




IKO

Super Precision Positioning Table

TX CTX



Oil Minimum
IKO Gentle to The Earth



CAT-57184

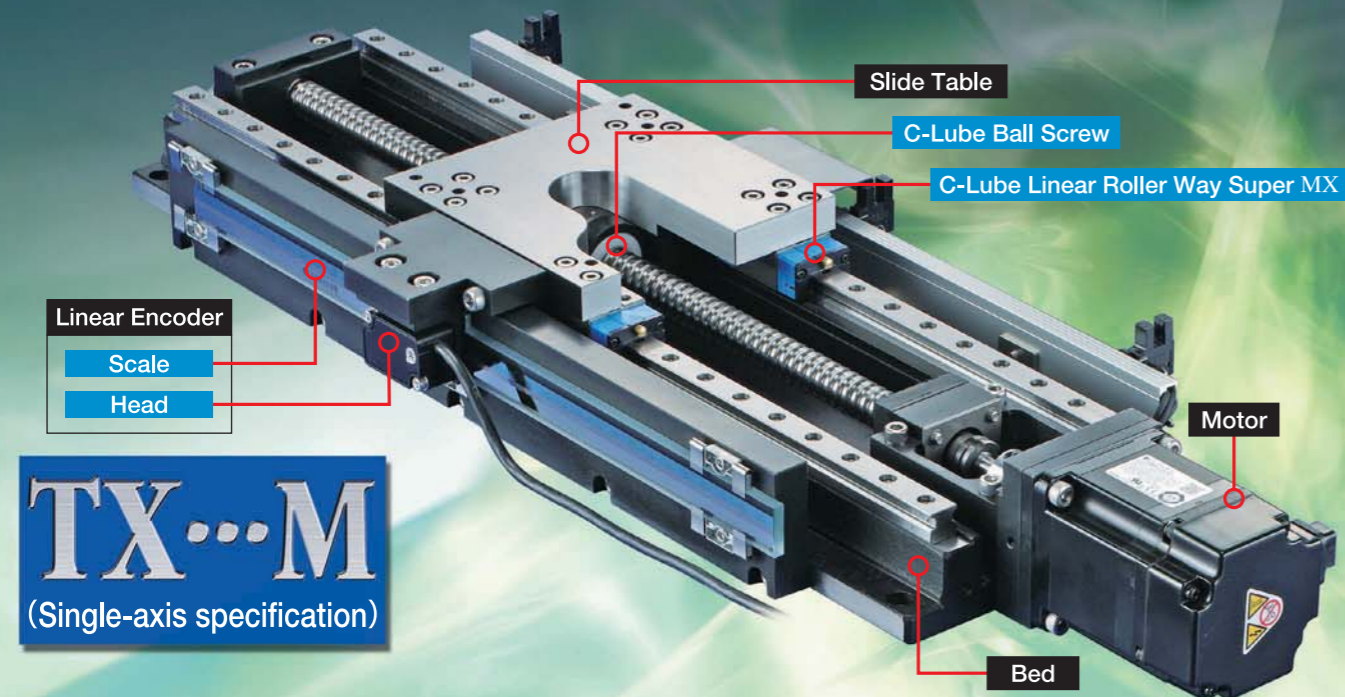
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TX Series of Rolling Guide Type Realizing Ultimate Positioning Performance

IKO Super Precision Positioning Table TX...M has realized almost as high positioning performance as the air stage by incorporated the ultimate rolling guide IKO C-Lube Linear Roller Way Super MX in IKO High Rigidity Precision Positioning Table LH which is well-known for high accuracy and high rigidity as the base.

As a precision ground ball screw is adopted for driving mechanism, high reliability and high precision positioning is possible.

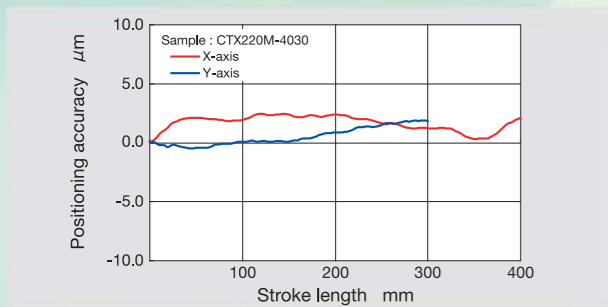
IKO Super Precision Positioning Table TX...M has four kinds of table widths from 120mm to 420mm in single-axis specification, and two-axes specification. This positioning table series is best suitable for the fields that require higher accuracy and cannot be satisfied by conventional rolling guide types.



Ultimate positioning performance

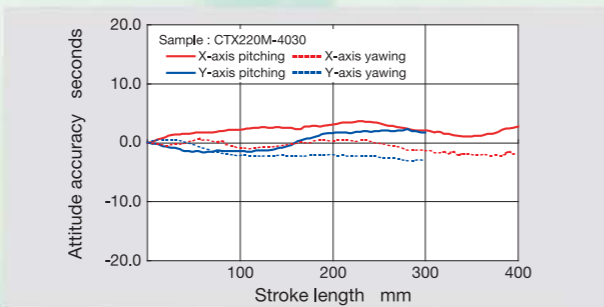
High positioning accuracy and resolution due to super-high accuracy linear encoder

By directly feeding back positional information from the super-high accuracy linear encoder of a resolution of 0.016 μm , a full-closed-loop control system is established. This control system assures high positioning accuracy in the whole stroke length.



Ultimate running accuracy by adopting C-Lube Linear Roller Way Super MX

Rolling guide type of ultimate running accuracy thanks to good combination of components that are machined and assembled very accurately and IKO C-Lube Linear Roller Way Super MX that demonstrates the best running accuracy.



IKO Super Precision Positioning Table TX...M and CTX...M

Simple system configuration available

The air supply devices for drive like an air stage are unnecessary. System constitution becomes simple, and space saving and reduction of the equipment cost are possible.

Suitable control system for the use

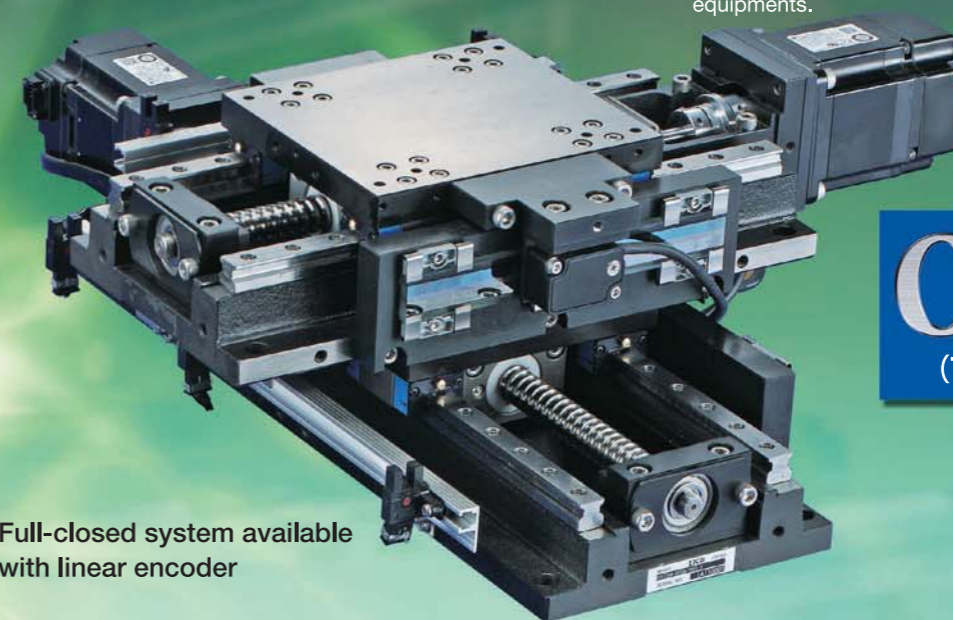
As AC servo or stepper motor is selectable and linear encoder is optional for the table, the most suitable control system can be adopted for the use.

For clean room application

Low dust generating clean grease is available as an option. Please consult IKO.

Long-term maintenance free

Lubricant part, C-Lube is built-in linear motion rolling guide and ball screw achieves long-term maintenance free. It reduces lubricating labor time and improves reliability of machines and equipments.

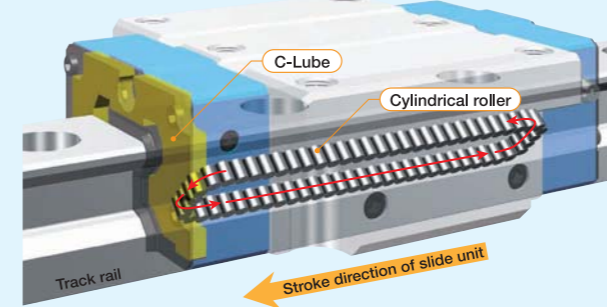


Full-closed system available with linear encoder

Lubricant part, C-Lube built-in Linear Roller Way Super MX and Ball screw achieves long-term maintenance free

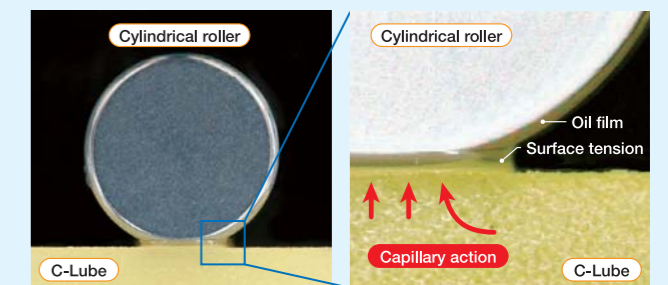
Lubricant is distributed by the circulation of the rolling elements

Lubricant is supplied directly to the rolling elements. As the rolling elements circulate, the lubricant is distributed to the loading area along the track rail. This results in adequate lubrication being properly maintained in the loading area for a long time.



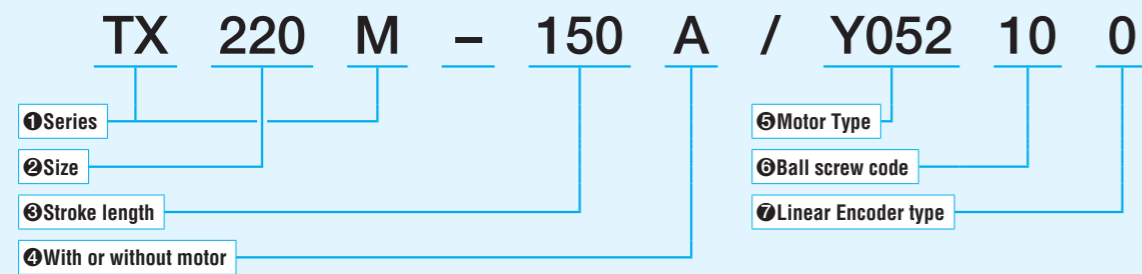
Lubricant is deposited directly to the surface of the rolling elements

The surface of C-Lube is always covered with the lubricant. Lubricant is continuously supplied to the surface of rolling elements by surface tension in the contact of C-Lube surface and rolling elements. New oil permeates automatically from the core of C-Lube to the internal surface that comes in contact with rolling elements.



