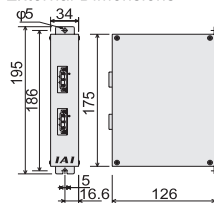
Panel Unit

Features A display that lets you check controller error codes and the program number of the current program.

Model REU—2

φ3.2 17 43
114
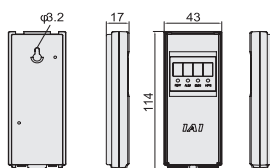
Absolute Data Backup Battery

Features An absolute-data backup battery used when an absolute actuator is operated.
The battery is the same as the system-memory backup battery.

Model AB—5

System-memory Backup Battery

Features This battery is required if you are using global flags, etc., in the program and want to retain the data even after the power is turned off.
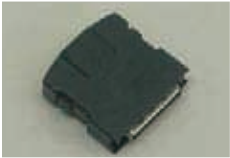
Model AB—5—CS (with case)
AB—5 (battery)

Options

Dummy Plug

▪ Features A plug to be connected to the teaching port to cut off the enable circuit when the SSEL controller is connected to a PC via a USB cable.
(This plug is supplied with the PC software IA-101-X-USB.)

▪ Model DP－3

USB Cable

▪ Features A cable for connecting a controller with USB port to a PC.
To connect a controller without USB port (XSEL) to a PC, connect the controller's RS232C cable to a USB cable via a USB conversion adapter, and connect the USB cable to the USB port on the PC.
DP－3 (Refer to the PC software IA-101-X-USBMW.)

▪ Model CB－SEL－USB010 ((cable length 1 m)

Connector Conversion Table

▪ Features A conversion cable for connecting the D-sub, 25-pin connector for teaching pendant/PC software to the teaching connector (half-pitch) on the SSEL controller.
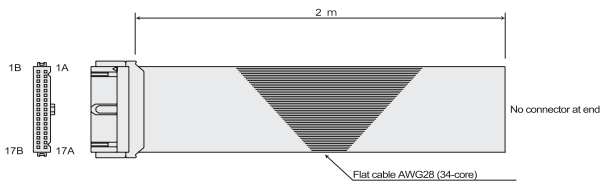
▪ Model CB－SEL－SJ002 (cable length 0.2 m)

Replacement Parts

I/O Flat Cable

Model **CB-DS-PIO**□□□   □□□ indicates the cable length (L). You can specify a desired length up to 10 m is supported. Example) 080 = 8 m

No.	Color	Wiring	No.	Color	Wiring
1A	Brown 1		9B	Gray 2	
1B	Red 1		10A	White 2	
2A	Orange 1		10B	Black 2	
2B	Yellow 1		11A	Brown-3	
3A	Green 1		11B	Red 3	
3B	Blue 1		12A	Blue 1	
4A	Purple 1		12B	Orange3	
4B	Gray 1	Flat cable, pressure-welded	13A	Green 3	Flat cable, pressure-welded
5A	White 1		13B	Blue 3	
5B	Black 1		14A	Purple 3	
6A	Brown-2		14B	Gray 3	
6B	Red 2		15A	White 3	
7A	Orange 2		15B	Black 3	
7B	Yellow 2		16A	Brown-4	
8A	Green 2		16B	Red 4	
8B	Blue 2		17A	Orange 4	
9A	Purple 2		17B	Yellow 4	

