

PATENT PENDING

IKO

Micro Precision Positioning Table

TMM



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CAT-57160

IKO Micro Precision Positioning Table **TM**



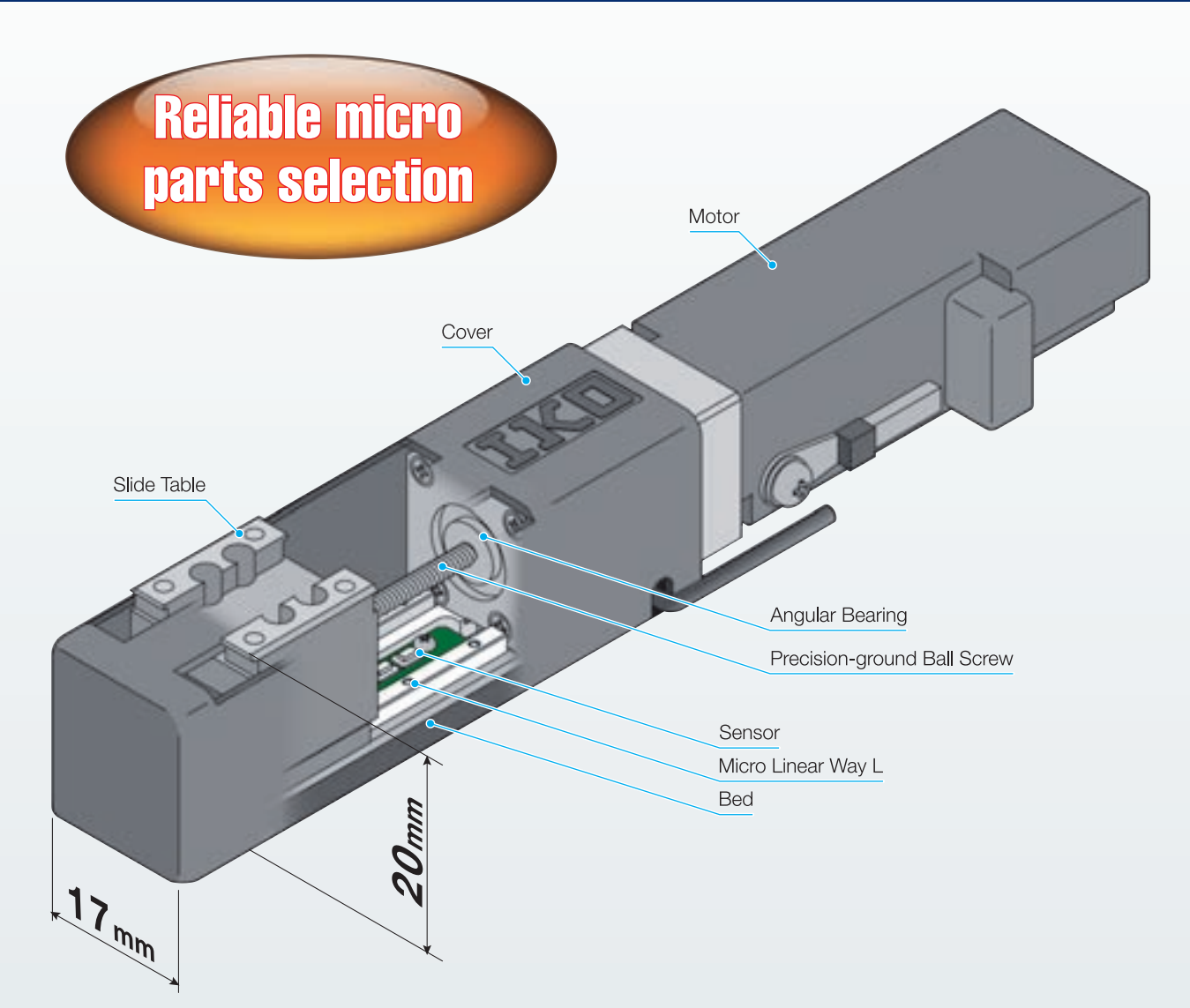
**The lowest height 20mm driven
by precision ball screw**



