MOTORIZED STAGES

High-Grade Stage

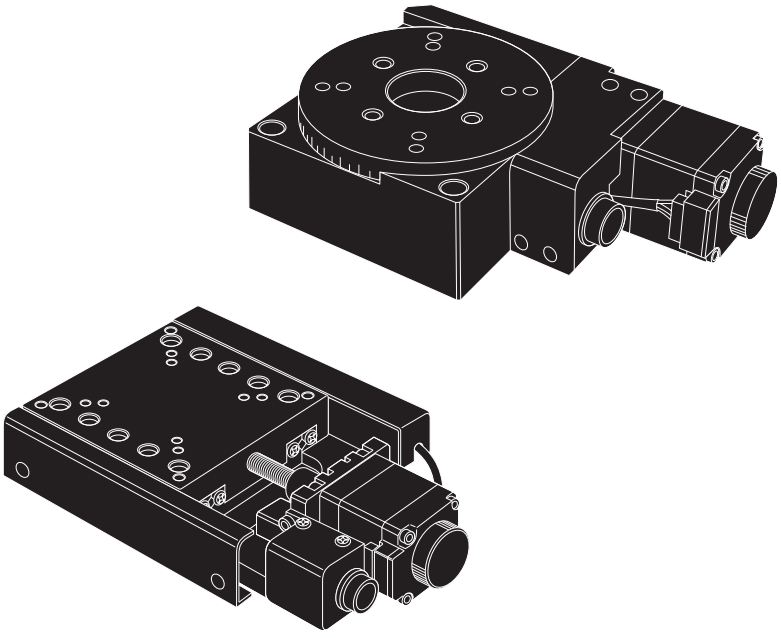
(Motorized)

X Stage / XY Stage / Z Stage / Rotary Stage

0.75 A/phase

Instruction Manual

Thank you for purchasing our product.
Please read this manual thoroughly to use the product in a correct, safe manner, and keep it where it can be referred to at any time.



THK CHUO

Introduction

About this manual

This manual explains all 52 models of the High-Grade Stage (Motorized). Refer to the appropriate sections that correspond to the product you purchased.

- Installation procedure and connection to other devices vary depending on the model.
- Some models are used as representative examples for explanations and illustrations.

Types of High-Grade Stages (Motorized)

The following table shows the types of High-Grade Stages (Motorized)

		Precision screw type		Ball screw type	
Travel direction and stage surface		Standard	Symmetrical	Standard	Symmetrical
X Stage	40 mm × 40 mm	TALS-4011-G0M	TALS-4011-G0M-R	TALS-4011-G1M	TALS-4011-G1M-R
	50 mm × 50 mm	TALS-5012-G0M	TALS-5012-G0M-R	TALS-5012-G1M	TALS-5012-G1M-R
	60 mm × 60 mm	TALS-6012-G0M	TALS-6012-G0M-R	TALS-6012-G1M	TALS-6012-G1M-R
	70 mm × 70 mm	TALS-7013-G0M	TALS-7013-G0M-R	TALS-7013-G1M	TALS-7013-G1M-R
XY Stage	40 mm × 40 mm	TALD-4011-G0M	TALD-4011-G0M-R	TALD-4011-G1M	TALD-4011-G1M-R
	50 mm × 50 mm	TALD-5012-G0M	TALD-5012-G0M-R	TALD-5012-G1M	TALD-5012-G1M-R
	60 mm × 60 mm	TALD-6012-G0M	TALD-6012-G0M-R	TALD-6012-G1M	TALD-6012-G1M-R
	70 mm × 70 mm	TALD-7013-G0M	TALD-7013-G0M-R	TALD-7013-G1M	TALD-7013-G1M-R
Z Stage	40 mm × 40 mm	TALZ-4011-G0M	TALZ-4011-G0M-R	TALZ-4011-G1M	TALZ-4011-G1M-R
	50 mm × 50 mm	TALZ-5012-G0M	TALZ-5012-G0M-R	TALZ-5012-G1M	TALZ-5012-G1M-R
	60 mm × 60 mm	TALZ-6012-G0M	TALZ-6012-G0M-R	TALZ-6012-G1M	TALZ-6012-G1M-R
	70 mm × 70 mm	TALZ-7013-G0M	TALZ-7013-G0M-R	TALZ-7013-G1M	TALZ-7013-G1M-R
Rotary Stage	ø 40 mm	TARS-4036-GM			
	ø 50 mm	TARS-5036-GM			
	ø 60 mm	TARS-6036-GM			
	ø 70 mm	TARS-7036-GM			

Contents

1 Features

Ample product lineup

A total of 52 models of High-Grade Stage (Motorized) are available. There are four sizes of the stage surface (40 mm / 50 mm / 60 mm / 70 mm) and two different types, i.e., standard type and symmetrical type with different connector and sensor housing mounting positions (for X/XY/Z Stages).
Select an appropriate stage according to the purpose of use.
All products are colored black in consideration of the effect on optical devices.

All models are equipped with a home sensor as standard

All the 52 models of High-Grade Stage (Motorized) are equipped with a home sensor (photo sensor) as standard. High precision home return is possible.

Utilizes the HG-VCR method (X/XY/Z Stages)

These products utilize the newly developed HG-VCR method. Compared with the conventional VCR method, the HG-VCR method can accommodate more cross rollers with a large diameter, thereby achieving a high load capacity and high accuracy. In addition, the HG-VCR method has excellent impact resistance and high rigidity.

Light weight and high rigidity (X/XY/Z Stages)

The main body is made of aluminum alloy to reduce the weight. A part of the guide rail is integrated in to the main body to achieve high rigidity.

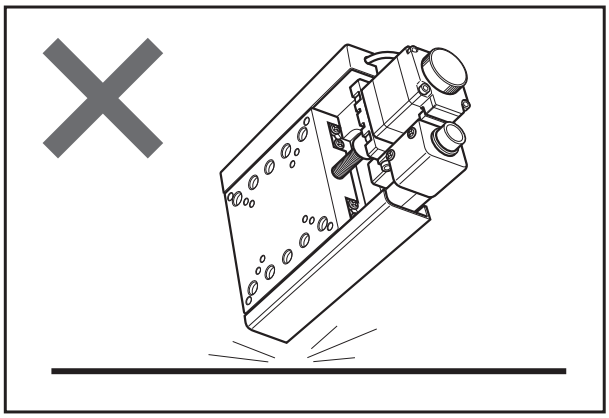
2 Supplied Accessories

The product comes with the following accessories. Make sure necessary accessories are provided when unpacking. If there is any missing item, please contact THK.

Hexagon socket head cap screw (for fixing the stage)

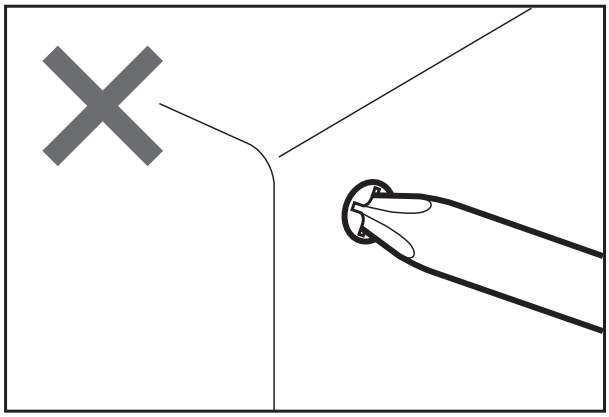
M3 (for 40 mm / 50 mm surface stages) 4 (3)
M4 (for 60 mm / 70 mm surface stages) 4 (3)
Number for Rotary Stage in parentheses

3 Precautions for Use



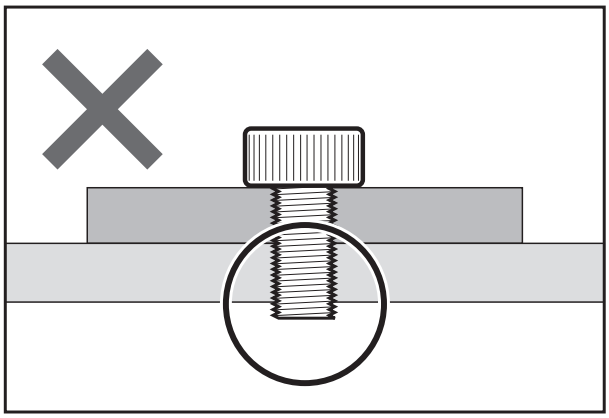
Do not subject the product to impacts

The product consists of precision parts. Do not subject the product to impacts or use it in a place subject to vibrations caused by other devices. Operation within the guaranteed accuracy will not be possible.



Do not disassemble or modify the product

Never disassemble or modify the product since it is adjusted precisely. Doing so may cause the product to malfunction or move incorrectly. If accuracy is reduced or malfunction occurs due to disassembly or modification, the warranty will be voided. When modification or additional work is required, please contact THK.

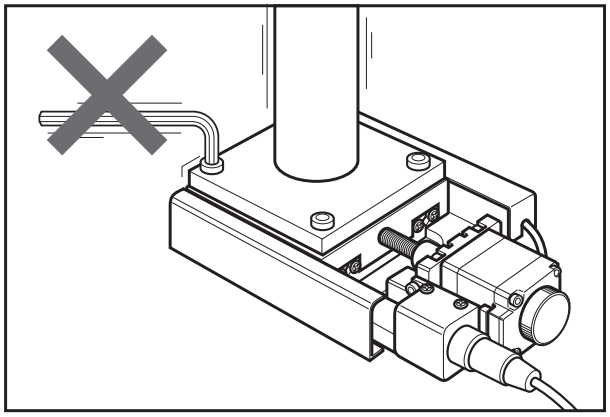


When securing other devices to the stage surface (1)

Pay attention to the length of mounting screws when securing other devices to the stage surface.

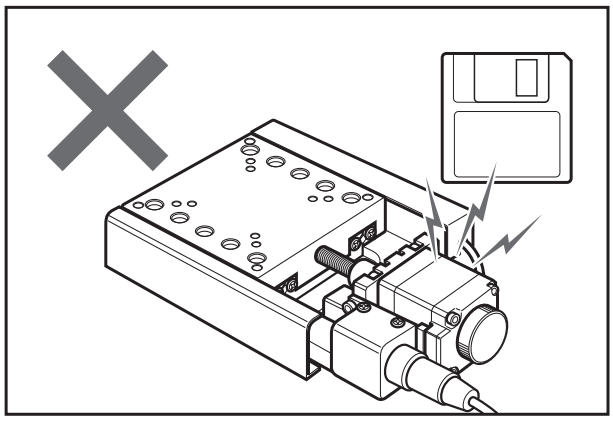
Stage type	Screw diameter	When mounting on the upper surface of the table	When mounting on the lower surface of the base
X/XY/Z	M3	8 mm or less	6 mm or less
	M4	10 mm or less	8.5 mm or less
Rotary	M2	3.5 mm or less	-
	M3	6 mm or less	-

If the screw is too long, it may cause damage. Refer to “5. Main Specifications” for details.



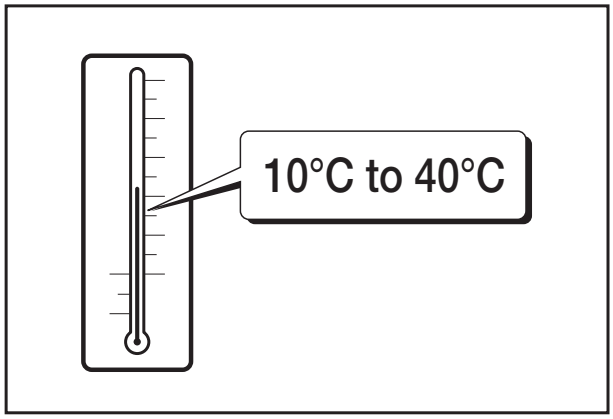
When securing other devices to the stage surface (2)

When securing other devices to the stage surface, secure the moving part firmly so that an excessive force will not be applied, then attach devices. Note that applying force without securing the moving part may affect accuracy or damage the moving part.



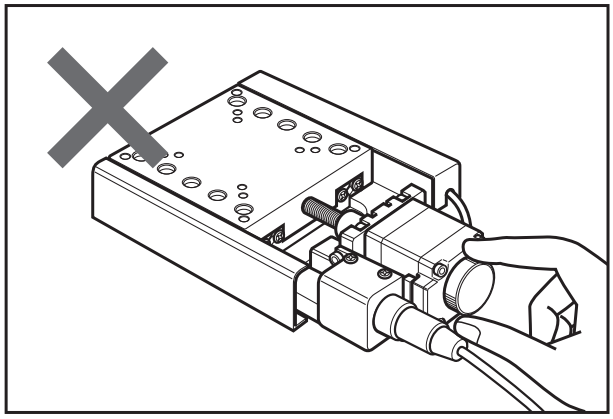
Keep away from magnetic recording media

The motor in the stage uses a powerful magnet. Keep magnetic recording media away from the stage. Otherwise data corruption may occur.



