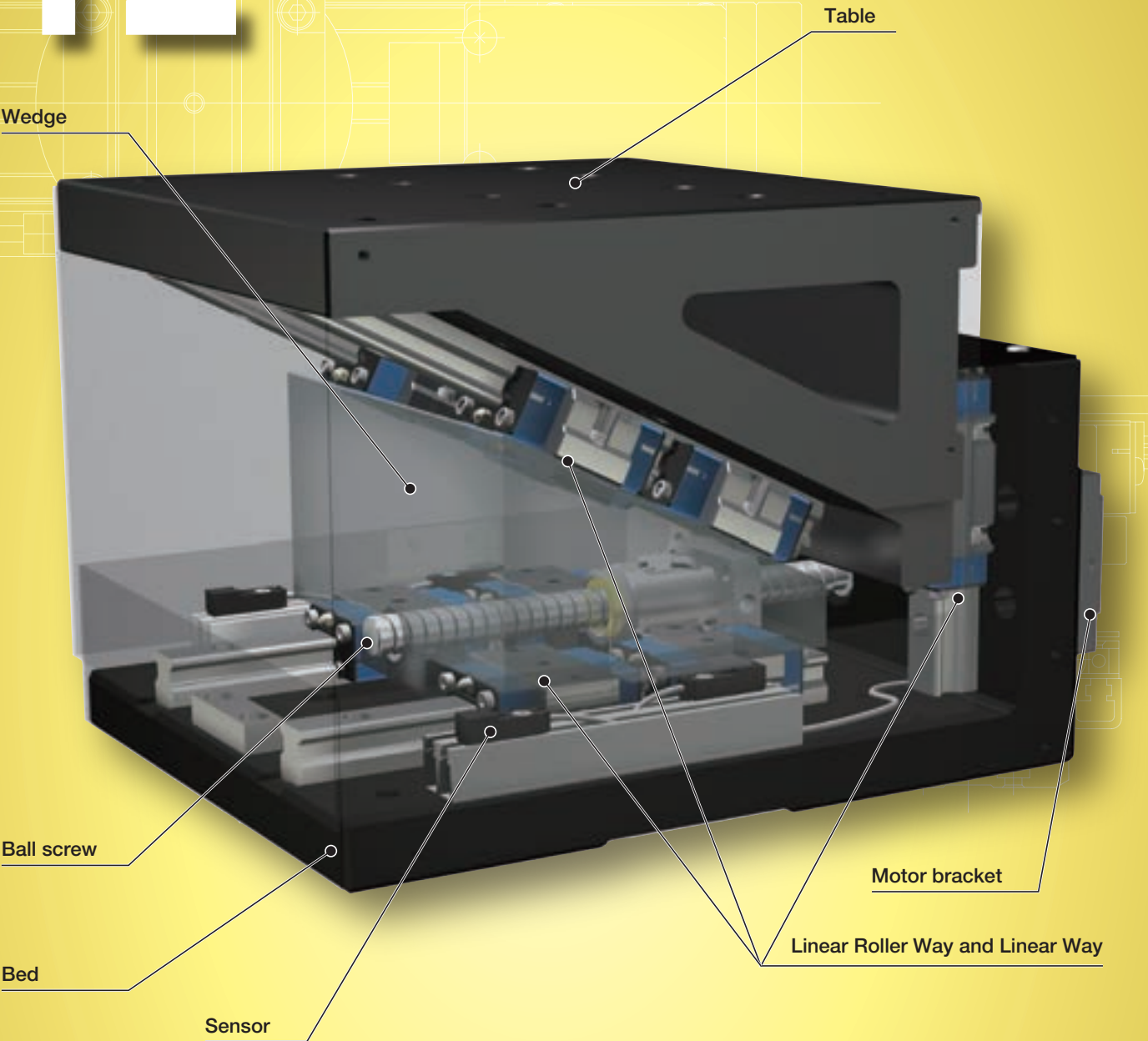


TZ

TZ



Major product specifications

Driving method	Precision ball screw
Linear motion rolling guide	Linear Roller Way (roller type) Linear Way (ball type)
Built-in lubrication part	Lubrication part "C-Lube" is built-in
Material of table and bed	Aluminum extruded material (Alumite)
Sensor	Provided as standard

Accuracy

Positioning repeatability	±0.001
Positioning accuracy	0.005
Lost motion	0.001
Parallelism in table motion A	—
Parallelism in table motion B	—
Attitude accuracy	—
Straightness	—
Backlash	—

unit: mm

Points

● Compact precision elevating table

This is an elevating table for performing compact yet high precision vertical positioning with unique wedge mechanism adopted.

● Two types and two sizes selectable depending on the usage

Table dimensions of □120 mm and □200 mm have been added to our lineup, including the high accuracy/high rigidity type with roller-type linear motion rolling guide incorporated and the standard type with superior cost performance. Two kinds of wedge reduction ratio are prepared, thus enabling vertical positioning of up to 24mm in stroke.

● Installation of linear encoder enables the positioning of a rank higher level.

Specifying an optional linear encoder attached unit and performing the fully-closed loop control enables the positioning of even higher precision.

