Rotating Nut Linear Actuator **NS**

Long Stroke and High-Speed Movement

IAI

Nut Rotation Actuator that Provides Long Stroke and Speed Nearly As Fast as a Linear

Maximum Speed 2400 mm/s, Maximum Acceleration 1G High-Speed Performance and Multislider to Greatly Reduce Cycle Time

1 Moves the slider by rotating a nut, not with a ball screw.

The actuator structure is that rather than moving the nut in the straight line by rotating a ball screw, the ball screw is fixed and the nut is rotated by a servo motor built into the slider, so the slider moves in a straight line.
Because the ball screw does not rotate, the influence of dangerous rotation speeds is minimal and this makes movement at high speed possible even for long strokes.

Nut

Motor

Ball screw

Ball screw

Nut + servo motor

ISA series

NS series
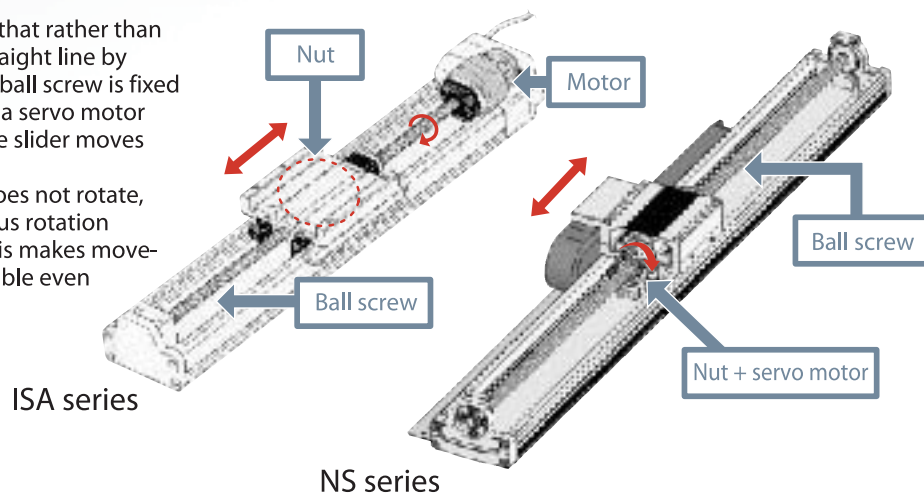
2 Maximum speed 2400 mm/s, maximum acceleration 1g high-speed performance

A maximum speed of 2400 mm/s is attained through the use of high-lead precision screws (equivalent to C5). Also, since there is minimal impact from dangerous rotation speeds, movement is possible at the maximum 2400 mm/s even at the maximum stroke (3000 mm), so the cycle time can be greatly reduced.

Graph — Maximum speed (m/s) vs Stroke (mm)
NS series — 2400m/s
ISA series — 680m/s
about 3.5x high-speed performance
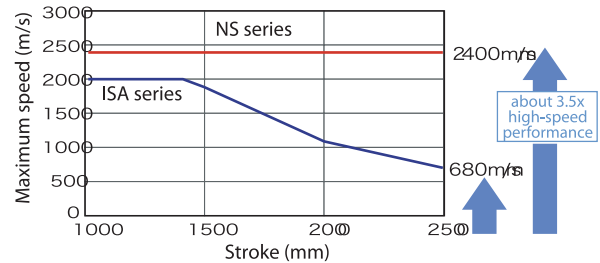
3 The middle support structure provides a long stroke of 3000 mm.

The NS series combines nut rotation functions with the intermediate support structure that has proven itself in the ISA series to attain a 3000-mm stroke, stunning for a ball screw machine.

Intermediate support

Intermediate support
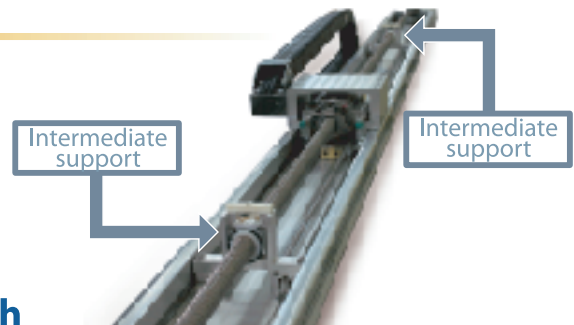
4 Multi-slider support [equipped with collision prevention function]

Two sliders are set on one shaft and a multi-slider is set to operate them separately. Since this makes it possible for two shafts to operate in the space of one shaft, it has a great effect in saving space and reducing tact time. The "collision prevention function" to prevent collisions between the sliders is standard equipment.
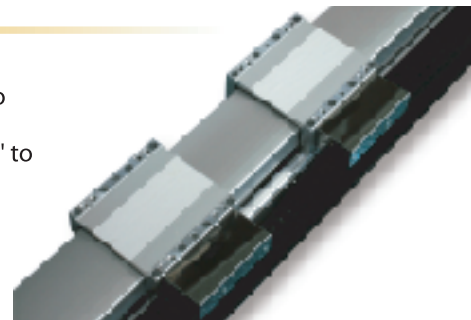
5 Length reduced further

Using a servo motor and putting the motor on the outside of the ball screw eliminates the previous need for motor installation space and links the ball screw directly to further shorten the length even compared to the IS series which has already greatly reduced it.

62 mm shortening

NS series

IS series
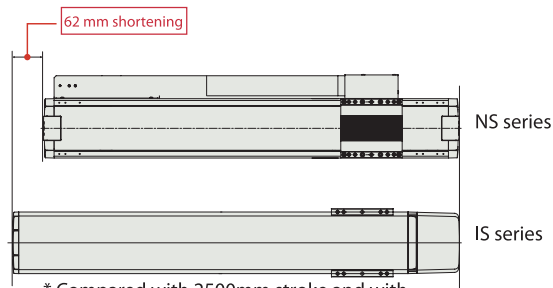
* Compared with 2500mm stroke and with mid support

6 Extension cable track option setting

A cable track that expands the capacity is available as an option.

120
14
40
201

<Standard cable track>

KSH–24W（THK）
31
151
120
24
55
218

<Extension cable track>

Model

NS	☐	☐	400	☐	☐	T2	☐	☐
Series	Type	Encoder type	Motor type	Lead	Stroke	Adaptive controller	Cable length	Options

400	400W

A	Absolute
I	Incremental

20	20mm
40	40mm

LXMS	Horizontal specifications/ single slider
LXMM	Horizontal specifications/ multi-slider
LXMXS	Horizontal specifications/ single slider with intermediate support
LZMS	Vertical specifications/ single slider
LZMM	Vertical specifications/ multi-slider