IKO Micro Precision Positioning Table TM is an extremely compact precision positioning table comprising IKO Micro Linear Way L of a track rail width of 2 mm, which has a reputation in a micro device field and a precision-ground ball screw of 2 mm in diameter. Micro Linear Way L, ball screw, and other steel parts are made of stainless steel and highly corrosion resistant. This positioning table can satisfy the highest precision requirement that cannot be satisfied by conventional small positioning tables in addition to device downsizing and space saving requirements

IKO Micro Precision Positioning Table TM

Structure of Linear Motor Table LT...M



Features of Micro Precision Positioning Table TM

1 Very compact positioning table of 20 mm high (sectional) and 17 mm wide driven by a ground ball screw

IKO Micro Linear Way L of a rail width of 2 mm for the table guide and a miniature ball screw of a screw diameter of 2 mm for the feeding mechanism are used. The ground ball screw has the lowest sectional height that cannot be accomplished ever, and realizes smooth and stable sliding motion, high running accuracy, small backlash and high accuracy positioning of good follow-up property.



2 AC servo motor and stepping motor selectable

IKO provides various kinds of AC servo motors and stepping motors which are selectable according to user applications.

3 Optional miniature sensors (can be built in)

Micro Precision Positioning Table TM can contain Origin, Pre-origin, CW and CCW sensors without changing external dimensions.

Applications in wide range

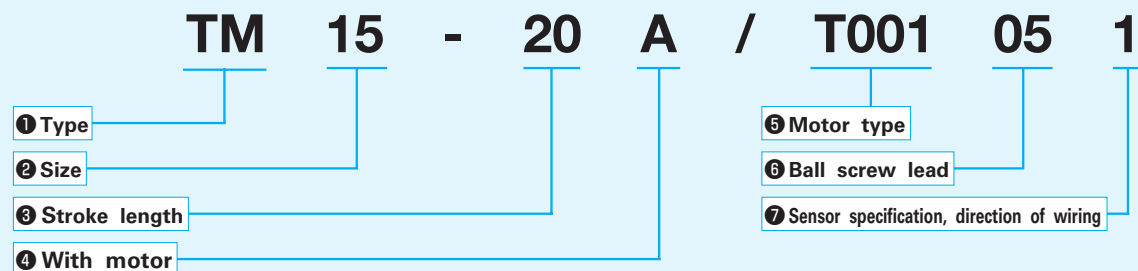
Micro Precision Positioning Table TM is best suited to increase the accuracy of a positioning mechanism of a miniature device since it realizes high-precision positioning although it is very small. Moreover, Micro Precision Positioning Table TM uses stainless steel parts and can also be used in places that inhibit oil and grease and in damp places.

- Measuring apparatus
- Electronic part assembling equipment
- Robots
- Bio-related equipment
- Medical equipment
- Watch assembling machines
- Wire coiling machine, etc.

Best suited for positioning mechanism of miniature device

Identification Number

Example of identification number



1 Type	TM : Micro-precision positioning table TM
2 Size	15 : Table width 15 mm
3 Stroke length	20 : Stroke length 20mm
4 With motor	A : With motor
5 Motor type	T001 : AC servo motor T002 : Stepping motor (5 phases) T003 : Stepping motor (2 phases)
6 Ball screw lead	05 : Lead 0.5mm 10 : Lead 1mm
7 Sensor specification, direction of wiring	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)

For details of motor specifications, see pages 6 to 8. In case of using non-standard motor, consult .

In case "without sensor" is selected, adding a sensor afterward is not possible.

Remark Table cover is made of resin. If a stainless steel table cover is required, consult .

Characteristics

Table 1 Accuracy

unit : mm

Type	Ball screw lead	Positioning accuracy	Repeatability
TM15	0.5	0.015	±0.002
	1		

Table 2 Maximum speed

Type	Motor type	Motor speed r/min	Maximum speed mm/s	
			Lead 0.5 mm	Lead 1 mm
TM15	AC servo motor	4000	33	67
	Stepping motor	1800	15	30

Remark The values of the maximum speed are applicable when the standard motor is used. The actual maximum operation speed must be determined by examining the operating pattern for the motor used, load conditions, etc.

Table 3 Maximum loading mass

Type	Maximum loading mass N
TM15	15

Remark This is a maximum load applicable without causing problems with functionality or performance.