X-SEL

Program controller for
one to six axes

Model List/Prices

A multi-axis program controller capable of operating 230 VAC linear axes. Up to six axes can be controlled simultaneously.
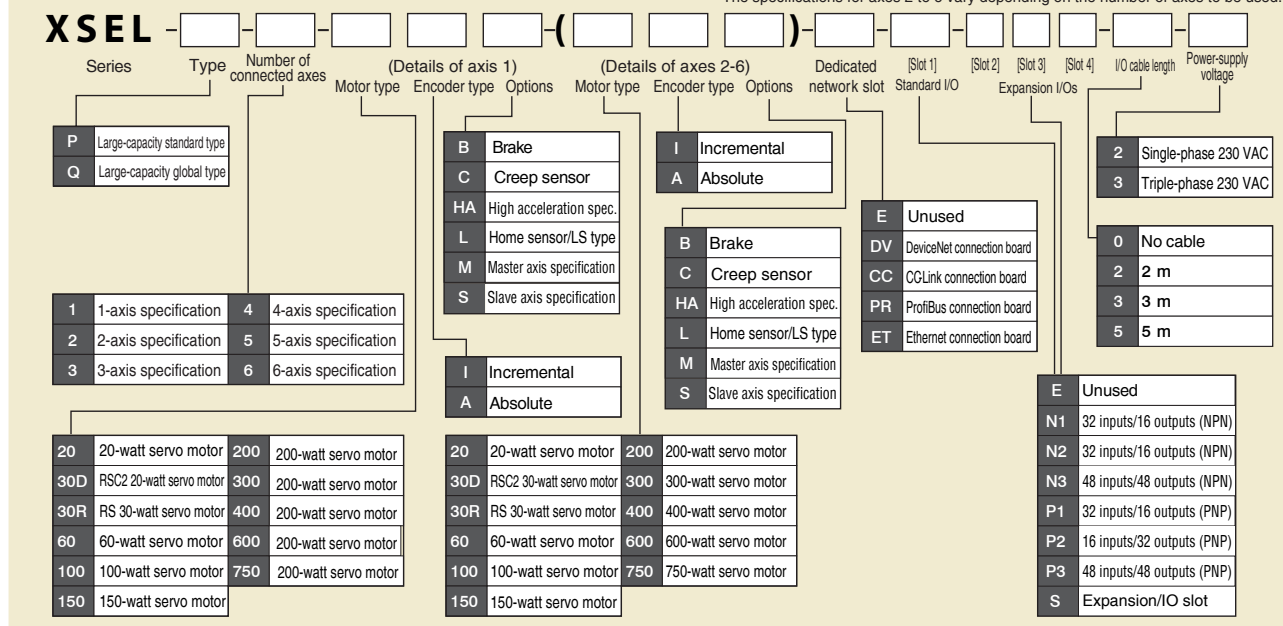
Type	P	Q
Name	Large-capacity standard type	Large-capacity global type (safety category specification)
Exterior View		
Description	A large-capacity type capable of controlling up to six axes.	A large-capacity type conforming to safety category 4.
Max number of controlled axes	6-axes	
Number of Positions	20000 positions	
Maximum total wattage of connected axes	1600/2400 W	
Power supply	Single-phase 230 VAC/three-phase 230 VAC	
Safety category	B	4 (with additional circuit)
Safety standards	CE	CE、ANSI

Explanation

[XSEL-P/Q types]

* If you are selecting multiple options, specify them in an alphabetical order. (Example: Brake + home sensor -> BL)

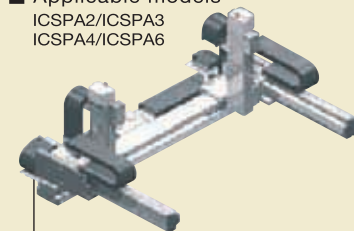* The specifications for axes 2 to 6 vary depending on the number of axes to be used.

XSEL – ☐ – ☐ – ☐ ☐ ☐ – (☐ ☐ ☐) – ☐ – ☐ – ☐ ☐ ☐ ☐ – ☐ – ☐

Series | Type | Number of connected axes | (Details of axis 1) Motor type / Encoder type / Options | (Details of axes 2-6) Motor type / Encoder type / Options | Dedicated network slot | [Slot 1] Standard I/O | [Slot 2] [Slot 3] [Slot 4] Expansion I/Os | I/O cable length | Power-supply voltage

P	Large-capacity standard type
Q	Large-capacity global type

1	1-axis specification	4	4-axis specification
2	2-axis specification	5	5-axis specification
3	3-axis specification	6	6-axis specification

Details of axis 1 — Options:

B	Brake
C	Creep sensor
HA	High acceleration spec.
L	Home sensor/LS type
M	Master axis specification
S	Slave axis specification

Encoder type:

I	Incremental
A	Absolute

Motor type (axis 1):

20	20-watt servo motor	200	200-watt servo motor
30D	RSC2 20-watt servo motor	300	200-watt servo motor
30R	RS 30-watt servo motor	400	200-watt servo motor
60	60-watt servo motor	600	200-watt servo motor
100	100-watt servo motor	750	200-watt servo motor
150	150-watt servo motor		

Details of axes 2-6 — Encoder type:

I	Incremental
A	Absolute

Options:

B	Brake
C	Creep sensor
HA	High acceleration spec.
L	Home sensor/LS type
M	Master axis specification
S	Slave axis specification

Motor type (axes 2-6):

20	20-watt servo motor	200	200-watt servo motor
30D	RSC2 30-watt servo motor	300	300-watt servo motor
30R	RS 30-watt servo motor	400	400-watt servo motor
60	60-watt servo motor	600	600-watt servo motor
100	100-watt servo motor	750	750-watt servo motor
150	150-watt servo motor		

Dedicated network slot:

E	Unused
DV	DeviceNet connection board
CC	CGLink connection board
PR	ProfiBus connection board
ET	Ethernet connection board

Power-supply voltage:

2	Single-phase 230 VAC
3	Triple-phase 230 VAC

I/O cable length:

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

Standard I/O / Expansion I/Os:

E	Unused
N1	32 inputs/16 outputs (NPN)
N2	32 inputs/16 outputs (NPN)
N3	48 inputs/48 outputs (NPN)
P1	32 inputs/16 outputs (PNP)
P2	16 inputs/32 outputs (PNP)
P3	48 inputs/48 outputs (PNP)
S	Expansion/IO slot

System Configuration

P (large-capacity standard type)/Q (large-capacity global type)

■ Applicable models
ICSPA2/ICSPA3
ICSPA4/ICSPA6

■ External device
PLC, etc.