Identification Number and Specification

Example of identification number (Single axis)



1 Series	TX...M : Super Precision Positioning Table TX...M (Single axis)
2 Size	Width of table Select from Table 1.
3 Stroke length	Select from Table 1.
4 With or without motor	No symbol : Without motor A : With Motor If the motor is prepared on the customer side, specify "Without motor". (no symbol)
5 Motor type	Select motor from Table 2. When "Without motor" (no symbol) is selected in item 4, motor attachment and coupling applicable to the selected motor are mounted at delivery.
6 Ball screw code	5 : 5mm lead 10 : 10mm lead
7 Linear encoder	No symbol : Without linear encoder 0 : Resolution 0.0156~0.500 μm (Applicable for Y0000) 1 : Resolution 0.1~0.2 μm (Applicable for P0000 and J0000) 10 : Resolution 0.01~0.05 μm (Applicable for P0000 and J0000)

When V0000 is specified on item 7, specify "No symbol".
Please refer to Maximum speed shown on page 6 for resolution.

Table 1 Models and stroke length

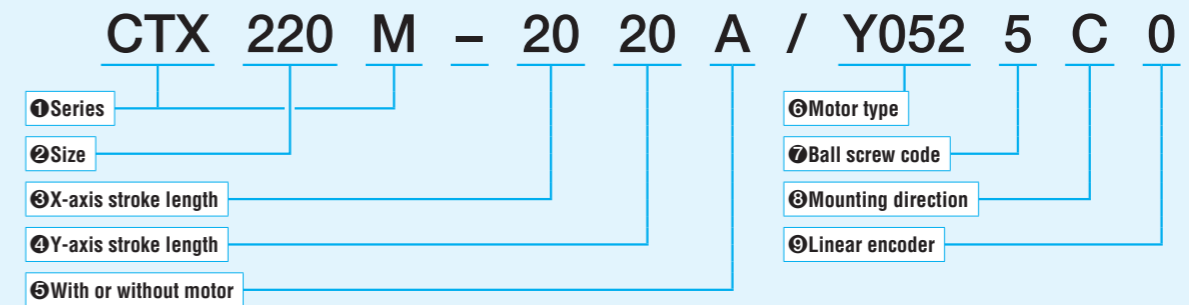
Model	Width of table mm	Stroke length mm				
		100	150	200	250	300
TX120M	120	100	150	200	250	300
TX220M	220	150	200	250	300	400
TX320M	320	300	400	500	—	—
TX420M	420	500	600	800	—	—

Table 2 Motor type

Model	Motor code		Manufacture
	Without brake	With breke	
TX120M	Y051	Y055	Yaskawa Electric
	P023	P028	Panasonic
	J013	J018	Mitsubishi Electric
	V011	V012	Oriental Motor
TX220M	Y052	Y056	Yaskawa Electric
	P024	P029	Panasonic
	J014	J019	Mitsubishi Electric
	V013	V014	Oriental Motor
TX320M	Y053	Y057	Yaskawa Electric
	P024	P029	Panasonic
	J014	J019	Mitsubishi Electric
	V013	V014	Oriental Motor
TX420M	Y054	Y058	Yaskawa Electric
	P025	P030	Panasonic
	J015	J020	Mitsubishi Electric

Remark : For the detail of motor, see motor and driver specification on page 16 to 19.

Example of identification number (X-Y specification)



1 Series	CTX...M : Super precision Positioning Table TX...M (X-Y specification)
2 Size	Width of table Select from Table 3. Combination of tables in different size is possible.
3 X-axis stroke length 4 Y-axis stroke length	Select from Table 3. Indicate the stroke length by "cm".
5 With or without motor	No symbol : Without motor A : With Motor If the motor is prepared on the customer side, specify "Without motor". (no symbol)
6 Motor type	Select motor from Table 4. When "Without motor" (no symbol) is selected in item 5, motor attachment and coupling applicable to the selected motor are mounted at delivery.
7 Ball screw code	5 : 5mm lead 10 : 10mm lead
8 Mounting direction	No symbol : X-axis motor locates 90 degrees from Y-motor in clockwise direction when looking down. C : X-axis motor locates 90 degrees from Y-motor in counterclockwise direction when looking down.
9 Linear encoder	No symbol : Without linear encoder 0 : Resolution 0.0156~0.500 μm (Applicable for Y0000) 1 : Resolution 0.1~0.2 μm (Applicable for P0000 and J0000) 10 : Resolution 0.01~0.05 μm (Applicable for P0000 and J0000)

When V0000 is specified on item 9, specify "No symbol".
Please refer to Maximum speed shown on page 6 for resolution.

Table 3 Models and stroke length

Model	Width of table mm	Stroke length mm	
		X-axis	Y-axis
CTX120M	120	100	100
		200	100
		200	200
		300	200
CTX220M	220	200	200
		300	200
		300	300
		400	300

Table 4 Motor type

Model	Motor code		Motor manufacture
	Without brake	With brake	
CTX120M	Y051	Y055	Yaskawa Electric
	P023	P028	Panasonic
	J013	J018	Mitsubishi Electric
	V011	V012	Oriental Motor
CTX220M	Y052	Y056	Yaskawa Electric
	P024	P029	Panasonic
	J014	J019	Mitsubishi Electric
	V013	V014	Oriental Motor

Remarks 1 : For the table with brake, motor with brake is mounted on Y-axis only.
For example, if Y055 is selected, X-axis has Y051 and Y-axis has Y055.

2 : For the detail of motor, see motor and driver specification on page 16 to 19.

Accuracy

Table 5 Accuracy

unit : mm

Model	Stroke length		Positioning accuracy	Repeatability	Lost motion (') ⁽¹⁾	Parallelism in table operation A	Attitude Accuracy (") ⁽²⁾ sec	Straightness in vertical Straightness in horizontal	Squareness of X-Y travel
	X-axis	Y-axis							
Single axis TX120M	100		0.003 (0.006)	±0.0005 (±0.001)	0.001	0.005	5	0.003	—
	150								
	200		0.004 (0.008)						
	250								
	300								
Single axis TX220M	150		0.003 (0.006)	±0.0005 (±0.001)	0.001	0.005	5	0.003	—
	200								
	250		0.004 (0.008)						
	300								
	400		0.005 (0.2)						
Single axis TX320M	300		0.004 (0.008)	±0.0005 (±0.001)	0.001	0.006	6	0.004	—
	400		0.005 (0.013)						
	500								
Single axis TX420M	500		0.005 (0.013)	±0.0005 (±0.001)	0.001	0.007	7	0.005	—
	600		0.006 (0.016)						
	800		0.008 (0.020)						
X-Y axis CTX120M	100	100	0.005 (0.007)	±0.0005 (±0.001)	0.001	0.008	8	0.005	0.005
	200	100							
	200	200	0.005 (0.010)						
	300	200							
	200	200							
	200	200							
X-Y axis CTX220M	200	200	0.006 (0.010)	±0.0005 (±0.001)	0.001	0.009	9	0.006	0.005
	300	200							
	300	300							
	400	300	0.008 (0.010)						

Notes (1) : The values show backlash when without linear encoder.
 (2) : The values in the table show pitching yawing.
 Remark : The values in () are applicable to tables without linear encoder.

Maximum Speed

Maximum speed of Super Precision Positioning Table TX is different by application of linear encoder. Maximum speed and resolution are given by the lead of ball screw, driver's parameter (Electric gear), and setting of linear encoder serial converting unit. Actual speed should not exceed values in Table 6 to 9.

■ **Table with Linear encoder**

Table 6 Maximum speed for the motor of Yaskawa Electric Corporation

Resolution μm/pulse	Maximum speed mm/s		Serial converter
	lead 5mm	lead 10mm	
0.0156	62.5	62.5	JZDP-D003-000-E
0.0312	125	125	
0.0625	250 (224)	250 (224)	
0.125	250 (224)	500 (448)	
0.250	250 (224)	500 (448)	
0.500	—	500 (448)	

Remarks 1 : Values in () are applicable for TX320 and TX420.
 2 : Actual maximum speed may be affected by load condition.
 3 : If higher speed is required, change resolution by electric gear.

Table 7 Maximum speed for the motor of Panasonic Corporation

Resolution μm/pulse	Maximum speed mm/s		Linear encoder serial converter (')
	lead 5mm	lead 10mm	
0.01	26.4	26.4	APE371 [TTL×50]
0.02	52	52	
0.04	104	104	
0.05	132	132	
0.1	250 (224)	264	APE371 [TTL×10]
0.2	250 (224)	500 (448)	

Note (1) : Selectable resolution is according to the type of linear encoder serial converter.
 Remarks 1 : Values in () are applicable for TX320 and TX420.
 2 : Actual maximum speed may be affected by load condition.
 3 : If higher speed is required, change resolution by the switch in linear encoder serial converter.

Table 8 Maximum speed for the motor of Mitsubishi Electric Corporation

Resolution μm/pulse	Maximum speed mm/s		Linear encoder serial converter (')
	lead 5mm	lead 10mm	
0.01	40	40	APE371 [TTL×50]
0.02	80	80	
0.04	160	160	
0.05	200	200	
0.1	250 (224)	400	
0.2	250 (224)	500 (448)	APE371 [TTL×10]

Note (1) : Selectable resolution is according to the type of linear encoder serial converter.
 Remarks 1 : Values in () are applicable for TX320 and TX420.
 2 : Actual maximum speed may be affected by load condition.
 3 : If higher speed is required, change resolution by the switch in linear encoder serial converter.

■ **Table without Linear Encoder**

Table 9 Maximum speed for the table without linear encoder

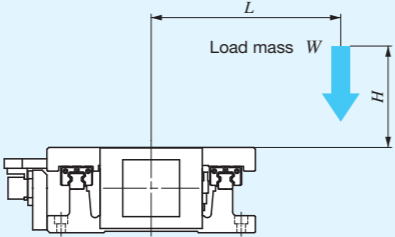
Type of motor	Model	Number of motor rotation r/min	Maximum speed mm/s	
			lead 5mm	lead 10mm
AC Servo motor	TX120M	3000	250	500
	TX220M			
	TX320M	2690	224	448
	TX420M			
Stepper motor	TX120M	1800	150	300
	TX220M			
	TX320M			

Remark : For CTX, each axis can be considered as single stage.

Maximum Load Mass

Maximum load masses of Super Precision Positioning Table TX are shown in Table10. The values in the table are reference values for the maximum mass that can be mounted on each models used in horizontal position and very much depending on the position of load mass.