Table 4 Table inertia and starting torque

Type	Table inertia J_r $\times 10^{-8} \text{kg} \cdot \text{m}^2$		Starting torque T_0 N · m
	Lead 0.5 mm	Lead 1 mm	
TM15	0.00029	0.00027	0.005

Table 5 Sensor Specification

Item	Specification
Type	Magnetic sensor
Power supply voltage	DC12V~24V ±10%
Current consumption ⁽¹⁾	65 mA or less
Output ⁽²⁾	Open corrector
	• Maximum input current : 12 mA or less
	• Applied voltage : DC30V or less
	• Residual voltage : 1.7 V or less for 12 mA of input current 1.1 V or less for 4 mA of input current
Output operation	When approaching : ON (When detected : ON)
Operation indicator	LED (green) : Current
	LED (yellow) : CW limit sensor
	LED (red) : Origin sensor
	Pre-origin sensor CCW limit sensor
Circuit diagram	

Note⁽¹⁾ This is the current consumption of the entire system including the sensor amplifier.

⁽²⁾ This is the output per circuit.

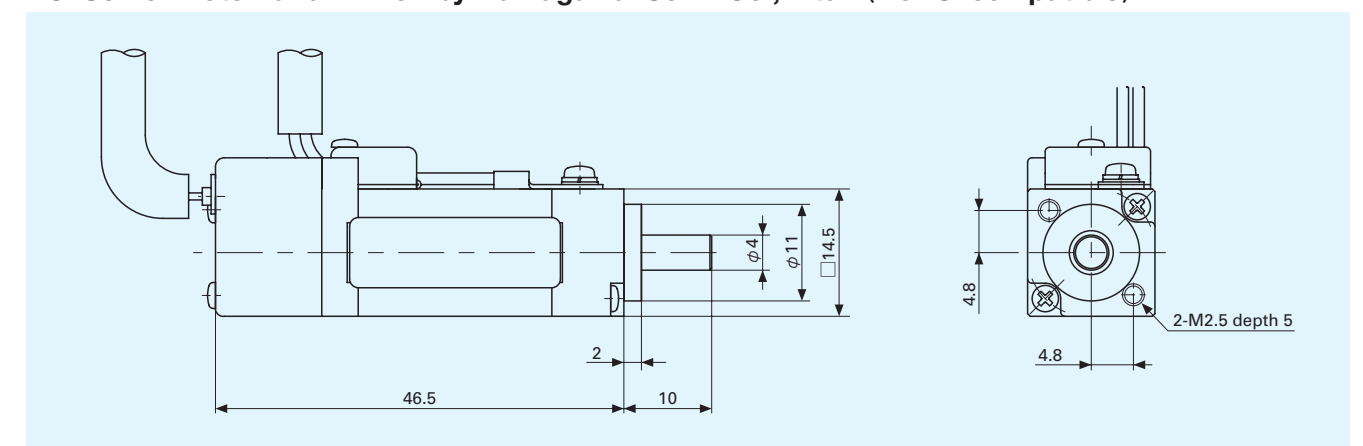
Table 6 Specifications of Connector

Pin No.	Signal name	Connector (by Molex Japan Co., Ltd.)	
		Body side	Other side ⁽²⁾
1	Origin ⁽¹⁾	Housing 43020-0600	Housing 43025-0600
2	Pre-origin		
3	CW limit		
4	CCW limit	Terminal Contactor 43031-0007	Terminal Contactor 43030-0007
5	Power input		
6	GND		

Note⁽¹⁾ When AC servo motor is selected, use an encoder C-phase as origin signal.

⁽²⁾ Other side connector shall be prepared by customer.

