MECHANO TRANSFORMER
Specialist of Precision Piezo-Actuators

Piezo Assist Stage

Manual precision positioning stage

Version2.2
Mar 14, 2022

What is the “Piezo Assist Stage”

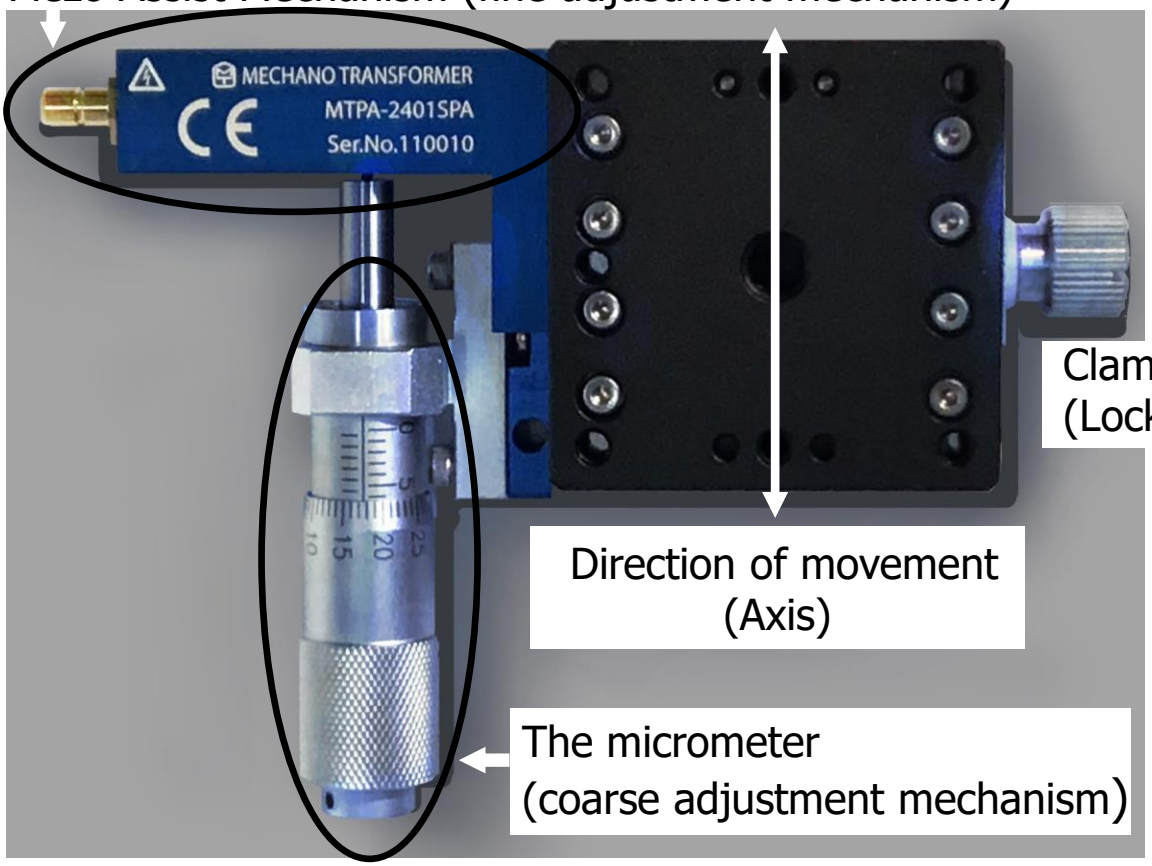
Manually controlled precision positioning stage

- Intuitive operation just turning the knob
- Lightweight and Compact
- High resolution and wide range of motion

	Resolution	Range of motion*
Piezo Assist Mechanism	**20 nm**	0.03 mm
The micrometer	0.01 mm	**13 mm**

