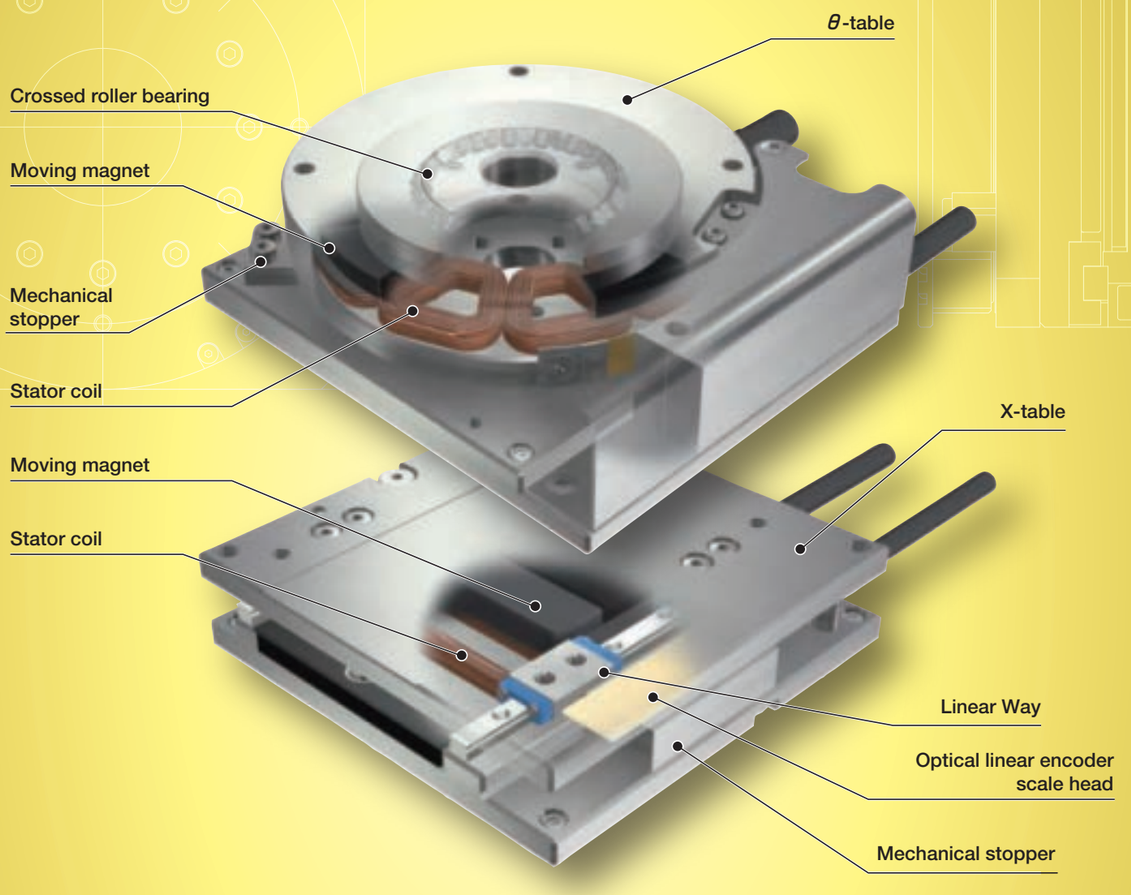
SA···DE

SA···DE

Linear motor drive

Linear Alignment

IKO C-Lube Maintenance-free



Major product specifications

Driving method	Linear motor
Linear motion rolling guide and bearing	XY-axis: Linear Way (ball type) θ-axis: Crossed Roller Bearing
Lubrication	Lubrication part "C-Lube" is built-in (θ-axis is not included.)
Material of table and bed	High carbon steel
Sensor	Provided as standard

Accuracy

unit: mm

Positioning repeatability	XY-axis: ±0.0005 θ-axis: ±0.5 ～ 1.5 sec
Positioning accuracy	–
Lost motion	–
Parallelism in table motion A	–
Parallelism in table motion B	–
Attitude accuracy	–
Straightness	–
Backlash	–

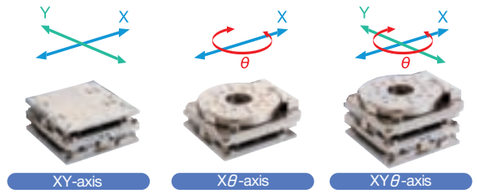
Points

● Compact XYθ-table

1 Using a Linear Way L miniature linear motion rolling guide in the linear motion guiding parts and Crossed Roller Bearing in the rotation guiding parts respectively and adopting direct drive method in the drive section, this is an alignment stage for achieving low profile and compact XYθ motion.

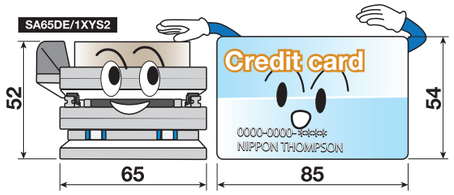
● Flexible combination of XYθ

2 X-table for linear movement and θ-table serving as rotary positioning section are listed on lineup as basic configuration. Combination of X-axis and θ-axis and alignment table for XY-axis can be easily configured.



