IAI
Quality and Innovation

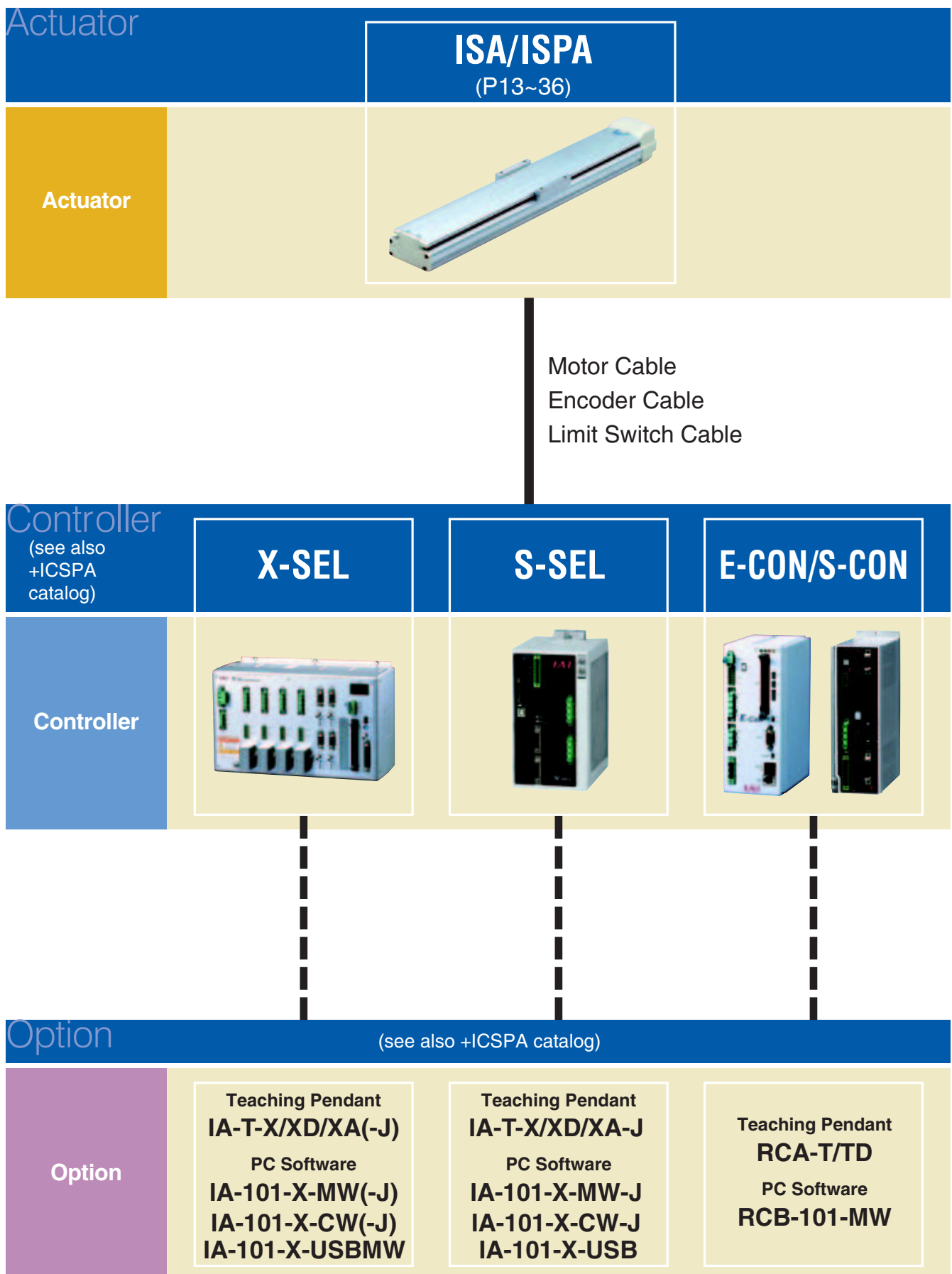**LINEAR AXIS** # ISA/ISPA

INTELLIGENT ACTUATOR

www.intelligentactuator.de

Single-Axis Robot Series Specification Table

Stroke (mm), maximum speed (mm/sec) (Note 1)	Load capacity (Note 2) Horizontal (kg)	Vertical (kg)	Motor capacity (W)	Lead (mm)	Model	Page
800	12	3	60	16	ISA(ISPA)-SXM-□-60-16-✱✱✱	P13
400	25	6	60	8	ISA(ISPA)-SXM-□-60-8-✱✱✱	P13
200	50	14	60	4	ISA(ISPA)-SXM-□-60-4-✱✱✱	P13
800	12	3	60	16	ISA(ISPA)-SYM-□-60-16-✱✱✱	P14
400	25	6	60	8	ISA(ISPA)-SYM-□-60-8-✱✱✱	P14
200	50	14	60	4	ISA(ISPA)-SYM-□-60-4-✱✱✱	P14
400	-	6	60	8	ISA(ISPA)-SZM-□-60-8-✱✱✱-B	P15
200	-	14	60	4	ISA(ISPA)-SZM-□-60-4-✱✱✱-B	P15
1000 (1000 795 645 540)	20	5	100	20	ISA(ISPA)-MXM-□-100-20-✱✱✱	P16
500 (480 380 310 255)	40	9	100	10	ISA(ISPA)-MXM-□-100-10-✱✱✱	P16
250 (220 175 145 120)	80	19	100	5	ISA(ISPA)-MXM-□-100-5-✱✱✱	P16
1500 (1500 1190 965 810)	25	6	200	30	ISA(ISPA)-MXM-□-200-30-✱✱✱	P17
1000 (1000 795 645 540)	40	9	200	20	ISA(ISPA)-MXM-□-200-20-✱✱✱	P17
500 (480 380 310 255)	80	19	200	10	ISA(ISPA)-MXM-□-200-10-✱✱✱	P17
1500 (1425 1200 1050 900 825 750 675)	25	-	200	30	ISA(ISPA)-MXMX-□-200-30-✱✱✱	P18
1000 (950 800 700 600 550 500 450)	40	-	200	20	ISA(ISPA)-MXMX-□-200-20-✱✱✱	P18
1000 (1000 795 645 540)	20	5	100	20	ISA(ISPA)-MYM-□-100-20-✱✱✱	P19
500 (480 380 310 255)	40	9	100	10	ISA(ISPA)-MYM-□-100-10-✱✱✱	P19
250 (220 175 145 120)	80	19	100	5	ISA(ISPA)-MYM-□-100-5-✱✱✱	P19
1500 (1500 1190 965 810)	25	6	200	30	ISA(ISPA)-MYM-□-200-30-✱✱✱	P20
1000 (1000 795 645 540)	40	9	200	20	ISA(ISPA)-MYM-□-200-20-✱✱✱	P20
500 (480 380 310 255)	80	19	200	10	ISA(ISPA)-MYM-□-200-10-✱✱✱	P20
500 (480 380 310 255)	-	9	100	10	ISA(ISPA)-MZM-□-100-10-✱✱✱-B	P21
250 (220 175 145 120)	-	19	100	5	ISA(ISPA)-MZM-□-100-5-✱✱✱-B	P21
500 (480 380 310 255)	-	19	200	10	ISA(ISPA)-MZM-□-200-10-✱✱✱-B	P22
1000 (1000 830 690 585 500)	40	9	200	20	ISA(ISPA)-LXM-□-200-20-✱✱✱	P23
500 (470 385 320 270 235)	80	19	200	10	ISA(ISPA)-LXM-□-200-10-✱✱✱	P23
2000 (1660 1380 1170 1000)	40	9	400	40	ISA(ISPA)-LXM-□-400-40-✱✱✱	P24
1000 (830 690 585 500)	80	19	400	20	ISA(ISPA)-LXM-□-400-20-✱✱✱	P24
