

V22 Version



Piezo Nano Motion

- Piezo Nanopositioning Stages -

Piezo Nanopositioning Stages

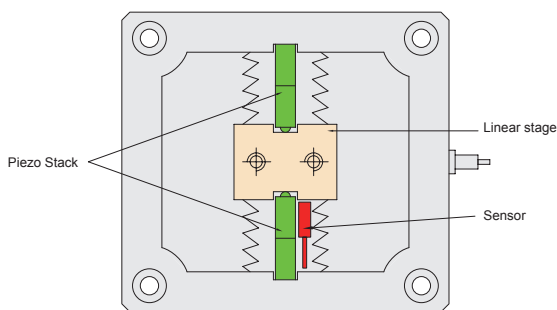


Piezo Nanopositioning Stages

Piezo nanopositioning stages are driven by piezo actuators, combined with flexible hinge mechanism to realize X/Z/XY/ XZ/XYZ motion. The max travel range is up to 300 μ m. It has the characteristics of small size, fast response, etc. The high-precision sensor can be integrated to achieve nano-resolution and positioning accuracy with extremely high reliability.

► Characteristics

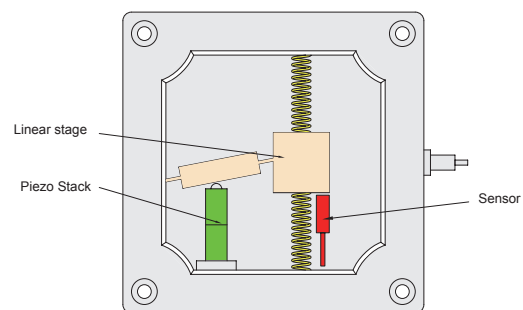
Direct-drive



Direct-drive

- High resolution, fast response
- Large stiffness, large load capacity

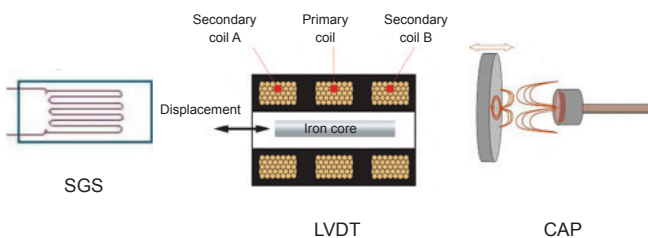
Amplified-drive



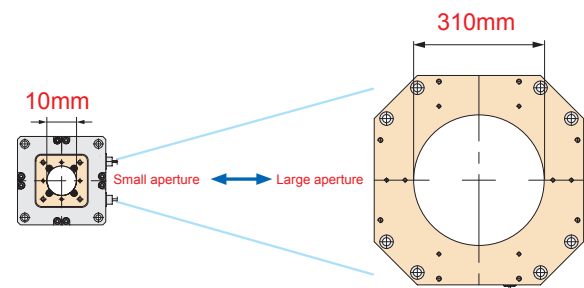
Amplified-drive

- Large displacement
- High resolution
- High accuracy of closed-loop repeatability

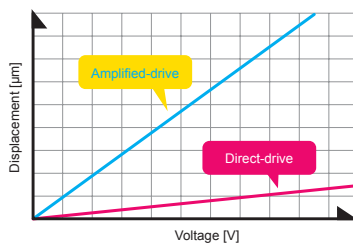
► Sensor Types



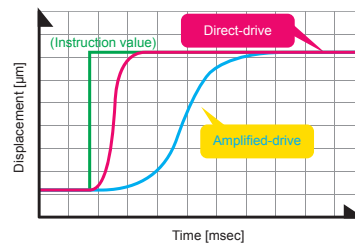
► Various Aperture Sizes



► Comparison of Direct Drive and Amplified Drive



In the same applied voltage, the displacement of the amplified-drive stage is several times to over ten times longer than that of direct-drive stage.



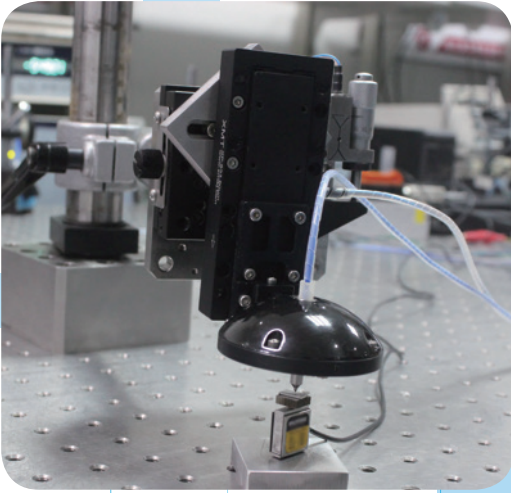
Response time affects positioning time

	Direct-drive	Amplified-drive
Resolution	A	A
Repeatability	A	A
Load capacity	A	B
Blocking force	A	B
Response time	A	B

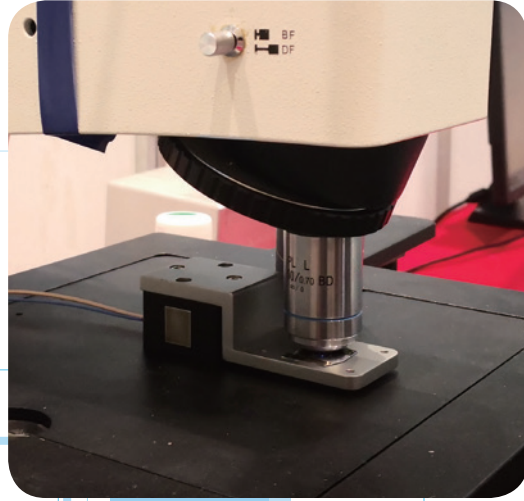
Both drive modes have high accuracy for closed loop

► Applications

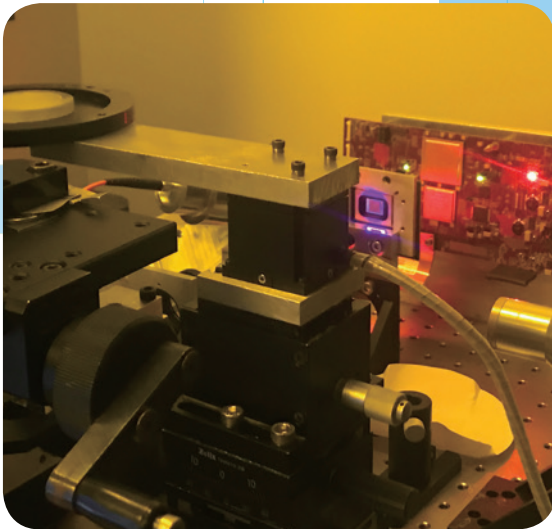
Piezo Nanopositioning Stages



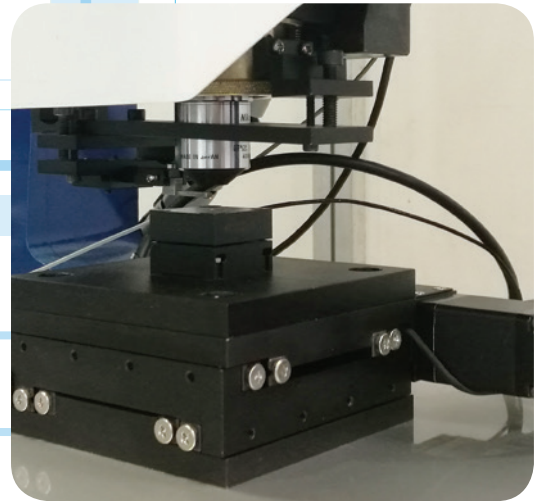
Aluminum Surface Processing



Structural Optical Tomography

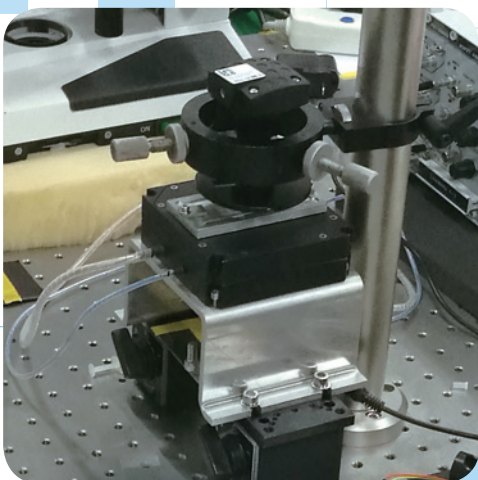


3D Micro-Nano Printing

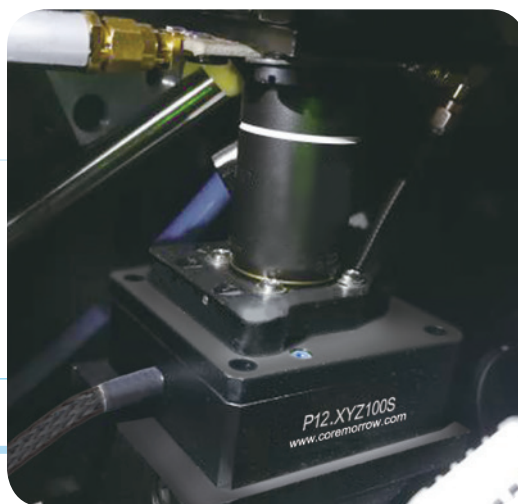


Scanning Microscope

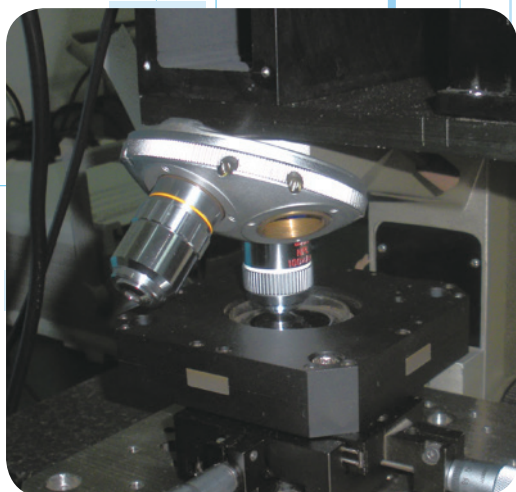
► Applications



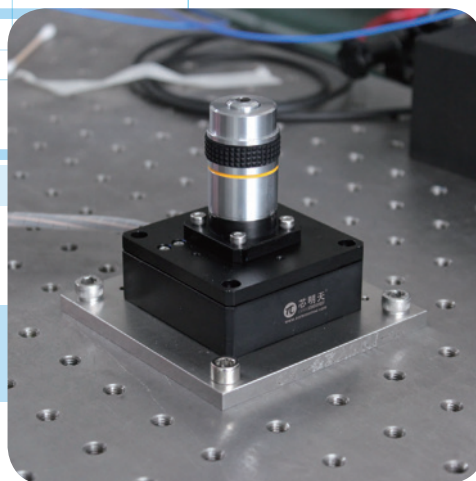
Sample Scanning



Fluorescence Microscopy



Lithography



Inverted Microscopy

► Application

- Scanning microscope
- CCD image processing
- Optical Communication
- Optical path adjustment
- Laser interference
- Nano-measurement
- Nanometer manipulation technology
- Nano-lithography, biotechnology
- Nano imprint

► Product List – No Aperture

Type	Models	Axes	Stroke[μm]	Load[kg]	Resonant frequency[kHz]	Resolution [nm]	Mechanism	Page
P11	P11.X100	X	100	0.8	0.3	4	Amplified	6
	P11.Z100	Z	100	0.8	0.3	4	Amplified	6
	P11.Z200	Z	200	0.5	0.18	4	Amplified	6
	P11.Z300	Z	300	0.4	0.12	5	Amplified	6
	P11.XY100	XY	100/axis	0.7	X0.2/Y0.3	4	Amplified	6
	P11.XZ100	XZ	100/axis	0.7	X0.2/Z0.3	4	Amplified	6
	P11.XYZ100	XYZ	100/axis	0.6	X0.2/Y0.3/Z0.18	4	Amplified	6
	P11.XY200Z300	XYZ	XY180/Z300	0.2	X0.2/Y0.18/Z0.2	2	Amplified	8
P13	P13.XY40	XY	37.5/axis	0.05	X0.45/Y0.55	0.7	Amplified	9
	P13.XY50	XY	43/axis	0.8	X0.55/Y0.52	1	Amplified	9
	P13.XYZ40	XYZ	37.5/axis	0.05	X0.35/Y0.4/Z0.58	0.7	Amplified	9
	P13.XY50Z7	XYZ	XY43/Z8	0.8	X0.55/Y0.52/Z8.7	1	Amplified	9
P60	P60.X250	X	±165	0.6	0.49	5	Amplified	11
	P60.Z250	Z	250	1	0.26	3	Amplified	12
	P60.Z500	Z	500	2	0.29	5	Amplified	12
	P60.XYZ200	XYZ	200/axis	0.3	0.27	5	Amplified	13
P63	P63.X7	X	6.8	0.8	2	0.1	Direct	14
	P63.Z7	Z	6.8	0.8	2.5	0.1	Direct	14
	P63.XY7	XY	6.8/axis	0.5	X1.3/Y1.9	0.1	Direct	14
	P63.XZ7	XZ	6.8/axis	0.5	X1.5/Z1.6	0.1	Direct	14
	P63.XYZ7	XYZ	6.8/axis	0.4	X0.9/Y0.95/Z1.2	0.1	Direct	14
	P63.X18-D1	X	18	0.5	2	0.3	Direct	16
	P63.Z8-D1	Z	8	0.5	1	0.3	Direct	16
	P63.XY18-D1	XY	18/axis	0.5	2	0.3	Direct	16
	P63.X18Z8-D1	XZ	X18/Z8	0.5	X2/Z1	0.3	Direct	16
	P63.XY18Z8-D1	XYZ	XY18/Z8	0.5	X2/Y2/Z1	0.3	Direct	16
P66	P66.X30	X	30	8	5	0.7	Direct	17
	P66.X60	X	60	6	1.3	0.8	Direct	17
	P66.Z30	Z	30	1	1.4	0.7	Direct	17
	P66.XY30	XY	30/axis	5	X0.9/Y1.6	0.7	Direct	17
	P66.XY60	XY	60/axis	4	X0.9/Y1.2	0.8	Direct	17
	P66.XZ30	XZ	30/axis	1	X1.5/Z0.8	0.7	Direct	17
	P66.XYZ30	XYZ	30/axis	1	X0.6/Y0.7/Z1.2	0.7	Direct	17
XD604	XD604.XZ8	XZ	8/axis	80	0.56	4	Direct	19
XP-611	XP-611.X100	X	100	0.8	0.28	4	Amplified	20
	XP-611.Z100	Z	100	1.2	0.28	4	Amplified	20
XP-63X	XP-630.X	X	15	5	3.2	0.1	Direct	22
	XP-631.X	X	30	5	2.4	0.2	Direct	22
	XP-633.X	X	60	5	1.5	0.3	Direct	22
W08	W08	XYZ	120/axis	10	-	-	Amplified	24
Custom Z Axes	-	Z	800	1	0.2	6	Amplified	24
Z03	Z03	Z	250	5	0.2	-	Amplified	25
Custom	20059	Z	1000	0.7	-	8	Amplified	26
	20090	XY	30/axis	2	-	-	Amplified	27
	20100	XYZ	XY400/Z100	-	-	-	Amplified	27
	20136	XZ	100/200	10	-	-	Amplified	28
	21001	XYZ	20/axis	5	-	1	Amplified	29
	N60	X	30	0.5	1.8	0.5	Amplified	29

► Product List – With Aperture

Type	Models	Axes	Stroke[μm]	Aperture[mm]	Load[kg]	Resonant frequency[kHz]	Resolution [nm]	Mechanism	Page
P12	P12.X100	X	100	Φ25/Φ35	0.8	0.23	4	Amplified	30
	P12.Z100	Z	100	Φ25/Φ35	0.8	0.22	4	Amplified	30
	P12.Z200	Z	200	Φ25/Φ35	0.5	0.15	4	Amplified	30
	P12.Z300	Z	300	Φ25/Φ35	0.4	0.1	5	Amplified	30
	P12.XY100	XY	100/axis	Φ25/Φ35	0.7	X0.18/Y0.23	4	Amplified	30
	P12.XZ100	XZ	100/axis	Φ25/Φ35	0.6	0.2	4	Amplified	30
	P12.XYZ100	XYZ	100/axis	Φ25/Φ35	0.6	X0.23/Y0.18/Z0.15	4	Amplified	30
P12A	P12.XY500Z800	XYZ	XY500Z800	Φ18	0.25	-	5	Amplified	32
	P12A.X100	X	100	45×45	0.7	0.23	4	Amplified	33
	P12A.Z100	Z	100	45×45	0.7	0.2	4	Amplified	33
	P12A.XY100	XY	100/axis	45×45	0.6	X0.17/Y0.2	4	Amplified	33
	P12A.XZ100	XZ	100/axis	45×45	0.6	X0.2/Z0.15	4	Amplified	33
	P12A.XYZ100	XYZ	100/axis	45×45	0.5	X0.2/Y0.15/Z0.12	4	Amplified	33
	P12A.XY200Z100	XYZ	XY250Z100	45×45	0.5	XY0.24/Z0.15	4	Amplified	35
P12B	P12B.XYZ100	XYZ	100/axis	Φ10	0.2	-	-	Amplified	36
P13A	P13A.XY50	XY	90/axis	10×10	≤ 0.15	0.45	0.5	Amplified	37
	20083	XYZ	80/axis	5×5	0.1	0.35	4	Amplified	37
	20089	XY	180/axis	15×15	0.2	-	4	Amplified	37
P15	P15.XYZ100	XYZ	100/axis	60×60	0.5	-	20	Amplified	38
	P15.XYZ300	XYZ	300/axis	66×66	0.5	X0.27/Y0.27/Z0.55	6	Amplified	38
P16	P16.XY20	XY	±10/axis	Φ26	1	2	0.5	Amplified	39
	P16.XY50	XY	50/axis	Φ20	1.5	0.5	5	Amplified	41
	P16.XY80	XY	105/axis	Φ43	0.5	0.7	10	Amplified	41
	P16.XY100	XY	±50/axis	Φ20	1.5	0.6	5	Amplified	41
P17	P17.XY15	XY	15/axis	25×27.5	0.2	1	0.2	Direct	43
	P17.XY200	XY	187.5/axis	60×60	1	X0.24/Y0.4	5	Amplified	45
P18	P18.X200	X	250	Φ35	2	0.5	5	Amplified	47
	P18.X300	X	±187.5	Φ35	3.5	0.6	5	Amplified	47
	P18.Z200	Z	250	Φ35	1	0.3	5	Amplified	47
	P18.XY200	XY	250/axis	Φ35	1.5	X0.2/Y0.45	5	Amplified	47
	P18.XY300	XY	±187.5/axis	Φ35	3	X0.25/Y0.5	5	Amplified	47
	P18.XZ200	XZ	200/axis	Φ35	1	X0.2/Z0.3	5	Amplified	47
	P18.XYZ200	XYZ	200/axis	Φ35	0.8	X0.12/Y0.2/Z0.3	5	Amplified	47
P70	P70.XY20	XY	±8.5/axis	Φ10	0.3	1.2	0.6	Amplified	49
	P70.Z8	Z	8	Φ12	0.2	3.6	0.6	Direct	49
P77	P77.S/K242	Z	17.5	Φ242	15	3.09	0.5	Direct	50
	P77.30S/K140	Z	16/32	Φ140	5	0.2	0.5	Direct	50
	P77.S/K310	Z	17	Φ310	12	-	0.5	Direct	50
	P77.S/K106	Z	17.5	Φ106	15	0.3	0.5	Direct	50
	P77.S/K106A	Z	17.5	Φ106	10	0.15	0.5	Direct	50
	P77.S/K36	Z	17.5	Φ36	7	0.3	0.5	Direct	50
	P77.S/K160	Z	17.5	Φ160	10	0.14	0.5	Direct	50
	P77.S/K160A	Z	17.5	Φ160	10	0.12	0.5	Direct	50
	P77.S/K210	Z	17.5	Φ210	10	0.1	0.5	Direct	50
P77A	P77A.K65	Z	20	Φ65	5	1.4	0.5	Direct	53
	P77A.50K65	Z	50	Φ65	3	1.4	1.5	Direct	53
P78	P78.Z100	Z	100	120×70	1	0.4	4	Amplified	54
	P78.Z200	Z	187.5	64×64	1	0.27	3	Amplified	55
	P78.Z300	Z	262.5	64×64	0.5	0.2	5	Amplified	55
P79	P79.Z100	Z	100	83×65	2	0.2	3	Amplified	56
	P79.Z200	Z	187.5	83×65	1.5	0.15	5	Amplified	56
	P79.XYZ50	XYZ	50/axis	84×65	0.5	X0.52/Y0.63/Z0.49	1	Amplified	56
XP-780	XP-780.X	X	200	25×25	5	0.2	5	Amplified	58
Custom	18130	Z	90	128×60	-	-	-	Amplified	63
	18068	Z	500	210×170	-	0.1	-	Amplified	63
	19113	Z	500	123×87	-	-	-	Amplified	63
	20091	Z	50	Φ24	0.2	1.2	-	Amplified	61
	20142	XY	10/axis	Φ38/Φ33	0.2/0.15	> 500	5	Amplified	60
	20180	XYZ	XY±40/Z15	20×20	0.5	X0.47/Y0.59/Z0.9	10.7	Amplified	61
	20190	XY	200/axis	86×86	40	0.16	-	Direct	62

P11 Piezo Nanopositioning Stage(Amplified Drive)



P11 is a small-volume 1~3 axes piezo nanopositioning stage. It adopts a no-friction flexible hinge guiding mechanism and amplified-drive mechanism to ensure 100μm displacement. Closed-loop version could achieve positioning accuracy up to nano-scale. It has excellent control precision, the resolution and stability could reach nanometer level, stabilization time is only milliseconds, the stage is non-magnetic material, and is not affected by the magnetic field in operating.

► Characteristics

- 1~3 axes motion
- XYZ stroke to 300μm/axis
- Small size
- Fast response time
- Vacuum version available

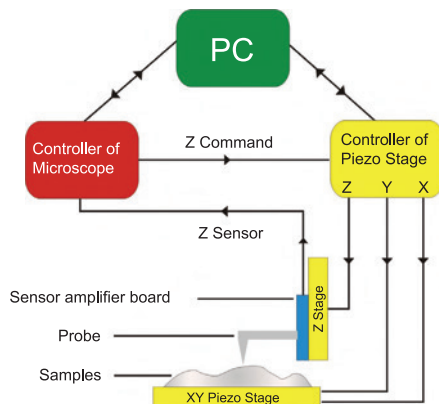
► 1~3 Axes

P11 includes X, Z, XY, XZ, XYZ versions. Precise motion of 100μm can be achieved.

► Applications

- Nanopositioning
- Quality assurance test
- Biotechnology
- Micromachining / precision control

► AFM



► Combination with Manual Micrometer



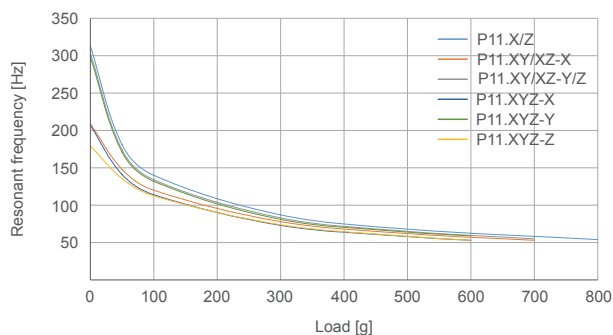
► Fast Response Time, Large Stroke

P11 adopts amplified mechanism and built-in high-reliability piezo actuator, which could realize precise motion of 100μm.

There are open-loop and closed-loop versions. Closed-loop version integrates high-precision sensors to detect and feedback the position in real time. CoreMorrow E00/E01, E52/E53 piezo servo controllers are ideal for driving PZT.

P11 has very fast response time, and the step time could be up to 0.8ms with E52 piezo controller.

