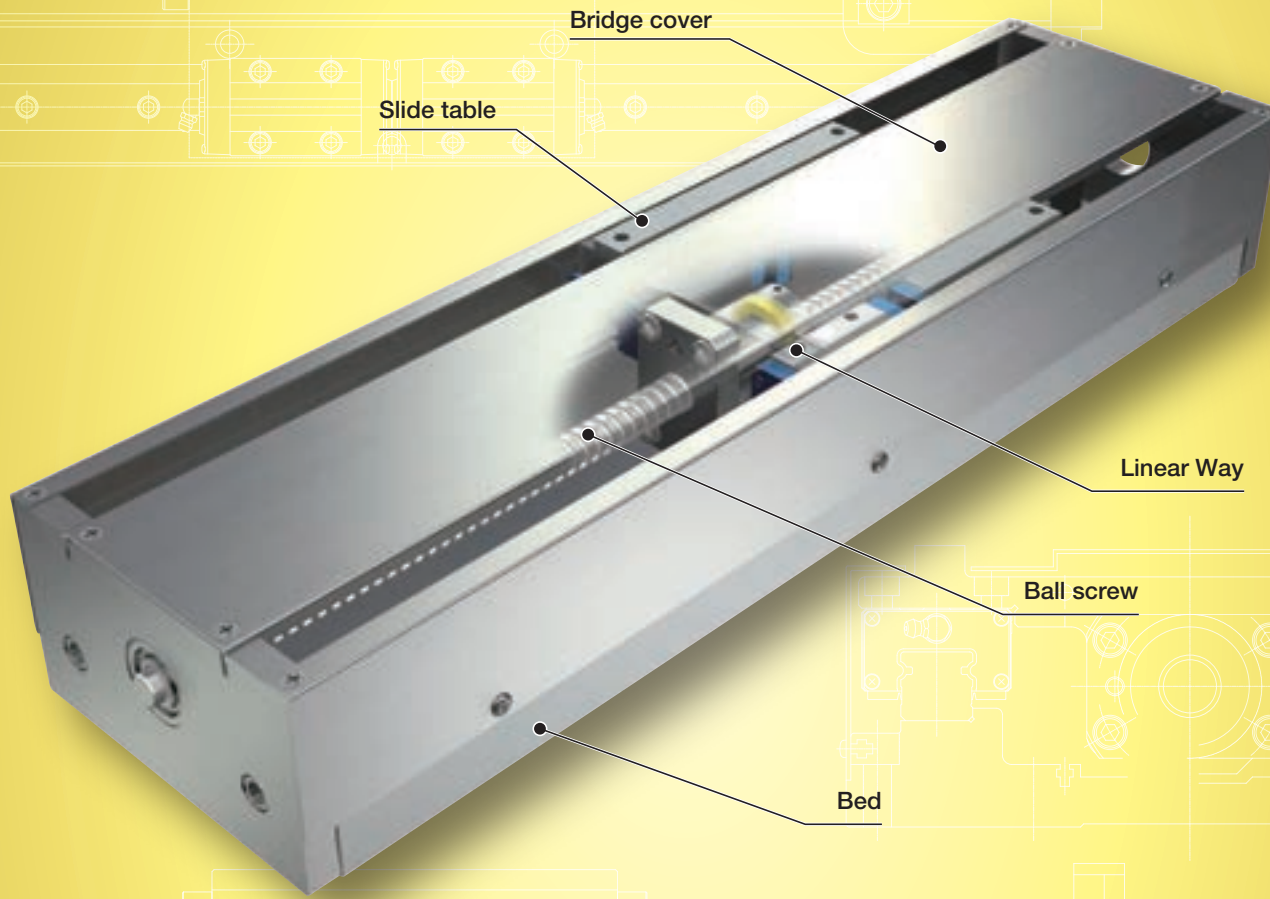


TSL...M

TSL...M

TSL...M



Major product specifications

Driving method	Precision ball screw
Linear motion rolling guide	Linear Way (ball type)
Built-in lubrication part	Lubrication part "C-Lube" is built-in
Material of table and bed	High-strength aluminum alloy
Sensor	Provided as standard

Accuracy

Positioning repeatability	±0.002
Positioning accuracy	0.015~0.060
Lost motion	-
Parallelism in table motion A	-
Parallelism in table motion B	0.020~0.070
Attitude accuracy	-
Straightness	-
Backlash	0.003

unit: mm

TSL...M

Points

● Light weight and long stroke positioning table

1 Light weight and long stroke positioning table configured with the slide table and bed made from high-strength aluminum alloy.

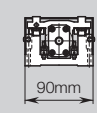
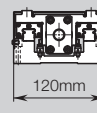
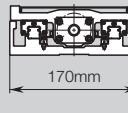
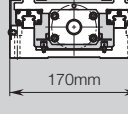
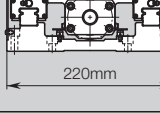
● Stable high running accuracy and positioning accuracy

2 High running accuracy and high accuracy positioning are realized by incorporating 2 sets of Linear Way in parallel, and combining with precision ball screws.