1000 (950 830 740 650 590 540 490 440 410 370 340)	40	-	200	20	ISA(ISPA)-LXMX-□-200-20-✱✱✱	P25
2000 (1900 1660 1480 1300 1180 1080 980 880 820 740 680)	40	-	400	40	ISA(ISPA)-LXMX-□-400-40-✱✱✱	P26
1000 (950 830 740 650 590 540 490 440 410 370 340)	80	-	400	20	ISA(ISPA)-LXMX-□-400-20-✱✱✱	P26
1000 (950 830 740 650 590 540 490 440 410 370 340)	40	-	200	20	ISA(ISPA)-LXUWX-□-200-20-✱✱✱	P27
2000 (1900 1660 1480 1300 1180 1080 980 880 820 740 680)	40	-	400	40	ISA(ISPA)-LXUWX-□-400-40-✱✱✱	P28
1000 (950 830 740 650 590 540 490 440 410 370 340)	80	-	400	20	ISA(ISPA)-LXUWX-□-400-20-✱✱✱	P28
1000 (1000 830 690 585 500)	40	9	200	20	ISA(ISPA)-LYM-□-200-20-✱✱✱	P29
500 (470 385 320 270 235)	80	19	200	10	ISA(ISPA)-LYM-□-200-10-✱✱✱	P29
2000 (2000 1660 1380 1170 1000)	40	9	400	40	ISA(ISPA)-LYM-□-400-40-✱✱✱	P30
1000 (1000 830 690 585 500)	80	19	400	20	ISA(ISPA)-LYM-□-400-20-✱✱✱	P30
500 (470 385 320 270 235)	-	19	100	10	ISA(ISPA)-LZM-□-200-10-✱✱✱-B	P31
500 (470 385 320 270 235)	-	39	400	10	ISA(ISPA)-LZM-□-400-10-✱✱✱	P32
2000 (1670 1390 1170 1000 865)	60	14	600	40	ISA(ISPA)-WXM-□-600-40-✱✱✱	P33
1000 (835 695 585 500 430)	120	29	600	20	ISA(ISPA)-WXM-□-600-20-✱✱✱	P33
500 (415 345 290 250 215)	150	60	600	10	ISA(ISPA)-WXM-□-600-10-✱✱✱	P33
2000 (1670 1390 1170 1000 865)	60	14	750	50	ISA(ISPA)-WXM-□-750-50-✱✱✱	P34
1000 (835 695 585 500 430)	120	29	750	25	ISA(ISPA)-WXM-□-750-25-✱✱✱	P34
2000 (1965 1725 1530 1365 1225 1110 1005 915 840 770 710 655)	60	-	600	40	ISA(ISPA)-WXMX-□-600-40-✱✱✱	P35
1000 (980 860 765 680 610 555 500 455 420 385 355 325)	120	-	600	20	ISA(ISPA)-WXMX-□-600-20-✱✱✱	P35
2000 (1930 1740 1580 1440 1320 1210 1115 1035)	60	-	750	50	ISA(ISPA)-WXMX-□-750-50-✱✱✱	P36
1250 (1200 1075 965 870 790 720 660 605 555 515)	120	-	750	25	ISA(ISPA)-WXMX-□-750-25-✱✱✱	P36

Row group label: ISA / ISPA

Stroke axis scale (mm): 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500

(Note 1) The figure in the elongated circle indicates the maximum speed for each stroke. (Note 2) The load capacity is based on actuator operation at the rated acceleration (refer to page 7).