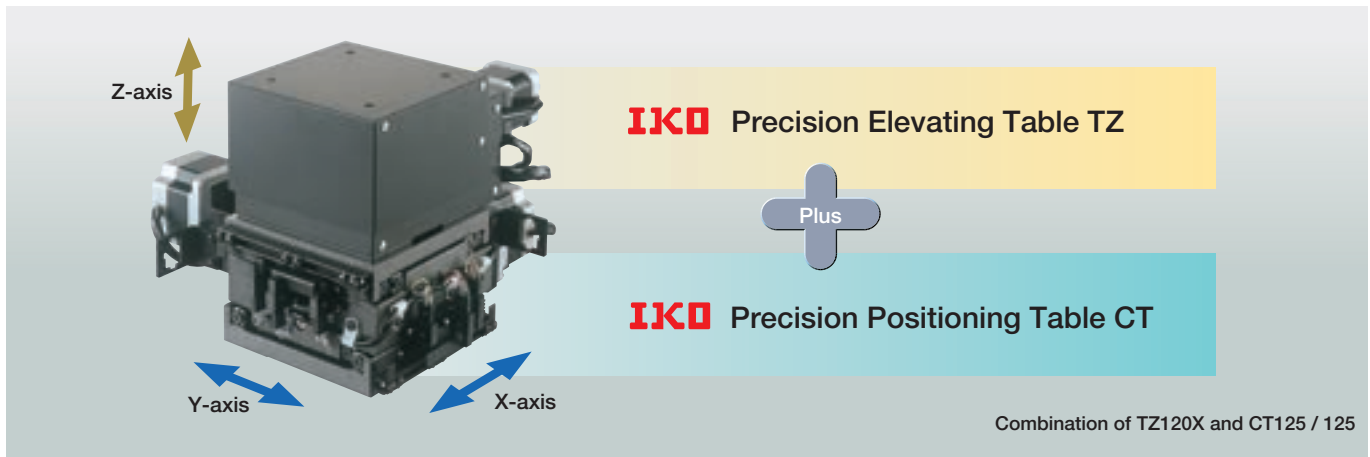
● Sensor provided as standard

Limit sensor and origin / pre-origin sensors are provided as standard. The sensor is compactly built in the main unit, thus facilitating the incorporation into a machine or device.

● Available as multi-axis configured Z-axis

Placing the unit on a slide table of precision positioning table makes the unit available as Z-axis positioning mechanism of the multi-axis table.

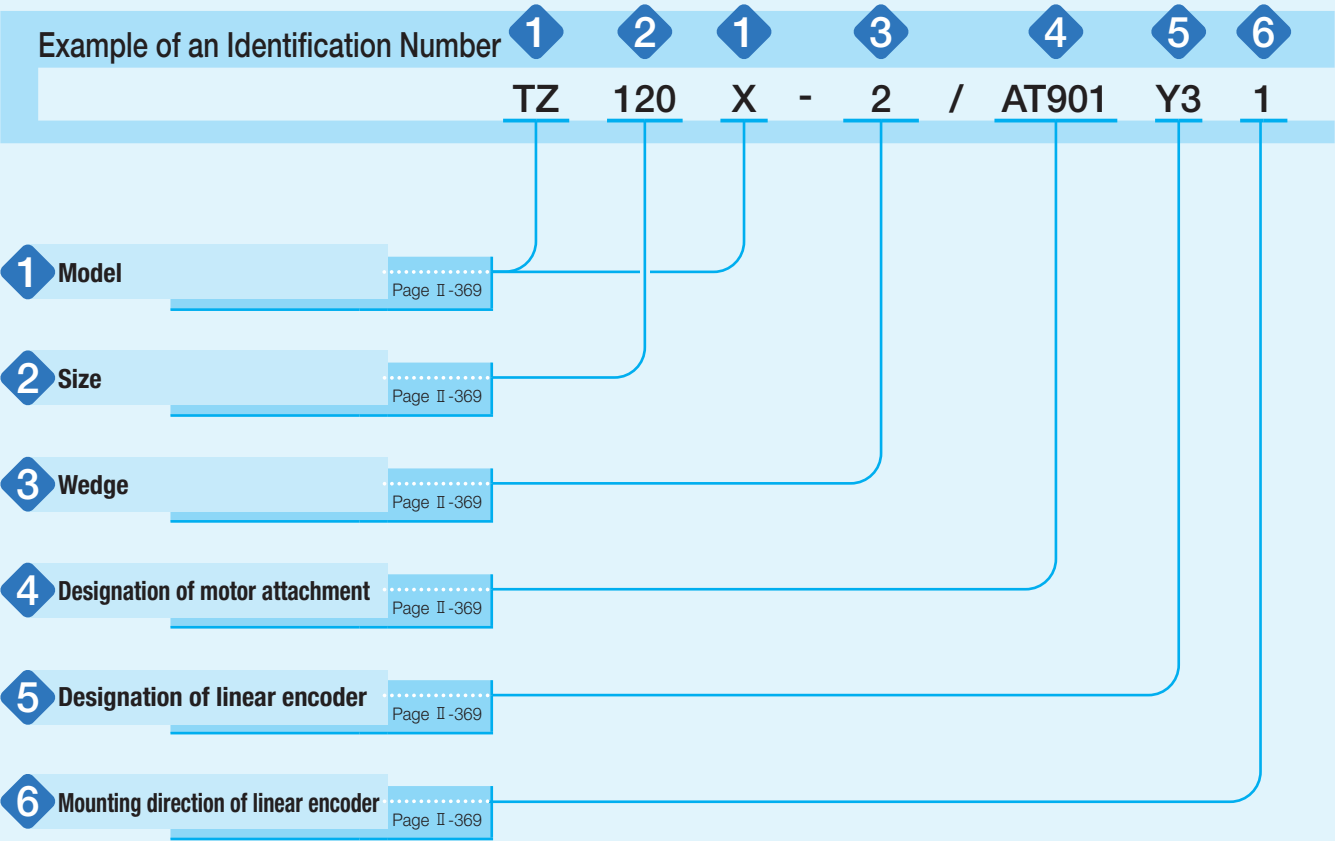
Example of combination with XYZ positioning table using the Precision Elevating Table TZ