► Frequency vs Load Curve



► Recommended Controllers

E00/E01	E70	E53
		
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	1 channel Analog, digital Open/closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

► Technical Data

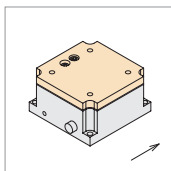
Type	S-Closed loop K-Open loop	P11.X100S P11.X100K	P11.Z100S P11.Z100K	P11.Z200S P11.Z200K	P11.Z300S P11.Z300K	P11.XY100S P11.XY100K	P11.XZ100S P11.XZ100K	P11.XYZ100S P11.XYZ100K	Units
Active axes		X	Z	Z	Z	X, Y	X, Z	X, Y, Z	
Travel range(0~120V)		80	80	160	240	80/axis	80/axis	80/axis	$\mu\text{m}\pm 10\%$
Travel range(0~150V)		100	100	200	300	100/axis	100/axis	100/axis	$\mu\text{m}\pm 10\%$
Sensor		SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Closed/open loop resolution		7/4	7/4	7/4	11/5	7/4	7/4	7/4	nm
Linearity		0.05/-	0.05/-	0.15/-	0.5/-	0.1/-	0.1/-	0.1/-	%F.S.
Repeatability		0.02/-	0.02/-	0.06/-	0.12/-	0.03/-	0.03/-	0.05/-	%F.S.
Pitch/yaw/roll		<10	<10	<10	<10	<10	<10	<10	μrad
Push/pull force		30/10	30/10	70/6	50/4	25/10	25/10	30/5	N
Stiffness		0.3	0.3	0.45	0.25	X0.25/Y0.3	X0.25/Z0.3	X0.25/Y0.3/Z0.2	$\text{N}/\mu\text{m}\pm 20\%$
Unloaded resonant frequency		0.3	0.3	0.18	0.12	X0.2/Y0.3	X0.2/Z0.3	X0.2/Y0.3/Z0.18	$\text{kHz}\pm 20\%$
Closed/open-loop unloaded step time		10/0.8	10/0.8	10/0.8	10/0.8	15/0.8	15/0.8	20/0.8	$\text{ms}\pm 20\%$
Unloaded operating frequency	10% Travel	100	100	100	100	100	100	50	$\text{Hz}\pm 20\%$
	100% Travel	9	10	10	10	9	9	5	
Load capacity		0.8	0.8	0.5	0.4	0.7	0.7	0.6	kg
El. capacitance		1.8	1.8	3.6	5.4	1.8/axis	1.8/axis	1.8/axis	$\mu\text{F}\pm 20\%$
Material		Steel, Aluminum							
Mass		100	100	170	230	170	170	230	$\text{g}\pm 5\%$

Note: Max driving voltage could be -20V~150V, Recommended voltage 0~120V for long-term operation to extend lifetime.

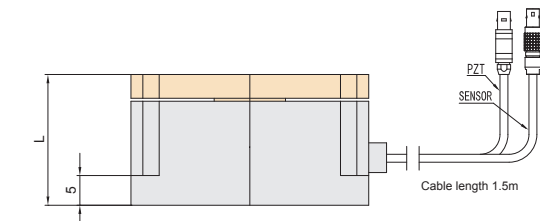
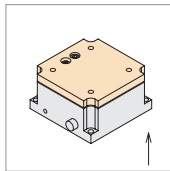
Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Drawings

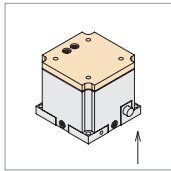
P11.X100



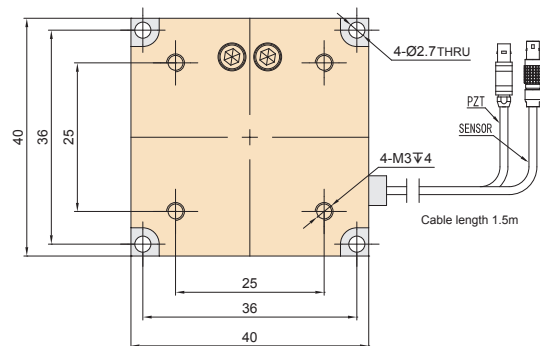
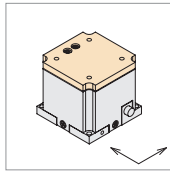
P11.Z100



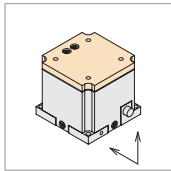
P11.Z200/300



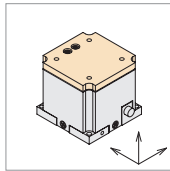
P11.XY100



P11.XZ100



P11.XYZ100



Models	L(mm)
P11.X	22
P11.Z100	22
P11.Z200/300	36.5

Models	L(mm)
P11.XY	36.5
P11.XZ	36.5
P11.XYZ	36.5

P11.XY200Z300S/K Piezo Nanopositioning Stage



► Characteristics

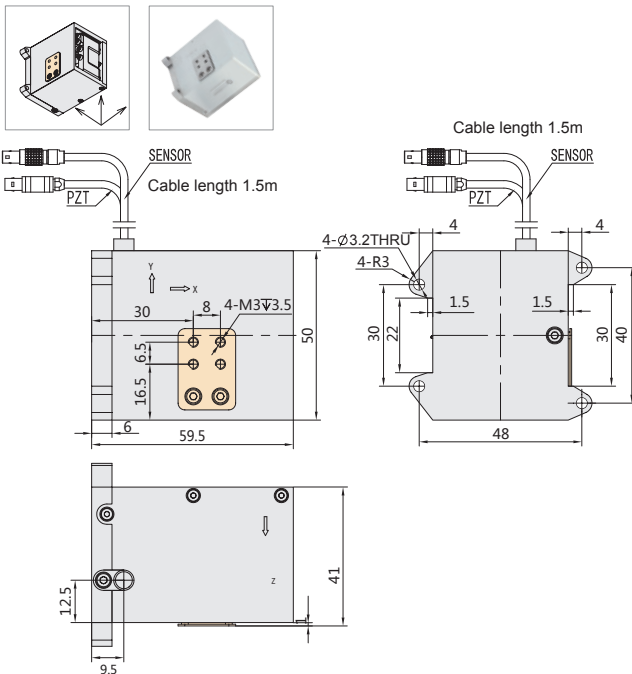
• XYZ motion • Stroke to X180/Y180/Z300μm • Load capacity to 200g • Open/closed-loop versions • Vacuum version available

► Technical Data

Type	P11.XY200Z300S	P11.XY200Z300K	Units
Active axes	X, Y, Z	X, Y, Z	
Travel range(0~+120V)	X130/Y130/Z250	X130/Y130/Z250	μm±10%
Travel range(0~+150V)	X180/Y180/Z300	X180/Y180/Z300	μm±10%
Sensor	SGS	-	
Resolution	XY7, Z10	XY2, Z4	nm
Linearity	0.4	-	%F.S.
Repeatability	0.1	-	%F.S.
Unloaded resonant frequency	X200/Y180/Z200	X200/Y180/Z200	Hz±20%
Load capacity	0.2	0.2	kg
El. capacitance	X2.2/Y2.2/Z7	X2.2/Y2.2/Z7	μF±20%
Material	Steel, Aluminum	Steel, Aluminum	

► Drawing

P11.XY200Z300S/K



► Recommended Controllers

E00/E01	E70	E53
1~3 channels Analog input, Rotary knob Open/closed loop Ave. current: 291mA	3 channels Analog input Open/closed loop Ave. current: 70mA	1 channel Analog input Open/closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

P13 Piezo Nanopositioning Stage(Amplified Drive)



P13 is an XY or XYZ piezo stage. It adopts parallel kinematic mechanism with built-in high-performance piezo actuator with displacement of $43\mu\text{m}/\text{axis}$. Open loop or Closed loop version is available.

► Characteristics

- 2~3 axes
- Small size
- Vacuum version available
- Max stroke to $43\mu\text{m}$
- Fast response time
- Open/closed-loop versions

► Typical Application

- 2D/3D scanning
- Semiconductor
- AFM
- Optical path adjustment
- Micromanipulation
- Nanopositioning

► Ultra-Small Size, High Resolution

It has very high resolution and good linearity of motion.

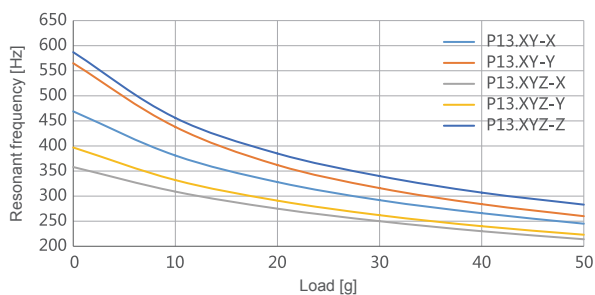
P13 could be easily mounted to other positioning systems and could be equipped with sensor to eliminate the hysteresis and creep of piezoelectric ceramics.

P13 Piezo Stage is ideal for dynamic and scanning applications.

► P13.XYZ50



► Frequency vs Load Curve (P13.XY/XYZ40)



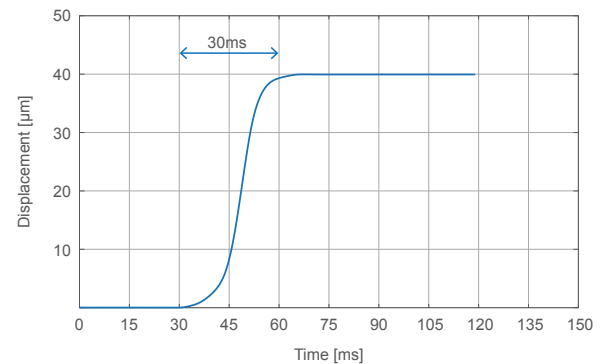
► 2~3 Axes

P13 piezo nanopositioning stage includes two specifications of XY axis and XYZ axis.



► Closed Loop Stabilization Time

Settling time of the P13.XY closed loop version at full stroke is about 30ms.



► Recommended Controllers

E00/E01	E53.B	E70
1~3 channels Analog, digital Open/closed loop Ave. current: 291	3 channels Analog, digital Open/closed loop Ave. current: 60mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA
Note: For technical data, please refer to "Piezo Controllers".		

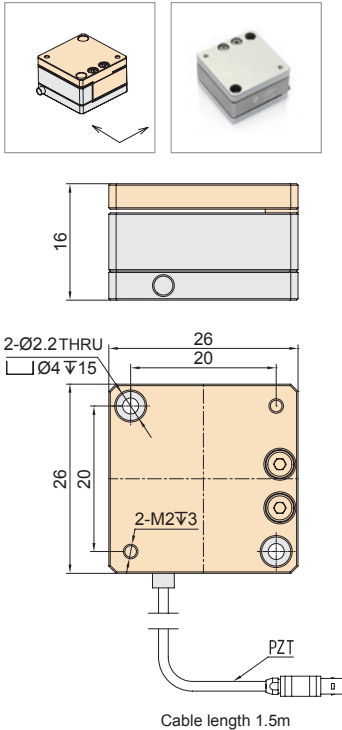
► Technical Data

Type	S-Closed loop K-Open loop	P13.XY40S P13.XY40K	P13.XYZ40S P13.XYZ40K	P13.XY50S P13.XY50K	P13.XY50Z7S P13.XY50Z7K	Units
Active axes		X, Y	X, Y, Z	X, Y	X, Y, Z	
Travel range(0~120V)		30/axis	30/axis	34/axis	X34/Y34/Z6	$\mu\text{m}\pm 20\%$
Travel range(0~150V)		37.5/axis	37.5/axis	43/axis	X43/Y43/Z8	$\mu\text{m}\pm 20\%$
Integrated sensor		SGS/-	SGS/-	SGS/-	SGS/-	
Resolution		1.5/0.7	1.5/0.7	3/1	3/1	nm
Closed-loop linearity		0.2/-	0.2/-	0.2/-	0.2/-	%F.S.
Repeatability		0.1/-	0.1/-	0.1/-	0.1/-	%F.S.
Pitch/yaw/roll		<5	<5	-	-	μrad
Push/pull force capacity		5/2	8/3	-	-	N
Stiffness		X0.15/Y0.2	X0.1/Y0.15/Z0.2	-	-	N/ $\mu\text{m}\pm 20\%$
Unloaded resonant frequency		X0.45/Y0.55	X0.35/Y0.4/Z0.58	X0.55/Y0.52	X0.55/Y0.52/Z8.7	kHz $\pm 20\%$
Unloaded step time		30/2	30/3	30/3	30/3	ms $\pm 20\%$
Unloaded operating frequency	10% Travel	50	35	-	-	Hz $\pm 20\%$
	100% Travel	5	3	-	-	
Load capacity		0.05	0.05	0.8	0.8	kg
El. capacitance		0.8/axis	0.8/axis	0.8/axis	0.8/axis	$\mu\text{F}\pm 20\%$
Material		Steel, Aluminum, low temperature version is available.				
Mass		110	220	120	130	g $\pm 5\%$

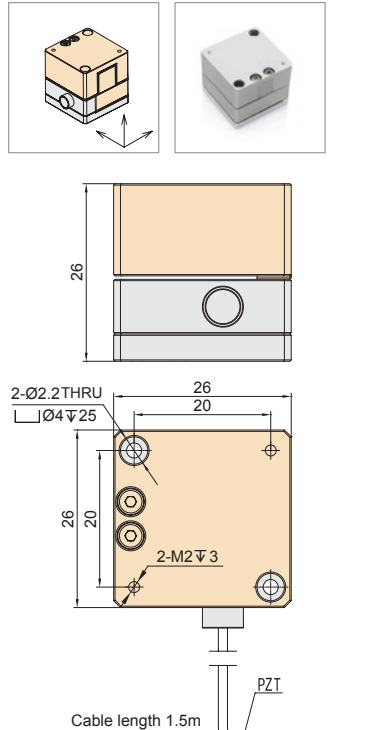
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation.
Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Drawings

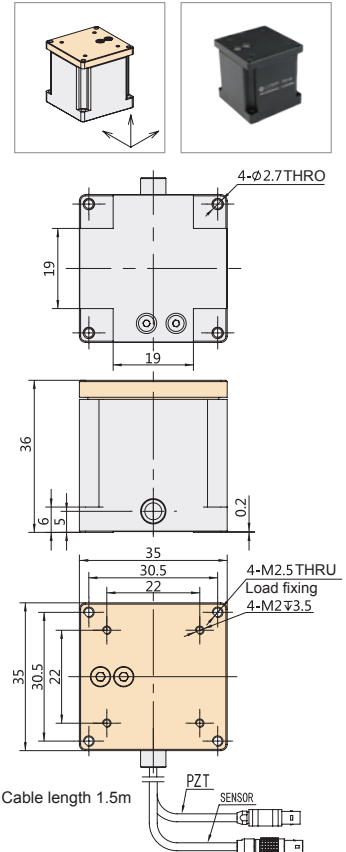
P13.XY40K



P13.XYZ40K

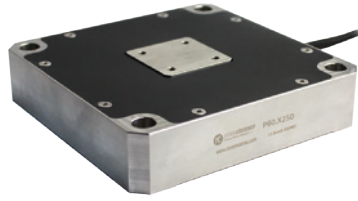


P13.XY50Z7S/K, P13.XY50S/K



* For drawings of P13.XY40/XYZ40 closed loop versions, please refer to CoreMorrow website or consulting sales engineer.

P60.X250 Piezo Nanopositioning Stage



► Characteristics

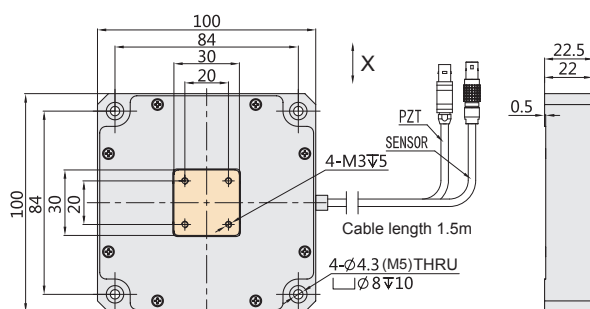
- Closed-loop version for high accuracy
- Anti-vibration design
- Differential drive
- High/low-temperature/vacuum version available
- Fast response

► Technical Data

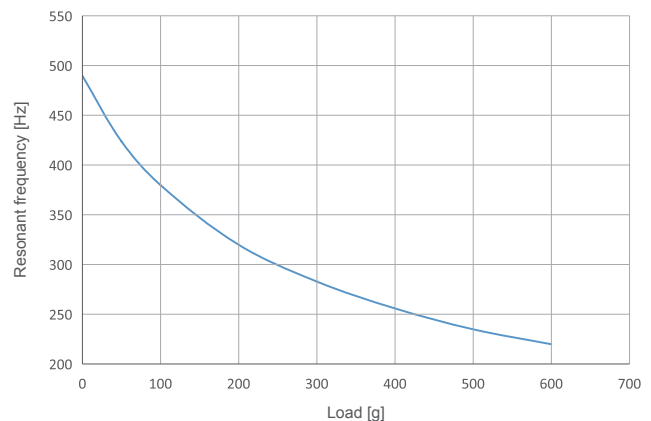
Type	P60.X250S	P60.X250K	Units
Active axes	X	X	
Travel range(0~120V)	±130	±130	μm±10%
Travel range(0~150V)	±165	±165	μm±10%
Sensor	SGS	-	
Resolution	12	5	nm
Linearity	0.1	-	%F.S.
Repeatability	0.04	-	%F.S.
Pitch/yaw/roll	<1	<1	μrad
Push/pull force	300/30	300/30	N
Stiffness	1.2	1.2	N/μm±20%
Unloaded resonant frequency	490	490	Hz±20%
Unloaded step time	80	40	ms±20%
Unloaded operating frequency	10% travel: 60 100% travel: 6	60 6	Hz±20%
Load capacity	0.6	0.6	kg
El. capacitance	24.6	24.6	μF±20%
Operating temperature	-40~+80	-40~+80	°C
Anti-vibration design	Half sine wave: 15g, 11ms Back peak sawtooth wave: 20g, 11ms	15g, 11ms 20g, 11ms	
Material	Steel, Aluminum	Steel, Aluminum	
Mass	950	950	g±5%

► Drawing

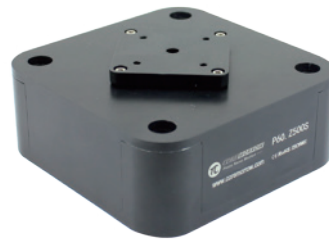
P60.X250



► Frequency vs Load Curve



P60.Z250/500 Piezo Nanopositioning Stage



► Characteristics

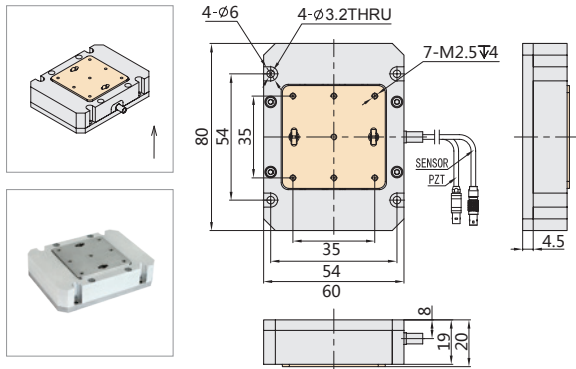
- Motion in Z
- Travel to 250µm or 500µm
- Load capacity up to 2kg
- Optional vacuum version

► Technical Data

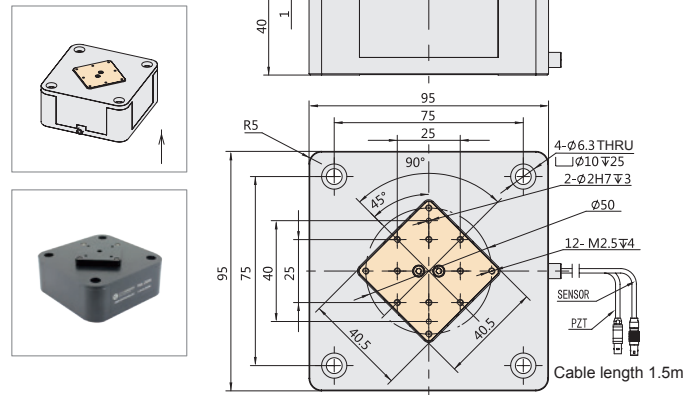
Type	S-Closed loop K-Open loop	P60.Z250S	P60.Z250K	P60.Z500S	P60.Z500K	Units
Active axes		Z	Z	Z	Z	
Travel range(0~120V)		200	200	400	400	µm±20%
Travel range(0~150V)		250	250	500	500	µm±20%
Sensor		SGS	-	SGS	-	
Resolution		10	3	20	5	nm
Linearity		0.4	-	0.1	-	%F.S.
Repeatability		0.1	-	0.05	-	%F.S.
Unloaded resonant frequency		260	-	290	290	Hz±20%
Load capacity		1	1	2	2	kg
El. capacitance		21.6	21.6	28.8	28.8	µF±20%
Material		Steel, Aluminum	Steel, Aluminum	Steel, Aluminum	Steel, Aluminum	
Mass(with no cable)		0.4	0.4	0.65	0.65	kg±20%
Vacuum		1×10 ⁻⁵	1×10 ⁻⁵	-	-	mbar

► Drawings

P60.Z250



P60.Z500



P60.XYZ200 Piezo Nanopositioning Stage



► Characteristics

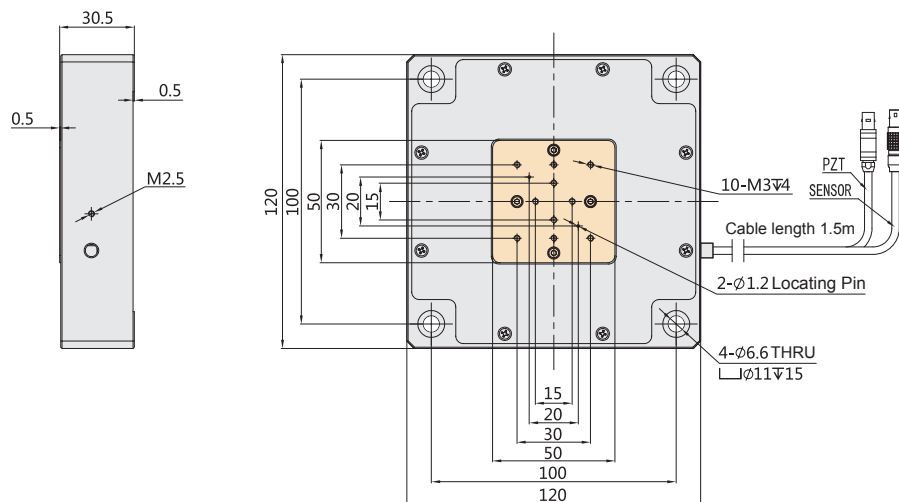
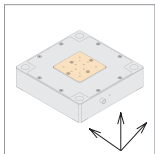
- XYZ motion
- Stroke to 200 μ m/axis
- Load capacity to 300g
- Closed-loop version for high accuracy
- Available UHV version

► Technical Data

Type	P60.XYZ200S	P60.XYZ200K	Units
Active axes	X, Y, Z	X, Y, Z	
Travel range(0~120V)	160	160	μ m $\pm$ 10%
Travel range(0~150V)	200	200	μ m $\pm$ 10%
Sensor	SGS	-	
Resolution	10	5	nm
Linearity	0.2	-	%F.S.
Repeatability	0.1	-	%F.S.
Unloaded resonant frequency	270	270	Hz $\pm$ 20%
Resonant frequency@100g	110	110	Hz $\pm$ 20%
Unloaded resonant frequency@50% travel range	20	20	Hz $\pm$ 20%
El. capacitance	14/14/7.2	14/14/7.2	μ F $\pm$ 20%
Material	Aluminum	Aluminum	
Operating temperature	-20~80	-20~80	$^{\circ}$ C
Load capacity	300	300	g

► Drawing

P60.XYZ200



P63 Piezo Nanopositioning Stage(Direct Drive)



P63 is a small-volume 1~3 axes piezo nanopositioning stage. It features ultra-precision and very compact. The size of XYZ version is only 30×30×42mm (only 30×30×21mm for X version) and is very easy to integrate into any scanning instrument.

P63 is an ultra-high precision nanopositioning system. It is designed for AFM, SPM, STM and other micro-scanning nano-operations.

► Characteristics

- 1~3 axes motion
- Fast response time
- Displacement to 6.8μm/axis
- Max load capacity to 0.8kg

► 1~3 Axes

P63 piezo nanopositioning stage include X, Z, XY, XZ, XYZ versions and the displacement is up to 6.8μm/axis. Ultra-small size is easy to integrate.