Single-Axis Robot Series **System Configurations**

Actuator

Actuator	**ISA/ISPA** (P13~36)
Actuator	

Motor Cable
Encoder Cable
Limit Switch Cable

Controller
(see also +ICSPA catalog)

Controller	**X-SEL**	**S-SEL**	**E-CON/S-CON**
Controller			

Option
(see also +ICSPA catalog)

Option	Teaching Pendant **IA-T-X/XD/XA(-J)** PC Software **IA-101-X-MW(-J)** **IA-101-X-CW(-J)** **IA-101-X-USBMW**	Teaching Pendant **IA-T-X/XD/XA-J** PC Software **IA-101-X-MW-J** **IA-101-X-CW-J** **IA-101-X-USB**	Teaching Pendant **RCA-T/TD** PC Software **RCB-101-MW**

Single-Axis Robot Series **Points to Note**

Notes on Catalog Specifications

Speed

"Speed" refers to the specified speed at which the actuator slider will move.
The slider accelerates from a stationary state, and once the specified speed is reached it will maintain that speed until the specified position (immediately before the target position), where it will begin decelerating to stop at the target position.

< Caution >
① The maximum speed of the ISA/ISPA Series will remain the same even when the load placed on the slider is changed.
② The time needed to reach the specified speed will vary according to the acceleration (deceleration).
③ If the travel distance is short, the specified speed may not be reached.
④ With a long-stroke axis, the maximum speed will drop to avoid reaching a dangerous speed.
   (If you are using a 600 or longer stroke, check the maximum speed for the applicable stroke in the corresponding dimensional drawing.)
⑤ When calculating the travel time, consider acceleration, deceleration and stabilization periods in addition to the travel time at the specified speed. (Refer to pages 39 and 40 for the method to calculate travel time.)
⑥ Speed can be set in increments of 1 mm/sec in a program.

Acceleration/ Deceleration

"Acceleration" refers to the rate of change of speed when the speed rises from zero (stationary state) to the specified speed.
"Deceleration" refers to the rate of change of speed when the specified speed drops to zero (stationary state).

< Caution >
① Increasing the acceleration (deceleration) will shorten the duration the actuator accelerates (decelerates) and decrease the travel time. However, doing so will also cause rapid acceleration (deceleration), resulting in increased shock.
② The rated acceleration is 0.3 G (or 0.15 G if the lead is 4 or 5 mm).
   (The load capacity is set based on the rated acceleration.)
③ If the ISA/ISPA Series is operated at an acceleration (deceleration) exceeding the rated acceleration, the load capacity will drop.
   (Refer to page 40 for details.)
④ Acceleration can be set in increments of 0.01 G in a program.

Duty

IAI recommends that our actuators be used at a duty of 50% or less as a guideline in view of the relationship of service life and accuracy.

$$\text{Duty (\%)} = \frac{\text{Motion time}}{\text{Motion time + Inactivity}} \times 100$$

Positioning Repeatability

"Positioning repeatability" refers to the positioning accuracy of repeated movements to a pre-stored position.
**This is not the same as "absolute positioning accuracy," so exercise caution.**

Positioning repeatability
Accuracy variation of the stop position when positioning is performed repeatedly to the same point.

Point A   Home
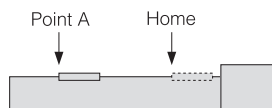
Absolute positioning accuracy
Difference between the coordinate value and the measured value when positioning is performed to a given positioning point specified by coordinates.

100.00   0
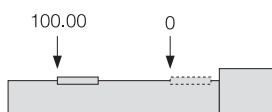
Single-Axis Robot Series **Points to Note**

Notes on Catalog Specifications

Home

The home is set on the motor side for the standard specification, or on the counter-motor side for the reversed-home specification.

- The incremental actuator always requires homing every time the power is reconnected.
- During homing the slider will move to the mechanical end before reversing, so be careful to prevent contact with surrounding parts.
- To change the home direction, the controller parameters must be changed.

Allowable Load Moments (Ma, Mb, Mc)

Each allowable load moment is calculated by assuming the service life of the guide as 10,000 km. Applying a moment exceeding the specified value will reduce the life of the guide, so exercise caution.

Directions of load moment for slider type
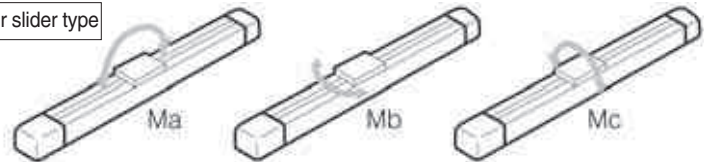
Overhung Load Length (L)

"Overhung load length" refers to a reference offset at which the actuator can operate smoothly when a load, bracket, etc., is installed at a position offset from the actuator/slider center.
When each model is used with an overhung load exceeding the allowable length, vibration or stabilization delay may result. Therefore, be sure to keep the overhung load length within the allowable value.
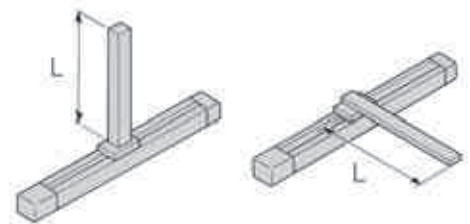

Actuator Accuracy

The accuracy of the ISA/ISPA-Series actuators is specified below.
The side and bottom faces of the actuator base provide reference surfaces for slider travel. Use them to adjust parallelism when installing the actuator.

and load-mounting surface (top face)
±0.05 mm/m or less

Parallelism when mounted on frame (when the actuator is mounted to a flat surface [1])
±0.05 mm/m or less
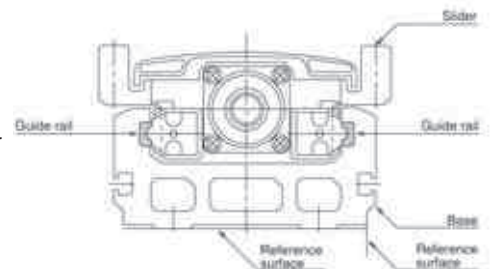
Condition: The above values are applicable at 20°C.   [1] Flatness: 0.05 mm or less

Explanation of Model Specification Items

Refer to the right page for the explanation of each model specification item.
The selection range for each item will vary depending on the actuator type. For details, refer to the page corresponding to each actuator type.