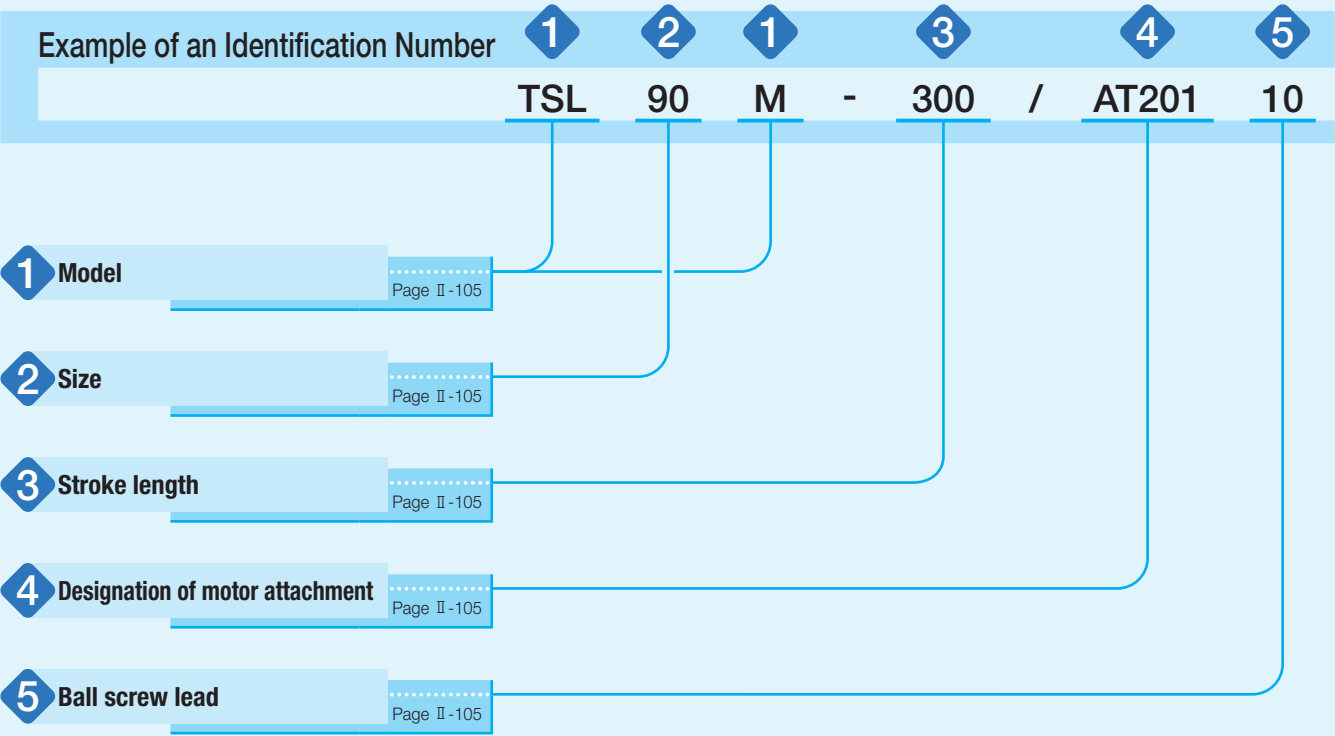
● Configuration of multiaxis system available with XY bracket

3 A series of four sizes from 90mm to 220mm (table width) is available. Multiaxis configuration can be easily realized with XY bracket.

Variation

Shape	Model and size	Table width (mm)	Stroke length (mm)										
			50	100	150	200	250	300	400	500	600	800	1 000
	TSL 90 M	90	☆	☆	☆	☆	☆	☆	-	-	-	-	-
	TSL120 M	120	-	☆	☆	☆	☆	☆	☆	☆	☆	-	-
	TSL170 M	170	-	-	☆	☆	☆	☆	☆	☆	-	-	-
	TSL170SM	170	-	-	-	-	-	☆	☆	☆	☆	☆	☆
	TSL220 M	220	-	-	-	-	-	☆	☆	☆	☆	☆	☆

Identification Number



Identification Number and Specification

1 Model	TSL...M: Precision Positioning Table L
2 Size	Size indicates table width. Select a size from the list of Table 1.
3 Stroke length	Select a stroke length from the list of Table 1.

Table 1 Sizes, table width dimensions, and stroke lengths unit: mm

Model and size	Table width	Stroke length
TSL 90 M	90	50, 100, 150, 200, 250, 300
TSL120 M	120	100, 150, 200, 250, 300, 400, 500, 600
TSL170 M	170	150, 200, 250, 300, 400, 500
TSL170S M	170	300, 400, 500, 600, 800, 1 000
TSL220 M	220	300, 400, 500, 600, 800, 1 000

4 Designation of motor attachment	As for a motor attachment, select it from the list of Table 2. · Motor should be prepared by customer. · Please specify motor attachment applicable to motor for use. · A coupling shown in Table 3 is mounted on the main body before shipment. However, the final position adjustment should be performed by customer since it is only temporarily fixed. · When specifying an AC servomotor attachment, an origin sensor is not provided.
5 Ball screw lead	5: Lead 5mm 10: Lead 10mm

Table 2 Application of motor attachment

Models of motor to be used					Flange size mm	Motor attachment			
Type	Manufacturer	Series	Model	Rated output W		TSL 90M TSL170M	TSL120M	TSL170SM	TSL220M
AC servo motor	YASKAWA ELECTRIC CORPORATION	Σ-V	SGMJV-01A	100	□40	AT201	AT201	—	—
			SGMAV-01A			AT201	AT201	—	—
			SGMJV-02A	200	□60	—	—	AT202	AT202
			SGMAV-02A			—	—	AT202	AT202
	Mitsubishi Electric Corporation	J4	HG-MR13	100	□40	AT201	AT201	—	—
			HG-KR13			AT201	AT201	—	—
			HG-MR23	200	□60	—	—	AT202	AT202
			HG-KR23			—	—	AT202	AT202
	Panasonic Corporation	MINAS A5	MSMD01	100	□38	AT203	AT203	—	—
			MSME01			AT203	AT203	—	—
			MSMD02	200	□60	—	—	AT204	AT204
			MSME02			—	—	AT204	AT204
Stepper motor	ORIENTAL MOTOR Co., Ltd.	α step	ADMA-01L	100	□40	AT201	AT201	—	—
			ADMA-02L	200	□60	—	—	AT202	AT202
			ARM66		□60	AT205	AT206	—	—
			ARM69		□60	AT205	AT206	—	—
			ARM98		□85	—	—	AT207	AT210
			ARM911		□85	—	—	AT207	AT210
		RKS CRK	CRK56 ⁽¹⁾		□60	AT208	AT209	—	—
			RKS59		□85	—	—	AT207	AT210

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 3 Coupling models

Motor attachment	Coupling models	Manufacturer	Coupling inertia J_c ×10 ⁻⁵ kg · m ²
AT201	UA-25C- 8× 8	Sakai Manufacturing Co., Ltd	0.29
AT202	UA-35C-12×14	Sakai Manufacturing Co., Ltd	1.34
AT203	UA-25C- 8× 8	Sakai Manufacturing Co., Ltd	0.29
AT204	UA-35C-11×12	Sakai Manufacturing Co., Ltd	1.34
AT205	MSTS-25C- 8×10	Nabeya Bi-tech Kaisha	0.71
AT206	MSTS-25C- 8×10	Nabeya Bi-tech Kaisha	0.71
AT207	MSTS-32C-12×14	Nabeya Bi-tech Kaisha	2.70
AT208	MSTS-20C- 8× 8	Nabeya Bi-tech Kaisha	0.25
AT209	MSTS-25C- 8× 8	Nabeya Bi-tech Kaisha	0.71
AT210	MSTS-32C-12×14	Nabeya Bi-tech Kaisha	2.70

