



New Product

Micro Precision Positioning Table

T^M High-Performance New AC Servomotor Specification



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Introducing the new high-performance AC Servomotor Specification Micro Precision Positioning Table TM, boasting excellent reliability and high accuracy while incredibly compact!

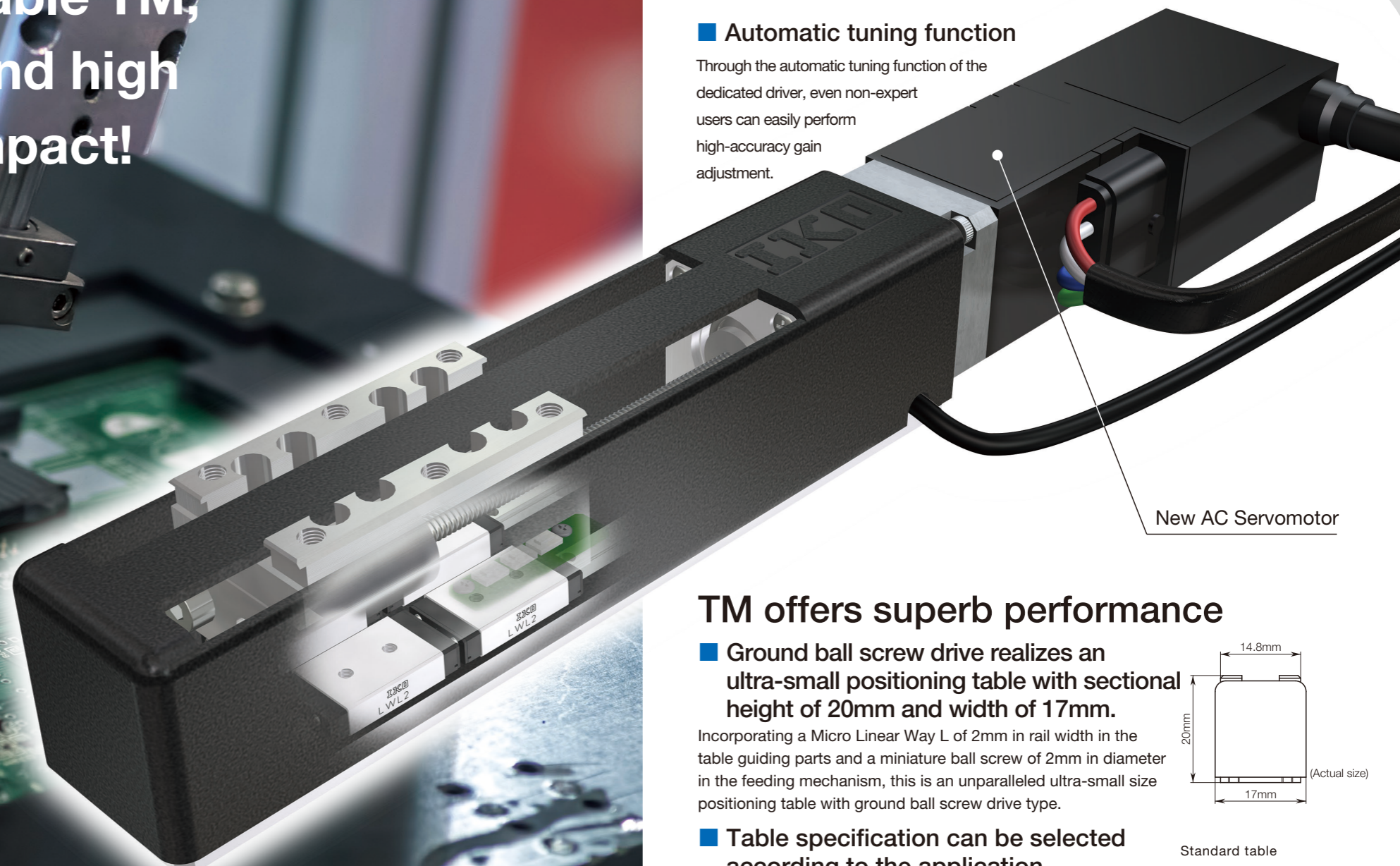
Features of the New AC Servomotor Specification **NEW!!**

■ Reliable controllability

The use of a high-resolution AC Servomotor and a dedicated driver shortens the settling time thanks to high controllability and contributes to further improved productivity.

■ Automatic tuning function

Through the automatic tuning function of the dedicated driver, even non-expert users can easily perform high-accuracy gain adjustment.

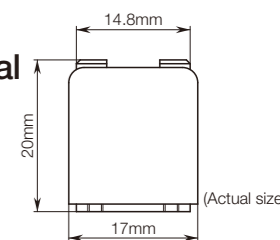


New AC Servomotor

TM offers superb performance

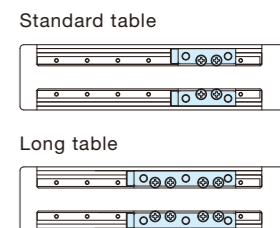
■ Ground ball screw drive realizes an ultra-small positioning table with sectional height of 20mm and width of 17mm.