(1)	(2)	(3)		(4)		(5)		(6)		(7)		(8)		(9)
Series	Type	Encoder type		Motor output		Lead		Stroke		Applicable controller		Cable length		Options
ISA ISPA	SXM SYM	A I	–	60	–	4 8 16	–	100 ~ 600	–	T1 T2	–	N S M X □ □	–	AQ B C CL L LL LLM LM NM RT S EU
	SZM		–		–	4 8	–		–		–		–	
	MXM MYM		–	100	–	5 10 20	–	100 ~ 1000	–		–		–	
			–	200	–	10 20 30	–		–		–		–	
	MZM		–	100	–	5 10	–		–		–		–	
			–	200	–	10	–		–		–		–	
	MXMX		–	200	–	20 30	–	800 ~ 2000	–		–		–	
	LXM LYM		–	200	–	10 20	–	100 ~ 1200	–		–		–	
			–	400	–	20 40	–		–		–		–	
	LZM		–	200	–	10	–		–		–		–	
			–	400	–	10	–		–		–		–	
	LXMX		–	200	–	20	–	1000 ~ 2500	–		–		–	
			–	400	–	20 40	–		–		–		–	
	LXUWX		–	200	–	20	–		–		–		–	
			–	400	–	20 40	–		–		–		–	
	WXM		–	600	–	10 20 40	–	100 ~ 1300	–		–		–	
			–	750	–	25 50	–		–		–		–	
	WXMX		–	600	–	20 40	–	900 ~ 2500	–		–		–	
			–	750	–	25 50	–	900 ~ 2500	–		–		–	

(1) Series

Indicate the name of each series.

(2) Type

Indicate the classification by size (S, M, L or W), shape (X, Y or Z), etc.

(3) Encoder type

Indicate whether the encoder installed in the actuator is an "absolute type" or "incremental type."

A: Absolute type — Since the current slider position will be retained after the power is turned off, homing is not required when the actuator is powered up.

I: Incremental type — Since the slider position data are cleared when the power is turned off, homing must be performed every time the actuator is powered up.

(4) Motor output

Indicate the output of the motor installed in the actuator in watts.

(5) Lead

Indicate the ball screw lead.
"Lead" refers to the distance the slider will move when the ball screw rotates by one revolution.
The larger the lead, the faster the maximum speed becomes.

(6) Stroke

Indicate the actuator stroke (range of operation) in millimeters.

(7) Applicable controller

Indicate the type of controller that can be used with the actuator.
T1: X-SEL-KE/KT, E-CON
T2: X-SEL-P/Q, S-SEL, S-CON

(8) Cable length

Indicate the length of the motor/encoder cable connecting the actuator and the controller.
N : No cable
S : 3m
M : 5m
X□□: Use this field when a length other than 3 m and 5 m is specified.
(Example X08 : 8m)

* The standard cable is a robot cable.

(9) Actuator Accuracy

Indicate a desired option(s) to be equipped on the actuator. Refer to pages 11 and 12 for the explanation of each option.
* When selecting multiple options, specify them in alphabetical order (e.g., AQ-B-L-NM).

AQ : [AQ seal] A unit that supplies lubricant to the sliding sections of the ball screw and guide.
B   : [Brake] A brake for preventing the slider from falling in a vertical application when the power or servo is turned off.
C   : [Creep sensor] A sensor for increasing the homing speed and thereby decreasing the homing time.
CL : [Creep sensor on opposite side] The creep sensor is normally installed on the right side as viewed from the motor. Select this option if you want to install the sensor on the left side.
L   : [Home limit switch] A limit switch for completing homing by reversing the slider using a sensor, not by the normal contact method, during homing.
LL : [Home limit switch on opposite side] Similarly to the creep sensor on opposite side option, select this option if you want to install the limit switch on the opposite side.
LM : [Master-axis designation] Specify this option for the axis to be used as the master in synchronized operation.
S   : ▫
        required).
LLM : [M▫
        master axis used in synchronized operation.
NM : [Reverse-homing specification] Normally the home is set on the motor side. Select this option to specify the home on the counter-motor side.
RT : [Guide with ball-retaining mechanism] A mechanism for reducing noise while extending the service life of the guide by inserting a spacer (retention device) between guide balls.
EU : [Metal cablejoint connector] Select this option for a motor/encoder cable with metal cable plugs (see page 13). Without this option plastic plugs are default. By this option cable lengths to 5 m are without surcharge, too.

Options

AQ: [AQ seal]

The AQ seal is a lubrication unit that utilizes lubrication material made of resin-solidified lubricant.

The porous material impregnated with a large amount of lubricant allows lubricant to ooze out onto its surface via the capillary effect.

Lubricant is supplied when the AQ seal is pushed against the guide or ball-screw surface (steel-ball rolling surface). Combined use of the AQ seal and grease helps achieve maintenance-free operation for a long period.
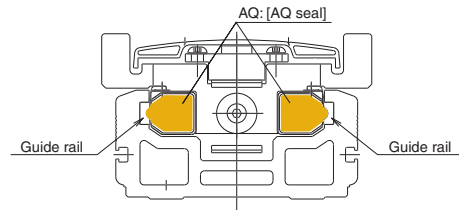
(Sectional view of actuator)
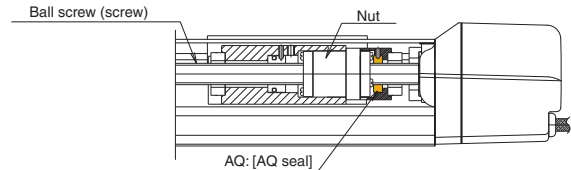
(Side view of actuator)

B: [Brake]

A retention mechanism that prevents the slider from falling and damaging the load when the power or servo is turned off in a vertical actuator application.

