V22 Version

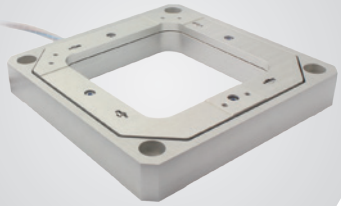
COREMORROW
Piezo Nano Motion

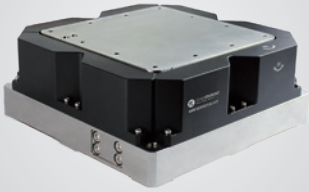
Piezo Nano Motion

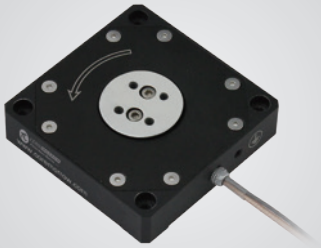
- Piezo Z/Tip/Tilt/Rotation Stage -

Harbin Core Tomorrow Science & Technology Co.,Ltd.

Piezo Z/Tip/Tilt/Rotation Stage





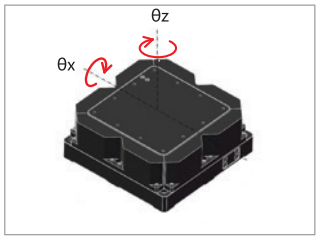


Based on piezoelectric ceramics as the driving source, Piezo Z and Tip/Tilt/ Rotation Stages can generate θx, θy, θz or/ and XYZ motion.

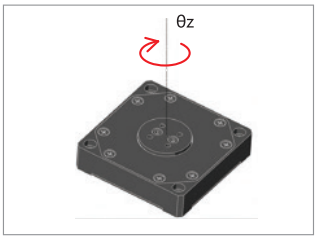
Piezo Z/Tip/Tilt/Rotation Stages

Piezo Z and Tip/Tilt/Rotation Stages are precisely angular and linear motion stages, drived by piezoelectric ceramic actuator. The internal flexible hinge parallel structure design ensures excellent deflection accuracy, high stability and fast response. It is very suitable for laser beam scanning and optical path adjustment such as laser beam combining.

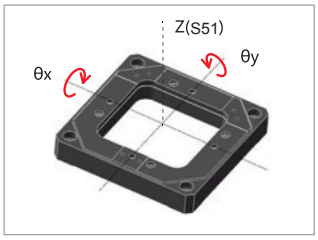
▸ Motion Directions: θx, θy, θz, X, Y, Z



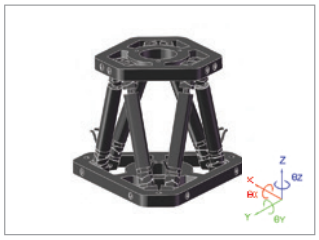
N50



P21/S20

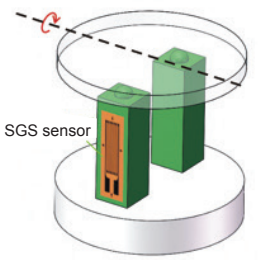


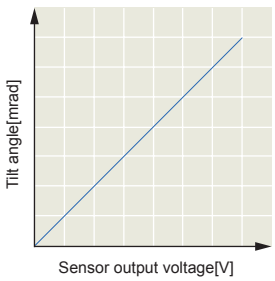
P54/P51



H61/H60

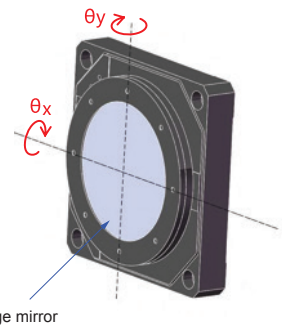
▸ Optional Sensor for High Accuracy



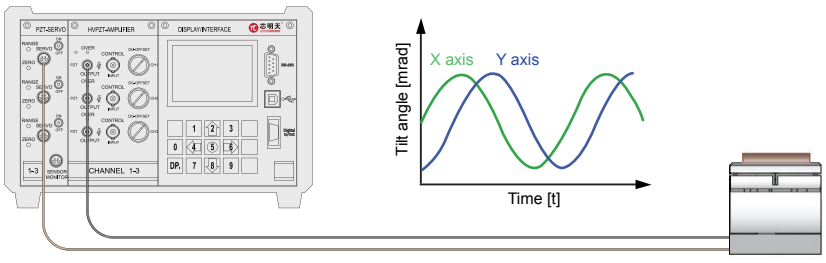


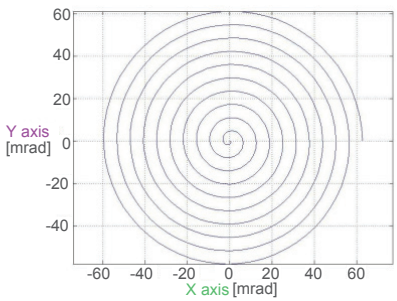
▸ Large Aperture, Large Load Capacity

Piezoelectric ceramic drive and high-stiffness structure make it can carry up to 125mm outer diameter lens.

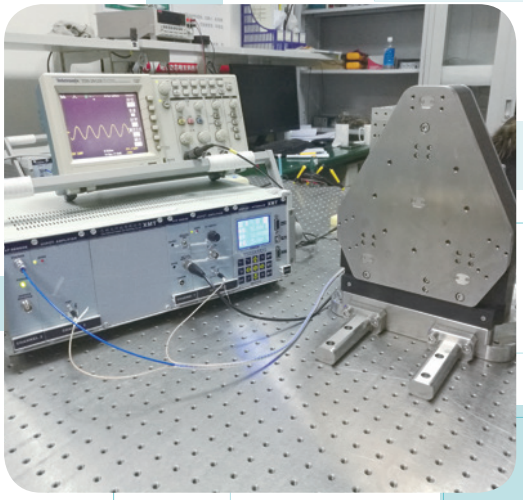


▸ Driving and Control

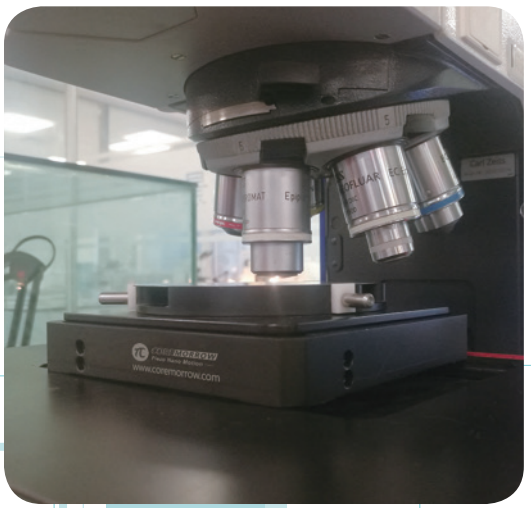




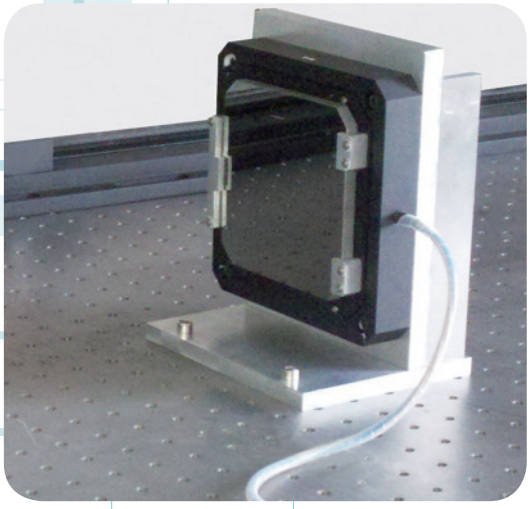
▸ Applications



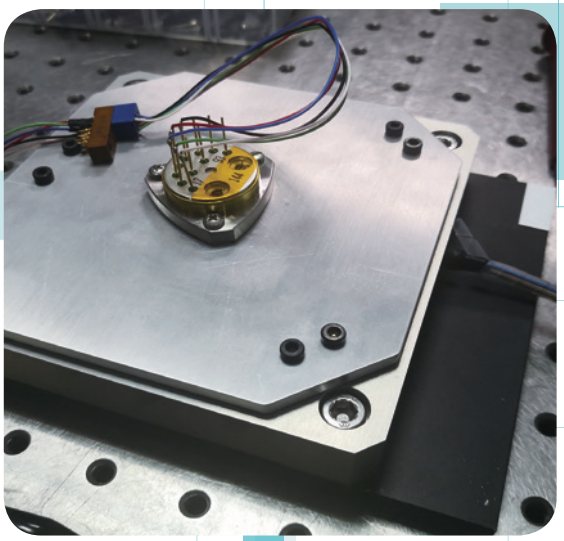
Vibration Simulation



Sample Leveling and Focusing



Laser Beam Adjustment



Sensor Calibration

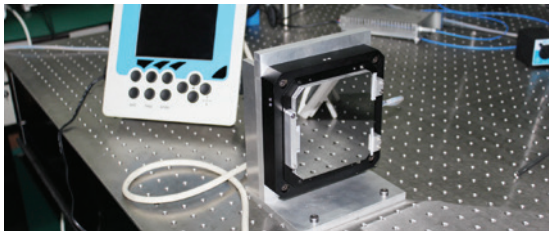
▸ Typical Applications

- Imaging process
- Image stabilization
- Interlaced scanning, jitter
- Beam combiner
- Laser beam tilt/stabilization
- Optics
- Optical filter/switch
- Laser scanning