● Thin and compact

3 Coreless linear motor, Linear Way L and Crossed Roller Bearing are adopted. As compared with ball screw-driven stage, extremely low profile is achieved.



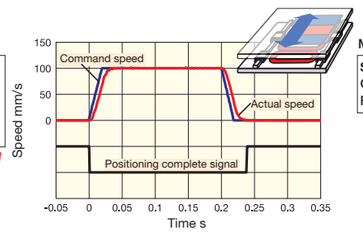
● High resolution and high responsiveness

4 Performing full-closed loop control of direct drive-type stage with high resolution linear encoder built-in has achieved high resolution and high accuracy.

Driving conditions

SA120DE/1X2
Speed : 100mm/s
Acceleration / deceleration time : 20ms
Stroke : 10mm
Carrying mass : 250g

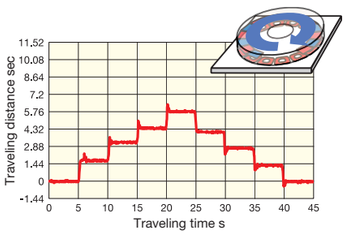
Enables high-speed positioning against command!



Measuring condition

SA120DE/1S2
Carrying mass : 1000g
Feeding command : 1.44 sec

Securely makes a step for minute feeding!!

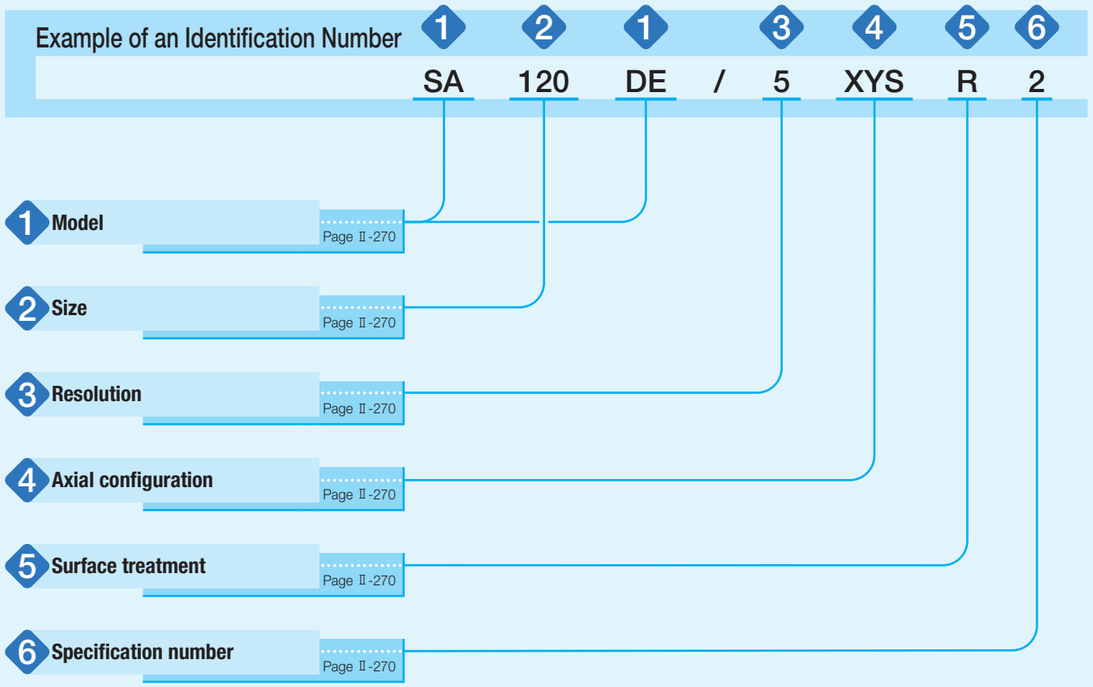


Alignment Stage SA specification list

Model and size		SA65DE/X		SA120DE/X		SA65DE/S	SA120DE/S	SA200DE/S
Sectional shape		65, 15		120, 25		65, 22	120, 25	200, 30
Maximum thrust	N	25		70		Max. torque 0.5N·m	Max. torque 2.0N·m	Max. torque 4.0N·m
Rated thrust	N	3.5		15		Rated torque 0.06N·m	Rated torque 0.4N·m	Rated torque 1.2N·m
Maximum load mass	kg	2.4		5.9		2.2	6.8	12.3
Effective stroke length	mm	10		20		Effective operating angle 50degree	Effective operating angle 60degree	Effective operating angle 280degree
Resolution	μm	0.1	0.5	0.1	0.5	0.64sec 5625pulse/deg	0.36sec 10000pulse/deg	0.25sec 14400pulse/deg
Maximum speed	mm/s	270	500	400	800	720deg/sec	400deg/sec	270deg/sec
Positioning repeatability	μm	±0.5		±0.5		±1.3sec	±0.8sec	±0.5sec

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Identification Number



Identification Number and Specification

1 Model

SA···DE: Alignment Stage SA

2 Size

65: □ 65, ϕ 65
120: □120, ϕ120
200: ϕ200

3 Resolution

1: 0.1μm
5: 0.5μm
Specify the resolution of the encoder for X-axis or XY-axis.
When selecting only S: θ-axis in the entry of section 4, set "No symbol" for the resolution.