Incorporating a Micro Linear Way L of 2mm in rail width in the table guiding parts and a miniature ball screw of 2mm in diameter in the feeding mechanism, this is an unparalleled ultra-small size positioning table with ground ball screw drive type.



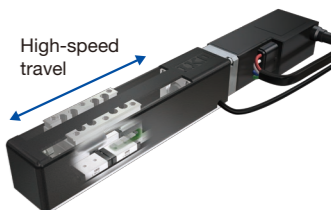
■ Table specification can be selected according to the application.

There are two types of slide table: standard table and long table. As two Micro Linear Way L with two slide units are incorporated in parallel into the long table, the table is structurally resistant to moment and complex load. The motor can be selected from standard type and high torque type according to the application.



■ Maximum table speed of 150mm/s is achieved.

The combination of high-lead ball screw and high-torque motor enables the table to move at high speed without reducing the accuracy.



■ Super-miniature sensors can also be optionally built in.

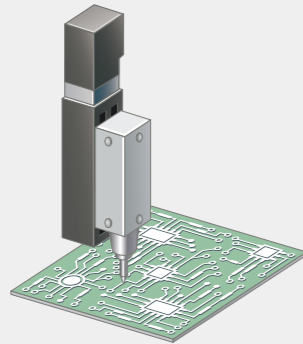
Built-in origin, pre-origin, CW limit and CCW limit sensors can be indicated without modifying the outside dimensions.

Possible applications

Featuring both an ultra-small size and high-precision positioning capability, the TM is ideal for enhancing the accuracy of positioning mechanisms in super-miniature devices. Also, the use of stainless steel in steel parts allows the table to be used even in locations where use of rust prevention oil and grease should be avoided and in environments that suffer from water scattering.

Semiconductor manufacturing related equipment

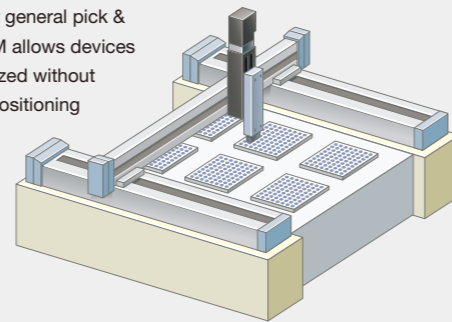
TM contributes to device miniaturization and accurate application of liquids through its compactness and high precision positioning.



Equipment used	Discharge device
Location used	Coating amount adjustment unit

General machinery

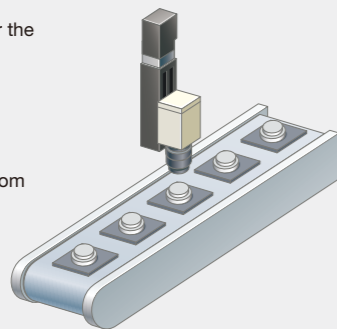
When used for general pick & place work, TM allows devices to be miniaturized without reducing the positioning accuracy.



Equipment used	Workpiece transport device
Location used	Z-axis

Testing and inspection equipment

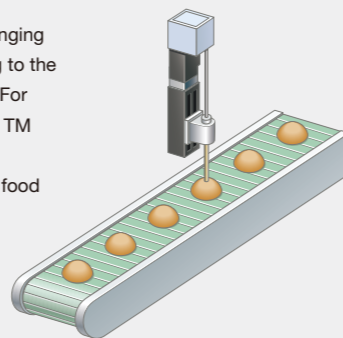
Stainless steel is used for the steel components of TM, making them suitable for applications where rust prevention oil should be avoided, such as cleanroom environments.



Equipment used	Component testing and inspection equipment
Location used	Camera focus adjustment unit

Food processing machine

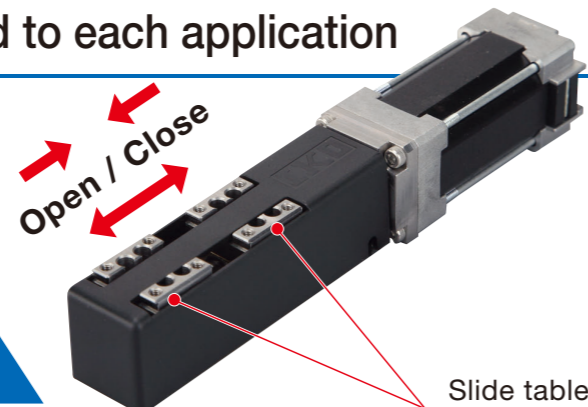
IKO specializes in changing specifications according to the customer's application. For example, we can offer a TM design with optimum specifications for use in food machinery.



Equipment used	Filling device
Location used	Injection amount adjustment unit on Z-axis

Responding to your needs, suited to each application

We produce tables of various specifications such as switching table specification, lead screw specification, and stainless steel cover specification, in order to meet customer needs. For more information, please contact **IKO**.



* The photo shows stepper motor specifications.