Table 10 Maximum Load Mass



unit : kg

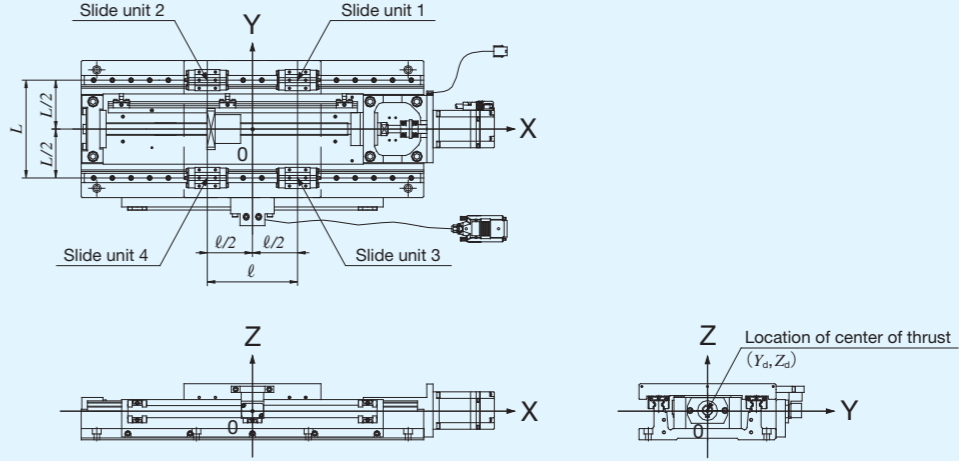
Model	Ball screw lead mm	Height H mm	Length L mm									
			0	100	200	300	400	500	600	800	1000	
TX120M	5	0	310	94	55	39	30	25	21	16	13	
		200	260	92	55	39	30	25	21	16	13	
		400	200	87	53	38	30	25	21	16	13	
		600	160	80	52	38	30	24	21	16	13	
	10	0	180	74	43	30	24	19	16	12	10	
		200	150	67	42	30	23	19	16	12	10	
400		100	58	39	29	23	19	16	12	9.9		
TX220M	5	0	410	260	170	120	97	80	68	53	43	
		200	410	260	170	120	97	80	68	53	43	
		400	410	250	160	120	96	80	68	53	43	
		600	410	230	160	120	95	79	68	53	43	
	10	0	270	210	130	96	76	63	53	41	33	
		200	270	190	130	95	75	62	53	41	33	
		400	270	170	120	91	73	61	52	41	33	
		600	230	150	110	87	71	60	51	40	33	
	TX320M	5	0	820	820	620	470	380	320	270	210	180
			200	820	820	620	470	380	320	270	210	180
			400	820	820	610	470	380	320	270	210	180
		10	0	380	380	380	370	300	250	210	170	140
200			380	380	380	360	290	250	210	170	140	
400			380	380	380	350	290	240	210	160	140	
TX420M	5	0	800	800	800	660	540	450	390	310	250	
		200	800	800	800	650	530	450	390	310	250	
		400	800	800	800	650	530	450	390	310	250	
		600	800	800	800	640	530	450	390	310	250	
	10	0	0	360	360	360	360	350	310	240	200	
		200	200	360	360	360	360	350	300	240	200	
		400	400	360	360	360	360	350	300	240	200	
		600	600	360	360	360	360	350	300	240	200	

Remarks 1 : The above values are obtained by calculating the mass for which the rating life of the ball screw or linear motion rolling guide becomes 18,000 hours when the table is operated continuously at the maximum speed (for each size), and 0.2s each, at acceleration and direction.
 2 : For CTX, consider load mass for each axis independently.

Specifications for Linear Motion Rolling Guides and BallScrews

The specifications of linear motion rolling guides and ball screws used in Super Precision Positioning Table TX are shown in Table 11 and 12 as reference. These load ratings are not applicable for the maximum load on product.

Table 11 Specifications of linear motion rolling guide



Model	Basic dynamic load rating (1) C N	Basic static load rating (1) C ₀ N	Locations			
			L mm	ℓ mm	Y _d mm	Z _d mm
TX120M	5890	10400	88	82	0	2
TX220M	11500	20000	157	145	0	1
TX320M	32100	56300	240	210	0	6
TX420M	38200	70300	300	290	0	0

Note (1) : Values in the table are load ratings for one slide unit.
 Remark : For X-Y axis table, load rating of each axis is the same as that of single axis.

Table 12 Specification of ball screws

Model	Type	lead mm	Outside dia. of screw mm	Axial clearance mm	Basic dynamic load rating C N	Basic static load rating C ₀ N
TX120M	Ground type ball screw	5	15	0	7070	12800
		10			7070	12800
TX220M	Ground type ball screw	5	20	0	8230	17150
		10			10900	21700
TX320M	Ground type ball screw	5	25	0	16700	43500
		10			15800	32700
TX420M	Ground type ball screw	5	25	0	16700	43500
		10			15800	32700

Remark : For X-Y axis table, load rating of each axis is the same as that of single axis.

Table inertia and Starting Torque

Table 13 Table inertia, coupling inertia and starting torque

Model	Stroke length mm		Table inertia J_T $\times 10^{-3} \text{kg} \cdot \text{m}^2$		Coupling Inertia J_C $\times 10^{-3} \text{kg} \cdot \text{m}^2$	Starting torque T_0 N · m	
	X-axis	Y-axis	lead 5mm	lead 10mm			
Single axis	TX120M	100		1.3	1.8	0.29	0.07
		150		1.5	2.0		
		200		1.6	2.2		
		250		1.8	2.4		
		300		2.0	2.6		
	TX220M	150		5.2	7.0	0.285	0.12
		200		5.8	7.6		
		250		6.4	8.2		
		300		7.1	8.8		
	TX320M	300		20	26	0.85	0.26
		400		23	29		
		500		26	32		
TX420M	500		30	39	0.85	0.30	
	600		33	42			
	800		39	48			
X-Y axis	CTX120M	100	100	2.1	4.7	0.29	0.07
		200	100	2.4	5.1		
		200	200	2.5	5.8		
		300	200	2.9	6.2		
	CTX220M	200	200	8.2	16.9	0.85	0.13
		300	200	9.5	18.1		
		300	300	9.8	19.3		
		400	300	11	20.5		

Remark : For X-Y axis table, values in the table show of X axis. Values of Y axis are applicable to the single axis in table.

Sensor Specification

Table 14 Specifications of sensors

Item	Sensor	Photo sensor
	Limit, Pre-origin, Origin	
Power supply voltage	DC5~24V $\pm 10\%$	
Current consumption	15mA or less	
Output	Open collector, NPN transistor <ul style="list-style-type: none"> • Max. current : 50mA • Applied voltage : DC30V or less • Residual voltage : 0.7V or less at 50mA in-flow current 0.4V or less at 16mA in-flow current 	
Output operation	When approaching : ON/OFF (Optional) (1)	
Operation indicator	LED (red, Light ON)	
Circuit diagram		

Note (1) : OUT1 is selected for ON when approaching at delivery.

Table 15 Specifications of connectors

Pin No.	Signal name	Sensor-side connector type	Opposite-side connector type (1)
1	Origin	Cap housing 172160-1	Plug housing 172168-1
2	Pre-origin		
3	CW limit		
4	CCW limit	Connector 170365-1 170366-1	Connector 170363-1
5	Power input		
6	GND		

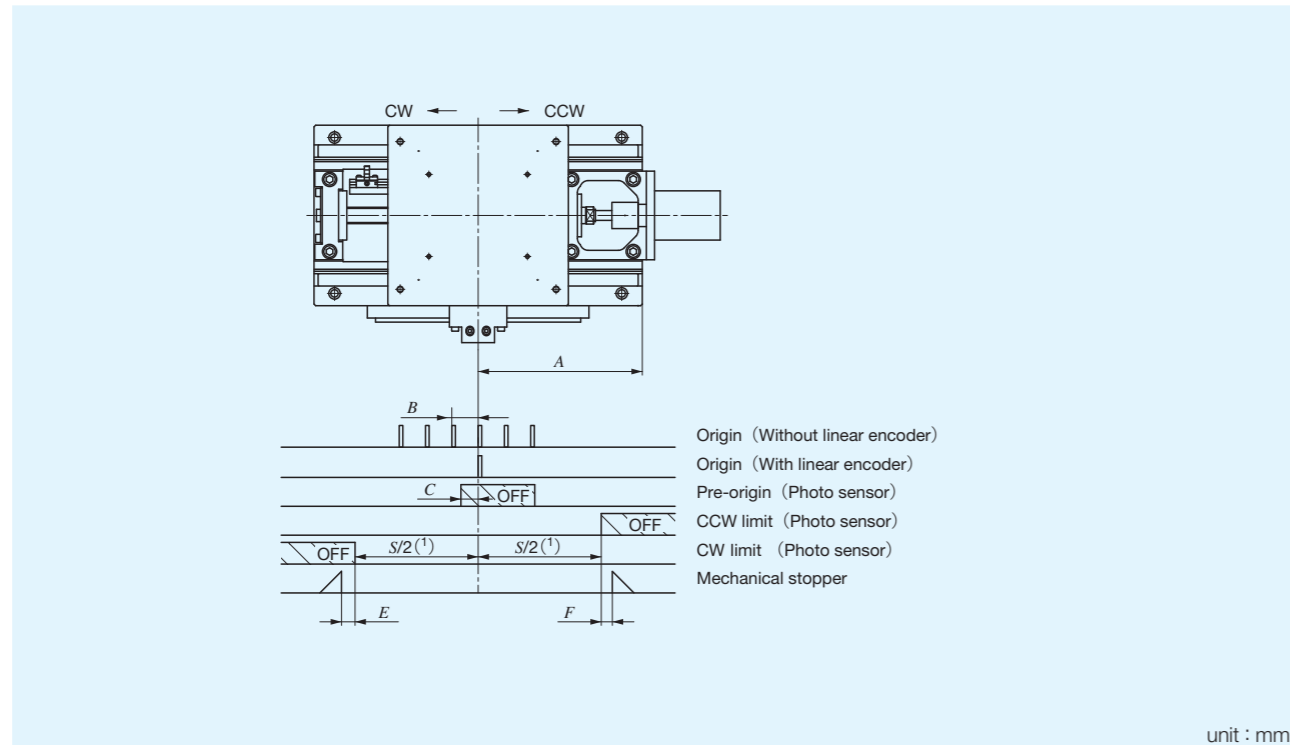
Note (1) : Prepare the opposite-side connector by customer.

Remarks 1 : Connector is made by Tyco Electronics Japan G.K.

2 : Above table shows connector specification in case of table with stepper motor. In case of AC servomotor, origin signal from encoder of linear encoder shall be used.