Variation

Shape	Model and size	Table width (mm)	Linear motion rolling guide type	Wedge reduction ratio
	TZ120X-2	□120	Roller Type	1 : 2
	TZ120X-4			1 : 4
	TZ200H-2	□200	Ball type	1 : 2
	TZ200H-4			1 : 4
	TZ200X-2		Roller Type	1 : 2
	TZ200X-4			1 : 4

Identification Number



Identification Number and Specification

1 Model	TZ...H: Precision Elevating Table (applicable to size 200) TZ...X: Precision Elevating Table, high precision and high rigidity type (applicable to size 120, 200)
2 Size	120: Table size □120mm 200: Table size □200mm
3 Wedge	2: Wedge reduction ratio 1 : 2 4: Wedge reduction ratio 1 : 4 This ratio indicates the reduction ratio of vertical travel distance to the ball screw feed rate.
4 Designation of motor attachment	As for a motor attachment, select it from the list of Table 1. · Motor should be prepared by customer. · Please specify motor attachment applicable to motor for use. · A coupling shown in Table 2 is mounted on the main body before shipment. However, the final position adjustment should be made by customer since it is only temporarily fixed. · When specifying an AC servomotor attachment, an origin sensor is not provided.
5 Designation of linear encoder	No symbol: Without linear encoder When specifying the linear encoder, see Table 3. · "With linear encoder" is only applicable to AC Servomotor specification. For applicable models and motor attachments, see Table 1.
6 Mounting direction of linear encoder	No symbol: On the right as viewed from the side opposite the motor 1 : On the left as viewed from the side opposite the motor · The mounting direction of the linear encoder and pull-out direction of the sensor cord are the same.

Identification Number and Specification

Table 1 Application of motor attachment

Motor model					Flange size mm	Motor attachment	
Type	Manufacturer	Series	Model	Rated output W		TZ120X	TZ200H TZ200X
AC servo motor	YASKAWA ELECTRIC CORPORATION	Σ-7	SGM7J-A5A	50	□40	AT901	—
			SGM7A-A5A			AT901	—
			SGM7J-01A	100		AT901	AT902
			SGM7A-01A			AT901	AT902
			SGM7A-C2A	150		—	AT902
	Mitsubishi Electric Corporation	J4/J5	HG-MR053	50	□40	AT901	—
			HG-KR053/HK-KT053W			AT901	—
			HG-MR13	100		AT901	AT902
			HG-KR13/HK-KT13W			AT901	AT902
	Panasonic Corporation	MINAS A6	MSMF5A	50	□38	AT903	—
MSMF01			100	AT903		AT904	
Stepper motor	ORIENTAL MOTOR Co., Ltd.	α step	ARM46		□42	AT905	—
			ARM66		□60	—	AT906
			ARM69		□60	—	AT906
		CRK	CRK54		□42	AT907	—
			CRK56 ⁽¹⁾		□60	—	AT908

Note (1) Applicable to the outer diameter φ8 of motor output shaft.
Remark: For detailed motor specifications, please see respective motor manufacturer's catalog.

Table 2 Coupling models

Motor attachment	Coupling models	Manufacturer	Coupling inertia J _c × 10 ⁻⁶ kg · m ²
AT901	UA-20C-5× 8	Sakai Manufacturing Co., Ltd	0.086
AT902	UA-25C-8× 8	Sakai Manufacturing Co., Ltd	0.29
AT903	UA-20C-5× 8	Sakai Manufacturing Co., Ltd	0.086
AT904	UA-25C-8× 8	Sakai Manufacturing Co., Ltd	0.29
AT905	UA-20C-5× 6	Sakai Manufacturing Co., Ltd	0.086
AT906	UA-25C-8× 10	Sakai Manufacturing Co., Ltd	0.29
AT907	UA-20C-5× 5	Sakai Manufacturing Co., Ltd	0.086
AT908	UA-25C-8× 8	Sakai Manufacturing Co., Ltd	0.29

Remark: For detailed coupling specifications, please see respective manufacturer's catalog.

Table 3 Linear encoder models

Target models		TZ120X			TZ200H, TZ200X		
Item		Y3	J3	P3	Y4	J4	P4
Designation code of linear encoder		Y3	J3	P3	Y4	J4	P4
Manufacturers of compatible drivers		YASKAWA ELECTRIC CORPORATION	Mitsubishi Electric Corporation	Panasonic Corporation	YASKAWA ELECTRIC CORPORATION	Mitsubishi Electric Corporation	Panasonic Corporation
Linear encoder	Manufacturer	Renishaw plc			Renishaw plc		
	Head	T1031-30A	V2BCY30D04F		T1031-30A	V2BCY30D04F	
	Interface	Ti0000A00V	—		Ti0000A00V	—	
	Scale	A-9715-0004			A-9715-0007		

Specifications

Table 4 Specifications

Model and size	Wedge reduction ratio	Ball screw lead mm	Resolution ⁽¹⁾ μm/pulse	Stroke length mm
TZ120X-2	1 : 2	4	2.0 (0.1)	10
TZ120X-4	1 : 4		1.0 (0.1)	5
TZ200H-2	1 : 2	5	2.5 (0.1)	24
TZ200H-4	1 : 4		1.25 (0.1)	12
TZ200X-2	1 : 2		2.5 (0.1)	24
TZ200X-4	1 : 4		1.25 (0.1)	12

Note ⁽¹⁾ The resolution indicates a value when fraction sizes of the motor are 1,000 pulses/rev.
Remark: The values in () indicate values with linear encoder and Panasonic Corporation MINAS A5 system selected. If the ΣV system of YASKAWA ELECTRIC CORPORATION is selected, it should be 0.078125 μm/pulse.