Example of special specification: Switching table specification

Identification number

Example of identification number for the new TM AC Servomotor Specification is shown.

Example → **TM 15 G - 50 A / Y061 05 1**

Model	
TM	Micro Precision Positioning Table TM
Size	
15	Table width 15mm
Shape of slide table	
No symbol	Standard table
G	Long table
Effective stroke length	
Select an effective stroke length from the list of Table 1.	
Table 1 Shape of slide table and effective stroke length	
Shape of slide table	Effective stroke length mm
Standard table	20, 40, 60
Long table	10, 30, 50
With motor	
A	With motor
Motor type	
Y061	AC Servomotor (standard type)
Y062	AC Servomotor (high torque type)
Ball screw lead	
05	Lead 0.5mm
10	Lead 1.0mm
15	Lead 1.5mm

When the ball screw lead of 0.5mm is specified, Y062: AC Servomotor (high torque type) cannot be specified.

Sensor specification	
0	Without sensor
1	With sensor (on the right as viewed from the side opposite the motor)
2	With sensor (on the left as viewed from the side opposite the motor)

Once you select Without sensor, adding a sensor afterward is not possible.
Once you select Without sensor, the motor wiring will be on the right as viewed from the side opposite the motor.
If With sensor is selected, the wirings for the motor and the sensor are in the same direction.

Remark: For the identification number etc. of the conventional motor specification, refer to the Mechanics General Catalog CAT-1567.

Specifications

Accuracy				unit: mm
Model	Ball screw lead	Positioning repeatability	Positioning accuracy	
TM15	0.5	±0.001	0.015	
	1	±0.002		
	1.5			

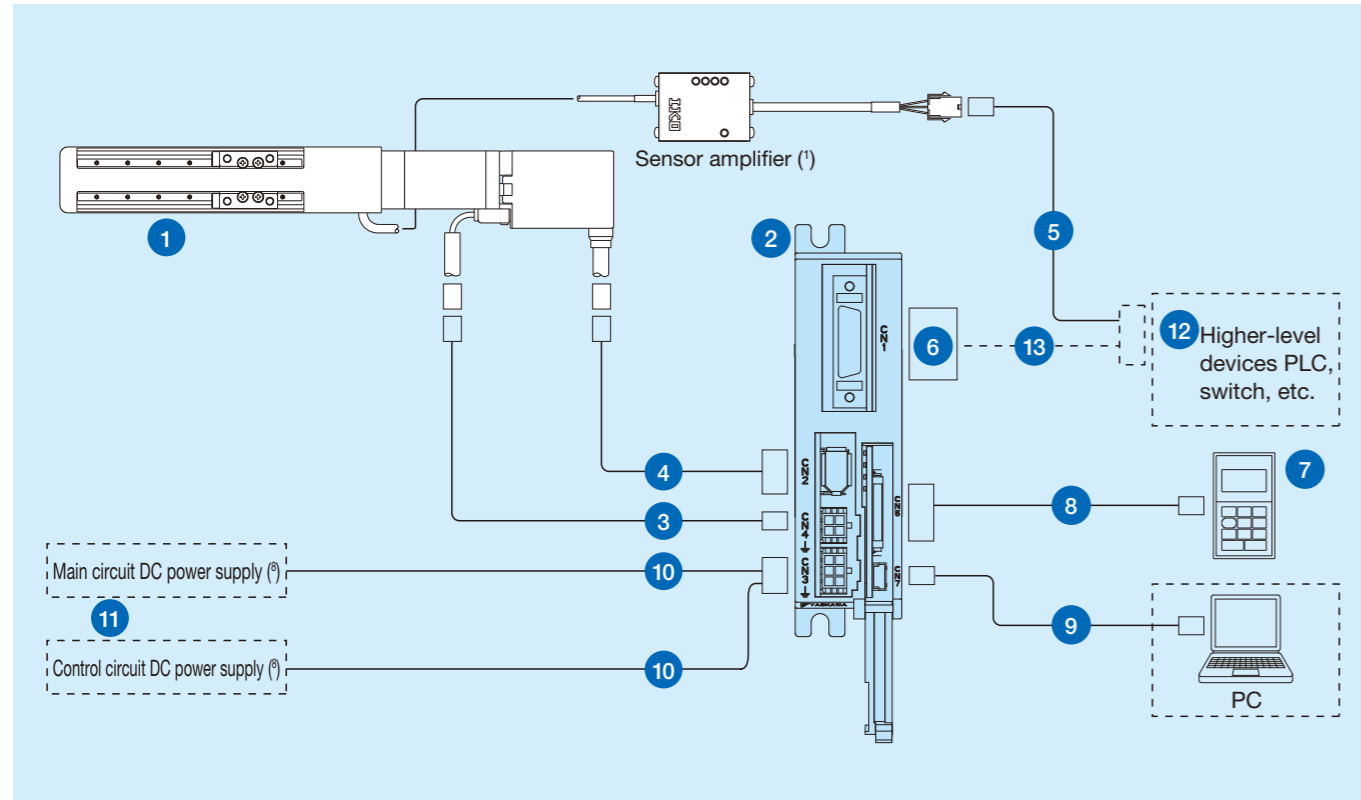
Maximum speed				
Motor type	Number of revolutions of motor min ⁻¹	Maximum speed mm/s		
AC Servomotor	6 000	Lead 0.5mm	Lead 1mm	Lead 1.5mm
		50	100	150