■ Connection with various field networks
• Device Net
• CC-Link
• Profi Bus
• Ethernet

■ RS232 cable: 5 m (Refer to P. 71.)

Teaching pendant

PC software

PERSONAL COMPUTER

(Refer to P.71)

I/O flat cable: 2 m (Supplied with the controller) (Refer to P. 71.)

Motor cable: 3m/5m (standard)
Encoder cable: 3m/5m (standard)

4 m
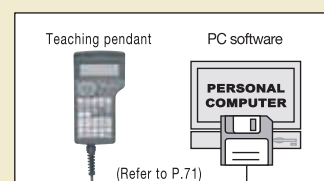
RS232 cable: 5 m (Refer to P. 71.) (Supplied with the PC software)

Regeneration unit cable: 1m (Supplied with the regenerative unit)

Regeneration unit

(see P70)

■ Control power supply
Single phase: AC 230AC

■ Motor-drive power supply
Three-phase 230VAC (Q type)

■ System I/Os
• Emergency stop
• Enable
• System ready

■ Expansion I/Os
• PIO board
* If the expansion I/Os are added to the P or Q type, the controller enclosure will be changed. (Refer to P. 68.)

Drive-source cutoff circuit (provided by the customer)

Required only for the Q type (not required for the P type).
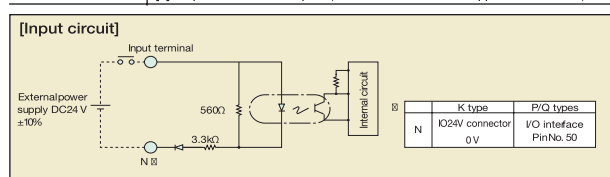
I/O Wiring

■ Input   External Input Specification (NPN Specification)

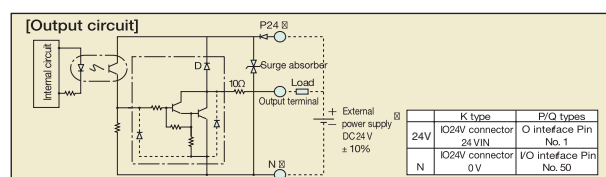| Item	Specification	
Input voltage	DC24V ±10%	
Input current	7 mA per circuit	
ON/OFF voltages	ON voltage- Min. 16.0 VDC / OFF voltage- Max. 5.0 VDC	
Insulation method	(Photo-coder insulation)	
Externally connected devices	[1] No-voltage contacts (with a minimum load of approx. 5.0 VDC/1mA)	
	[2] Photo-electric/proximity sensors (NPN type)	
	[3] Sequencer transistor outputs (open-collector type)	
	[4] Sequencer contact outputs (with a minimum load of approx. 5 VDC/1mA)	

[Input circuit]

External power supply DC24 V ±10%

560Ω

3.3kΩ

Input terminal

Internal circuit

	K type	P/Q types
24V	IO24V connector 24 VIN	O inteface Pin No. 1

■ Input   External Intput Specification (PNP Specification)

Item	Specification	
Input voltage	DC24V ±10%	
Input current	7 mA per circuit	
ON/OFF voltages	ON voltage- Min. 8 VDC / OFF voltage- Max. 19 VDC	
Insulation method	(Photo-coder insulation)	
Externally connected devices	[1] No-voltage contacts (with a minimum load of approx. 5.0 VDC/1mA)	
	[2] Photo-electric/proximity sensors (PNP type)	
	[3] Sequencer transistor outputs (open-collector type)	
	[4] Sequencer contact outputs (with a minimum load of approx. 5 VDC/1mA)	

[Input circuit]

Input terminal

External power supply DC24 V ±10%

560Ω

3.3kΩ

Internal circuit

	K type	P/Q types
N	IO24V connector 0 V	I/O inteface Pin No. 50

■ Output   External Input Specification (NPN Specification)

Item	Specification	
Load voltage	DC24V	
Maximum load current	100 mA per point, 400 mA peak (total current)	TD62084 (or equivalent) is used
Leak current (max.)	Max. 0.1mA per point	
Insulation method	(Photo-coder insulation)	
Externally connected devices	[1] Minature relays [2] Sequencer input units	