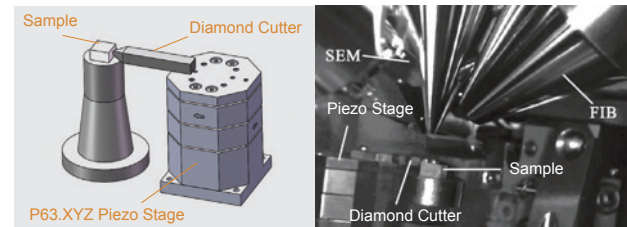


► Applications

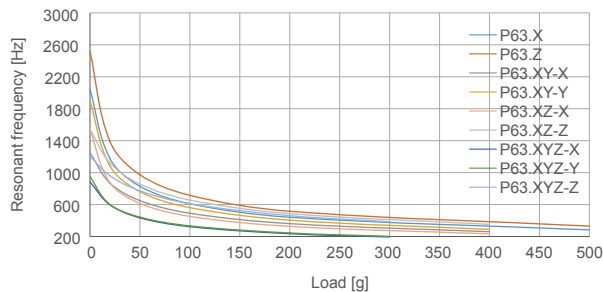
- Microscopic imaging
- Nanopositioning
- 3-axis micro turning
- AFM

► Application Example

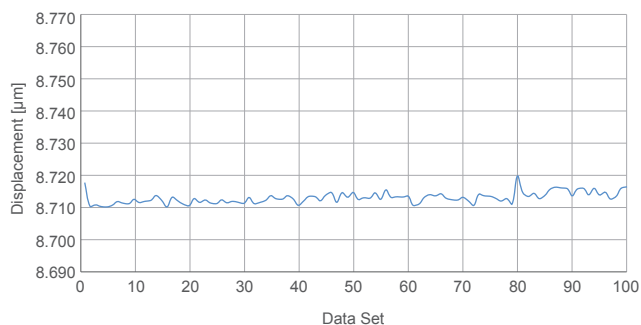
P63.XYZ applies to cutting force test based on SEM online nano cutting stage.



► Frequency vs Load Curve



► Displacement Stability at 150V



► Fast Response, Available Sensor

P63 piezo stage is an ultra-high-precision nano-positioning system designed for AFM, SPM, STM and other micro-scanning and nano-operation applications. It has ultra-low inertia, response time up to 0.3ms, available integrated sensor for high-accuracy scanning.

► Recommended Controllers

E00/E01	E70	E53
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	1 channel Analog, digital Open/closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

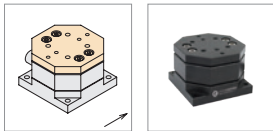
► Technical Data

Type	S-closed loop K-open loop	P63.X7S P63.X7K	P63.Z7S P63.Z7K	P63.XY7S P63.XY7K	P63.XZ7S P63.XZ7K	P63.XYZ7S P63.XYZ7K	Units
Active axes		X	Z	X, Y	X, Z	X, Y, Z	
Travel range(0~120V)		5.5	5.5	5.5/axis	5.5/axis	5.5/axis	$\mu\text{m}\pm 10\%$
Travel range(0~150V)		6.8	6.8	6.8/axis	6.8/axis	6.8/axis	$\mu\text{m}\pm 10\%$
Sensor		SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Closed/open-loop resolution		0.3/0.1	0.3/0.1	0.3/0.1	0.3/0.1	0.3/0.1	nm
Closed-loop linearity		0.4/-	0.4/-	0.4/-	0.4/-	0.4/-	%F.S.
Repeatability		0.2/-	0.2/-	0.2/-	0.2/-	0.2/-	%F.S.
Pitch/yaw/roll		<5	<5	<10	<10	<15	μrad
Push/pull force capacity		10/2	12/2	8/2	9/2	7/2	N
Stiffness		1.5	2	X1.2/Y1.4	X1.2/Z1.5	X0.9/Y1/Z1.2	$\text{N}/\mu\text{m}\pm 20\%$
Unloaded resonant frequency		2	2.5	X1.3/Y1.9	X1.5/Z1.6	X0.9/Y0.95/Z1.2	$\text{kHz}\pm 20\%$
Closed/open-loop unloaded step time		1.5/0.3	1.5/0.3	1.5/0.3	1.5/0.3	1.5/0.3	$\text{ms}\pm 20\%$
Unloaded operating frequency	10% travel	1000	1000	500	500	200	$\text{Hz}\pm 20\%$
	100% travel	200	200	100	100	50	
Load capacity		0.8	0.8	0.5	0.5	0.4	kg
El. capacitance		0.8	0.8	0.8/axis	0.8/axis	0.8/axis	$\mu\text{F}\pm 20\%$
Material		Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	
Mass		70	70	120	120	160	$\text{g}\pm 5\%$

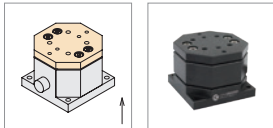
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation to extend lifetime. Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Drawing

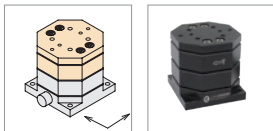
P63.X



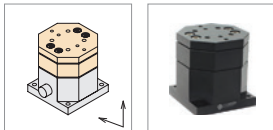
P63.Z



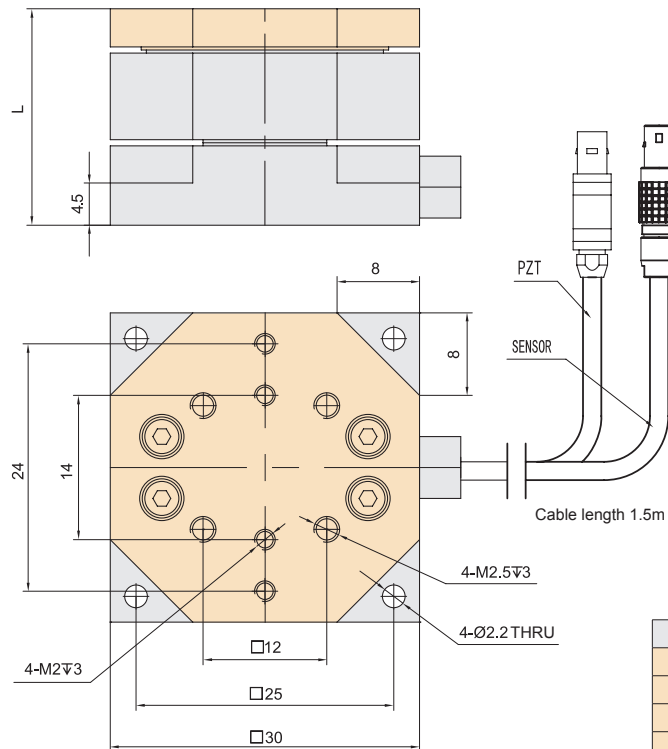
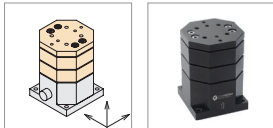
P63.XY



P63.XZ



P63.XYZ



Models	L(mm)
P63.X	21
P63.Z	24
P63.XY	30
P63.XZ	33
P63.XYZ	42

P63-D1 Piezo Nanopositioning Stage



► Characteristics

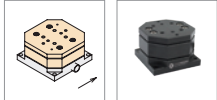
- 1~3 axes motion
- XY stroke to 18μm/axis
- Z stroke to 8μm
- Open/closed loop
- Load to 0.5kg
- Optional UHV version

► Technical Data

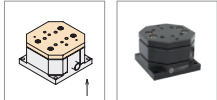
Type	S-closed loop K-open loop	P63.X18S-D1 P63.X18K-D1	P63.Z8S-D1 P63.Z8K-D1	P63.XY18S-D1 P63.XY18K-D1	P63.X18Z8S-D1 P63.X18Z8K-D1	P63.XY18Z8S-D1 P63.XY18Z8K-D1	Units
Active axes		X	Z	X, Y	X, Z	X, Y, Z	
Travel range(0~120V)		16	6	16/axis	X16, Z6	XY16, Z6	μm±10%
Travel range(0~150V)		18	8	18/axis	X18, Z8	XY18, Z8	μm±10%
Sensor		SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Closed/open loop resolution		0.7/0.3	0.7/0.3	0.7/0.3	0.7/0.3	0.7/0.3	nm
Closed-loop linearity		0.3/-	1/-	0.3/-	X0.3, Z1/-	XY0.3, Z1/-	%F.S.
Repeatability		0.25/-	0.25/-	0.25/-	0.25/-	0.25/-	%F.S.
Pitch/yaw/roll		≤15	≤15	≤15	≤15	≤15	μrad
Unloaded resonant frequency		2	1	2	X2/Z1	X2/Y2/Z1	kHz±20%
Closed/open-loop unloaded step time		8/0.5	8/0.5	8/0.5	8/0.5	8/0.5	ms±20%
Load capacity		0.5	0.5	0.5	0.5	0.5	kg
El. capacitance		1.8	0.8	1.8	X1.8, Z0.8	XY1.8, Z0.8	μF±20%
Operating temperature		-20~80	-20~80	-20~80	-20~80	-20~80	°C
Material		Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	
Cable length		1.5	1.5	1.5	1.5	1.5	m±10mm

► Drawings

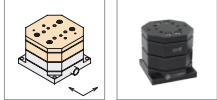
P63.X18-D1



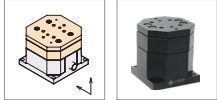
P63.Z8-D1



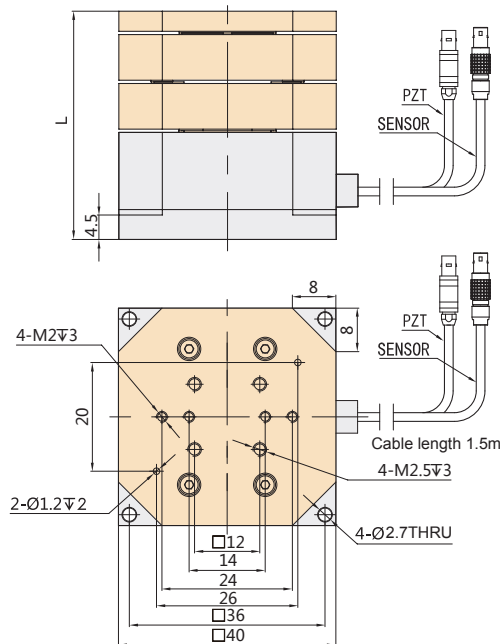
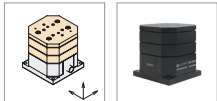
P63.XY18-D1



P63.X18Z8-D1



P63.XY18Z8-D1



Models	L(mm)
P63.X18-D1	21
P63.Z8-D1	24
P63.XY18-D1	30
P63.X18Z8-D1	33
P63.XY18Z8-D1	42

P66 Piezo Nanopositioning Stage(Direct Drive)



P66 is a piezo nanopositioning stage with 1~3 axes motion using a direct-drive mechanism. It is a nanopositioning system combining piezo and flexible hinges, which could reach millisecond response time, sub-nano accuracy, and optional high-precision sensors for closed-loop control. It is ideal for positioning applications such as optical path length correction in interference, sample positioning in microscopy or scanning applications, etc.

► Characteristics

- Optional 30 μ m/60 μ m displacement
- Load to 8kg
- Repeatability to 12nm
- Open/closed loop
- UHV version is available

► 1~3 Axes

P66 family include: P66.X(X axis), P66.Z(Z axis), P66.XY(XY axes), P66.XZ(XZ axes), P66.XYZ(XYZ axes).



P66.X

P66.Z

P66.XY

P66.XZ

P66.XYZ

► Open/Closed-Loop Version

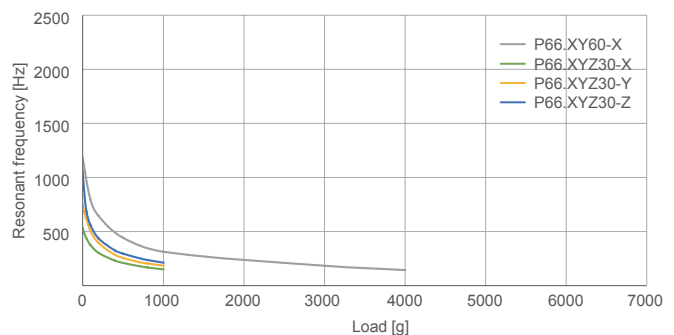
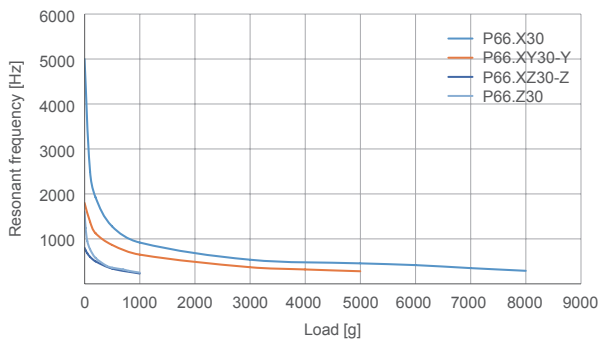
P66 could be selected as an open-loop or closed-loop version. Closed-loop version is equipped with high-resolution and fast-responding strain sensor (SGS). The sensor feedbacks high-bandwidth, high-precision voltage signals.

The sensor uses full-bridge configuration to eliminate thermal drift, allowing piezo nanopositioning stages to achieve high linearity and repeatability.

► Applications

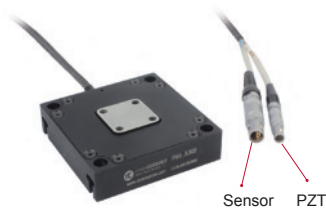
- Interference / scanning
- Metering
- Micromachining / precision control
- CD disc test

► Frequency vs Load Curve



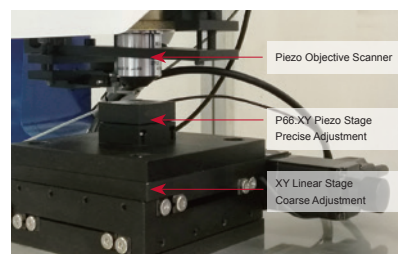
► Connectors

The standard connectors for driving and sensing are LEMO connectors, and could be customized according to the interface type of the piezo controller.



► Application Example-AFM

P66.XY piezo nanopositioning stage is widely used in AFM for its high response frequency, high precision and high reliability.

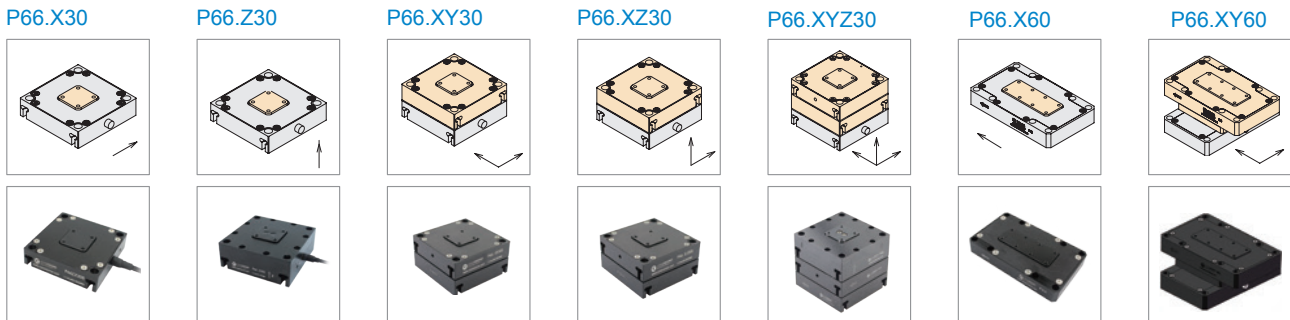


► Technical Data

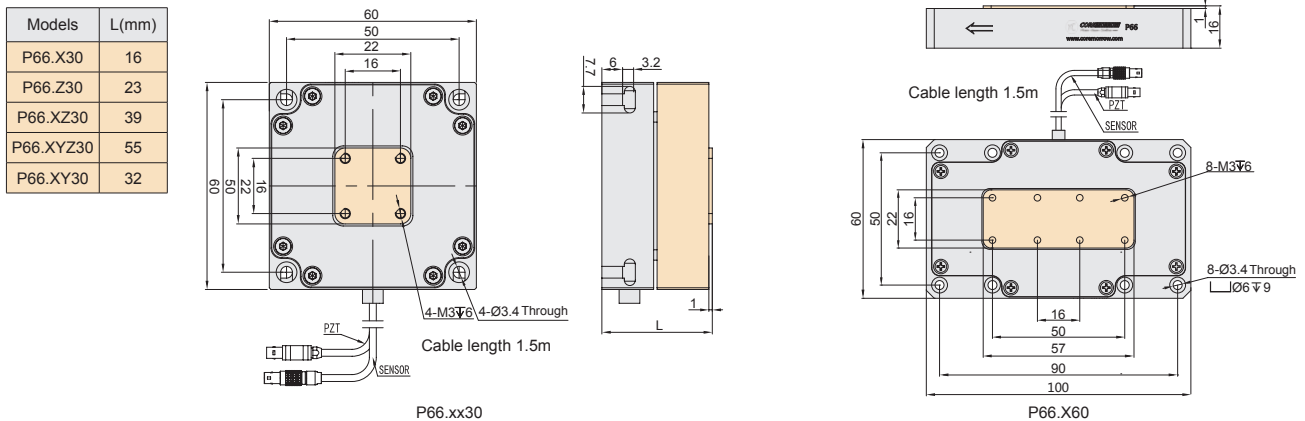
Type	S-Closed loop K-Open loop	P66.X30S P66.X30K	P66.X60S P66.X60K	P66.Z30S P66.Z30K	P66.XY30S P66.XY30K	P66.XY60S P66.XY60K	P66.XZ30S P66.XZ30K	P66.XYZ30S P66.XYZ30K	Units
Active axes		X	X	Z	X, Y	X, Y	X, Z	X, Y, Z	
Travel range(0~120V)		24	48	24	24/axis	48/axis	24/axis	24/axis	μm±10%
Travel range(0~150V)		30	60	30	30/axis	60/axis	30/axis	30/axis	μm±10%
Sensor		SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Closed/open loop resolution		1.5/0.7	2/0.8	1.5/0.7	1.5/0.7	2/0.8	1.5/0.7	1.5/0.7	nm
Closed-loop linearity		0.1/-	0.1/-	0.1/-	0.1/-	0.15/-	0.1/-	0.15/-	%F.S.
Repeatability		0.05/-	0.05/-	0.05/-	0.08/-	0.1/-	0.08/-	0.1/-	%F.S.
Pitch/yaw/roll		<15	<20	<15	<15	<20	<15	<15	μrad
Push/pull force capacity		120/15	160/16	30/10	100/15	120/12	30/10	30/10	N
Stiffness in motion direction		4.4	2.8	1.1	3.3	2.1	1.1	1.1	N/μm±20%
Unloaded resonant frequency		5	1.3	1.4	X0.9/Y1.6	X0.9/Y1.2	X1.5/Z0.8	X0.6/Y0.7/Z1.2	kHz±20%
Closed/open-loop unloaded step time		5/0.8	10/1.6	15/1	8/0.8	20/1.6	20/1	30/1	ms±20%
Unloaded operating frequency	10% travel	500	200	80	260	100	60	40	Hz±20%
	100% travel	50	20	8	25	10	6	4	
Load capacity		8	6	1	5	4	1	1	kg
El. capacitance		3.6	7.2	3.6	3.6/axis	7.2/axis	3.6/axis	3.6/axis	μF±20%
Material		Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	
Mass		120	190	200	260	450	320	460	g±5%

Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation to extend lifetime. Technical data is measured by CoreMorrow E00/E01 series piezo controller.

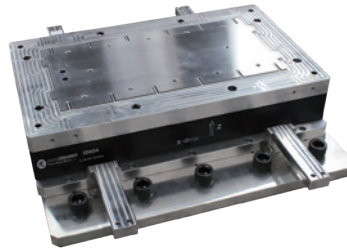
► Drawings



The overall size of L100×W100×H39mm for P66.XY, please refer to www.coremorrow.com.



XD604 Large Load XZ Piezo Nanopositioning Stage



► Characteristics

- XZ movement
- 8 μm /axis travel
- Load capacity up to 80kg
- 0~1000V drive

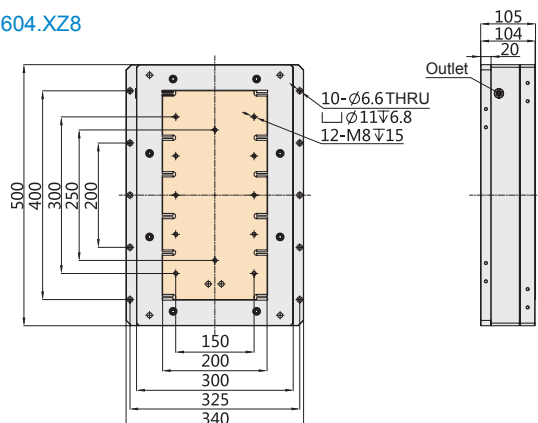
► Technical Data

Type	XD604.XZ8S	XD604.XZ8K	Units
Active axes	X, Z	X, Z	
Travel range in X(0~1000V)	8	8	$\mu\text{m}\pm 10\%$
Travel range in Z(0~1000V)	8	8	$\mu\text{m}\pm 10\%$
Sensor	SGS	-	
Resolution	4	4	nm
Linearity	0.19	0.19	%F.S.
Repeatability	0.13	0.13	%F.S.
Unloaded resonant frequency	560	560	Hz $\pm 20\%$
Resonant frequency@80kg load	340	340	Hz $\pm 20\%$
Resonant frequency@80kg load & 200nm travel	20	20	Hz $\pm 20\%$
Load step time	15	<10	ms $\pm 20\%$
El. capacitance	X0.44/Z1.33	X0.44/Z1.33	$\mu\text{F}\pm 20\%$
Material	Steel, Aluminum	Steel, Aluminum	
Load capacity	80	80	kg
Mass	63	63	kg $\pm 5\%$
Cable length	1.5	1.5	m $\pm 10\text{mm}$

Note: The above parameters are measured by E01.B2 piezoelectric controller. The maximum driving voltage can be -200V~1000V; For high reliability and long term use, it is recommended that the driving voltage be between 0 and 800V.

► Drawing

XD604.XZ8



► Recommended Controllers

E00.D2



CoreMorrow E00/E01 high-voltage piezo controllers can output a high voltage of 0~1000V.

XP-611 Piezo Nanopositioning Stage(Amplified Drive)



XP-611 is an X-axis or Z-axis piezo nanopositioning stage. It adopts amplified mechanism and built-in high-performance piezo actuator. It could realize 100μm displacement in X-axis or Z-axis. Closed-loop version has high positioning accuracy and is ideal for precision positioning and scanning.

► Characteristics

- X/Z axis motion
- Small size
- Max stroke to 100μm
- Fast response time

► X/Z-Axis Motion

XP-611 is a one-dimensional motion piezo stage in X or Z.



XP-611.X



XP-611.Z

► High Precision and High Reliability

CoreMorrow XP-611 has excellent design structure, small size, 100μm stroke, built-in high-reliability piezo actuators, and configured with high-precision sensor. Positioning accuracy could reach nanometer level, it has been applied to industry precision automated processing.

CoreMorrow offers customized service. The following image shows the customized XYZ axes piezo stage based on XP-611.



► Applications

- Microscopic imaging
- Nanopositioning
- Biotechnology
- Semiconductor technology
- Precision positioning
- Micromanipulation

► Small Size, Short Settling Time

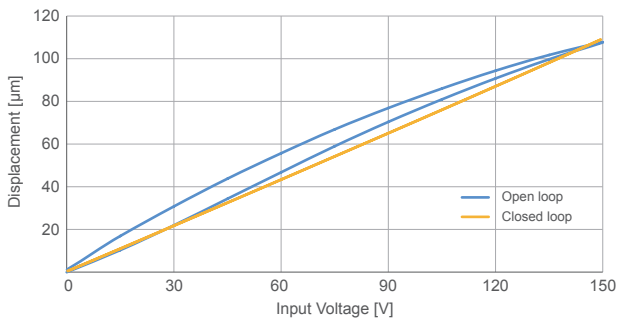
XP-611 adopts the principle of mechanism amplification design. It is small in size and compact in structure. The size of XP-611. X is only 35×35×20mm, which is easy to integrate with other equipment.

The max displacement could be up to 100μm, the unloaded resonant frequency is high, the response speed is fast, and the step time of 100μm is 0.8ms. This product has won the favor of industrial users with its high reliability and high cost performance.