*Range of motion of the minimum size model are 0.025 mm and 6 mm

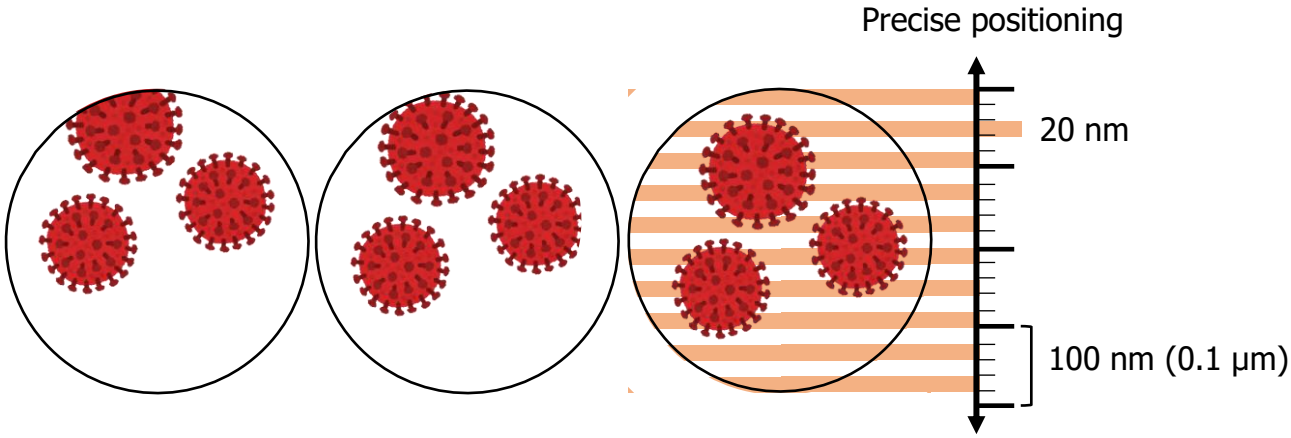
Piezo Assist Mechanism (fine adjustment mechanism)



Resolution and range of motion

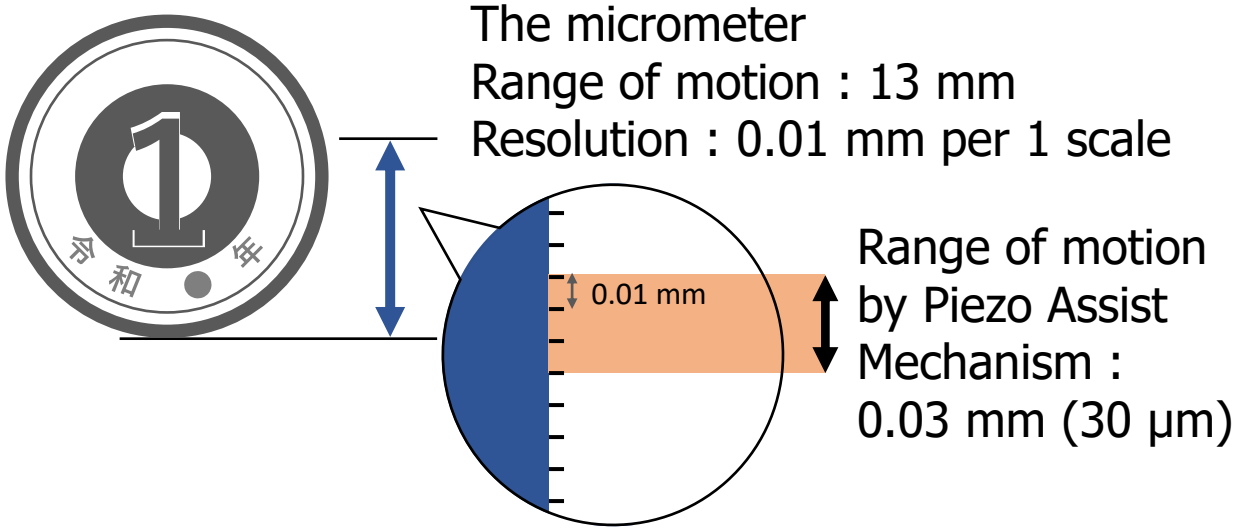
✓ Resolution : **20** nm(nanometre)