[Output circuit]

Internal circuit

Surge absorber

10Ω

Load

Output terminal

External power supply DC24 V ±10%

	K type	P/Q types
24V	IO24V connector 24 VIN	O inteface Pin No. 1
N	IO24V connector 0 V	I/O inteface Pin No. 50

■ Output   External Output Specification (PNP Specification)

Item	Specification	
Load voltage	DC24V	
Maximum load current	100 mA per point, 400 mA for 8 ports*	TD62784 (or equivalent) is used
Leak current(max.)	Max. 0.1 mA per point	
Insulation method	(Photo-coder insulation)	
Externally connected devices	[1] Minature relays [2] Sequencer input units	

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

[Output circuit]

Internal circuit

Surge absorber

10Ω

Output terminal

External power supply DC24 V ±10%

Load

	K type	P/Q types
24V	IO24V connector 24 VIN	I/O interface Pin No. 1
N	IO24V connector 0V	I/O interface Pin No. 50
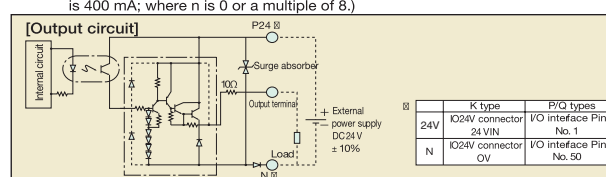
I/O Signal Tables

Standard I/O Signal Table (when N1 or P1 is selected)

Pin No.	Category	Port No.	Standard Setting
1		—	P/Q types: 24-V connection/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		014	General purpose input
17	Input	015	General purpose input
18		016	General purpose input
19		017	General purpose input
20		018	General purpose input
21		019	General purpose input
22		020	General purpose input
23		021	General purpose input
24		022	General purpose input
25		023	General purpose input
26		024	General purpose input
27		025	General purpose input
28		026	General purpose input
29		027	General purpose input
30		028	General purpose input
31		029	General purpose input
32		030	General purpose input
33		031	General purpose input
34		300	Alarm output
35		301	Ready output
36		302	Emergency stop output
37		303	General purpose output
38		304	General purpose output
39		305	General purpose output
40		306	General purpose output
41		307	General purpose output
42	Output	308	General purpose output
43		309	General purpose output
44		310	General purpose output
45		311	General purpose output
46		312	General purpose output
47		313	General purpose output
48		314	General purpose output
49		315	General purpose output
50		☒	(P/Q types: 0V connection/K type: NC)

Expansion I/O Signal Table (when N1 or P1 is selected)

Pin No.	Category	Standard Setting
1		(P/Q types: 24-V connection/K type : 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		(P/Q types: 0V connection/K type: NC)

Expansion I/O Signal Table (when N1 or P1 is selected)

Pin No.	Category	Standard Setting
1		(P/Q types: 24-V connection/K type : 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		(P/Q types: 0V connection/K type: NC)

Specification Table

■ P (Standard Type)/Q (Global Type Conforming to Safety Category)

Item	Description											
Controller series/type	P (Standard) Type						Q (Global) Type					
Connectable actuators	RCS2/ISA/ISPA/ISP/ISDA/ISDACR/ISPDACR/IF/FS/RS/LSA											
Applicable motor output	20/30/60/100/150/200/300/400/600/750											
Number of controlled axes	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 axes	Max. 2400W (1600 W for single-phase, 230-VAC specification)											
Controller power input	200/230-VAC, single-phase - 15% + 10%						200/230-VAC, single-phase - 15% + 10%					
Motor power input	200/230-VAC, single-phase/three-phase - 10% + 10%						200/230-VAC, single-phase/three-phase - 10% + 10%					
Power-supply frequency	50/60 Hz											
Insulation resistance	10MΩ or more (@ 500 VDC, measured between the power-supply terminal and each I/O terminal and between all external terminals and the case)											
Withstand voltage	1500 VAC (1 minute)						1500 VAC (1 minute)					
Power-supply 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	Incremental encoder (wire-saving type) Multi-rotational data backup absolute encoder (wire-saving type)											
Complete circuit structure	Redundancy not supported						Redundancy supported					
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	1mm/sec ~ Maximum setting varies depending on the actuator's specifications											
Acceleration/Deceleration setting	0.01G ~ Maximum setting varies depending on the actuator's specifications											
Program language	Super SEL Language											
Number of programs	128											
Number of program steps	9999											
Number of multitask programs	16											
Number of positions	20000											
Data storage device	FLASH ROM + SRAM battery backup											
Data input method	Teaching pendant or PC											
Standard I/Os	I/O 48 points PIO board (NPN/PNP), I/O 96 points PIO board (NPN/PNP) - 1 board can be installed											
Expansion 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.											
Ambient operating temperature, humidity	9-40°C / 10-95%											
Weight (*2)	5.2kg						5.7kg		4.5kg			5 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.