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

Specifications

Table 4 Accuracy

Model and size	Stroke length	Positioning repeatability	Positioning accuracy	Parallelism in table motion B	Backlash
TSL 90 M	50	±0.002	0.015	0.020	0.003
	100		0.020	0.030	
	150				
	200		0.025		
	250		0.030		
TSL120 M	300	±0.002	0.030	0.040	0.003
	100		0.020	0.030	
	150		0.025		
	200			0.030	
	250		0.040	0.050	
	300		0.045		
	400		0.050	0.070	
TSL170 M	500	±0.002	0.050	0.070	0.003
	600		0.020	0.030	
	150				
	200		0.030	0.050	
	250		0.040		
	300		0.045		
TSL170SM TSL220 M	400	±0.002	0.030	0.040	0.003
	500		0.040	0.050	
	600		0.045		
	800		0.050	0.070	
	1 000		0.060		

Table 5 Maximum speed

Motor type	Model and size	Stroke length mm	Maximum speed mm/s	
			Lead 5mm	Lead 10mm
AC servo motor	TSL 90 M	—	250	500
	TSL120 M			
	TSL170 M			
	TSL170SM TSL220 M	600 or less	250	500
Stepper motor	TSL 90 M TSL120 M TSL170 M TSL170SM TSL220 M	800	249	498
		1 000	169	338
		—	150	300

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 6 Maximum carrying mass

Model and size	Ball screw lead mm	Maximum carrying mass kg	
		Horizontal	Vertical
TSL 90M	5	46	7
	10	26	4.7
TSL120M	5	195	18
	10	97	18
TSL170M	5	195	18
	10	97	17
TSL170SM	5	218	21
	10	113	20
TSL220M	5	226	19
	10	111	18

Table 7 Specification of linear motion rolling guide

Model and size	Basic dynamic load rating ⁽¹⁾ C N	Basic static load rating ⁽¹⁾ C ₀ N	Arrangement			
			L mm	ℓ mm	Y _d mm	Z _d mm
TSL 90 M	1 810	2 760	60	60	0	-7
TSL120 M			80	66	0	8
TSL170 M			106	66	0	11
TSL170SM	11 600	13 400	120	130	0	1
TSL220 M			162	95	0	11

Note ⁽¹⁾ Represent the value per slide unit.

Table 8.1 Specifications of ball screw 1

Model and size	Lead mm	Shaft dia. mm	Axial clearance mm	Basic dynamic load rating C N	Basic static load rating C_0 N
TSL 90 M	5	10	0.005	1 470	2 210
	10			1 030	1 370
TSL120 M	5	15	0.005	3 820	6 370
TSL170 M	10			3 820	6 370
TSL170SM	5	20	0.005	4 460	8 580
TSL220 M	10			4 460	8 580

Table 8.2 Specifications of ball screw 2

unit: mm

Model and size	Stroke length	Shaft dia.	Overall length
TSL 90 M	50	10	179
	100		229
	150		279
	200		329
	250		379
	300		429
TSL120 M	100	15	273
	150		323
	200		373
	250		423
	300		473
	400		573
TSL170 M	500	15	673
	600		773
	150		289
	200		339
	250		389
	300		439
TSL170SM	400	20	539
	500		639
	300		545
	400		645
	500		745
	600		845
TSL220 M	800	20	1 045
	1 000		1 245
	300		545
	400		645
	500		745
	600		845

Table 9 Table inertia and starting torque

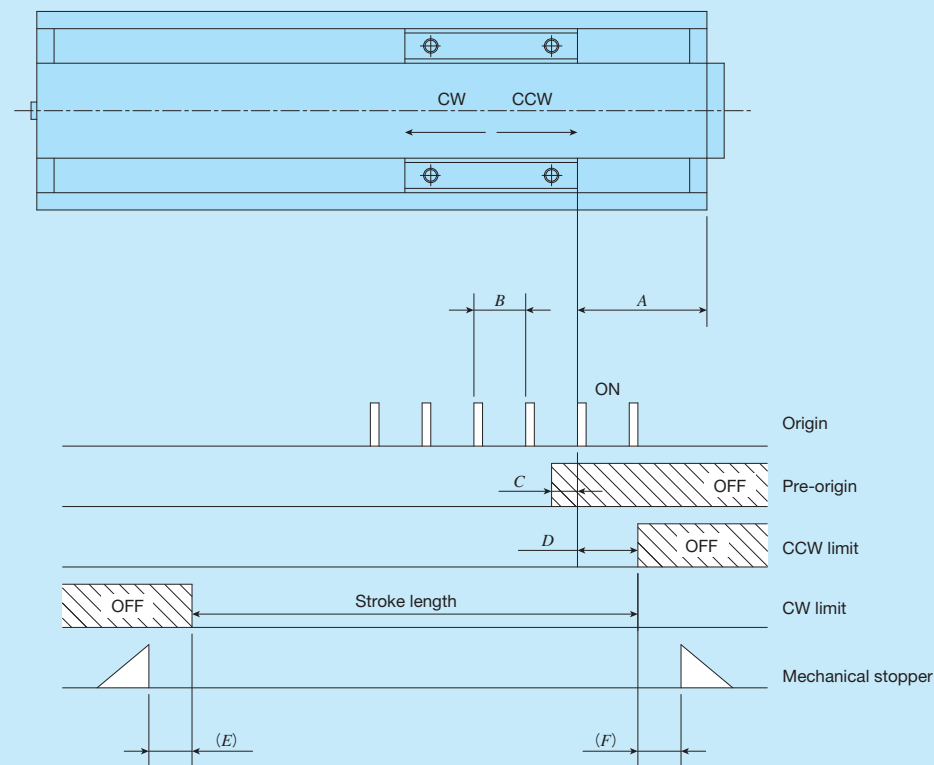
Model and size	Stroke length mm	Table inertia J_T $\times 10^{-5} \text{kg} \cdot \text{m}^2$		Starting torque T_s N · m
		Lead 5mm	Lead 10mm	
TSL 90 M	50	0.20	0.33	0.05
	100	0.25	0.38	
	150	0.28	0.40	
	200	0.33	0.45	
	250	0.35	0.48	
	300	0.40	0.53	
TSL120 M	100	1.3	1.7	0.06
	150	1.5	1.9	
	200	1.7	2.1	
	250	1.9	2.3	
	300	2.1	2.5	
	400	2.4	2.9	
TSL170 M	500	2.8	3.3	0.06
	600	3.2	3.7	
	150	1.4	1.8	
	200	1.6	2.0	
	250	1.8	2.2	
	300	2.0	2.4	
TSL170S M	400	2.3	2.8	0.10
	500	2.7	3.2	
	300	6.9	7.4	
	400	8.1	8.6	
	500	9.3	9.8	
	600	11	11	
TSL220 M	800	13	14	0.10
	1 000	15	16	
	300	7.5	8.5	
	400	8.7	9.7	
	500	9.9	11	
	600	11	12	

Mounting

For the processing accuracy of the Precision Positioning Table mounting surface and the tightening torque of the fixing screws, see page III-29.