250	250m
I	I
3000	3000mm

T2	S CO N
	SSE L
	X SE LP／Q

N	No cable
P	1 m
S	3 m
M	5 m
X ☐☐	Length specified
R ☐☐	Robot cable

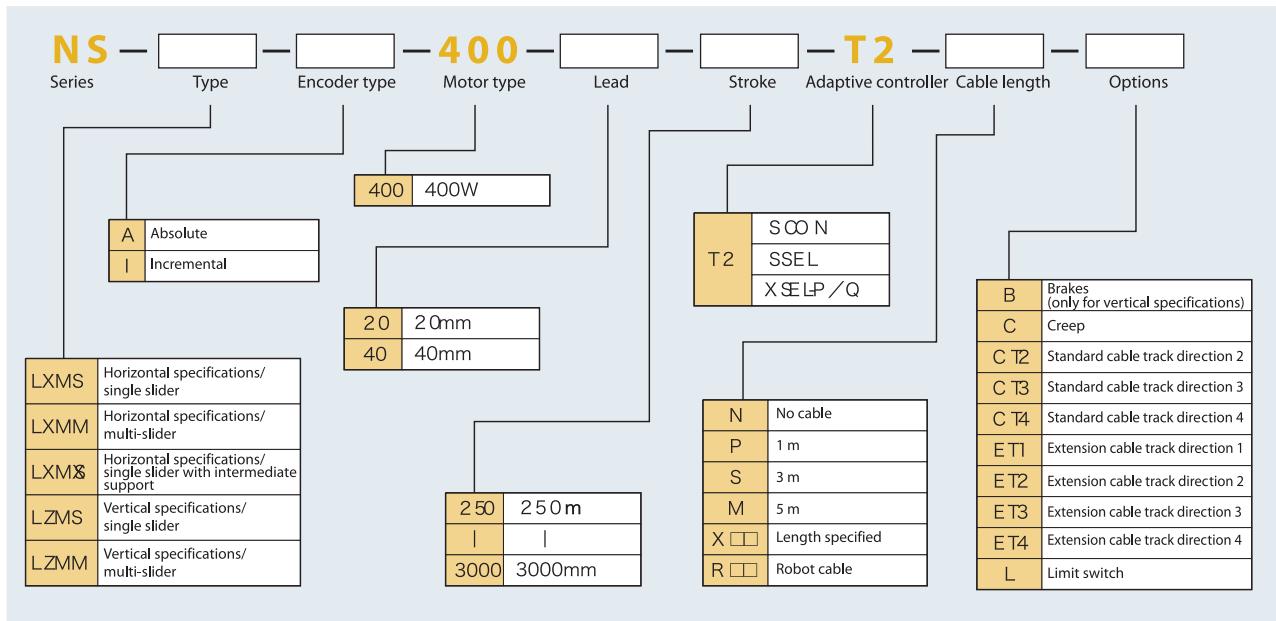| B	Brakes (only for vertical specifications)
C	Creep
C T2	Standard cable track direction 2
C T3	Standard cable track direction 3
C T4	Standard cable track direction 4
E T1	Extension cable track direction 1
E T2	Extension cable track direction 2
E T3	Extension cable track direction 3
E T4	Extension cable track direction 4
L	Limit switch

Specifications Table

	Slider	Appearance	Type	Encoder type	Motor type	Lead (mm)	Stroke (mm)	Rated thrust (N)	Maximum transportable weight (kg)	Maximum speed" (mm/s)	Page
Horizontal specifications	Single slider		LXMS	Absolute Incremental	400	40	500 - 1200	170	40	2400	P5
						20		340.1	80	1300	
	Multi-slider		LXMM			40	250 - 2250	170	40	2400	P6
						20		340.1	80	1300	
Horizontal specifications with intermediate support	Single slider		LXMXS			40	1300 - 3000	170	40	2400	P7
						20		340.1	80	1300	
Vertical specifications	Single slider		LZMS			20	500 - 1000	340.1	16	1000	P8
	Multi-slider		LZMM				250 - 950				P9

Table of Payload By Acceleration Conditions

1. Horizontal installation

Type	Motor output (W)	Lead (mm)	Maximum speed" (mm/s)	Maximum acceleration (G)	Payload by acceleration (kg)							
					0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G
LXMS LXMM	400	40	2400	1.0	40	30	25	20	17	15	13	10
		20	1300	1.0	80	60	48	40	34	30	27	24
LXMXS		40	2400	0.3	40	ó	ó	ó	ó	ó	ó	
		20	1300		80	ó	ó	ó	ó	ó	ó	

2. Vertical installation

Type	Motor output (W)	Lead (mm)	Maximum speed" (mm/s)	Maximum acceleration (G)	Payload by acceleration (kg)							
					0.3G	0.4G	0.5G	0.6G	0.7G	0.8G	0.9G	1.0G
LZMS LZMM	400	20	1000	0.8	16	12.3	11.1	10.1	9.2	6	ó	ó

Explanation of Main Unit Options

Brakes

Model **B**

Explanation

This is a structure that holds the slider so that if the actuator is used vertically and the power is switched Off or the servo goes Off, the slider does not fall and damage installed items. In the NS series vertical specifications (LZMS/LZMM), brakes are standard equipment. (Brakes are not set for the horizontal specifications.)
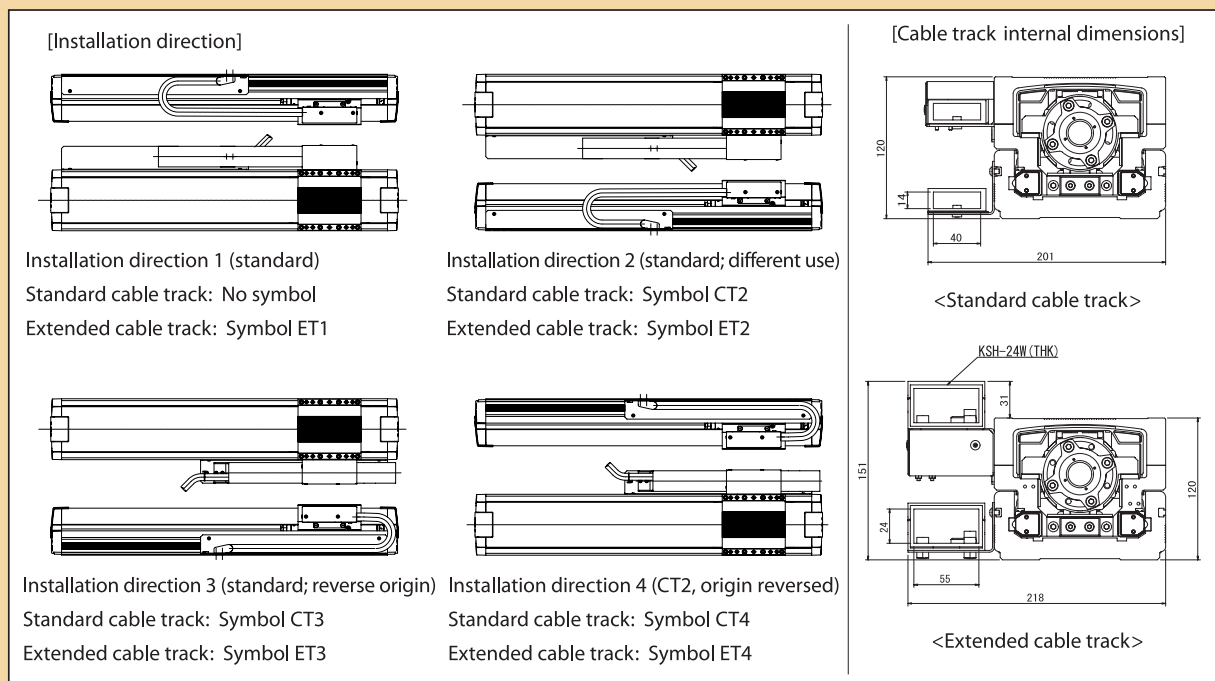
Creep sensor

Model **C**

Explanation

When the homing operation is carried out with the incremental specifications, in order to shorten the homing time, the slider is moved at high speed to just before the position and when it passes this sensor, the speed is dropped to resume normal homing operations. Since this sensor is mounted within the actuator itself, it does not affect the appearance or external dimensions.