External Dimensions

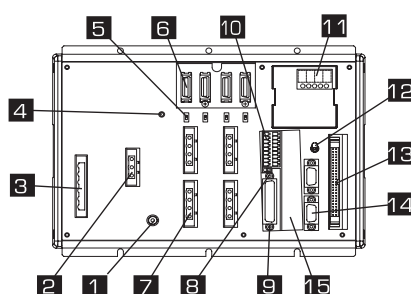### ■P (Large-capacity Standard Type)/Q (Large-capacity Global Type)

With the XSEL-P/Q types, the shape and dimensions vary according to the controller specifications (encoder type, with/without brake, and with/without I/O expansion).
The four shapes shown below are available. Check the applicable dimensions based on the desired type and number of axes.

Controller specifications		Base shape (incremental specification)	With brake/ absolute unit	With I/O expansion base	With brake/absolute unit + I/O expansion base	Side view
	Encoder	Incremental	Absolute	Incremental	Absolute	
	Brake	Not equipped	Equipped	Not equipped	Equipped	
	I/O	Standard only	Standard only	Standard + expansion	Standard + expansion	
P type (large capacity)	1 to 4-axis specification					
	5 to 6-axis specification					
Q type (large capacity) (conforming to safety category) Controllers of single-phase, 230 VAC specification conform to the P type dimensions.	1 to 4-axis specification					
	5 to 6-axis specification					

Name of Each Part

P type (standard, 4-axis)

Q type (with absolute brake unit + expansion base, 6-axis)

Meanings of five LEDs

Name	Status when LED is lit
RDY	The CPU is ready (to perform program operation).
ALM	A CPU alarm (system-shutdown level error) or CPU hardware error is present.
EMG	An emergency stop has been actuated or a CPU or power-supply hardware error is present.
PSE	A power-supply hardware error is present.
CLK	The system clock is abnormal.

1 FG connection terminal

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

2 External regenerative unit connector

This connector is used to connect an additional regenerative resistor unit that is connected when the built-in regenerative resistor is not enough due to high acceleration, high load, etc. Whether or not an external regenerative resistor is required depends on the specifics of the application such as the axis configuration.

3 AC-power input connector

A 230-VAC, 1-/3-phase input connector. This connector has six terminals including the motor/control power terminals and PE terminal.
The standard specification only comes with a terminal block.

Note To prevent electric shock, do not touch this connector while the power is supplied.

4 Control-power monitor LEDA

A green light is lit when the control power supply is generating the internal controller power properly.

5 Absolute-battery enable/disable switch

A switch to enable/disable the encoder backup operation using the absolute battery. The factory setting is to disable the backup operation. After connecting the encoder/axis-sensor cables, turn on the power and then set the switch to the top position.

6 Encoder/axis-sensor connector

A connector for the actuator encoder and axis sensors such as LS, CREEP and OT. *(LS, CREEP and OT sensors are optional.)

7 Motor connector

A connector for driving the motor in the actuator.

8 Teaching-pendant type selector switch

This switch is used to change the type of the teaching pendant to be connected to the teaching connector 9 . You can switch between IAI's standard teaching pendant and ANSI teaching pendant. Set the switch on the front side of the board according to the teaching pendant you are using.

9 Teaching connector

This teaching interface is used to connect IAI's teaching pendant or a PC (PC software) to operate, set or otherwise manipulate your system.
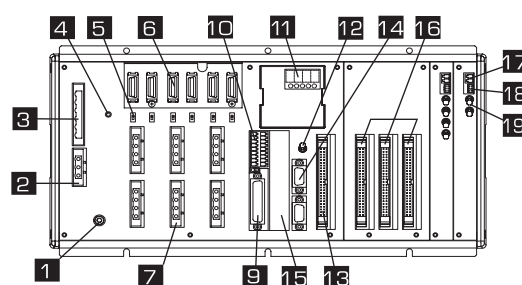
10 System I/O connector

This I/O connector controls the safety operations of the controller. For controllers of global specification, a safety circuit meeting up to safety category 4 can be configured using this connector together with an external safety circuit.

11 Panel window

This window consists of a 4-line, 7-segment LED display and five LED lamps, all indicating the status of your system.

12 Mode switch

This alternate switch with lock is used to indicate the operation mode of the controller. To operate this switch, pull the switch toward you and then tilt it to a desired position. The top position corresponds to the MANU (manual) mode, while the bottom position corresponds to the AUTO (auto) mode. Teaching operation can be performed only in the MANU mode. Also note that auto program start is not supported in the MANU mode.