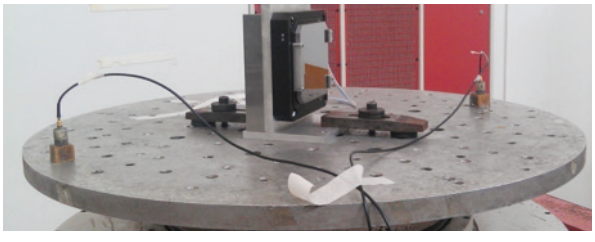
▸ Product List

Type	Active axes	Travel range	Resolution	Page
S20	θz	0.5mrad(≈ 100)	0.01μrad(<0.01)	4
S21	θz	7.5mrad(≈ 1500)	0.2μrad(≈ 0.04)	6
S50.U0C/K	θx	0.19mrad(≈ 39)	-	8
S50.U0C/K-D1	θx	0.5mrad(≈ 100)	0.01μrad(<0.01)	9
S50.UR0C/K	θx, θz	0.5mrad(≈ 100) /axis	0.01μrad(<0.01)	10
S50.UR1S/K	θx, θz	1.3mrad(≈ 268) /axis	0.03μrad(<0.01)	12
S51.ZT1S/K	θx, θy Z	±1.1mrad(≈ ±220 v/axis 100μm	0.05μrad(≈ 0.01) 4nm	13
S54	θx, θy	±1mrad(≈ ±200) /axis	0.05μrad(≈ 0.01)	15
H60.XYZTR1	θx, θy θz X, Y Z	±0.16mrad(≈ ±30) /axis ±0.24mrad(≈ ±50) ±6.5μm/axis ±3.2μm	0.01μrad(<0.01) 0.02μrad(<0.01) 0.4nm 0.2nm	17
H60.XYZTR2	θx, θy θz X, Y Z	±0.32mrad(≈ ±66)/axis ±0.48mrad(≈ ±99) ±12.5μm/axis ±6.4μm	0.02μrad(<0.01) 0.03μrad(<0.01) 0.8nm 0.4nm	17
H60.XYZTR5	θx, θy θz X, Y Z	±0.64mrad(≈ ±130)/axis ±0.96mrad(≈ ±198) ±25μm/axis ±12.8μm	0.04μrad(<0.01) 0.06μrad(≈ 0.01) 1.6nm 0.8nm	17
H61	θx, θy, θz X, Y, Z	1mrad(≈ 200)/axis 6μm/axis	0.01μrad(<0.01) 0.1nm	18
H62	θx, θy θz X, Y Z	±12.5mrad(≈ ±2578)/axis 1.6mrad(≈ 330) ±100μm/axis 200μm	0.25μrad(≈ 0.05) 0.01μrad(<0.01) 2nm 2nm	19
20060	θx, θy	±1.25mrad(≈ ±257)/axis	0.05μrad(≈ 0.01)	20

▸ Performance Test



Measuring angular range



Vibration test

S20 Piezo Rotation Stage

The S20 piezo rotation stage with a diameter of 20mm central aperture, features compact size, a rotation angle of 0.5mrad and closed-loop repeatability of 0.2% F.S.

▸ Characteristics

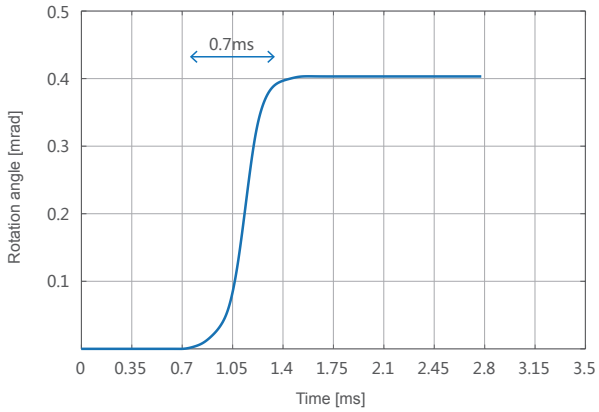
• Rotation angle range to 0.5mrad • Aperture diameter: Ø20mm • Closed loop for high accuracy • Fast response • Small size

▸ θz Rotation

▸ Large Load Capacity

S20 has a maximum rotation angle of 0.5mrad. The excellent hinge guiding mechanism design features a load capacity of up to 4kg and high stability. It is very suitable for applications like scientific research and industrial precision operation, optical path adjustment, etc.

▸ Short Step Time

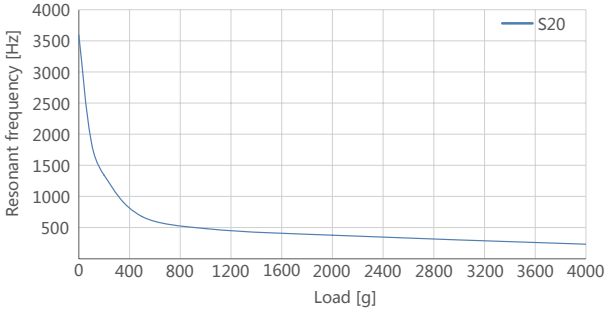


▸ Mini, Aperture,High Resolution & Reliability

S20 is a θz high-precision rotating platform, and its rotating axis is located in the center. The center aperture is suited for transmitted-light applications. The finite element analysis is used to optimize the microstructure to meet the dynamic and guiding accuracy.

The high-reliability piezoelectric ceramic is used as the driving component, and the flexible hinge mechanism features frictionless, high resolution and reliability. OEM custom is available.

▸ Frequency and Load Curve



▸ Recommended Controllers

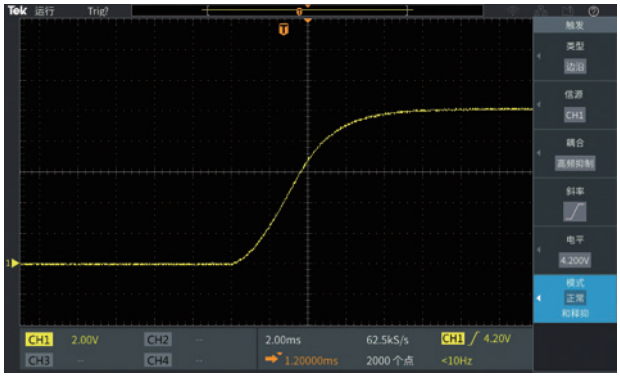
E01	E53	E52
		
1 channel Digital, analog Open/closed loop Ave. current 291mA	1 channel Digital, analog Open/closed loop Ave. current 60mA	1 channel Digital, analog Open/closed loop Ave. current 300mA
Note: Please see "Piezo Controller" for detailed information.		

Typical Applications

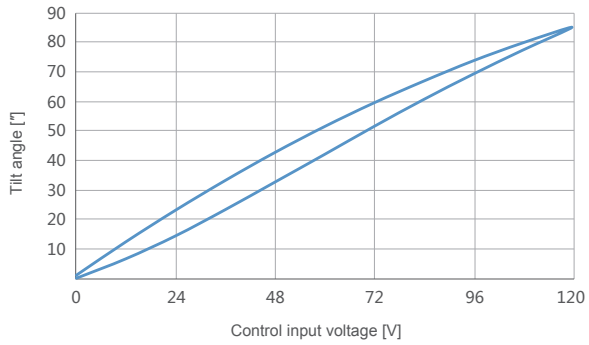
- Fiber alignment
- Micro-operation
- Sensor calibration
- Materials Science
- Image stabilization
- Optical path

Step Time

The unloaded step time of S20.R0S to 100% rotation angle is about 8ms.



Open-Loop Curve



Positioning Accuracy

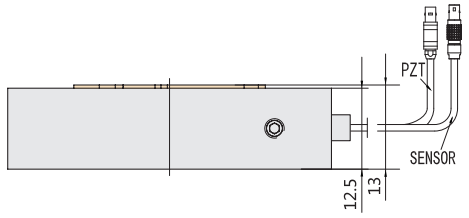
Technical Data

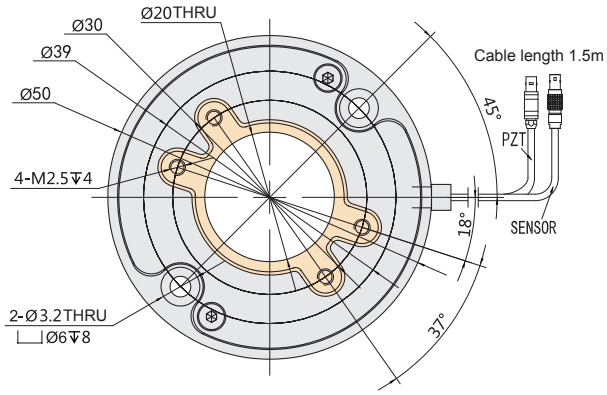
Type	S - closed loop K - open loop	S20.R0S S20.R0K	Units
Active axes		θz	
Rotation angle(0~+120V)		0.4(≈80″)	mrad±20%
Rotation angle(0~+150V)		0.5(≈100″)	mrad±20%
Integrated sensor		SGS/-	
Resolution		0.02(<0.01″) /0.01(<0.01″)	μrad
Closed-loop linearity		0.5/-	%F.S.
Closed-loop repeatability		0.2/-	%F.S.
Push/pull force		50/10	N
Stiffness		5	N/μm±20%
Unloaded resonant frequency		3.5	kHz±20%
Unloaded step time		8/0.7	ms±20%
Unloaded operating frequency	10% travel	200	Hz±20%
	100% travel	30	
Load capacity		4	kg
El. capacitance		1.6	μF±20%
Material		Steel	
Mass		140	g±5%

Note: Above parameters are measured with the E00/E01 piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term operation, the recommended driving voltage is 0~120V.