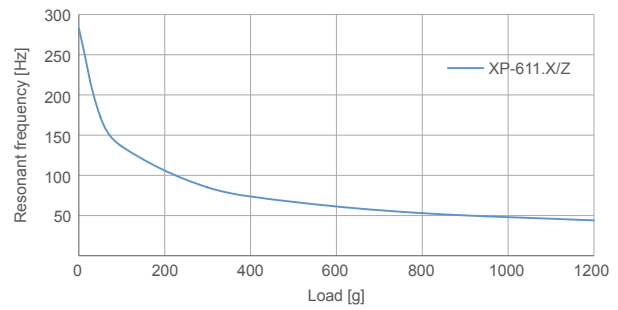
► Recommended Controllers

E00/E01	E70	E53
		
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	1 channel Analog, digital Open/closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

► Open/Closed-Loop Curve



► Frequency vs Load Curve



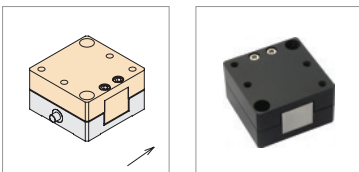
► Technical Data

Type	S-Closed loop K-Open loop	XP-611.X100S XP-611.X100K	XP-611.Z100S XP-611.Z100K	Units
Active axes		X	Z	
Travel range(0~120V)		80	80	μm±10%
Travel range(0~150V)		100	100	μm±10%
Sensor		SGS/-	SGS/-	
Closed/open loop resolution		7/4	7/4	nm
Closed-loop linearity		0.2/-	0.2/-	%F.S.
Repeatability		0.05/-	0.05/-	%F.S.
Pitch/yaw/roll		<15	<15	μrad
Push/pull force capacity		30/10	30/10	N
Stiffness		0.3	0.3	N/μm±20%
Unloaded resonant frequency		0.28	0.28	kHz±20%
Closed/open-loop unloaded Step time		10/0.8	10/0.8	ms±20%
Unloaded operating frequency	10% travel	100	100	Hz±20%
	100% travel	10	10	
Load capacity		0.8	1.2	kg
El. capacitance		1.8	1.8	μF±20%
Material		Steel, Aluminum	Steel, Aluminum	
Mass		80	80	g±5%

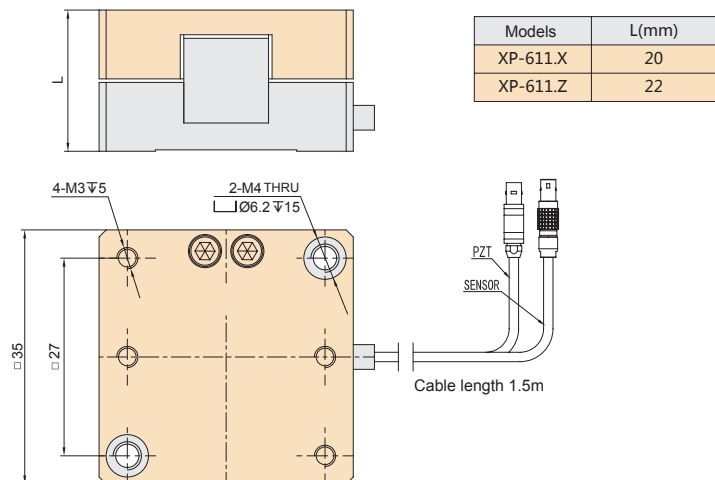
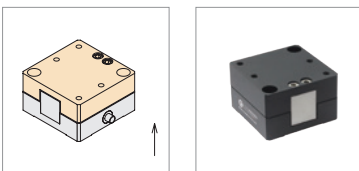
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation.
 Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Drawings

XP-611.X



XP-611.Z



XP-63X Piezo Nanopositioning Stage(Direct Drive)



XP-63X piezo nanopositioning stage adopts frictionless flexible hinge guiding mechanism and has the characteristics of high rigidity, high resolution and fast response time. XY, XYZ versions could be available through adapter.

► 1-3 Axes

Two or three XP-63X could be connected through the adapter to form a variety of motion structures of XY, XZ and XYZ.

Flexible hinges use precision wire cutting technology.

► Characteristics

- 1~3 axes
- Max stroke to 60μm
- Max load to 5kg
- Repeatability 0.05%F.S.
- Fast response time
- UHV version is available

► Applications

- Interference
- Biotechnology
- Nano positioning
- Micromachining/precision control

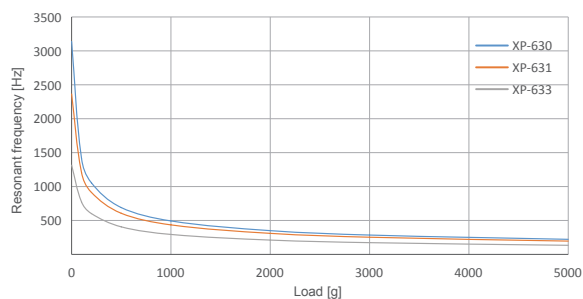
► Small Size, Large Stiffness

XP-63X has the characteristics of large stiffness, large load capacity and high unloaded resonant frequency. It also features high operating frequency with load and the response time could be up to sub-milliseconds. XP-630 loading 20g load goes to 100% stroke with response time of 5ms.

The dimension of XP-630.X is only 60×45×18mm, making it easy to integrate with other devices.

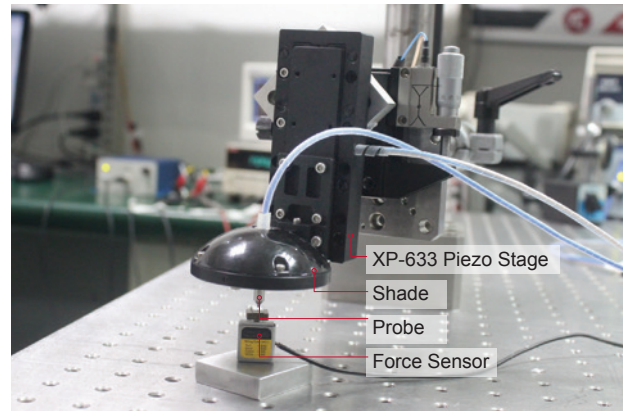
Closed-loop version is equipped with strain sensor, which could detect the position signal in real time and feed it back to the servo controller. The controller corrects position through the PID to achieve nano positioning.

► Frequency vs Load Curve



► Application Example

XP-633 is used to drive the probe for precise displacement control, and the displacement and force are calibrated. The resolution of the force could reach 0.3mN.



► Recommended Controllers

E00/E01	E70	E53
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	1 channel Analog, digital Open/closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

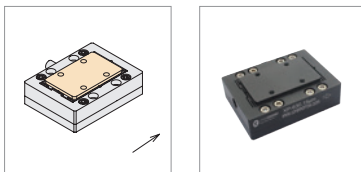
► Technical Data

Type	S-Closed loop K-Open loop	XP-630.XS XP-630.XK	XP-631.XS XP-631.XK	XP-633.XS XP-633.XK	Units
Active axes		X	X	X	
Travel range(0~120V)		12	24	48	$\mu\text{m}\pm 10\%$
Travel range(0~150V)		15	30	60	$\mu\text{m}\pm 10\%$
Sensor		SGS/-	SGS/-	SGS/-	
Closed/open-loop resolution		0.5/0.1	1/0.2	2/0.3	nm
Closed-loop linearity		0.1/-	0.15/-	0.15/-	%F.S.
Repeatability		0.05/-	0.05/-	0.1/-	%F.S.
Pitch/yaw/roll		<20	<25	<30	μrad
Push/pull force capacity		480/80	480/80	480/80	N
Stiffness		40	20	10	$\text{N}/\mu\text{m}\pm 20\%$
Unloaded resonant frequency		3.2	2.4	1.5	$\text{kHz}\pm 20\%$
Closed/open-loop unloaded step time		1.5/0.8	3/1.6	5/3.2	$\text{ms}\pm 20\%$
Unloaded operating frequency	10% travel	200	100	50	$\text{Hz}\pm 20\%$
	100% travel	60	30	15	
Load capacity		5	5	5	kg
El. capacitance		1.8	3.6	7.2	$\mu\text{F}\pm 20\%$
Material		Aluminum	Aluminum	Aluminum	
Mass		150	250	450	$\text{g}\pm 5\%$

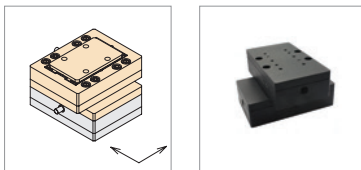
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation.
Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Drawings

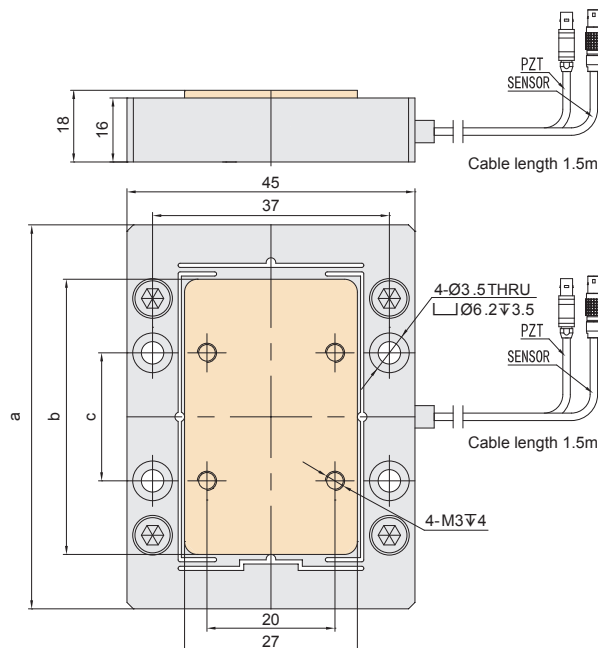
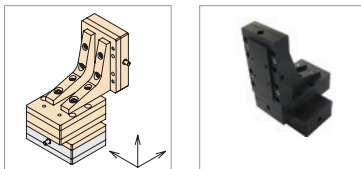
XP-63X.X



XP-63X.XY



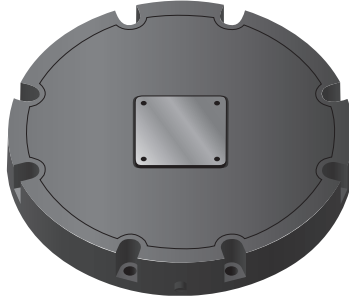
XP-63X.XYZ



Models	Size	a	b	c
XP-630		60	43	20
XP-631		78	61	20
XP-633		114	97	20 70

* XP-63X.XY/XP-63X.XYZ, drawings, please refer to CoreMorrow website or consult sales engineer.

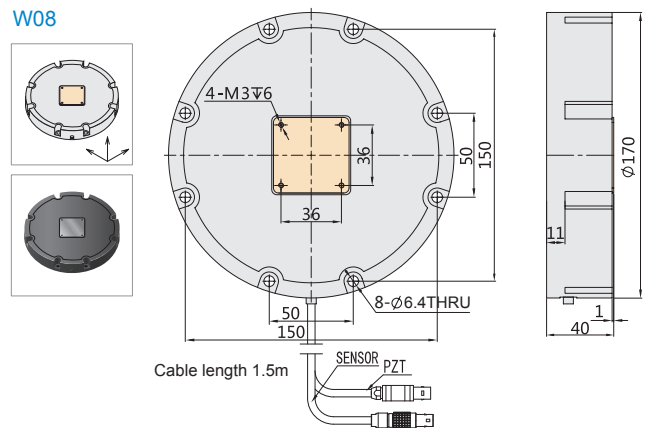
W08 Piezo Stage(Custom Version)



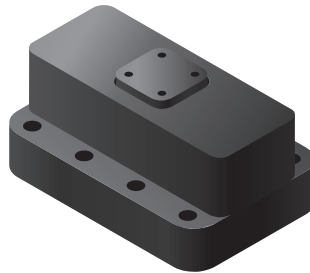
► Technical Data

Type	W08	Units
Travel	120	$\mu\text{m}(@120\text{V})/\text{axis}\pm 20\%$
Z capacitance	5.4	$\mu\text{F}\pm 20\%$
XY capacitance	3.6	$\mu\text{F}/\text{axis}\pm 20\%$
Load capacity	10	kg(max)
Mass	3.5	kg(cal.)

► Drawing



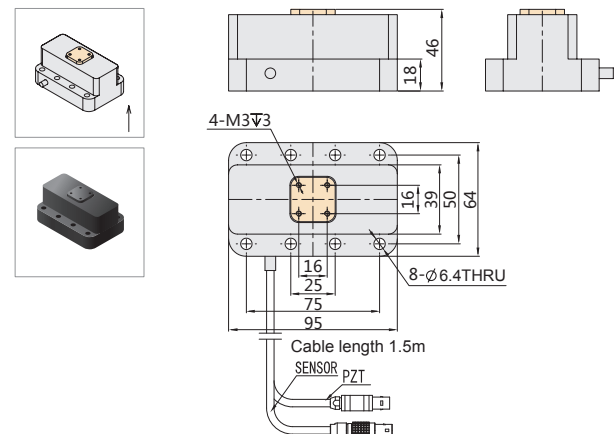
Custom Z Piezo Stage



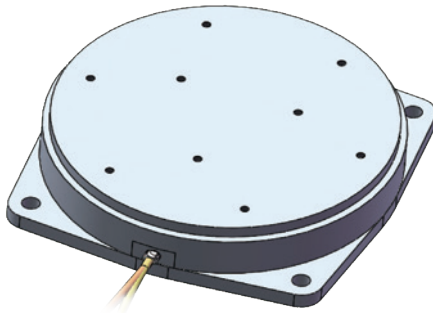
► Technical Data

Parameters	Parameter values	Units
Active axes	Z	
Travel range(0~+120V)	640	$\mu\text{m}\pm 20\%$
Travel range(0~+150V)	800	$\mu\text{m}\pm 20\%$
Sensor	SGS	
Closed/open loop resolution	24/6	nm
Closed-loop linearity	0.2	%F.S.
Repeatability	0.1	%F.S.
Unloaded resonant frequency	200	Hz $\pm 20\%$
Load capacity	1	kg
El. capacitance	15	$\mu\text{F}\pm 20\%$
Material	Steel, Aluminum	

► Drawing



Z03 Piezo Nanopositioning Stage(Custom)



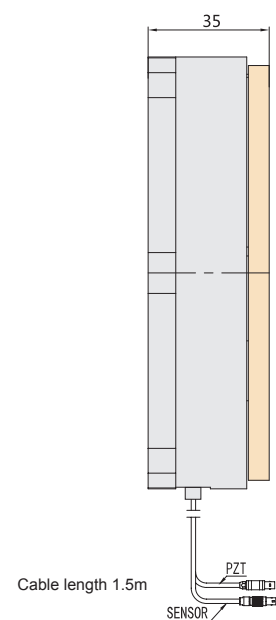
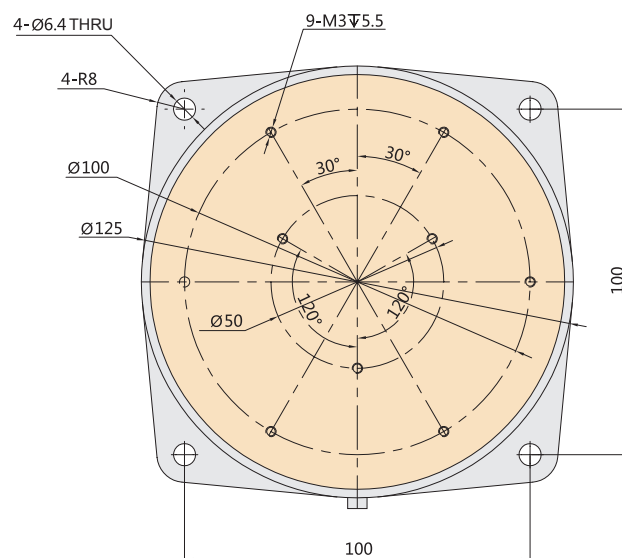
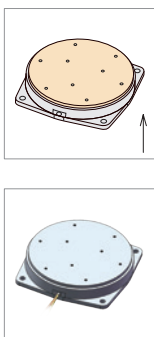
Z03 piezo nanopositioning stage is a one-dimensional Z-direction movement piezoelectric platform. Its travel range is up to 250μm. It has a large moving platform and is suitable for large-volume load applications.

► Piezo Nanopositioning Stage(Custom)

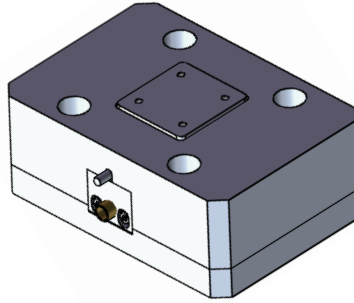
Type	Z03	Units
Travel range	250	μm(@150V)±20%
El. capacitance	28.8	μF±20%
Carrying capacity	5	kg(max)
Weight	1.5	kg(cal.)
No-load resonance frequency	200	Hz(cal.)

► Drawing

Z03



20059 Piezo Nanopositioning Stage(Custom Version)



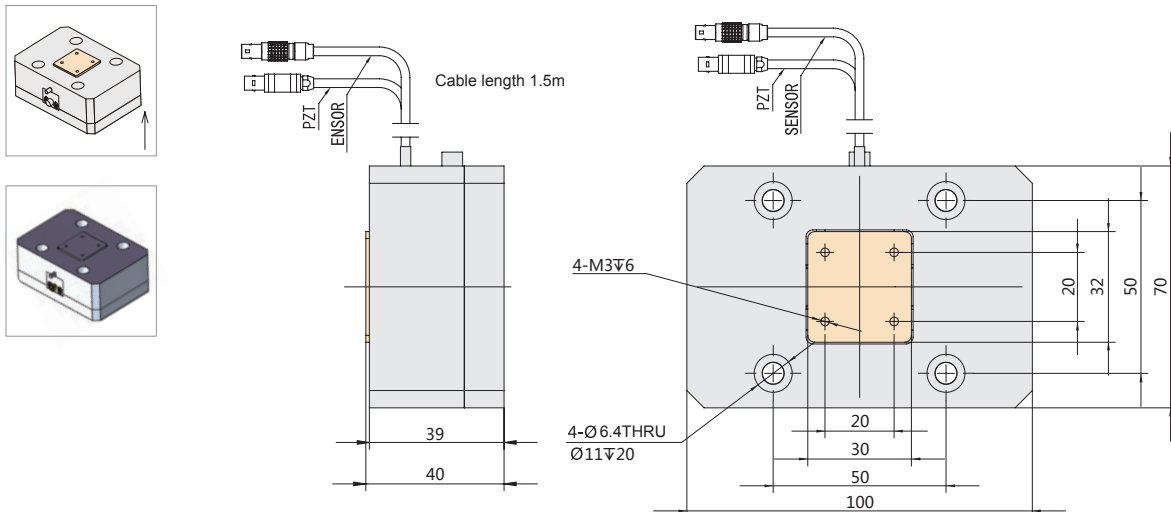
► Characteristics

- 1mm travel in Z
- Capacitive closed loop sensor
- Load capacity up to 700g
- Resolution up to 8nm
- Vacuum version available

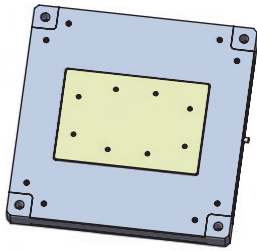
► Technical Data

Type	20059	Units
Active axes	Z	
Travel range(0~120V)	800	$\mu\text{m}\pm 20\%$
Travel range(0~150V)	1000	$\mu\text{m}\pm 20\%$
Sensor	CAP capacitance	
Closed-loop resolution	27	nm(Under 5mV ripple)
Open-loop resolution	8	nm
Linearity	0.1	%F.S. $\pm 20\%$
Repeatability	0.02	%F.S. $\pm 20\%$
Load capacity	700	g
El. capacitance	58	$\mu\text{F}\pm 20\%$

► Drawing



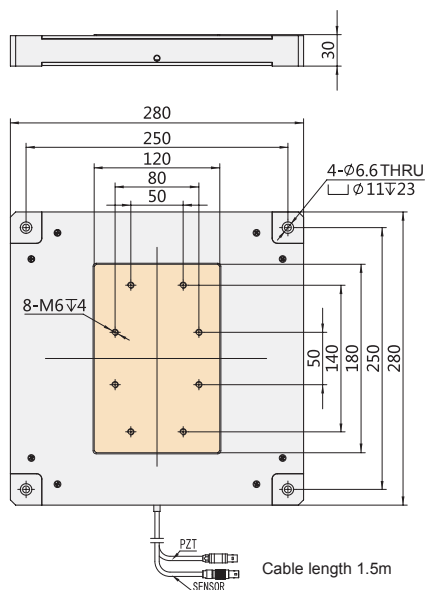
20090 XY Piezo Stage



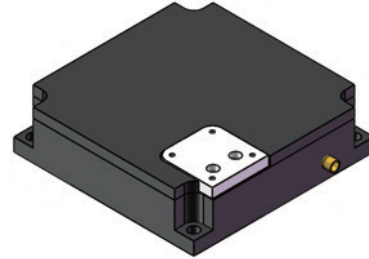
► Technical Data

Type	20090	Units
Active axes	X, Y	
Travel range	30	$\mu\text{m}/\text{axis} \pm 20\%$
Driving voltage	0~150	V
Resonant frequency@2kg load	180	$\text{Hz} \pm 20\%$
El. capacitance	14.5	$\mu\text{F}/\text{axis} \pm 20\%$
Load capacity	2	kg
Materials	aluminum	
Mass (not include cable)	5.3	$\text{kg} \pm 5\%$

► Drawing



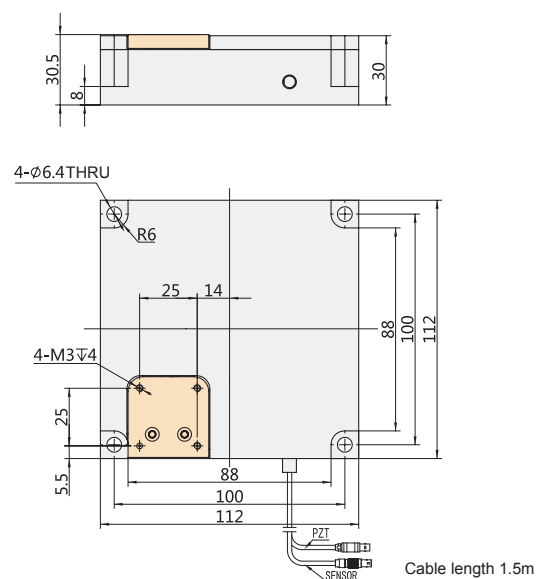
20100 XYZ Piezo Stage



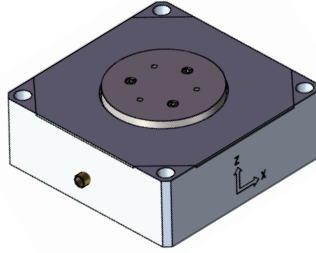
► Technical Data

Type	20100	Units
Active axes	X, Y, Z	
XY Travel range(0~150V)	400	$\mu\text{m}/\text{axis} \pm 20\%$
Z Travel range(0~150V)	100	$\mu\text{m} \pm 20\%$
X, Y capacitance	10.8	$\mu\text{F}/\text{axis} \pm 20\%$
Z capacitance	3.6	$\mu\text{F} \pm 20\%$

► Drawing



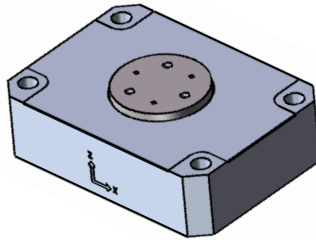
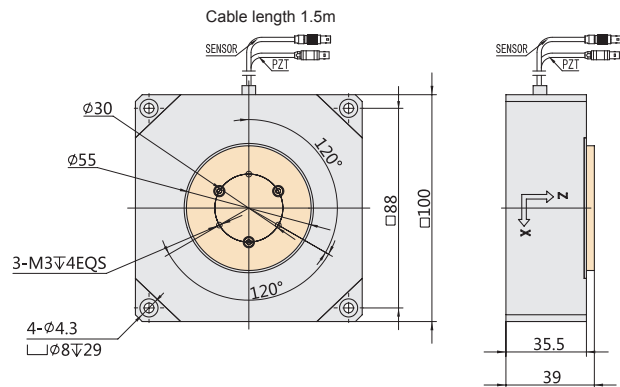
20136 Piezo Nanopositioning Stage(For Static Application)



► Technical Data

Type	20136-100μm	Units
Active axes	X, Z	
Travel range in X	±50	μm±20%
Travel range in Z	100	μm±20%
Driving voltage	0~150	V
Sensor	SGS	
Load capacity	10	kg