13 Standard I/O connector

This alternate switch with lock is used to indicate the operation mode of the controller. To operate this switch, pull the switch toward you and then tilt it to a desired position. The top position corresponds to the MANU (manual) mode, while the bottom position corresponds to the AUTO (auto) mode. Teaching operation can be performed only in the MANU mode. Also note that auto program start is not supported in the MANU mode.

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

14 General-purpose RS232C port connector

A port to connect general-purpose RS232C devices (two channels are available).

15 Field-network board slot

Install a field-pass interface module in this slot.

16 Expansion I/O board (optional)

Install an optional expansion I/O board in this slot.

17 Brake-power input connector

A power input connector for driving the brake in the actuator. 24 VDC must be supplied externally. If the specified power is not supplied, the actuator brake cannot be released. Be sure to supply the brake power for axes with brake. Use a shielded cable for the brake power cable and connect the shield on the 24-V power supply side.

18 Brake-release switch connector

This connector is used to connect a switch for releasing the actuator brake from outside the controller. The brake can be released by shorting the COM terminal and BKMRL* terminal of this connector. Use this connector if you want to operate the actuator manually when the controller power has been cut off or any other error is present.

19 Brake switch

This alternate switch with lock is used to release the axis brake. To operate this switch, pull the switch toward you and then tilt it to a desired position. The brake is forcibly released when the switch is in the top (RLS) position, or controlled automatically by the controller when the switch is in the bottom (NOM) position.

Options

■ Regenerative Resistor Unit

Model REU-1

Description

A unit for converting to heat the regenerative current produced when the motor decelerates. Although the controller has a built-in regenerator resistor, an additional regenerative unit or units may be required if a large load that cannot be handled by the built-in regenerative resistor is received from the vertical axis(es).

Installation Standards Determine whether or not to install a regenerative resistor unit, and how many, if required, according to the total motor capacity of the connected vertical axes.

Horizontal Application

Motor Wattage	P/Q Type	K Type
~200 W	Not necessary	Not necessary
~800 W	1 unit	Not necessary
~1000 W	1 unit	Not necessary
~1500 W	2 units	Not necessary
~2000 W	3 units	–
~2400 W	4 units	–

Vertical Application

Motor Wattage	P/Q Type	K Type
~100 W	Not necessary	Not necessary
~200 W	1 unit	Not necessary
~400 W	1 unit	Not necessary
~800 W	1 unit	1 unit
~800 W	1 unit	1 unit
~1200 W	2 units	2 units
~1600 W	3 units	Contact IAI for details
~2000 W	4 units	–
~2400 W	5 units	–

Specification

Item	Specification
Dimensions	W 34 mm×H 195 mm× D 126 mm
Weight	0.9 kg
Built-in regenerative resistor	220Ω 80 W
Accessory	Controller connection cable (model: CB-ST-REU010), 1 m
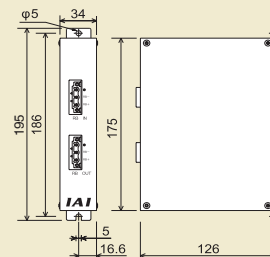
■ Absolute-data Backup Battery (for XSEL-KE/KET)

Model IA-XAB-BT

Features A data backup battery for absolute actuators. Replace the battery as soon as the controller generates a battery alarm.

Packing Configuration Individually packed. (One battery is required for one axis. Speciify the correct quantity that covers all of the axes used.)

■ Absolute-data Backup Battery

Model AB-5

Features An absolute-data backup battery used when absolute actuators are operated.

■ Expansion PIO Board

Description An optional board you can use to increase the number of I/O (input/output) points.
On general-purpose/large-capacity controllers, up to three expansion PIO boards can be installed in the expansion slots.
(On small controllers, only one expansion PIO board can be installed in the expansion slot, provided that the controller is of 3/4-axis type.)

■ Expansion SIO Board (General-purpose type)

Model / Specification
IA-105-X-MW-A (RS232C connection) (board with joint cable [1] x 2)
IA-105-X-MW-B (RS422C connection) (board with joint cable [2] x 1)
IA-105-X-MW-C (RS485C connection) (board with joint cable [2] x 1)

Description A board for serial communication with an external device. This board has two channels and supports one of three communication formats according to the supplied joint cable.
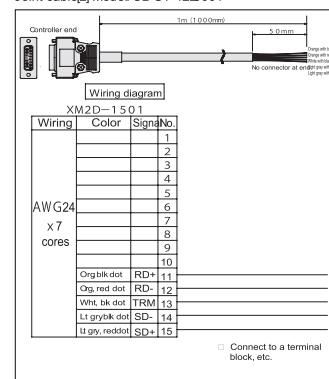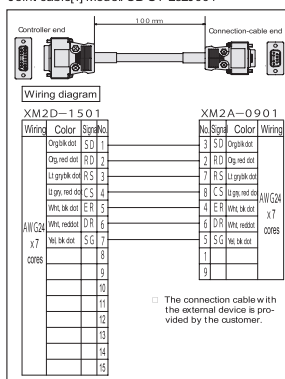
Joint cable[1] Model: CB-ST-232J001

Joint cable[2] Model: CB-ST-422J001

■ DeviceNet Connection Board

A board for connecting the XSEL controller to DeviceNet.