AC Servo Motor and Driver by Tamagawa Seiki Co., Ltd. (RoHS compatible)



Specifications of Motor

Motor code	Model	Power supply V	Rated output W	Rated torque N·m	Instantaneous peak torque N·m	Rated rotation speed r/min	Motor inertia J/M ×10 ⁻⁴ kg·m ²	Resolver specification pulse/rev	Mass kg
T001	TS4861N4020E500	24	4	0.0095	0.0285	4000	0.00064	2048	0.05

Specifications of Driver

Driver type	TA8410N7318E913
Motor code	T001
Rated output of motor	4W
Feedback	Brushless resolver
Type of command pulse input	CW/CCW signal, pulse signal, rotation direction signal
System of command pulse input	Line driver, Open corrector
Main circuit power voltage	DC24V ±10%
Control circuit power supply	DC24V ±10%
Continuous output current Arms	0.68
Maximum output current Arms	1.92
Ambient temperature in operation	0~40°C
Ambient temperature in storage	-10~85°C (No freezing)
Ambient humidity (use and storage)	Less than 90% RH (No condensation)
Mass kg	0.3

Remark DC24V power supply shall be prepared by customer.

Specifications of motor wiring and connector

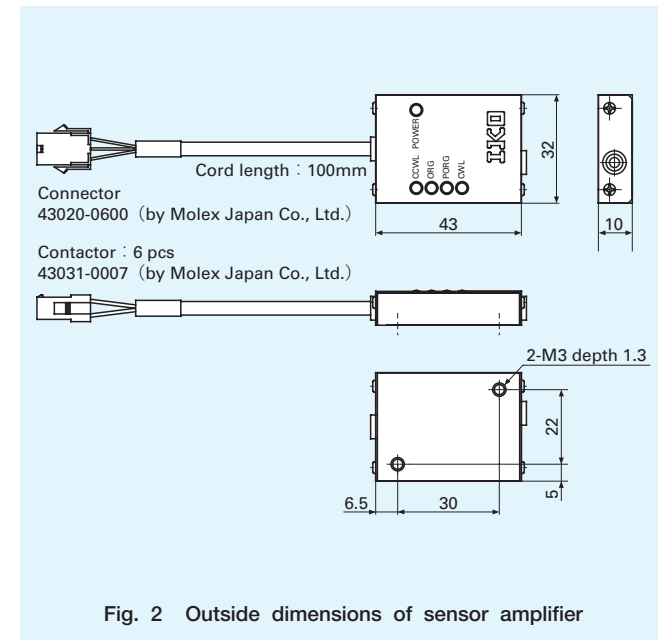
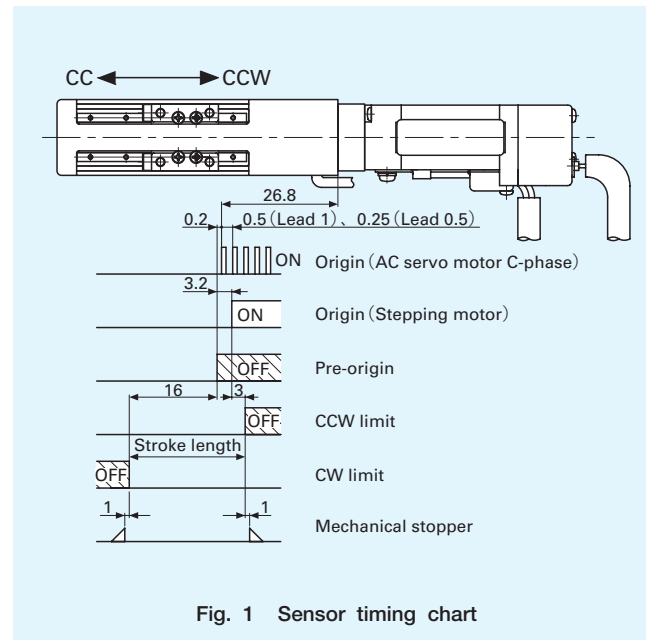
Motor code T001				Connectors (Tyco Electronics AMP K.K.)	
Pin No.	Code	Description	Sheath color of lead wire	Motor side	Connection side ⁽¹⁾
A1	U	Motor U-phase	Red	Cap housing 178964-3	Plug housing 178289-3
A2	V	Motor V-phase	White		
A3	W	Motor W-phase	Black		
B1	E	Frame ground	Green	Contactor 175287-2	Contactor 175218-2
B2	—	—	—		
B3	—	—	—		

Note⁽¹⁾ Other side connector shall be prepared by customer.