Sensor Specification

Table 10 Sensor timing chart



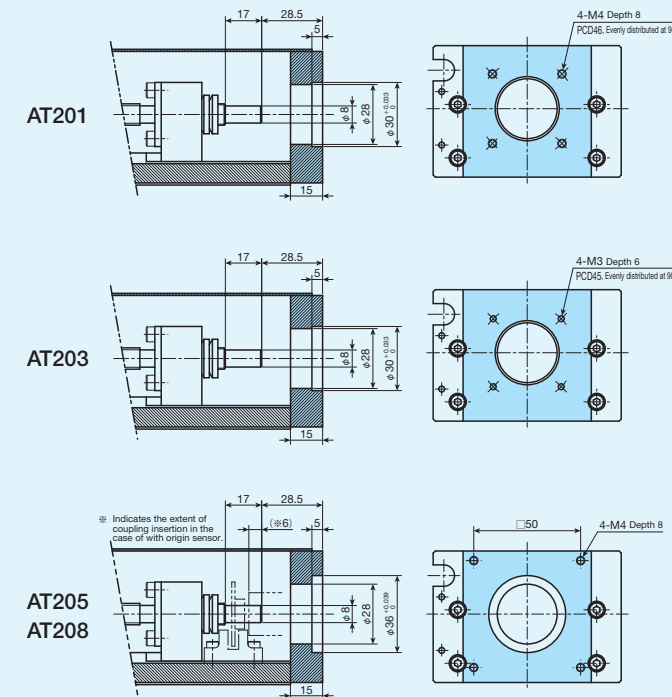
unit: mm

Model and size	Ball screw lead	A	B	C	D	E	F
TSL 90 M	5	50	5	3	20	5	5
	10		10	7			
TSL120 M	5	60	5	3	20	15	15
	10		10	7			
TSL170 M	5	45	5	3	20	3	3
	10		10	7			
TSL170SM	5	60	5	3	20	5	5
	10		10	7			
TSL220 M	5	60	5	3	20	5	5
	10		10	7			

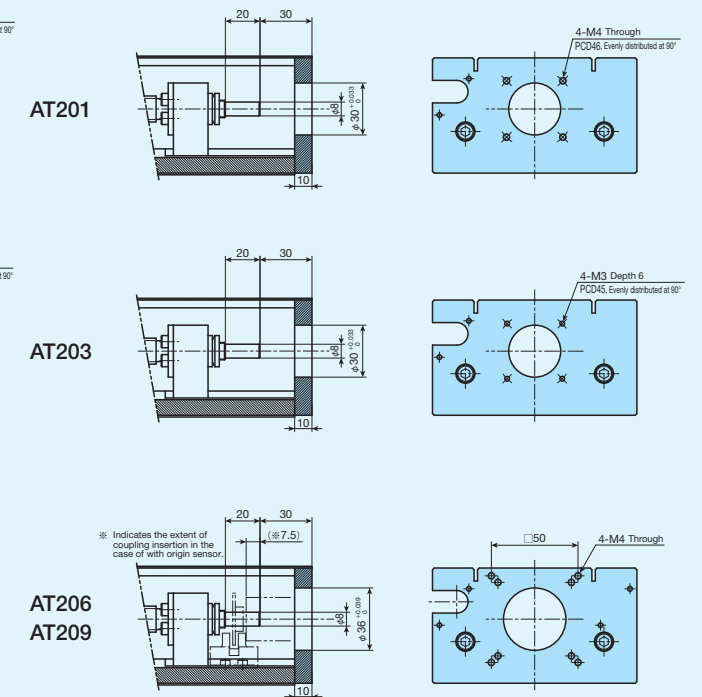
Remark: For detailed specifications of respective sensors, please see the section of sensor specification in General Explanation.

Dimensions of Motor Attachment

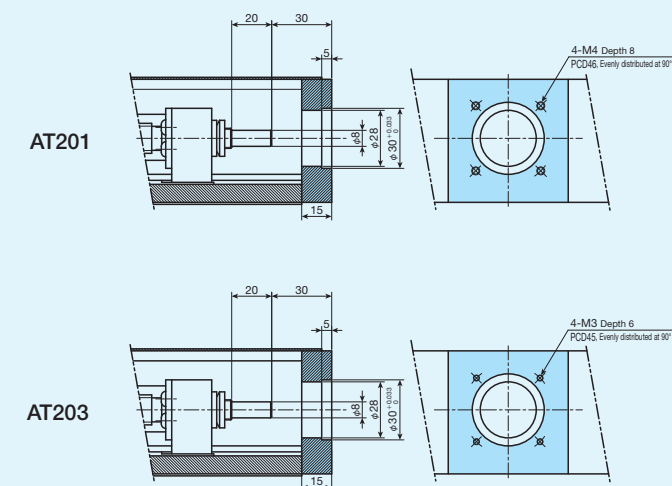
TSL90M



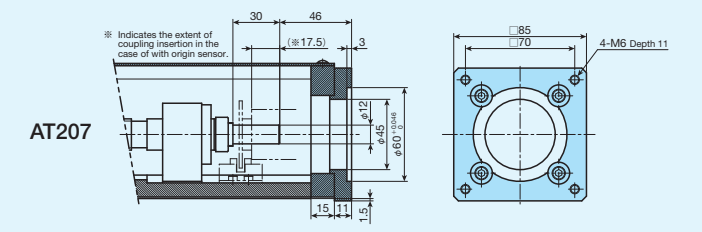
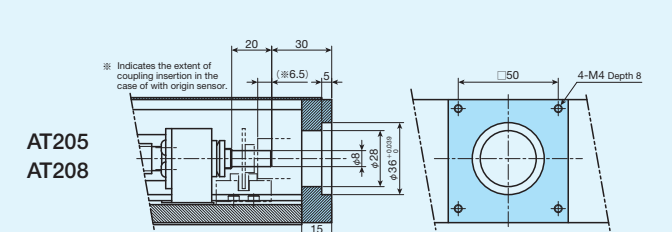
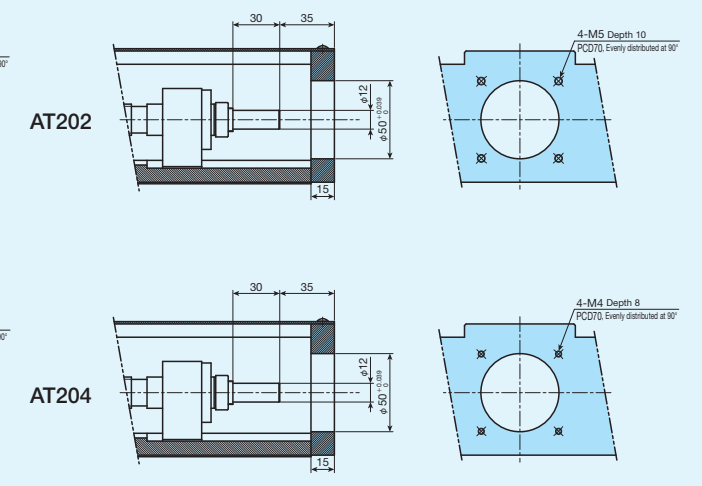
TSL120M