Reference example, Observation of microscope:
Coronavirus (approx. 50 nm ~ 200 nm in diameter)



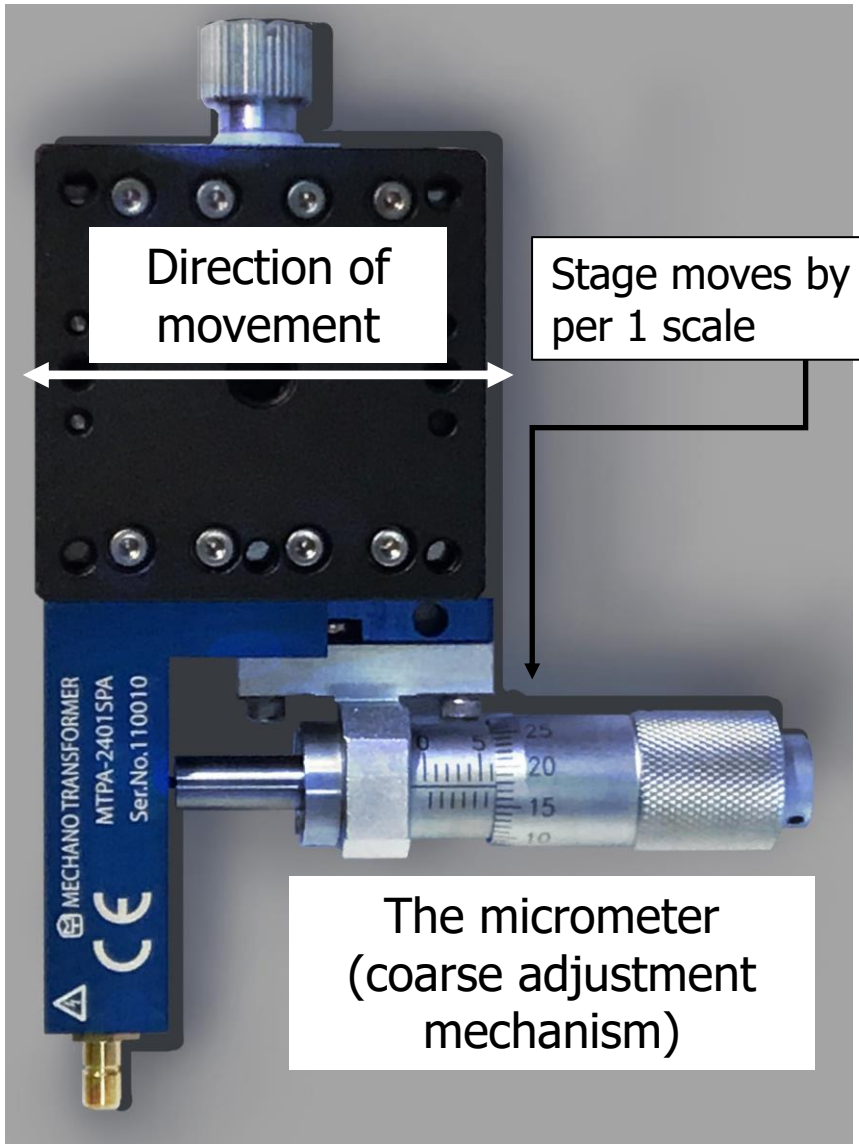
✓ Range of motion : max **13** mm(millimetre)

Reference example, 1-yen coin (approx. 20mm in diameter)