Specifications of resolver wiring and connector

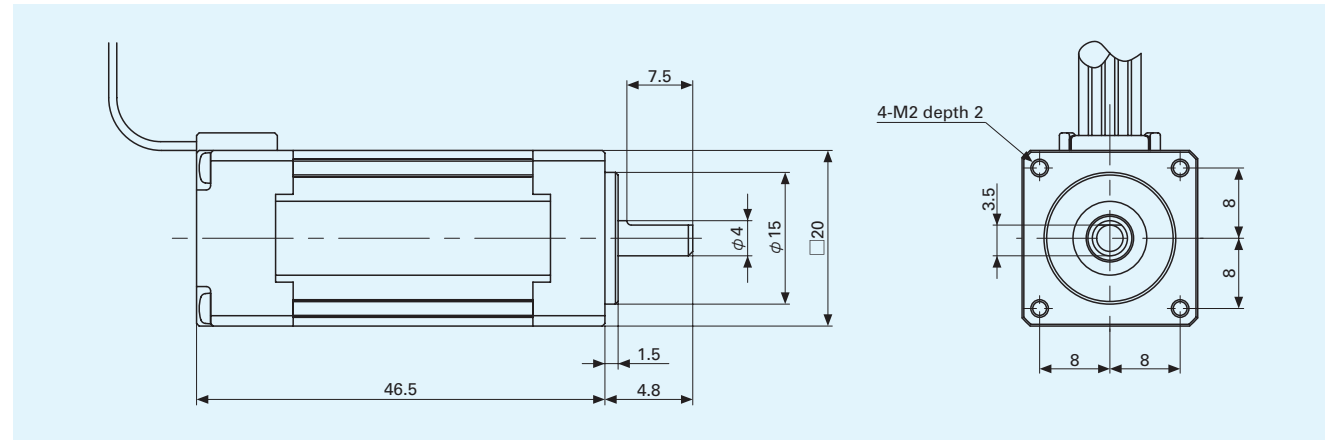
Motor code T001				Connectors (Tyco Electronics AMP K.K.)	
Pin No.	Code	Description	Sheath color of lead wire	Motor side	Connection side ⁽¹⁾
A1	S2	Signal output	Yellow	Cap housing 1-1318115-6	Cap housing 1-1318118-6
A2	S1	Signal output	Red		
A3	R1	Excitation signal	White		
B1	S4	Signal output	Blue	Contactor 1318112-1	Contactor 1318108-1
B2	S3	Signal output	Black		
B3	R2	Excitation signal	Orange		

Note⁽¹⁾ Other side connector shall be prepared by customer.



Specifications of Motor and Driver

Stepping Motor and Driver by Tamagawa Seiki Co., Ltd. (RoHS compatible)



Specifications of Motor

Motor code	Model	Step angle degree	Maximum holding torque N · m	Current A-phase	Rotor Inertia JM kg · m ²	Mass (Ref.) kg
T002	TS3682N2	0.72	0.024	0.35	4×10 ⁻⁷	0.085
T003	TS3692N2	1.80	0.024	0.35	4×10 ⁻⁷	0.085

Specifications of Driver

Driver type	TD-5M13-L	eTD-24A
Applicable motor code	T002	T003
Excitation type	Micro step 500 divisions maximum	Micro step 500 divisions maximum
Input	Photo coupler input, input resistance 220Ω	
Input type	CW/CCW signal Pulse/Rotational direction signal	
Power supply	DC15~36V 2.5A	DC24V±10% 3A
Ambient temperature in operation	0~40°C (No freezing)	
Ambient humidity in operation	Less than 85% RH (No condensation)	
Mass kg	0.17	0.06

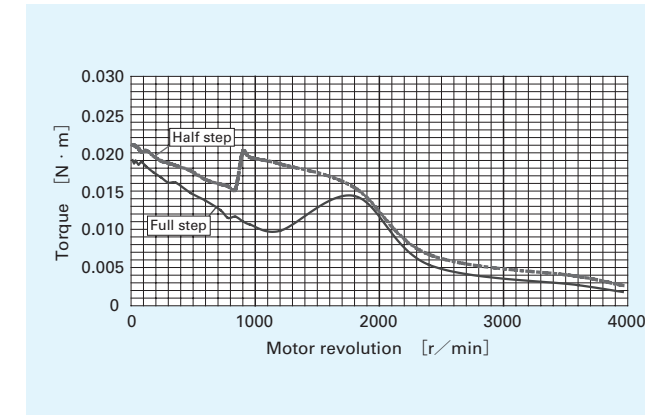
Remark DC24V power supply shall be prepared by customer.