The S, M and L-type Z-axis actuators of the ISA/ISPA Series (SZM, MZM and LZM) are designed for use in a vertical application and therefore come standard with a brake.

If any axis other than the Z-axis is to be used vertically, install an optional brake.

For the S, M and L types, the brake is installed on the outside of the end cover on the counter-motor side (refer to the drawing of each model). The brake is installed inside the actuator only for the W type.
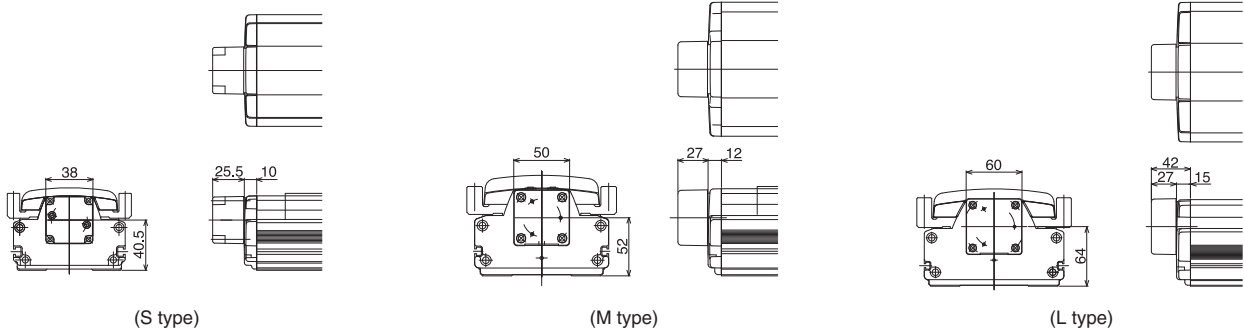
(S type)　　　　　　　　　(M type)　　　　　　　　　(L type)

C: [Creep sensor]

A sensor used for achieving high-speed homing.

Normally during homing, the slider is caused to contact the stopper at the motor-side stroke end and then reverse, so the homing speed is kept to between 10 and 20 mm/s.

For this reason, it takes time to complete homing when the stroke is long. This proximity sensor reduces the homing time by allowing the slider to return at high speed and then reducing the speed to the normal homing speed just before homing is completed.

The standard installation position of this sensor is on the right side of the actuator as viewed from the motor (option code: C) (refer to the limit switch drawing on the right page).

A cover similar to that for the limit switch is provided on the outside of the sensor.To install the sensor on the opposite side, select CL (opposite side specification).

Performing homing on a long-stroke axis will take longer time to reach the mechanical end.
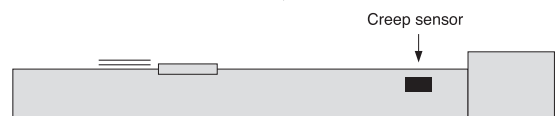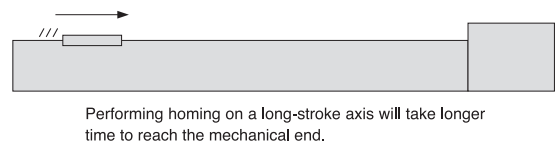
A sensor is provided before the mechanical end, and upon detection of the sensor the speed will be reduced to the normal homing speed.

Options

## LL: [Home limit switch on opposite side]

The normal homing operation of the ISA/ISPA Series conforms to the "contact method," whereby the slider is caused to contact the stopper and then reverse, after which the Z phase will be detected and set as the home.

Option L (home limit switch) achieves this homing operation by letting the slider reverse upon proximity sensor detection, without contacting the stopper. When this option is specified, three proximity sensors of HOME (for home detection), +OT (counter-motor side overtravel) and -OT (motor-side overtravel) will be installed. Use this option if you want to fine-tune the reversing position.

The standard installation position of the home limit switch and cover is on the right side of the actuator as viewed from the motor (option code: L).

To install the switch on the opposite side, select LL (opposite side specification).

*The ISP-W and ISPDCR-W come standard with a limit switch. Since the limit switch is installed inside the actuator, no cover will be provided on the side face of the actuator (creep sensor is also housed in the actuator).

Limit switch cover

Limit switch cover

Limit switch cover

Stroke-end side

Motor side
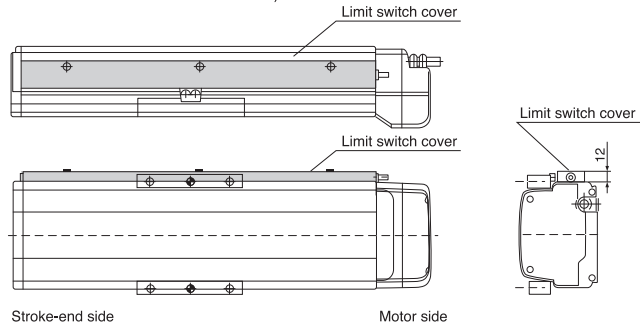
LM: [Master-axis designation in synchronized operation]

"Synchronized operation function" is one of the functions provided by the X-SEL controller.

It allows two actuator axes to operate simultaneously, with one axis acting as the master (option code: M) and the other as the slave (option code: S). The slave follows the master by super-high speed processing control to achieve simultaneous operation of the two axes. The two actuator axes used in synchronized operation must have the same specifications (type, lead motor output and stroke).When performing synchronized operation, the master axis must be of the limit switch specification. Therefore, specify LM (limit-switch master-axis designation) for the master axis and S (slave-axis designation) for the slave axis.