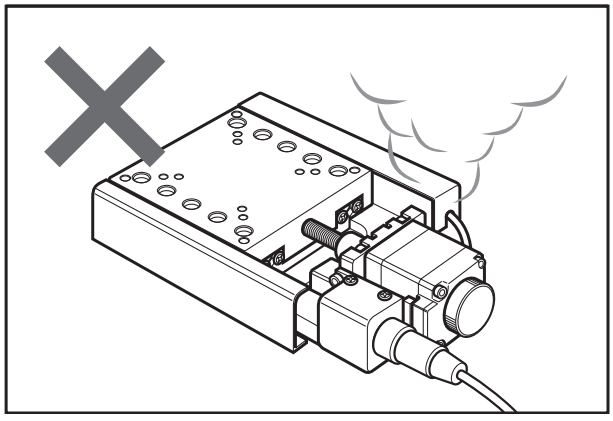
Use the product in an appropriate operating environment

Do not use the product in a place where the ambient temperature is extremely high or low, the ambient temperature changes drastically, or in a place with a lot of dust. Use the product at an ambient temperature of 10°C to 40°C, and an ambient humidity of 20% to 80% RH.



Do not touch the moving stage

When operating the stage with the controller, do not touch the moving stage and manual knobs.
Accurate operation will not be possible and it may cause the product to malfunction or move incorrectly. Also, your fingers may be caught and injured.
The motor generates heat during use. Be careful not to touch the motor as this may cause burns.



If a problem occurs

If abnormal noise, odor, or smoke occurs during use, immediately stop using the product, turn off the controller (driver), unplug the power plug from the outlet, and contact the distributor or THK.

4 Installation

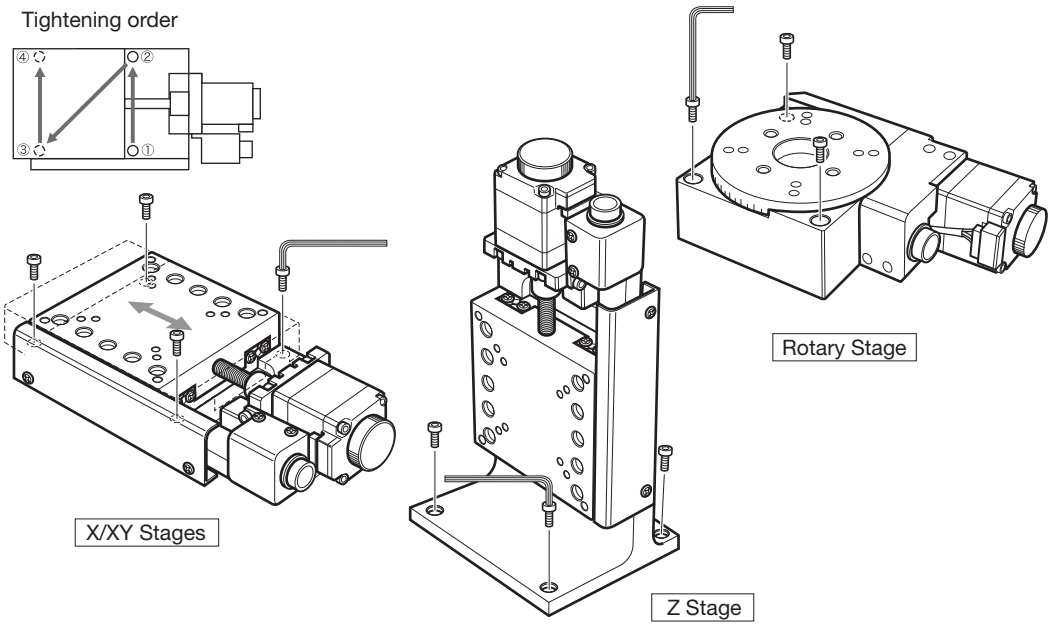
4.1 Precautions for Installation

- Install the stage with the supplied hexagon socket head cap screws on a solid work bench.
- The spacing of the mounting holes and the diameter of the hexagon socket head cap screws vary depending on the model. Before mounting, refer to “5. Main Specifications” (p. 10) and apply threading on the installation surface.
- When installing the X/XY stages, the table should be moved so that the mounting holes are visible. Refer to “4.3. Moving the Stage during Installation” (p. 7) for details.
- If the flatness of the surface on which the stage is installed is insufficient, the stage performance will not be fully realized, and it may also cause failure or malfunction. Pay sufficient attention to the accuracy of the installation surface.
- Be careful of dirt and scratches on the installation surface and the stage bottom.
- If you moved the stage manually, be sure to return it manually to the center position after installation. If the stage is used at the moved position, the limit sensor may be out of the detection range. Continuing motor drive operation may cause failure or malfunction (for X/XY/Z Stage only).

4.2 Stage Installation

Install the Z Stage using the holes on the bracket. Install the rotary stage by inserting screws into the three holes on the upper surface of the stage.
The mounting holes of the X Stage are hidden under the table, so move the stage as described below and then install the stage.
*For the XY Stage, move the table of the lower axis in the same manner

1. Move the table so that the mounting holes (1) and (2) are visible.
2. Insert the supplied hexagon socket head cap screws and lightly tighten them with a hex wrench (temporary tightening at this step).
3. Move the table in the opposite direction so that the mounting holes (3) and (4) are visible, and fix them securely with the supplied screws.
4. Return the table to the position in step 2 and tighten the temporarily tightened screws securely.



4.3 Moving the Stage during Installation

There are two ways to move the stage: manually by turning the knob and automatically with the controller (driver).

Caution

- When moving the stage manually, be sure to turn off the controller. If the manual knob is turned with the controller turned on, the product may malfunction or move incorrectly.
- When moving the stage automatically, be careful not to pinch your fingers or tools. It may cause the product to malfunction or move incorrectly, and moreover, you may be injured.
- For some models, the mounting holes will be hidden when the stage is moved automatically. If this happens, turn off the controller and move the stage manually.

5 Main Specifications

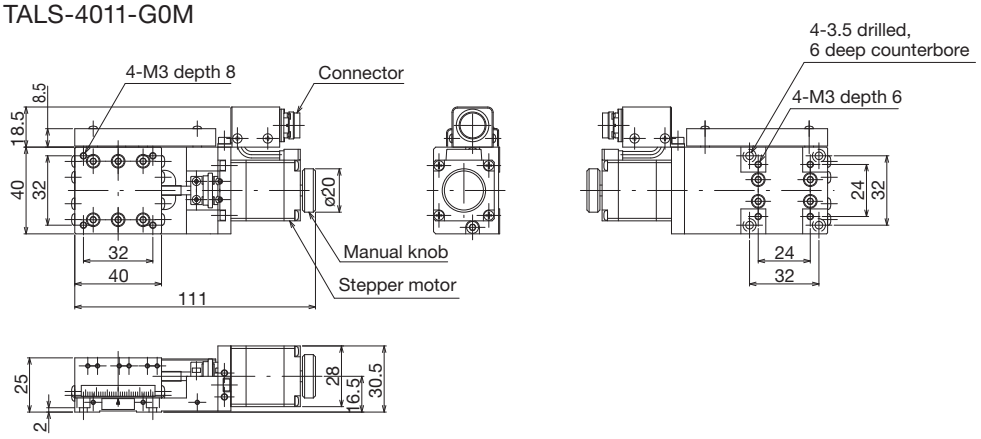
5.1 Stage

X Stage (40 mm)

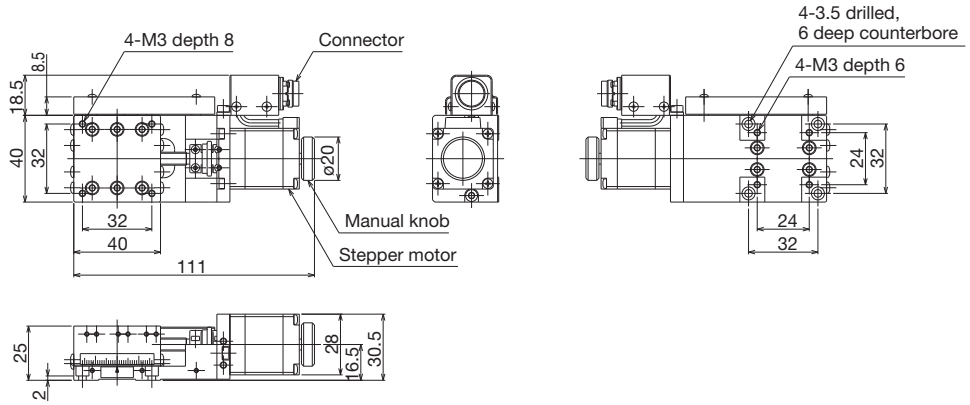
Product No.	TALS-4011-G0M Precision screw type (standard)	TALS-4011-G1M Ball screw type (standard)
	TALS-4011-G0M-R Precision screw type (symmetrical)	TALS-4011-G1M-R Ball screw type (symmetrical)
Travel direction	X axis single direction	
Travel amount	± 7.5 mm	
Stage surface	40 mm x 40 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.010 mm	0.006 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.02 mm	0.015 mm
Moment rigidity	Yaw rigidity 0.25sec / N·cm Pitch rigidity 0.3sec / N·cm Roll rigidity 0.3sec / N·cm	
Load capacity	49 N (5 kgf)	
Mass	0.32 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

X Stage (40 mm) external view

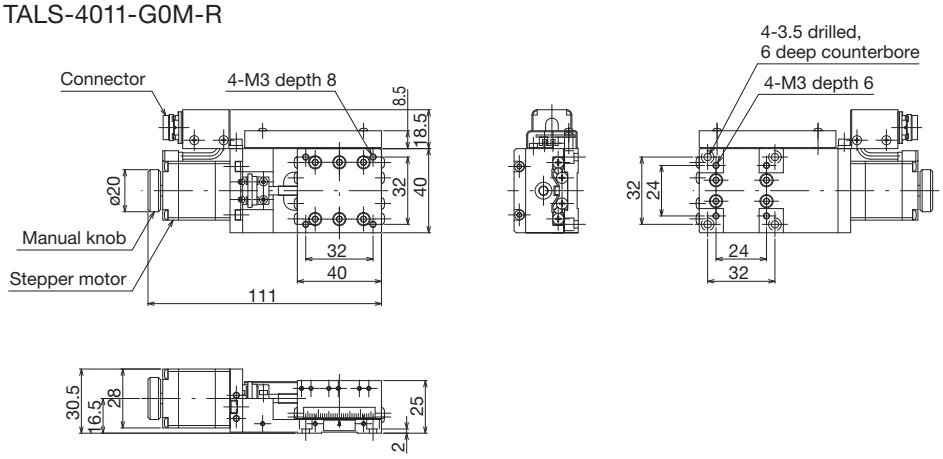
TALS-4011-G0M



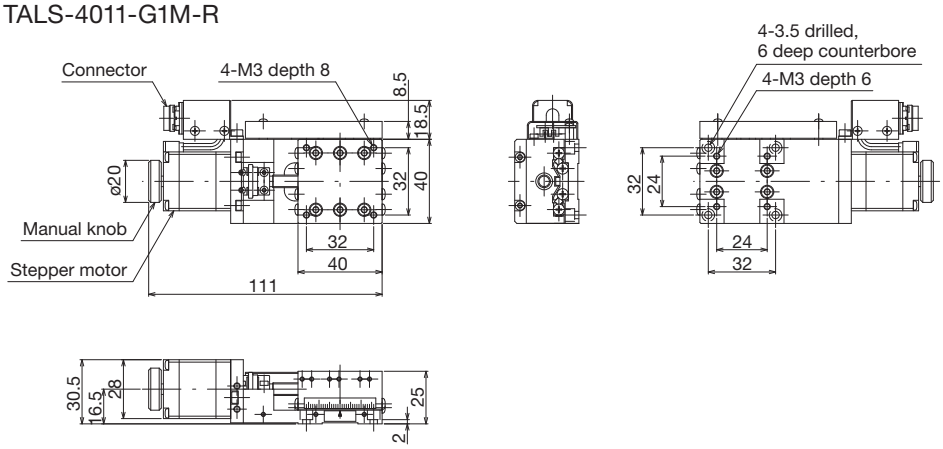
TALS-4011-G1M



TALS-4011-G0M-R



TALS-4011-G1M-R

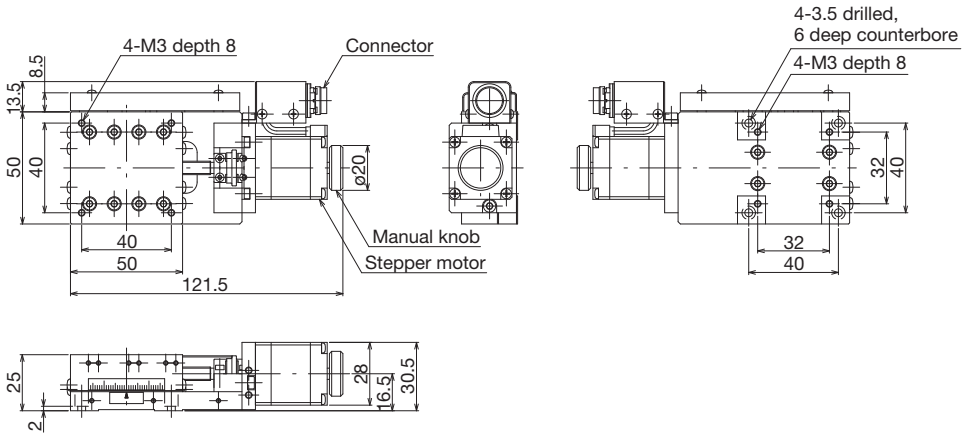


X Stage (50 mm)