Specifications of motor wiring and connector

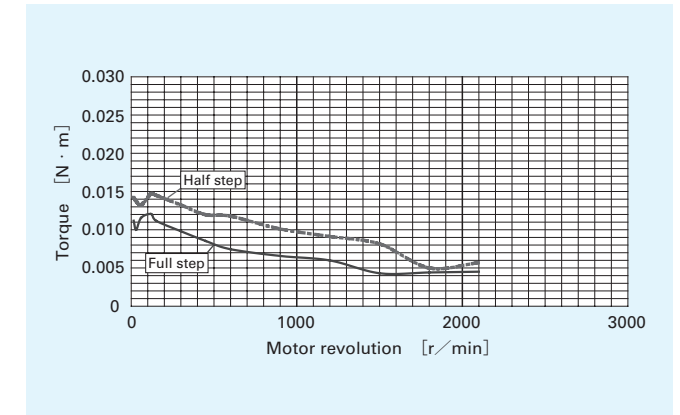
Motor code T002		Motor code T003		Connectors (Molex Japan Co., Ltd.)	
Pin No.	Sheath color of lead wire	Pin No.	Sheath color of lead wire	Motor side	Connection side ⁽¹⁾
1	Blue	1	Black	Housing 43025-0600	Housing 43020-0600
2	Red	2	No-use		
3	Orange	3	Blue		
4	Green	4	Red		
5	Black	5	Orange	Terminal contactor 43030-0007	Terminal contactor 43031-0007
6	No-use	6	Green		

Note⁽¹⁾ Other side connector shall be prepared by customer.