Table 5 Accuracy

unit: mm						
Model and size	Wedge reduction ratio	Positioning repeatability	Positioning accuracy	Lost motion	Parallelism in table elevating	Squareness in table elevating
TZ120X-2	1 : 2	±0.001	—	0.001	0.010	0.010
TZ120X-4	1 : 4		(0.005)			
TZ200H-2	1 : 2	±0.001	—	—	—	—
TZ200H-4	1 : 4		(0.005)			
TZ200X-2	1 : 2	±0.001	—	0.001	0.010	0.010
TZ200X-4	1 : 4		(0.005)			

Remark: The values in () indicate values with a linear encoder.

Table 6 Maximum speed

Model and size	Wedge reduction ratio	Ball screw lead mm	Maximum speed mm/s	
			AC servomotor	Stepper motor
TZ120X-2	1 : 2	4	100	60
TZ120X-4	1 : 4		50	30
TZ200H-2	1 : 2	5	125	75
TZ200H-4	1 : 4		62.5	37.5
TZ200X-2	1 : 2		125	75
TZ200X-4	1 : 4		62.5	37.5

Remark: To measure the practical maximum speed, it is required to consider operation patterns based on the motor to be used and load conditions.

Table 7 Maximum carrying mass

Model and size	Wedge reduction ratio	Carrying mass position mm	Maximum carrying mass kg							
			Horizontal direction				Vertical direction			
		Length L Height H	0	100	200	300	0	100	200	300
TZ120X	1:2	0	146	45	25	18	10	10	6	4.5
		100	95	37	23	16	10	7	5	3.8
		200	61	31	20	15	6	5	4.1	3.3
		300	45	26	18	14	4.4	3.7	3.2	2.8
	1:4	0	146	46	26	18	10	10	6	4.6
		100	98	37	23	16	10	8	5	3.8
		200	63	31	20	15	6	5	4.2	3.3
		300	46	26	18	14	4.5	3.8	3.2	2.8
TZ200H	1:2	0	109	59	35	25	9	9	7	5
		100	88	45	30	22	9	7	5	4.3
		200	59	36	26	20	6	5	4.2	3.6
		300	44	30	23	18	4.5	3.8	3.3	2.9
	1:4	0	109	62	37	26	10	10	8	5
		100	95	47	31	23	10	8	6	4.6
		200	62	38	27	20	7	5	4.7	3.9
		300	46	31	23	18	5	4.3	3.7	3.2
TZ200X	1:2	0	159	123	72	51	9	9	9	9
		100	159	119	71	51	9	9	9	9
		200	159	112	70	50	9	9	9	9
		300	159	103	67	49	9	9	9	9
	1:4	0	160	124	73	51	10	10	10	10
		100	160	120	72	51	10	10	10	10
		200	160	113	70	50	10	10	10	10
		300	160	105	68	49	10	10	10	10

Remark: The maximum carrying mass is adjusted by the mass when the rating life of the linear motion rolling guide, ball screws, or bearings is 18,000 hours during continuous operation at a number of revolutions of the motor of 3000min⁻¹ and an acceleration/deceleration time of 0.2s. The mass calculated is based upon the basic static load rating of the linear motion rolling guide.

Table 8 Maximum load mass

Model and size	Wedge reduction ratio	Maximum load mass kg	
		Horizontal direction	Vertical direction
TZ120X-2	1:2	118	116
TZ120X-4	1:4	246	237
TZ200H-2	1:2	126	124
TZ200H-4	1:4	261	251
TZ200X-2	1:2	126	124
TZ200X-4	1:4	261	251

Remarks 1. The maximum load mass shows the mass that ensures acceleration/deceleration of 0.3G.
2. The values shown in this table were calculated with the motor with the highest rated torque installed, selected from the AC servomotor models listed in Table 1.

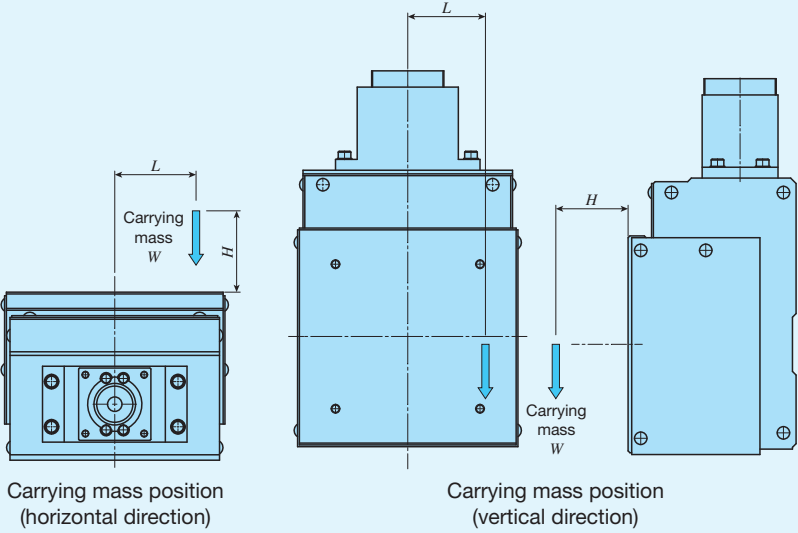


Table 9 Specifications of ball screw

unit: mm

Model and size	Shaft dia.	Overall length
TZ120X	8	168
TZ200H	12	215
TZ200X	12	215