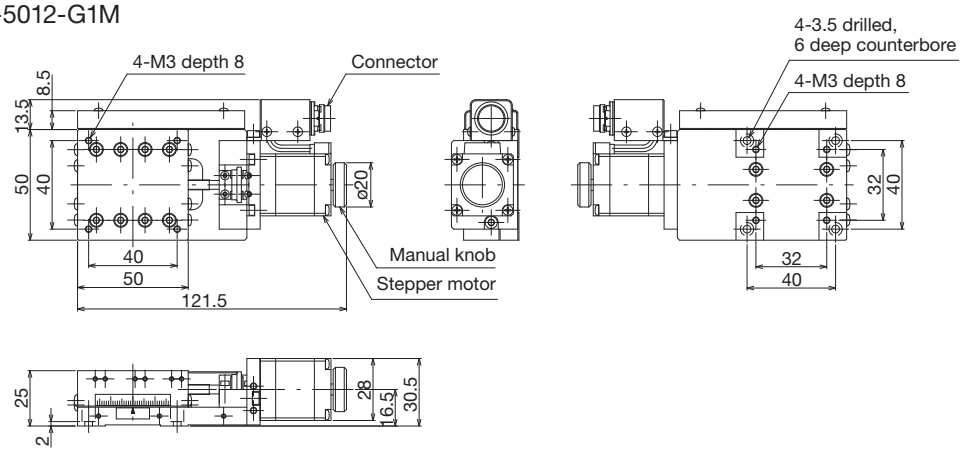
Product No.	TALS-5012-G0M Precision screw type (standard)	TALS-5012-G1M Ball screw type (standard)
	TALS-5012-G0M-R Precision screw type (symmetrical)	TALS-5012-G1M-R Ball screw type (symmetrical)
Travel direction	X axis single direction	
Travel amount	± 10 mm	
Stage surface	50 mm x 50 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.012 mm	0.008 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.015 mm	0.01 mm
Moment rigidity	Yaw rigidity 0.15 sec / N·cm Pitch rigidity 0.2 sec / N·cm Roll rigidity 0.2 sec / N·cm	
Load capacity	49 N (5 kgf)	
Mass	0.4 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

X Stage (50 mm) external view

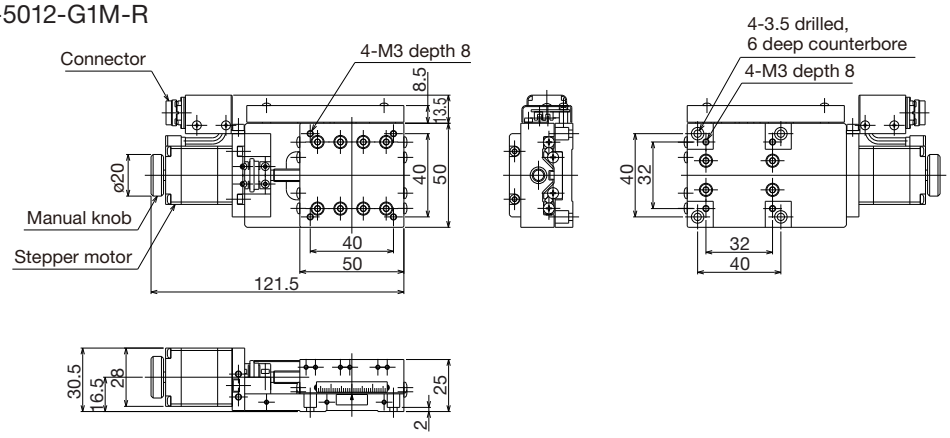
TALS-5012-G0M



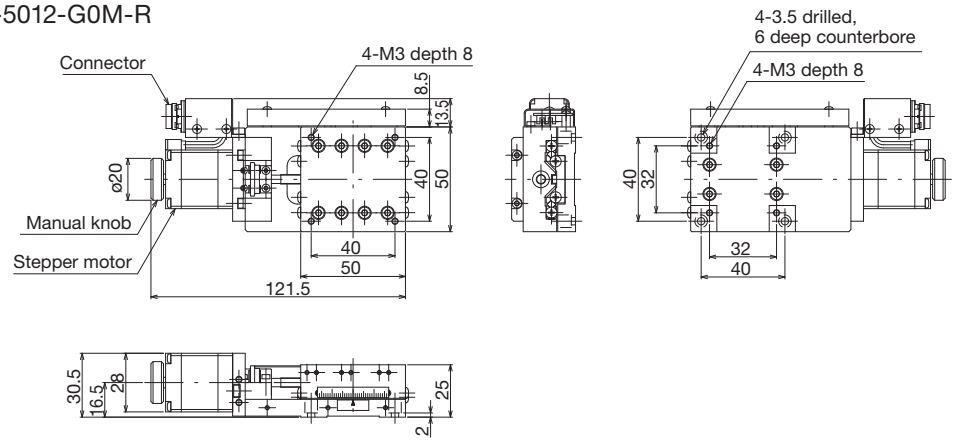
TALS-5012-G1M



TALS-5012-G1M-R



TALS-5012-G0M-R

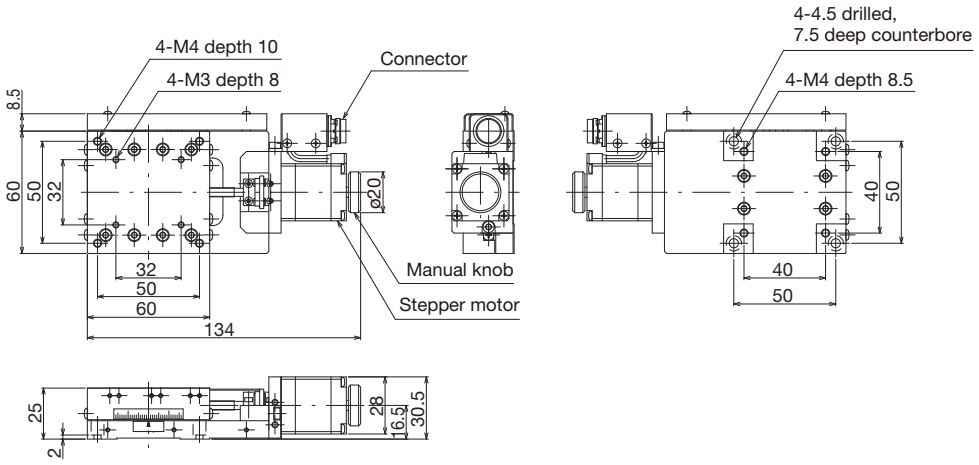


X Stage (60 mm)

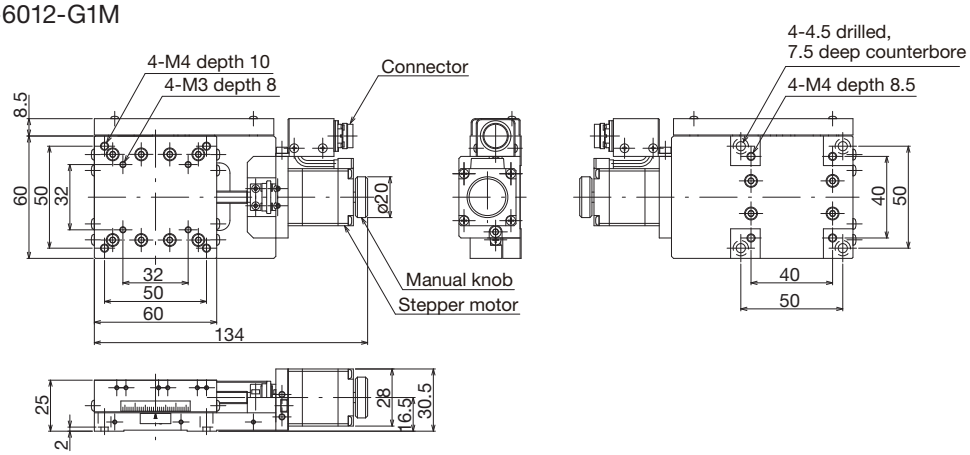
Product No.	TALS-6012-G0M Precision screw type (standard)	TALS-6012-G1M Ball screw type (standard)
	TALS-6012-G0M-R Precision screw type (symmetrical)	TALS-6012-G1M-R Ball screw type (symmetrical)
Travel direction	X axis single direction	
Travel amount	± 12.5 mm	
Stage surface	60 mm x 60 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.014 mm	0.01 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.015 mm	0.01 mm
Moment rigidity	Yaw rigidity 0.1 sec / N·cm Pitch rigidity 0.1 sec / N·cm Roll rigidity 0.1 sec / N·cm	
Load capacity	49 N (5 kgf)	
Mass	0.50 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

X Stage (60 mm) external view

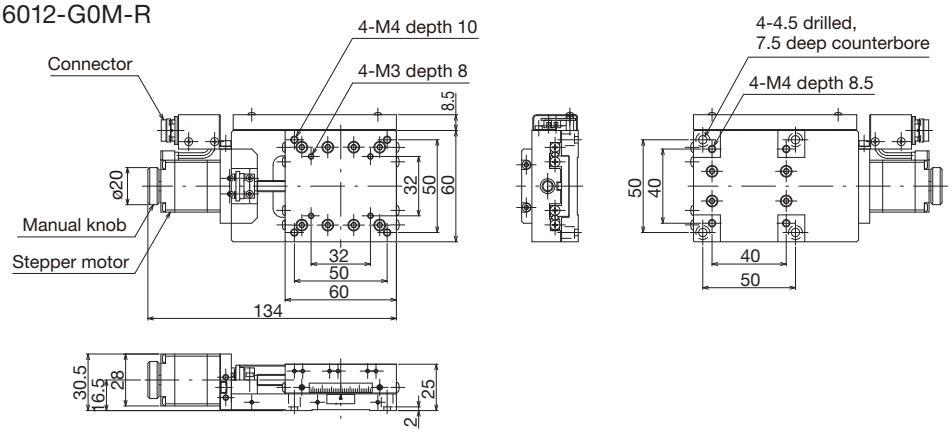
TALS-6012-G0M



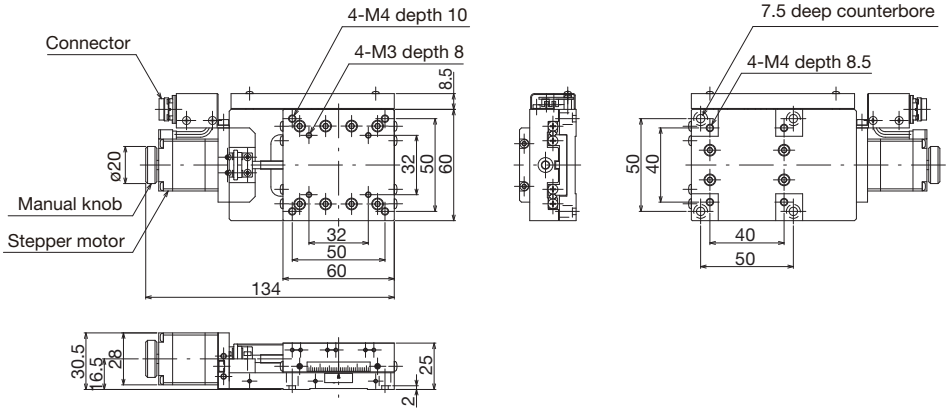
TALS-6012-G1M



TALS-6012-G0M-R



TALS-6012-G1M-R

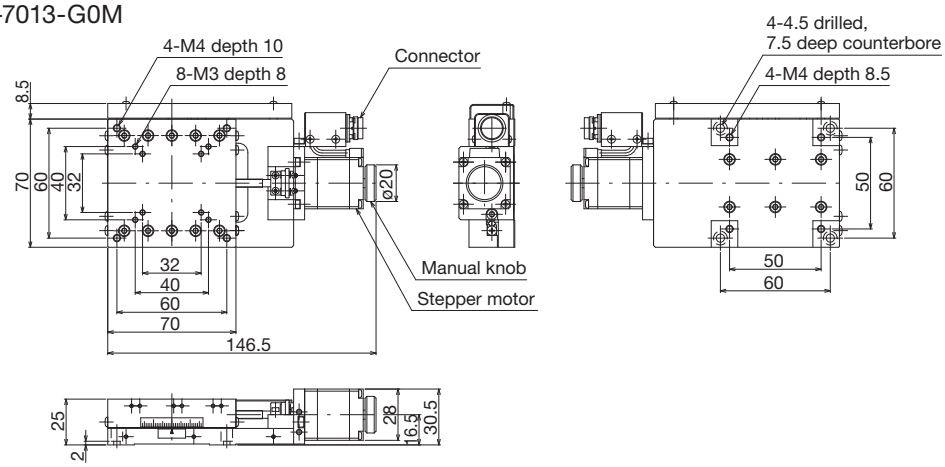


X Stage (70 mm)