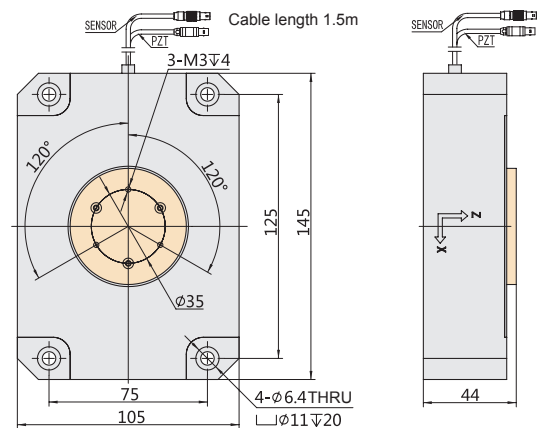
► Drawing



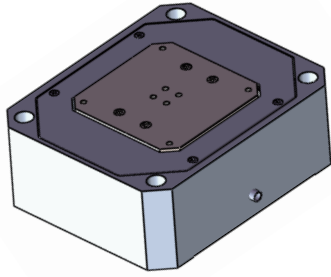
► Technical Data

Type	20136-200μm	Units
Active axes	X, Z	
Travel range in X	±100	μm±20%
Travel range in Z	200	μm±20%
Driving voltage	0~150	V
Sensor	SGS	
Load capacity	10	kg

► Drawing



21001 XYZ Piezo Stage

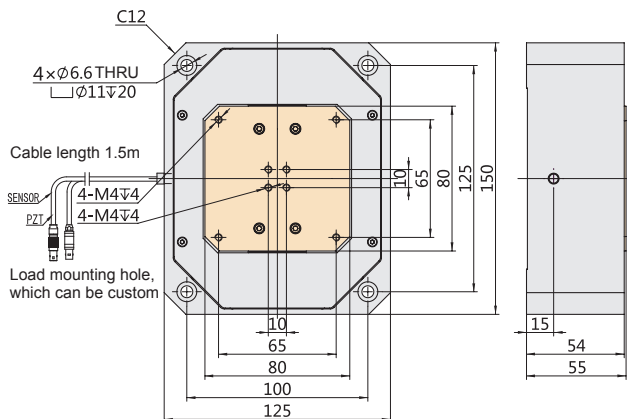
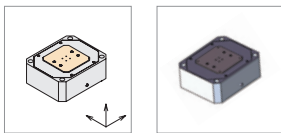


► Technical Data

Type	21001	Units
Active axes	X, Y, Z	
Travel range(0~150V)	20/axis	$\mu\text{m}\pm 20\%$
Sensor	SGS	
Open-loop resolution	1	nm
Resolution	20	%F.S.
El. capacitance	13.2/axis	$\mu\text{F}\pm 20\%$
Load capacity	5	kg
Material	Steel, Aluminum	

► Drawing

21001



N60 X Piezo Stage

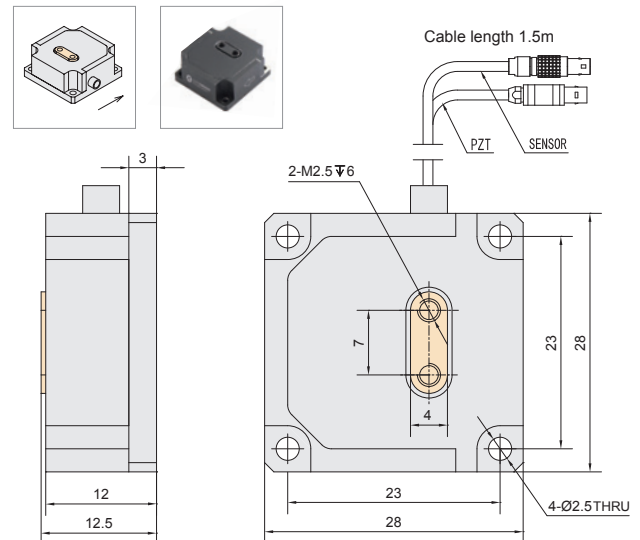


► Technical Data

Type	S-Closed loop K-Open loop	N60.X30S N60.X30K	Units
Active axes		X	
Travel range(0~120V)		24	$\mu\text{m}\pm 10\%$
Travel range(0~150V)		30	$\mu\text{m}\pm 10\%$
Sensor		SGS/-	
Closed/open loop resolution		1/0.5	nm
Closed-loop linearity		0.5/-	%F.S.
Repeatability		0.3/-	%F.S.
Pitch/yaw/roll		<10	μrad
Push/pull force		8/2	N
Stiffness		0.6	N/ $\mu\text{m}\pm 20\%$
Unloaded resonant frequency		1.8	kHz $\pm 20\%$
Closed/open-loop unloaded step time		10/2	ms $\pm 20\%$
Unloaded operating frequency	10% travel 100% travel	100 10	Hz $\pm 20\%$
Load capacity		0.5	kg
El. capacitance		0.8	$\mu\text{F}\pm 20\%$
Material		Aluminum	
Mass		80	g $\pm 5\%$

► Drawing

N60.X30



P12 Piezo Nanopositioning Scanners(Amplified Drive)



P12 is a 1~3 axes piezo scanning stage. The aperture diameter could be selected as 25mm or 35mm, which is suitable for light-transmitted applications such as microscopy. The piezo scanner could realize single axis displacement of 300μm. Integrated structure makes multidimensional motion uncoupled and could be selected in various specifications to meet the needs of different applications.

► Characteristics

- 1~3 axes motion
- Load capacity to 0.8kg
- With Ø25 or Ø35 aperture
- Optional UHV compatible version
- Closed-loop version for high repeatability
- Z travel to 300μm
- XYZ travel to 100μm/axis

► Applications

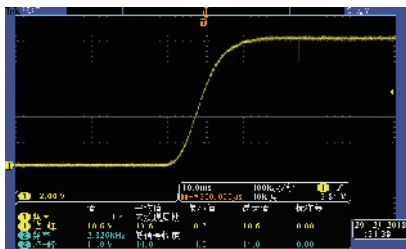
- Scanning interference
- Confocal microscopy
- Surface measurement
- Wafer positioning
- Image processing and stabilization
- Optical capture

► 1~3 – Axis Scanning Stage

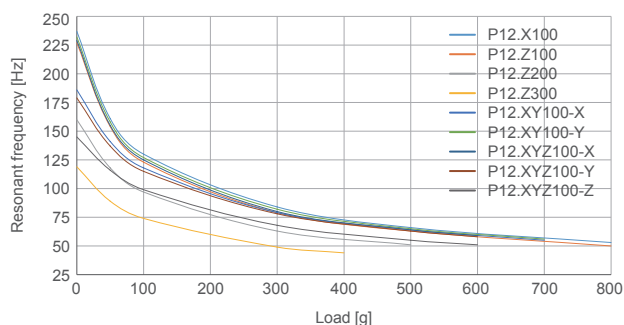
P12 piezo nanopositioning stage is a 1~3-axis linear piezo scanning stage, including X, Z, XY, XZ, XYZ motion versions. A variety of specifications and models for choice with optional aperture diameter of 25mm or 35mm.

► Loaded Step Time

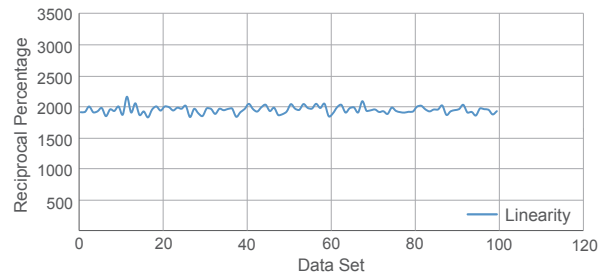
The figure shows the closed-loop stabilization time of P12.X100S is about 20ms at loading 125g, 100% travel.



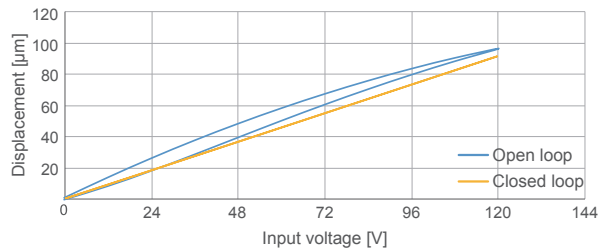
► Frequency vs Load Curve



► Linearity



► Open/Closed Loop Curve



► Compatible Piezo Controllers

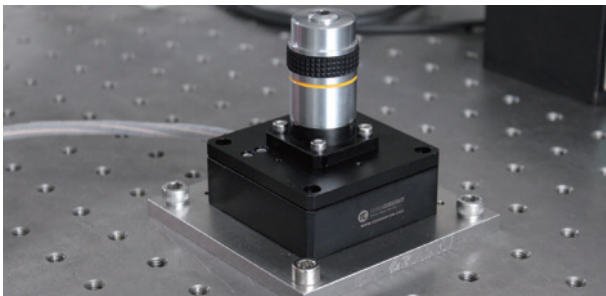
E00/E01	E53.B	E70
1~3 channels Analog/digital control Ave. current: 291mA	3 channels Analog/digital control Ave. current: 60mA	3 channels Analog/digital control Ave. current: 70mA
Note: For technical data, please refer to "Piezo Controllers".		

► Technical Data

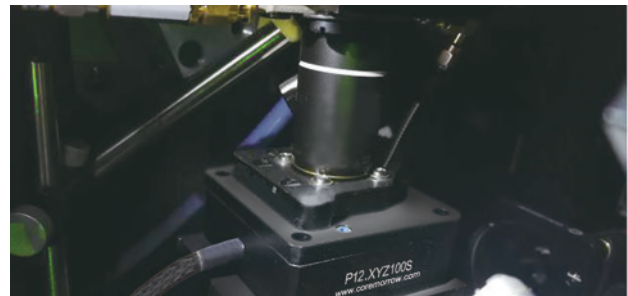
Type	S-Closed loop K-Open loop	P12.X100S P12.X100K	P12.Z100S P12.Z100K	P12.Z200S P12.Z200K	P12.Z300S P12.Z300K	P12.XY100S P12.XY100K	P12.XZ100S P12.XZ100K	P12.XYZ100S P12.XYZ100K	Units
Active axes		X	Z	Z	Z	X, Y	X, Z	X, Y, Z	
Travel range(0~120V)		80	80	160	240	80/axis	80/axis	80/axis	$\mu\text{m}\pm 10\%$
Travel range(0~150V)		100	100	200	300	100/axis	100/axis	100/axis	$\mu\text{m}\pm 10\%$
Sensor		SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Aperture		Ø25/Ø35	Ø25/Ø35	Ø25/Ø35	Ø25/Ø35	Ø25/Ø35	Ø25/Ø35	Ø25/Ø35	mm
Resolution		7/4	7/4	7/4	11/5	7/4	7/4	7/4	nm
Linearity		0.05/-	0.05/-	0.1/-	0.15/-	0.1/-	0.12/-	0.1/-	%F.S.
Repeatability		0.02/-	0.02/-	0.05/-	0.1/-	0.05/-	0.08/-	0.05/-	%F.S.
Pitch/yaw/roll		<10	<10	<15	<15	<10	<10	<15	μrad
Push/pull force		30/10	30/10	30/10	30/10	25/8	25/8	20/4	N
Stiffness		0.3	0.3	0.2	0.1	X0.25/Y0.3	0.25	X0.3/Y0.25/Z0.2	$\text{N}/\mu\text{m}\pm 20\%$
Unloaded resonant frequency		230	220	150	100	X180/Y230	200	X230/Y180/Z150	$\text{Hz}\pm 20\%$
Closed/open-loop unloaded step time		10/0.8	10/0.8	15/1.6	30/2.4	15/0.8	30/0.8	30/0.8	$\text{ms}\pm 20\%$
Unloaded operating frequency	10% travel	100	100	50	30	100	100	50	$\text{Hz}\pm 20\%$
	100% travel	9	10	5	3	9	9	5	
Load capacity		0.8	0.8	0.5	0.4	0.7	0.6	0.6	kg
El. capacitance		1.8	1.8	3.6	5.4	1.8/axis	1.8/axis	1.8/axis	$\mu\text{F}\pm 20\%$
Material		Steel, Aluminum							
Mass		140	140	200	260	200	200	260	$\text{g}\pm 5\%$

Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term, high-reliability operation. Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Application Examples

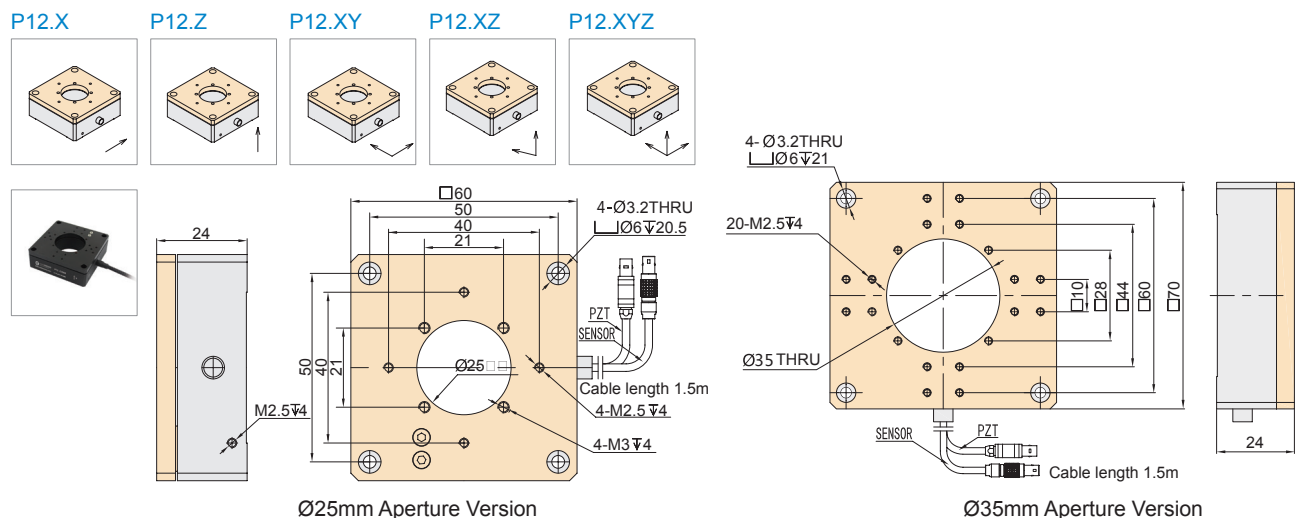


Inverted Piezo Scanner

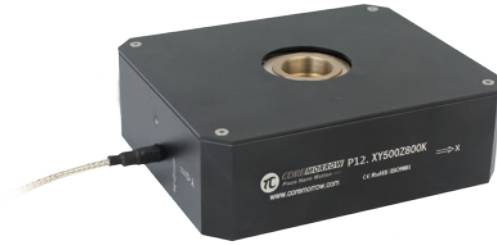


P12.XYZ100S applied to fluorescence microscopy

► Drawings



P12.XY500Z800S/K Piezoelectric Scanning Stage



► Characteristics

- XYZ linear motion
- XY travel to 500μm, Z travel to 800μm
- For objective XYZ positioning adjustment
- Vacuum version available

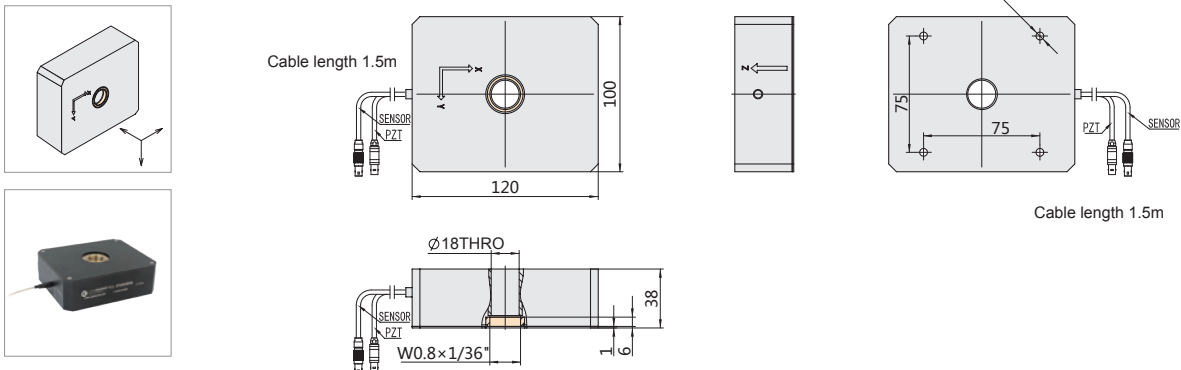
► Technical Data

Type	P12.XY500Z800S	P12.XY500Z800K	Units
Active axes	X, Y, Z	X, Y, Z	
XY Travel range(0~150V)	500	500	μm/axis±10%
Z Travel range(0~150V)	800	800	μm±10%
Integrated sensor	SGS	-	
Load capacity	250	250	g
XY capacitance	28.8	28.8	μF/axis±20%
Z capacitance	43.2	43.2	μF±20%
XY resolution	20	5	nm
Z resolution	30	8	nm
Mass	1000(with no cable)	1000(with no cable)	g±5%

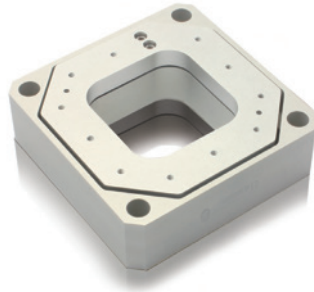
Note: Above are measured using E00/E01 piezo controllers. The maximum driving voltage can be -20V~150V; Recommended 0~120V for high-reliability and long-term use.

► Drawing

P12.XY500Z800S/K



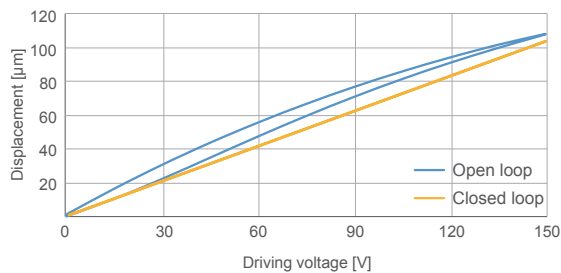
P12A Piezo Nanopositioning Scanners(Amplified Drive)



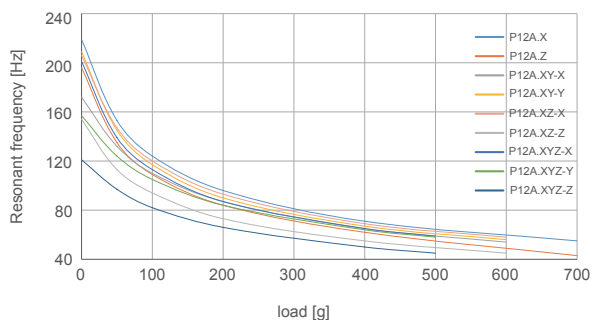
► Characteristics

- Travel to 100 μ m/axis
- Load capacity to 0.7kg
- Aperture: 45 $\times$ 45mm
- Closed-loop version for high repeatability
- Open/closed loop optional
- Optional UHV compatible version

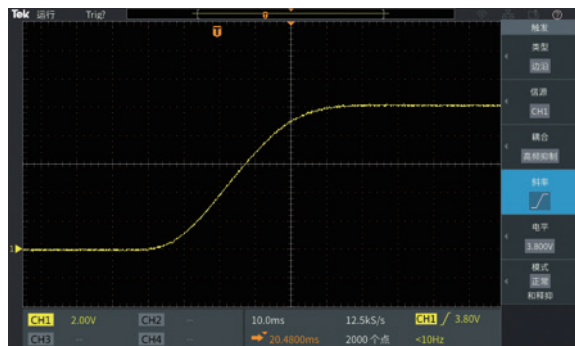
► Open/Closed Loop Curve



► Frequency vs Load Curve



► Loaded Step Time



P12A.XYZ100S loading 200g, the step time is about 50ms.

► Applications

- Scanning microscopy
- Confocal microscopy
- Surface measurement
- Semiconductor test

► High Precision of Sensor Positioning

The P12A piezo scan stage is equipped with a high-resolution sensor, which detects the position in real time and feeds it back to the piezo controller. The controller adjusts the voltage to correct the displacement through the PID algorithm to achieve high-precision positioning.

P12A piezo scan stage, matched with CoreMorrow E70 modular controller, is applied to optical microscopy imaging to realize XYZ axis precision scanning.



► Compatible Piezo Controllers

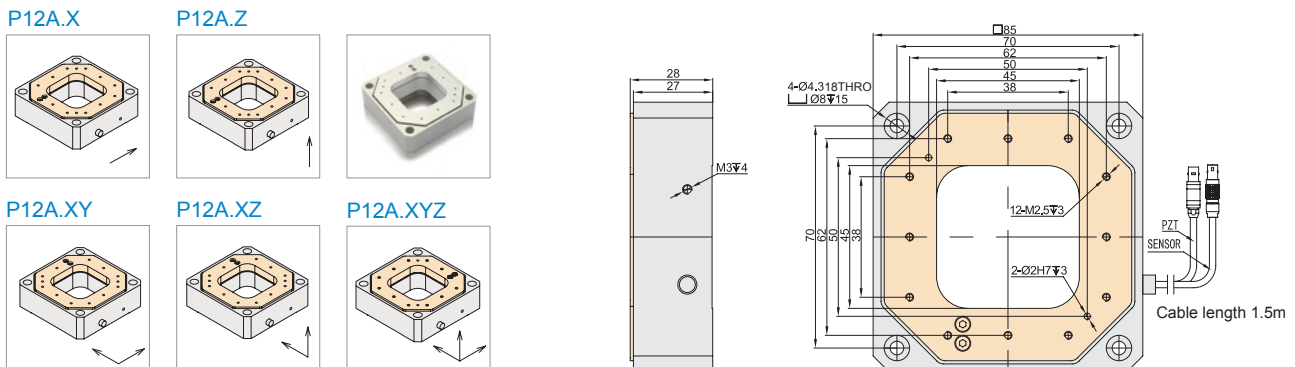
E01/E00	E52	E53
1 channels Analog/digital Open/closed-loop Ave. current: 291mA	1 channels Analog/digital Open/closed-loop Ave. current: 300mA	1 channels Analog/digital Open/closed-loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

► Technical Data

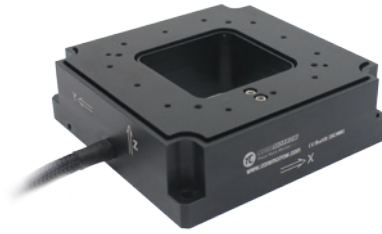
Type	S-Closed loop K-Open loop	P12A.X100S P12A.X100K	P12A.Z100S P12A.Z100K	P12A.XY100S P12A.XY100K	P12A.XZ100S P12A.XZ100K	P12A.XYZ100S P12A.XYZ100K	Units
Active axes		X	Z	X, Y	X, Z	X, Y, Z	
Travel range(0~120V)		80	80	80/axis	80/axis	80/axis	μm±10%
Travel range(0~150V)		100	100	100/axis	100/axis	100/axis	μm±10%
Integrated sensor		SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Aperture		45×45	45×45	45×45	45×45	45×45	mm
Resolution		7/4	7/4	7/4	7/4	7/4	nm
Linearity		0.1/-	0.1/-	0.1/-	0.1/-	0.15/-	%F.S.
Repeatability		0.04/-	0.04/-	0.05/-	0.05/-	0.1/-	%F.S.
Pitch/yaw/roll		<10	<10	<15	<15	<20	μrad
Push/pull force		30/10	30/10	25/8	25/8	20/4	N
Stiffness		0.3	0.3	X0.25/Y0.3	X0.3/Z0.25	X0.3/Y0.25/Z0.2	N/μm±20%
Unloaded resonant frequency		230	200	X170/Y200	X200/Z150	X200/Y150/Z120	Hz±20%
Closed/open-loop unloaded step time		10/0.8	10/0.8	15/0.8	15/0.8	30/0.8	ms±20%
Unloaded resonant frequency	10% travel	60	65	55	50	30	Hz±20%
	100% travel	8	8	7	6	4	
Load capacity		0.7	0.7	0.6	0.6	0.5	kg
El. capacitance		3.6	3.6	3.6/axis	3.6/axis	3.6/axis	μF±20%
Material	Steel, Aluminum						
Mass		240	240	290	290	350	g±5%

Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term, high-reliability operation. Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Drawing