4 Axial configuration

Select an axial configuration from the list of Table 1.

Table 1 Axial configuration and application

Axial configuration	SA65DE	SA120DE	SA200DE
X : Only X-axis	○	○	–
S : Only θ-axis	○	○	○
XY : XY -based two-axis configuration	○	○	–
XS : Xθ -based two-axis configuration	○	○	
XYS: X, Y, and θ-based three-axis configuration	○	○	

5 Surface treatment

No symbol: Electroless nickel plating
R : Black chrome surface treatment
Surface treatment is performed on the surfaces of table and bed.

6 Specification number

2: Specification number 2

The specification number is limited to 2.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Specifications

Table 2.1 Specification / Performance

Item \ Identification number		SA65DE/1X	SA65DE/5X	SA120DE/1X	SA120DE/5X
Maximum thrust (1)	N	25		70	
Rated thrust (2)	N	3.5		15	
Effective stroke length	mm	10		20	
Maximum load mass	kg	2.4		5.9	
Resolution	μm	0.1	0.5	0.1	0.5
Maximum speed (3)	mm/s	270	500	400	800
Positioning repeatability (4)	μm	±0.5			
Mass of moving table	kg	0.17		1.2	
Total mass (5)	kg	0.35		2.5	
Ambient temperature and humidity in operation		0～40℃ · 20～80%RH (keep dewdrop free)			

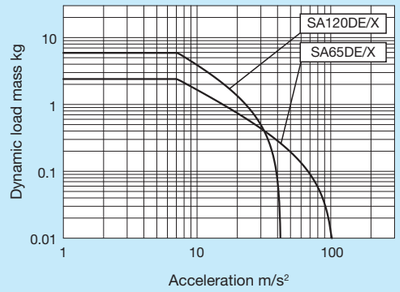
Notes (1) The duration of maximum thrust is up to 1 second.
(2) This is based on the case of mounting on a metal mating member material at an ambient temperature of 20℃.
(3) For the case of exceeding the displayed speed, please contact IKO.
(4) When the temperature of the product is constant.
(5) Mass of the cord is not included.

Table 2.2 Specification / Performance

Item \ Identification number		SA65DE/S	SA120DE/S	SA200DE/S
Maximum torque (1)	N·m	0.5	2.0	4.0
Rated torque (2)	N·m	0.06	0.4	1.2
Maximum load mass	kg	2.2	6.8	12.3
Effective operating angle	degree	50	60	280
Resolution	sec	0.64	0.36	0.25
	pulse/degree	5 625	10 000	14 400
Maximum speed (3)	degree/sec	720	400	270
Positioning repeatability (4)	sec	±1.3	±0.8	±0.5
Inertia moment of moving table	kg·m²	0.00012	0.002	0.013
Total mass (5)	kg	0.5	2	6
Ambient temperature and humidity in operation		0～40℃ · 20～80%RH (keep dewdrop free)		

Notes (1) The duration of maximum torque is up to 1 second.
(2) This is based on the case of mounting on a metal mating member material at an ambient temperature of 20℃.
(3) For the case of exceeding the displayed speed, please contact IKO.
(4) When the temperature of the product is constant.
(5) Mass of the cord is not included.

〈X(Y)-axis〉



〈θ-axis〉

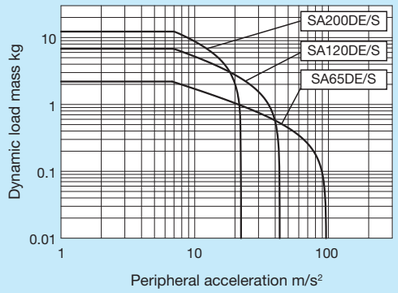
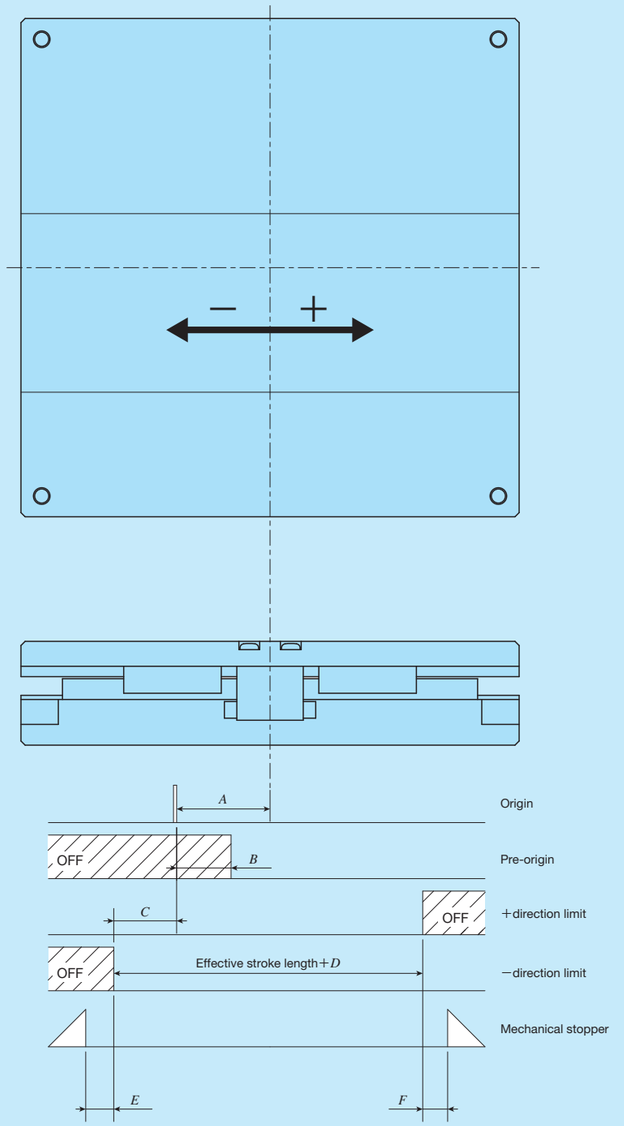