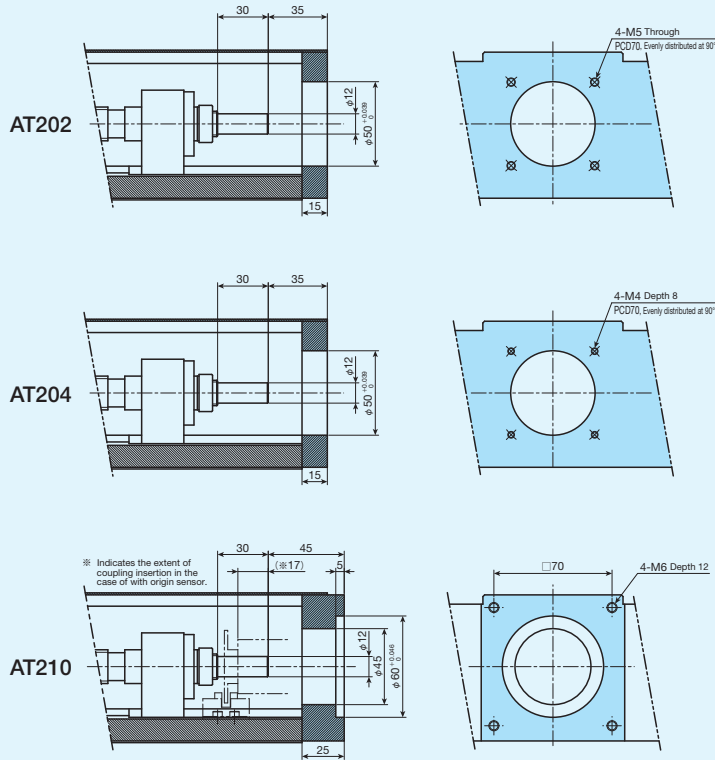
TSL170M



TSL170SM

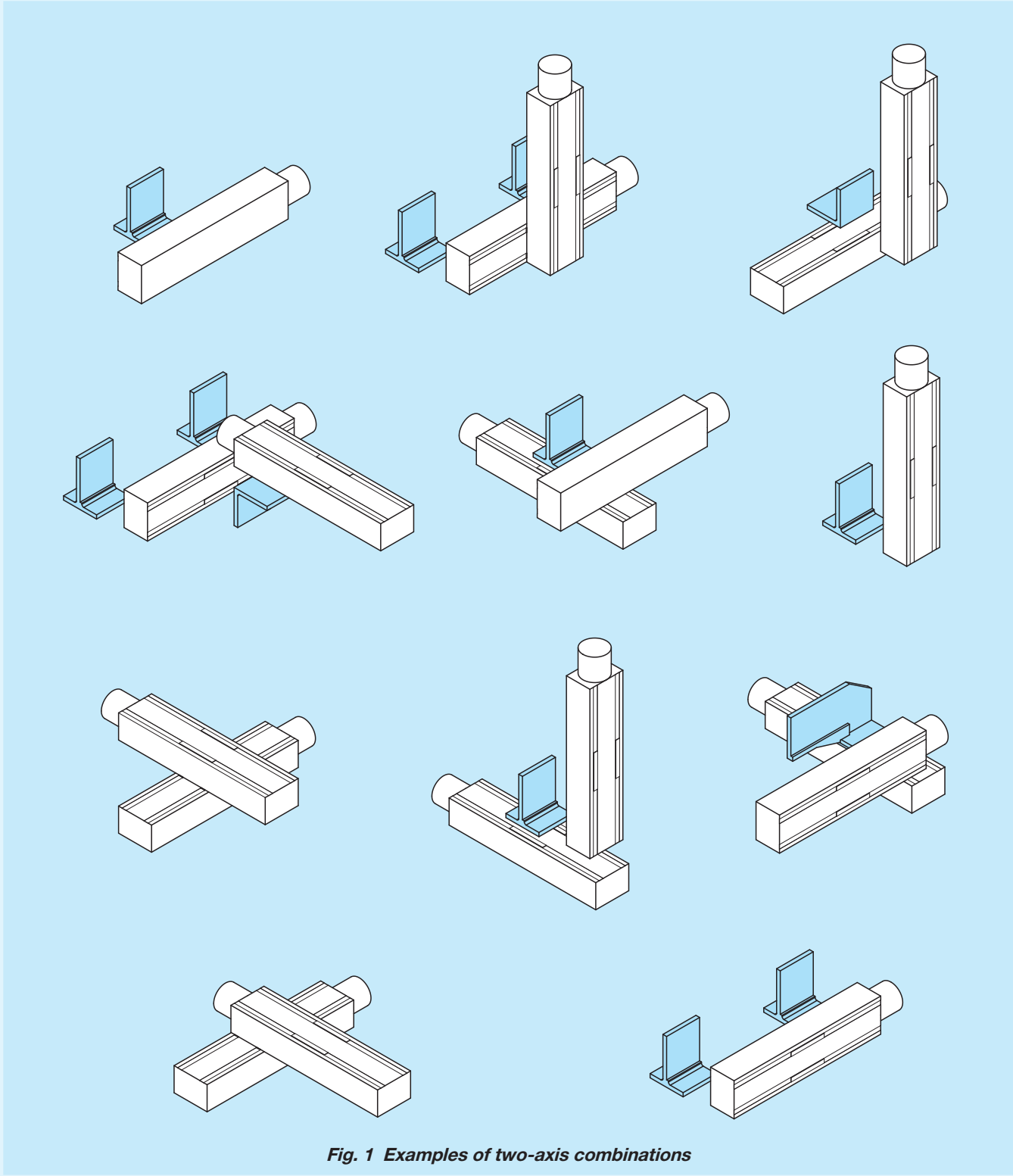


TSL220M

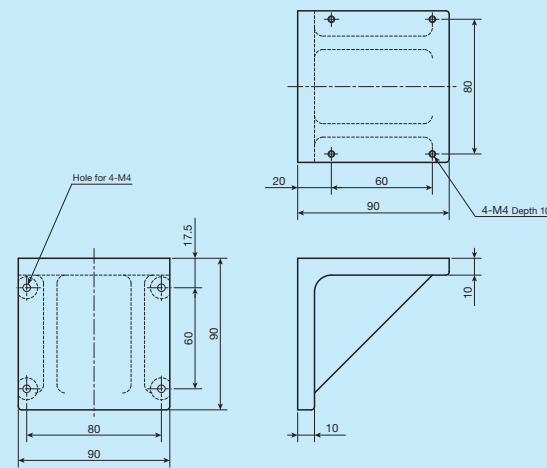


XY Bracket

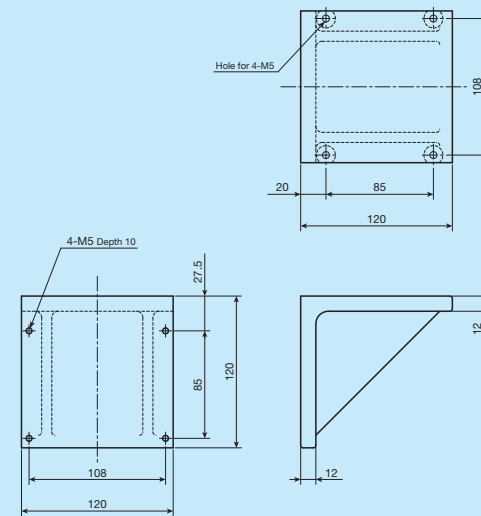
Precision Positioning Table L can configure various combinations of two-axis using XY bracket (aluminum alloy) shown in Fig. 2. If you are interested, please specify the identification number of your desired model from the figure.