Maximum carrying mass				
Model and size	Ball screw lead mm	Maximum carrying mass kg		
TM15	0.5 / 1 / 1.5	Horizontal	Vertical	
		0.7	0.5	
TM15G	0.5 / 1 / 1.5	1.5	0.5	

Table inertia, coupling inertia, and starting torque					
Model and size	Table inertia J_T x10 ⁻⁶ kg·m ²			Coupling inertia J_C x10 ⁻⁶ kg·m ²	Starting torque T_s N·m
	Lead 0.5mm	Lead 1mm	Lead 1.5mm		
TM15 -20	0.00013	0.00016	0.00022	0.0028	0.005
TM15 -40	0.00016	0.00019	0.00024		
TM15 -60	0.00018	0.00021	0.00026		
TM15G-10	0.00014	0.00019	0.00028		
TM15G-30	0.00016	0.00021	0.00030		
TM15G-50	0.00018	0.00023	0.00032		

System configuration

A dedicated driver for Micro Positioning Table TM is provided. The following table shows its typical system configuration. For the driver specification, see the section of driver specifications on page 8. When you place an order, specify the desired model from the following table.



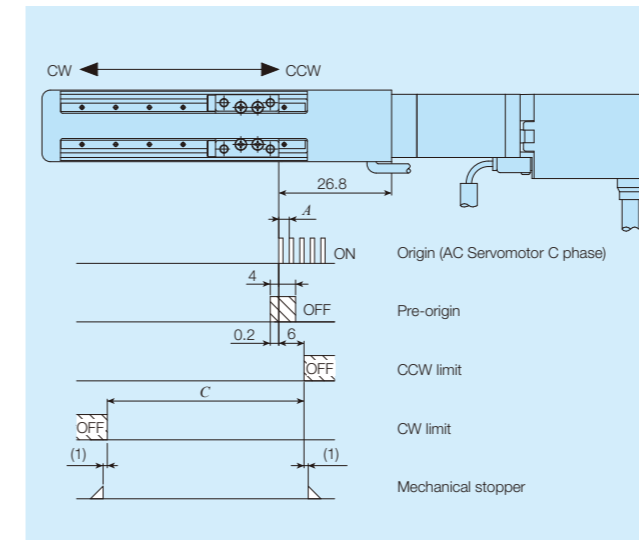
No.	Name	Identification number	
1	Table body (motor code)	Y061 AC Servomotor (standard type)	Y062 AC Servomotor (high torque type)
2	Driver (2)	SGDV-1R7EP1A	
3	Motor cord (3m) (2) (2)	JZSP-CF1M20-03-E	
4	Encoder cord (3m) (2) (2)	JZSP-CMP10-03-E	
5	Sensor extension cord (3m) (2) (2) (2)	TAE10W0-LC03	
6	I/O connector	TAE20W1-CN (2)	
7	Digital operator (2) (2)	JUSP-OP05A-1-E	
8	Digital operator extension cable (2) (2)	JZSP-CF1S00-A3-E	
9	PC connection cable (2) (2)	JZSP-CVS06-02-E	
10	Power supply cable (2) (2) (2)	JZSP-CF1G00-□□-E	
11	Power supply (2)	This must be prepared by customer	
12	Higher-level device		
13	I/O connector connection cable		

- (1) Once you select Without sensor, a sensor amplifier will not be attached.
- (2) Manufactured by Yaskawa Electric Corporation.
- (2) For specific cord length, please contact **IKO**.
- (2) The higher-level device side of the cord will be loose.
- (2) I/O connector TAE20W1-CN is a combined product of 10126-3000PE (connector) and 10326-52F0-008 (cover) from Sumitomo 3M Limited.
- (2) A digital operator or ordinary PC is required for parameter setting.
- (2) Specify the length from 1 to 3m in 1m increments in □□ of the identification number. (Example for 3m: JZSP-CF1G00-03-E)
- (2) The main circuit power supply supports DC48V as well as DC24V. The control circuit power supply is DC24V. Each power supply must be prepared separately by the customer.

Remark 1: The motor cord, encoder cord and sensor extension cord have excellent bending resistance.
 2: Initial setting of parameters is required for the driver for AC Servomotor.
 When setting parameters with an ordinary PC, download the setting software from the Yaskawa Electric Corporation website.
 (URL: <http://www.e-mechatronics.com/download/tool/servo/sgmwinpls/download.html>)

Sensor specification

Sensor timing chart



unit: mm

Model and size	Ball screw lead	A	Effective stroke length (1)	C (Ref.)
TM15-20	0.5	0.5	20	Effective stroke length +2
	1	1		
TM15-40	0.5	0.5	40	Effective stroke length +2
	1	1		
TM15-60	0.5	0.5	60	Effective stroke length +2
	1	1		
TM15G-10	1	1	10	Effective stroke length +0.5
	1.5	1.5		
TM15G-30	0.5	0.5	30	Effective stroke length +0.5
	1	1		
TM15G-50	1	1	50	Effective stroke length +0.5
	1.5	1.5		

Note (1) The sensor position cannot be adjusted. The effective stroke length indicates the stroke length that can be surely secured between the limit sensors.