Fig. 1 Dynamic load mass

Remark: Dynamic load mass of θ-axis is a value calculated as cube of steel. And, the acceleration is converted as value of stage periphery.

Sensor Specification

Table 3.1 Sensor timing chart for SA···DE/X (X-axis)



unit: mm

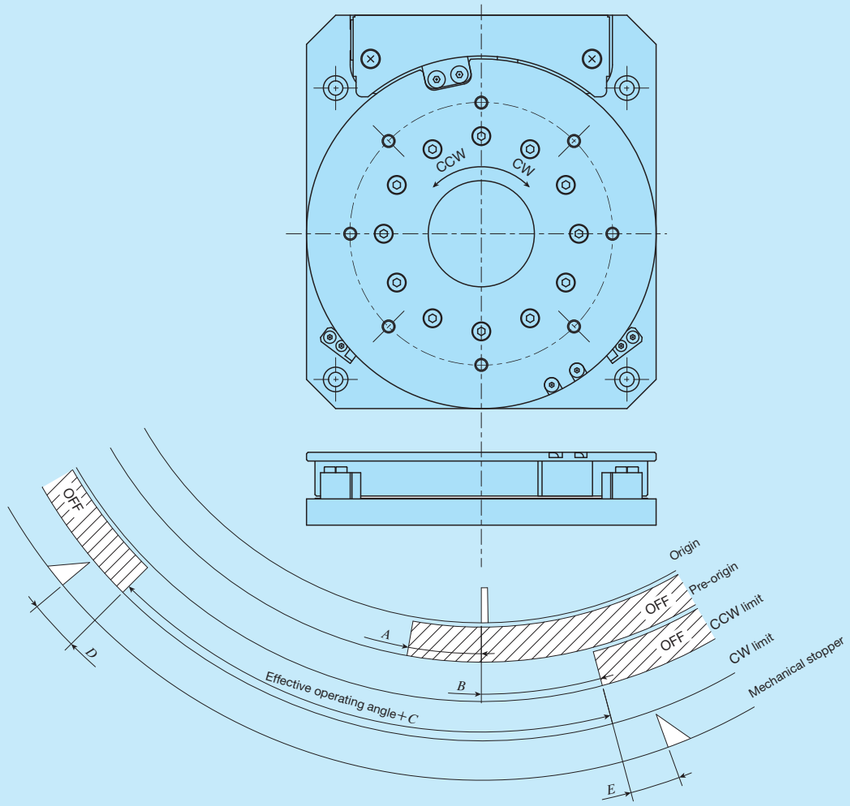
Model and size	A	B	C	D	E	F
SA65DE/X	5	2.5	1.5	3	1.5	1.5
SA120DE/X	0	3	12	4	2	2

Remarks 1. Respective values are for reference and are not guaranteed values. For detailed dimensions, please contact IKO.
2. For the specifications of respective sensors, please see the section of sensor specification in General Explanation.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Sensor Specification

Table 3.2 Sensor timing chart for SA···DE/S (θ-axis)



unit: degree

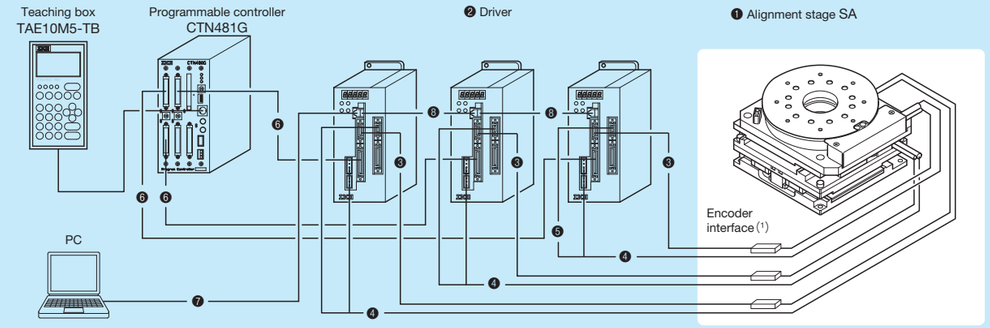
Model and size	*A*	*B*	*C*	*D*	*E*
SA65DE/S	4	11	10	5	5
SA120DE/S	3	3	6	3	3
SA200DE/S	2	4	0	4	4

Remarks 1. Respective values are for reference and are not guaranteed values. For detailed dimensions, please contact IKO.
2. For the specifications of respective sensors, please see the section of sensor specification in General Explanation.