How to use ①The micrometer

Intuitive position control by turning knob



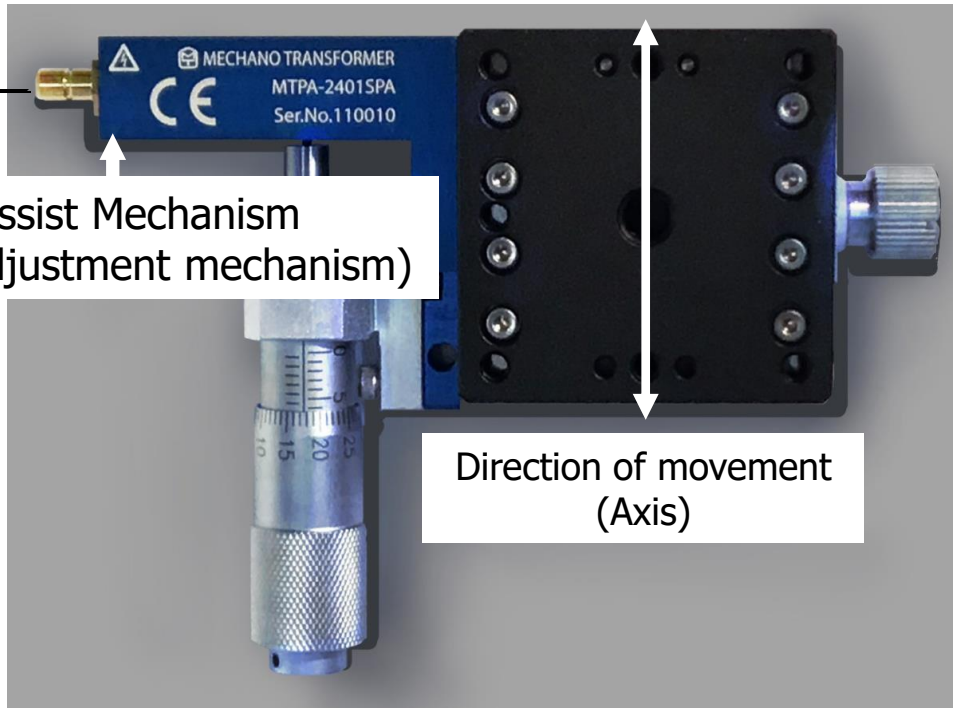
How to use ②Piezo Assist Mechanism

Precise position control by turning the knob of controller*

*Controller and power supply adapter are sold separately.

Connect with the attached cable

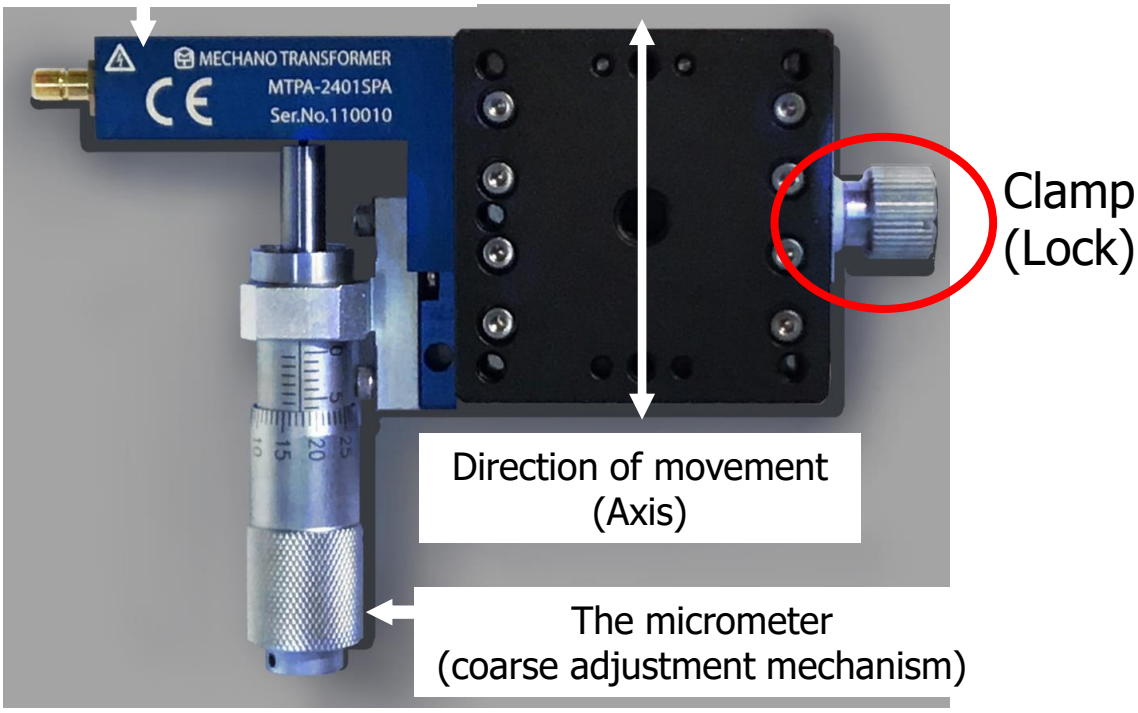
According to the rotation of knob, the applied voltage changes and the position is adjusted precisely