Remark: With/Without sensor and wiring directions are specified using the identification number.

Connector specifications

Pin No.	Signal name	Connector used (Product of Molex Japan)	
		Sensor side	Mating side
1	Origin	Housing 43020-0600	Housing 43025-0600
2	Pre-origin		
3	CW limit		
4	CCW limit	Terminal 43031-0010	Terminal 43030-0007
5	Power input		
6	GND		

Sensor specification

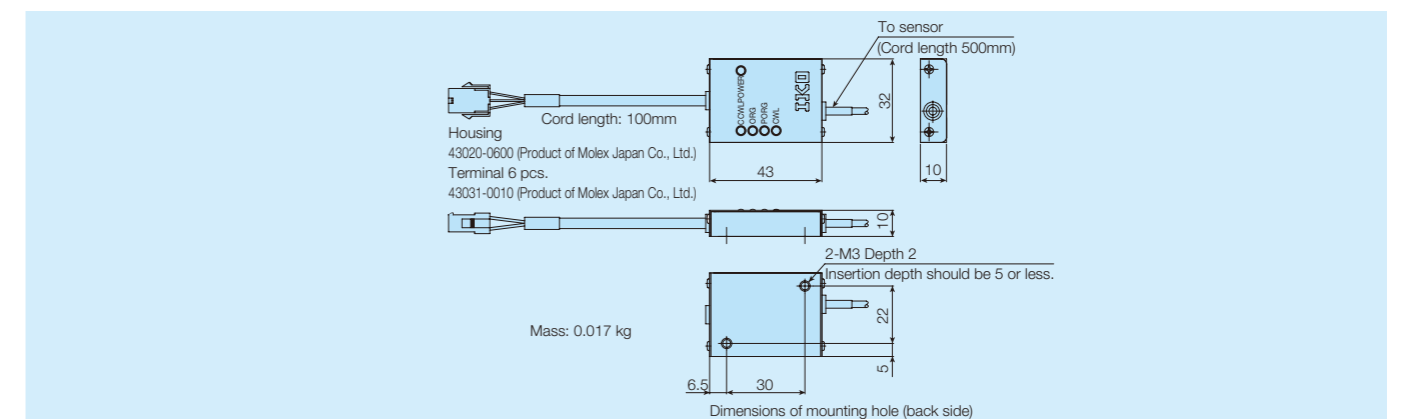
Item	Sensor	TM
Power supply voltage		DC12 ~ 24V ±10%
Current consumption		65mA or less (1)
Output (2)		NPN open collector -Maximum input current : 12mA -Applied voltage : DC36V or less -Residual voltage : 1.7V or less at input current of 12mA : 1.1V or less at input current of 4mA
	Output operation	Pre-origin : OFF in proximity Limit : OFF in proximity Origin (3) : ON in proximity
Operation indication	Pre-origin	Red LED (ON upon detection)
	CW (+) limit	Yellow LED (ON upon detection)
	CCW (-) limit	Red LED (ON upon detection)
	Origin (3)	Red LED (ON upon detection)
Circuit diagram		

Note (1) Current consumption of the entire system, including sensor amplifier.

(2) Output per circuit.

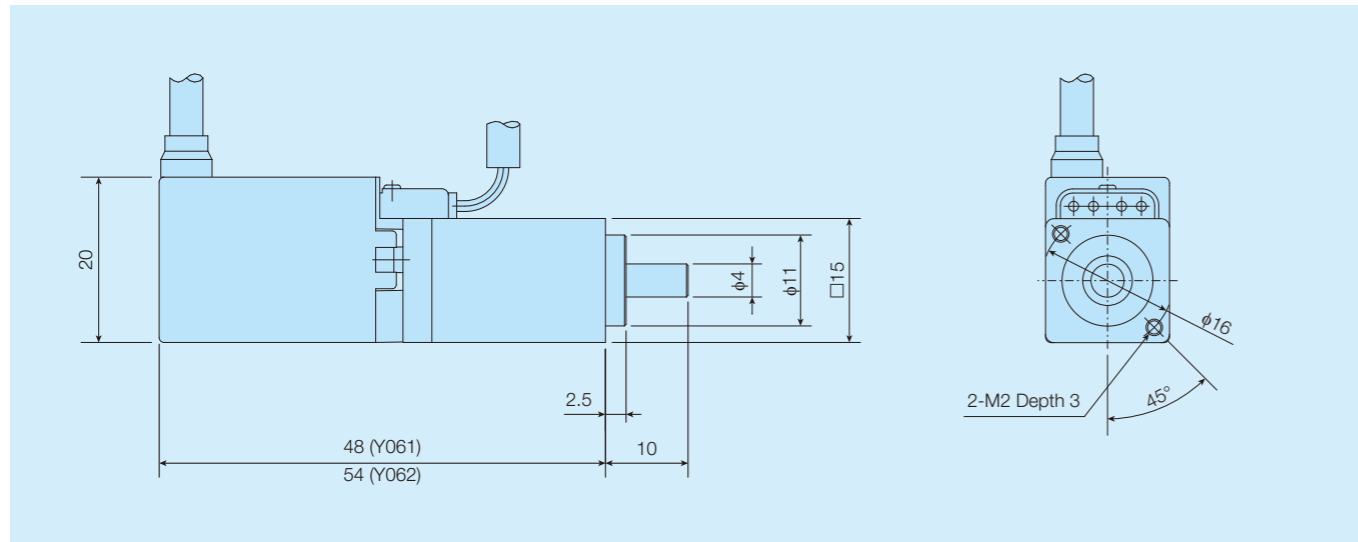
(3) The origin is for stepper motor.