Controllers

Y-Axis

Slave axis (S)

X-Axis

Master axis (LM)
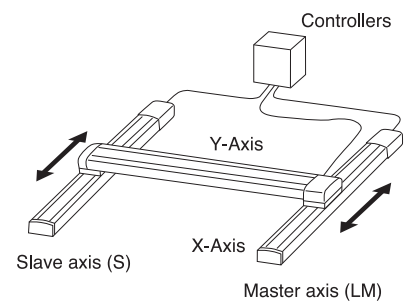
NM: [Reverse homing specification]

With the ISA/ISPA Series, the standard home direction is the motor side. To change the home direction, the encoder must be adjusted. If you prefer a reverse homing specification, specify it when placing an order.

RT: [Guide with ball-retaining mechanism]

A spacer (retainer) is inserted between guide balls (steel balls) to reduce noise while extending the service life of the guide.
The spacer eliminates annoying metal noise caused by colliding balls.
Since wear due to ball friction decreases, the service life of the guide will increase.
Elimination of ball contact will make the guide movement smoother, resulting in improved slider operability.

Ball

Ball   Spacer (retainer)
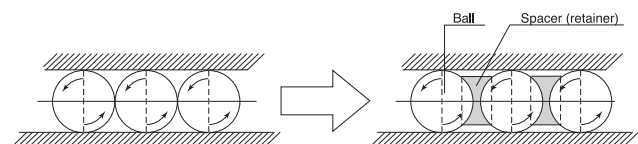
S: [Slave-axis designation in synchronized operation]

Specify this option for the axis to be used as the slave in synchronized operation. Refer to the explanation of LM (master-axis designation in synchronized operation) for details.

ISA-SXM
Single-Axis Robot: Compact X-Axis Type, Actuator Width 90mm, 60W, Straight Shape

ISPA-SXM
Single-Axis Robot: Compact X-Axis Type, Actuator Width 90mm, 60W, Straight Shape
High-Precision Specification

| Type | Compact X-axis (90-mm wide) | Stroke | 100~600mm | Load capacity | 50kg (horizontal)/14kg (vertical) |

■ Model specification items — Series — Type — Encoder type — Motor output — Lead — Stroke — Applicable controller — Cable length — Options

ISA[ISPA] – SXM – A – 60 – 16 – 600 – T1 – S – B

* Refer to page 9 for the details of model specification items.

Models/Specifications

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (mm) In increments of 50mm (Note 1)	Speed (mm/s)	Acceleration (Note 2)				Load capacity (Note 2)				Rated thrust (N)
						Horizontal (G)		Vertical (G)		Horizontal (kg)		Vertical (kg)		
						Rated	Maximum	Rated	Maximum	Rated acceleration	Maximum acceleration	Rated acceleration	Maximum acceleration	
ISA [ISPA] -SXM-A-60-16- ✱✱✱ -T1(2)-△-□	Absolute	60	16	100~600	1~800	0.3	1.0	0.3	0.7	12	3.5	3	2	63.7
ISA [ISPA] -SXM-A-60-8- ✱✱✱ -T1(2)-△-□	Absolute		8		1~400	0.3	0.6	0.3	0.5	25	12	6	5	127.4
ISA [ISPA] -SXM-A-60-4- ✱✱✱ -T1(2)-△-□			4		1~200	0.15	0.5	0.15	0.3	50	30	14	12	254.8
ISA [ISPA] -SXM-I-60-16- ✱✱✱ -T1(2)-△-□	Incremental		16		1~800	0.3	1.0	0.3	0.7	12	3.5	3	2	63.7
ISA [ISPA] -SXM-I-60-8- ✱✱✱ -T1(2)-△-□	Incremental		8		1~400	0.3	0.6	0.3	0.5	25	12	6	5	127.4
ISA [ISPA] -SXM-I-60-4- ✱✱✱ -T1(2)-△-□			4		1~200	0.15	0.5	0.15	0.3	50	30	14	12	254.8

* In the above model names, ✱✱✱ indicates the stroke, △ the cable length and □ the applicable options.   *1.0G=9800mm/sec²

Options

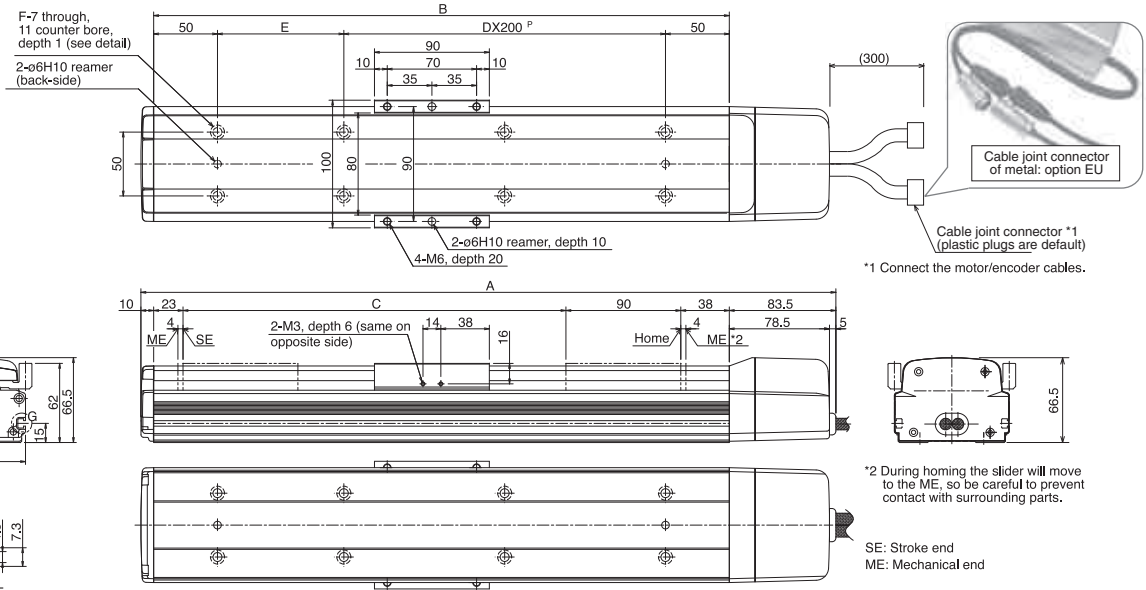| Name	Code	Page	Name	Code	Page
AQ seal	AQ	→ P11	Master-axis designation	LM	→ P12
Brake	B	→ P11	Master-axis designation (sensor on opposite side)	LLM	→ P12
Creep sensor	C	→ P11	Reverse homing specification	NM	→ P12
Creep sensor on opposite side	CL	→ P11	Guide with ball-retaining mechanism	RT	→ P12
Home limit switch	L	→ P12	Slave-axis designation	S	→ P12
Home limit switch on opposite side	LL	→ P12	Metal cable joint connector	EU	

Common Specifications
* Refer to page 8 for the details of common specification items.