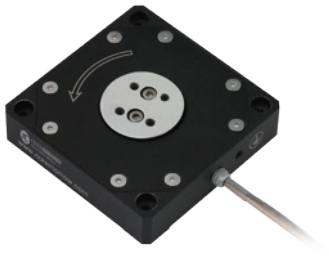
Drawing

S20





S21 Piezo Rotation Stage



S21 piezoelectric rotation stage is a θz rotation stage with small size, a rotation angle of 7.5mrad and a load capacity of 0.1kg, which can drive the lens to make precise rotation motion.

Characteristics

- θz rotation
- Rotation range to 7.5mrad
- Closed loop for high accuracy
- Fast response
- Small size

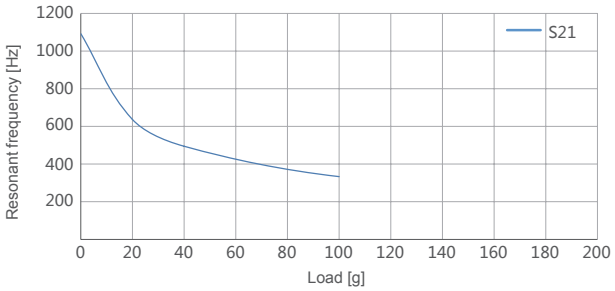
Typical Applications

- Optical path adjustment
- Interference/Metrology
- Beam scanning
- Sensor calibration

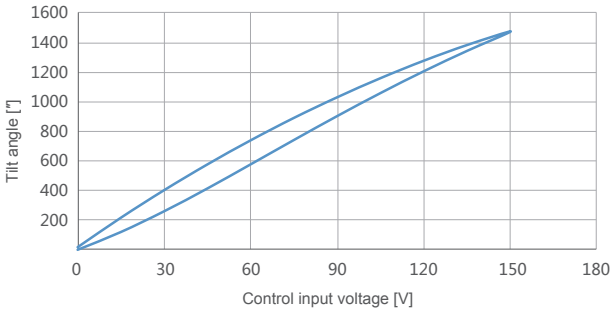
High Resolution and Accuracy

S21 rotation stage adopts the principle of mechanism amplification design. Piezoelectric ceramic is used as the driving component, and the stage body adopts a flexible hinge mechanism, which has no friction, and can achieve a resolution of 0.2 μrad. The closed-loop version with built-in SGS sensor can realize the positioning accuracy of micro-radians and plays a very important role in the precise adjustment of the optical path.

Frequency and Load Curve



Open-Loop Curve

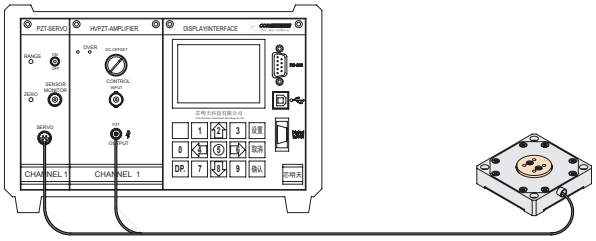


Application Example

S21 piezo rotation stage can be used with CoreMorrow any linear or tilting stage to form a multi-axis precision positioning operations.

Driving and Control

S21 rotation stage needs a piezo controller with 1-channel voltage output. The P21 closed-loop version equipped with E01 series closed-loop controller realizes θz high-precision rotary positioning control.

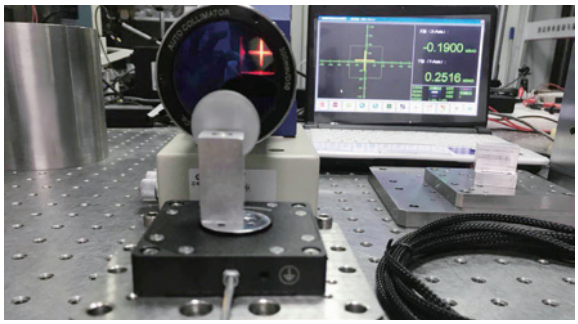


Recommended Controllers

E01	E53	E52
		
1 channel Digital, analog Open/closed loop Ave. current 291mA	1 channel Digital, analog Open/closed loop Ave. current 60mA	1 channel Digital, analog Open/closed loop Ave. current 300mA
Note: Please see "Piezo Controller" for detailed information.		

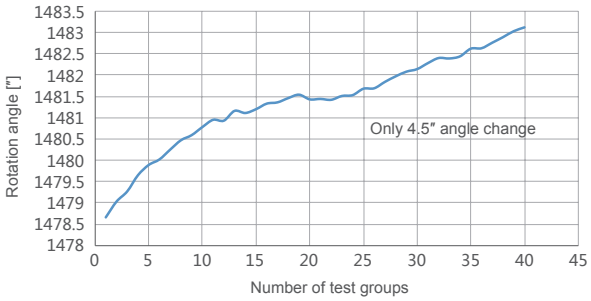
Tilt Angle Measuring

The tilt angle range of the S21.R7S is measured by a laser collimator.



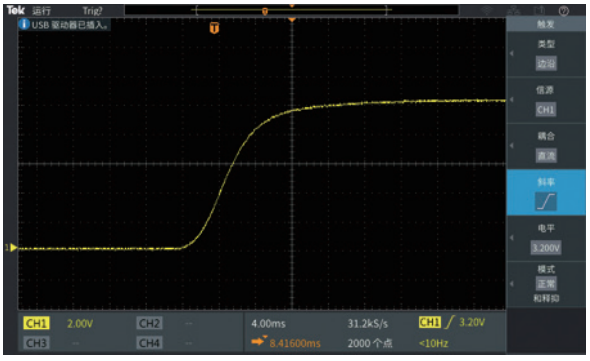
Angle Stability

40 groups are tested for the rotation angle range of S21.R7S, and the max rotation angle difference was about 4.5″.



Step Time

Drived by E53.D piezo controller, the loaded step time of S21. R7S is about 30ms.



Positioning Accuracy

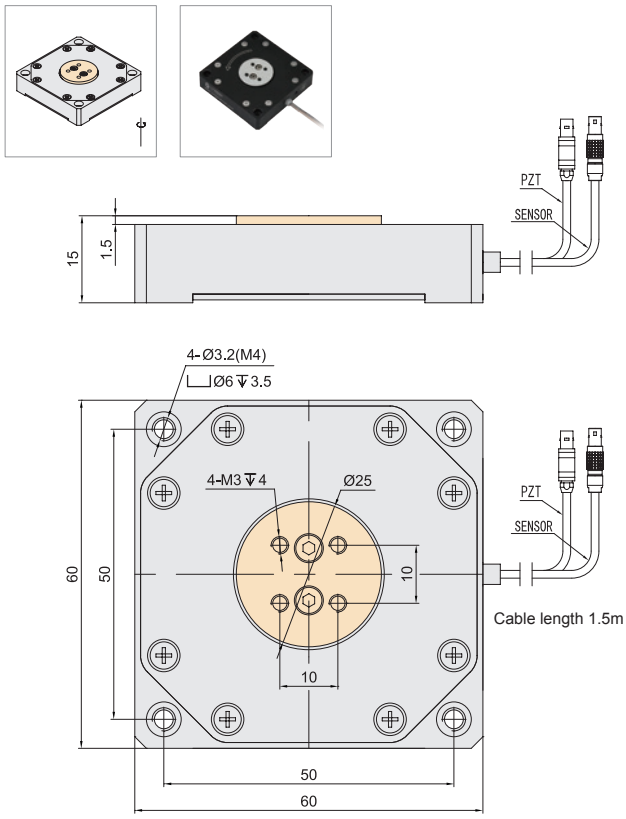
Technical Data

Type	S - closed loop K - open loop	S21.R7S S21.R7K	Units
Active axes		θz	
Rotation angle(0~+120V)		6(≈1240″)	mrad±10%
Rotation angle(0~+150V)		7.5(≈1500″)	mrad±10%
Integrated sensor		SGS/-	
Resolution		0.4(≈0.085″) /0.2(≈0.04″)	μrad
Closed-loop linearity		0.5/-	%F.S.
Closed-loop repeatability		0.2/-	%F.S.
Push/pull force		10/5	N
Stiffness		1	N/μm±20%
Unloaded resonant frequency		1.1	kHz±20%
Unloaded step time		30/1.5	ms±20%
Unloaded operating frequency	10% travel	50	Hz±20%
	100% travel	15	
Load capacity		0.1	kg
El. capacitance		1.8	μF±20%
Material		Aluminum	
Mass		105	g±5%

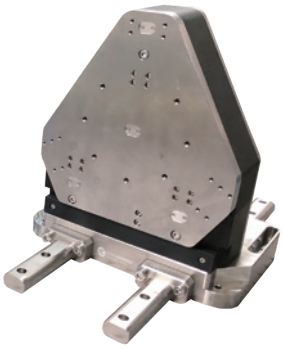
Note: Above parameters are measured with the E00/E01 piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term operation, the recommended driving voltage is 0~120V.

Drawing

S21



S50.U0C/K Large-Load Piezo Tilt Stage



The S50.U0C/K piezo stage is an X deflection stage, which is specially designed for heavy load applications. It features 7kg load capacity, the deflection angle under 100V driving voltage of 0.19mrad, and the corresponding closed-loop step time of 17ms.