Standard cable track installation direction change/extension cable track installation

Model **CT2 / CT3 / CT4 (standard cable track installation direction)**
ET1 / ET2 / ET3 / ET4 (extended cable track installation direction)

Explanation

The cable track installation direction can be selected from the following four types (including the standard installation direction).

[Installation direction]

[Cable track internal dimensions]

Installation direction 1 (standard)
Standard cable track: No symbol
Extended cable track: Symbol ET1

Installation direction 2 (standard; different use)
Standard cable track: Symbol CT2
Extended cable track: Symbol ET2

Installation direction 3 (standard; reverse origin)
Standard cable track: Symbol CT3
Extended cable track: Symbol ET3

Installation direction 4 (CT2, origin reversed)
Standard cable track: Symbol CT4
Extended cable track: Symbol ET4

<Standard cable track>

KSH–24W (THK)

<Extended cable track>

Origin limit switch

Model **L**

Explanation

Normal NS series homing operations use the "push contact technique" in which the origin is reached by bringing the slider in contact with a stopper, inverting, then detecting the Z phase. L (origin limit switch) is the option for executing the homing operation without contact by detecting using a proximity sensor, then inverting. Since origin limit switch is mounted within the actuator itself, it does not affect the appearance or external dimensions.

NS-LXMS
Single-axis robot nut rotation type   Main unit width 145mm 400 W horizontal specifications/single slider

■ Model item

NS — LXMS — ☐ — 400 — ☐ — ☐ — T2 — ☐ — ☐

| Series | Type | Encoder type
A : Absolute
I : Incremental | Motor type
400:400W | Lead
40:40mm
20:20mm | Stroke
500:500mm

1200:1200mm | Adaptive
controller
T2:SCON
SSEL
XSEL-P/Q | Cable length
N:None
S :3m
M:5m
X:Length
specified | Options
See option
table
below |

Model/specs

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (mm)	Speed (mm/s)	Acceleration (*1)				Payload (*1, *2)		Rated thrust (N)
						Horizontal (G)		Vertical (G)		Horizontal (kg)	Vertical (kg)	
						Rated	Maximum	Rated	Maximum	Rated / Maximum acceleration	Rated / Maximum acceleration	
NS-LXMS-①-400-40-②-T2-③-④	Absolute Incremental	400	40	500 - 1200	2400	0.3	1.0	Horizontal only		40	10	170
NS-LXMS-①-400-20-②-T2-③-④			20		1300	0.3	1.0			80	24	340.1

* For the model types above, ① is the encoder type, ② the stroke, ③ the cable length, and ④ the options.
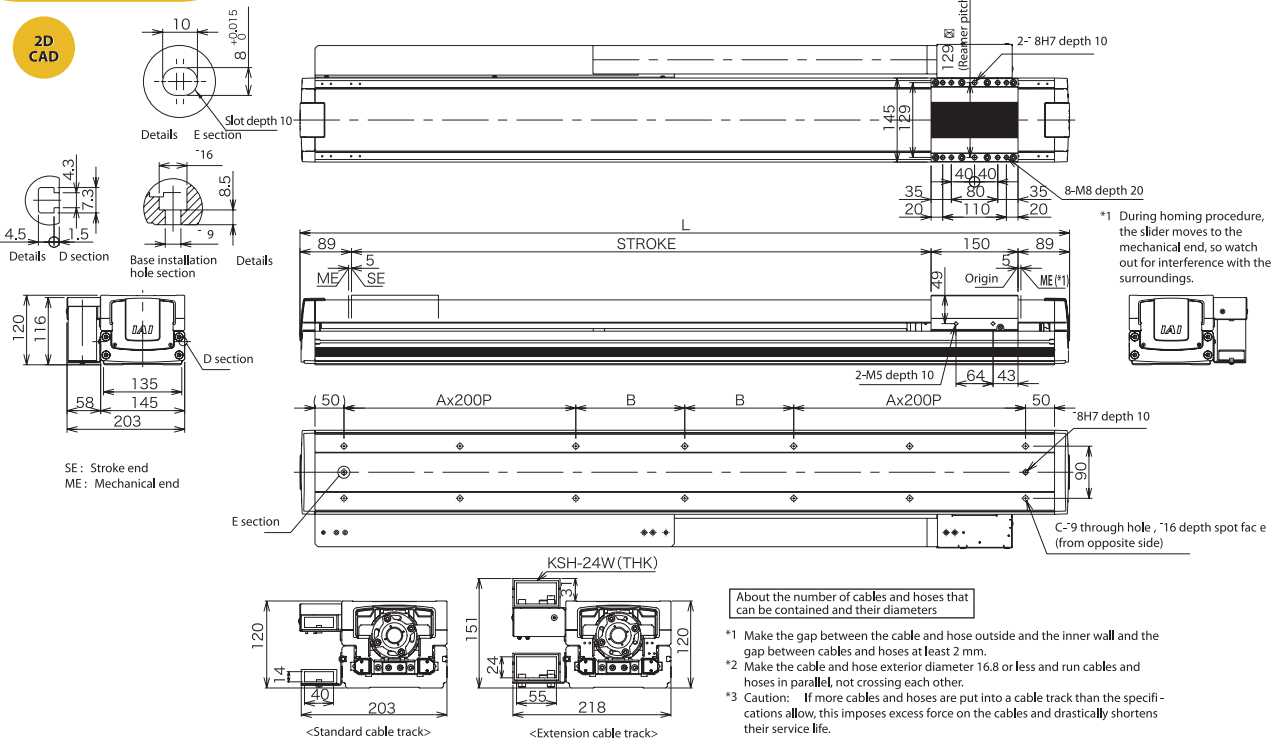
Options

Name	Model	See Page
Creep sensor	C	P4
Standard cable track installation direction change	CT2 - CT4	P4
Extended cable track	ET1 - ET4	P4
Limit switch	L	P4

Common specifications

Drive type	Ball screw ⌀20 mm Equivalent to C5 form rolled
Repeatability	Absolute specifications ±0.01 mm/Incremental specifications ±0.02 mm
Backlash	0.02 mm max.
Guide	Base one-piece model
Permitted load moment	Ma:104.9N・m Mb:149.9N・m Mc:248.9N・m
Extension load length	Ma direction: 750 mm max. Mb, Mc direction: 750 mm max.
Base	Material: Aluminum, white treated alumite
Cable length (*3)	N: No cable S: 3m M: 5m X: Length specified
Usage ambient temperature	0-40℃, 85% RH max. (no condensation allowed)

Dimension diagram

CAD drawings can be downloaded from the homepage

2D CAD

*1 During homing procedure, the slider moves to the mechanical end, so watch out for interference with the surroundings.

SE : Stroke end
ME : Mechanical end

KSH-24W (THK)

<Standard cable track>

<Extension cable track>

About the number of cables and hoses that can be contained and their diameters

*1 Make the gap between the cable and hose outside and the inner wall and the gap between cables and hoses at least 2 mm.
*2 Make the cable and hose exterior diameter 16.8 or less and run cables and hoses in parallel, not crossing each other.
*3 Caution: If more cables and hoses are put into a cable track than the specifications allow, this imposes excess force on the cables and drastically shortens their service life.