Item	Specification			
Number of I/O points	1 board with 256 input points/256 output points * Only one board can be installed.			
Communication protocol	A certified DeviceNet 2.0 interface module is used (certification pending).			
	Group 2 only server			
	Insulated node of network-power operation type			
Communication specifications	Master-slave connection	Bit strobe		
		Polling		
		Cyclic		
Baud rate	500 k/250 k/125 kbps (switchable using DIP switches)			
Communication cable	Baud rate	Max. network length	Max. branch length	Total branch length
	500kbps	100m	6 m	39 m
	250kbps	250m		78 m
	125kbps	500m		156m
	Note) When a thick DeviceNet cable is used.			
Communication power supply	24 VDC (supplied from DeviceNet)			
Current consumption	60 mA or more			
Number of occupied nodes	1 node			
Connector	MSTBA2.5/5-G.08AUM by Phoenix Contact (*1)			

(*1) The cable-end connector (SMSTB2.5/5-ST-5.08AU) by Phoenix Contact) is a standard accessory.

■ CC-Link Connection Board

A board for connecting the XSEL controller to CC-Link.

Item	Specification			
Number of I/O points	1 board with 256 input points/256 output points *Only one board can be installed.			
Communication protocol	ACC-Link Version 1.10 (certified)			
Baud rate	10M/5M/2.5M/625k/156kbps (switchable using a rotary switch)			
Communication method	Communication method			
Synchronization method	Frame synchronization method			
Encoding method	NRZI			
Transmission path format	Bus type (conforming to EIA RS485)			
Transmission format	Conforming to HDLC			
Error control method	CRC($X^{16}+X^{12}+X^{5}+X1$)			
Number of occupied stations	1 to 3 stations (remote device stations)			
Communication cable length	Baud rate (bps)	10 M	5 M	2.5 M	625 k
	Cable length (m)	100	160	400	900
Connector (controller end)	MSTBA2.5/5-G.08AUM by Phoenix Contact (*1)			

(*1) The cable-end connector (SMSTB2.5/5-ST-5.08AU) by Phoenix Contact) is a standard accessory.

Options

Teaching Pendant

■ Features   A teaching device offering functions for program/
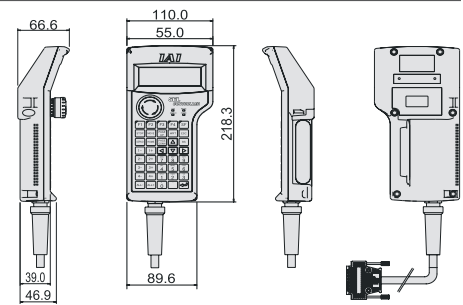position input, test operation, monitoring, and more.

■ Model

Model	Description
SEL-T	Standard Type
SEL-TD	Deadman Switch Type

Configuration

5m

Applicable controller
XSEL—P/Q

66.6
110.0
55.0
218.3
39.0
46.9
89.6
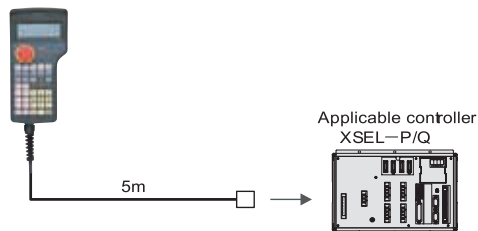
■Specification

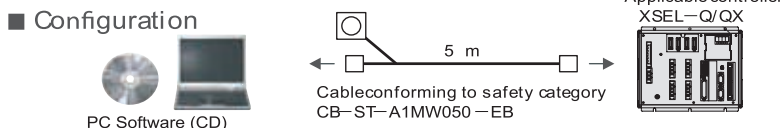| Item	SEL—T	SEL—TD
3-position enable switch	Not equipped	Equipped
ANSI/UL standard	Not compliant	Compliant
CE Mark	Compliant	
Display	20 characters x4 lines	
Surrounding air temp humidity	0-40 C, 10-90% RH (non-condensing)	
Protection structure	IP54	
Weight	Approx 0.4 kg (excluding cables)	