▸ Characteristics

- θx deflection
- 7kg load capacity
- Capacitive closed-loop sensor
- Unloaded resonant frequency up to 1kHz

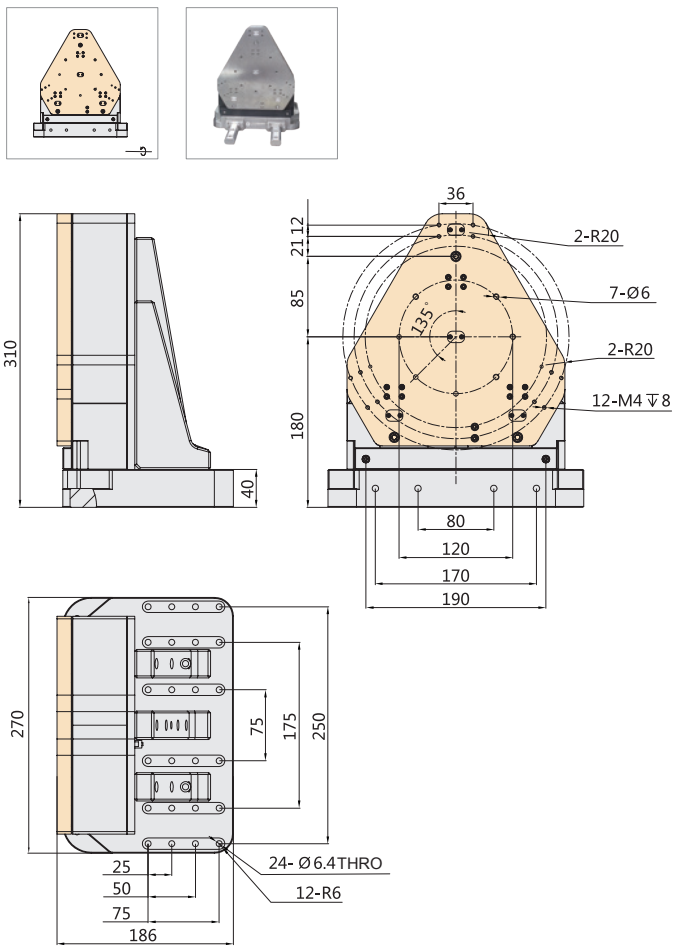
▸ Technical Data

Type	S50.U0C/K	Units
Active axis	θx	
Tilt angle@100V	0.19	mrad±10%
Integrated sensor	CAP/-	
Closed-loop linearity	1.25/-	%F.S.
Closed-loop repeatability	1/-	%F.S.
Unloaded resonant frequency	1000	Hz±20%
Resonant frequency @7kg load	210	Hz±20%
Closed/open-loop step time	17/16	ms±20%
Load capacity	7	kg±5%
El. capacitance	40	μF±20%

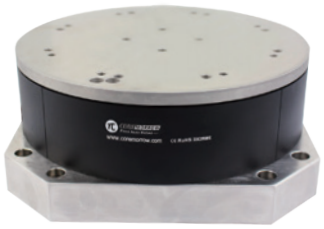
Note: The above parameters are measured using E00/ E01 piezo controllers. The max driving voltage can be -20~150V; For high-reliability and long-term operation, the recommended driving voltage is 0~120V.

▸ Drawing

S50.U0C/K



S50.U0C/K Piezo Tilt Stage



S50.U0C/K is a 1-axis θx piezo stage, featuring load capacity of 60kg, and tilt angle of ±0.25mrad. It uses capacitive closed-loop sensor with resolution of up to 10nrad and can work at high frequencies at load of 20kg. It is very suitable for large-load motion experiments.

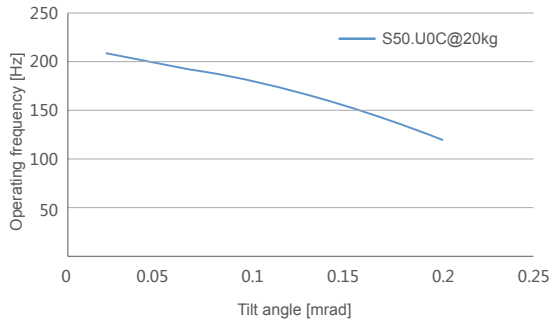
▸ Characteristics

- Tilt in θx
- Load to 60kg
- Tilt angle to 0.5mrad@150V
- Operating frequency to 210Hz@±0.01mrad

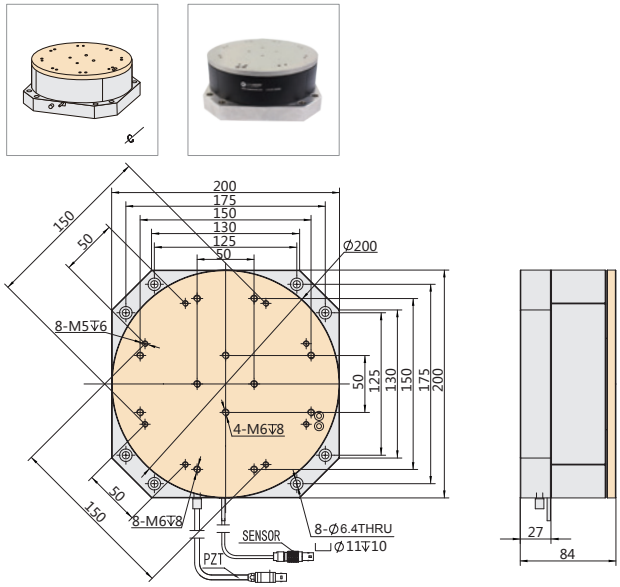
▸ Applications

- Beam scanning
- Heavy load motion experiment
- Interference/metering
- Vibration simulation system

▸ Tilt Angle vs Operating Frequency



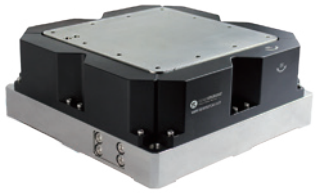
▸ Drawing



▸ Technical Data

Type		S50.U0C/K-D1				Units
Active axis		θx				
Tilt angle(0~120V)		0.4(≈80″)				mrad±10%
Tilt angle(0~150V)		0.5(≈100″)				mrad±10%
Integrated sensor		CAP/-				
Resolution		0.02/0.01(<0.01″)				μrad
Closed-loop linearity		0.3/-				%F.S.
Closed-loop repeatability		0.3/-				%F.S.
Unloaded resonant frequency		750				Hz±20%
Unloaded step time		30/15				ms±20%
Tilt angle vs operating frequency @20kg load	Angle	±0.1	±0.05	±0.02	±0.01	mrad±20%
	Frequency	0~120	0~180	0~200	0~210	Hz±20%
Load capacity		60				kg
EI. capacitance		30				μF±20%
Material		Aluminum, Steel				
Cable length		1.5				m±10mm

S50.UR0C/K Piezo Tilt/Rotation Stage

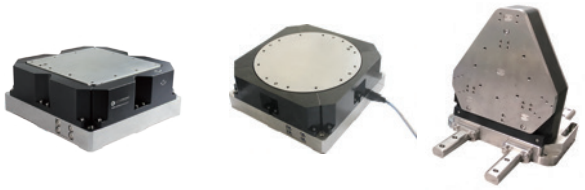


S50.UR0C/K is a θx and θz axes tilt/rotation stage, with super large load capacity of up to 40kg and deflection angle of ±0.25mrad. It can work in dynamics with a 20kg load. The products are mainly used in large load tilt/rotation motion experiments, such as vibration simulation experiments.

▸ Characteristics

- θx, θz motion
- Tilt angular range to ±0.25mrad
- Load capacity to 40kg
- CAP sensor
- High response

▸ θx, θz Motion



Standard

Custom is available

▸ Typical Applications

- Beam scanning
- Heavy load motion experiment
- Interference/metering
- Vibration simulation system

▸ Performance Test

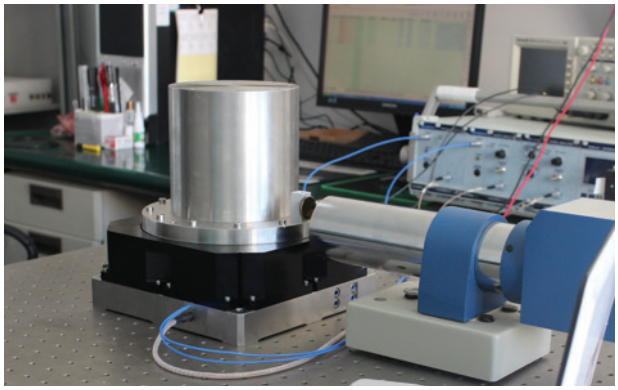
S50 stage requires three-channel controller for drive control, and different power piezo controllers are used according to the required frequency. For example, for the operating frequency of 100~200Hz, we recommend E00/E01 controller with E05 amplifier module.

▸ Large Load, High Accuracy & Frequency

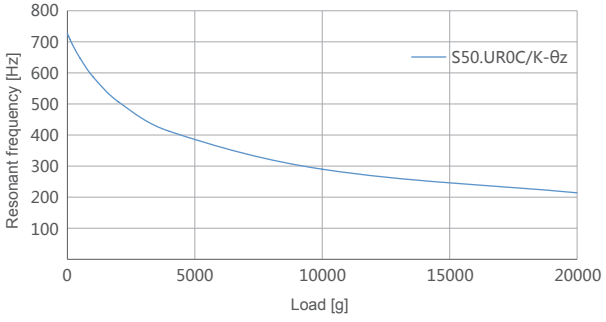
S50 stage features a large load capacity specially designed for large load applications. It has capacitive closedloop amplitude correction function and can move precisely with a 40kg load. The maximum travel is ±0.25mrad/axis.