Outside dimension of sensor amplifier



Motor specification

AC Servomotor manufactured by Yaskawa Electric Corporation (Y061, Y062)



Motor specification

Motor type	Motor code	Motor identification number	Voltage specification	Rated output W	Rated torque N·m	Max. momentary torque N·m	Rated number of revolutions min ⁻¹	Motor inertia J_M x10 ⁻⁴ kg·m ²	Encoder resolution pulse/rev	Mass kg
Standard	Y061	SGMMV-B3E2A21	DC 24V DC 48V	3.3	0.0105	0.0263	3 000	0.000441	131072 (17-bit)	0.055
High torque	Y062	SGMMV-B5E2A21	DC 24V DC 48V	5.5	0.0175	0.0438	3 000	0.000796	131072 (17-bit)	0.06

Remark: 1. The main circuit power supply supports DC48V as well as DC24V.
2. Motor torque starts to decrease when the number of revolutions of the motor exceeds 3,000 min⁻¹.

Specifications of motor wiring and connector

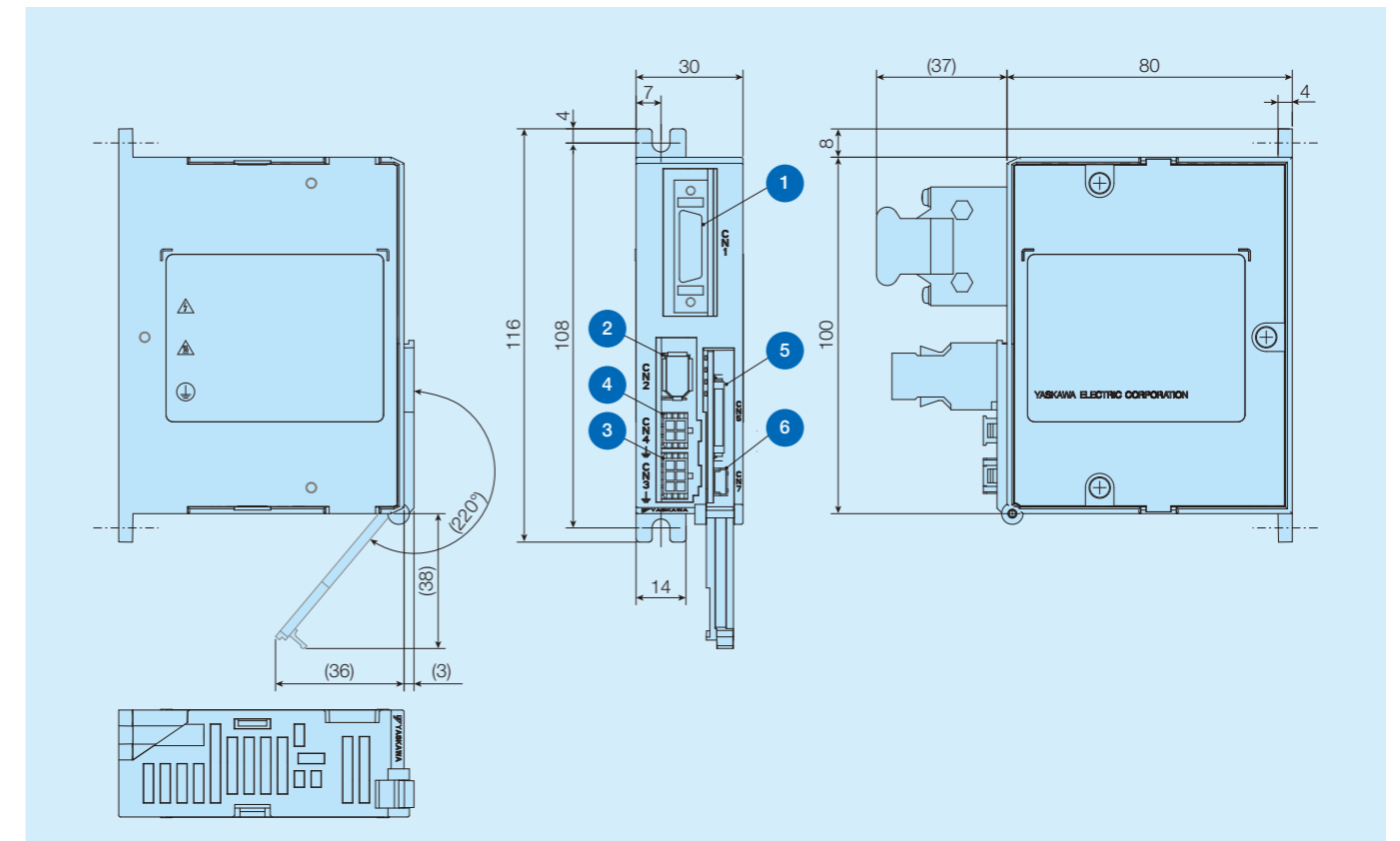
Motor code: Y061, Y062			Motor side	Mating side
Pin No.	Content	Wire color		
1	U phase	Red	Connector 43020-0401 Contact 43031-0001 Molex Japan Co., Ltd.	Connector 43025-0400 Contact 43030-0001 Molex Japan Co., Ltd.
2	V phase	White		
3	W phase	Blue		
4	FG	Green		