Stroke	500	600	700	800	900	1000	1100	1200
L	828	928	1028	1128	1228	1328	1428	1528
A	1	1	1	1	2	2	2	2
B	138	188	238	288	138	188	238	288
C	10	10	10	10	14	14	14	14
Weight (kg)	18.6	20.1	21.6	23.1	24.5	26.0	27.5	29.0

Adaptive controller specifications

Adaptive controller	Maximum number of axes controlled	Connectable encoder types	Operation method	Power supply voltage
X-SEL-P/Q	6 axes	Absolute/incremental	Program	Three phase/single phase 200 VAC
SSEL	2 axes			Single phase
SCON	1 axis		Positioner pulse string control	100/200 VAC

⚠ Notes

Note 1: For details on the relationship between the acceleration and the payload, see Page 3.
Note 2: The payload is the value when operating at the maximum speed.
Note 3: The maximum cable length is 30 m. When specifying the length, enter in meters. (Example: X08=8 m)

NS-LXMM

Single-axis robot nut rotation type Main unit width 145mm 400 W
Horizontal specifications/multi-slider

■ Model item

NS	—	LXMM	—	☐	—	400	☐	—	☐	—	T2	☐	—	☐	Options

- **Series**: NS
- **Type**: LXMM
- **Encoder type**: A : Absolute / I : Incremental
- **Motor type**: 400:400W
- **Lead**: 40:40mm / 20:20mm
- **Stroke**: 250:250mm ~ 2250:2250mm
- **Adaptive controller**: T2:SCON / SSEL / XSEL-P/Q
- **Cable length**: N:None / S :3m / M:5m / X:Length specified
- **Options**: See option table below

■ Model/specs

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (mm)	Speed (mm)	Acceleration (*1) Horizontal (kg) Rated	Acceleration (*1) Horizontal (kg) Maximum	Acceleration (*1) Vertical (kg) Rated	Acceleration (*1) Vertical (kg) Maximum	Payload (*1, *2) Horizontal (kg) Rated / Maximum acceleration	Payload (*1, *2) Vertical (kg) Rated / Maximum acceleration	Rated thrust (N)
NS-LXMM-①-400-40-②-T2-③-④	Absolute Incremental	400	40	250 ~ 2250	2400	0.3	1.0	Horizontal only		40 10	Horizontal only	170
NS-LXMM-①-400-20-②-T2-③-④			20		1300	0.3	1.0			80 24		340.1

* For the model types above, ① is the encoder type, ② the stroke, ③ the cable length, and ④ the options.

■ Options

Name	Model	See Page
Creep sensor	C	P4
Extension cable track	ET1	P4
Limit switch	L	P4

■ Common specifications

Drive type	Ball screw ⌀ 20 mm Equivalent to C5 form rolled
Repeatability	Absolute specifications ±0.01 mm/Incremental specifications ± 0.02 mm
Backlash	0.02 mm max.
Guide	Base one-piece model
Permitted load moment	M a:104.9N m M b:149.9N m M c:248.9N m
Extension load length	Ma direction: 750 mm max. Mb, Mc directions: 750 mm max.
Base	Material: Aluminum, white treated alumite
Cable length (*3)	N: No cable S: 3m M: 5m X: Length specified
Usage ambient temperature	0-40ʃ C, 85% RH max. (no condensation allowed)

■ Dimension diagram

CAD drawings can be downloaded from the homepage

2D CAD

Details E section
Slot depth 10

Details D section
Base installation hole section
Details

SE: Stroke end
ME: Mechanical end

E section

*1 During homing procedure the slider moves to the mechanical end, so watch out for interference with the surroundings.

100 (minimum between sliders)
ME (*1)   Origin
STROKE
STROKE
Origin   ME (*1)

Ax200P   B   B   Ax200P

2-⌀8 H7 depth 10
8-M8 depth 20
⌀8 H7 depth 10
C-⌀9 through hole ,⌀16 depth spot face (from opposite side)

M5 depth 10
M5 depth 10

KSH-24W (THK)

<Standard cable track>   <Extension cable track>

About the number of cables and hoses that can be contained and their diameters

1) Make the gap between the cable and hose outside and the inner wall and the gap between cables and hoses at least 2 mm.
2) Make the cable and hose exterior diameter 16.8 or less and run cables and hoses in parallel, not crossing each other.
3) Caution :   If more cables and hoses are put into a cable track than the specifications allow, this imposes excess force on the cables and drastically shortens their service life.

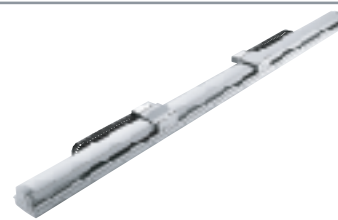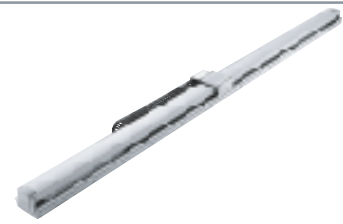| Stroke	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250
L	828	928	1028	1128	1228	1328	1428	1528	1628	1728	1828	1928	2028	2128	2228	2328	2428	2528	2628	2728	2828
A	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6
B	138	188	238	288	138	188	238	288	138	188	238	288	138	188	238	288	138	188	238	288	138
C	10	10	10	10	14	14	14	14	18	18	18	18	22	22	22	22	26	26	26	26	30
Weight (kg)	24.7	26.4	28.2	29.9	31.6	33.4	35.1	36.8	38.6	40.3	42	43.8	45.5	47.2	48.9	50.7	52.4	54.1	55.9	57.6	59.3

■ Adaptive controller specifications

Adaptive controller	Maximum number of axes controlled	Connectable encoder types	Operation method	Power supply voltage
X-SEL-P/Q	6 axes	Absolute/incremental	Program	Three phase/single 200 VAC
SSEL	2 axes			Single phase 100/200 VAC
SCON	1axis		Positioner pulse string control	

⚠ **Notes**

Note 1: For details on the relationship between the acceleration and the payload, see Page 3.
Note 2: The payload is the value when operating at the maximum speed.
Note 3: The maximum cable length is 30 m. When specifying the length, enter in meters. (Example: X08=8 m)

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NS-LXMXS
Single-axis robot nut rotation type, Main unit width 145mm 400W
Horizontal specifications, single slider with intermediate support

Model item

NS — LXMXS — □ — 400 — □ — □ — T2 — □ — □ — □

Series	Type	Encoder type A : Absolute I : Incremental	Motor type 400:400W	Lead 40:40mm 20:20mm	Stroke 1300:1300mm 3000:3000mm	Adaptive controller T2:SCON SSEL XSEL-P/Q	Cable length N:None S :3m M:5m X:Length specified	Options See option table below

Model/specs

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (mm)	Speed (mm)	Acceleration (*1)				Payload (*1, *2)		Rated thrust (N)
						Horizontal (kg)		Vertical (kg)		Horizontal (kg)	Vertical (kg)	
						Rated	Maximum	Rated	Maximum	Rated / Maximum acceleration	Rated / Maximum acceleration	
NS-LXMXS-①-400-40-②-T2-③-④	Horizontal only	400	40	1300 ~ 3000	2400	0.3				40		170
NS-LXMXS-①-400-20-②-T2-③-④			20		1300	0.3		Horizontal only		80	Horizontal only	340.1