Using finite element analysis to optimize the structure, S50 has very high stiffness, high dynamics even under load, up to 500 Hz.

A variety of sensor types are available, such as CAP, SGS, LVDT, and etc.



▸ Frequency and Load Curve



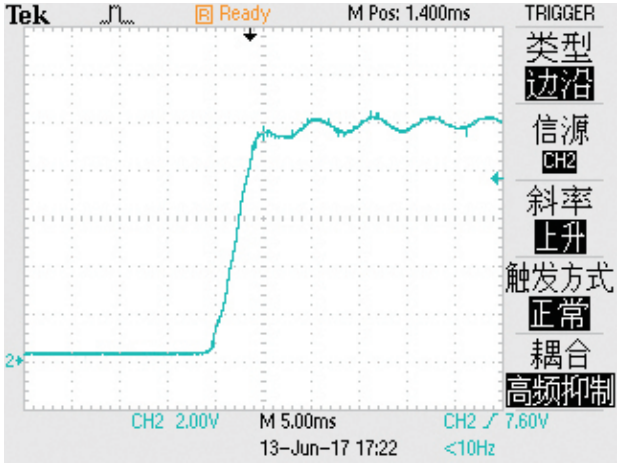
▸ Recommended Controllers

E01	E00	E70
		
3 channels Digital, analog Open/closed loop Ave. current 58mA	3 channels Digital, analog Open/closed loop Ave. current 291mA	3 channels Digital, analog Open/closed loop Ave. current 70mA

Note: Please see "Piezo Controller" for detailed information.

Loaded Step Time

When S50.UR0C/K piezo tilt/rotation stage is loaded with a 20kg load, works in 100% travel, and step time is set to 5ms, the step curve is as shown in the following figure.



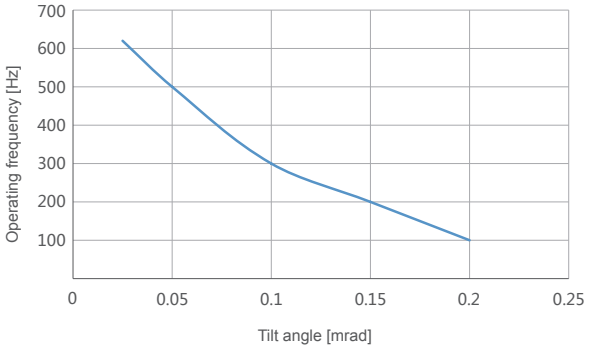
Technical Data

Type	C - closed loop K - open loop	S50.UR0C S50.UR0K	Units
Active axes		θx, θz	
Tilt angle(0~+120V)		0.4/axis(≈80″)	mrad±10%
Tilt angle(0~+150V)		0.5/axis(≈100″)	mrad±10%
Integrated sensor		CAP/-	
Resolution		0.02/0.01(<0.01″)	μrad
Closed-loop linearity		0.3/-	%F.S.
Closed-loop repeatability		0.2/-	%F.S.
Unloaded resonant frequency		θx500/θz750	Hz±20%
Unloaded step time		30/15	ms±20%
Unloaded operating frequency	10% travel	100	Hz±20%
	100% travel	50	
Load capacity		40	kg
El. capacitance		30/axis	μF±20%
Material		Aluminum, Steel	
Mass		12.5	kg±5%

Note: Above parameters are measured with the E00/E01 piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term operation, the recommended driving voltage is 0~120V.

Dynamic Performance

Loaded with 20kg, the relationship between tilt angles and operating frequency of S50.UR0C is showed in below figure.

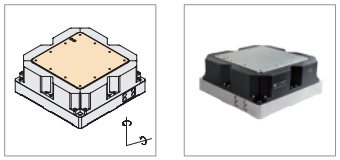


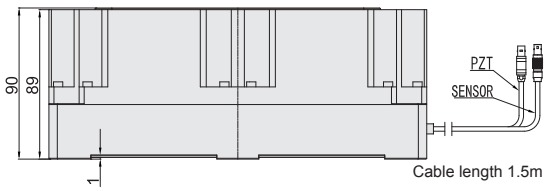
With 20kg Load, Tilt Angle vs Frequency

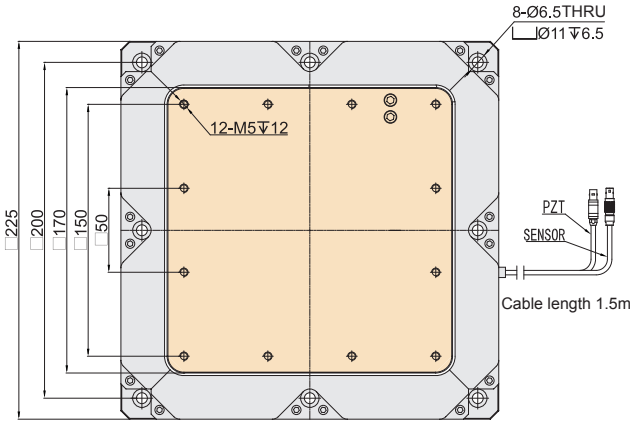
Angle	±0.1	±0.05	±0.02	±0.01	mrad±20%
Frequency θz	0-100	0-300	0-400	0-500	Hz±20%
Frequency θx	0-130	0-180	0-200	0-210	Hz±20%

Drawing

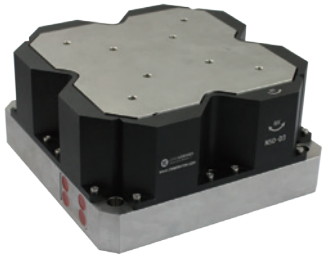
S50.UR0C/K







S50.UR1S/K Piezo Tilt/Rotation Stage



▸ Characteristics

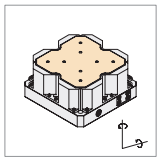
- θx deflection, θz rotation
- Optional closed-loop sensor
- Load up to 20kg
- Resolution up to 0.03μrad

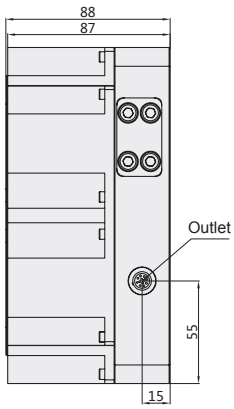
▸ Technical Data

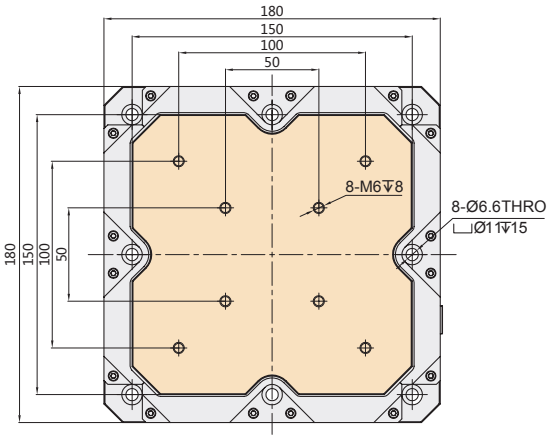
Type	S50.UR1S	S50.UR1K	Units
Active axis	θx, θz	θx, θz	
Tilt angle(0~120V)	1/axis	1/axis	mrad±10%
Tilt angle(0~150V)	1.3/axis	1.3/axis	mrad±10%
Sensor	SGS	-	
Resolution	0.03	0.03	μrad
Linearity	0.2	-	%F.S.
Closed loop repeatability	0.07	-	%F.S.
Unloaded resonant frequency, θx/θz	726/604	726/604	Hz±20%
Resonant frequency@20kg load, θx/θz	155/68	155/68	Hz±20%
Unloaded step time	50/20	50/20	ms±20%
Load capacity	20	20	kg
El. capacitance, θx/θz	36/44.3	36/44.3	μF±20%
Material	Steel, Aluminum	Steel, Aluminum	
Mass	9.5	9.5	kg±5%

▸ Drawing

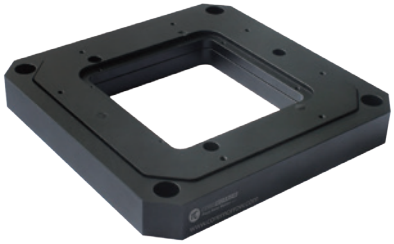
S50.UR1S/K







S51 Piezo Tip/Tilt and Z Stage



S51 is a piezoelectric deflection stage with 3 axes motion in θx, θy and Z, and with a 80×80mm central large aperture. It adopts frictionless flexible hinge structure design, featuring fast response speed and high precision of closed-loop positioning. The central large aperture makes it easy to integrate into microscopic and scanning optical system.