System Configuration

There are dedicated driver for alignment stage SA, and the system configuration is shown in Table 4. For the driver specification, please see the section of driver specification on Page Ⅱ-275. When you place an order, please specify desired identification numbers from the list of Table 4.

Table 4 System configuration



❶Model and size	❷Driver	❸Encoder cord	❹Motor extension cord	❺Limit relay cord	❻Pulse cord and limit cord	❼RS232C cord
SA 65DE/X	TDL1-1600/06L	TAE20Q4-EC	—	—	TAE10R6-LD	TAE2089-RSP (Dsub25-pin) TAE2090-RSD (Dsub 9-pin)
SA 65DE/S	TDL1-1600/06S	TAE2088-EC	—	—	TAE10R6-LD	
SA 65DE/XY	TDL1-1600/06L×2	TAE20Q4-EC×2	—	—	TAE10R6-LD×2	
SA 65DE/XS	TDL1-1600/06L + TDL1-1600/06S	TAE20Q4-EC + TAE2088-EC	—	—	TAE10R6-LD×2	TAE2089-RSP (Dsub25-pin) TAE2090-RSD (Dsub 9-pin) ×2
SA 65DE/XYS	TDL1-1600/06L×2 + TDL1-1600/06S	TAE20Q4-EC×2 + TAE2088-EC	—	—	TAE10R6-LD×3	TAE2089-RSP (Dsub25-pin) TAE2090-RSD (Dsub 9-pin) ×3
SA120DE/X	TDL1-1600/12L	TAE2088-EC	—	—	TAE10R6-LD	TAE2089-RSP (Dsub25-pin) TAE2090-RSD (Dsub 9-pin)
SA120DE/S	TDL1-1600/12S	TAE2088-EC	—	—	TAE10R6-LD	
SA120DE/XY	TDL1-1600/12L×2	TAE2088-EC×2	—	—	TAE10R6-LD×2	
SA120DE/XS	TDL1-1600/12L + TDL1-1600/12S	TAE2088-EC×2	—	—	TAE10R6-LD×2	TAE2089-RSP (Dsub25-pin) TAE2090-RSD (Dsub 9-pin) ×2
SA120DE/XYS	TDL1-1600/12L×2 + TDL1-1600/12S	TAE2088-EC×3	—	—	TAE10R6-LD×3	TAE2089-RSP (Dsub25-pin) TAE2090-RSD (Dsub 9-pin) ×3
SA200DE/S	TDL1-1600/20S	TAE2088-EC	TAE20K5-MC03	TAE10V7-LC03	TAE10R6-LD	TAE2089-RSP (Dsub25-pin) TAE2090-RSD (Dsub 9-pin)

Note (1) XY-axis of SA65DE is not provided with an encoder interface.
Remarks 1. The lengths of encoder cord, motor extension cord, and limit relay cord are 3m.
2. The lengths of pulse cord and limit cord are 1.5m.
3. The length of RS232C cord is 2m.
4. For details on inter axial cable ❽ placed between drivers when using SA···DE in plural axes, please contact IKO.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Driver Specification

- This device can be controlled by PC using RS232C interface.
- Adding optional mail box (automatic execution program area) enables automatic operation of only driver without placing a load on the host side such as PC. If needed, please contact IKO.
- This device can be connected to external devices through sequence I/O, thus allowing you to configure the system with IKO programmable controller CTN480G used.