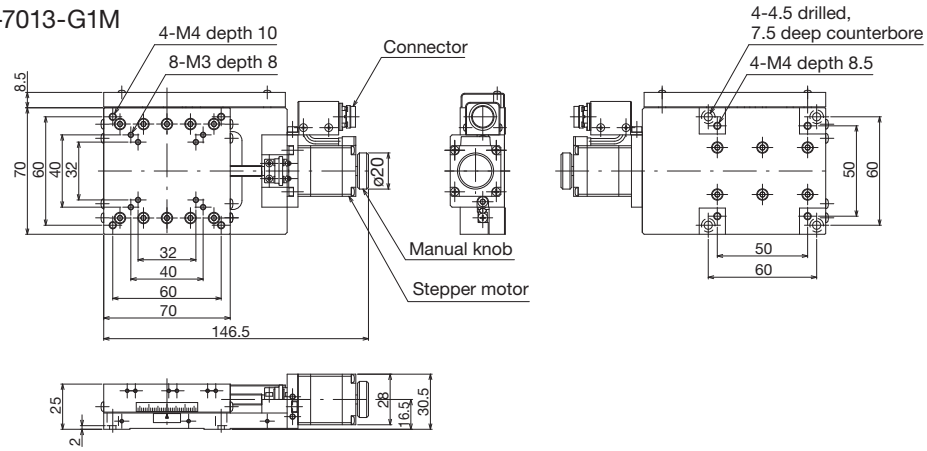
Product No.	TALS-7013-G0M Precision screw type (standard)	TALS-7013-G1M Ball screw type (standard)
	TALS-7013-G0M-R Precision screw type (symmetrical)	TALS-7013-G1M-R Ball screw type (symmetrical)
Travel direction	X axis single direction	
Travel amount	± 15 mm	
Stage surface	70 mm x 70 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.016 mm	0.012 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.015 mm	0.01 mm
Moment rigidity	Yaw rigidity 0.06 sec / N·cm Pitch rigidity 0.08 sec / N·cm Roll rigidity 0.08 sec / N·cm	
Load capacity	49 N (5 kgf)	
Mass	0.62 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

X Stage (70 mm) external view

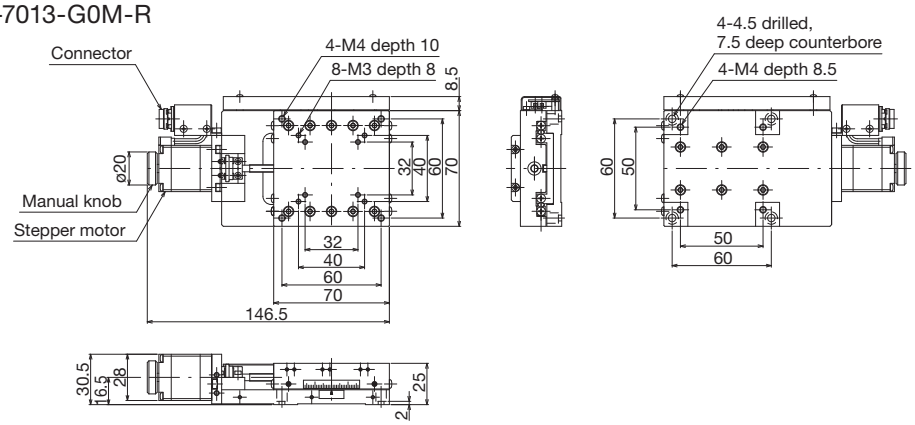
TALS-7013-G0M



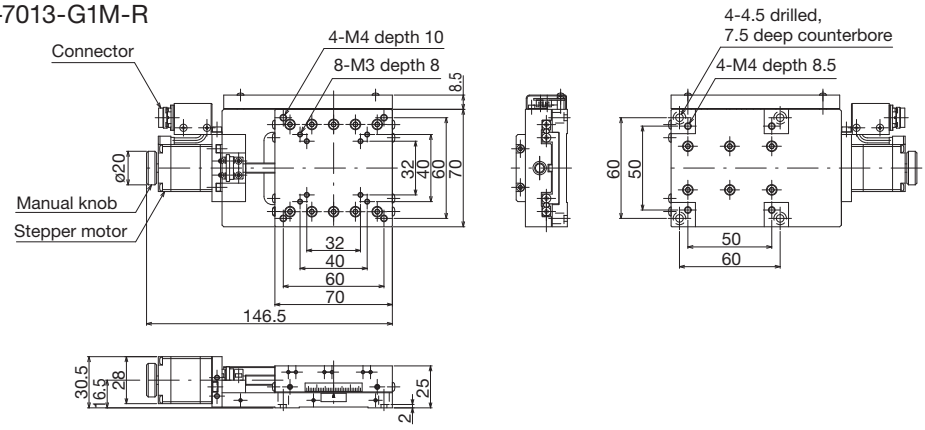
TALS-7013-G1M



TALS-7013-G0M-R



TALS-7013-G1M-R

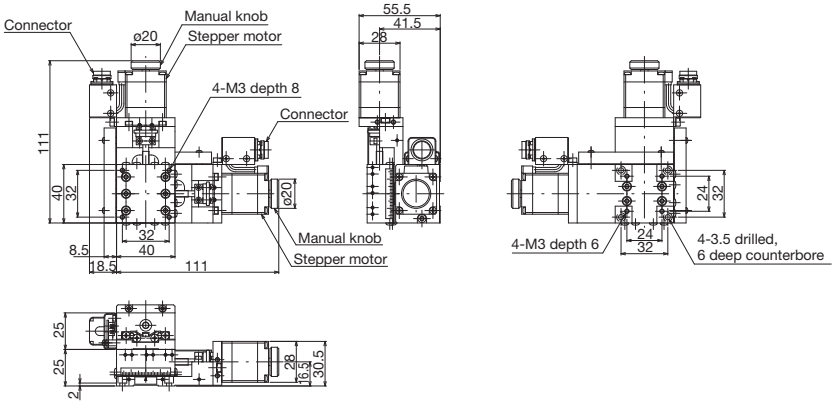


XY Stage (40 mm)

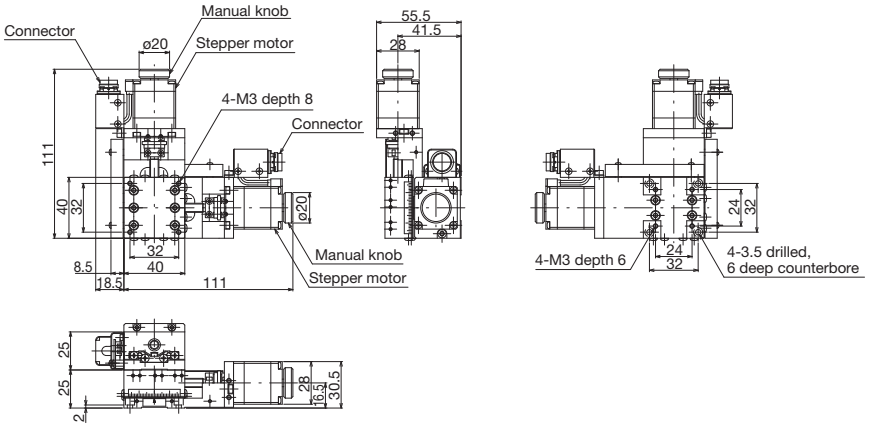
Product No.	TALD-4011-G0M Precision screw type (standard)	TALD-4011-G1M Ball screw type (standard)
	TALD-4011-G0M-R Precision screw type (symmetrical)	TALD-4011-G1M-R Ball screw type (symmetrical)
Travel direction	XY axis double direction	
Travel amount	± 7.5 mm	
Stage surface	40 mm x 40 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.01 mm	0.006 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.04 mm	0.03 mm
XY orthogonality	0.006 mm	
Moment rigidity	Yaw rigidity 0.5 sec / N·cm Pitch rigidity 0.6 sec / N·cm Roll rigidity 0.6 sec / N·cm	
Load capacity	39.2 N (4 kgf)	
Mass	0.64 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

XY Stage (40 mm) external view

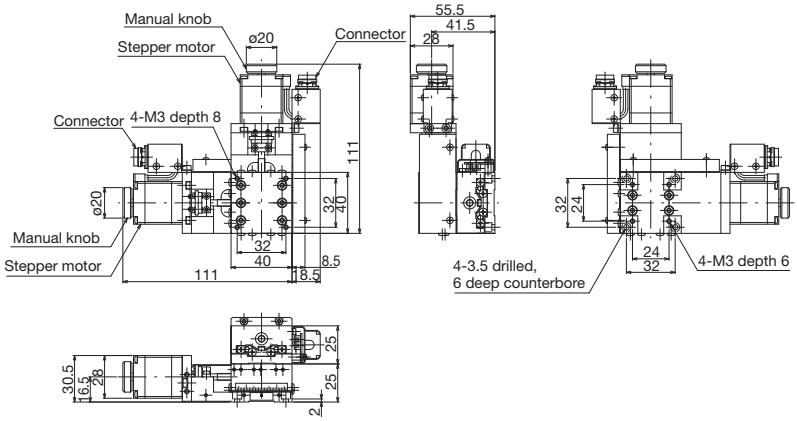
TALD-4011-G0M



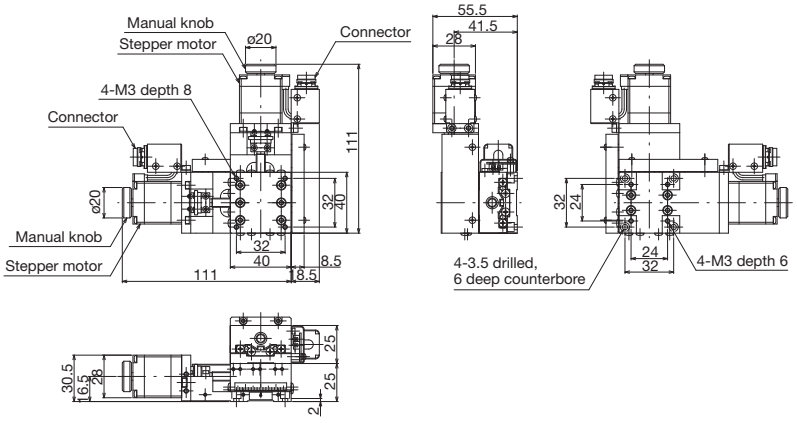
TALD-4011-G1M



TALD-4011-G0M-R



TALD-4011-G1M-R

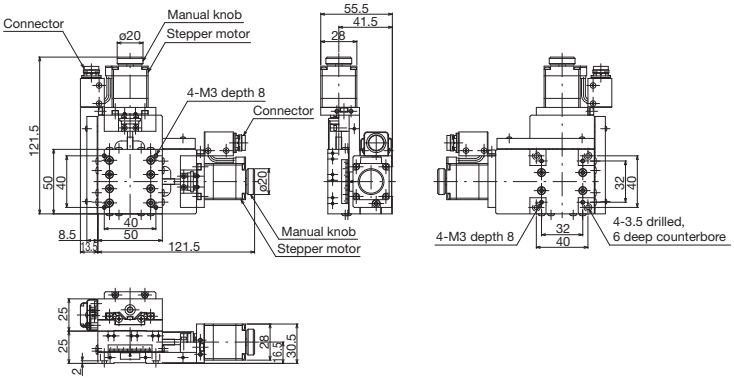


XY Stage (50 mm)