*For the model types above, ① is the encoder type, ② the stroke, ③ the cable length, and ④ the options.
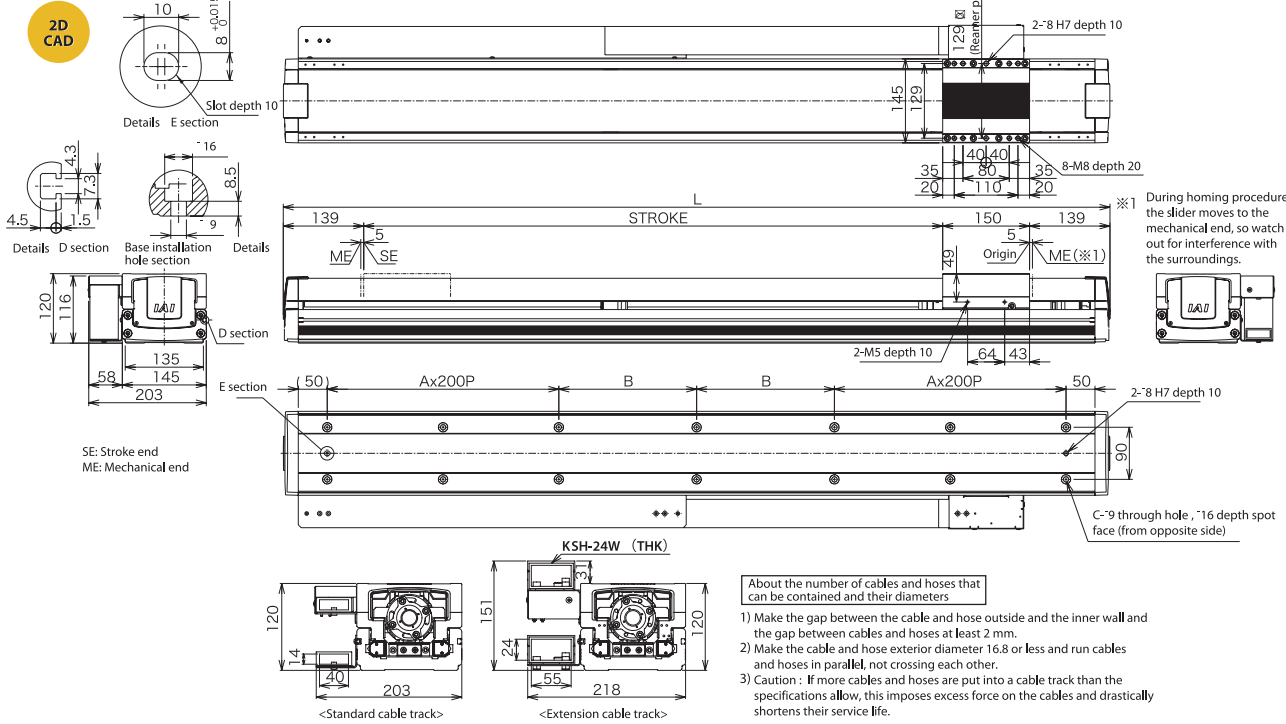
Options

Name	C	P4
Creep sensor	C	P4
Standard cable track installation direction change	CT2~CT4	P4
Extended cable track	ET1~ET4	P4
Limit switch	L	P4

Common specifications

Drive type	Ball screw ⌀20 mm Equivalent to C5 form rolled
Repeatability	Absolute specifications ±0.01 mm/Incremental specifications ±0.02 mm
Backlash	0.02 mm max.
Guide	Base one-piece model
Permitted load moment	Ma:104.9N・m Mb:149.9N・m Mc:248.9N・m
Extension load length	Ma direction: 750 mm max. Mb, Mc directions: 750 mm max.
Base	Material: Aluminum, white treated alumite
Cable length (*3)	N: No cable S: 3m M: 5m X: Length specified
Usage ambient temperature	0-40℃, 85% RH max. (no condensation allowed)

Dimension diagram

CAD drawings can be downloaded from the homepage

2D CAD

Details E section
Slot depth 10

Details D section
Base installation hole section
Details

SE: Stroke end
ME: Mechanical end

D section
E section

129 ⊠ (Reamer pitch)
2-⌀8 H7 depth 10
8-M8 depth 20
145 / 129

40 40 / 80 / 110
35 / 20 ... 35 / 20

L
139 ... STROKE ... 150 ... 139
ME ... SE
Origin ... ME(※1)

※1 During homing procedure, the slider moves to the mechanical end, so watch out for interference with the surroundings.

2-M5 depth 10
64 43

Ax200P ... B ... B ... Ax200P
50 ... 50
2-⌀8 H7 depth 10
90
C-⌀9 through hole , ⌀16 depth spot face (from opposite side)

KSH-24W（THK）

About the number of cables and hoses that can be contained and their diameters
1) Make the gap between the cable and hose outside and the inner wall and the gap between cables and hoses at least 2 mm.
2) Make the cable and hose exterior diameter 16.8 or less and run cables and hoses in parallel, not crossing each other.
3) Caution : If more cables and hoses are put into a cable track than the specifications allow, this imposes excess force on the cables and drastically shortens their service life.

`<Standard cable track>` `<Extension cable track>`

Stroke	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000
L	1728	1828	1928	2028	2128	2228	2328	2428	2528	2628	2728	2828	2928	3028	3128	3228	3328	3428
A	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7
B	188	238	288	138	188	238	288	138	188	238	288	138	188	238	288	138	188	238
C	18	18	18	22	22	22	22	26	26	26	26	30	30	30	30	34	34	34
Weight (kg)	31.5	32.9	34.4	35.9	37.4	38.9	40.4	41.9	43.4	44.9	46.4	47.9	49.4	50.9	52.3	53.8	55.3	56.8

Adaptive controller specifications

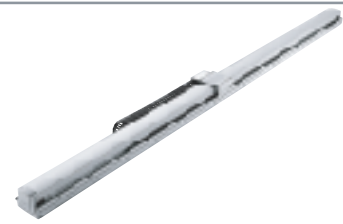| Adaptive controller	Maximum number of axes controlled	Connectable encoder types	Operation method	Power supply voltage
X-SEL-P/Q	6 axes	Absolute/ incremental	Program	Three phase/ single phase 200 VAC
SSEL	2 axes			Single phase 100/200 VAC
SCON	1 axis		Positioner pulse string control	

⚠ **Notes**

Note 1: The maximum acceleration is 0.3 G.
Note 2: The payload is the value when operating at the maximum speed.
Note 3: The maximum cable length is 30 m. When specifying the length, enter in meters. (Example: X08=8 m)

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NS-LZMS
Single-axis robot nut rotation type, Main unit width 145mm 400W
Vertical specifications, single slider

■ Model item

NS — LZMS — ☐ — 400 — ☐ — Stroke — T2 — ☐ — ☐ — Options

Series	Type	Encoder type A : Absolute I : Incremental	Motor type 400:400W	Lead 40:40mm	Stroke 500:500mm | 1000:1000mm	Adaptive controller T2:SCON SSEL XSEL-P/Q	Cable length N:None S :3m M:5m X:Length specified	Options See the option price table below.	