Table 10 Table inertia and starting torque

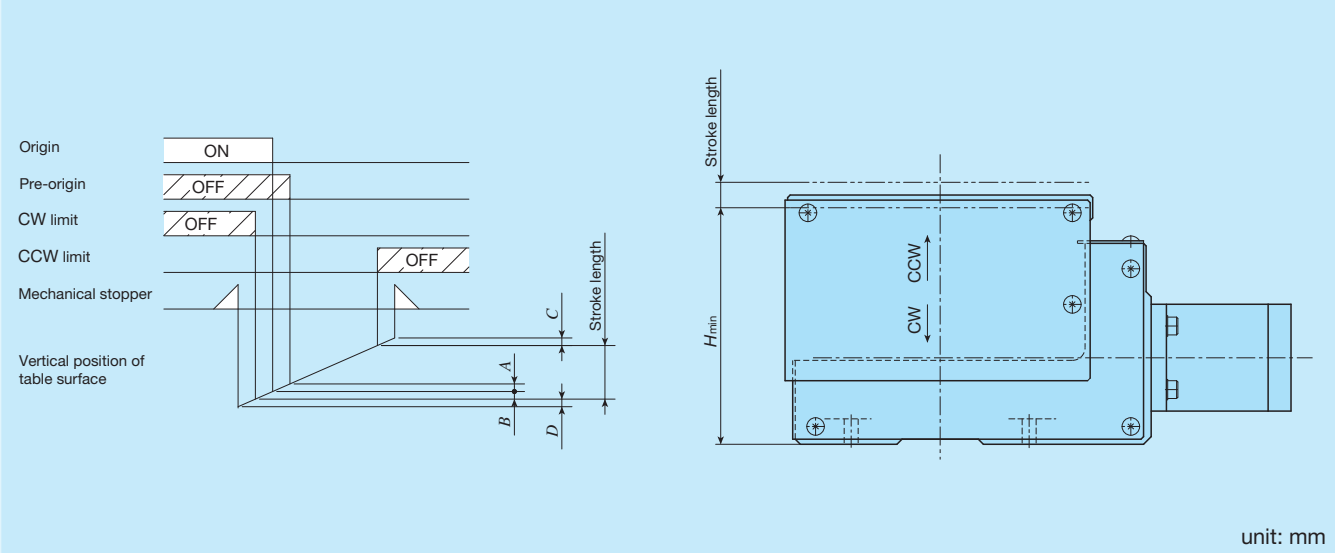
Model and size	Wedge reduction ratio	Table inertia J_T $\times 10^{-5} \text{kg} \cdot \text{m}^2$	Starting torque T_s N·m
TZ120 -2	1 : 2	0.076	0.03
TZ120 -4	1 : 4	0.061	0.02
TZ120X-2	1 : 2	0.076	0.03
TZ120X-4	1 : 4	0.064	0.02
TZ200H-2	1 : 2	0.581	0.07
TZ200H-4	1 : 4	0.473	0.06
TZ200X-2	1 : 2	0.581	0.07
TZ200X-4	1 : 4	0.473	0.06

Mounting

For the fixing screw tightening torque of the Precision Positioning Table, see page III-30.

Sensor Specification

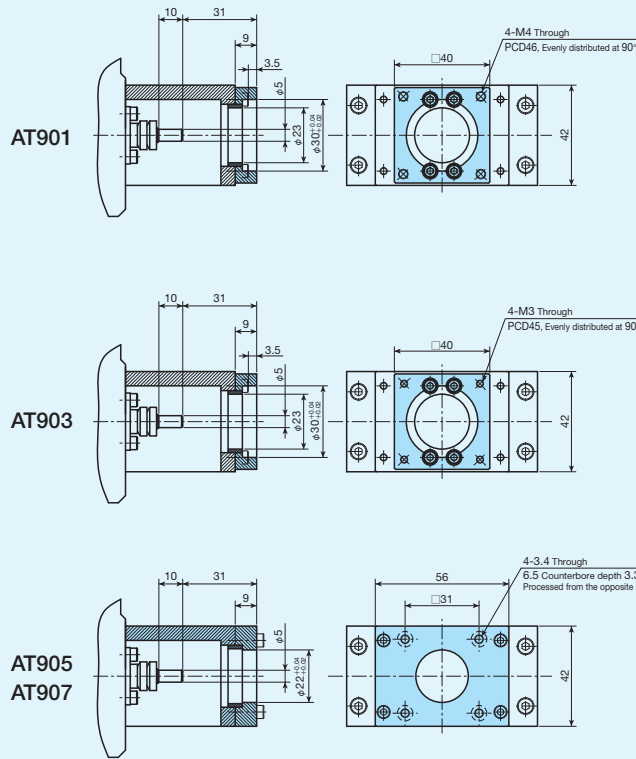
Table 11 Sensor timing chart



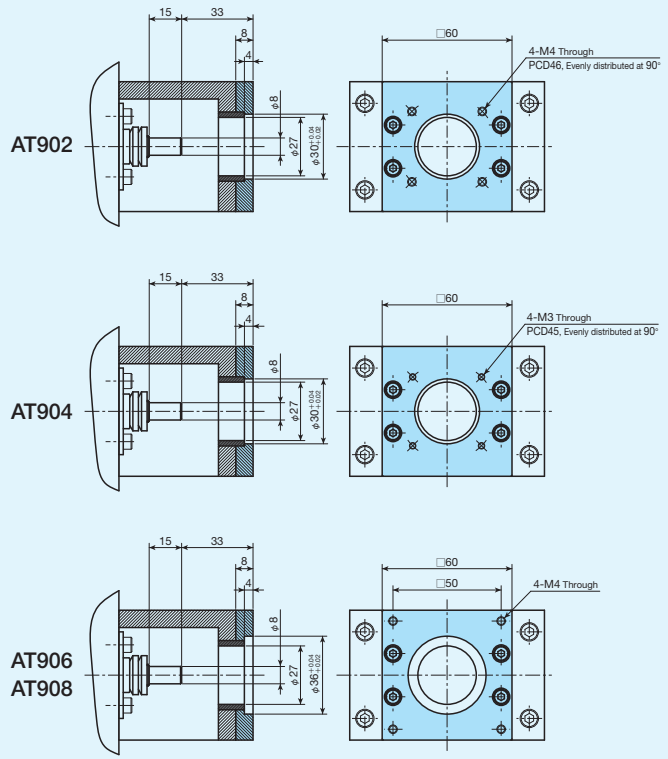
Identification number	A	B	C	D
TZ120X-2	1	1	1	1
TZ120X-4	0.5	0.5	0.5	0.5
TZ200H-2	1.5	1	2.5	1
TZ200H-4	0.75	0.5	1.25	0.5
TZ200X-4				