Specifications of encoder wiring and connector

Motor code: Y061, Y062			Motor side	Mating side
Pin No.	Content	Wire color		
1	PG 5V	Orange	Socket connector solder type 54280-0609 Molex Japan Co., Ltd.	Connector crimp type 55100-0670 Molex Japan Co., Ltd.
2	PG 0V	Light green		
3	BAT(+)	Red/Pink		
4	BAT(-)	Black/Pink		
5	PS	Red/Sky Blue		
6	/PS	Black/Sky Blue		
Shell	FG	FG		

Driver specification

Driver for AC Servomotor Y061/Y062, manufactured by Yaskawa Electric Corporation (1)



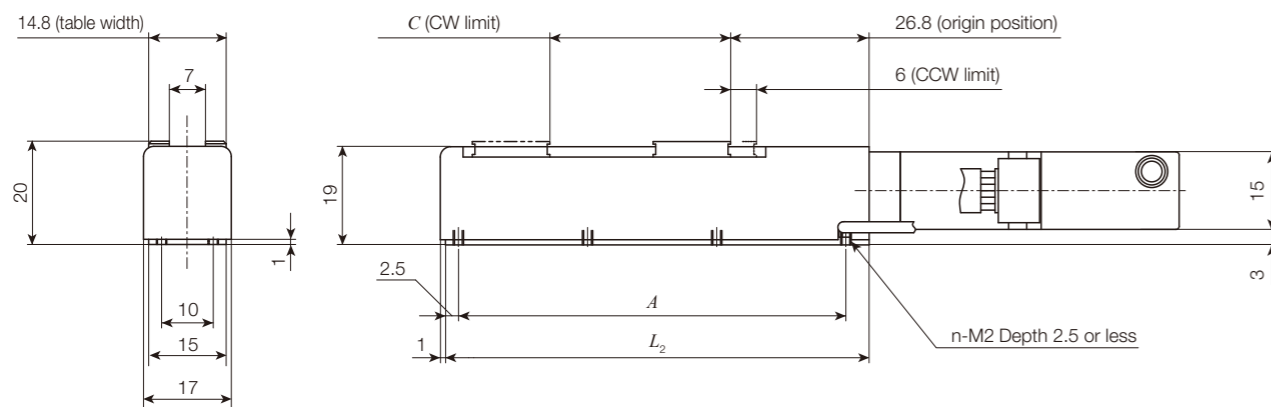
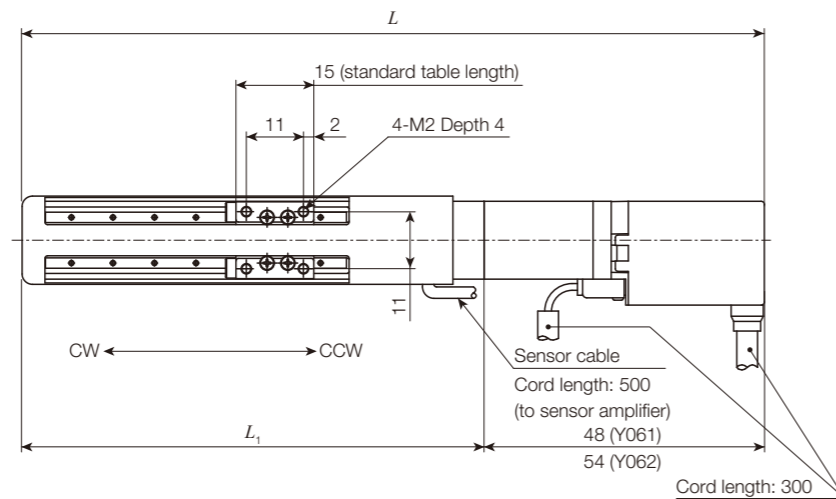
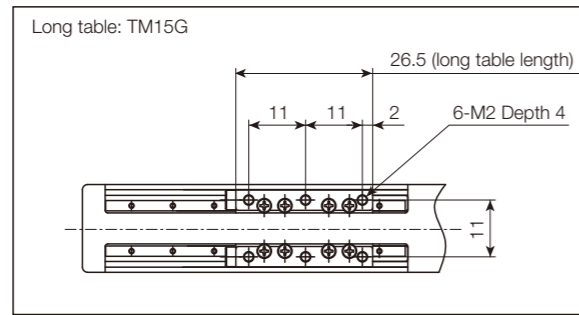
No.	Name	Function
1	CN1	I/O connector Connect a pulse cord to this connector.
2	CN2	Encoder connector Connect the encoder cord.
3	CN3	Driving power supply connector Connect to the driving power supply.
4	CN4	Motor connector Connect a motor cord to this connector.
5	CN5	Connector for digital operator Connect the digital operator extension cable.
6	CN7	Connector for PC Connect the PC connection cable.