P12A.XY200Z100 Piezo Nanopositioning Scanners



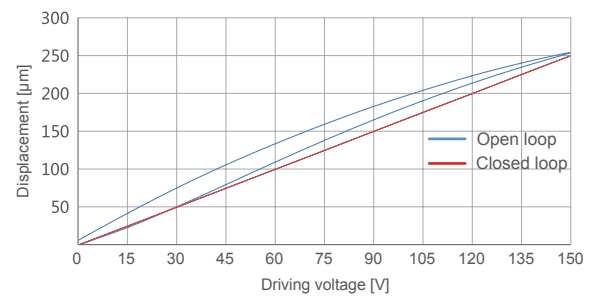
► Characteristics

- High accuracy
- XYZ motion
- Travel to X250/Y250/Z100μm
- Aperture: 45×45mm
- Vacuum version available

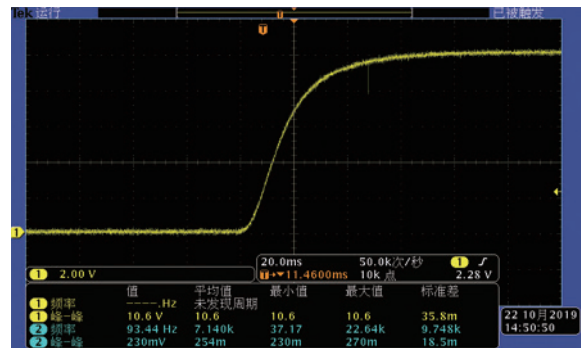
► Technical Data

Type	P12A.XY200Z100S	P12A.XY200Z100K	Units
Active axes	X, Y, Z	X, Y, Z	
Travel range(0~120V)	XY200/Z80	XY200/Z80	μm±10%
Travel range (0~150V)	XY250/Z100	XY250/Z100	μm±10%
Sensor	SGS	-	
Resolution	XY13/Z7	XY6/Z4	nm
Linearity	XY0.1/Z0.2	-	%F.S.
Repeatability	XY0.05/Z0.1	-	%F.S.
Unloaded resonant frequency	XY240/Z150	XY240/Z150	Hz±20%
Load capacity	500	500	g±5%
El. capacitance	XY7.2/Z1.8	XY7.2/Z1.8	μF±20%
Material	Steel, Aluminum		

► Displacement vs Voltage Curve



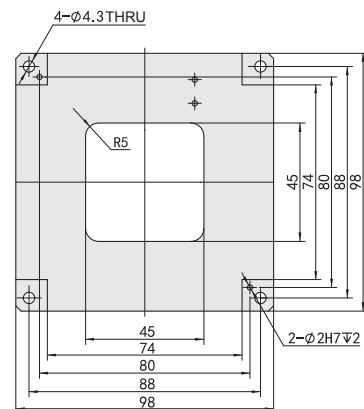
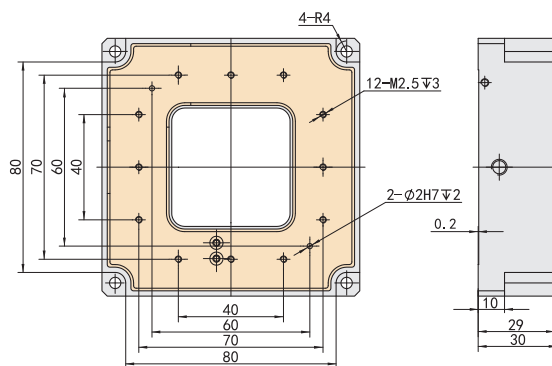
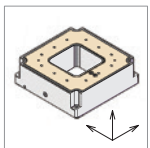
► Loaded Step Time



P12A.XY200Z100 loading 100g, step time of about 60ms

► Drawing

P12A.XY200Z100



P12B.XYZ100 Low Temperature Vacuum XYZ Piezo Stage



► Characteristics

- XYZ motion
- 100μm/axis travel
- Aperture: Ø10mm
- Suitable for vacuum application

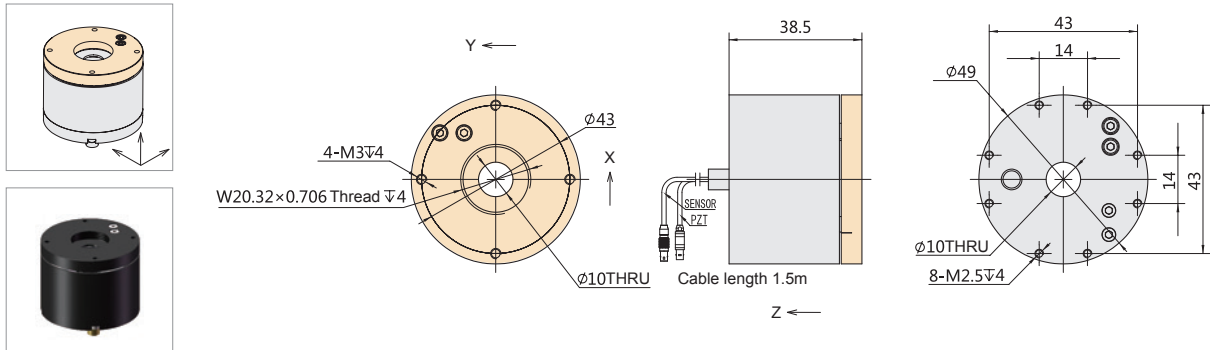
► Technical Data

Type	P12B.XYZ100S	P12B.XYZ100K	Units
Active axes	X, Y, Z	X, Y, Z	
Travel range(0~150V)	100/axis	100/axis	μm±20%
Sensor	SGS	-	
Aperture	Ø10	Ø10	mm
El. capacitance	3.6/axis	3.6/axis	μF±10%
Load capacity	200	200	g
Material	Steel, Aluminum	Steel, Aluminum	

Note: Above are measured using E00/E01piezo controller. The maximum driving voltage can be -20V~150V; Recommended 0~120V for high-reliability and long-term use.

► Drawing

P12B.XYZ100



P13A Low Temperature Piezo Stage



P13A piezo stage is specially designed for extremely low temperature and strong magnetic field. It adopts low-temperature piezo drive with light shell and is in XY scanning motion. Its volume is small and the size is only 33×33×14.6mm, with a 10×10mm through hole in the center.

All components adopt low temperature and strong magnetic compatible version to ensure its performance under low temperature and strong magnetic environment.

► Characteristics

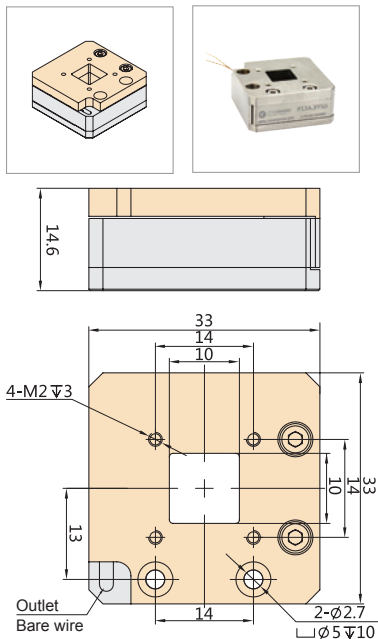
- Low temperature 4K
- Strong magnetic resistance
- Displacement up to 30μm@150V at 4K
- Resolution to 0.5nm
- Open-loop drive, quick response
- Vacuum version available

► Technical Data

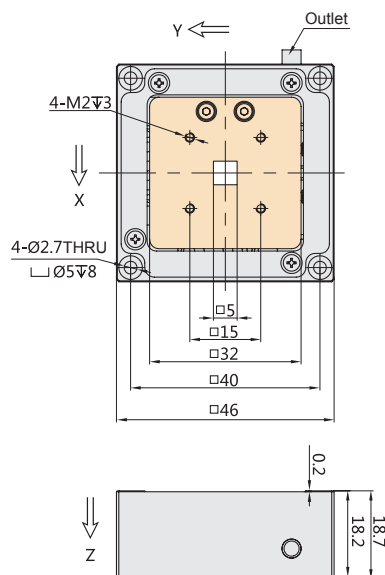
Type	P13A.XY50K		20083		20089		Units
Operating temperature	Room	4K	Room	4K	Room	4K	
Active axes	X, Y	X, Y	X, Y, Z	X, Y, Z	X, Y	X, Y	
Travel range	90 (0~60V)	30(0~150V)	80(0~60V)	25(0~150V)	180(0~60V)	80(0~150V)	μm±20%
Open-loop resolution	1	0.5	8	4	5	4	nm
Unloaded resonant frequency	450	450	350	350	-	-	Hz±20%
Resonant frequency@150g	160	160	-	-	-	-	Hz±20%
El. capacitance	5.5/axis	0.75/axis	XY5.5,Z11	XY0.75,Z1.5	12.1/axis	1.65/axis	μF±20%
Material	Titanium, Aluminum		Titanium	Titanium	Titanium	Titanium	
Load capacity	≤150	≤150	100	100	200	200	g
Mass	88	88	-	-	-	-	g±5%

► Drawings

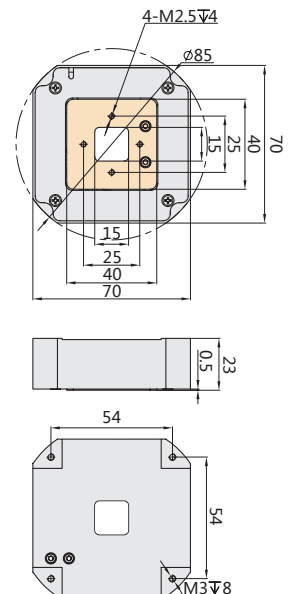
P13A.XY50



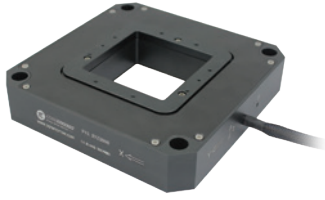
20083



20089



P15 Piezo Nanopositioning Scanners(Amplified Drive)



P15 is a fast, high-precision scanning and nanopositioning stage with very high straightness. The aperture is 66×66mm, which is ideal for transmitted-light applications such as near field scanning, confocal microscopy and mask positioning. P15 has 300 μm displacement and its internal finite element analysis (FEA) optimized wire-cut flexural hinge structure. FEA gives it the design with the highest possible stiffness and minimizes linear and angular runout.

► Technical Data

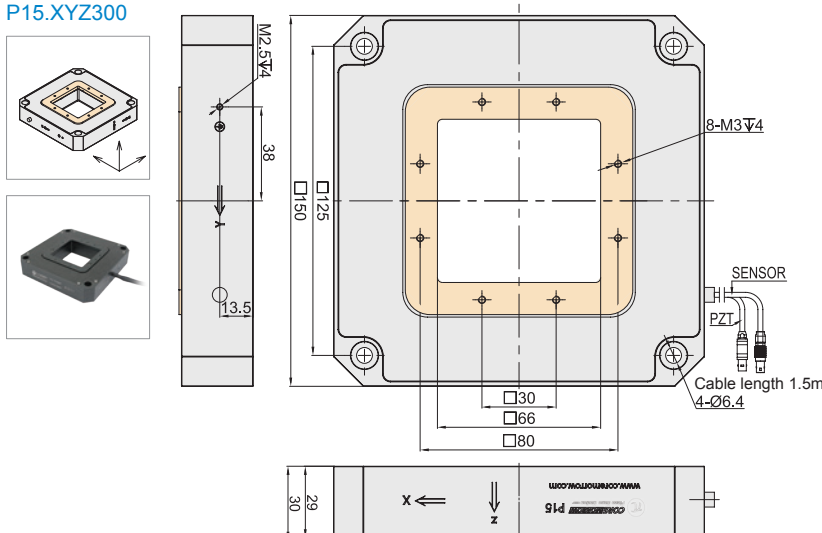
Type	S-Closed loop K-Open loop	P15.XYZ100S P15.XYZ100K	P15.XYZ300S P15.XYZ300K	Units
Active axes		X, Y, Z	X, Y, Z	
Travel rang(0~120V)		100/axis	240/axis	μm±10%
Travel rang(0~150V)		120/axis	300/axis	μm±10%
Sensor		SGS/-	SGS/-	
Aperture		60×60	66×66	mm
Resolution		20/6	13/6	nm
Linearity		0.2/-	0.2/-	%F.S.
Repeatability		0.1/-	0.1/-	%F.S.
Pitch/yaw/roll		30	<30	μrad
Push/pull force		100/20	50/10	N
Stiffness		0.8	0.1	N/μm±20%
Unloaded resonant frequency, X/Y/Z		300/350/400	140/170/220	Hz±20%
Closed/open-loop unloaded step time		-	60/10	ms±20%
Unloaded operating frequency	10% Travel	50	50	Hz±20%
	100% Travel	10	10	
Load capacity		1	0.5	kg
El. capacitance		XY7.2, Z14.4	10.8/axis	μF±20%
Material		Steel, Aluminum	Aluminum	
Mass		700 (with no cable)	900	g±5%

Note: Max driving voltage could be -20V~150V, Recommended voltage 0~120V for long-term and high-reliable operation.

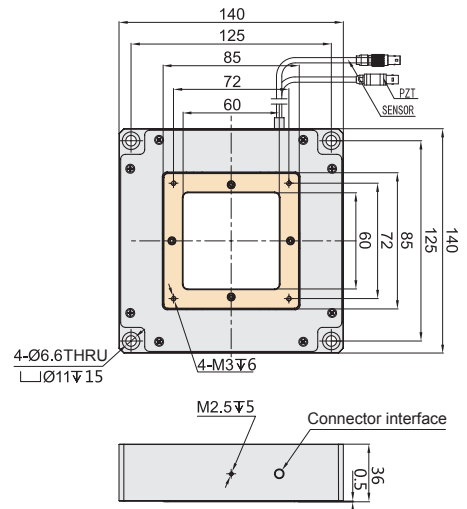
Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Drawing

P15.XYZ300



P15.XYZ100



► Characteristics

- 3 axes, travel to 300μm/axis
- Frictionless, high precision flexible guiding system
- Closed-loop sensor available
- High scanning flatness
- Aperture of 66×66mm
- UHV version available

► Applications

Scanning microscope, Mask/wafer Positioning, Interferometry, Metrology, Biotechnology, Micromanipulation, etc.

► Closed-Loop Sensor

P15 is available with closed-loop feedback sensor that provides higher positioning accuracy and is ideal for high-precision positioning applications.

P16.XY20 Piezo Scanner(Amplified Drive)

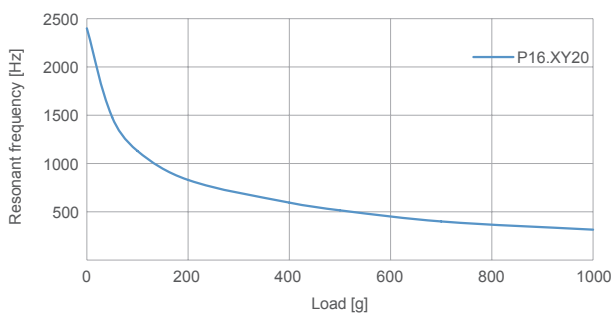


P16.XY20 piezo scanner is an XY motion scanning platform, adopting amplification mechanism. It features a center aperture diameter of 26mm and $\pm 10\mu\text{m}$ displacement in X and Y axes. The product is very compact and easy to integrate.

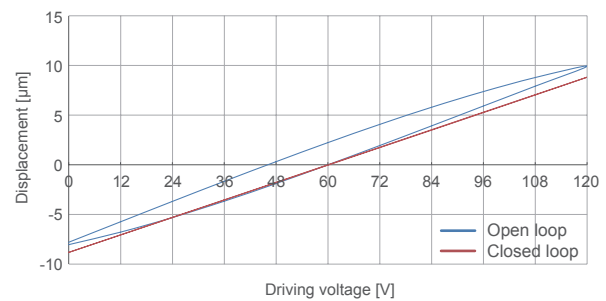
► Characteristics

• Travel to $\pm 10\mu\text{m}$ • Load capacity 1kg • Aperture: $\varnothing 26\text{mm}$ • Closed loop for high accuracy • Available UHV • Custom is available

► Frequency vs Load Curve



► Open/Closed Loop Curve



► Application Example

P16.XY20 piezoelectric scanning stage is applied to the infrared camera with its high frequency and high resolution, which greatly improves the resolution of the imaging.



► Typical Applications

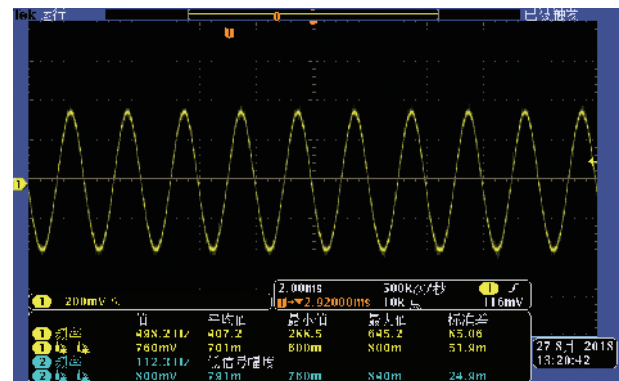
- Microscopic imaging
- Surface inspection
- Interference/metering
- Precision positioning
- Photoelectric aiming pod

► High Dynamics and Accuracy

P16.XY20 piezo scanner is a small-volume high-precision translation scanning stage. It moves in X and Y-axis, specially designed for high-resolution, high-dynamic, high-positioning precision applications. It has built-in high-reliability piezoelectric ceramics and can realize XY axes $\pm 10\mu\text{m}$ displacement, the resolution can reach 0.5nm, and the full-stroke repeatability accuracy is up to nanometer.

The product is made of stainless steel and has a special structural design to make it have a very high stiffness. The unloaded resonant frequency is 2000Hz, which meets the industrial demand for high frequency and high precision applications.

► Excellent Dynamics



Displacement curve of P16.XY20 with 10g load at 500Hz

► Recommended Controllers

E00/E01	E70	E53.B
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	3 channels Analog, digital Open/closed loop Ave. current: 60mA
Note: Please see "Piezo Controllers" for detailed information.		

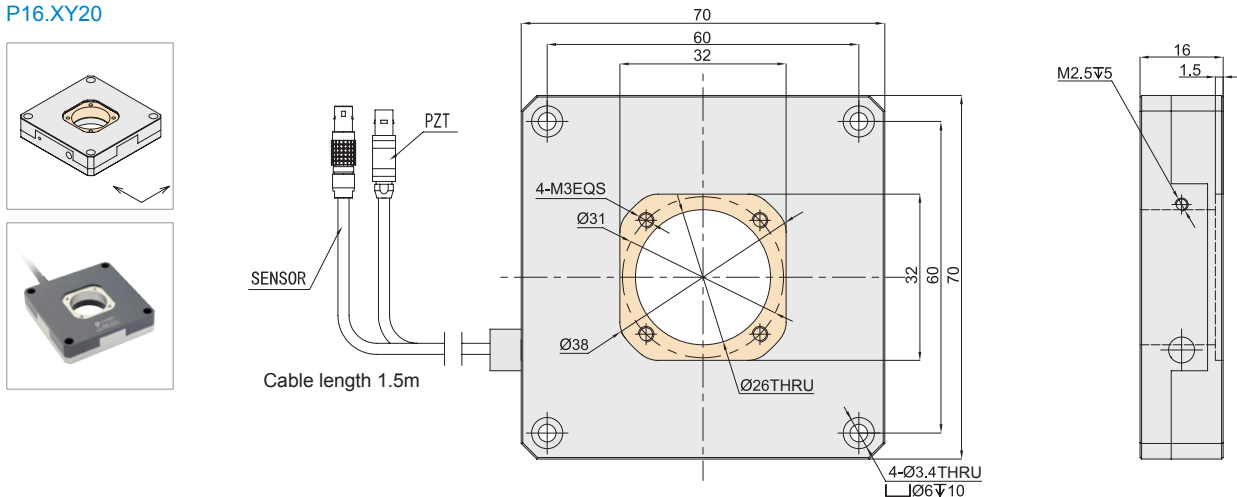
► Technical Data

Type	S-Closed loop K-Open loop	P16.XY20S	P16.XY20K	Units
Active axes		X, Y	X, Y	
Travel range(0~120V)		±8/axis	±8/axis	μm±10%
Travel range(0~150V)		±10/axis	±10/axis	μm±10%
Sensor		SGS	-	
Aperture		Ø26	Ø26	mm
Resolution		1	0.5	nm
Linearity		0.3	-	%F.S.
Repeatability		0.1	-	%F.S.
Pitch/yaw/roll		<10	<10	μrad
Push/pull force		44/44	44/44	N
Stiffness in motion direction		X2.2/Y2.2	X2.2/Y2.2	N/μm±20%
Unloaded resonant frequency		X2000/Y2000	X2000/Y2000	Hz±20%
Unloaded step time		1.5	0.7	ms±20%
Unloaded operating frequency	10% travel	150	150	Hz±20%
	100% travel	15	15	
Load capacity		1	1	kg
El. capacitance		1.6/axis	1.6/axis	μF±20%
Material		Steel, Al	Steel, Al	
Mass		180	180	g±5%

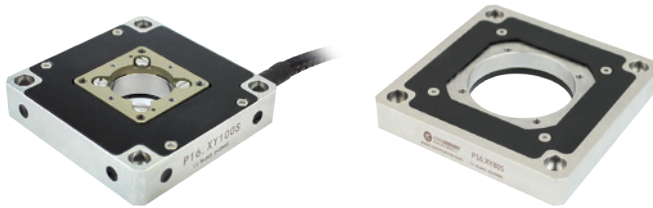
Note: Above parameters are measured with E00/E01 piezo controller. The maximum driving voltage can be -20V~150V; For high reliability and long-term use, the recommended driving voltage is 0~120V.

► Drawing

P16.XY20



P16 XY Piezo Scanner(Amplified Drive)



P16 series piezoelectric scanner is an XY-axis translation scanning platform adopting amplifying mechanism. The travel can be up to 105μm, and the open-loop/closed loop is optional.

► Characteristics

- Travel to 105μm
- Load capacity to 1.5kg
- Closed loop for high repeatability
- Optional vacuum version

► High Stiffness, Large Load Capacity

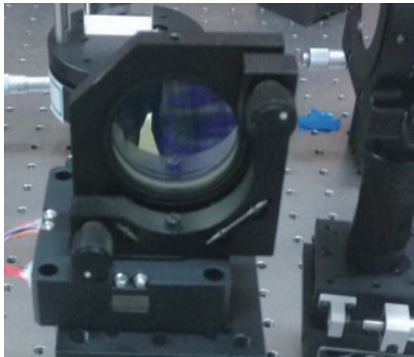
P16 series piezoelectric scanner adopts the principle of mechanism amplification design and built-in high-performance piezo actuator. The scanner can realize the travel of 50μm or 100μm.

P16.XY100 requires a three-channel piezoelectric controller with one constant-voltage output channel.

P16 XY piezo scanner is differentially controlled and widely used in microscopic imaging and other fields due to its small size, large load and high dynamics.

► Application Example

P16.XY piezo scanner is used in optical path adjustment experiment, carrying mirror frame to move precisely in XY axes.