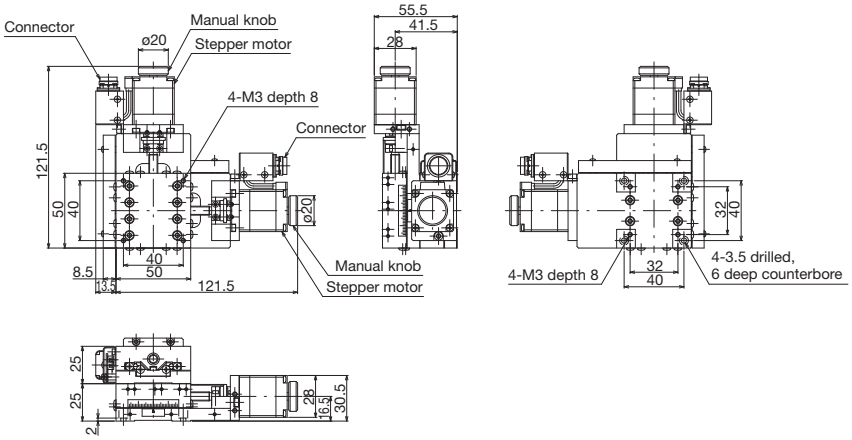
Product No.	TALD-5012-G0M Precision screw type (standard)	TALD-5012-G1M Ball screw type (standard)
	TALD-5012-G0M-R Precision screw type (symmetrical)	TALD-5012-G1M-R Ball screw type (symmetrical)
Travel direction	XY axis double direction	
Travel amount	± 10 mm	
Stage surface	50 mm x 50 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.012 mm	0.008 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.03 mm	0.02 mm
XY orthogonality	0.006 mm	
Moment rigidity	Yaw rigidity 0.3 sec / N·cm Pitch rigidity 0.4 sec / N·cm Roll rigidity 0.4 sec / N·cm	
Load capacity	39.2 N (4 kgf)	
Mass	0.8 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

XY Stage (50 mm) external view

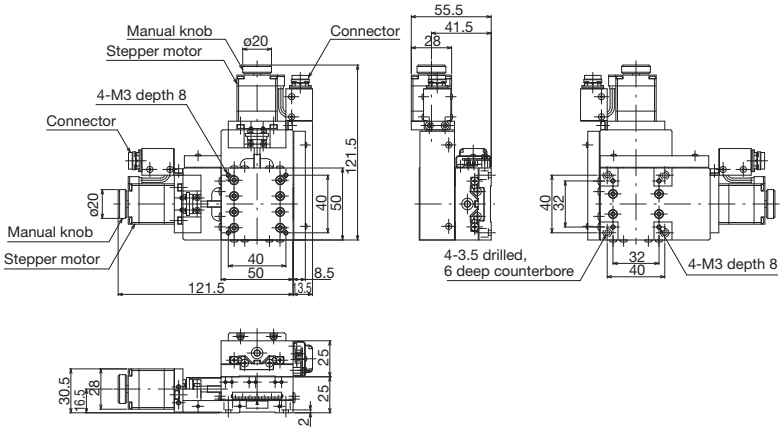
TALD-5012-G0M



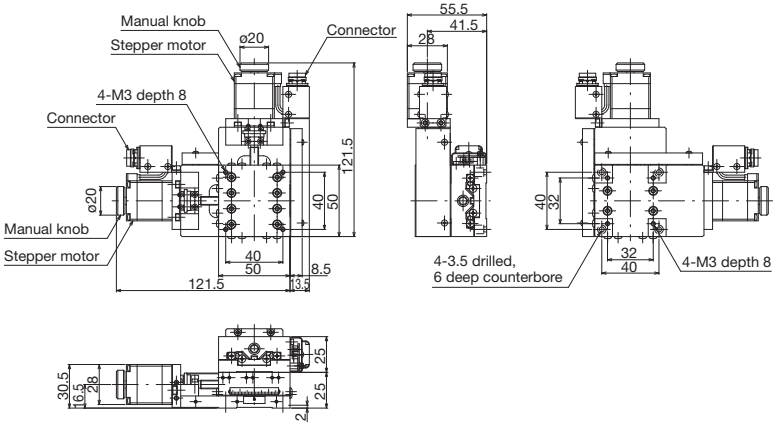
TALD-5012-G1M



TALD-5012-G0M-R



TALD-5012-G1M-R

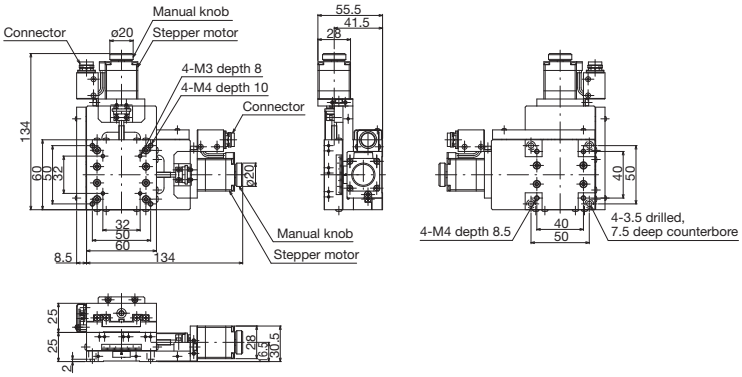


XY Stage (60 mm)

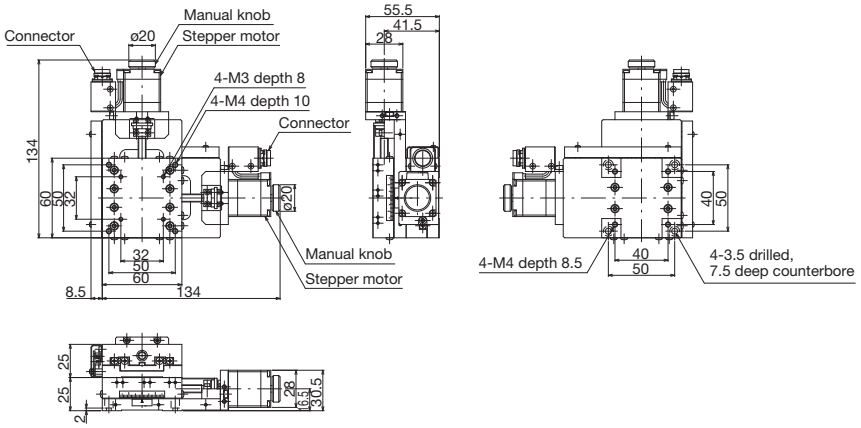
Product No.	TALD-6012-G0M Precision screw type (standard)	TALD-6012-G1M Ball screw type (standard)
	TALD-6012-G0M-R Precision screw type (symmetrical)	TALD-6012-G1M-R Ball screw type (symmetrical)
Travel direction	XY axis double direction	
Travel amount	± 12.5 mm	
Stage surface	60 mm x 60 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.014 mm	0.01 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.03 mm	0.02 mm
XY orthogonality	0.006 mm	
Moment rigidity	Yaw rigidity 0.2 sec / N·cm Pitch rigidity 0.2 sec / N·cm Roll rigidity 0.2 sec / N·cm	
Load capacity	39.2 N (4 kgf)	
Mass	1.0 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

XY Stage (60 mm) external view

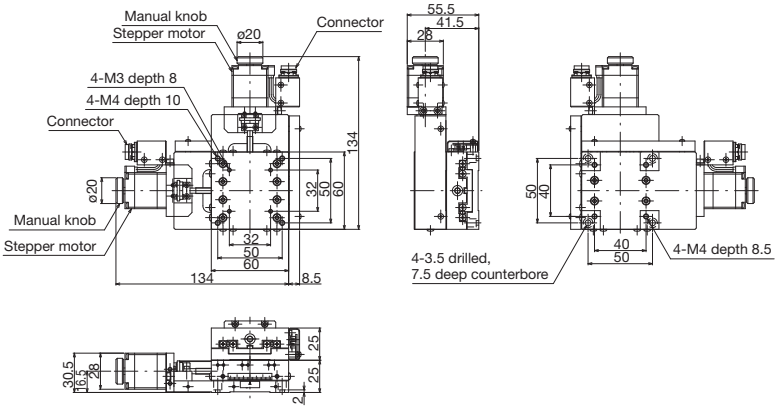
TALD-6012-G0M



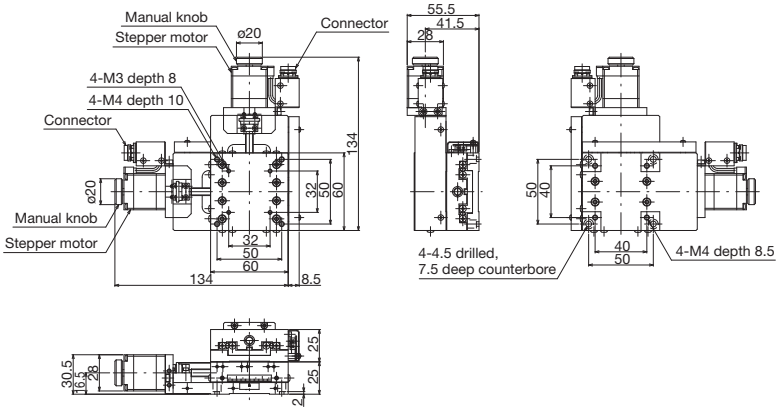
TALD-6012-G1M



TALD-6012-G0M-R



TALD-6012-G1M-R

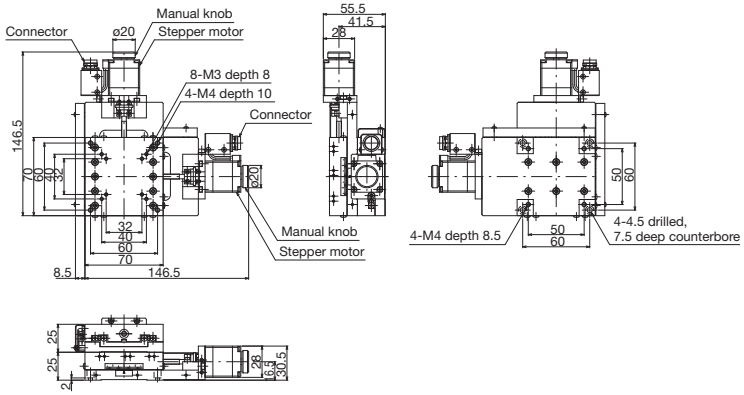


XY Stage (70 mm)

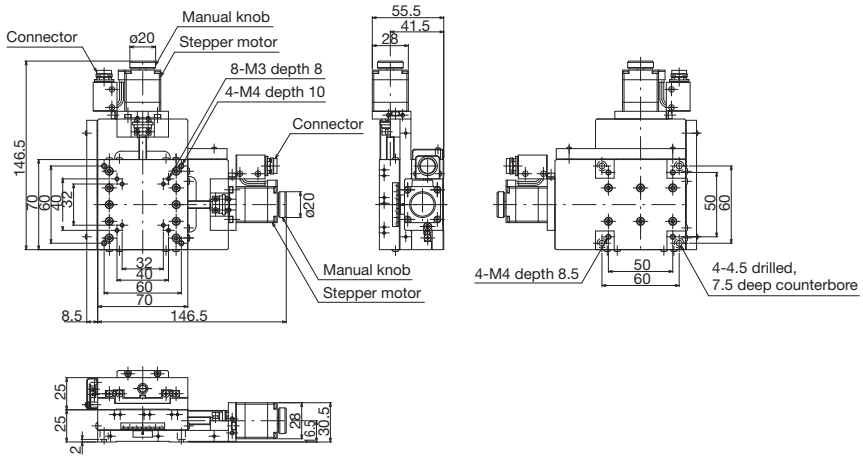
Product No.	TALD-7013-G0M Precision screw type (standard)	TALD-7013-G1M Ball screw type (standard)
	TALD-7013-G0M-R Precision screw type (symmetrical)	TALD-7013-G1M-R Ball screw type (symmetrical)
Travel direction	XY axis double direction	
Travel amount	± 15 mm	
Stage surface	70 mm x 70 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.016 mm	0.012 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Running parallelism	0.03 mm	0.02 mm
XY orthogonality	0.006 mm	
Moment rigidity	Yaw rigidity 0.12 sec / N·cm Pitch rigidity 0.16 sec / N·cm Roll rigidity 0.16 sec / N·cm	
Load capacity	39.2 N (4 kgf)	
Mass	1.2 kg	
Max. speed (at 8,000 pps)	8 mm/s	16 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