Driver specification

Identification number of driver	SGDV-1R7EP1A (1)	
Applicable motor code	Y061	Y062
Rated output of applicable motor	3.3W	5.5W
Feedback	Serial encoder 17-bit	
Specified system of pulse input (1)	CW/CCW signal, pulse signal/rotational direction signal	
Specified method of pulse input (1)	Line driver, open collector	
Main circuit power supply voltage (2)	DC24V ±15%, DC48V ±15%	
Control circuit power supply	DC24V ±15%	
Continuous output current Arms	1.7	
Maximum output current Arms	4.1	
Operating temperature range	0 to 55°C	
Storage temperature range	-20 to 85°C	
Operating humidity	90% RH or lower (keep freeze/condensation free)	
Mass kg	0.3	

(1) This driver is a pulse train command type. If the network communication command type or analog voltage command type is required, please contact **IKO**.
(2) The main circuit power supply supports DC48V as well as DC24V.

TM Dimension Table



unit: mm

Model and size	Stroke length		Dimensions of table						Mass (1) (Ref.) kg
	Effective stroke length (2)	CW limit position C	Overall length L		L ₁	L ₂	Mounting holes of bed		
			Y061	Y062			A (number of units × pitch)	n	
TM15 -20	20	16	117	123	69	62	50 (2×25)	6	0.15
TM15 -40	40	36	137	143	89	82	75 (3×25)	8	0.16
TM15 -60	60	56	157	163	109	102	96 (4×24)	10	0.17
TM15G-10	10	4.5	117	123	69	62	50 (2×25)	6	0.16
TM15G-30	30	24.5	137	143	89	82	75 (3×25)	8	0.17
TM15G-50	50	44.5	157	163	109	102	96 (4×24)	10	0.18

Note (1) Represents value when Y061 is specified. It will be 0.01 kg heavier when Y062 is specified.

(2) The sensor position cannot be adjusted. The effective stroke length indicates the stroke length that can be surely secured between the limit sensors.

Remark: A resin table cover is used but a stainless steel table cover can also be manufactured. If needed, please contact **IKO**.

Mounting

Machining precision of mounting surface

As the accuracy and performance of the table are effective by the precision of the mounting surface of the stand, the parallelism of the stand mounting surface should be 8 μm or less as a guideline for general conditions. However, it must be in accordance with operating conditions such as required motion performance and positioning accuracy. Be sure to remove dirt and harmful protrusions on the mounting surface.

Tightening torque for fixing screw

Typical tightening torque for fixing the Precision Positioning Table is indicated in the following table. If sudden acceleration / deceleration occurs frequently or moment is applied, it is recommended to tighten them to 1.3 times higher torque than that indicated in the table. In addition, when high accuracy is required with no vibration and shock, it is recommended to tighten the screws to torque smaller than that indicated in the table and use adhesive agent to prevent looseness of screws.

Screw tightening torque

Unit: N·m

Bolt size	Female thread component		
	Steel	Aluminum alloy	
		With screw insert	
M2 ×0.4	0.31	About 60% of steel value	About 80% of steel value

Precautions for Use

- As the Precision Positioning Table is a precision machine, excessive load or shock may impair accuracy and damage the parts. Take extra care when handling it.
- Check that the table mounting surface is free from dust and harmful projection.
- Use it in a clean environment where it is not exposed to water, oil and dust particles.
- As grease is applied to the linear motion rolling guide integrated with Precision Positioning Table and ball screw, take dust prevention measures to prevent dust and other foreign matter from entering the unit. If foreign matters get mixed, thoroughly eliminate the contaminated grease and apply clean grease again.
- Though lubrication frequency for Precision Positioning Table varies depending on usage conditions, wipe off old grease and apply clean grease again biannually for normal cases or every three months for applications with constant reciprocating motions in long distance.
- As the Precision Positioning Table is assembled through precise processing and adjustments, do not disassemble or alter it.

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