■ Model/specs

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (mm)	Maximum speed (m/s)	Acceleration (*1) Horizontal (G) Rated	Acceleration (*1) Horizontal (G) Maximum	Acceleration (*1) Vertical (G) Rated	Acceleration (*1) Vertical (G) Maximum	Payload (*1, *2) Horizontal (kg) Rated / Maximum acceleration	Payload (*1, *2) Vertical (G) Rated / Maximum acceleration	Rated thrust (N)
NS-LZMS-☐1-400-40-☐2-T2-☐3-B-☐4	Absolute Incremental	400	20	500 ~1000	1000	For vertical only		0.3	0.8	For vertical only	16 / 6.0	340.1

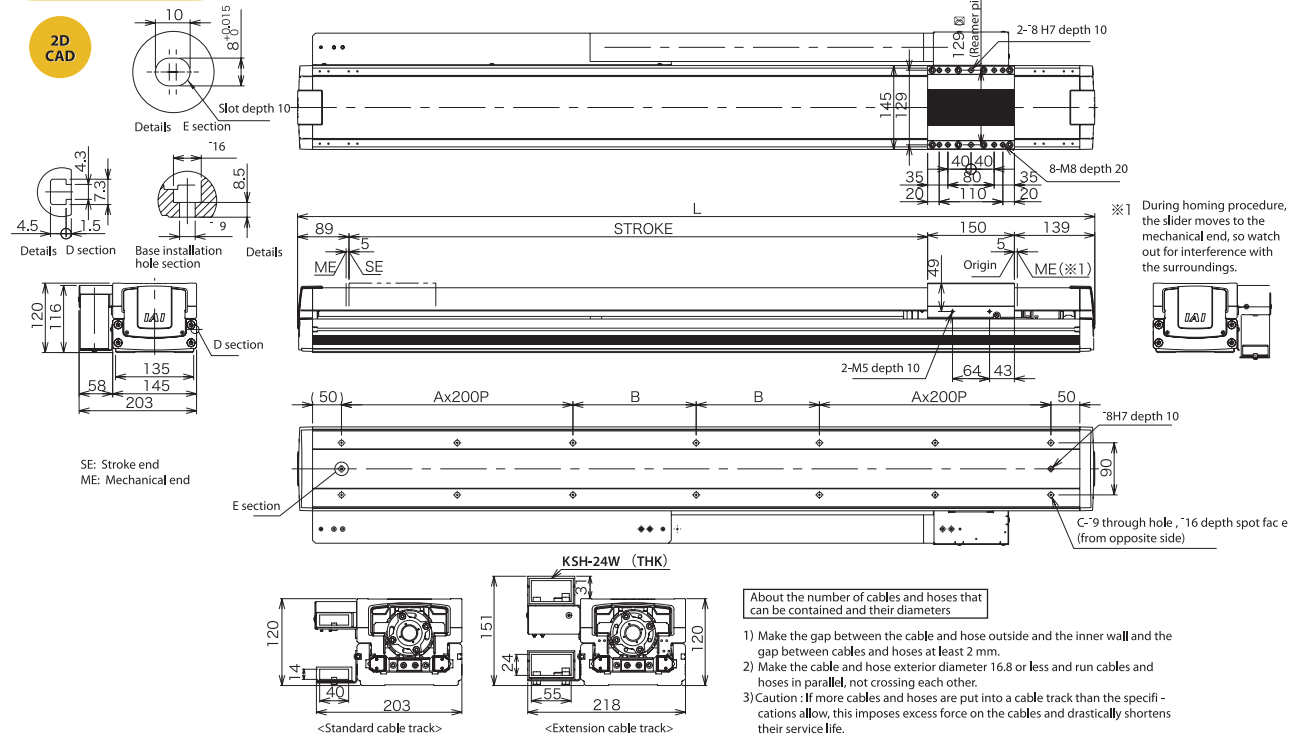* For the model types above, ☐1 is the encoder type, ☐2 the stroke, ☐3 the cable length, and ☐4 the options.

■ Options

Name	Model	See Page	Remarks
Brakes	B	P4	Standard equipment
Creep sensor	C	P4	
Standard cable track installation direction change	CT2~CT4	P4	
Extended cable track	ET1~ET4	P4	
Limit switch	L	P4	

■ Common specifications

Drive type	Ball screw ˉ 20 mm Equivalent to C5 form rolled
Repeatability	Absolute specifications ±0.01 mm/Incremental specifications ± 0.02 mm
Backlash	0.02 mm max.
Guide	Base one-piece model
Permitted load moment	M a:104.9N・m M b:149.9N・m M c:248.9N・m
Extension load length	Ma direction: 750 mm max. Mb, Mc directions: 750 mm max.
Brakes	Non-excitation operation electromagnetic brakes standard equipment
Base	Material: Aluminum, white treated alumite
Cable length (*3)	N: No cable S: 3m M: 5m X: Length specified
Usage ambient temperature	0-40∫ C, 85% RH max. (no condensation allowed)

■ Dimension diagram

CAD drawings can be downloaded from the homepage

2D CAD

※1 During homing procedure, the slider moves to the mechanical end, so watch out for interference with the surroundings.

SE: Stroke end
ME: Mechanical end

KSH-24W （THK）

<Standard cable track>

<Extension cable track>

About the number of cables and hoses that can be contained and their diameters

1) Make the gap between the cable and hose outside and the inner wall and the gap between cables and hoses at least 2 mm.
2) Make the cable and hose exterior diameter 16.8 or less and run cables and hoses in parallel, not crossing each other.
3) Caution : If more cables and hoses are put into a cable track than the specifi - cations allow, this imposes excess force on the cables and drastically shortens their service life.

Stroke	500	600	700	800	900	1000
L	878	978	1078	1178	1278	1378
A	1	1	1	2	2	2
B	163	213	263	113	163	213
C	10	10	10	14	14	14
Weight (kg)	19.9	21.4	22.9	24.4	25.9	27.4

■ Adaptive controller specifications

Adaptive controller	Maximum number of axes controlled	Connectable encoder types	Operation method	Power supply voltage
X-SEL-P/Q	6 axes	Absolute/ incremental	Program	Three phase/ single phase 200 VAC
SSEL	2 axes			
SCON	1 axis		Positioner pulse string control	Single phase 100/200 VAC

⚠ **Notes**

Note 1: For details on the relationship between the acceleration and the payload, see Page 3.
Note 2: The payload is the value when operating at the maximum speed.
Note 3: The maximum cable length is 30 m. When specifying the length, enter in meters. (Example: X08=8 m)

NS-LZMM

Single-axis robot nut rotation type, Main unit width 145 mm   400W
Vertical specification multi-slider

■ Model item

NS	—	LZMM	—	□	—	400	—	□	—	□	—	T2	—	□	—	□

| Series | Type | Encoder type
A : Absolute
I : Incremental | Motor type
400:400W | Lead
20:20mm | Stroke
250:250mm
╎
950:950mm | Adaptive
controller
T2:SCON
SSEL
XSEL-P/Q | Cable length
N:None
S :3m
M:5m
X:Length
specified | Options
Option
table
below
Reference |

■ Model/specs

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (mm)	Speed (mm/s)	Acceleration (*1)				Payload (*1, *2)		Rated propulsion
						Horizontal (G)		Vertical (G)		Horizontal (G)	Vertical (G)	
						Ratings	Maximum	Ratings	Maximum	Ratings / Maximum acceleration	Ratings / Maximum acceleration	
NS-LZMM-①-400-20-②-T2-③-B-④	Absolute Incremental	400	20	250 ~ 950	1000	Vertical only		0.3	0.8	Vertical only	16 6.0	340.1