Positioning repeatability (Note 3)	±0.02mm [±0.01mm]
Drive system (Note 4)	Ball screw ø12mm, rolled C10 [equivalent to rolled C5]
Backlash (Note 5)	0.05mm or less [0.02mm or less]
Guide	Integrated with base
Allowable load moment	Ma: 28.4N•m Mb: 40.2N•m Mc: 65.7N•m
Overhung load length	Ma direction: 450mm or less, Mb/Mc directions: 450mm or less
Base	Material: Aluminum with white alumite treatment
Cable length (Note 6)	N: No cable, S: 3m, M: 5m, X□□ : Length specification

Dimensions

* Note that changing the home direction will require the actuator to be returned to IAI for adjustment.

Cable joint connector of metal: option EU

Cable joint connector *1 (plastic plugs are default)

*1 Connect the motor/encoder cables.

*2 During homing the slider will move to the ME, so be careful to prevent contact with surrounding parts.

SE: Stroke end
ME: Mechanical end

Detail view of G (T-slot in base)

Detail view of base mounting part

■ Dimensions, Weight and Maximum Speed by Stroke

Stroke	100	(150)	200	(250)	300	(350)	400	(450)	500	(550)	600
A	344.5	394.5	444.5	494.5	544.5	594.5	644.5	694.5	744.5	794.5	844.5
B	251	301	351	401	451	501	551	601	651	701	751
C	100	150	200	250	300	350	400	450	500	550	600
D	0	0	0	1	1	1	1	2	2	2	2
E	151	201	251	101	151	201	251	101	151	201	251
F	4	4	4	6	6	6	6	8	8	8	8
Weight (kg)	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8
Maximum speed (mm/s) Lead 16	800										
Maximum speed (mm/s) Lead 8	400										
Maximum speed (mm/s) Lead 4	200										

Applicable Controller Specifications

Applicable controller	Maximum number of controlled axes	Compatible encoder type	Program operation	Positioner operation	Pulse-train control	Supply voltage	
X-SEL(-P/Q)	4(6) axes	Absolute/incremental	○	△		AC100/230V	
S-SEL	2 axes	Absolute/incremental	○	△		AC100/230V	
S-/E-CON	1 axis	Absolute/incremental		○ / ○	○ / -	AC100/230V	

⚠ Caution

(Note 1) The strokes that are set in increments of 50 mm are semi-standard settings.
(Note 2) Refer to page 38 for the relationship of acceleration and load capacity.
(Notes 3, 4, 5) The figures in brackets apply to the ISPA Series. Other specification values apply to both the ISA and ISPA Series.
(Note 6) The maximum cable length is 30 m. Specify the desired length in meters (e.g., X08 = 8 m).

* Refer to page 7 for other points to note.

ISA-SYM
Single-Axis Robot: Compact Y-Axis Type, Actuator Width 90mm, 60W, Straight Shape

ISPA-SYM
Single-Axis Robot: Compact Y-Axis Type, Actuator Width 90mm, 60W, Straight Shape
High-Precision Specification

| Type | Compact Y-axis (90-mm wide) | Stroke | 100~600mm | Load capacity | 50kg (horizontal)/14kg (vertical) |

■ Model specification items —— Series · Type · Encoder type · Motor output · Lead · Stroke · Applicable controller · Cable length · Options

ISA[ISPA] - SYM - A - 60 - 16 - 600 - T1 - S - B

* Refer to page 9 for the details of model specification items.

■ Models/Specifications

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (mm) In increments of 50mm (Note 1)	Speed (mm/s)	Acceleration (Note 2)				Load capacity (Note 2)				Rated thrust (N)
						Horizontal (G)		Vertical (G)		Horizontal (kg)		Vertical (kg)		
						Rated	Maximum	Rated	Maximum	Rated acceleration	Maximum acceleration	Rated acceleration	Maximum acceleration	
ISA [ISPA] -SYM-A-60-16- ✳✳✳ -T1(2)-△-❏	Absolute	60	16	100 ~ 600	1 ~ 800	0.3	1.0	0.3	0.7	12	3.5	3	2	63.7
ISA [ISPA] -SYM-A-60-8- ✳✳✳ -T1(2)-△-❏			8		1 ~ 400	0.3	0.6	0.3	0.5	25	12	6	5	127.4
ISA [ISPA] -SYM-A-60-4- ✳✳✳ -T1(2)-△-❏			4		1 ~ 200	0.15	0.5	0.15	0.3	50	30	14	12	254.8
ISA [ISPA] -SYM-I-60-16- ✳✳✳ -T1(2)-△-❏	Incremental		16		1 ~ 800	0.3	1.0	0.3	0.7	12	3.5	3	2	63.7
ISA [ISPA] -SYM-I-60-8- ✳✳✳ -T1(2)-△-❏			8		1 ~ 400	0.3	0.6	0.3	0.5	25	12	6	5	127.4
ISA [ISPA] -SYM-I-60-4- ✳✳✳ -T1(2)-△-❏			4		1 ~ 200	0.15	0.5	0.15	0.3	50	30	14	12	254.8