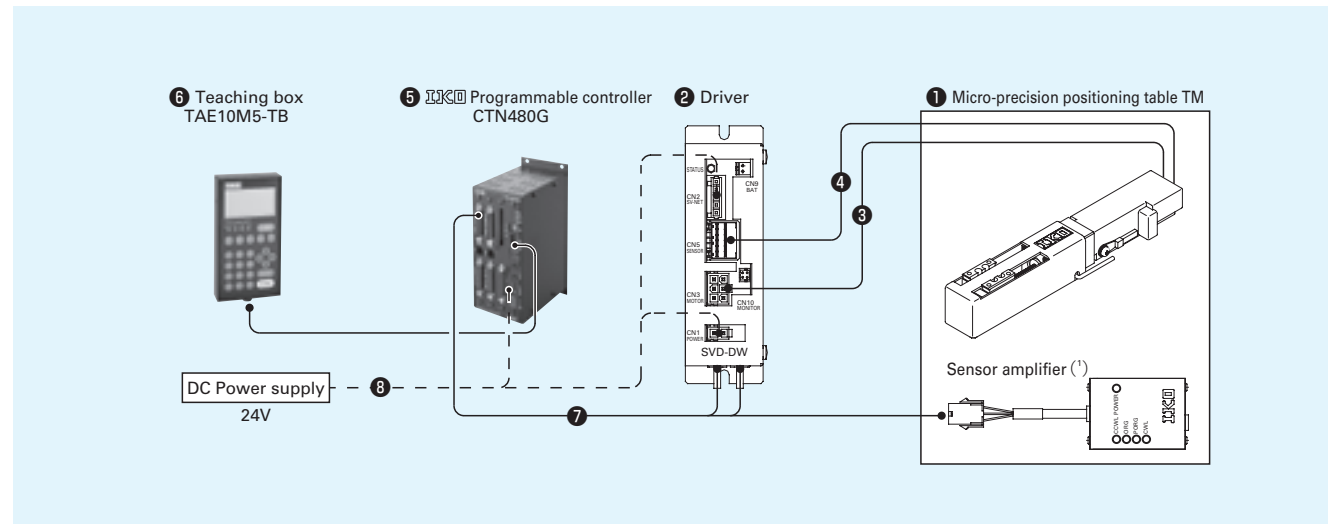
Torque charts of stepping motor



Motor code	Motor type	Driver type
T002	TS3682N2	TD-5M13-L



Motor code	Motor type	Driver type
T003	TS3692N2	eTD-24A



No.	System configuration	Model code		
①	Micro-precision positioning table TM	TM15-20		
	Motor code	T001 [AC servo motor]	T002 [Stepping motor (Five phases)]	T003 [Stepping motor (Two phases)]
②	Driver	TA8410N7318E913	TD-5M13-L	eTD-24A
③	Motor cord	EU9614N□0	TAE20S6-SM0□ (TAE20S7-SN0□)	TAE20S8-SM0□ (TAE20S9-SN0□)
④	Resolver cord	EU9615N□0	—	—
⑤	Program Controller	CTN480G		
⑥	Teaching box	TAE10M5-TB		
⑦	Pulse · Limit cord	TAE10U5-LD0□ (TAE10U6-LD0□)	TAE10U7-LD0□ (TAE10U8-LD0□)	TAE10U9-LD0□ (TAE10V0-LD0□)
⑧	Power supply cord ^(*)	Prepared by customer		

Note⁽¹⁾ If you specify "Without sensor," no sensor amplifier will be delivered.

^(*) Power supply DC24V shall be prepared by customer.

Connector set (EU9647N0006) needs to be prepared separately for a power supply. For details, consult IKO.

Remarks 1. Pulse limit cord in (), along with motor cord and resolver cord have high bending resistance.

2. The lengths of motor cord and resolver cord can be specified by increments of 1m up to 3m maximum in □ at the end of supplemental code. (Example of 3m: EU9614N30.) The lengths of limit cord of pulse limit cord can be specified by increments of 1m up to 3m maximum in □ at the end of supplemental code. (Example of 3m: TAE10U5-LD03.) If you wish to use one 3m or longer, consult IKO.

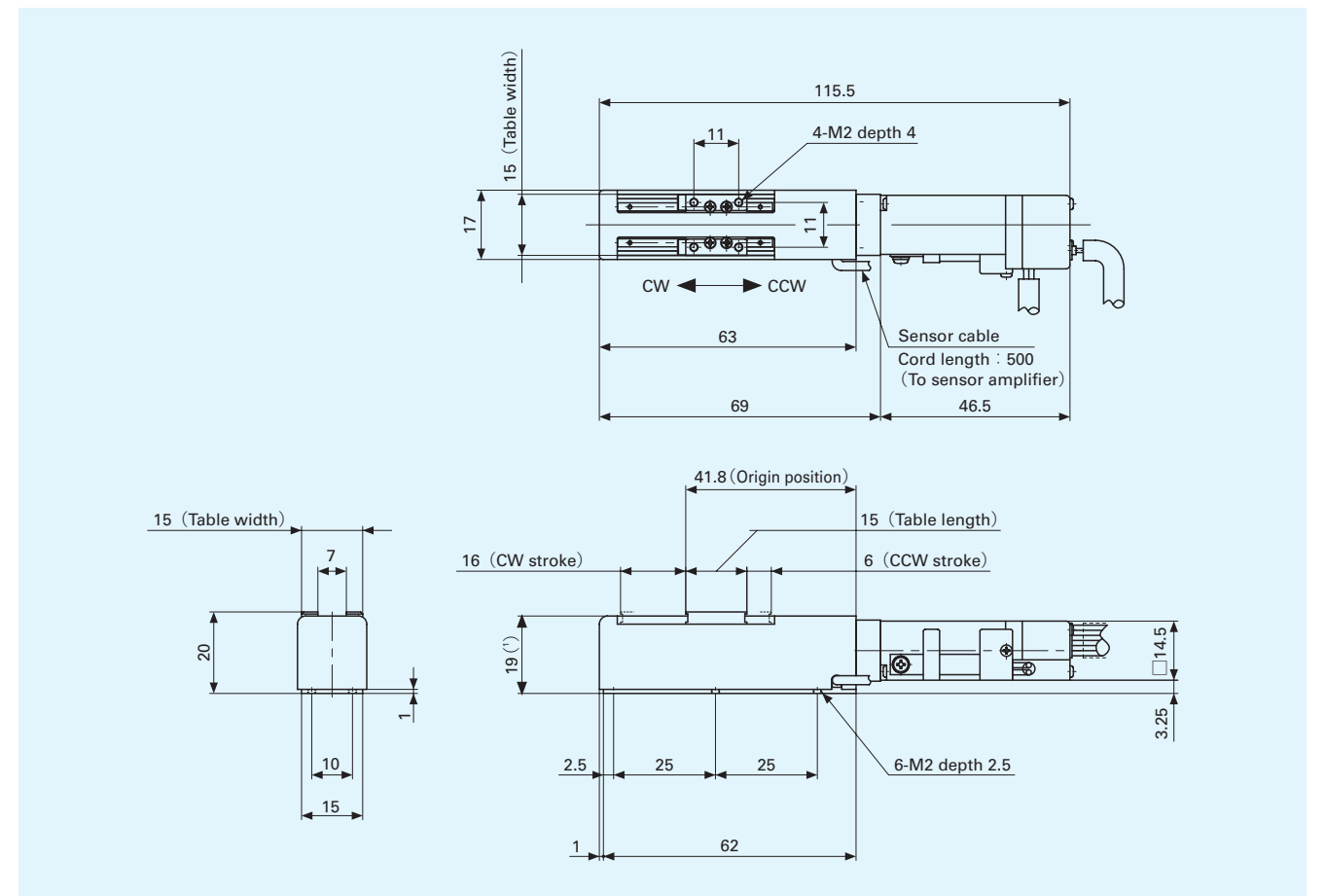
3. The length of pulse cord of pulse limit cord is 1.5m.