Sensor Specification

Table 16 Timing chart of sensors



Model	Ball screw lead	A	C	E	F
TX120M	5	L/2 ⁽¹⁾	3	5.5	4.5
	10		7		
TX220M	5	L/2 ⁽¹⁾	3	14	10
	10		7	12	10
TX320M	5	L/2 ⁽¹⁾	3	20	15
	10		7		
TX420M	5	L/2 ⁽¹⁾	3	18	15
	10		7		

Note ⁽¹⁾ : Refer to dimension tables on page 21 to 26.

Remark : For X-Y axis table, specification of each axis are the same as those of single axis.

System Configuration

Most suitable control system is prepared for each type of motor with Super Precision Positioning Table TX. Please specify electric devices with following model number separately when ordering a positioning table.

AC servo motor

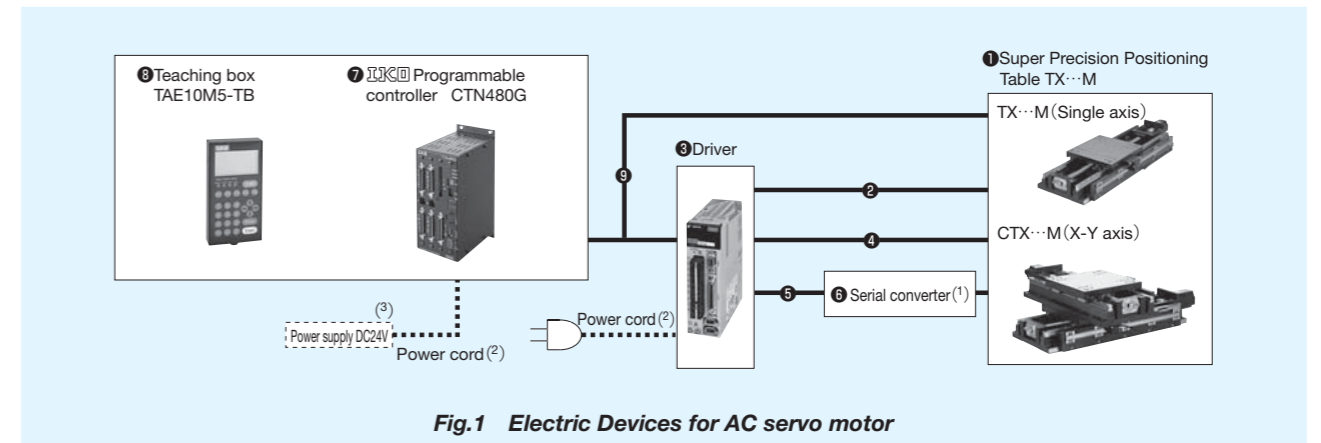


Fig.1 Electric Devices for AC servo motor

Notes ⁽¹⁾ : Serial converter is appended for Yaskawa Electric motor. Linear encoder serial converter is appended for Panasonic or Mitsubishi Electric motor.
⁽²⁾ : Power cord shall be prepared at customer side.
⁽³⁾ : DC24V power supply shall be prepared at customer side.

Table 17 Electric devices for the motor of Yaskawa Electric Corporation

Items	Model number			
① Super Precision Positioning Table TX···M	TX120	TX220	TX320	TX420
	CTX120	CTX220		
Motor without brake	Motor code	Y051	Y052	Y053
	② Motor cord	JZSP-CSM02-□□-E (JZSP-CSM22-□□-E)		
Motor with brake ⁽¹⁾	Motor code	Y055	Y056	Y057
	② Motor cord	JZSP-CSM12-□□-E (JZSP-CSM32-□□-E)		
③ Driver	With linear encoder	SGDV-1R6A01A 000000001	SGDV-2R8A01A 000000001	SGDV-3R8A01A 000000001
	Without linear encoder	SGDV-1R6A01A	SGDV-2R8A01A	SGDV-3R8A01A
④ Encoder cord	JZSP-CSP01-□□-E (JZSP-CSP21-□□-E)			
⑤ Serial converter cord ⁽²⁾	(JZSP-CLP70-□□-E)			
⑥ Serial converter ⁽³⁾	JZDP-D003-000-E			

Notes ⁽¹⁾ : For table with brake, power supply for brake release shall be prepared at customer side.

⁽²⁾ : With linear encoder, serial converter cord shall be prepared at customer side.

⁽³⁾ : With linear encoder, serial converter is appended.

Remarks 1 : Cord in () have high bending resistance.

2 : Each of ②~④ is necessary for single axis specification without linear encoder.

Each two sets of ②~④ are necessary for X-Y axis specification without linear encoder.

Each of ②~⑤ is necessary for single axis specification with linear encoder.

Each two sets of ②~⑤ are necessary for X-Y axis specification with linear encoder.

3 : Length of motor cord, encoder cord, serial converter cord can be selectable from 3m, 5m, 10m, or 20m by □□ at the end of model number.

※ The length under 10m is also selected by two digits. (Example of 3m : JZSP-CSM02-03E)

4 : For X-Y axis table with brake, brake on motor is applicable to Y-axis only.

Example : If Y055 is selected, X-axis has Y051 and Y-axis has Y055.

Table 18 Electric devices for the motor of Yaskawa Electric Corporation with IKO programmable controller CTN480G

Items	Model number
⑦ Programmable controller	CTN480G
⑧ Teaching box	TAE10M5-TB
⑨ Pulse and limit cord	TAE10M7-LD□□
	(TAE10M8-LD□□)

Remarks 1 : Cord in () have high bending resistance.

2 : The length of pulse and limit cord can be specified by □□ in the end of supplemental code. Selecting length is up to 20m in increments of 1m.

※ The length under 10m is also selected by two digits. (Example of 3m : TAE10M7-LD03)

3 : The length of pulse and limit cord is 1.5m.

4 : For X-Y axis table, two pieces of pulse limit cord are necessary.

System Configuration

Table 19 Electric devices for the motor of Panasonic Corporation

Items		Model number			
① Super Precision Positioning Table TX...M		TX120 CTX120	TX220 CTX220	TX320	TX420
	Motor without brake	Motor code P023	P024		P025
Motor with brake ⁽¹⁾	② Motor cord	MFMCA0□□0NJD			
	Motor code	P028	P024		P030
	② Motor cord	MFMCA0□□0NJD			
	Brake cord ⁽²⁾	MFMCB0□□0PJT			
③ Driver	MADHT1507	MBDHT2510		MCDHT3520	
④ Encoder cord	MFECA0□□0MJD				
⑤ Linear encoder cord ⁽³⁾	TAE20U7-EC□□				
⑥ Linear encoder serial converter ⁽⁴⁾	APE371 [TTL × 50] or APE371 [TTL × 10]				

Notes ⁽¹⁾ : For table with brake, power supply for brake release shall be prepared at customer side.
⁽²⁾ : For table with brake, brake cord shall be prepared at customer side.
⁽³⁾ : With linear encoder, linear encoder serial converter cord is required.
⁽⁴⁾ : With linear encoder, linear encoder serial converter corresponding to specified resolution is appended. Please refer to Maximum speed shown on page 6.

Remarks 1 : Each of ②~④ is necessary for single axis specification without linear encoder.
 Each two sets of ②~④ are necessary for X-Y axis specification without linear encoder.
 Each of ②~⑤ is necessary for single axis specification with linear encoder.
 Each two sets of ②~⑤ are necessary for X-Y axis specification with linear encoder.
 2 : Length of motor cord and encoder cord can be selectable from 3m, 5m, 10m, or 20m by □□ at the end of model number.
 ※ The length under 10m is also specified by two digits. (Example of 3m : MFMCA0030NJD)
 3 : Length of linear encoder serial converter cord can be selectable from 1m or 2m by □□ at the end of model number.
 ※ The length is specified by two digits. (Example of 1m : TAE20U7-EC01)
 4 : For X-Y axis table with brake, brake on motor is applicable to Y-axis only.
 Example : If P028 is selected, X-axis has P023 and Y-axis has Y028.

Table 20 Electric devices for the motor of Panasonic Corporation with IKO Programmable controller CTN480G

Items	Model number
⑦ Programmable controller	CTN480G
⑧ Teaching box	TAE10M5-TB
⑨ Pulse and limit cord	TAE10V2-LD□□
	(TAE10V3-LD□□)

Remarks 1 : Cord in () have high bending resistance.
 2 : The length of pulse and limit cord can be specified by □□ in the end of supplemental code. Selecting length is up to 20m in increments of 1m.
 ※ The length under 10m is also selected by two digits. (Example of 3m : TAE10V2-LD03)
 3 : The length of pulse and limit cord is 1.5m.
 4 : For X-Y axis table, two pieces of pulse limit cord are necessary.

Table 21 Electric devices for the motor of Mitsubishi Electric Corporation

Items		Model number			
① Super Precision Positioning Table TX...M		TX120 CTX120	TX220 CTX220	TX320	TX420
	Motor without brake	Motor code J013	J014		J015
Motor with brake ⁽¹⁾	② Motor cord	MR-PWS1CBL□M-A1-L (MR-PWS1CBL□M-A1-H)			
	Motor code	J018	J019		J020
	② Motor cord	MR-PWS1CBL□M-A1-L (MR-PWS1CBL□M-A1-H)			
	Brake cord ⁽²⁾	MR-BKS1CBL□M-A1-L (MR-BKS1CBL□M-A1-H)			
③ Driver	With linear encoder	MR-J3-20A-KE005	MR-J3-40A-KE005		MR-J3-70A-KE005
	Without linear encoder	MR-J3-20A	MR-K3-40A		MR-J3-70A
④ Encoder cord	MR-J3ENCBL□M-A1-L (MR-J3ENCBL□M-A1-H)				
⑤ Linear encoder cord ⁽³⁾	TAE20T4-EC□□				
⑥ Linear encoder serial converter ⁽⁴⁾	APE371 [TTL × 50] or APE371 [TTL × 10]				

Notes ⁽¹⁾ : For table with brake, power supply for brake release is needed.
⁽²⁾ : For table with brake, brake cord shall be prepared at customer side.
⁽³⁾ : With linear encoder, linear encoder serial converter cord shall be prepared at customer side.
⁽⁴⁾ : With linear encoder, linear encoder serial converter corresponding to specified resolution is appended. Please refer to Maximum speed shown on page 6.