* For the model type above, ① is the encoder type, ② the stroke, ③ the cable length, and ④ the options.
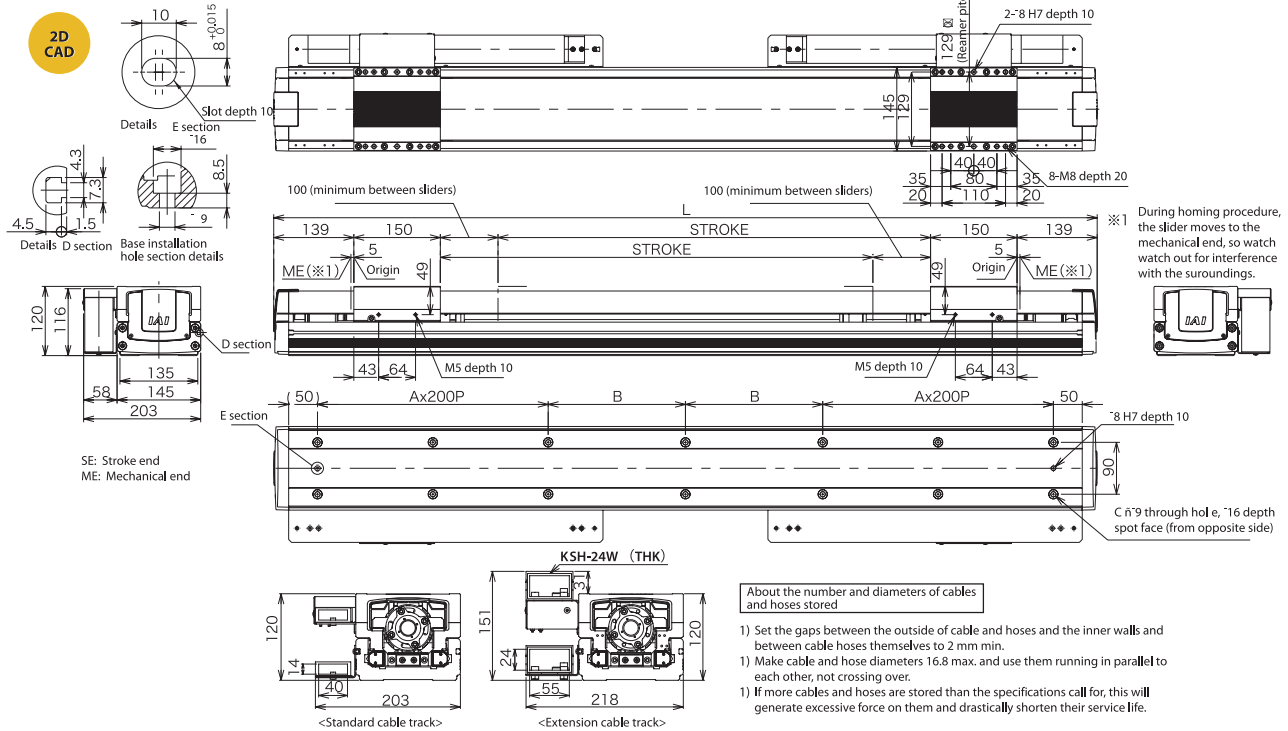
■ Options

Name	Model	Reference page	Remarks
Brakes	B	P4	Standard equipment
Creep sensor	C	P4	
Extended cable pair	ET1	P4	
Limit switch	L	P4	

■ Common specifications

Drive type	Ball screw ⌀20 mm Equivalent to C5 form rolled
Repeatability	Absolute specifications ±0.01 mm/Incremental specifications ±0.02 mm
Backlash	0.02 mm max.
Guide	Base one-piece model
Permitted load moment	Ma:104.9N・m Mb:149.9N・m Mc:248.9N・m
Extended load length	Ma direction: 750 mm max. Mb, Mc direction: 750 mm max.
Brakes	Non-excitation operating electromagnetic brakes standard
Base	Material: Aluminum, white treated alumite
Cable length (*3)	N: No cable S: 3m M: 5m X: Length specified
Usage temperature	0–40∫C, 85% RH max. (no condensation allowed)

■ Dimensional diagram

CAD drawings can be downloaded from the home page.

2D CAD

SE: Stroke end
ME: Mechanical end

※1 During homing procedure, the slider moves to the mechanical end, so watch watch out for interference with the surroundings.

KSH-24W （THK）

<Standard cable track>
<Extension cable track>

About the number and diameters of cables and hoses stored

1) Set the gaps between the outside of cable and hoses and the inner walls and between cable hoses themselves to 2 mm min.
1) Make cable and hose diameters 16.8 max. and use them running in parallel to each other, not crossing over.
1) If more cables and hoses are stored than the specifications call for, this will generate excessive force on them and drastically shorten their service life.

Stroke	250	350	450	550	650	750	850	950
L	928	1028	1128	1228	1328	1428	1528	1628
A	1	1	1	2	2	2	2	3
B	188	238	288	138	188	238	288	138
C	10	10	10	14	14	14	14	18
Weight (kg)	27.1	28.8	30.5	32.2	34	35.7	37.4	39.2

■ Adaptive controller specifications

Adaptive controller	Maximum number of axes controlled	Connectable encoder types	Operation dimensions	Power supply voltage
X-SEL-P/Q	6 axes	Absolute/ incremental	Program	3-phase/1-phase, 200 VAC
SSEL	2 axes			
SCON	1 axis		Positioner pulse string control	Single phase AC, 100/200 V

⚠ **Notes**

Note 1: For the relationship between the acceleration and the payload, see Page 3.

Note 2: The payload is the value when operating at the maximum speed.

Note 3: The maximum cable length is 30 m. Enter the length specification in meters.
(Example: X08=8 m)

Controller specifications

	Controller series type	SCON	SSEL	XSEL	
				P (Standard) Type	**Q** (Global) Type
Basic specifications	Appearance				
	Power supply capacity	844 VA	1660 VA max. (for 400W, 2-axis operation)	4998 VA max. (for 2400W, 6-axis operation)	
	Insulation resistance	500 VDC, 100 M min.		500 VDC, 10 M min.	
	Withstand voltage	1500 VAC for one minute		2500 VAC for one minute	1500 VAC for one minute
	Input power supply	Single phase 200 VAC	Single phase 100 VAC Single phase 200 VAC	Three-phase 200 VAC Single phase 200 VAC	
	Within operating power supply voltage	±10%			
Control specifications	Maximum connected total axis output (W)	750W (200V power supply specifications)	400W (100V power supply specifications) 800W (200V power supply specifications)	2400W (for three-phase power) 1600W (for single-phase power)	
	Maximum number of axes controlled	1 axis	2 axis	6 axis	
	Position detection technique	Incremental encoder/absolute encoder			
	Safety circuit configuration	Duplex not possible		Duplex not possible	Duplexing possible
	Drive power cut-off	Internal relay cut-off		Internal relay cut-off	External safety circuit
	Enable input	B contact input (Internal power feed type)		B contact input (internal power feed type)	B contact input (External power feed type, duplex)
	Speed setting	1 mm/s ñ upper limit, which depends on the actuator			
	Acceleration setting	0.01 G 1 ñ upper limit, which depends on the actuator			
	Operation technique	Positioner operation Pulse string control	Program operation Positioner operation (Switchable)	Program operation only	
Program	Program language	–	Super SEL language		
	Program count	–	64		
	Program step count	–	2000	6000	
	Multi-task program count	–	8	16	
	Position count	512 max.	1500	4000	
	Data storage device	EEPROM	Flash ROM (Optional SRAM battery backup)	Flash ROM + SRAM battery backup	
	Data input device (Option)	Teaching box Models: RCM-T/TD/E/P Software for PC Model: RCM-101-MW (for RS232 communications) RCM-101-USB (for USB communications)	Teaching box Models: IA-T-X-J, IA-T-XD-J Software for PC Model: IA-101-X-MW-J (for RS232 communications) IA-101-USB (for USB communications)	Teaching box Models: IA-T-X, IA-T-XD Software for PC Model: IA-101-X-MW (for RS232 communications) IA-101-X-USB (for USB communications)	Teaching box Model: IA-T-XA Software for PC Model: IA-101-XA-MW (for RS232 communications) Safety category support (with cable)
Input/output communications	Standard I/O	16 inputs/16 outputs (NPN/PMP selectable)	24 inputs/8 outputs (NPN/PMP selectable)	32 inputs/16 outputs (NPN/PMP selectable)	
	Expanded I/O	Not possible		192 inputs max./192 outputs max.	
	Serial communications functions	Teaching port (RS485)	Teaching port (RS232C) USB connector	Teaching port (RS232C) 2ch RS232C port	
	Other I/O	System I/O (Emergency stop input, brake power supply)	System I/O (Emergency stop input, brake power supply)	System I/O (Emergency stop input, enable input, ready output)	
	Field network	DeviceNet, CC-Link, ProfiBus	(Future support planned)	DeviceNet, CC-Link, ProfiBus, Ethernet	
General specifications	Protection functions	Motor overcurrent, motor driver temperature check, overload check, encoder open line check, software limit over, system abnormality, battery abnormality, other			
	Usage ambient temperature and humidity	0–40∫ C, 10-95% (no condensation allowed)			
	Usage ambient atmosphere	There must be no corrosive gas and dust must not be particularly bad.			
	External dimensions	72(W)◊200.5(H)◊121(D)	100 (W) x 202.6 (H) x 126 (D) When absolute battery mounted	340 (W) x 195 (H) x 125.3 (D) (For 6-axis absolute specifications)	
	Weight	1.1kg	1.4kg	5.7 kg (for 6-axis absolute specifications)	
	Accessories	I/O flat cable (40 lines)	I/O flat cable (34 lines)	I/O flat cable (50 lines)	