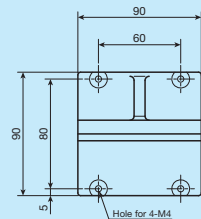
●TSL90-AGL



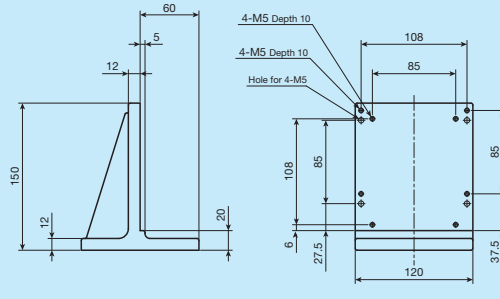
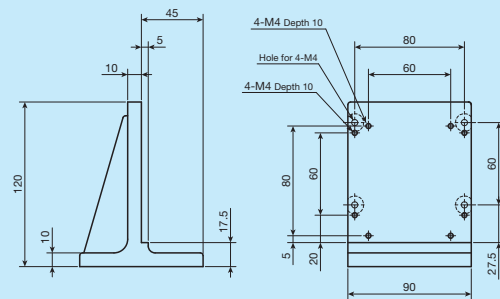
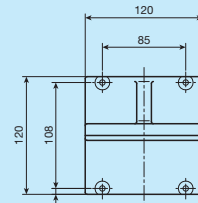
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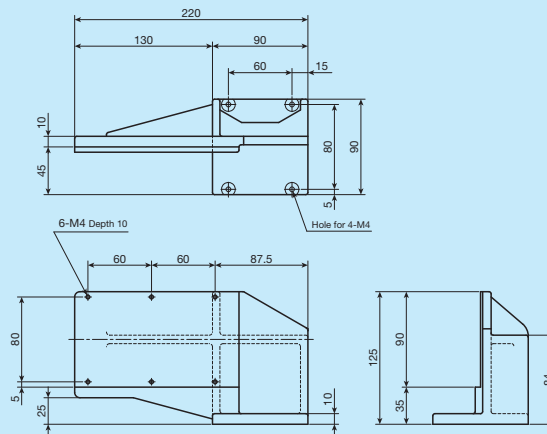
●TSL90-AGI



●TSL120-AGI



●TSL90-AGT



●TSL120-AGT

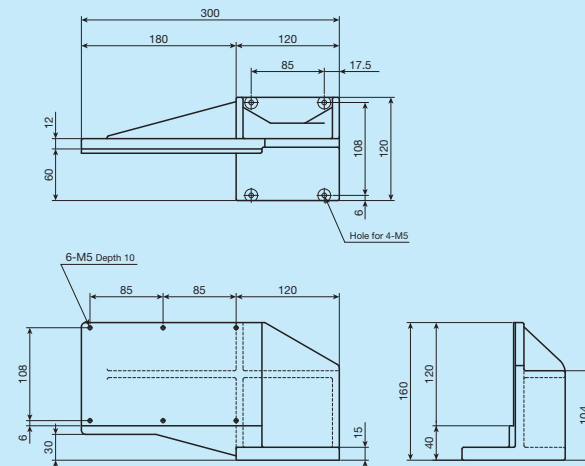
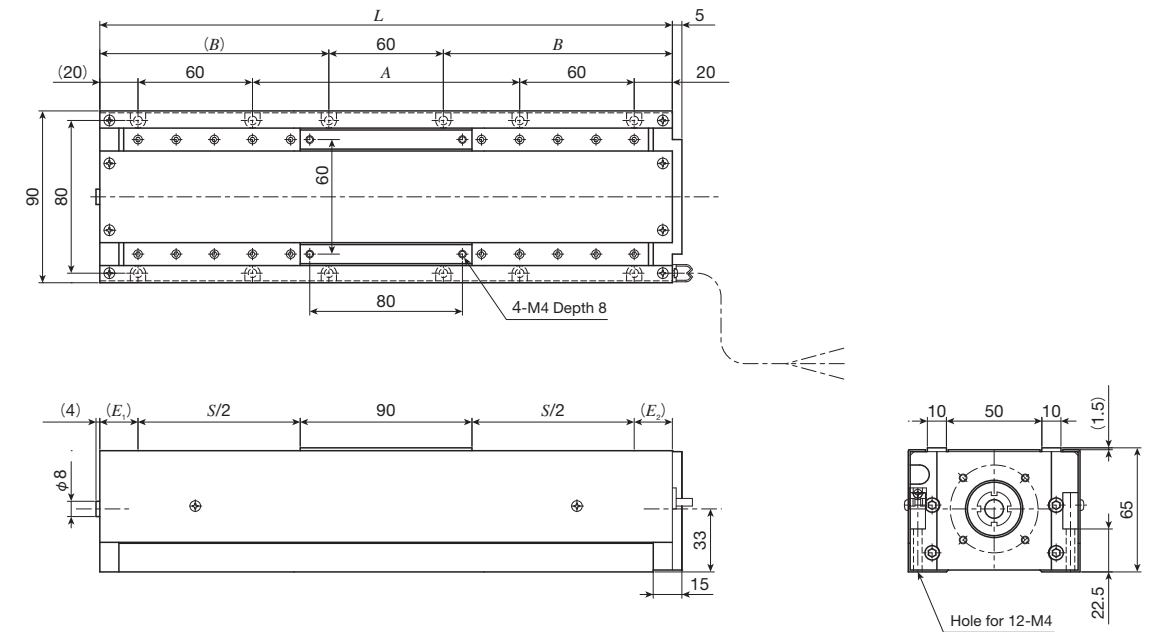