PC Software (Windows only)

■ Feature   A software application that assists you in the initial startup of your system by offering
functions for program/position input, test operation, monitoring, and more.
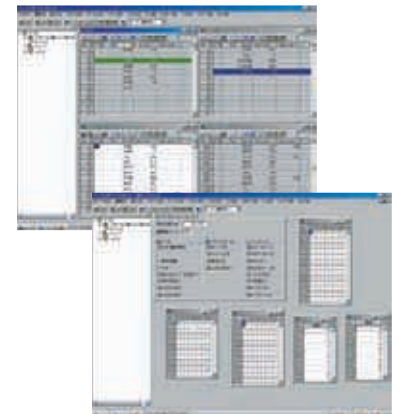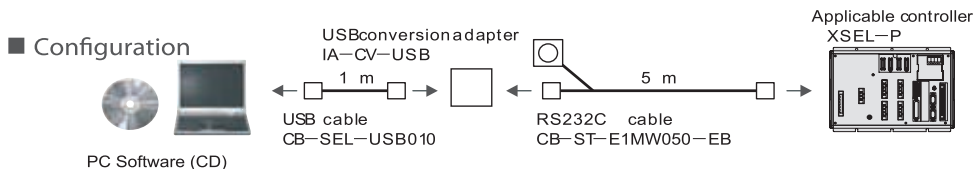Enhanced debugging functions help reduce the startup time.

■ Model   IA—101—X—MW   (with RS232C cable)

PC Software (CD)

5 m

RS232C   cable
CB—ST—E1MW050—EB

Applicable controller
XSEL—P
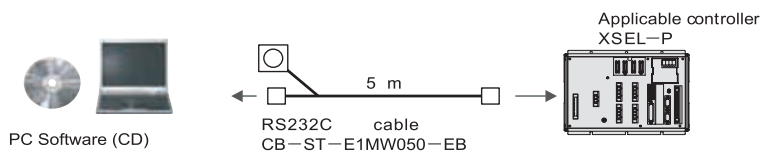
■ Model IA—101—XA—MW   (with cable conforming to safety category 4)

■ Configuration

PC Software (CD)

5 m

Cable conforming to safety category
CB—ST—A1MW050—EB

Applicable controller
XSEL—Q/QX

■ Model IA—101—X—USBMW   (with USB conversion adapter + cable)

■ Configuration

PC Software (CD)

USB conversion adapter
IA—CV—USB

1 m

USB cable
CB—SEL—USB010

5 m

RS232C   cable
CB—ST—E1MW050—EB

Applicable controller
XSEL—P

Replacement Parts

All you need a replacement cable after the purchase of your product, specify the applicable model by referring to the information below.

I/O Flat Cable (for XSEL-K/P/Q)

Model   **CB-X-PIO□□□**

□□□ indicates the cable length (L). You can specify a desired length up to 10 m is supported.
(Example) 080 = 8 m

L

2   1

50   49

No connector at end

Flat cable(50-core)
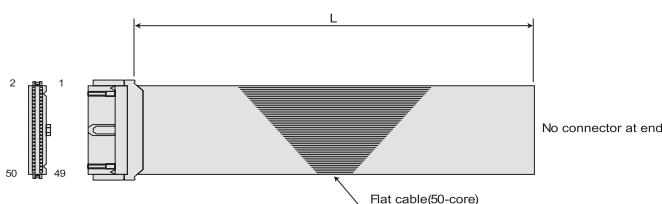
No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring
1	Brown 1		18	Gray 2		35	Green4	
2	Red 1		19	Black 2		36	Blue4	
3	Orange 1		20	White2		37	Puple 4	
4	Yellow 1		21	Brown-3		38	Gray4	
5	Green1		22	Red 3		39	Black 4	
6	Blue1		23	Orange 3		40	White 4	
7	Puple 1		24	Yellow 3		41	Brown-5	
8	Gray 1	Flat cable, pressure welded	25	Green 3	Flat cable, pressure welded	42	Red 5	Flat cable, pressure welded
9	White 1		26	Blue3		43	Orange 5	
10	Black 1		27	Puple 3		44	Yellow 5	
11	Brown-2		28	Gray 3		45	Green5	
12	Red 2		29	Black 3		46	Blue5	
13	Orange 2		30	White 3		47	Puple 5	
14	Yellow 2		31	Brown-4		48	Gray 5	
15	Green2		32	Red 4		49	Black 5	
16	Blue2		33	Orange 4		50	White 5	
17	Puple 2		34	Yellow 4				

**ICSPA-BN/BL Series
Catalogue No. 1208-E**

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

IAI

Quality and Innovation

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