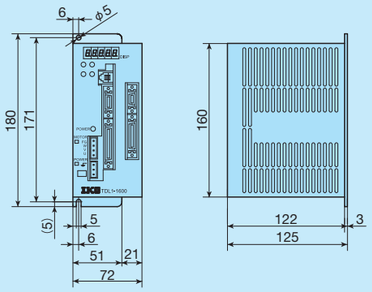


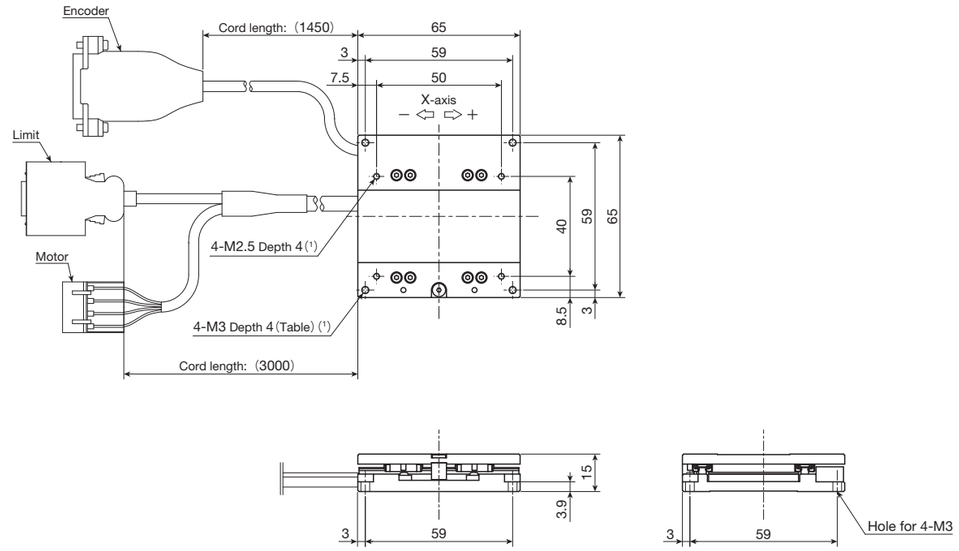
Table 5 Driver specification

Item \ Model number	TDL1-1600 (1)
Main power supply	AC85～110V 50/60Hz
Continuous rated current	0.7A
Max. momentary current	4A
Output limitation	Current feedback, overheat (motor, driver), thrust force control, servo off, forward direction movement disabled, backward direction movement disabled
PWM carrier frequency	40kHz
Ambient temperature	0～40℃
Radiation fin temperature	70℃ max (overheat cutting type)
Command input	Forward direction / backward direction pulse, position command pulse / direction command or A / B phase 10MHz max (A / B phase is at 2.5MHz)
Encoder input format	Two phase incremental encoder Line driver
Response speed	1.5m/s max (at resolution of 0.5μm), 1.0m/s max (at resolution of 0.1μm)
Sequence input	Servo on, forward direction movement disabled, backward direction movement disabled, gain LOW, reset, operation
Origin signal output	Origin position, pre-origin position
Sequence output	Servo ready, positioning complete, alarm
Parameter key	4 keys (digit selection, increment, data / parameter, write)
Data display	LED 7-segment 5 digits, output current / Parameter / Error code, etc.
Parameter item (non-volatile memory)	Resolution, mode, electronic gear, gain, positioning complete, electric origin, acceleration filter, etc.
Analog monitor	2 channels (present speed, output current)
Vibration, shock	Vibration 0.5G, Shock 5G 1time
Mass (Ref.)	1.2kg

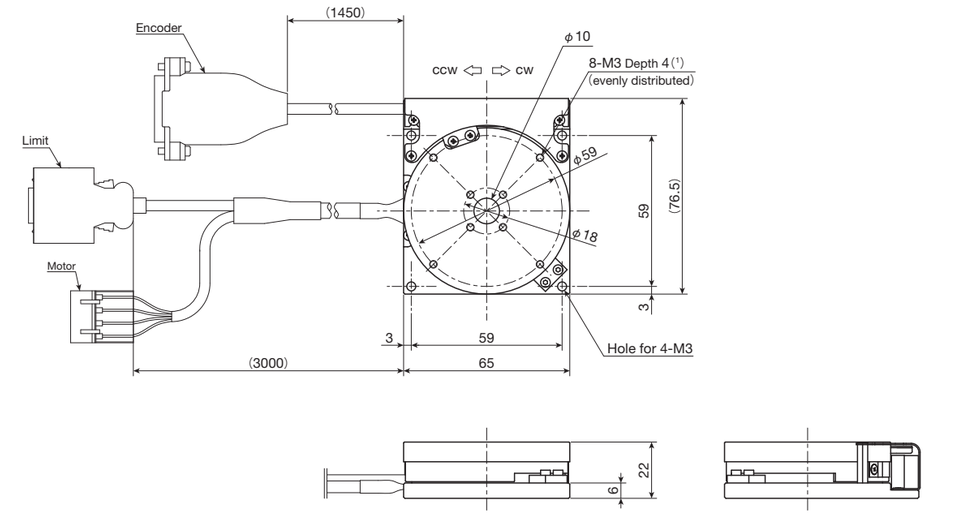
Note (1) Small type TDL1-1601 is also available. For detailed information, please contact IKO.

IKO Alignment Stage SA

SA65DE/X



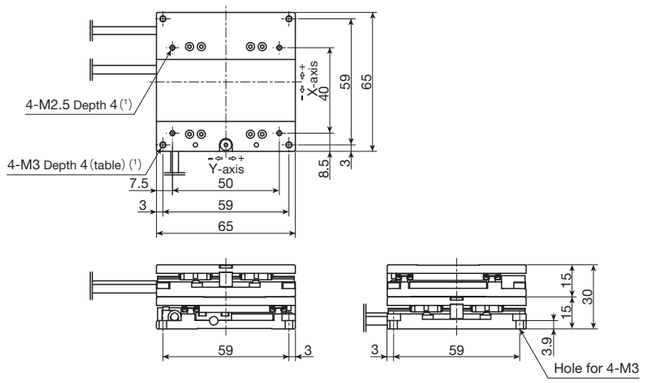
SA65DE/S



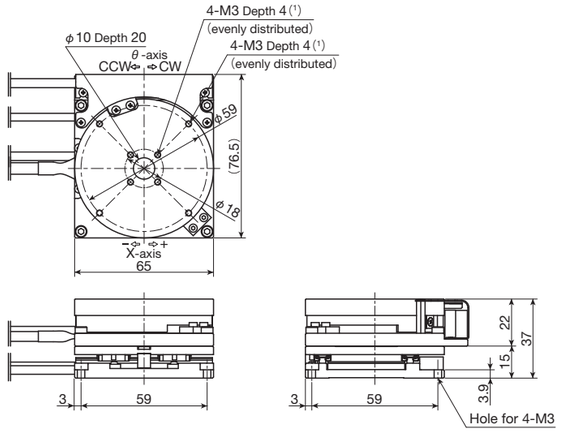
Note (1) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