Caution

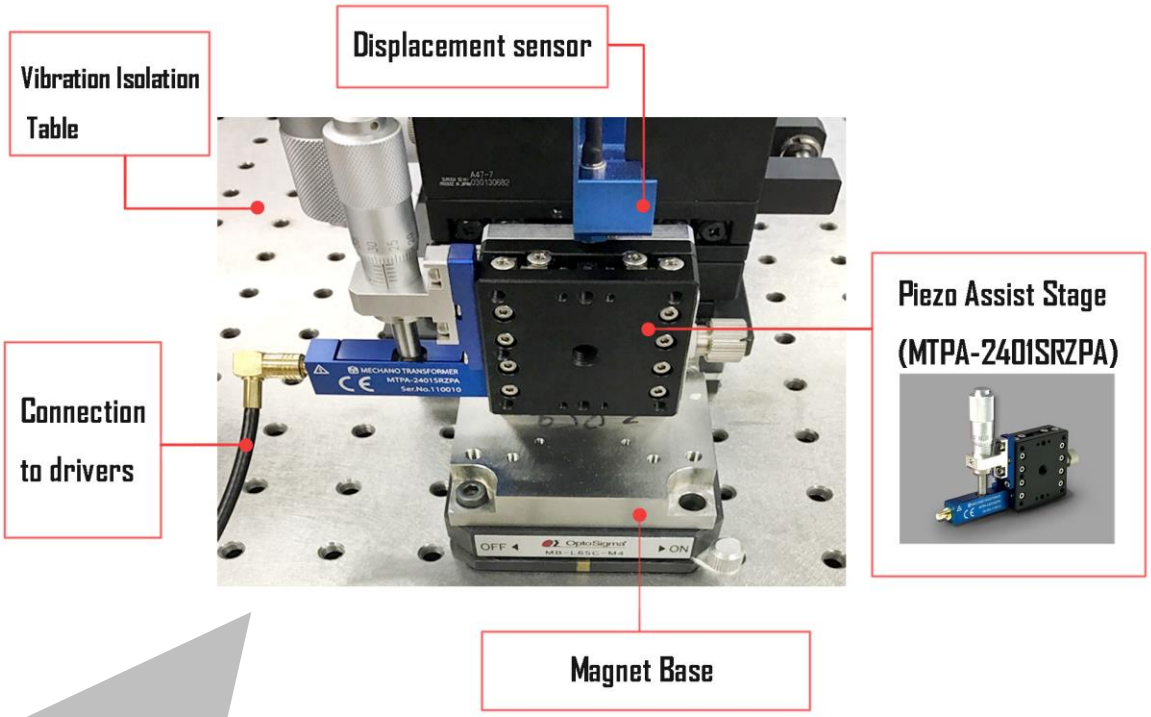
- Spring is attached to the stage. Since the piezo assist mechanism may be damaged, when releasing the lock by loosening the clamp during setup, take care not to give an impact by the force of the spring by supporting the stage with your hand.
- Since the piezo assist mechanism may be damaged, please make sure to lock the stage when moving/carrying the Piezo Assist Stage.
- When the power of the Piezo Assist controller is being switched OFF, the position adjustment of Piezo Assist Mechanism will also disappear.