▸ Characteristics

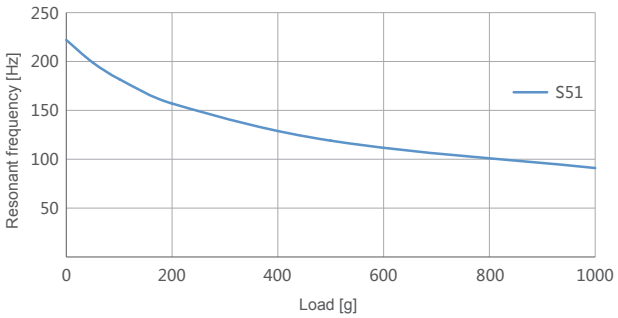
- θx, θy and Z motion
- High closed-loop positioning accuracy
- Fast response
- Light aperture: 80×80mm

▸ High Accuracy

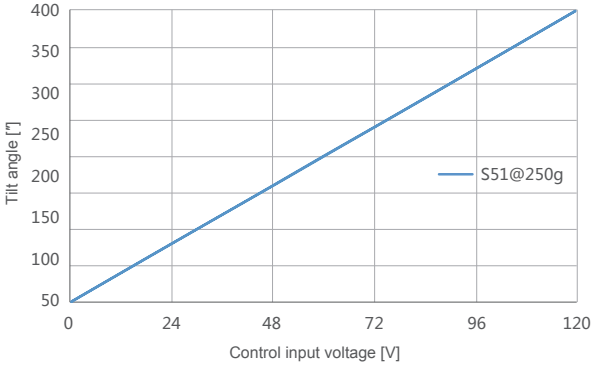
S51 piezo deflection stage adopts a frictionless flexible hinge guiding structure and is optimized by finite element analysis, with high stiffness and guiding precision.

The built-in precision sensor can be used for position feedback to ensure excellent motion control accuracy. The linear motion resolution can reach sub-nanometer, the deflection resolution of sub-microradian, and the positioning stabilization time is in the order of milliseconds.

▸ Frequency and Load Curve



▸ Closed-loop Curve

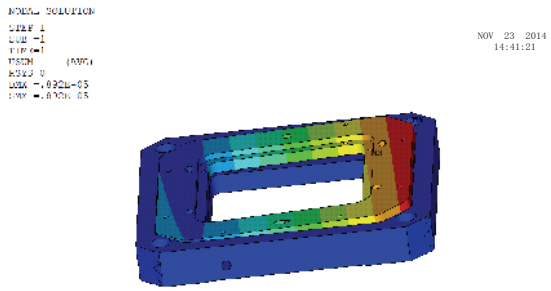


▸ Low-Profile Design

S51 piezo stage is specially designed for alignment, nanofocusing, metrology, etc, and features low-profile of only 20mm, easy to integrate.

▸ Simulation Analysis

S51 Finite element analysis techniques are used to design the highest stiffness in the direction of motion and to reduce angular misalignment. The hinge mechanism has no gaps and no friction offering high accuracy.



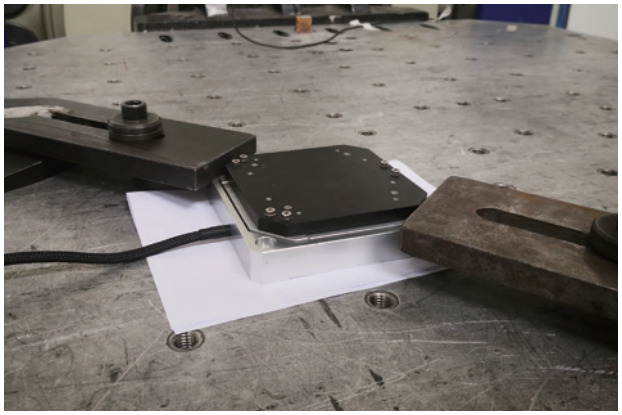
▸ Recommended Controllers

E00/E01	E53.B	E70
		
3 channels Digital, analog Open/closed loop Ave. current 291mA	3 channels Digital, analog Open/closed loop Ave. current 60mA	3 channels Digital, analog Open/closed loop Ave. current 70mA
Note: Please see "Piezo Controller" for detailed information.		

Typical Applications

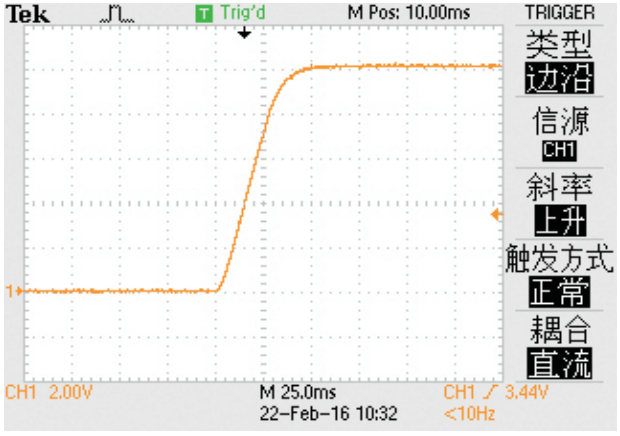
- Scanning microscopy
- Vibration simulation system
- Mask and wafer position adjustment
- Interference/Measuring
- Laser beam alignment
- Biotechnology

Tilt Range Measuring

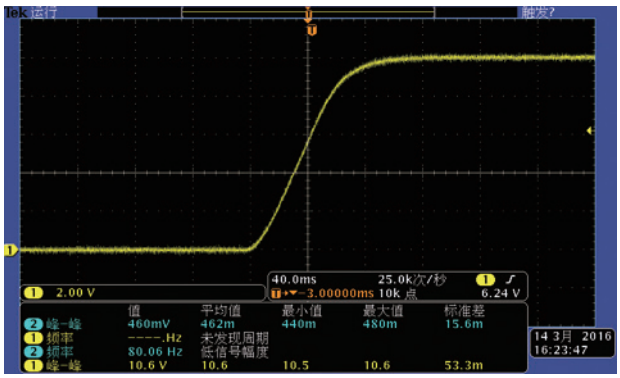


Load Step Time

S51.ZT1S piezo stage controlled with E01.D3 piezo controller, its step time of loading 240g to 100% travel is about 50ms, and the step time of loading 500g load to 100% travel is about 100ms.



Loading 240g



Loading 500g

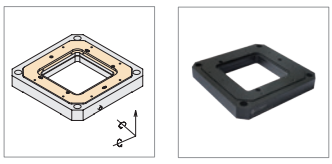
Technical Data

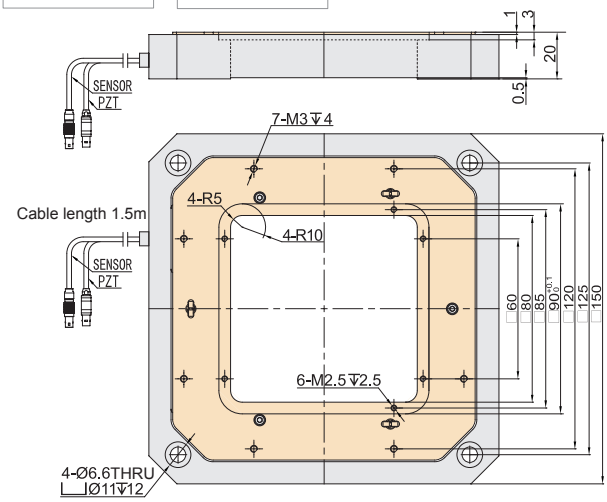
Type	S - closed loop K - open loop	S51.ZT1S S51.ZT1K	Units
Active axis		θx, θy, Z	
Linear travel axes(0~+120V)		80	μm±10%
Linear travel axes(0~+150V)		100	μm±10%
Tilt angle(0~+120V)		±0.9/axis(≈±190″)	mrad±10%
Tilt angle(0~+150V)		±1.1/axis(≈±220″)	mrad±10%
Integrated sensor		SGS/-	
Resolution in Z		7/4	nm
Resolution(θx, θy)		0.25(≈0.05″) /0.05(≈0.01″)	μrad
Closed-loop linearity		0.1/-	%F.S.
Closed-loop repeatability		0.05/-	%F.S.
Push/pull force		120/15	N
Stiffness in Z		1.5	N/μm±20%
Unloaded resonant frequency		340	Hz±20%
Unloaded step time		30/4.5	ms±20%
Unloaded operating frequency	10% travel	50	Hz±20%
	100% travel	15	
Load capacity		1(Optional 2.5 versions)	kg
El. capacitance		3.6/axis	μF±20%
Material		Aluminum, Steel	
Mass		820	g±5%

Note: Above parameters are measured with the E00/E01 piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term operation, the recommended driving voltage is 0~120V.

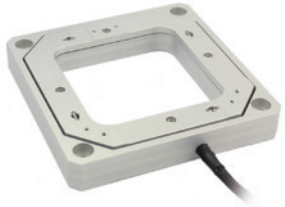
Drawing

S51





S54 Piezo Tip/Tilt Stages

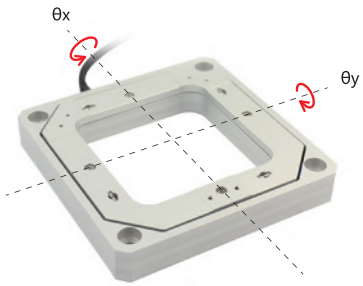


S54 is a two-axis piezoelectric deflection stage in θx, θy with a large aperture. It adopts a frictionless flexible hinge structure design with fast response speed and high closed-loop positioning accuracy. The 80×80mm aperture makes it easy to integrate into the systems of microscopy and scanning optical system.

▸ Characteristics

• θx, θy tilt • Open/closed loop • 80×80mm large aperture • High resolution • Low profile

▸ θx, θy Tilt



▸ Custom Design

Custom is available according to your application.