Remarks 1 : Cord in () have high bending resistance.
 2 : Each of ②~④ is necessary for single axis specification without linear encoder.
 Each two sets of ②~④ are necessary for X-Y axis specification without linear encoder.
 Each of ②~⑤ is necessary for single axis specification with linear encoder.
 Each two sets of ②~⑤ are necessary for X-Y axis specification with linear encoder.
 3 : Length of motor cord, encoder cord, serial converter cord can be selectable from 2m, 5m, or 10m by □□ at the end of model number.
 ※ The length under 10m also is specified by two digits. (Example of 2m : MR-PWS1CBL2M-A1-L)
 4 : Length of linear encoder serial converter cord can be selectable from 1m or 2m by □□ at the end of model number.
 ※ The length is specified by two digits. (Example of 1m : TAE20T4-EC01)
 5 : For X-Y axis table with brake, brake on motor is applicable to Y-axis only.
 Example : If J018 is selected, X-axis has J013 and Y-axis has J018.

Table 22 Electric devices for the motor of Mitsubishi Electric Corporation with IKO Programmable controller CTN480G

Items	Model number
⑦ Programmable controller	CTN480G
⑧ Teaching box	TAE10M5-TB
⑨ Pulse and limit cord	TAE10V2-LD□□
	(TAE10V3-LD□□)

Remarks 1 : Cord in () have high bending resistance.
 2 : The length of pulse and limit cord can be specified by □□ in the end of supplemental code. Selecting length is up to 20m in increments of 1m.
 ※ The length under 10m is also selected by two digits. (Example of 3m : TAE10V4-LD03)
 3 : The length of pulse and limit cord 1.5m.
 4 : For X-Y axis table, two pieces of pulse limit cord are necessary.

System Configuration

Stepper motor

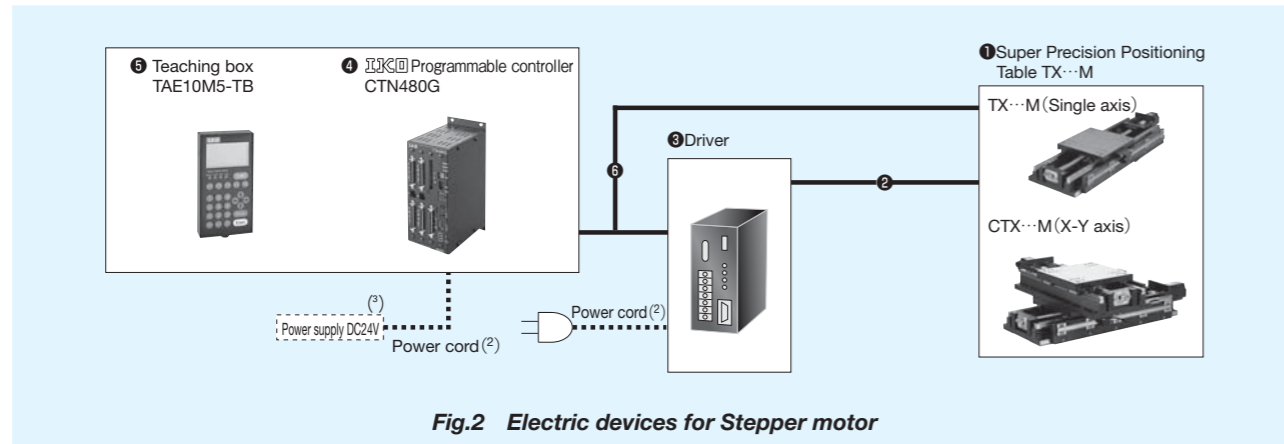


Fig.2 Electric devices for Stepper motor

Notes (1) : Power cord is prepared by customer.
 (2) : DC24V power supply is prepared by customer.

Table 23 Electric devices for the motor of Oriental Motor

Items		Model number		
① Super Precision Positioning Table TX...M		TX120 CTX120	TX220 CTX220	TX320
Motor without brake	Motor code	V011	V013	
	② Motor cord	TAE20R8-SM□□ (TAE20R9-SN□□)		
Motor with brake (1)	③ Driver	RKD514L-A	RKD514H-A	
	Motor code	V012	V014	
	② Motor cord	TAE20S1-SMB□□ (TYAE20S2-SNB□□)		
	③ Driver	RKD514LM-A	RKD514HM-A	

Note (1) : For "with brake model", power supply for brake release is needed.
 Remarks 1 : Cord in () have high bending resistance.
 2 : Each of ② and ③ is necessary for single axis specification.
 Each two sets of ② and ③ are necessary for X-Y axis specification.
 3 : The length of motor cord can be specified by □□ in the end of supplemental code. Selecting length is up to 20m in increments of 1m.
 ※ The length under 10m is also selected by two digits. (Example of 3m : TAE20R8-SM03)
 4 : For X-Y axis table with brake, brake on motor is applicable to Y-axis only.
 Example : If V012 is selected, X-axis has V011 and Y-axis has V012.

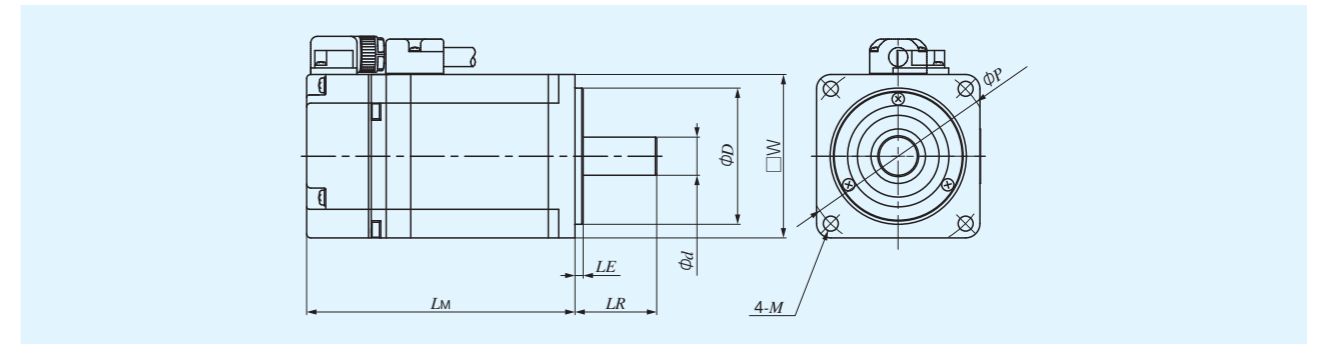
Table 24 Electric devices for the motor of Oriental Motor Corporation with I^KO programmable controller CTN480G

Items	Model number
④ Programmable controller	CTN480G
⑤ Teaching box	TAE10M5-TB
⑥ Pulse and limit cord	TAE10S3-LD□□ (TAE10S4-LD□□)

Remarks 1 : Cord in () have high bending resistance.
 2 : The length of pulse and limit cord can be specified by □□ in the end of supplemental code. Selecting length is up to 20m in increments of 1m.
 ※ The length under 10m is also selected by two digits. (Example of 3m : TAE10S3-LD03)
 3 : The length of pulse and limit cord is 1.5m.
 4 : For X-Y axis table, two pieces of pulse limit cord are necessary.

Specifications of Motor and Driver

AC servo motor and Driver of Yaskawa Electric Corporation (RoHS compliance)



Motor specifications

Motor code	Motor model number	Power supply voltage V	Rated output W	Rated torque N · m	Instantaneous maximum torque N · m	Rated number of revolution r/min	Motor inertia $J_M \times 10^{-4} \text{kg} \cdot \text{m}^2$	Encoder specification	Mass kg
Y051	SGMAV-02A3A21	200	200	0.637	1.91	3000	0.116	Common for incremental and absolute 20bits (1048576pulse/rev)	0.9
Y052	SGMAV-04A3A21		400	1.27	3.82		0.190		1.2
Y053	SGMAV-06A3A21		550	1.75	5.25		0.326		1.7
Y054	SGMAV-08A3A21		750	2.39	7.16		0.769		2.3
Y055	SGMAV-02A3A2C		200	0.637	1.91		0.180		1.5
Y056	SGMAV-04A3A2C		400	1.27	3.82		0.254		1.8
Y057	SGMAV-06A3A2C		550	1.75	5.25		0.390		2.4
Y058	SGMAV-08A3A2C		750	2.39	7.16		0.940		3.2

Motor mounting dimension

Motor code	$\square W \times L_M$	LR	LE	d	D	P	M
Y051	60 × 80	30	3	14	50	70	φ5.5
Y052	60 × 98.5	30	3	14	50	70	φ5.5
Y053	60 × 124.5	30	3	14	50	70	φ5.5
Y054	80 × 115	40	3	19	70	90	φ7
Y055	60 × 120	30	3	14	50	70	φ5.5
Y056	60 × 138.5	30	3	14	50	70	φ5.5
Y057	60 × 170.5	30	3	14	50	70	φ5.5
Y058	80 × 160	40	3	19	70	90	φ7

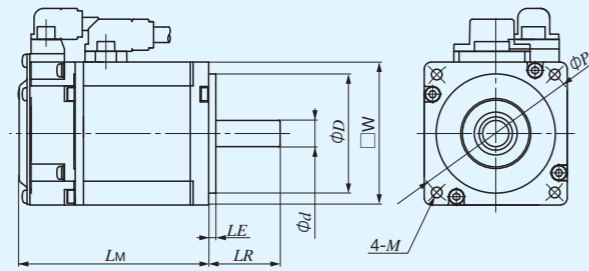
Driver specifications

Item	Model number of driver	SGDV-1R6A01A 000000001	SGDV-2R8A01A 000000001	SGDV-3R8A01A 000000001	SGDV-5R5A01A 000000001
			SGDV-1R6A01A	SGDV-2R8A01A	SGDV-3R8A01A
Applicable motor code		Y051, Y055	Y052, Y056	Y053, Y057	Y054, Y058
Rated output		200W	400W	550W	750W
Feedback	Servo motor	Serial encoder			
	Linear encoder (1)				
Command input pulse		Selection one from symbol with pulse line, CCW or CW with pulse line, two phase pulse with 90-degree difference			
Type of command input pulse		Line driver or Open collector			
Capability of command input speed		Line driver : 4Mpps Open collector : 200kpps			
Main power supply voltage		Three phases AC200~230V -15~10% 50/60Hz			
Control circuit supply voltage		Three phases AC200~230V -15~10% 50/60Hz			
Continuous rated current Arms		1.6	2.8	3.8	5.5
Maximum consumption current Arms		6.5	9.3	11.0	16.9
Ambient temperature in operation		0~55°C			
Ambient temperature in storage		-20~85°C			
Ambient temperature in operation and storage		90%RH or less (Keep dewdrop free)			
Mass kg		0.9	1.0	1.5	1.5

Note (1) : Applicable with linear encoder.