Piezo Assist Mechanism
(fine adjustment mechanism)

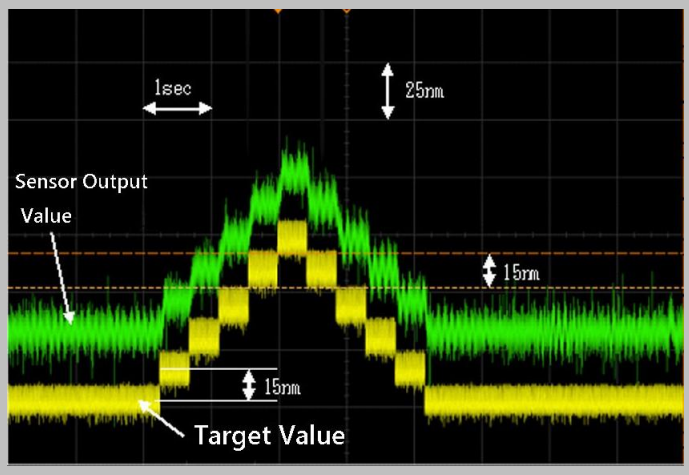


Application examples

As a high-end product, PID control system for less errors can be built by using displacement sensor in combination with PAS.

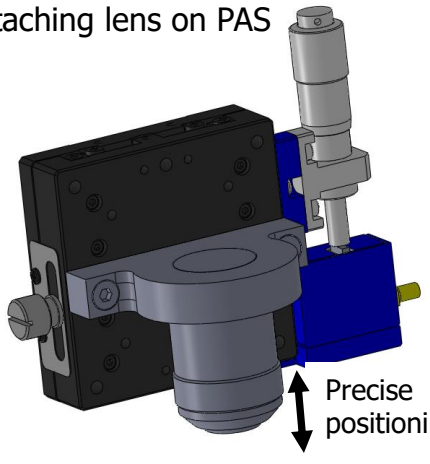


Accuracy experiment result of PID control system



Achieved stable and high-precision positioning, against the 15nm increment target value.

Reference example, attaching lens on PAS



Specifications

	MTPA-2251 series	MTPA-2401 series	MTPA-2601 series
Table size	25 × 25 mm	40 × 40 mm	60 × 60 mm
Coarse adjustment travel	±3 mm	±6.5 mm	±6.5 mm
Fine adjustment travel	25 μm or more	30 μm or more	30 μm or more
Micrometer Position	Side		
Travel distance per rotation (Micrometer)	0.5 mm		
Minimum resolution (Micrometer)	0.01 mm		
Fine movement (Minimum resolution)	20 nm or less		
Guide	Ball bearing guide		
Primary material	Aluminum		
Surface finish	Black anodized		
Load capacity (excluding Z-axis type)	39.2 N (4.0 kgf)	49 N (5.0 kgf)	
Load capacity of Z-axis type	9.8 N (1.0 kgf)		
Travel accuracy / Straightness	3 μm		
Max. Moment Capacity / Pitch (Z-axis type shows in brackets)	2.0 N·m (1.47 N·m)	2.5 N·m (2.5 N·m)	4.9 N·m (2.5 N·m)
Max. Moment Capacity / Roll (Z-axis type shows in brackets)	1.9 N·m (1.47 N·m)	3.0 N·m (2.5 N·m)	4.9 N·m (2.5 N·m)
Max. Moment Capacity / Yaw	1.9 N·m	2.5 N·m	4.9 N·m
Moment Stiffness / Pitch (Z-axis type shows in brackets)	2.5″/N·cm (6.0″/N·cm)	0.66″/N·cm (0.66″/N·cm)	0.3″/N·cm (0.66″/N·cm)
Moment Stiffness / Roll	2.0″/N·cm	0.36″/N·cm	0.25″/N·cm
Parallelism	30 μm		
Running Parallelism	10 μm		
Mass weight	0.07 kg	0.16 kg	0.25 kg