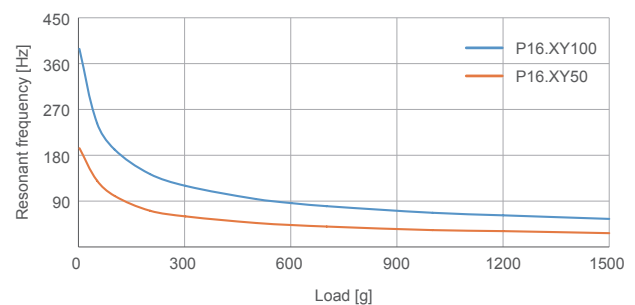
► Recommended Controllers

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

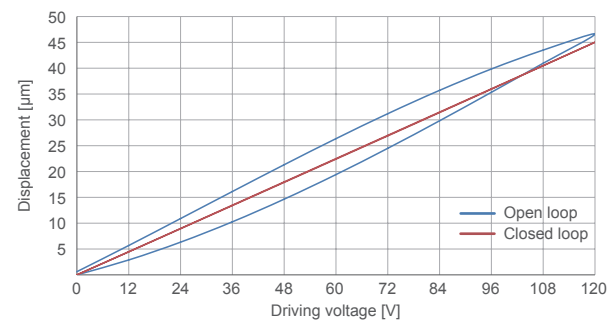
► Typical Applications

- Microscopic imaging
- Optical
- Precision positioning
- Surface inspection
- Micro-operation
- Interference/metering

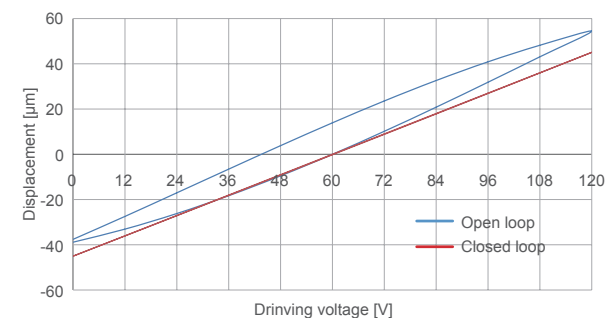
► Frequency vs Load Curve



► P16.XY50K Curve



► P16.XY100 Curve



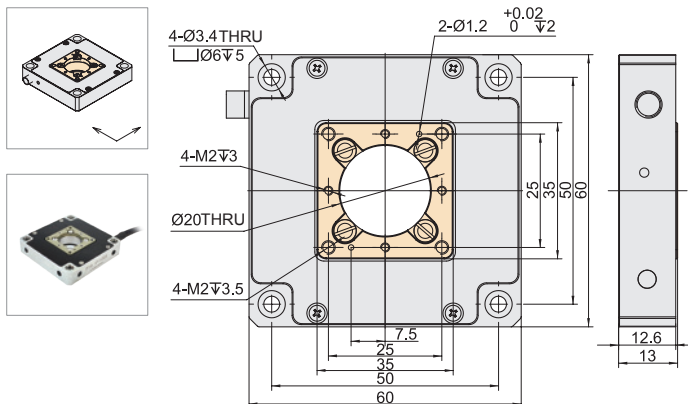
► Technical Data

Type	S-Closed loop K-Open loop	P16.XY50S P16.XY50K	P16.XY80S P16.XY80K	P16.XY100S P16.XY100K	Units
Active axes		X, Y	X, Y	X, Y	
Travel range(0~120V)		40/axis	80/axis	±40/axis	μm±10%
Travel range(0~150V)		50/axis	105/axis	±50/axis	μm±10%
Sensor		SGS/-	SGS/-	SGS/-	
Aperture size		Ø20	Ø43	Ø20	mm
Resolution		10/5	20/10	10/5	nm
Linearity		1/-	X0.3Y1/-	1/-	%F.S.
Repeatability		1/-	X0.1Y0.5/-	0.5/-	%F.S.
Pitch/yaw/roll		<20	<10	<25	μrad
Push/pull force		30/10	50/15	30/30	N
Stiffness in motion direction		0.5	1	0.5	N/μm±20%
Unloaded resonant frequency		500	700	600	Hz±20%
Unloaded step time		10/0.8	5/1.5	10/1.6	ms±20%
Unloaded operating frequency	10% travel	50	-	100	Hz±20%
	100% travel	20	75(-3dB)	40	
Load capacity		1.5	0.5	1.5	kg
El. capacitance		1.8/axis	3.6/axis	3.6/axis	μF±20%
Material		Steel, Al	Steel, Al	Steel, Al	
Mass		200	470	220	g±5%

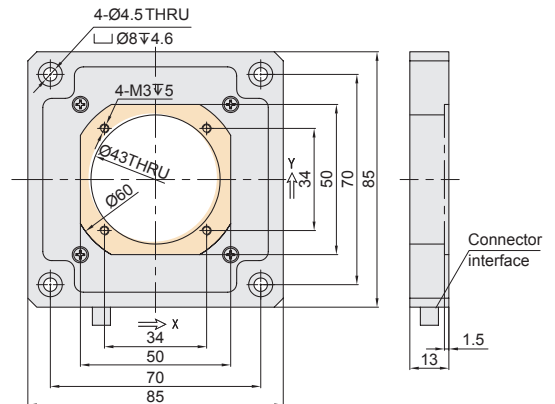
Note: Above parameters are measured with the E00/E01 series piezo controller. The maximum driving voltage can be -20V~150V; For high reliability long-term use, the recommended driving voltage is 0~120V.

► Drawings

P16.XY50/100



P16.XY80S/K



P17.XY15 Piezo Scanner(Direct Drive)



P17.XY15 piezoelectric scanning stage is an XY-axis translation scanning platform. The center has a aperture size of 25×27.5mm. The product is small in size and stable in performance. P17.XY15 scanning platform is an open-loop version and has excellent dynamics, suitable for dynamic scanning applications.

► Characteristics

- Travel to 15μm
- Load capacity to 0.2kg
- Aperture size: 25×27.5mm
- Sub-nm resolution
- Available UHV version

► XY Motion

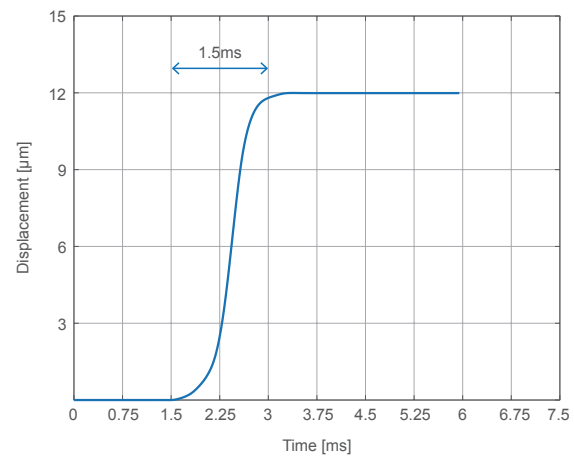


► Typical Applications

- Microscopic imaging
- Surface inspection
- Interference/metering
- Precision positioning
- Infrared thermal imaging
- Semiconductor testing

► Step Time

P17.XY15 piezoelectric scanning stage is driven with CoreMorrow high-power E00/E01 piezo controller, which can realize a step time of 1.5ms.

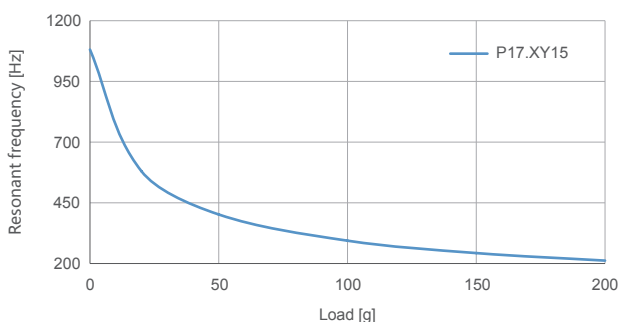


► High Stiffness, Resolution and Frequency

P17.XY15 series piezo scanner adopts direct-drive mechanism design and built-in high-performance piezoelectric ceramics. The product is very compact, and the through holes at the four corners of the stage are convenient for integration and installation.

P17.XY15 piezo scanning stage is based on an open-loop version with ultra-high resolution of 0.2nm. The excellent structural design makes it have a high stiffness of 3N/μm, and the XY axis unloaded resonant frequency can reach 1kHz. This product is ideal for high-speed scanning applications.

► Frequency vs Load Curve



► Applications Example

P17.XY15 features small size, fast response and aperture design, which makes it very suitable for image stabilization in photoelectric pod.



Photoelectric pod

► Technical Data

Type	K-Open loop	P17.XY15K	Units
Active axes		X, Y	
Travel range(0~120V)		12/axis	$\mu\text{m}\pm 10\%$
Travel range(0~150V)		15/axis	$\mu\text{m}\pm 10\%$
Aperture		25×27.5(See Drawing)	mm
Resolution		0.2	nm
Pitch/yaw/roll		<5	μrad
Push/pull force		30/3	N
Stiffness		X3/Y3	N/ $\mu\text{m}\pm 20\%$
Unloaded resonant frequency		X1000/Y1000	Hz $\pm 20\%$
Unloaded step time		1.5	ms $\pm 20\%$
Unloaded operating frequency	10% travel	100	Hz $\pm 20\%$
	100% travel	20	
Load capacity		0.2	kg
El. capacitance		0.7/axis	$\mu\text{F}\pm 20\%$
Material		Aluminum	
Mass		55	g $\pm 5\%$

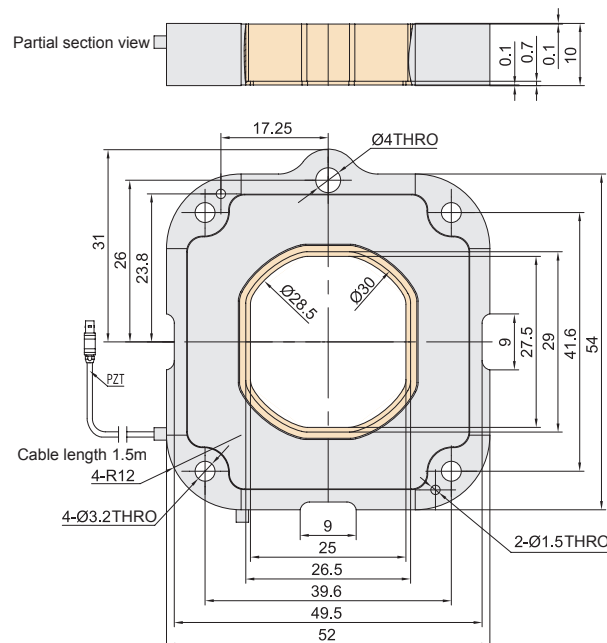
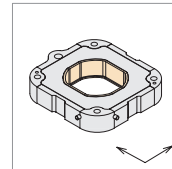
Note: Above parameters are measured with the E00/E01 series piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term use, the recommended driving voltage is 0~120V.

► Recommended Controllers

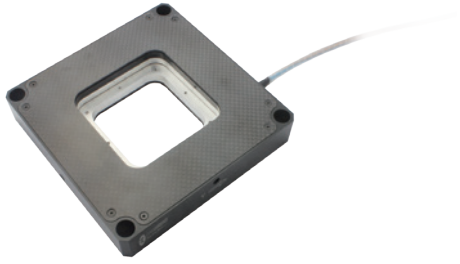
E00/E01	E70	E53.B3
		
1~3 channels Digital, analog Open/closed loop Ave. current 291mA	3 channels Digital, analog Open/closed loop Ave. current 70mA	3 channels Digital, analog Open/closed loop Ave. current 60mA
Note: Please see "Piezo Controller" for detailed information.		

► Drawing

P17.XY15



P17.XY200 Piezo Scanners(Amplified Drive)



P17 is an XY scanning stage specially developed for applications requiring large aperture and large displacement. The scanner adopts amplification mechanism and built-in high-reliability piezo actuators, which could realize the scanning range of 187.5 μ m. It has been widely used in the fields of precise positioning and scanning microscopy.

► Characteristics

- Max stroke to 187.5 μ m
- Load capacity to 1kg
- Aperture: 60 $\times$ 60mm
- Closed loop for high Repeatability
- Fast response time
- Available UHV version

► XY axes

P17 moves in XY axes with the displacement of 187.5 μ m/axis.

► Large Aperture, Large Displacement

P17.XY200 fast high-precision scanning stage could realize stroke of 187.5 μ m/axis with excellent structural design of no friction, high guiding precision and fast response time to 5ms. Closed-loop version uses high-precision feedback sensor. 60 $\times$ 60mm aperture of the scanner is suitable for wafer positioning or micro-operation in industrial automation.

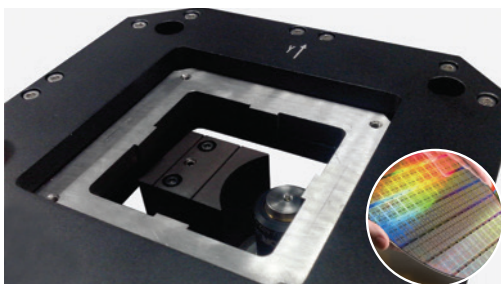
► Applications

- Image processing and stabilization
- Interference
- Scanning microscopy
- Surface inspection
- Wafer positioning
- Micromanipulation

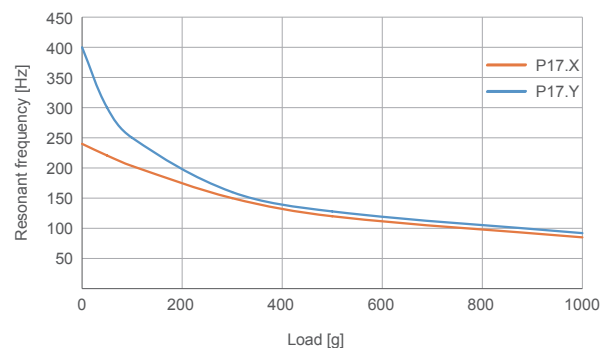
► Application Example

P17.XY200 has been successfully used in semiconductor testing, surface structure analysis, microscopic imaging.

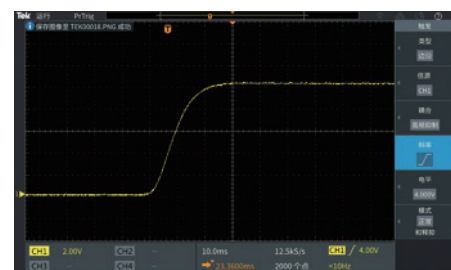
P17.XY200 used in conjunction with CoreMorrow XP-721 piezo objective scanner for wafer positioning, could perform nano-scale precision positioning of wafer.



► Frequency vs Load Curve

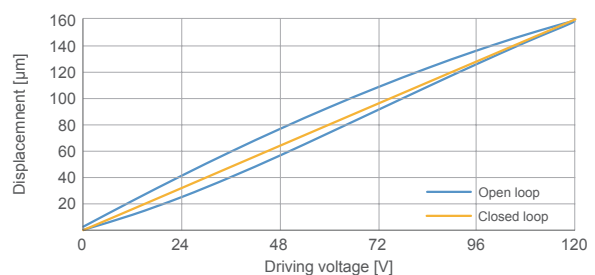


► Step Time



Step time of P17.XY200S loading 10g to full stroke is about 30ms.

► Open/Closed Loop Curve



► Technical Data

Type	S-Closed loop K-Open loop	P17.XY200S	P17.XY200K	Units
Active axes		X, Y	X, Y	
Travel range(0~120V)		150/axis	150/axis	μm±10%
Travel range(0~150V)		187.5/axis	187.5/axis	μm±10%
Sensor		SGS	-	
Aperture		60×60	60×60	mm
Resolution		8	5	nm
Closed/open-loop resolution		0.1	-	%F.S.
Repeatability		0.05	-	%F.S.
Pitch/yaw/roll		<15	<15	μrad
Push/pull force capacity		40/15	40/15	N
Stiffness		X0.2/Y0.2	X0.2/Y0.2	N/μm±20%
Unloaded resonant frequency		X240/Y400	X240/Y400	Hz±20%
Closed/open-loop unloaded step time		30	5	ms±20%
Unloaded operating frequency	10% travel	50	50	Hz±20%
	100% travel	10	10	
Load capacity		1	1	kg
El. capacitance		3.6/axis	3.6/axis	μF±20%
Material		Steel, Aluminum	Steel, Aluminum	
Mass		660	660	g±5%

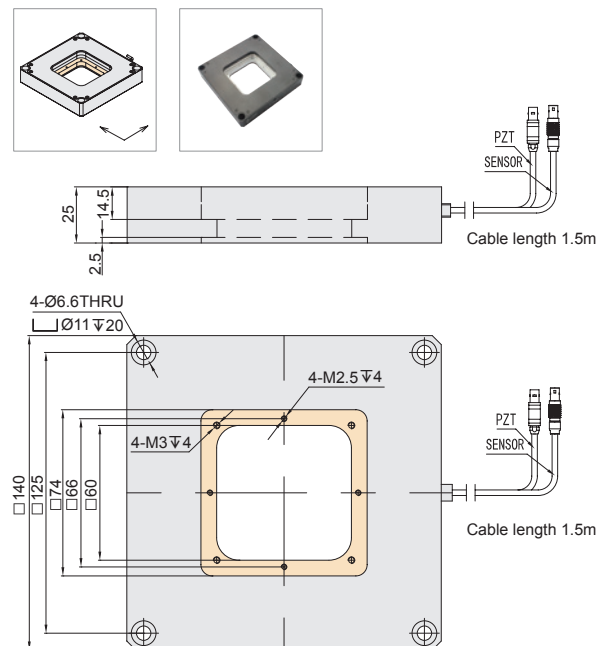
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation.
Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Recommended Controllers

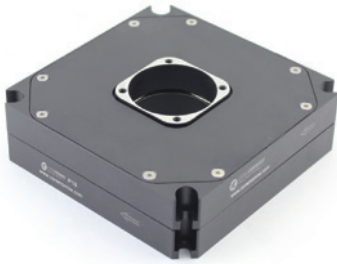
E00/E01	E70	E53.B3
		
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	3 channels Analog, digital Closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

► Drawing

P17.XY200



P18 Piezo Scanners(Amplified Drive)



P18 1~3 axes piezo linear scanner adopts amplified mechanism and built-in high-reliability piezo actuators, which could realize high-speed scanning up to 375 μ m. The aperture is $\varnothing$ 35mm, and various displacements and specifications are available for selection. It is suitable for long-travel multi-dimensional scanning applications.

► Characteristics

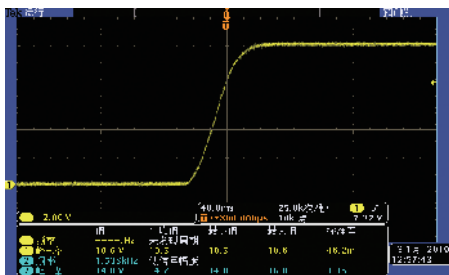
- Max stroke to 375 μ m
- Max load to 3.5kg
- Aperture: $\varnothing$ 35mm
- Available UHV version
- Fast response time
- 1~3 axes motion

► Large Stroke, Large Load Capacity

P18 built with high-reliability PZT could achieve the displacement up to 375 μ m. Closed-loop version could be selected to achieve excellent linearity and repeatability.

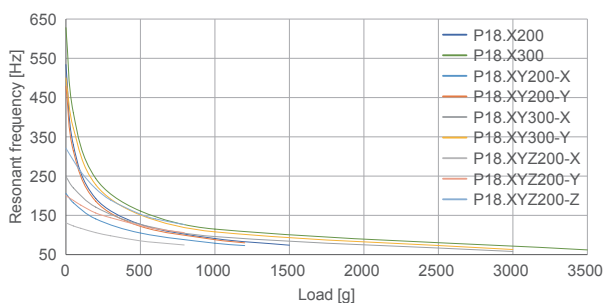
Max load capacity is up to 3.5kg and unloaded resonant frequency could be up to 600Hz. Matching CoreMorrow piezo controller, the step time could be up to 5ms. It is ideal for applications such as precision machining, semiconductor manufacturing, and scanning microscopy.

► Step Time



The step time of P18.XYZ300S is about 60ms loading 100g.

► Frequency vs Load Curve

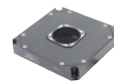


► Applications

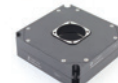
- Surface inspection
- Scanning microscopy
- Interference/metering
- Image processing and stabilization
- Optical metrology
- Semiconductor measurement

► 1~3 axes

P18 includes X/XY/XYZ versions, which could meet the application requirements of 1~3 axes large stroke scanning or positioning.



P18.X

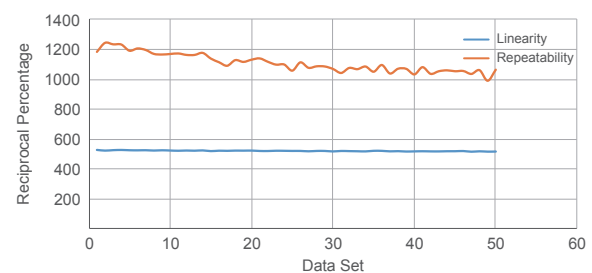


P18.XY



P18.XYZ

► Accuracy (P18.XY300S)



► Recommended Controllers

E00/E01	E70	E53
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	1 channel Analog, digital Open/closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

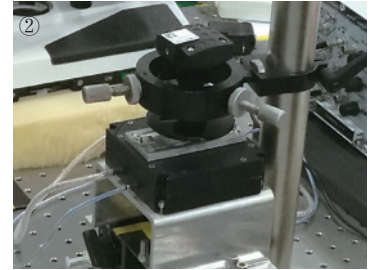
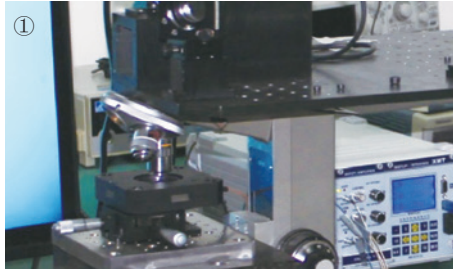
► Technical Data

Type	S-Closed loop K-Open loop	P18.X200S P18.X200K	P18.X300S P18.X300K	P18.Z200S P18.Z200K	P18.XY200S P18.XY200K	P18.XY300S P18.XY300K	P18.XZ200S P18.XZ200K	P18.XYZ200S P18.XYZ200K	Units
Active axes		X	X	Z	X, Y	X, Y	X, Z	X, Y, Z	
Travel range(0~120V)		200	±150	200	200/axis	±150/axis	160/axis	160/axis	μm±10%
Travel range(0~150V)		250	±187.5	250	250/axis	±187.5/axis	200/axis	200/axis	μm±10%
Sensor		SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Aperture		Ø35	Ø35	Ø35	Ø35	Ø35	Ø35	Ø35	mm
Closed/open loop resolution		8/5	10/5	8/5	8/5	10/5	8/5	8/5	nm
Closed-loop linearity		0.2/-	0.2/-	0.2/-	0.2/-	0.2/-	0.2/-	0.4/-	%F.S.
Repeatability		0.15/-	0.15/-	0.15/-	0.15/-	0.15/-	0.15/-	0.2/-	%F.S.
Pitch/yaw/roll		<10	<15	<20	<10	<15	<20	<25	μrad
Push/pull force		60/20	150/150	50/10	60/20	150/150	30/10	30/10	N
Stiffness		0.3	0.5	0.3	0.3	0.5	0.3	0.1	N/μm±20%
Unloaded resonant frequency		500	600	300	X200/Y450	X250/Y500	X200/Z300	X120/Y200/ Z300	Hz±20%
Closed/open-loop unloaded step time		30/5	30/10	30/5	50/5	50/10	50/5	80/10	ms±20%
Unloaded operating frequency	10% travel	100	50	80	50	40	50	20	Hz±20%
	100% travel	30	15	15	15	10	15	2	
Load capacity		2	3.5	1	1.5	3	1	0.8	kg
El. capacitance		11	21	11	11/axis	21/axis	11/axis	11/axis	μF±20%
Material		Aluminum							
Mass		200	220	400	360	380	550	750	g±5%

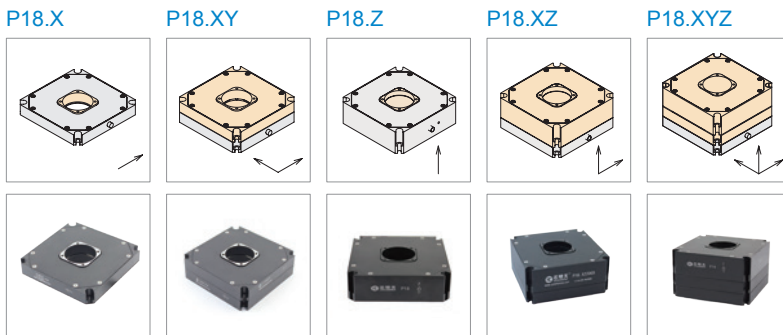
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation.
Technical data is measured by CoreMorrow E00/E01 series piezo controller.

► Application Examples–Nanolithography and Scanning Imaging

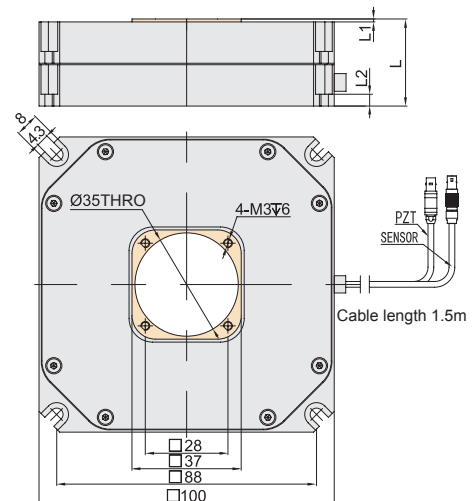
- ① CoreMorrow P18.XY300 featuring large displacement, high precision and high stability is applied to nanolithography experiments .
- ② P18.XY300 is applied to 2D scanning imaging.