Specifications of Motor and Driver

AC servo motor and Driver of Panasonic Corporation (RoHS compliance)



Motor specifications

Motor code	Motor model number	Power supply voltage V	Rated output W	Rated torque N · m	Instantaneous maximum torque N · m	Rated number of revolution r/min	Motor inertia $J_M \times 10^{-4} \text{kg} \cdot \text{m}^2$	Encoder specification	Mass kg
P023	MSME022S1A	200	200	0.64	1.91	3000	0.14	Common for incremental and absolute 17bits (131072pulse/rev)	0.82
P024	MSME042S1A		400	1.3	3.8		0.26		1.2
P025	MSME082S1A		750	2.4	7.1		0.87		2.3
P028	MSME022S1B		200	0.64	1.91		0.16		1.3
P029	MSME042S1B		400	1.3	3.8		0.28		1.7
P030	MSME082S1B		750	2.4	7.1		0.97		3.1

Motor mounting dimension

unit : mm

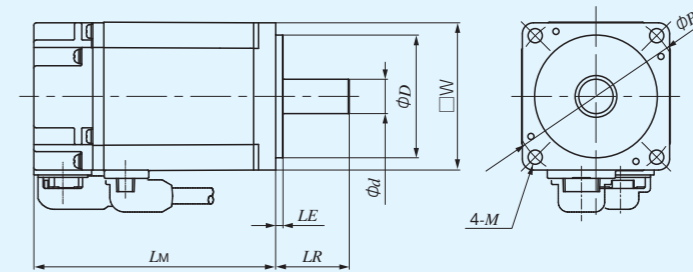
Motor code	$\square W \times L_M$	LR	LE	d	D	P	M
P023	60 × 79.5	30	3	11	50	70	φ 4.5
P024	60 × 99	30	3	14	50	70	φ 4.5
P025	60 × 112	35	3	19	70	90	φ 6
P028	60 × 116	30	3	11	50	70	φ 4.5
P029	60 × 135.5	30	3	14	50	70	φ 4.5
P030	60 × 148.2	35	3	19	70	90	φ 6

Driver specifications

Model number of driver		MADHT1507	MBDHT2510	MCDHT3520
Item				
Applicable motor code		P023, P028	P024, P029	P025, P030
Rated output		200W	400W	750W
Feedback	Servo motor	Serial encoder		
	Linear encoder ⁽¹⁾	Incremental encoder		
Command input pulse	Selection one from Symbol with pulse line, CCW or CW with pulse line, two phases pulse with 90-degree difference.			
Type of command input pulse	Line driver, Photo coupler			
Capability of command input speed	Line receiver : 4Mpps Photo coupler : 500kpps			
Main power supply voltage	Single phase AC200~240V -15~10% 50/60Hz			
Continuous rated current Arms		1.6	2.6	4.0
Maximum consumption current Arms		6.9	11.0	17.0
Control circuit supply voltage	Single phase AC200~240V -15~10% 50/60Hz			
Ambient temperature in operation	0~55°C (Keep freeze free)			
Ambient temperature in storage	-20~65°C (Keep freeze free)			
Ambient temperature in operation and storage	90%RH or less (Keep dewdrop free)			
Mass kg		0.8	1.0	1.6

Note ⁽¹⁾ : Applicable with linear encoder.

AC servo motor and Driver of Mitsubishi Electric Corporation (RoHS compliance)



Motor specification

Motor code	Motor model number	Power supply voltage V	Rated output W	Rated torque N · m	Instantaneous maximum torque N · m	Rated number of revolution r/min	Motor inertia $J_M \times 10^{-4} \text{kg} \cdot \text{m}^2$	Encoder specification	Mass kg
J013	HF-KP23	200	200	0.64	1.9	3000	0.24	Common for incremental and absolute 18bits (262144pulse/rev)	0.94
J014	HF-KP43		400	1.3	3.8		0.42		1.5
J015	HF-KP73		750	2.4	7.2		1.43		2.9
J018	HF-KP23B		200	0.64	1.91		0.31		1.6
J019	HF-KP43B		400	1.3	3.8		0.5		2.1
J020	HF-KP73B		750	2.4	7.2		1.63		3.9

Motor mounting dimension

unit : mm

Motor code	$\square W \times L_M$	LR	LE	d	D	P	M
J013	60 × 76.6	30	3	14	50	70	φ 5.8
J014	60 × 98.5	30	3	14	50	70	φ 5.8
J015	80 × 113.8	40	3	19	70	90	φ 6.6
J018	60 × 116.1	30	3	14	50	70	φ 5.8
J019	60 × 138	30	3	14	50	70	φ 5.8
J020	80 × 157	40	3	19	70	90	φ 6.6

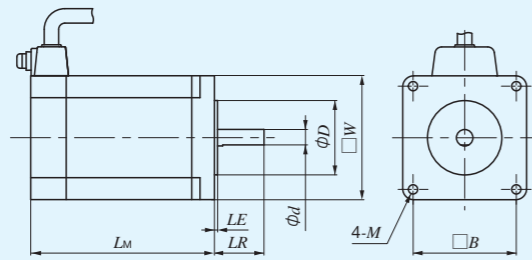
Driver specification

Model number of driver		MR-J3-20A-KE005	MR-J3-40A-KE005	MR-J3-70A-KE005
Item				
Applicable motor code		J013, J018	J014, J019	J015, J020
Rated output		200W	400W	750W
Feed back	Servo motor	Serial encoder		
	Linear encoder ⁽¹⁾	Incremental encoder		
Command input pulse	Selection one from Symbol with pulse line, CCW or CW with pulse line, two phase pulse with 90-degree difference.			
Type of command input pulse	Line driver, Open collector			
Capability of command input speed	Line driver : 4Mpps Open collector : 200kpps			
Main power supply voltage	Single phase/Three phase AC200~230V -15~10% 50/60Hz			
Control circuit supply voltage	Single phase AC200~230V -15~10% 50/60Hz			
Continuous rated current Arms		1.4	2.7	5.2
Maximum consumption current Arms		4.2	8.1	15.6
Ambient temperature in operation	0~55°C (Keep freeze free)			
Ambient temperature in storage	-20~65°C (Keep freeze free)			
Ambient temperature in operation and storage	90%RH or less (Keep dewdrop free)			
Mass kg		0.8	1.0	1.4

Note ⁽¹⁾ : Applicable with linear encoder.

Specifications of Motor and Driver

Stepper motor and Driver of Oriental Motor Corporation (RoHS compliance)



Motor Specifications

Motor code	Motor model number	Step angle	Maximum holding torque N · m	Current A-phase	Roter inertia $J_M \times 10^{-3} \text{kg} \cdot \text{m}^2$	Mass kg
V011	PK569AE	0.72	1.66	1.4	5.6	1.3
V012	PK569AEM		1.66		7.2	1.6
V013	PK596AE		2.1		14	1.7
V014	PK596AEM		2.1		24.7	2.4

Motor mounting dimension

Motor code	$W \times L_M$	LR	LE	d	D	B	M
V011	60 × 89	24	1.5	8	36	50	$\phi 4.5$
V012	60 × 129						
V013	85 × 68	37	2	14	60	70	$\phi 6.5$
V014	85 × 119						

Driver specifications

Items	Model number of driver	RKD514L-A	RKD514LM-A	RKD514H-A	RKD514HM-A
Applicable motor code		V011	V012	V013	V014
Executing type		Micro step			
Command input pulse		CW/CCW signal, pulse/Rotational direction signal			
Type of command input pulse		Photo coupler input, input resistance 220Ω, input current 10~20mA			
Main power supply voltage		Single phase 100~115V±15% 50/60Hz 4.5A			
Ambient temperature in operation		0~50°C (Keep Freeze free)			
Ambient temperature in storage		85% or less (Keep dew drop free)			
Mass kg		0.85			

Caution in Use

- ◆ Super Precision Positioning Table TX is a precision equipment. A careful handling is strongly required. Do not apply any excessive force or heavy shock.
- ◆ Make sure the mounting surfaces to be free from dirt and harmful foreign objects.
- ◆ Good flatness is required for mounting surfaces to assure positioning accuracy. 8μm or better is recommended.
- ◆ Lubricating part, C-Lube is built-in the linear motion rolling guides and the ball screw. It achieves long-term maintenance free.
- ◆ Grease is applied to the linear motion rolling guide and ball screw at delivery. Dust preventive cover is required to protect the inside of table from foreign particles or dusts. In case foreign particles or dusts enter into the table, intensive cleaning and re-greasing are necessary
- ◆ The re-lubrication interval varies depending on the operating conditions of the table. A six months' interval is generally recommended. If the table operation consists of reciprocating motions with many cycles and long strokes, re-lubrication in every three months with replacing old grease is recommended.
- ◆ Super Precision Positioning Table TX is machined, assembled and adjusted very precisely. Therefore, never disassemble or modify the table.
- ◆ Linear encoder is made of glass. Great care is necessary not to apply load and/or shock to it.
- ◆ Please make sure that surface of linear scale must be kept clean by ethyl alcohol or alternative cleaning solution, otherwise, malfunction or irregular operation may happen. In the application of dusty environment, dust-protective cover for linear encoder is recommended.

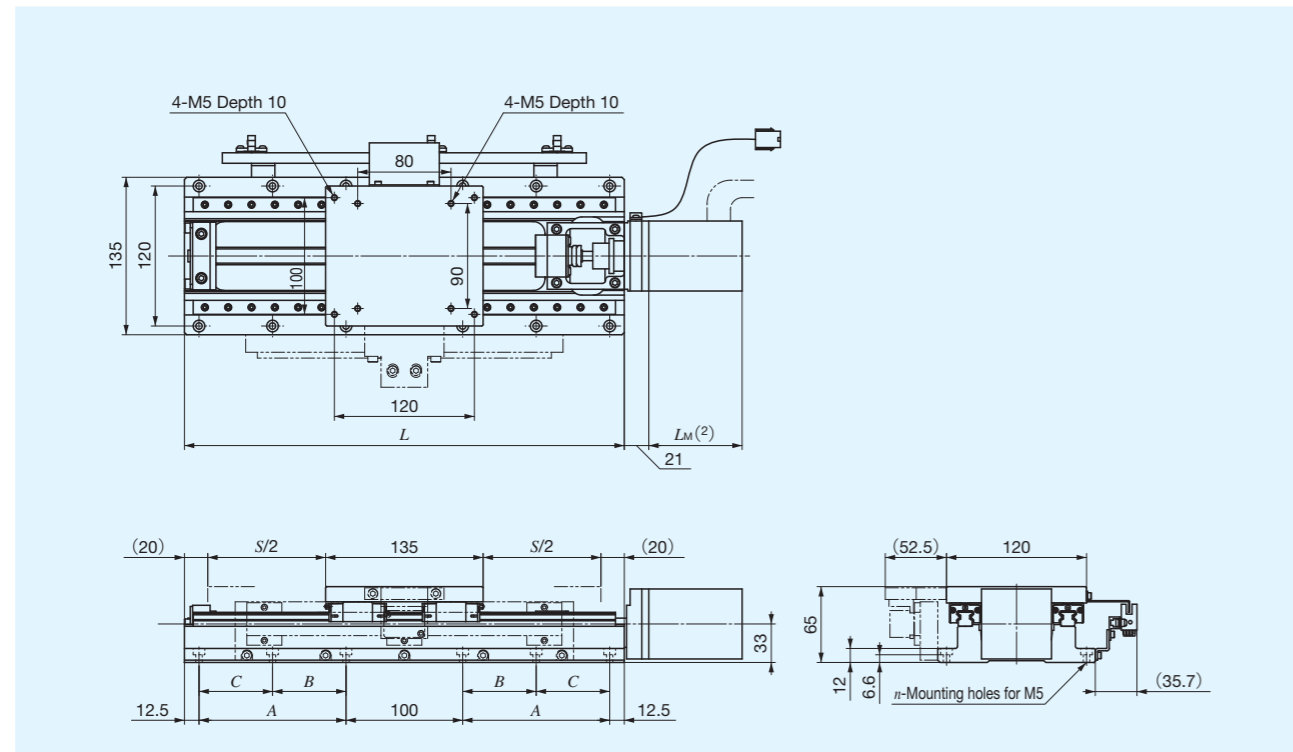
○The appearance, specifications and other details of the products are subject to change without prior for improvement.