Dimensions of Motor Attachment

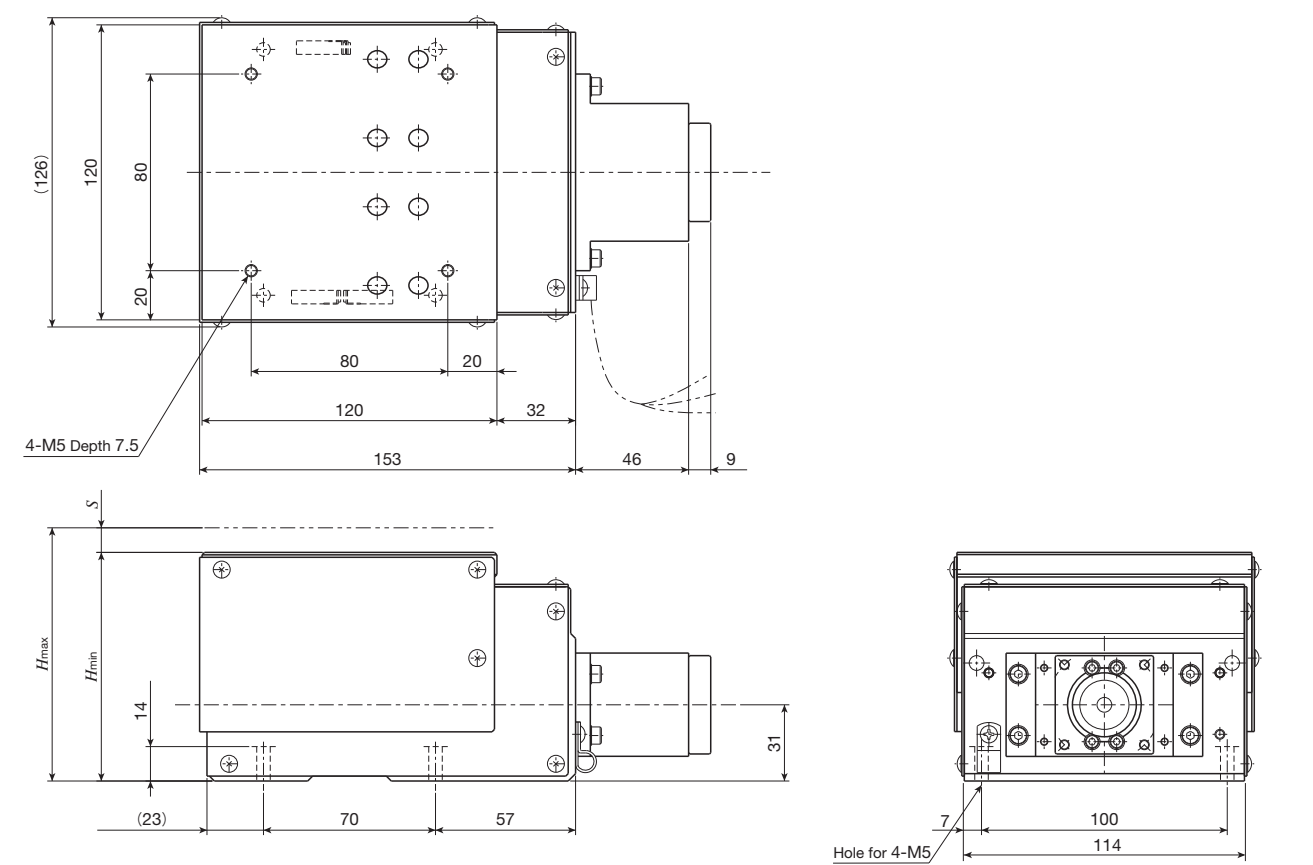
TZ120X



TZ200H, TZ200X

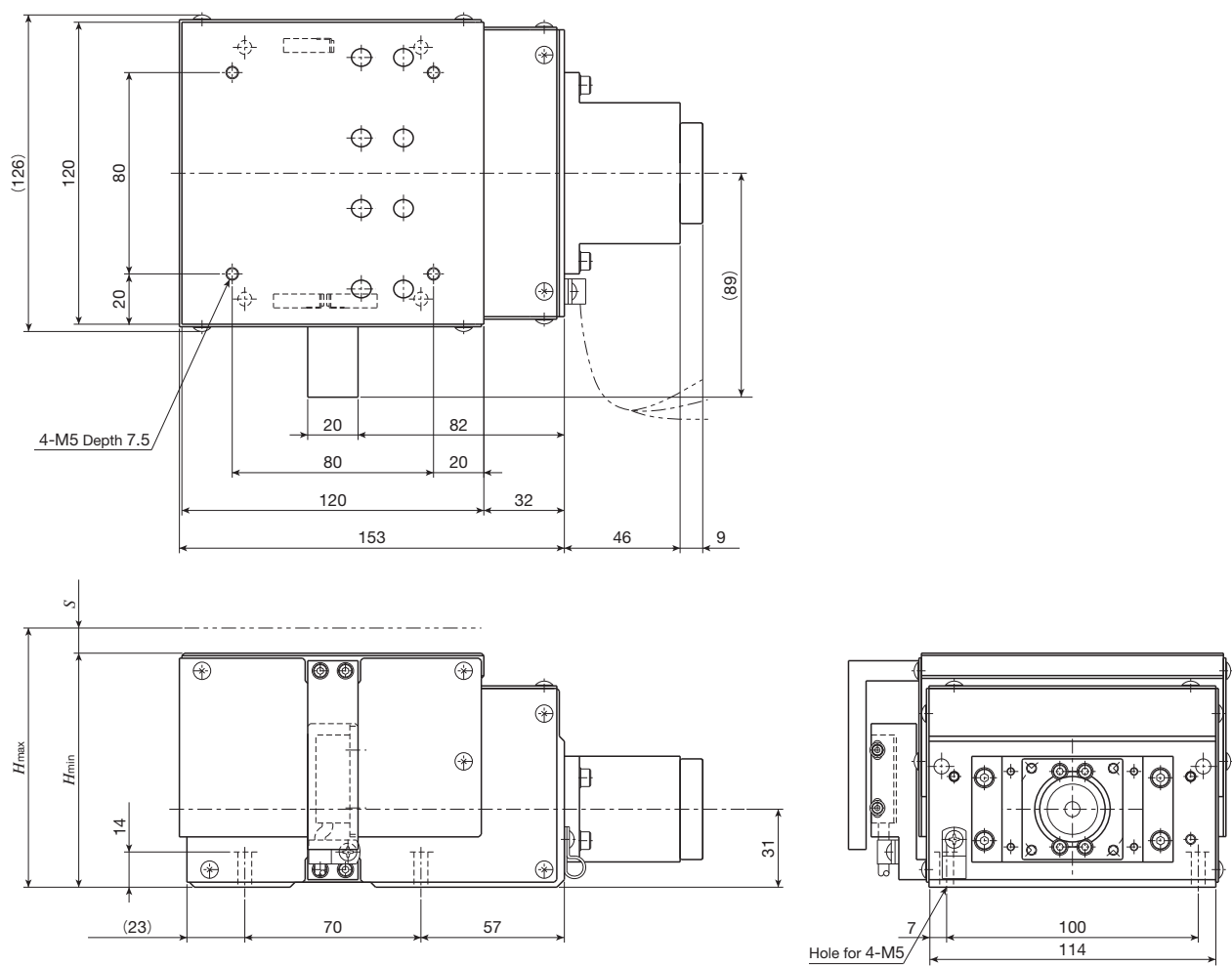


TZ120X without linear encoder



Identification number	Wedge reduction ratio	Mass (Ref.) kg	Height		Stroke length <i>S</i>
			<i>H</i> _{min} (CW limit position)	<i>H</i> _{max} (CCW limit position)	
TZ120X-2	1 : 2	3.8	93	103	10
TZ120X-4	1 : 4	3.4	84.5	89.5	5