XY Stage (70 mm) external view

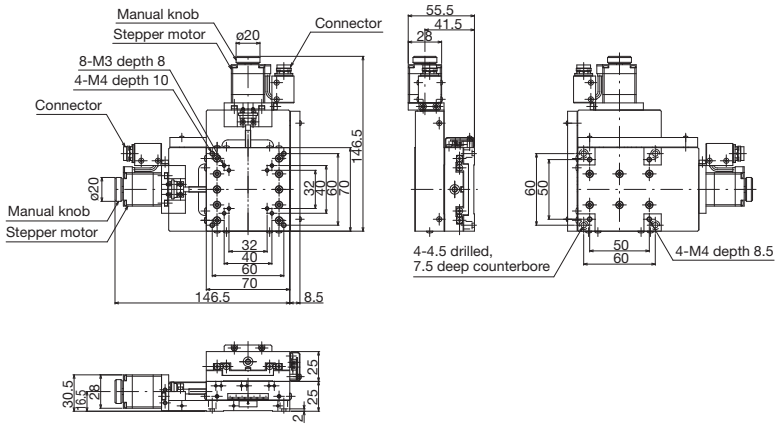
TALD-7013-G0M



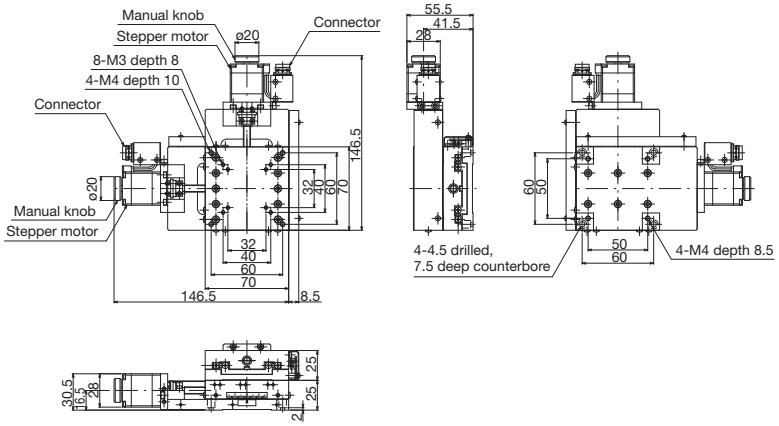
TALD-7013-G1M



TALD-7013-G0M-R



TALD-7013-G1M-R

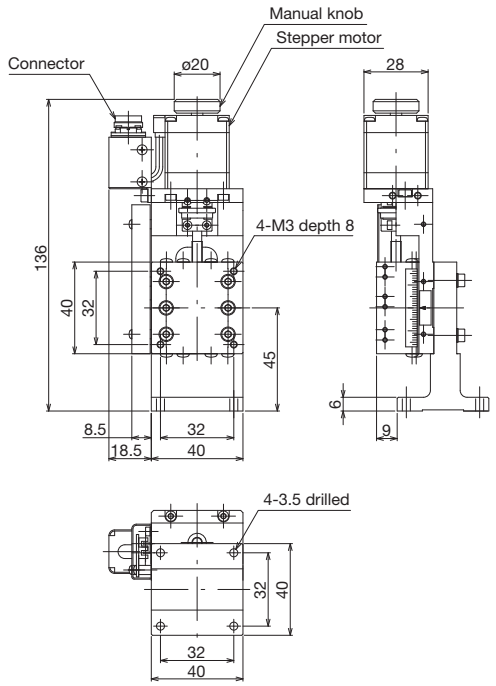


Z Stage (40 mm)

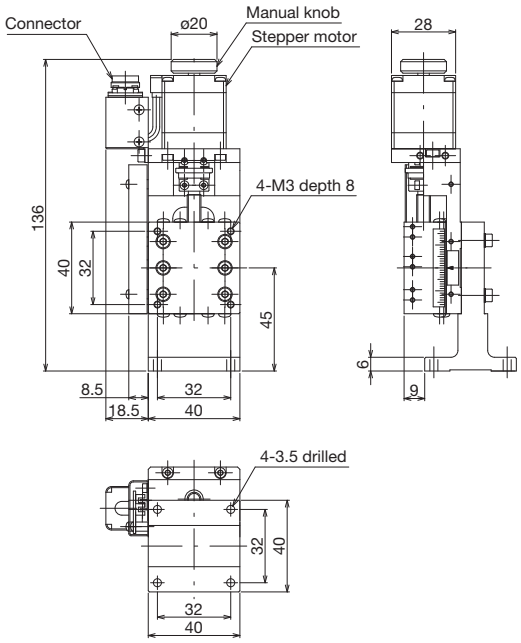
Product No.	TALZ-4011-G0M Precision screw type (standard)	TALZ-4011-G1M Ball screw type (standard)
	TALZ-4011-G0M-R Precision screw type (symmetrical)	TALZ-4011-G1M-R Ball screw type (symmetrical)
Travel direction	Z axis single direction	
Travel amount	± 7.5 mm	
Stage surface	40 mm x 40 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.01 mm	0.006 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Moment rigidity	Yaw rigidity 0.25 sec / N·cm Pitch rigidity 0.3 sec / N·cm Roll rigidity 0.3 sec / N·cm	
Load capacity	19.6 N (2 kgf)	
Mass	0.42 kg	
Max. speed (at 5,000 pps)	5 mm/s	10 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

Z Stage (40 mm) external view

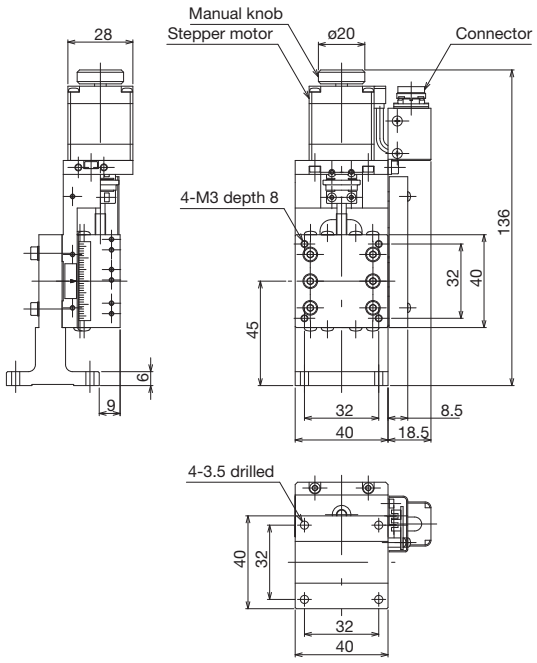
TALZ-4011-G0M



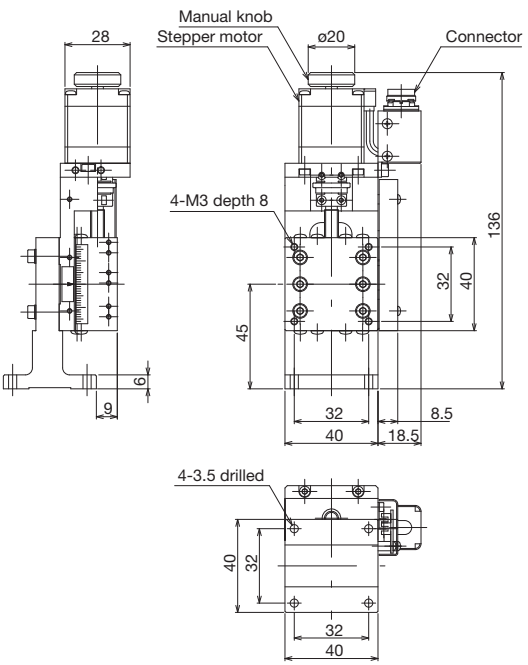
TALZ-4011-G1M



TALZ-4011-G0M-R



TALZ-4011-G1M-R

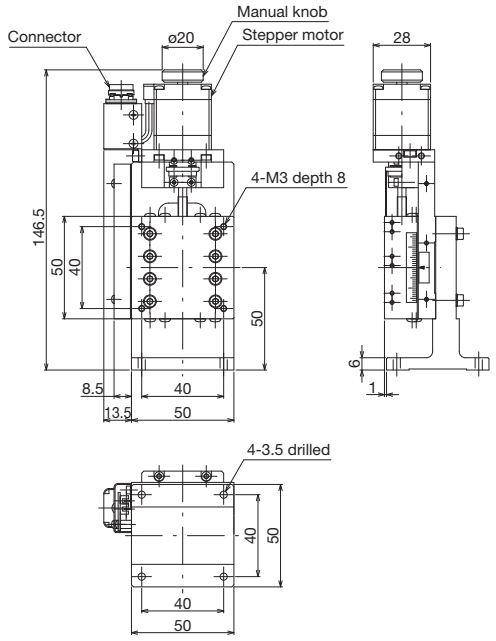


Z Stage (50 mm)

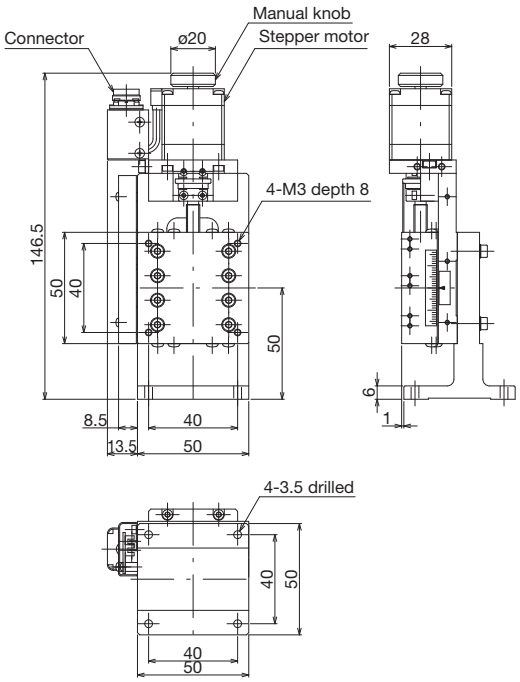
Product No.	TALZ-5012-G0M Precision screw type (standard)	TALZ-5012-G1M Ball screw type (standard)
	TALZ-5012-G0M-R Precision screw type (symmetrical)	TALZ-5012-G1M-R Ball screw type (symmetrical)
Travel direction	Z axis single direction	
Travel amount	± 10 mm	
Stage surface	50 mm x 50 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.012 mm	0.008 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.012 mm	0.008 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Moment rigidity	Yaw rigidity 0.15 sec / N·cm Pitch rigidity 0.2 sec / N·cm Roll rigidity 0.2 sec / N·cm	
Load capacity	19.6 N (2 kgf)	
Mass	0.54 kg	
Max. speed (at 5,000 pps)	5 mm/s	10 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

Z Stage (50 mm) external view

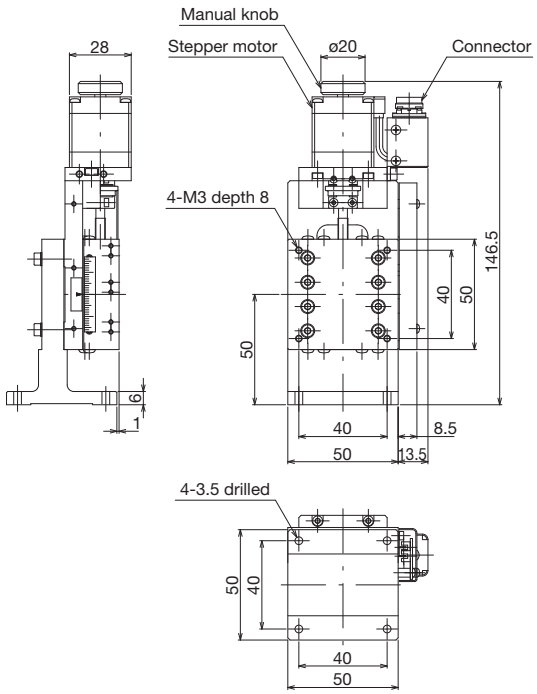
TALZ-5012-G0M



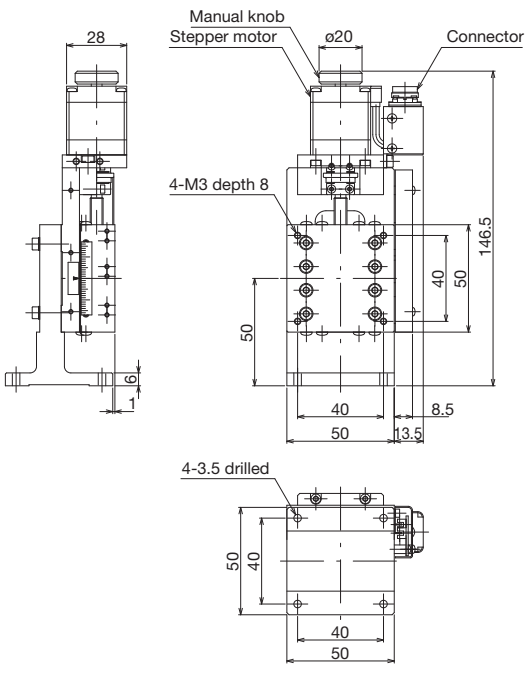
TALZ-5012-G1M



TALZ-5012-G0M-R



TALZ-5012-G1M-R

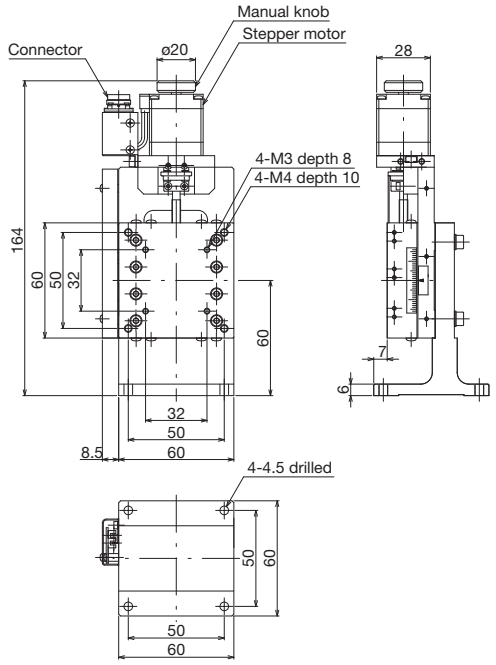


Z Stage (60 mm)