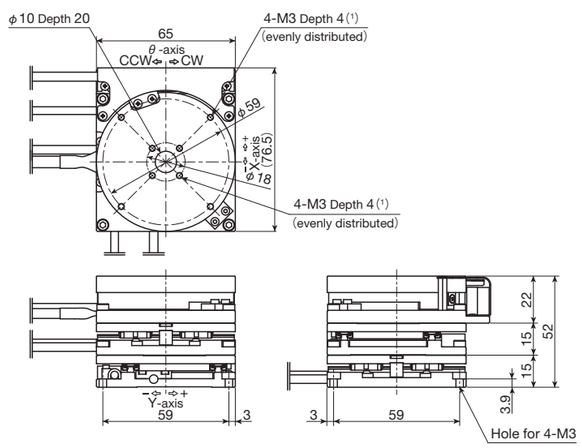
SA65DE/XY



SA65DE/XS



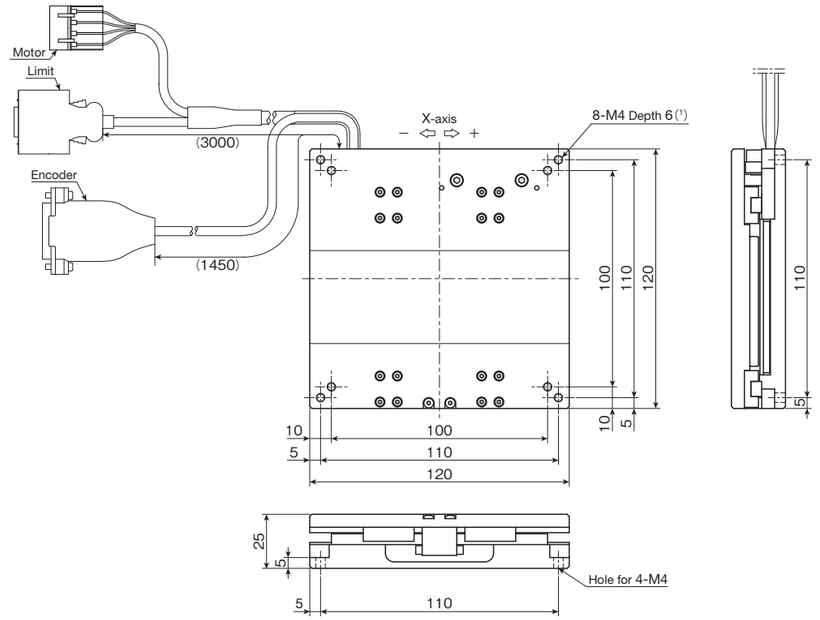
SA65DE/XYS



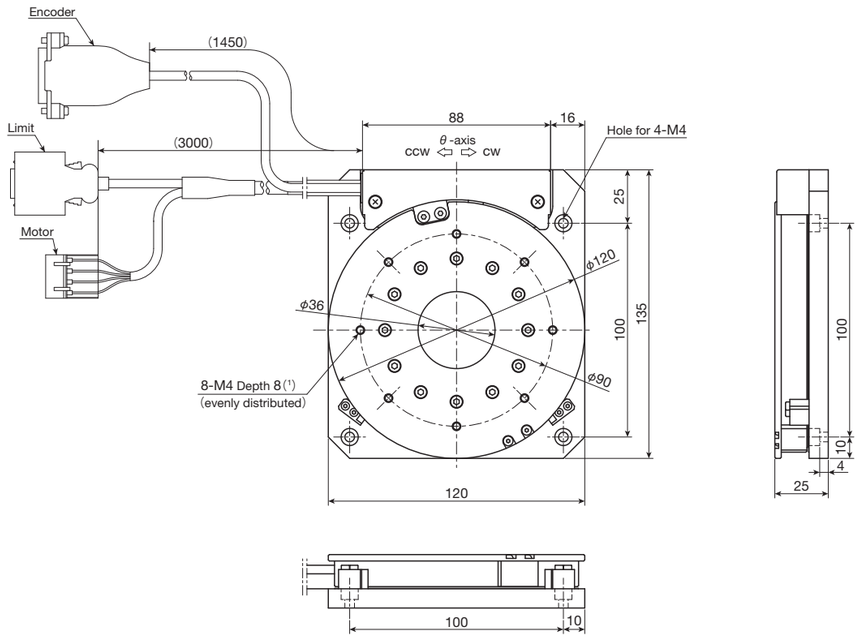
Note (1) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

Remark: For the cable length, please see the dimension tables for SA65DE/X and SA65DE/S.