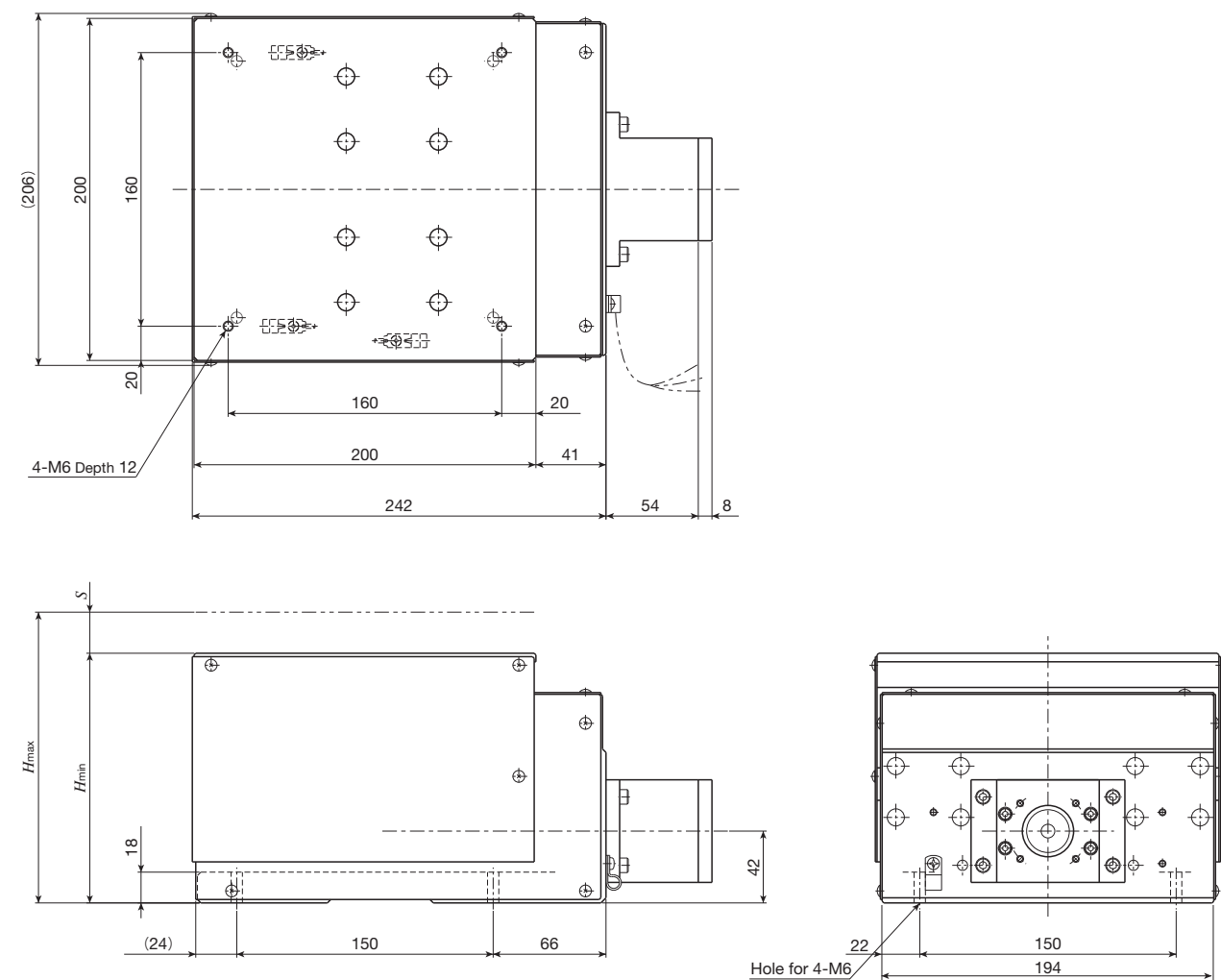
TZ120X with linear encoder



Identification number	Wedge reduction ratio	Mass (Ref.) kg	Height		Stroke length <i>S</i>
			<i>H</i> _{min} (CW limit position)	<i>H</i> _{max} (CCW limit position)	
TZ120X-2	1 : 2	4.5	93	103	10
TZ120X-4	1 : 4	4.1	84.5	89.5	5

IKO Precision Elevating Table TZ

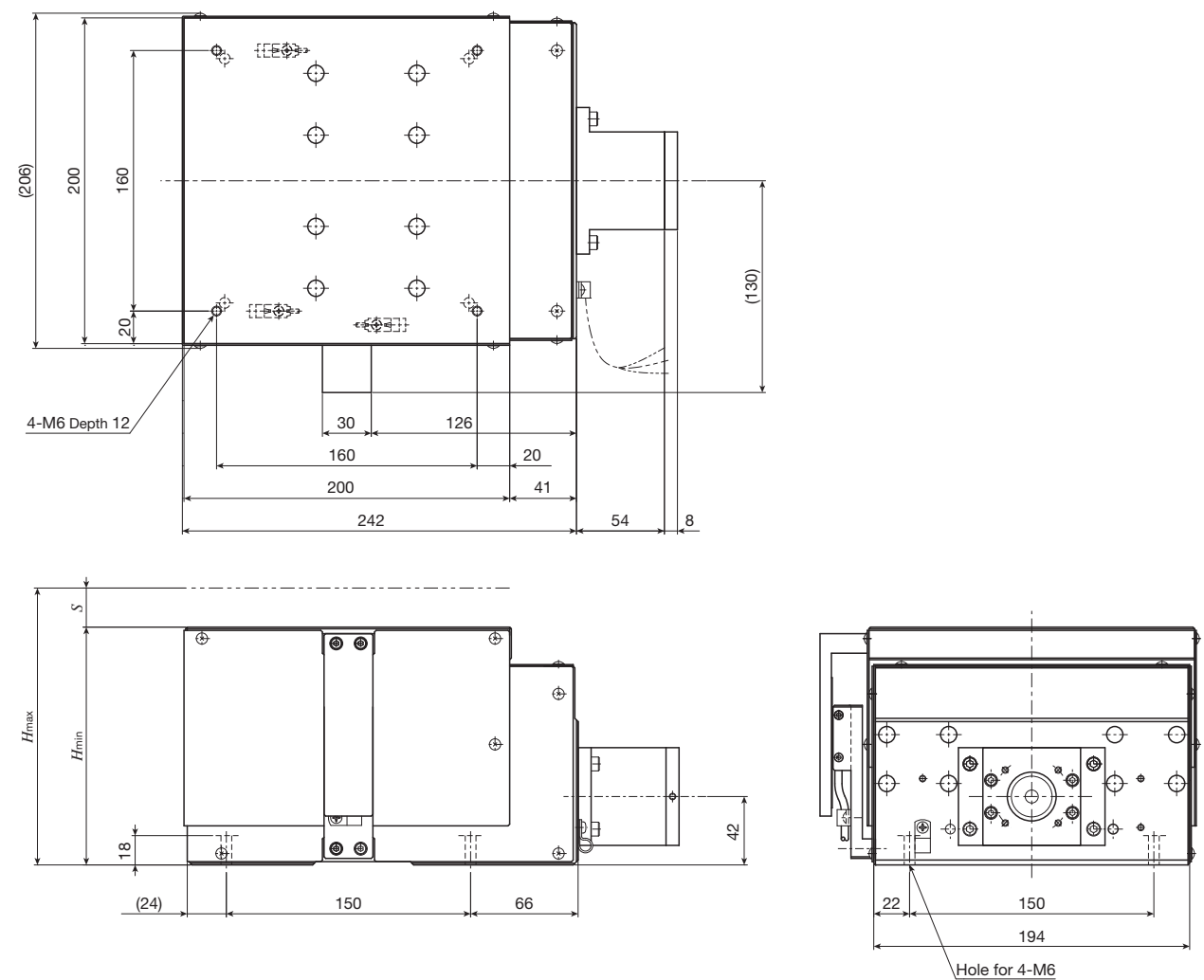
TZ200H, TZ200X without linear encoder



unit: mm

Identification number	Wedge reduction ratio	Mass (Ref.) kg	Height		Stroke length S
			H _{min} (CW limit position)	H _{max} (CCW limit position)	
TZ200H-2	1 : 2	13.2	146	170	24
TZ200H-4	1 : 4	12.2	132	144	12
TZ200X-2	1 : 2	13.3	146	170	24
TZ200X-4	1 : 4	12.3	132	144	12

TZ200H, TZ200X with linear encoder



unit: mm

Identification number	Wedge reduction ratio	Mass (Ref.) kg	Height		Stroke length S
			H _{min} (CW limit position)	H _{max} (CCW limit position)	
TZ200H-2	1 : 2	14.2	146	170	24
TZ200H-4	1 : 4	13.2	132	144	12
TZ200X-2	1 : 2	14.3	146	170	24
TZ200X-4	1 : 4	13.3	132	144	12