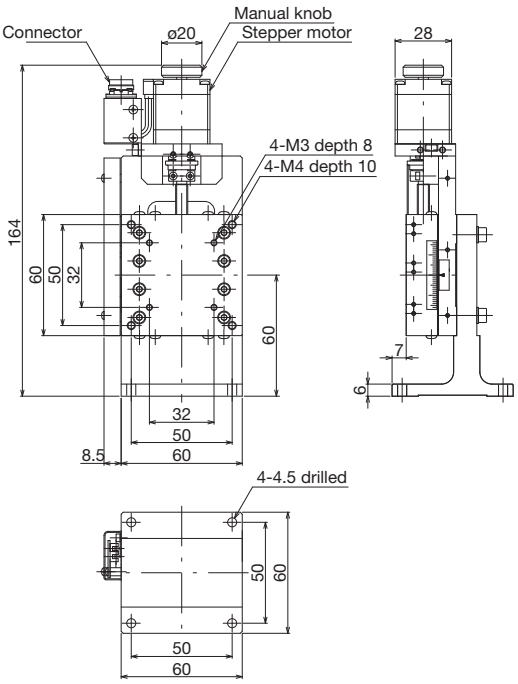
Product No.	TALZ-6012-G0M Precision screw type (standard)	TALZ-6012-G1M Ball screw type (standard)
	TALZ-6012-G0M-R Precision screw type (symmetrical)	TALZ-6012-G1M-R Ball screw type (symmetrical)
Travel direction	Z axis single direction	
Travel amount	± 12.5 mm	
Stage surface	60 mm x 60 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.014 mm	0.01 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Moment rigidity	Yaw rigidity 0.1 sec / N·cm Pitch rigidity 0.1 sec / N·cm Roll rigidity 0.1 sec / N·cm	
Load capacity	19.6 N (2 kgf)	
Mass	0.7 kg	
Max. speed (at 5,000 pps)	5 mm/s	10 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

Z Stage (60 mm) external view

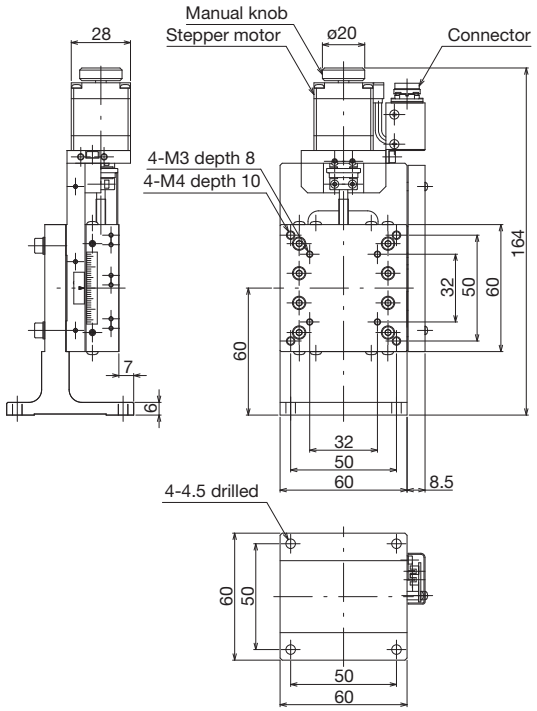
TALZ-6012-G0M



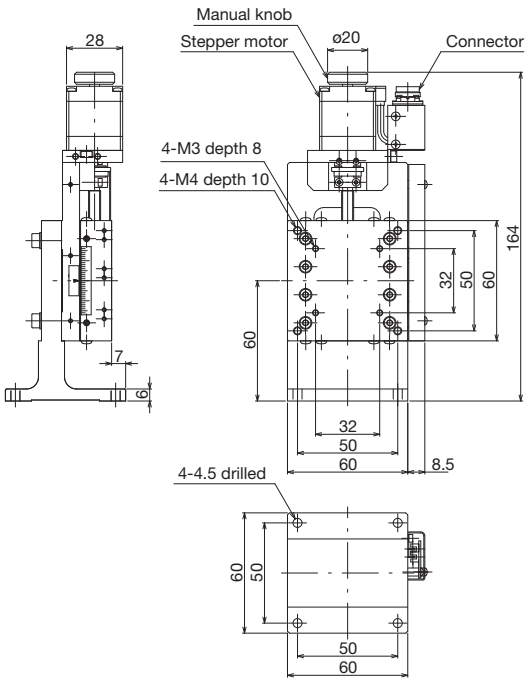
TALZ-6012-G1M



TALZ-6012-G0M-R



TALZ-6012-G1M-R

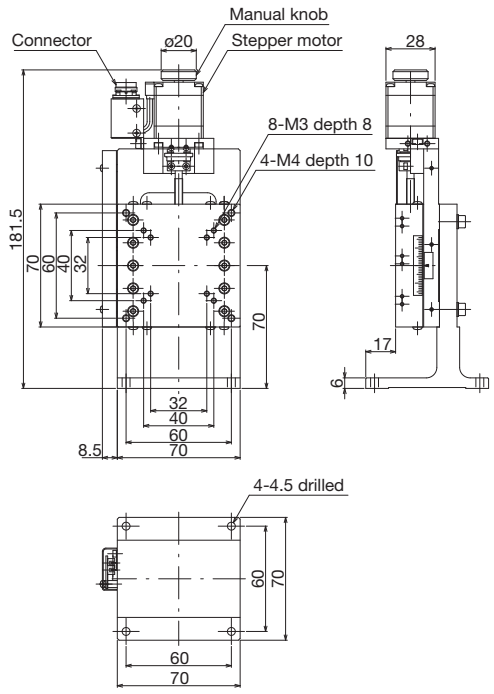


Z Stage (70 mm)

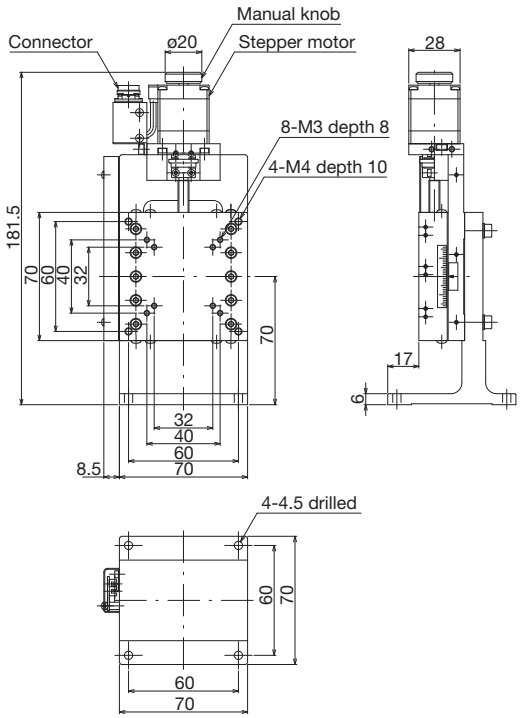
Product No.	TALZ-7013-G0M Precision screw type (standard)	TALZ-7013-G1M Ball screw type (standard)
	TALZ-7013-G0M-R Precision screw type (symmetrical)	TALZ-7013-G1M-R Ball screw type (symmetrical)
Travel direction	Z axis single direction	
Travel amount	± 15 mm	
Stage surface	70 mm x 70 mm	
Motor	Equivalent to PK523HPB	
Resolution	0.001 mm	0.002 mm
Feed screw lead	0.5 mm	1 mm
Travel guide	HG-VCR (V-groove and cross rollers)	
Straightness	0.002 mm (horizontal/vertical)	
	20 sec (Yawing) 30 sec (Pitching)	15 sec (Yawing) 25 sec (Pitching)
Positioning accuracy	0.016 mm	0.012 mm
Repeatability	± 0.0005 mm	± 0.0003 mm
Lost motion	0.005 mm	0.001 mm
Moment rigidity	Yaw rigidity 0.06 sec / N·cm Pitch rigidity 0.08 sec / N·cm Roll rigidity 0.08 sec / N·cm	
Load capacity	19.6 N (2 kgf)	
Mass	0.9 kg	
Max. speed (at 5,000 pps)	5 mm/s	10 mm/s
Material	Aluminum alloy	
Home sensor	N.C. (Normally Closed), photo sensor	
Limit sensor	N.C. (Normally Closed), photo sensor	
Applicable cable	TACB-STM-D3, TARC-STM-D3	

Z Stage (70 mm) external view

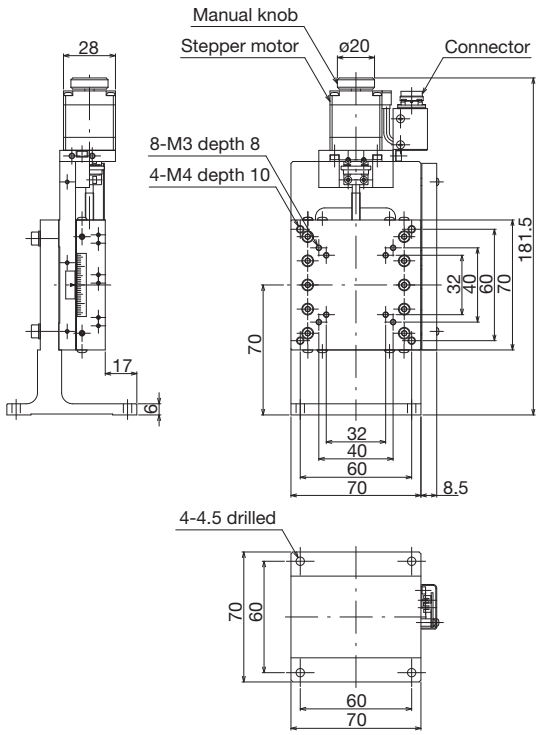
TALZ-7013-G0M



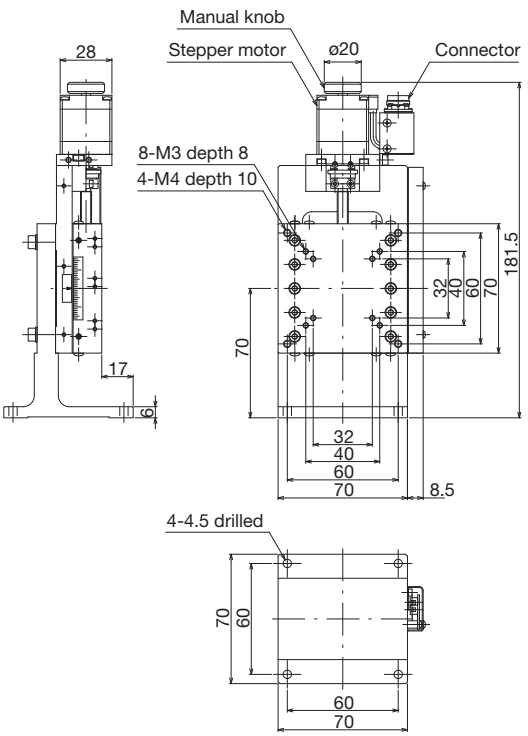
TALZ-7013-G1M



TALZ-7013-G0M-R



TALZ-7013-G1M-R

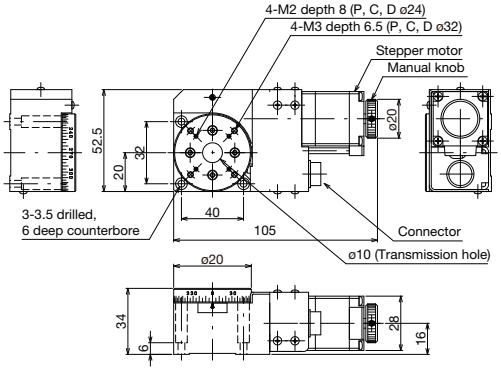


Rotary Stage

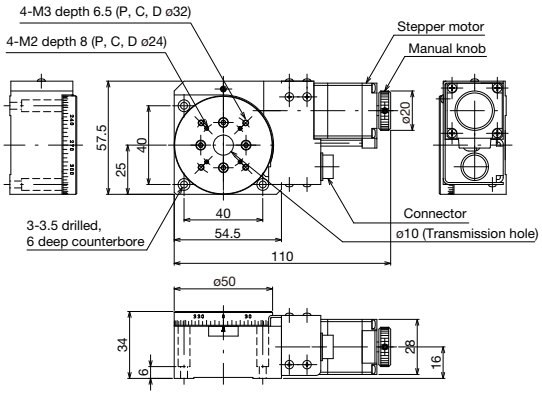
Product No.	TARS-4036-GM	TARS-5036-GM	TARS-6036-GM	TARS-7036-GM
Travel direction	Direction of rotation			
Travel amount	360°			
Stage surface	Ø 40 mm	Ø 50 mm	Ø 60 mm	Ø 70 mm
Motor	Equivalent to PK523HPB			
Resolution	0.01°			
Travel guide	Ball bearing			
Run-out	0.01 mm			
Surface run-out	0.04 mm		0.05 mm	0.06 mm
Positioning accuracy	0.08°		0.05°	
Repeatability	± 0.003°			
Lost motion	0.02°			
Load capacity	29.4 N (3 kgf)		39.2 N (4 kgf)	
Mass	0.4 kg	0.5 kg	0.6 kg	0.7 kg
Max. speed (at 5,000 pps)	50°/s			
Material	Aluminum alloy			
Home sensor	N.O. (Normally Open), photo sensor			
Applicable cable	TACB-STM-D3, TARC-STM-D3			