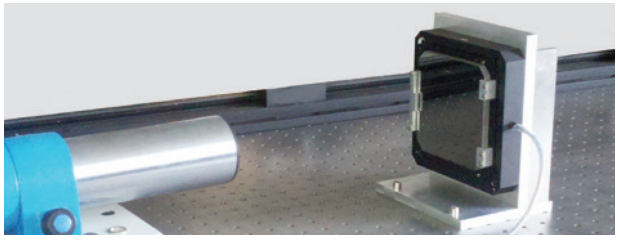
▸ Closed loop with High Accuracy

The internal flexible hinge guiding mechanism is optimized by finite element analysis to minimize the angular offset with no friction.

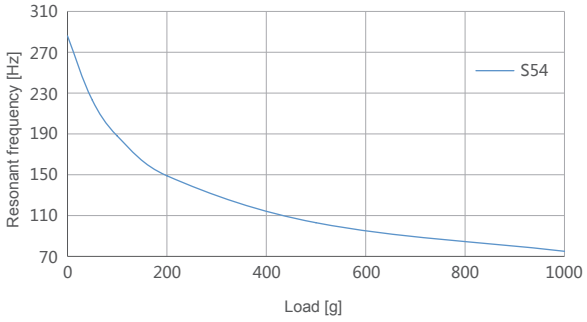
S54 tip/tilt stage can achieve a maximum deflection range of ±1mrad with a resolution of up to 0.05μrad. The closed-loop sensor can be optionally configured to achieve a repeatability of 0.1% F.S.

▸ Large Aperture

S54 piezoelectric stage has a large aperture of 80×80mm, which is very suitable for transmitted-light applications.



▸ Frequency and Load Curve



▸ Recommended Controllers

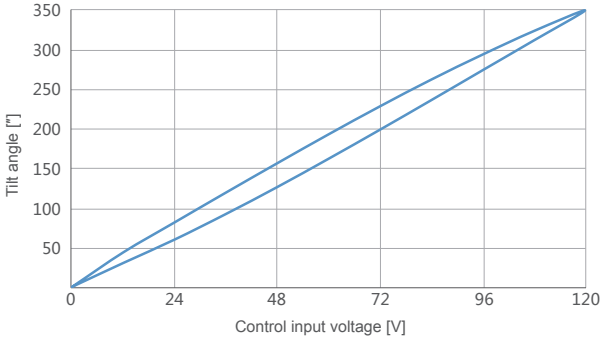
E01/E00	E53.B	E70
		
3 channels Digital, analog Open/closed loop Ave. current 291mA	3 channels Digital, analog Open/closed loop Ave. current 60mA	3 channels Digital, analog Open/closed loop Ave. current 70mA

Note: Please see "Piezo Controller" for detailed information.

Typical Applications

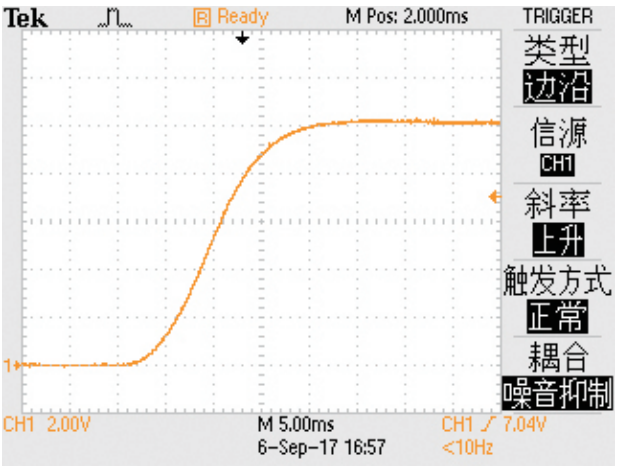
- Beam scanning
- Laser beam alignment
- Interference/Measuring
- Vibration simulation system
- Micro-operation
- Mask and wafer position adjustment

Open-Loop Curve

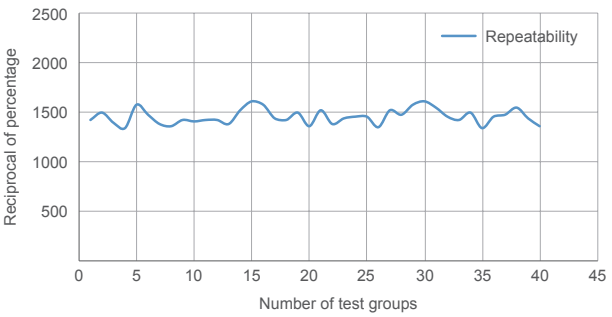


Step Time

S54.T2S unloaded step time to reach 100% travel is about 20ms.



Repeatability



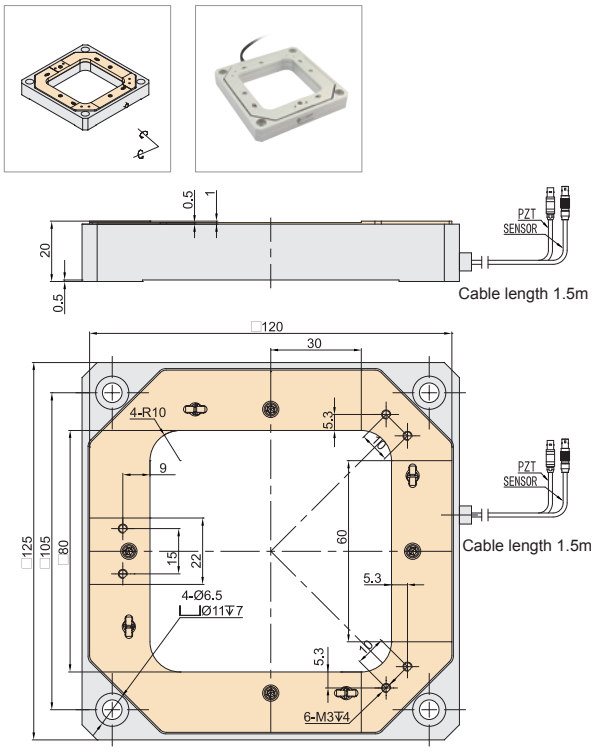
Technical Data

Type	S - closed loop K - open loop	S54.T2S S54.T2K	Units
Active axes		θx, θy	
Tilt angle(0~+120V)		±0.8/axis(≈±165″)	mrad±10%
Tilt angle(0~+150V)		±1/axis(≈±200″)	mrad±10%
Integrated sensor		SGS/-	
Tilt resolution		0.25(≈0.05″) /0.05(≈0.01″)	μrad
Closed-loop linearity		0.2/-	%F.S.
Closed-loop repeatability		0.1/-	%F.S.
Push/pull force		40/8	N
Stiffness		0.5	N/μm±20%
Unloaded resonant frequency		X450/Y400	Hz±20%
Unloaded step time		20/3.5	ms±20%
Unloaded operating frequency	10% travel	50	Hz±20%
	100% travel	15	
Load capacity		1	kg
El. capacitance		3.6/axis	μF±20%
Material		Aluminum, Steel	
Mass		510	g±5%

Note: Above parameters are measured with the E00/E01 piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term operation, the recommended driving voltage is 0~120V.

Drawing

S54



H60 Piezo Hexapod

H60 Piezo Hexapod is a piezo stage with 6-axis motion of θx, θy, θz, X, Y, and Z. 6-axis movement in space is realized by the coordinated expansion and contraction of six piezoelectric actuators. The closed-loop model has high positioning accuracy. It is suited for applications such as microelectronics precision machining, test, etc.

▸ Characteristics

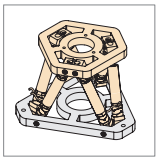
- θx, θy, θz, X, Y, Z motion
- Closed-loop control with high accuracy
- Ultra small coupling
- No accumulation of error

▸ Technical Data

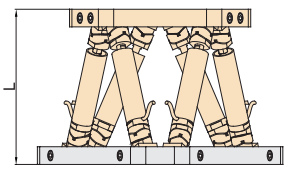
Type	S - closed loop K - open loop	H60.XYZTR1S H60.XYZTR1K	H60.XYZTR2S H60.XYZTR2K	H60.XYZTR5S H60.XYZTR5K	Units
Active axes			X, Y, Z, θx, θy, θz		
Linear travel in X, Y (0~120V)		±6.5	±12.5	±25	μm±20%
Linear travel in Z (0~120V)		±3.2	±6.4	±12.8	μm±20%
Tilt angle in θx, θy(0~120V)		±0.16(≈±30″)	±0.32(≈±66″)	±0.64(≈±130″)	mrad±20%
Tilt angle in θz(0~120V)		±0.24(≈±50″)	±0.48(≈±99″)	±0.96(≈±198″)	mrad±20%
Tilt resolution(θx, θy)		0.02(<0.01″) /0.01(<0.01″)	0.04(<0.01″) /0.02(<0.01″)	0.08(≈0.01″) /0.04(<0.01″)	μrad
Tilt resolution, θz		0.04(<0.01″) /0.02(<0.01″)	0.06(≈0.01″) /0.03(<0.01″)	0.12(≈0.02″) /0.06(≈0.01″)	μrad
Resolution in X, Y		0.8/0.4	1.6/0.8	3.2/1.6	nm
Resolution in Z		0.4/0.2	0.8/0.4	1.6/0.8	nm
Stiffness		50	58	66	N/μm±20%
Closed-loop linearity		0.25/-	0.25/-	0.25/-	%F.S.
Closed-loop repeatability		0.1/-	0.1/-	0.1/-	%F.S.
Unloaded resonant frequency			1		kHz±20%
Structure			Hexapods		
Driving source			Piezo actuators		
Load capacity			5		kg
Mass		1000	1150	1300	g±5%