Options for AC servo motor·Driver

Name	Models	Accessories			
		Name	Description	Models	Remark
Communication unit	TA8433N1	CN1 communication connector	Connector plug	734-105	WAGO Company of Japan, Ltd.
		CN2 power connector	Connector	231-102/026-000	
RS232C cable	EU6517N2	—	—	—	—
Set of connectors	EU9647N0006	CN1 main power connector	Housing	5557-02R	Molex Japan Co., Ltd.
			Terminal	5556TL (2pcs.)	
		CN2 control signal connector	Connector plug	734-105	HIROSE ELECTRIC Co., Ltd.
		CN7 I/O connection connector	Socket	HIF3BA-16D-2.54R	
		CN8 I/O connection connector	Socket	HIF3BA-14D-2.54R	
CN10 analog monitor connector	Socket	DF11-4DS-2C			
	Contact	DF11-2428SC (4pcs.)			

Remark Communication units and RS232C cables will be necessary in setting the parameters of the driver.

TM15



Note⁽¹⁾ Refer page 9 if stepping motor is required.

Remark Table cover is made of resin. If a stainless steel table cover is required, consult IKO.

Cautions in Use

- ◆ IKO Micro Precision Positioning Table TM is a precision device. Therefore, handle it with great care and do not apply any excessive load or strong impact on it.
- ◆ Make sure that the mounting base is free from dirt and harmful protuberances.
- ◆ The linear motion rolling guide and ball screws assembled in IKO Micro Precision Positioning Table TM are lubricated with grease. So take extreme care not to allow dirt or any foreign matters enter into the unit.
- ◆ The best way to lubricate IKO Micro Precision Positioning Table TM varies by operating conditions. In general, wipe off the old grease every 6 months and apply new grease. A special-purpose re-greasing tool (a miniature grease injector) is available. If you require one, please consult IKO.
- ◆ IKO Micro Precision Positioning Table TM makes use of a resin table cover. Therefore do not clean it with degreasing organic solvent, white kerosene or something similar.
- ◆ IKO Micro Precision Positioning Table TM is machined, assembled and adjusted with high accuracy. Accordingly never disassemble or remodel it in any case.
- ◆ The wiring in the motor, sensor and other electrical installations is very thin cabling. Therefore guard sufficiently against wire breaks due to hooking, pulling or other inadvertent action.

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

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Recognizing that conservation of the global environment is the top-priority challenge for the world's population, **IKO** will conduct its activities with consideration of the environment as a corporate social responsibility, reduce its negative impact on the environment, and help foster a rich global environment.

**ISO 9001 & 14001 Quality system
registration certificate**