Duration and scope of warranty

The period of warranty for the precision positioning table and related electrical devices is set at one year after delivery. If a failure occurs while the product is correctly being used and the failure is clearly attributable to its manufacture, the product will be repaired at no cost within the warranty period. A warranty here means the guarantee of the precision positioning table itself as a single unit. It shall be a fare-paying service is required. When the trouble is not obviously judged by our product deficiency as a result of our investigation, the customer shall be responsible for the repair coast. Secondary damage that occurs on the product breakdown or use is out of our warranty. When disposing of the product, treat them as ordinary industrial waste.

IKO Super Precision Positioning Table TX

TX120M



unit : mm

Model Number	Stroke length S	Total length L	Mounting holes of bed				Mass ⁽¹⁾ (Ref.) kg
			A	B	C	n	
TX120M-100	100	275	75	—	—	8	11.3
TX120M-150	150	325	100	—	—	8	12.9
TX120M-200	200	375	125	—	—	8	14.0
TX120M-250	250	425	150	75	75	12	15.3
TX120M-300	300	475	175	100	75	12	16.7

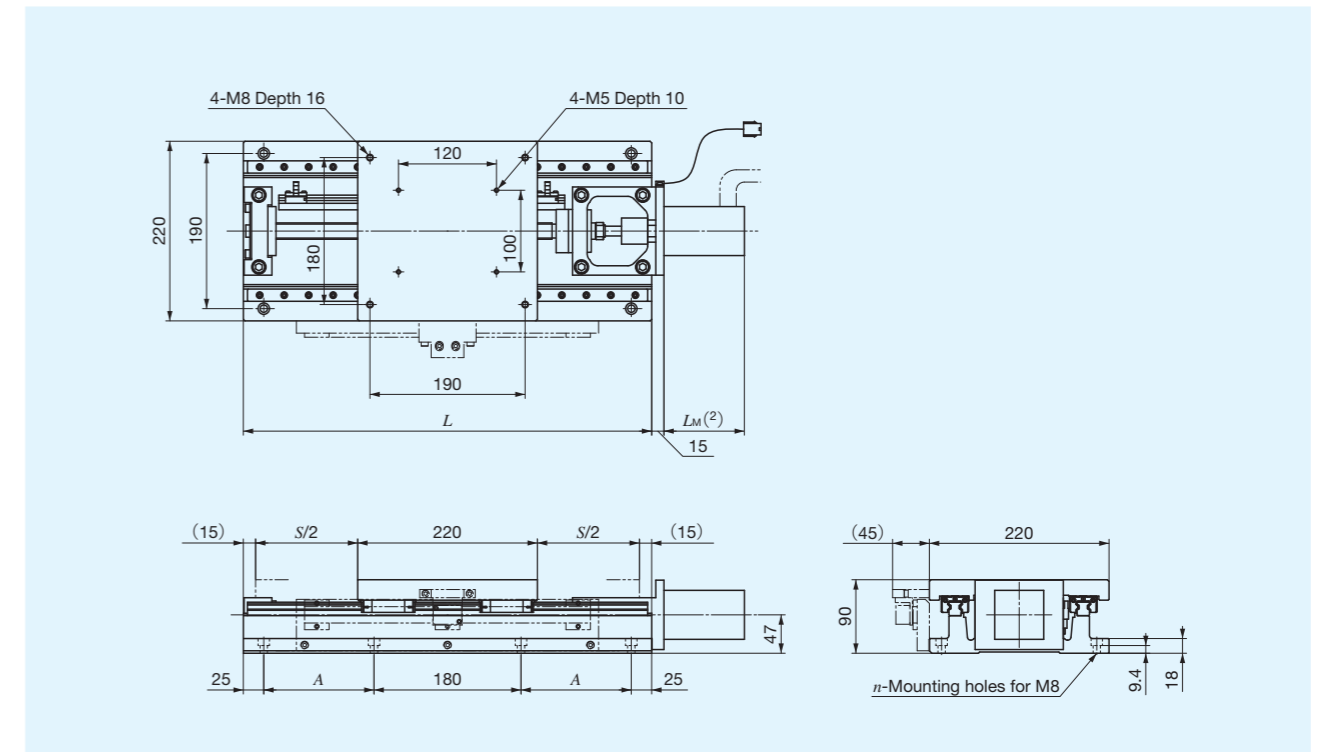
Notes⁽¹⁾ : Motor weight is not included.

⁽²⁾ : Refer to specifications of motor and driver.

Remark : Two dots-dash line in above drawing shows linear encoder.

IKO Super Precision Positioning Table TX

TX220M



unit : mm

Model Number	Stroke length S	Total length L	Mounting holes of bed		Mass ⁽¹⁾ (Ref.) kg
			A (Number × Pitch)	n	
TX220M-150	150	400	85	8	33.6
TX220M-200	200	450	110	8	36.4
TX220M-250	250	500	135	8	38.7
TX220M-300	300	550	160	8	41.2
TX220M-400	400	650	210 (2 × 105)	12	46.4

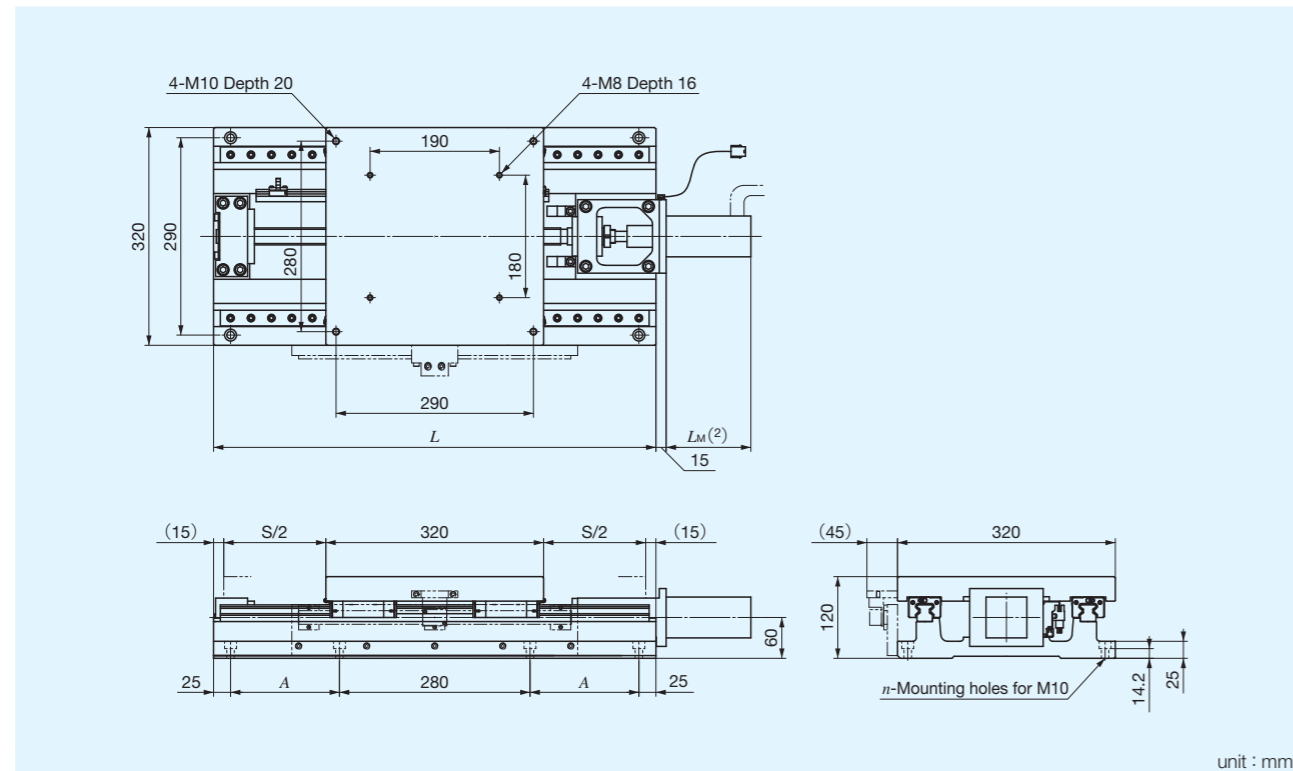
Notes⁽¹⁾ : Motor weight is not included.

⁽²⁾ : Refer to specifications of motor and driver.

Remark : Two dots-dash line in above drawing shows linear encoder.