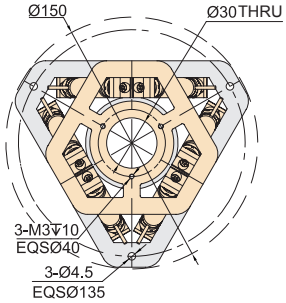
▸ Drawing

H60



Type	L
H60.XYZTR1	57
H60.XYZTR2	67.5
H60.XYZTR5	88





▸ Recommended Controllers

E00 Piezo Controller

E00.A6 Piezo Controller

H61 6-Axis Motion Piezo Stage

▸ Characteristics

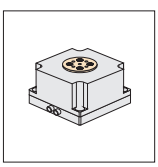
- Motion in X, Y, Z, θx, θy, θz
- Linear travel to 6μm@150V
- Deflection travel to 1mrad@150V
- Load capacity to 500g

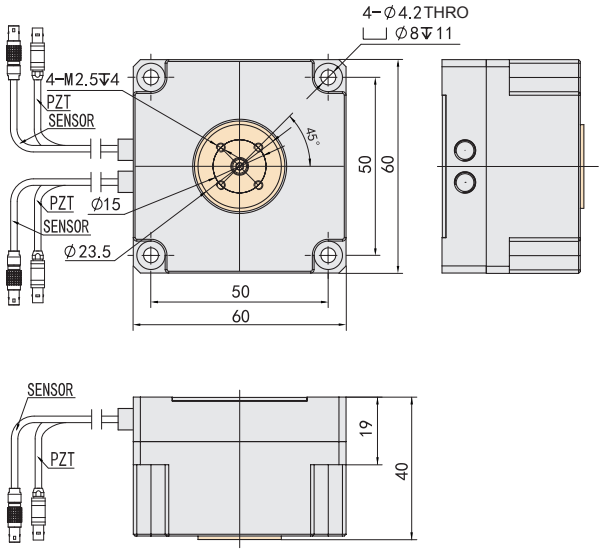
▸ Technical Data

Type	S - closed loop K - open loop	H61.XYZTR1S H61.XYZTR1K	Units
Active axis		X, Y, Z, θx, θy, θz	
Motion & Position			
X, Y, Z travel range (0~+150V)		6/axis	μm±10%
θx, θy, θz deflection angle (0~+150V)		1/axis	mrad±10%
Integrated sensor		SGS/-	
Closed/open-loop angular resolution		0.15/0.01	μrad
Closed/open-loop linear resolution		1.5/0.1	nm
Closed-loop linearity		0.25/-	%F.S.
Closed-loop repeatability		0.2/-	%F.S.
Mechanical Property			
Unloaded resonant frequency		X2330/Y895/Z1425/ θx3485/θy5620/θz2300	Hz±20%
Unloaded closed-loop step time		25	ms±20%
Load capacity		500	g
Drive Performance			
El. capacitance, XYZ		1.8	μF/axis±20%
El. capacitance, θx, θy, θz		3.6	μF/axis±20%
Others			
Material		Steel, Aluminum	
Mass		440(Not include cable)	g±5%
Cable length		1.5	m±10mm
Sensing/voltage Connector		DB15-HD(Needle)	

▸ Drawing

H61





▸ E51.D7S Piezo Controller

Front panel

Rear panel

H62 6-Axis Motion Piezo Nanopositioning Stage

▸ Characteristics

- Motion in X, Y, Z, θx, θy, θz
- Optional closed-loop feedback sensor
- Load capacity up to 200g
- Low profile

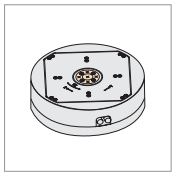
▸ Technical Data

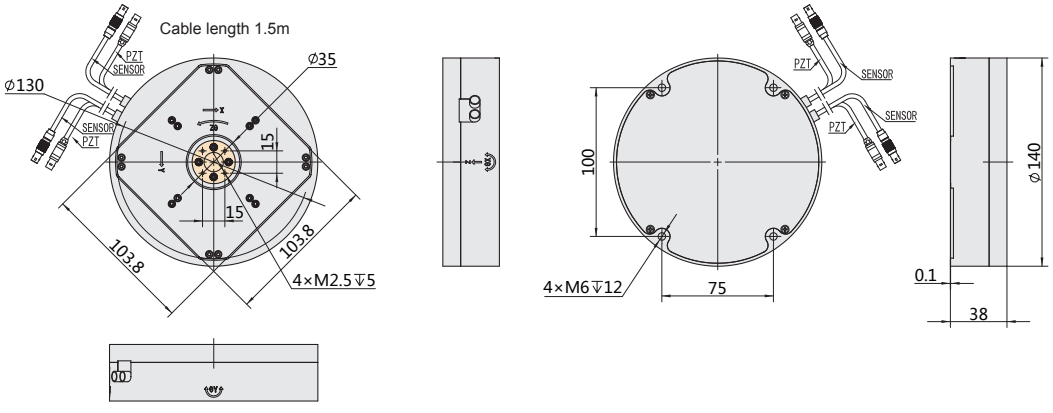
Type	S - closed loop K - open loop	H62.XYZTR25S	H62.XYZTR25K	Units
Active axis		X, Y, Z, θx, θy, θz	X, Y, Z, θx, θy, θz	
XYZ nominal travel range (0~150V)		XY: ±100, Z: 200	XY: ±100, Z: 200	μm±20%
θxθyθz nominal travel range (0~150V)		θxθy: ±12.5, θz: 1.6	θxθy: ±12.5, θz: 1.6	mrad±20%
Integrated sensor		SGS	-	
XYZ resolution		7	2	nm
θxθyθz resolution		θxθy: 0.9, θz: 0.06	θxθy: 0.25, θz: 0.01	μrad
Closed-loop linearity		0.5	-	%F.S.
Closed-loop repeatability		0.2	-	%F.S.
Unloaded resonant frequency		X140/Y150/Z200 θx270/θy280/θz110	X140/Y150/Z200 θx270/θy280/θz110	Hz±20%
Load capacity		0.2	0.2	kg±5%
El. capacitance		XYθxθy: 14.4 Z: 28.8 θz: 3.6	XYθxθy: 14.4 Z: 28.8 θz: 3.6	μF/axis±20%
Material		Steel, Aluminum	Steel, Aluminum	
Mass		960(Not include cable)	960(Not include cable)	g±5%

Note: The above parameters are measured using E00/E01 piezo controllers. The max driving voltage can be -20~150V; For high-reliability and long-term operation, the recommended driving voltage is 0~120V.

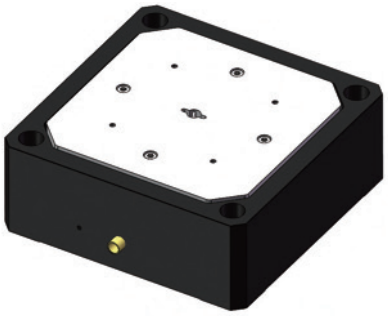
▸ Drawing

H62





20060 Piezo Tip/Tilt Stage (Custom Version)



▸ Characteristics

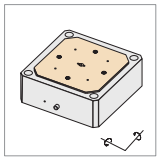
- θx,θy deflection
- Travel up to 2.5mrad
- Load capacity up to 5kg
- Resolution up to 50nrad

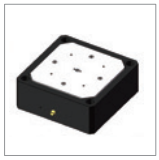
▸ Technical Data

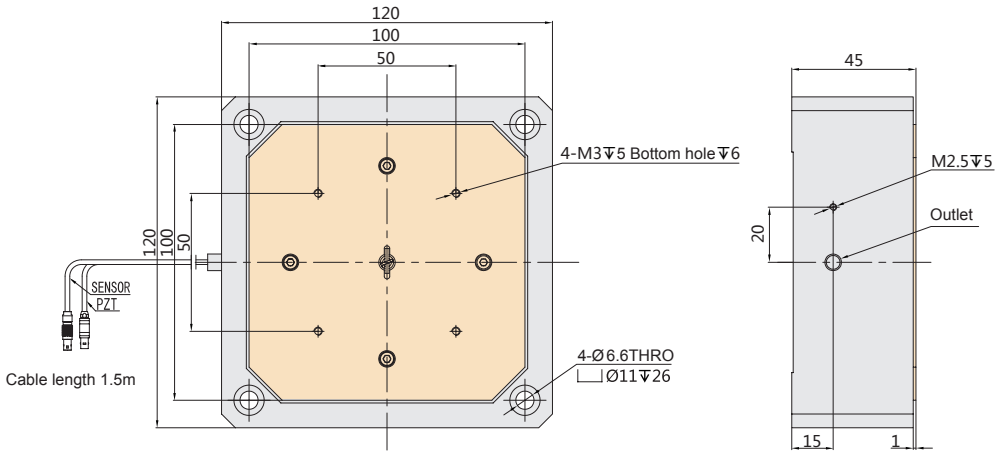
Type	20060	Units
Active axes	θx, θy	
Travel range(0~120V)	±1	mrad±20%
Travel range(-20~150V)	±1.25	mrad±20%
Integrated sensor	SGS	
Closed/open-loop resolution	0.25/0.05	μrad
Linearity	0.2/-	%F.S.
Repeatability	0.1/-	%F.S.
Unloaded resonant frequency	200	Hz±20%
Push/pull capacity	100/20	N±20%
El. capacitance	14.4/axis	μF±20%
Material	Steel, Aluminum	
Load capacity	5	kg±5%

▸ Drawing

20060







Challenge the Limits of Nano Motion and Control Technology...

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