SA120DE/X



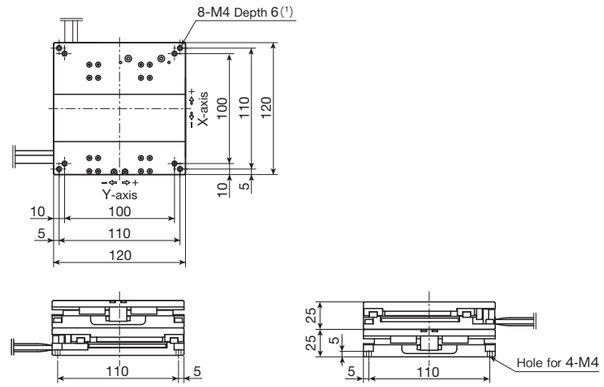
SA120DE/S



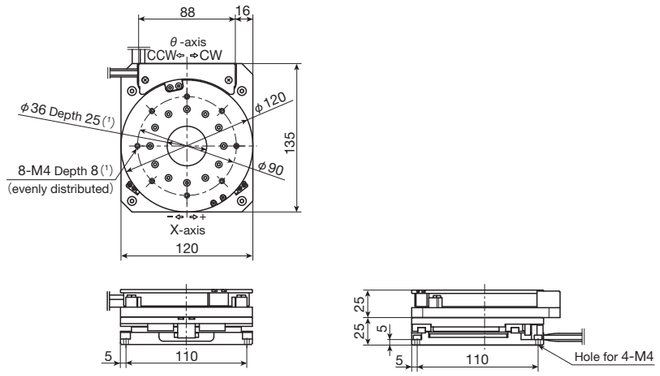
Note (1) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

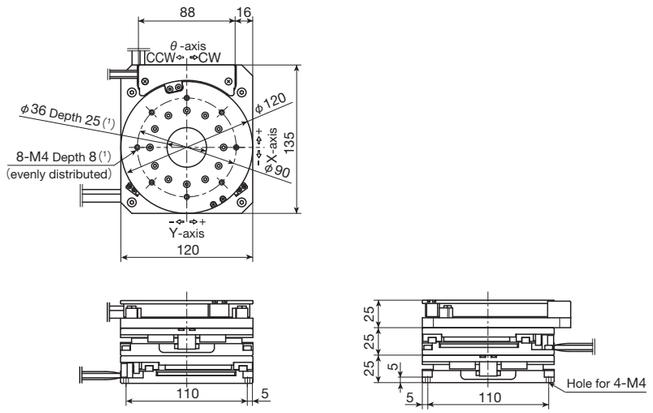
SA120DE/XY



SA120DE/XS



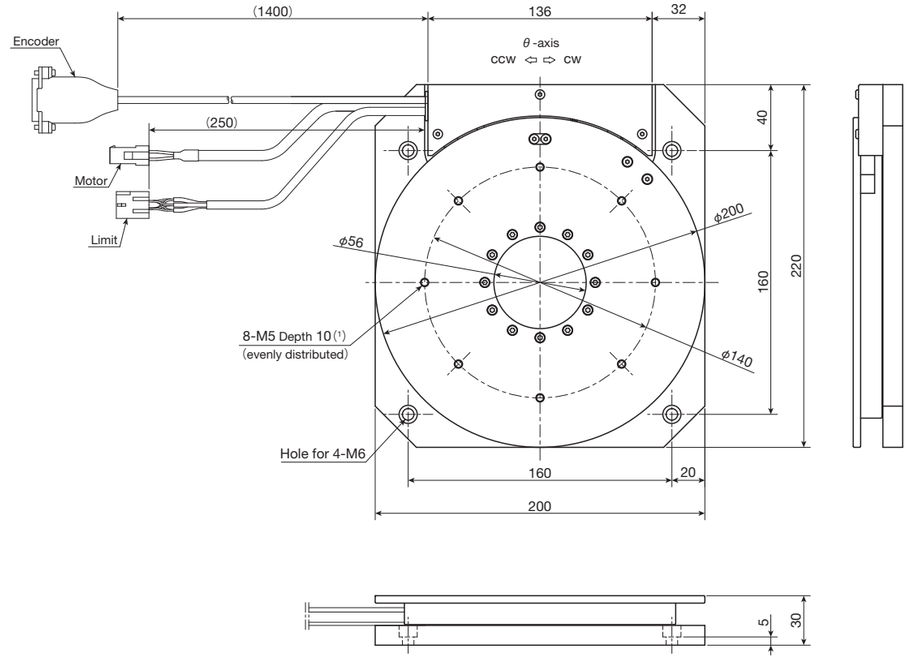
SA120DE/XYS



Note (1) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

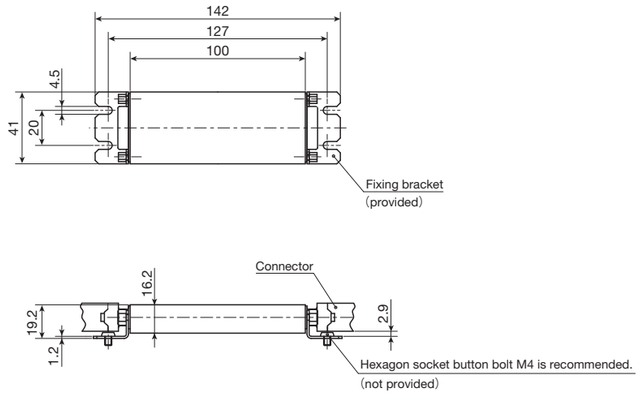
Remark: For the cable length, please see the dimension tables for SA120DE/X and SA120DE/S.

SA200DE/S



Note (1) Too deep insertion depth of the mounting bolt may affect the running performance of the moving table, so never insert a bolt longer than the depth of the through hole.

Encoder interface



1N=0.102kgf=0.2248lbs.
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