Fig. 2 XY bracket

IKO Precision Positioning Table L

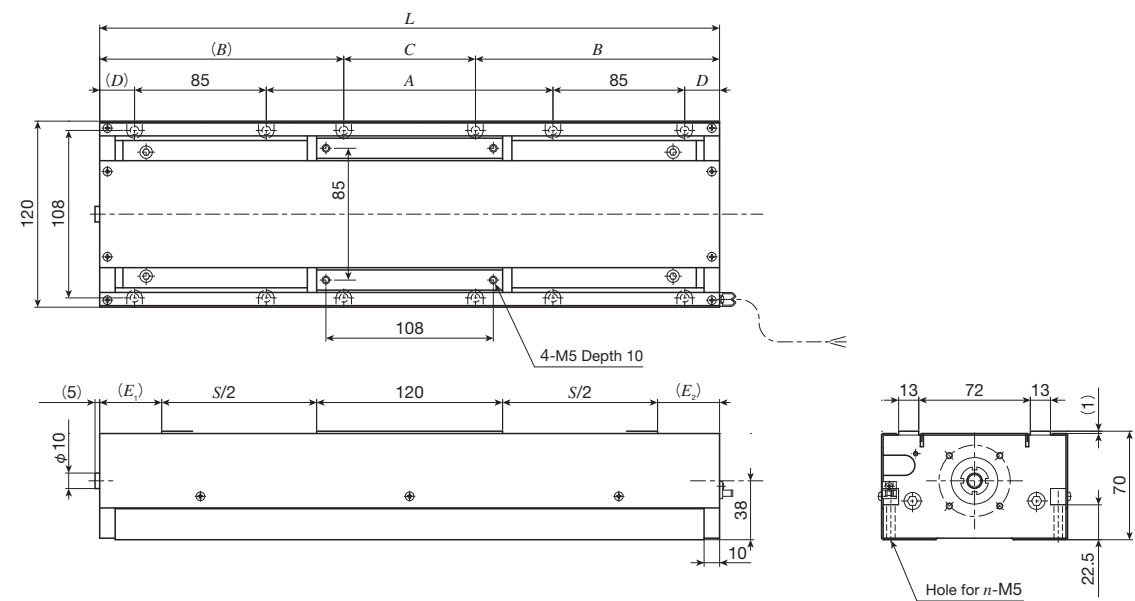
TSL90M



unit: mm

Identification number	Stroke length			Dimensions of table			Mass (Ref.) kg
	S	E_1	E_2	Overall length L	Mounting holes of bed A B		
TSL90M- 50	50	30	30	200	40	70	2.8
TSL90M-100	100			250	90	95	3.2
TSL90M-150	150			300	140	120	3.5
TSL90M-200	200			350	190	145	3.9
TSL90M-250	250			400	240	170	4.2
TSL90M-300	300			450	290	195	4.6

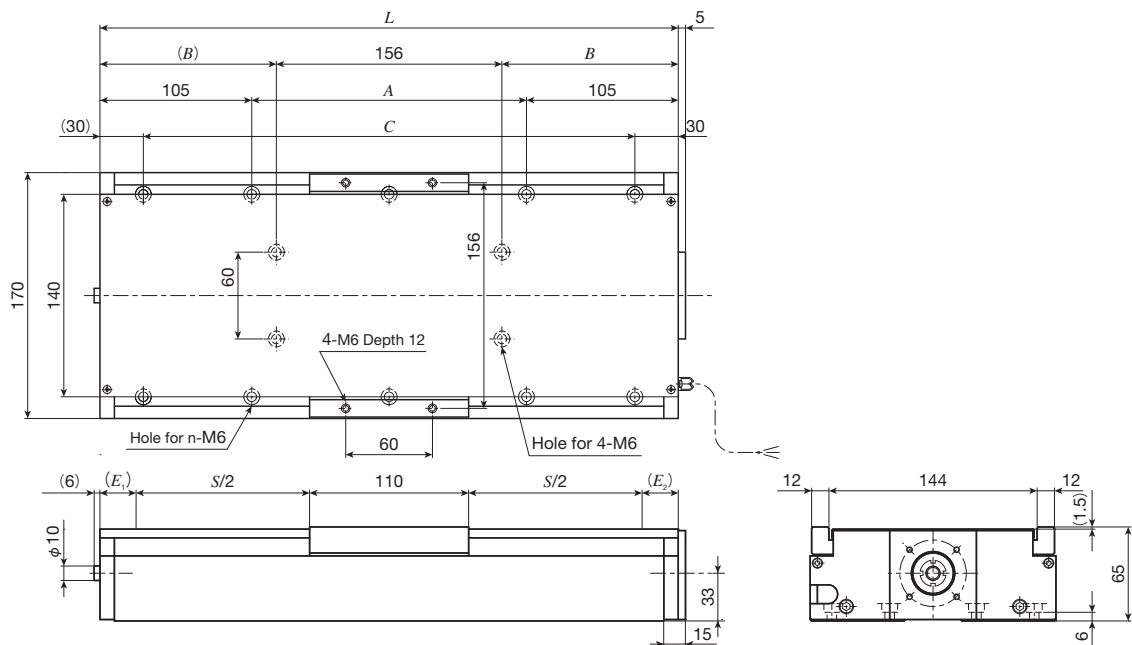
TSL120M



unit: mm

Identification number	Stroke length			Dimensions of table						Mass (Ref.) kg
	S	E ₁	E ₂	Overall length L	A	B	C	D	n	
TSL120M-100	100	40	40	300	85	107.5	85	22.5	8	6.1
TSL120M-150	150			350	135	132.5	85	22.5	12	6.6
TSL120M-200	200			400	185	157.5	85	22.5	12	7.1
TSL120M-250	250			450	235	182.5	85	22.5	12	7.6
TSL120M-300	300			500	255	207.5	85	37.5	12	8.1
TSL120M-400	400			600	355	207.5	185	37.5	12	9.1
TSL120M-500	500			700	455	207.5	285	37.5	12	10.1
TSL120M-600	600			800	555	207.5	385	37.5	12	11.1