Rotary Stage external view

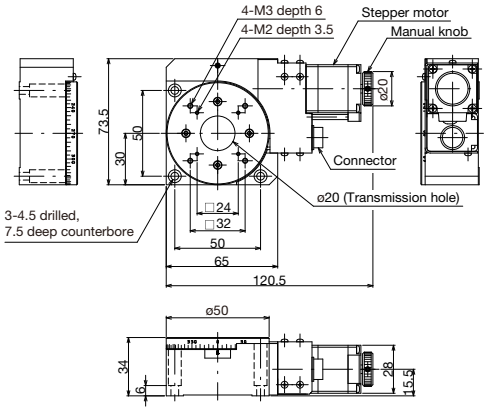
TARS-4036-GM



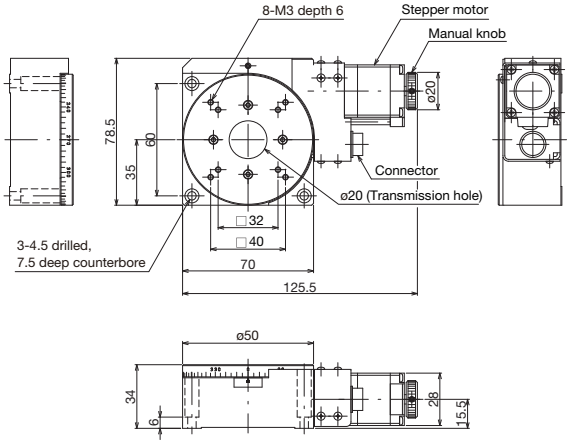
TARS-5036-GM



TARS-6036-GM



TARS-7036-GM



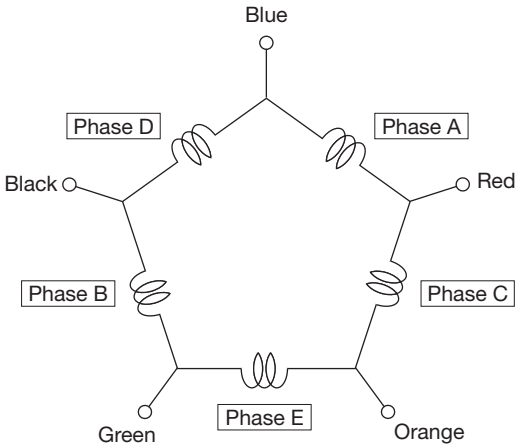
5.2 Motor

Item	Specifications
Motor type	Equivalent to PK523HPB
Max. excitation torque	0.046 N·m (0.46 kg·cm)
Current	0.75 A / phase
Coil resistance	1.1 Ω / phase
Rotor moment of inertia	9 g·cm^2
Mass	0.11 kg
Motor structure	Hybrid
Number of phases	5 phases
Step angle	Full step 0.72° / Half step 0.36°
Static angle error	± 0.05° (± 3')
Insulation resistance	100 MΩ or more when 500 VDC megohmmeter is applied between the motor coil cases at normal temperature and humidity.
Dielectric strength	Sufficient to withstand 0.5 kV applied at 50 Hz for 1 minute between the motor coil cases at normal temperature and humidity.
Insulation class	UL/CSA standard: Class A insulation, IEC standard: Class B insulation (130°C)
Temperature rise	80°C or less measured at rated current, at standstill, five phases energized at normal temperature and humidity (by the resistance change method).
Operating temperature	–10°C to +50°C

*Static angle error: value with full step (0.72°), no load (the value changes according to the load)
*This motor is exclusively manufactured for THK by ORIENTAL MOTOR CO., LTD.

5.3 Internal Connection of the Motor

The internal connection of the motor is five-wire type pentagonal connection. Be careful when selecting a driver.

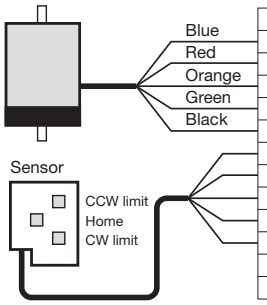


5.4 Connector

The connector wiring is shown below.

X/XY/Z Stages

Motor : Equivalent to PK523HPB

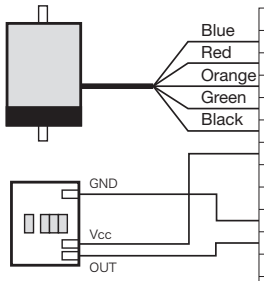


Connector (Hirose Electric Co.,Ltd.)
Receptacle: HR10A-10R-12PC(71)
Contact: HR10-PC-112

Pin No.	Description
1	Motor wire
2	Motor wire
3	Motor wire
4	Motor wire
5	Motor wire
6	Sensor Vcc +5 V to +24 V
7	+ limit (CW)
8	– limit (CCW)
9	Sensor common (GND)
10	Home
11	N.C.
12	Frame ground for maintenance

Rotary Stage

Motor : Equivalent to PK523HPB



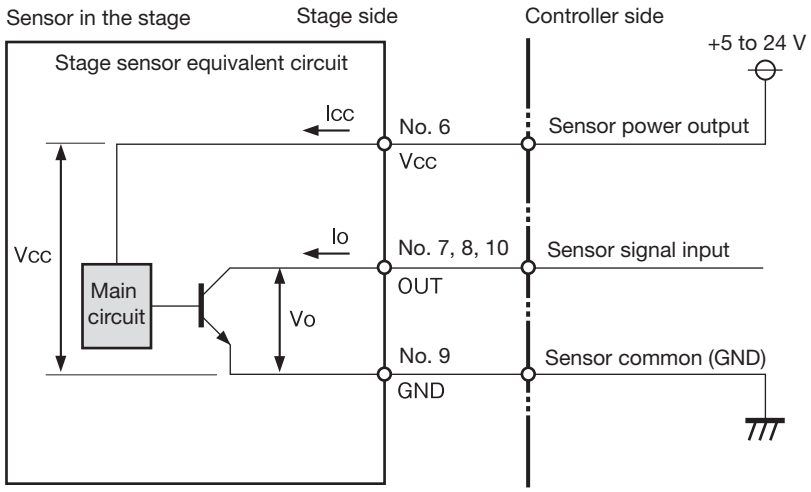
Connector (Hirose Electric Co.,Ltd.)
Receptacle: HR10A-10R-12PC(71)
Contact: HR10-PC-112

Pin No.	Description
1	Motor wire
2	Motor wire
3	Motor wire
4	Motor wire
5	Motor wire
6	Sensor Vcc +5 V to +24 V
7	N.C.
8	N.C.
9	Sensor common (GND)
10	Home
11	N.C.
12	Frame ground for maintenance

Precautions

- Length of the cable between stage and driver should be no greater than 3 m.
- We recommend isolating the limit output and Home sensor output with a device such as a photocoupler on the controller side.

5.5 Sensors



The photo interrupter IC EE-SX4134 (OMRON Corporation) is used as a sensor to detect when light is blocked or not.

Output form :	Open collector
Sensor power supply voltage (Vcc) :	5 V to 24 V
Sensor current consumption (Icc) :	30 mA (per sensor)
Max. voltage (Vo) :	30 V
Max. current (Io) :	30 mA

5.6 Operation Logic of Limit and Home Signals

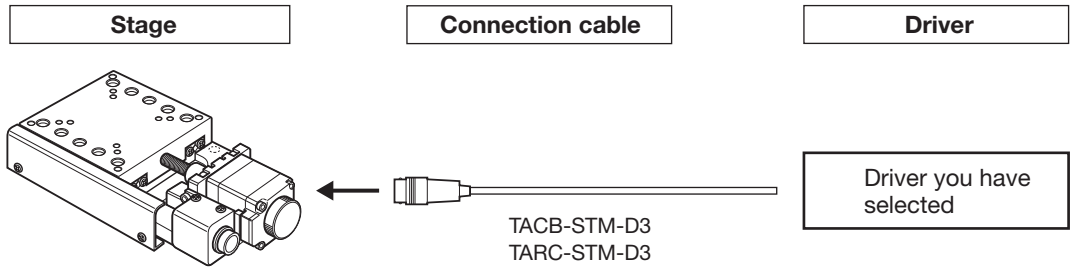
The High-Grade Stage (motorized) has a home sensor near the center of stage movement. There is no pre-home sensor. The rotary stage is not equipped with a limit sensor.

Stage type	Limit sensor	Home sensor
X / XY / Z	N.C.	N.C.
Rotary	-	N.O.

N.C. : Normally Closed (ON when light is blocked)
N.O. : Normally Open (OFF when light is blocked)

6 Connection

The connection with the driver is shown here. The driver must be selected and supplied by the customer.



Product name	Product No.
Driver connection cable 3 m	TACB-STM-D3
Driver connection cable 3 m (robot cable specification)	TARC-STM-D3

7 Maintenance

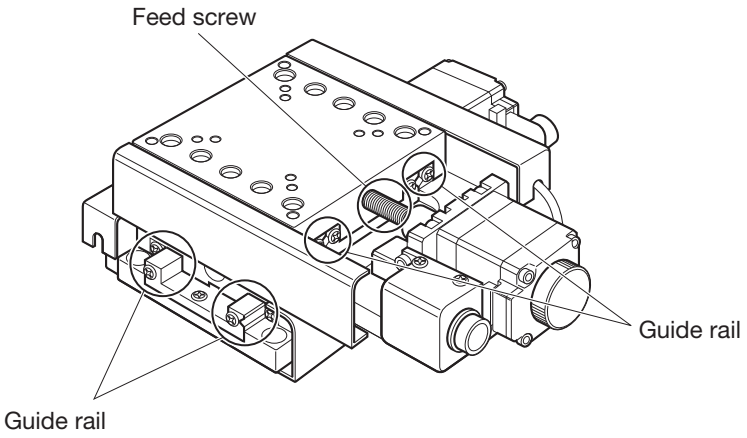
The following maintenance and inspections are required to keep the stage performance in good condition.

Maintenance items and maintenance intervals

X/XY/Z Stages

Maintenance items

Apply grease to the threaded part of the feed screw and the rolling surface of the guide rails.



Grease to be used

Feed screw (precision screw): AFF grease (by THK)
Feed screw (ball screw): AFE-CA grease (by THK)
Guide rail: AFF grease (by THK)

*If grease is found to be dirty, wipe off the dirty grease with a rag and apply new grease.

Maintenance interval

30,000 to 40,000 reciprocations

*An appropriate maintenance interval varies depending on the stage operating conditions and environment. Check the maintenance items periodically.
When the amount of grease is insufficient or it is found to be dirty, apply new grease or wipe off the dirty grease and then apply new grease.

Rotary stage

Caution

Professional knowledge and skills are required to grease the rotary stage. If trouble or abnormal noise occurs, contact the distributor or THK.

8 Warranty and Repair

We will replace or repair the product free of charge only when a failure or damage is found at the time of delivery or unpacking, and when we find we are responsible for the cause of the failure or damage. The final decision on whether a replacement or repairs will be made for a fee or free of charge will be made when the product is confirmed by THK.

Contact

THK CO., LTD.

Headquarters, 2-12-10 Shibaura
Minato-ku, Tokyo 108-8506 Japan
International Sales Department
Phone: +81-3-5730-3860

- Please note that the contents in this manual are subject to change without notice. Please also note that products are subject to change without notice for the purpose of improvement.
- Although we have carefully prepared the instruction manual, we are not responsible for any damage caused by typographical errors or omissions.

High-Grade Stage (Motorized) 0.75A / Phase
Instruction Manual Ver.4.0 (E)
Nov. 30, 2019 ADV.

THK CO., LTD.

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Phone: +81-3-5730-3860

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