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Motor cable (for XSEL-J/K/P/Q、 SSEL、 SCON)

Model CB-X-MA

* Enter the cable length (L) at ___. Up to 30 meters is supported. Example: 080=8 m

(Front diagram)
Controller side

Machine side
(Front diagram)
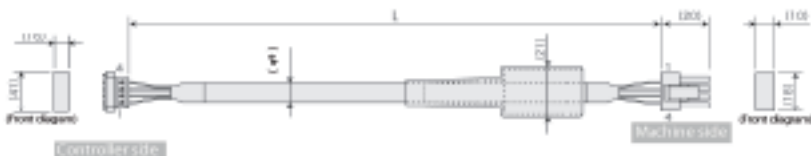
Wire	Color	Signal	No.		No.	Signal	Color	Wire
0.75sq	Green	PE	1		1	U	Red	0.75sq press fit
	red	U	2		2	V	White	
	white	V	3		3	W	Black	
	black	W	4		4	PE	Green	

Encoder cable (for XSEL-P/Q、 SSEL、 SCON)

Model CB-X2-PA

* Enter the cable length (L) at ___. Up to 30 meters is supported. Example: 080=8 m

(Front diagram)
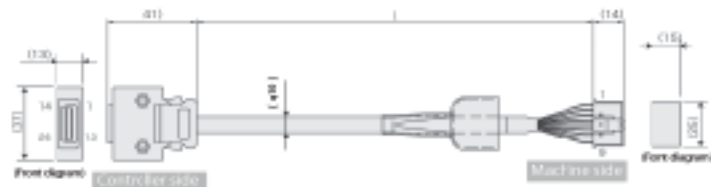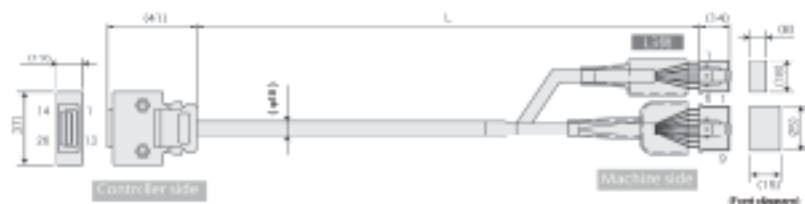Controller side

Machine side
(Front diagram)

Wire	Color	Signal	No.		No.	Signal	Color	Wire
	—	—	10		1	A	White/blue	AWG26 (press fit)
	—	E24V	12		2	A	White/yellow	
	—	0V	13		3	B	White/red	
	—	LS	20		4	B	White/blck	
	—	CREEP	21		5	Z	White/purple	
	—	OT	24		6	Z	White/gray	
	—	RSV	23		7	—	—	
	—	—	11		8	—	—	
	—	—	18		9	FG	Green	
	—	—	19		10	SD	Orange	
AWG26 (soldered)	White/blue	A+	1		11	SD	Green	
	White/yellow	A−	2		12	BAT+	Purple	
	White/red	B+	3		13	BAT−	Gray	
	White/blk	B−	4		14	VCC	Red	
	White/purpl	Z+	5		15	GND	Black	
	White/gra	Z−	6		16	—	—	
	Orange	SRD+	7		17	BK−	Blue	
	Green	SRD−	8		18	BK+	Yellow	
	Purple	BAT+	14					
	Gray	BAT−	15					
	Red	VCC	16					
	Black	GND	17					
	Blue	BKR−	20					
	—	—	21					
	—	—	22					

The shield is camped to the hood.
Drain line and shield braid
(The wire colors white/blue show the band color/insulation color.)

Encoder cable (for XSEL-P/Q、 SSEL、 SCON, specifications with limit switch, for connection)

Model CB-X2-PLA

* Enter the cable length (L) at ___. Up to 30 meters is supported. Example: 080=8 m

(Front diagram)
Controller side

Machine side
(Front diagram)

Wire	Color	Signal	No.		No.	Signal	Color	Wire
	—	—	10		1	E24V	White/cont	AWG26 (press fit)
	White/blng	E24V	12		2	0V	White/gra	
	White/gra	0V	13		3	LS	Brown/blk	
	Brown/blu	LS	20		4	CREEP	Brown/blck	
	Brown/yello	CREEP	21		5	OT	Brown/blu	
	Brown/red	OT	24		6	RSV	Brown/blck	
	Brown/blk	RSV	23					
	—	—	11					
	—	—	18					
	—	—	19		1	A	White/blue	AWG26 (press fit)
AWG26 (soldered)	White/blue	A+	1		2	A	White/yellow	
	White/yellow	A−	2		3	B	White/red	
	White/red	B+	3		4	B	White/blk	
	White/blk	B−	4		5	Z	White/purple	
	White/purpl	Z+	5		6	Z	White/gra	
	White/gra	Z−	6		7	—	—	
	Orange	SRD+	7		8	—	—	
	Green	SRD−	8		9	FG	Green	
	Purple	BAT+	14		10	SD	Orange	
	Gray	BAT−	15		11	SD	Green	
	Red	VCC	16		12	BAT+	Purple	
	Black	GND	17		13	BAT−	Gray	
	Blue	BKR−	20		14	VCC	Red	
	Yellow	BKR+	21		15	GND	Black	
	—	—	22		16	—	—	
					17	BK−	Blue	
					18	BK+	Yellow	

The shield is camped to the hood.
Drain line and shield braid
(The wire colors white/blue show the band color/insulation color.)

Homepage:
The contents of this catalog are subject to change without notice due to product improvement.