TSL170M

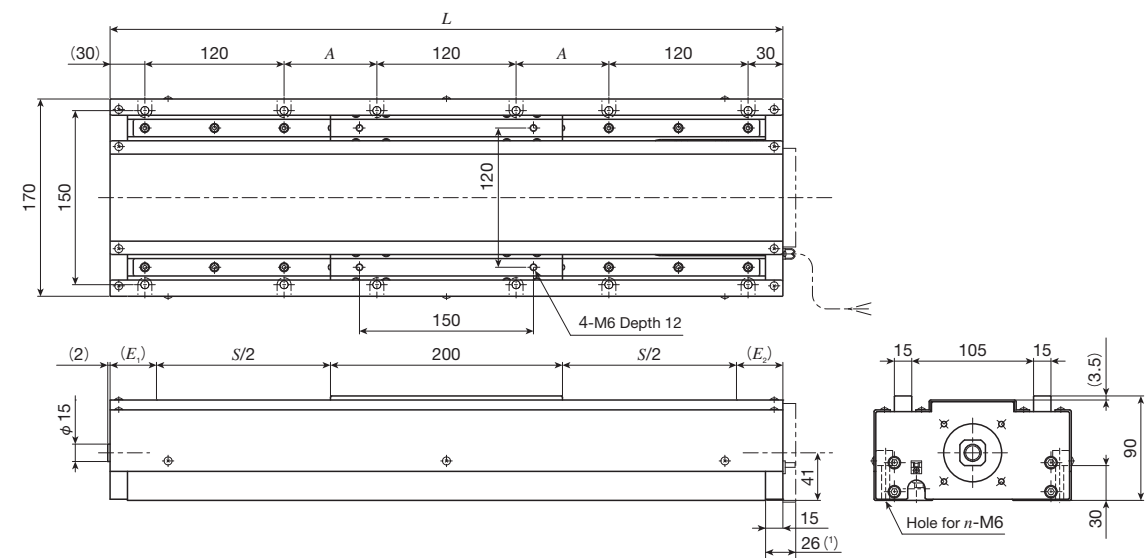


unit: mm

Identification number	Stroke length			Dimensions of table					Mass (Ref.) kg
	S	E ₁	E ₂	Overall length L	A	B	C (the number of holes×pitch)	n	
TSL170M-150	150	25	25	310	100	77	250	8	7.2
TSL170M-200	200			360	150	102	300	8	7.8
TSL170M-250	250			410	200	127	350 (2×175)	10	8.4
TSL170M-300	300			460	250	152	400 (2×200)	10	9.1
TSL170M-400	400			560	350	202	500 (2×250)	10	10.4
TSL170M-500	500			660	450	252	600 (2×300)	10	11.6

IK Precision Positioning Table L

TSL170SM

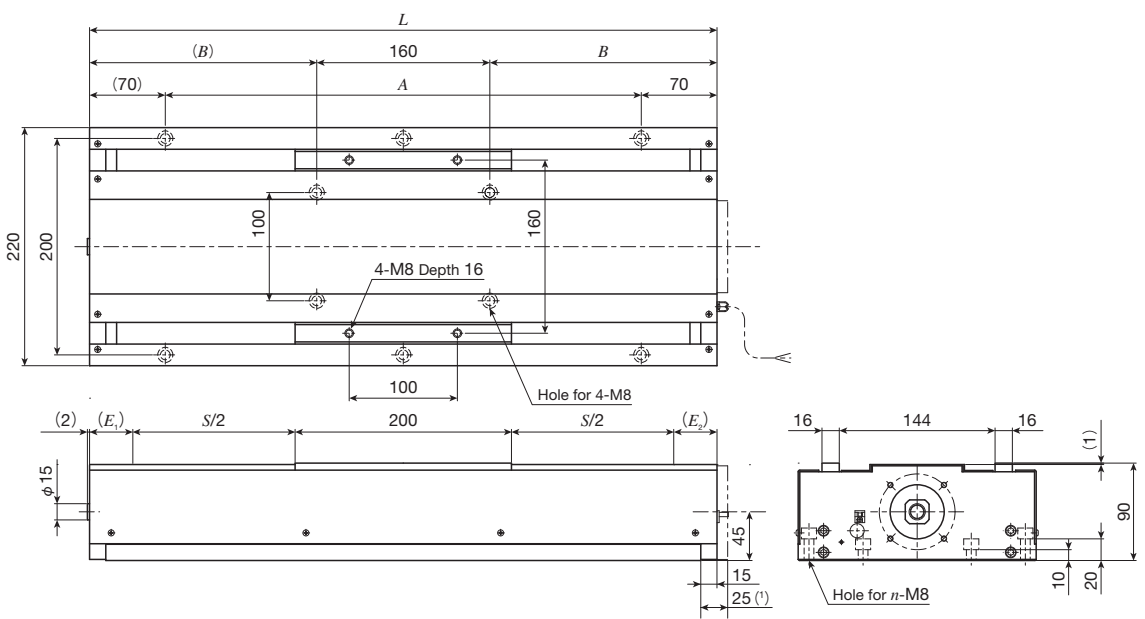


unit: mm

Identification number	Stroke length			Dimensions of table			Mass (Ref.) kg
	S	E_1	E_2	Overall length L	Mounting holes of bed		
					A (the number of holes×pitch)	n	
TSL170SM- 300	300	40	40	580	80	12	14.8
TSL170SM- 400	400			680	130	12	16.6
TSL170SM- 500	500			780	180	12	18.5
TSL170SM- 600	600			880	230	12	20.3
TSL170SM- 800	800			1 080	330 (2×165)	16	24.0
TSL170SM-1000	1 000			1 280	430 (2×215)	16	27.7

Note (1) Applicable to AT207.

TSL220M



unit: mm

Identification number	Stroke length			Dimensions of table				Mass (Ref.) kg
	S	E ₁	E ₂	Overall length L	Mounting holes of bed			
					A (the number of holes×pitch)	B	n	
TSL220M- 300	300	40	40	580	440 (2×220)	210	6	20.1
TSL220M- 400	400			680	540 (2×270)	260	6	22.5
TSL220M- 500	500			780	640 (2×320)	310	6	24.7
TSL220M- 600	600			880	740 (4×185)	360	10	27.0
TSL220M- 800	800			1 080	940 (4×235)	460	10	31.5
TSL220M-1000	1 000			1 280	1 140 (4×285)	560	10	36.2

Note (1) Applicable to AT210.