IKO Super Precision Positioning Table TX

TX320M

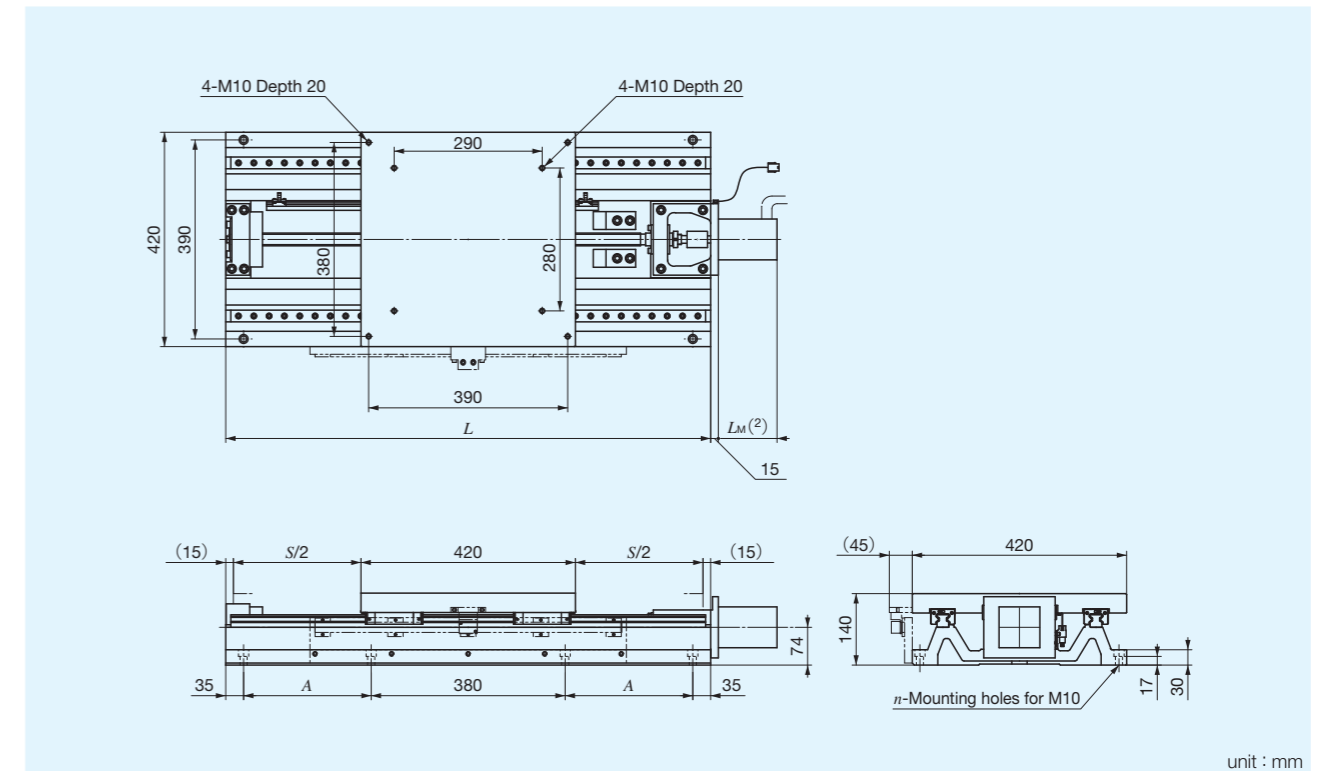


Model Number	Stroke length	Total length	Mounting holes of bed		Mass ⁽¹⁾ (Ref.) kg
	S	L	A	n	
TX320M-300	300	650	160	8	103.7
TX320M-400	400	750	210	8	114.1
TX320M-500	500	850	260	8	124.0

Notes⁽¹⁾ : Motor weight is not included.
⁽²⁾ : Refer to specifications of motor and driver.
 Remark : Two dots-dash line in above drawing shows linear encoder.

IKO Super Precision Positioning Table TX

TX420M

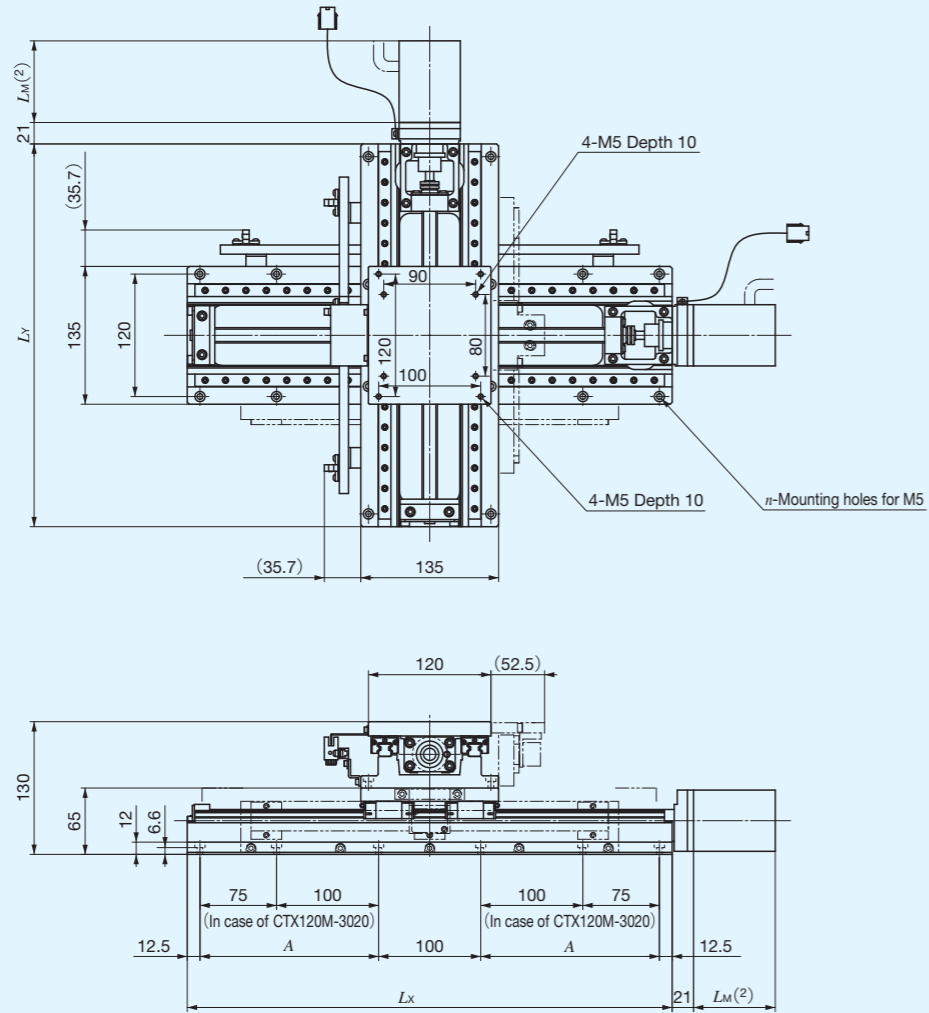


Model Number	Stroke length	Total length	Mounting holes of bed		Mass ⁽¹⁾ (Ref.) kg
	S	L	A (Number × Pitch)	n	
TX420M-500	500	950	250	8	183.0
TX420M-600	600	1050	300	8	196.1
TX420M-800	800	1250	400 (2 × 200)	12	222.2

Notes⁽¹⁾ : Motor weight is not included.
⁽²⁾ : Refer to specifications of motor and driver.
 Remark : Two dots-dash line in above drawing shows linear encoder.

IKO Super Precision Positioning Table TX

CTX120M



unit : mm

Model Number	Stroke length S		Total length		Mounting holes of bed		Mass ⁽¹⁾ (Ref.) kg
	X-axis	Y-axis	L_x	L_y	A	n	
CTX120M-1010	100	100	275	275	75	8	22.6
CTX120M-2010	200	100	375	275	125	8	25.3
CTX120M-2020	200	200	375	375	125	8	28.0
CTX120M-3020	300	200	475	375	175	12	30.7

Notes⁽¹⁾ : Motor weight is not included.

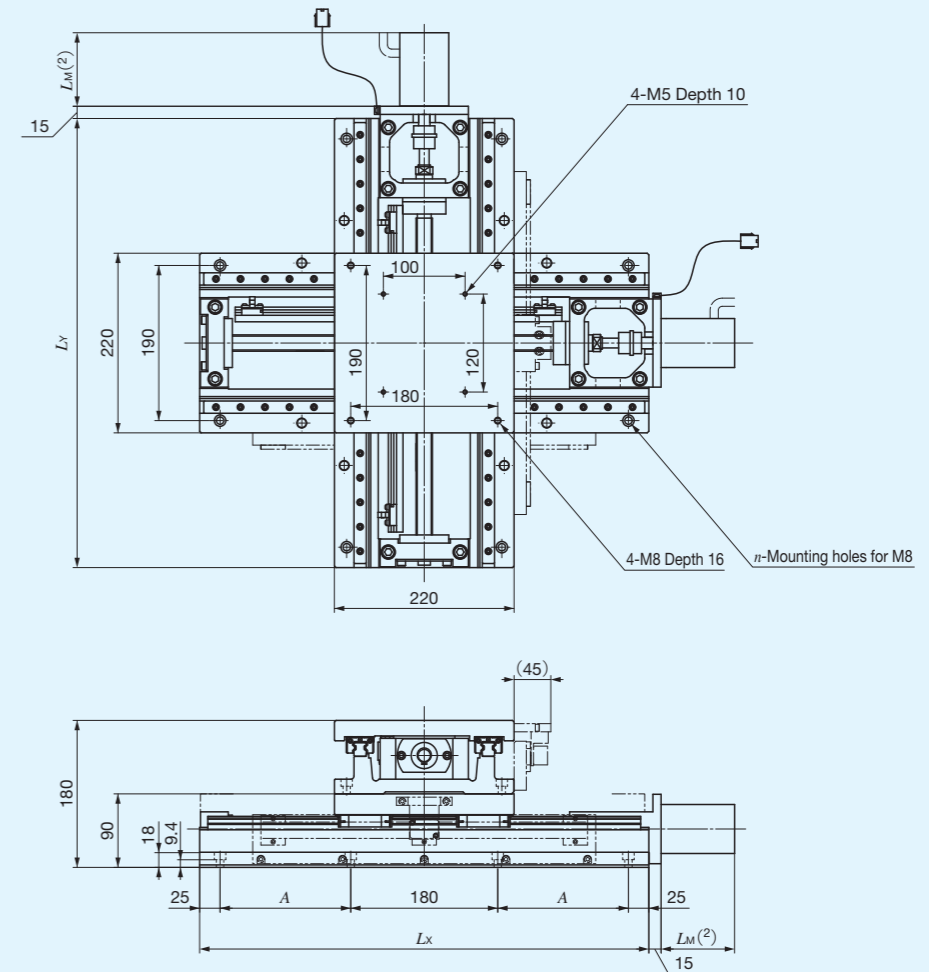
⁽²⁾ : Refer to specifications of motor and driver.

Remarks 1 : Two dots-dash line in above drawing shows linear encoder.

2 : Deferent stroke length, combination of different table sizes and tables with plastic cable carrier can be available. Consult **IKO**.

IKO Super Precision Positioning Table TX

CTX220M



unit : mm

Model Number	Stroke length S		Total length		Mounting holes of bed		Mass ⁽¹⁾ (Ref.) kg
	X-axis	Y-axis	L_x	L_y	A (Number × Pitch)	n	
CTX220M-2020	200	200	450	450	110	8	72.8
CTX220M-3020	300	200	550	450	160	8	77.6
CTX220M-3030	300	300	550	550	160	8	82.4
CTX220M-4030	400	300	650	550	210 (2 × 105)	12	87.6

Notes⁽¹⁾ : Motor weight is not included.

⁽²⁾ : Refer to specifications of motor and driver.

Remarks 1 : Two dots-dash line in above drawing shows linear encoder.

2 : Deferent stroke length, combination of different table sizes and tables with plastic cable carrier can be available. Consult **IKO**.

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