* In the above model names, ✳✳✳ indicates the stroke, △ the cable length and ❏ the applicable options.　　*1.0G=9800mm/sec^2

■ Options

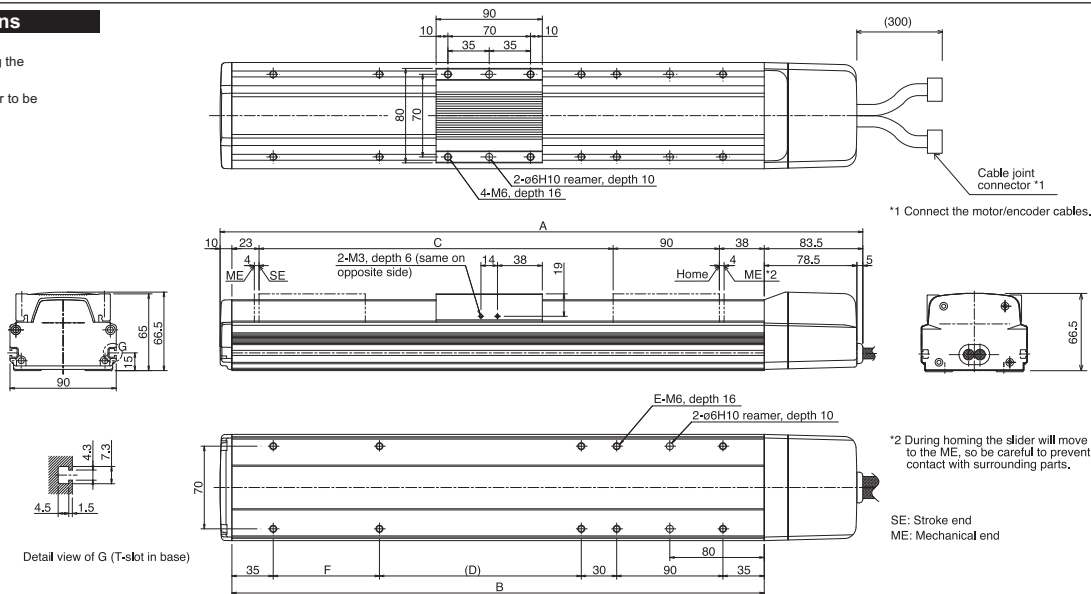| Name	Code	Page	Name	Code	Page
AQ seal	AQ	➜ P11	Master-axis designation	LM	➜ P12
Brake	B	➜ P11	Master-axis designation (sensor on opposite side)	LLM	➜ P12
Creep sensor	C	➜ P11	Reverse homing specification	NM	➜ P12
Creep sensor on opposite side	CL	➜ P11	Guide with ball-retaining mechanism	RT	➜ P12
Home limit switch	L	➜ P12	Slave-axis designation	S	➜ P12
Home limit switch on opposite side	LL	➜ P12	Metal cable joint connector	EU	➜ P13

■ Common Specifications
* Refer to page 8 for the details of common specification items.

Positioning repeatability (Note 3)	±0.02mm [±0.01mm]
Drive system (Note 4)	Ball screw ø12mm, rolled C10 [equivalent to rolled C5]
Backlash (Note 5)	0.05mm or less [0.02mm or less]
Guide	Integrated with base
Allowable load moment	Ma: 28.4Nm　　M b: 40.2Nm　　M c: 32.8Nm
Overhung load length	Ma direction: 450mm or less, Mb/Mc directions: 450mm or less
Base	Material: Aluminum with white alumite treatment
Cable length (Note 6)	N: No cable, S: 3m, M: 5m, X❏❏ : Length specification

■ Dimensions

* Note that changing the home direction will require the actuator to be returned to IAI for adjustment.

2-ø6H10 reamer, depth 10
4-M6, depth 16
Cable joint connector *1
*1 Connect the motor/encoder cables.

2-M3, depth 6 (same on opposite side)
Home
ME *2
SE

*2 During homing the slider will move to the ME, so be careful to prevent contact with surrounding parts.

E-M6, depth 16
2-ø6H10 reamer, depth 10

SE: Stroke end
ME: Mechanical end

Detail view of G (T-slot in base)

■ Dimensions, Weight and Maximum Speed by Stroke

Stroke	100	(150)	200	(250)	300	(350)	400	(450)	500	(550)	600
A	344.5	394.5	444.5	494.5	544.5	594.5	644.5	694.5	744.5	794.5	844.5
B	251	301	351	401	451	501	551	601	651	701	751
C	100	150	200	250	300	350	400	450	500	550	600
D	61	21	71	121	171	221	271	321	371	421	471
E	8	10	10	10	10	10	10	10	10	10	10
F	Ð	90	90	90	90	90	90	90	90	90	90
Weight (kg)	2.8	3.2	3.5	3.9	4.2	4.6	4.9	5.3	5.6	6.0	6.3
Maximum speed (mm/s) Lead 16	800										
Lead 8	400										
Lead 4	200										

■ Applicable Controller Specifications

Applicable controller	Maximum number of controlled axes	Compatible encoder type	Program operation	Positioner operation	Pulse-train control	Supply voltage	
X-SEL(-P/Q)	4(6) axes	Absolute/incremental	○	△		AC100/230V	
S-SEL	2 axes	Absolute/incremental	○	△		AC100/230V	
S-/E-CON	1 axis	Absolute/incremental		○ / ○	○ / -	AC100/230V	

⚠ Caution

(Note 1) The strokes that are set in increments of 50 mm are semi-standard settings.
(Note 2) Refer to page 38 for the relationship of acceleration and load capacity.
(Notes 3, 4, 5) The figures in brackets apply to the ISPA Series. Other specification values apply to both the ISA and ISPA Series.
(Note 6) The maximum cable length is 30 m. Specify the desired length in meters (e.g., X08 = 8 m).

* Refer to page 7 for other points to note.