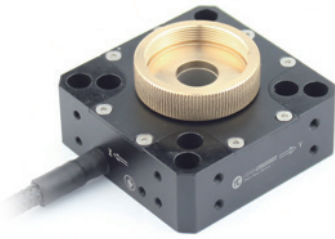
► Drawing



Type	L(mm)	L1(mm)	L2(mm)
P18.X	15	1	4
P18.XY	29.5	1	4
P18.Z	31	0.5	10.5
P18.XZ	43	0.5	4
P18.XYZ	57.5	0.5	4

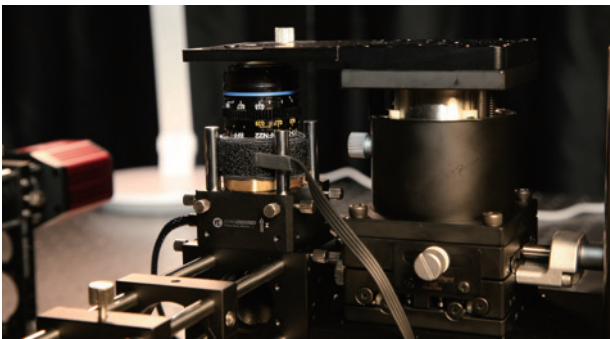


P70 Piezoelectric Nanopositioning Scanner



P70 piezo nanopositioning scanner has two versions, XY-motion and Z-motion version. Both versions have four through holes at the four corners, and the hole center distance is 30mm, which is very suitable for the installation of cage structures.

► Applied to Cage Structures

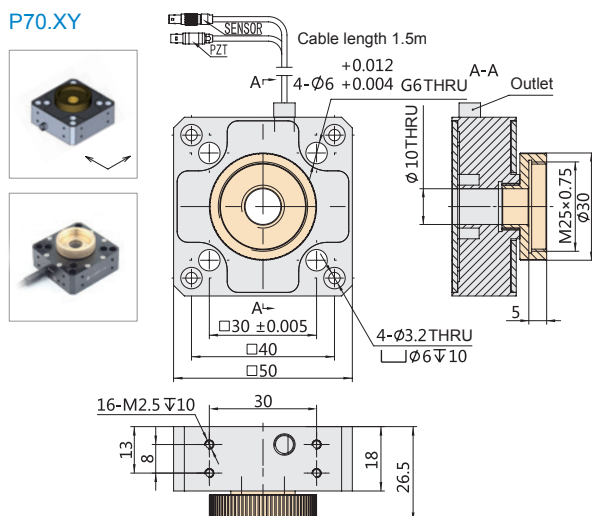


► Technical Data

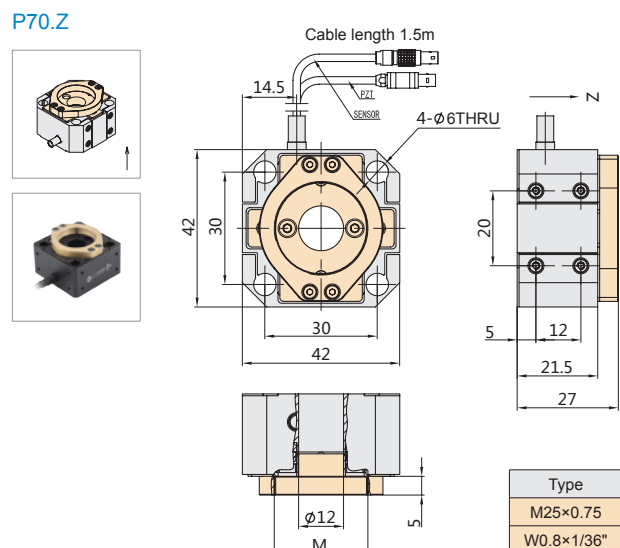
Type	S-Closed loop K-Open loop	P70.XY20S P70.XY20K (amplified)	P70.Z8S P70.Z8K (direct-drive)	Units
Active axes		X, Y	Z	
Travel		±8.5/axis (@120V)	8 (@150V)	μm±10%
Sensor		SGS/-	SGS/-	
Resolution		1/0.6	1/0.6	nm
Linearity		0.3/-	0.25/-	%F.S.
Repeatability		0.2/-	0.16/-	%F.S.
Pitch/yaw/roll		<15	<10	μrad
Load capacity		300	200	g
Closed-loop unloaded response		30	20	ms±20%
Unloaded resonant frequency		1.2	3.6	kHz±20%
Loaded resonance		0.4(53g)	1.5(200g)	kHz±20%
El. capacitance		0.8/axis	1.6	μF±20%
Mass		175	128.5	g±5%

► Drawing

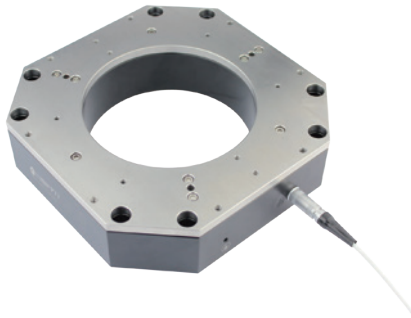
P70.XY



P70.Z



P77 Piezo Phase Shifter (Direct Drive)



P77 piezo phase shifters are specially designed for optical detection and phase shifting applications, with travel range of up to 50μm and load capacity of up to 15kg, which is very suitable for large-aperture optical inspection equipment, like laser interferometer, for various lenses. Custom versions are available.

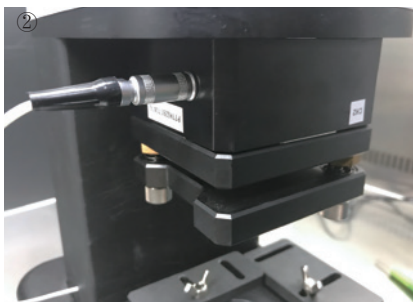
► Characteristics

- Load capacity to 15kg
- Nanoscale step, millisecond response
- Optional upright, lateral, inverted mounting
- Custom design with larger aperture, fast response, etc.

► Applications

- Microscopic imaging
- Precision positioning
- Optical interference / measurement
- Surface inspection
- Optical capture
- Phase shifter

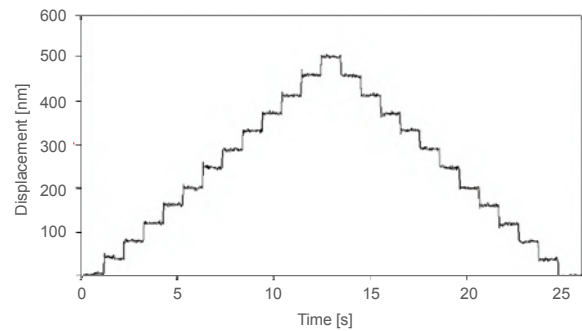
► Application Examples



① : P77.Z20S applied for small interferometer.

② : P77.D2 applied to Michelson Interferometer for optical phase shifter.

► 40nm Step(P77.K36)



► Recommended Controllers

E70	E53
3 channels Analog and digital control Optional servo control RS-232/RS-422/USB	1 channel, small size Analog and digital control Optional servo control RS-232/RS-422/USB
Note: For technical data, please refer to "Piezo Controllers".	

► P77 Family



P77.S/K106 P77.S/K106A P77.S/K36 P77.S/K160 P77.S/K160A P77.S/K210 P77.S/K242 P77.30S/K140 P77.S/K310

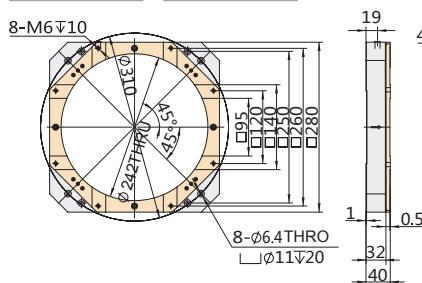
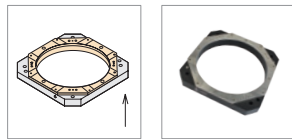
► Technical Data

Type	P77.S242 P77.K242	P77.30S140 P77.30K140	P77.S310 P77.K310	P77.S106 P77.K106	P77.S106A P77.K106A	P77.S36 P77.K36	P77.S160 P77.K160	P77.S160A P77.K160A	P77.S210 P77.K210	Units
Active axes	Z	Z	Z	Z	Z	Z	Z	Z	Z	
Travel range(0~120V)	14	12.8/25.6	13.5	14	14	14	14	14	14	μm±10%
Travel range(0~150V)	17.5	16/32	17	17.5	17.5	17.5	17.5	17.5	17.5	μm±10%
Sensor	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	SGS/-	
Aperture	Φ242	Φ140	Φ310	Φ106	Φ106	Φ36	Φ160	Φ160	Φ210	mm
Resolution	0.5	0.5	0.5	1/0.5	0.5	0.5	0.5	0.5	0.5	nm
Pitch/yaw/roll	<15	<15	-	<10	<10	<10	<10	<10	<10	μrad
Push/pull force	100/20	80/15	100/20	100/20	100/20	100/20	100/20	100/20	100/20	N
Unloaded resonant frequency	3090	200	-	300	150	300	140	120	100	Hz±20%
Unloaded step time	20	14/7	-	5/2.5	3.5	2	2.5	3.5	2.5	ms±20%
Load capacity	Upright	15	-	12	15	10	7	10	10	kg
	Lateral	1	5	-	5	5	1	5	5	
	Inverted	10	-	-	10	5	5	2	5	
El. capacitance	5.4	14.4/28.8	10.8	5.4	7.2	3.6	5.4	7.2	5.4	μF±20%
Material	Aluminum, steel			Al		Aluminum, steel				
Mass	5000	4200	4200	1600	2000	610	2400	2900	3000	g±5%
Operating temperature	-20~80	-20~80	-20~80	-20~80	-20~80	-20~80	-20~80	-20~80	-20~80	°C
Control channels	1	1 or 2	1~3	1	1~3	1~3	1 or 3	1 or 2	1 or 3	
Connector	LEMO	LEMO	LEMO	LEMO	LEMO	LEMO	LEMO	LEMO	LEMO	
Cable length	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	m±10mm

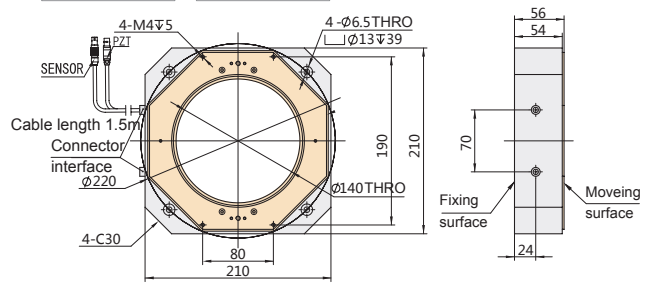
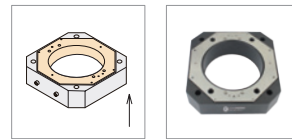
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term, high-reliability operation. Technical data are measured by CoreMorrow E00/E01 series piezo controller.

► Drawing

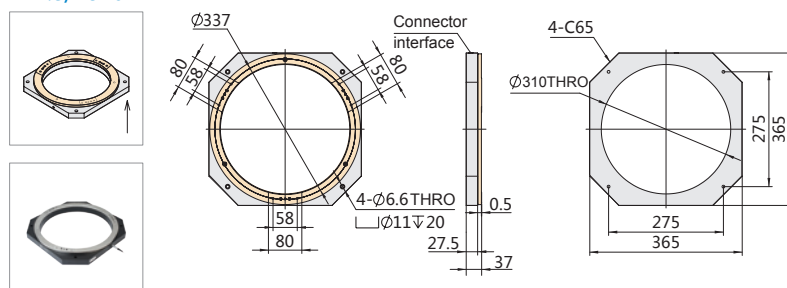
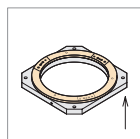
P77.S/K242



P77.30S/K140

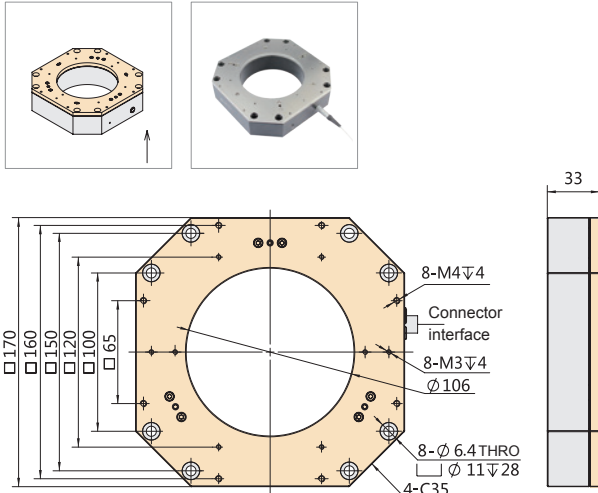


P77.S/K310

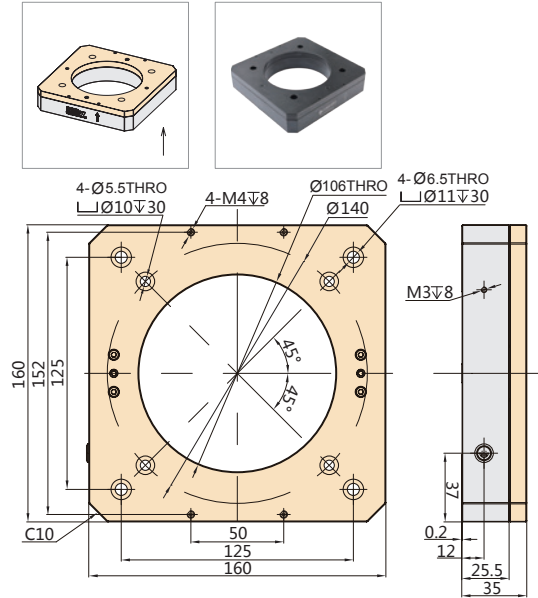


Drawings

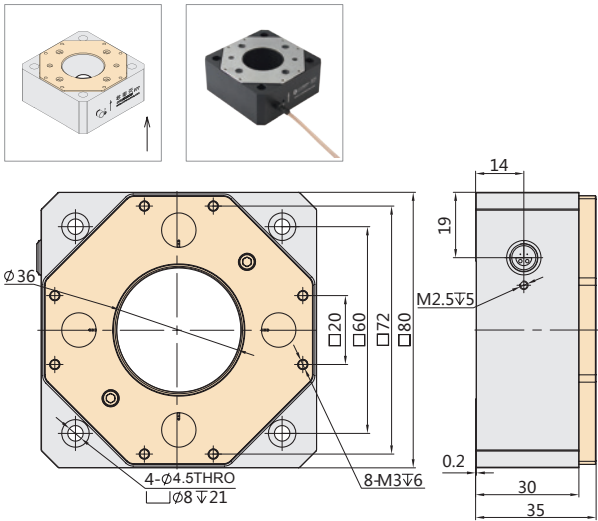
P77.S/K106



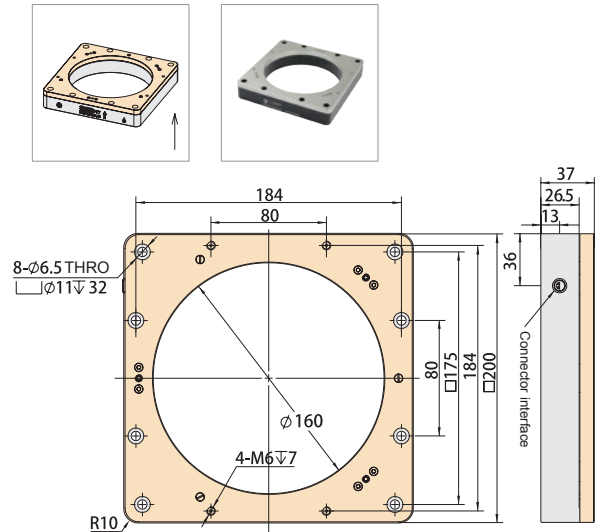
P77.S/K106A



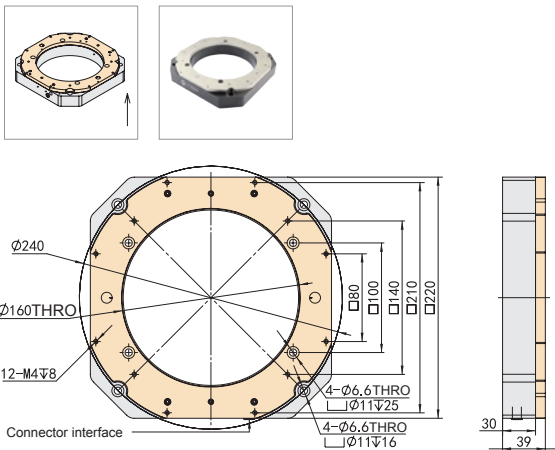
P77.S/K36



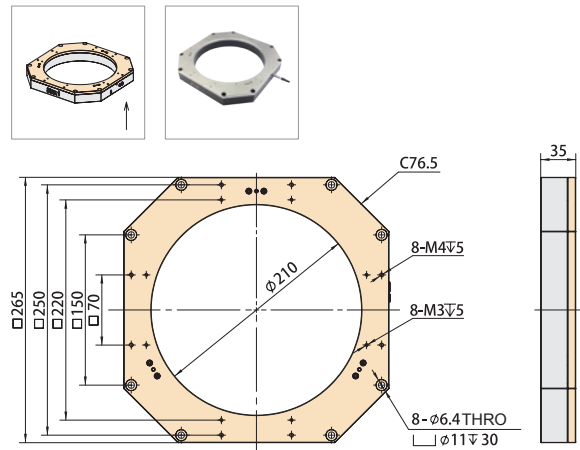
P77.S/K160



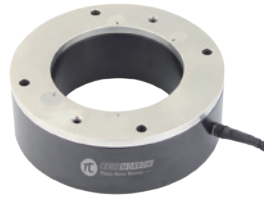
P77.S/K160A



P77.S/K210



P77A Piezo Phase Shifter

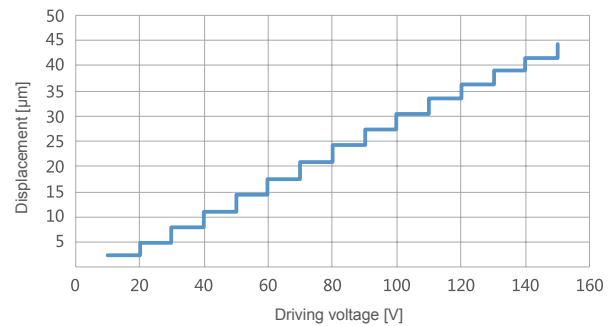


Technical Data

Type	P77A.K65	P77A.50K65	Units
Active axes	Z	Z	
Travel range(0~120V)	16	40	$\mu\text{m}\pm 10\%$
Travel range(0~150V)	20	50	$\mu\text{m}\pm 10\%$
Aperture	$\Phi 65$	$\Phi 65$	mm
OD	$\Phi 105$	$\Phi 105$	mm
Height	35	72.5	mm
Resolution	0.5	1.5	nm
Pitch/yaw/roll	<10	<10	μrad
Push/pull force	100/20	50/10	N
Unloaded resonant frequency	1400	1400	$\text{Hz}\pm 20\%$
Unloaded Step time	1	2.5	$\text{ms}\pm 20\%$
Load capacity	Upright	5	kg
	Lateral	2	
	Inverted	3	
El. capacitance	1.8	5.4	$\mu\text{F}\pm 20\%$
Material	Aluminum, steel		
Mass	670	1100	$\text{g}\pm 5\%$
Operating temperature	-20~80	-20~80	$^{\circ}\text{C}$
Control channel	2	2	
Connector	LEMO	LEMO	
Cable length	1.5	1.5	$\text{m}\pm 10\text{mm}$

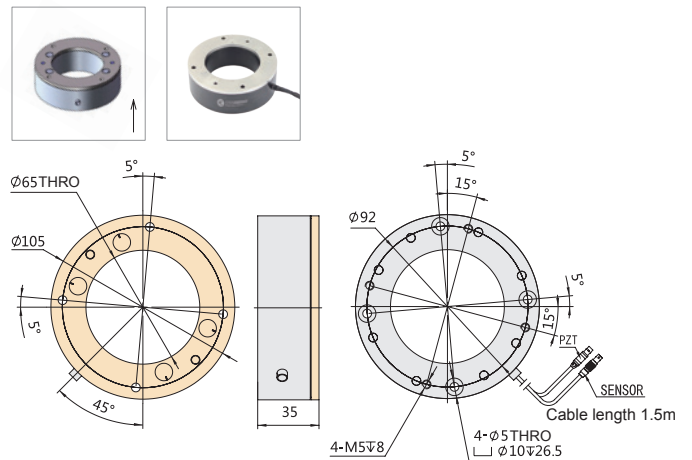
Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term, high-reliability operation. Technical data are measured by CoreMorrow E00/E01 series piezo controller.

10V Step(P77A.50K65)

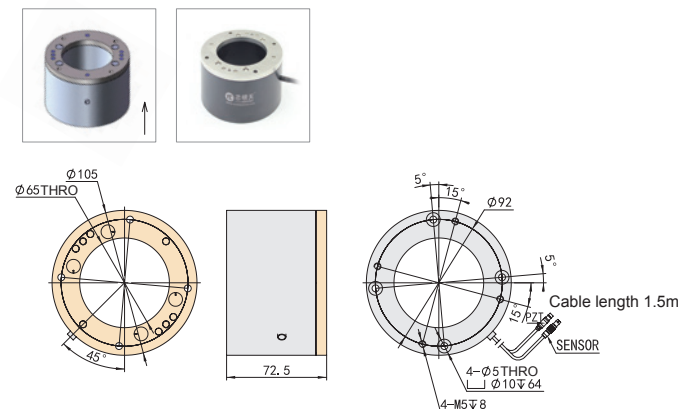


Drawings

P77A.K65



P77A.50K65



P78.Z100S/K-D1 Piezo Z Microscope Scanner



P78 piezo microscope scanner is a Z-axis piezoelectric scanning stage designed for biomedical microscopy applications. It is easy to integrate into microscopic instruments.

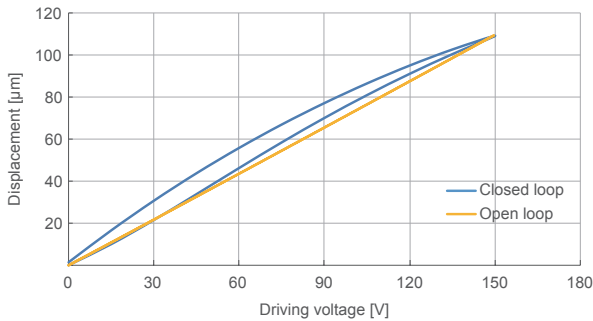
Characteristics

- Z motion
- Travel range to 100 μ m
- Resolution to 4nm
- Aperture: 120 $\times$ 70mm

Applications

Microscopic imaging, biotechnology, super-resolution microscopy, 3D imaging, interferometry, measurement techniques, autofocus systems etc.

Open/Closed Loop Curve

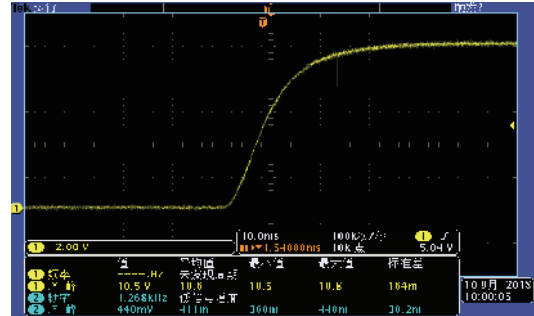


Technical Data

Type	S-Closed loop K-Open loop	P78.Z100S P78.Z100K	Units
Active axes		Z	
Travel range(0 ~+120 V)		80	μ m $\pm$ 10%
Travel range(0~+150 V)		100	μ m $\pm$ 10%
Sensor type		SGS/-	
Aperture size		120 $\times$ 70	mm
Resolution		7/4	nm
Linearity		0.3/-	%F.S.
Repeatability		0.1/-	%F.S.
Pitch/yaw/roll		<25	μ rad
Push/pull force		120/15	N
Stiffness		1.5	N/ μ m $\pm$ 20%
Unloaded resonant frequency		400	Hz $\pm$ 20%
Unloaded step time		30/5	ms
Unloaded operating frequency	10% travel	50	Hz $\pm$ 20%
	100% travel	15	Hz $\pm$ 20%
Load capacity		1	kg
El. capacitance		5.4	μ F $\pm$ 20%
Operating temperature		-20~80	$^{\circ}$ C
Material		Steel, Al	
Mass		560	g $\pm$ 5%
Cable length		1.5	m $\pm$ 10mm
Sensor/voltage connector		LEMO	

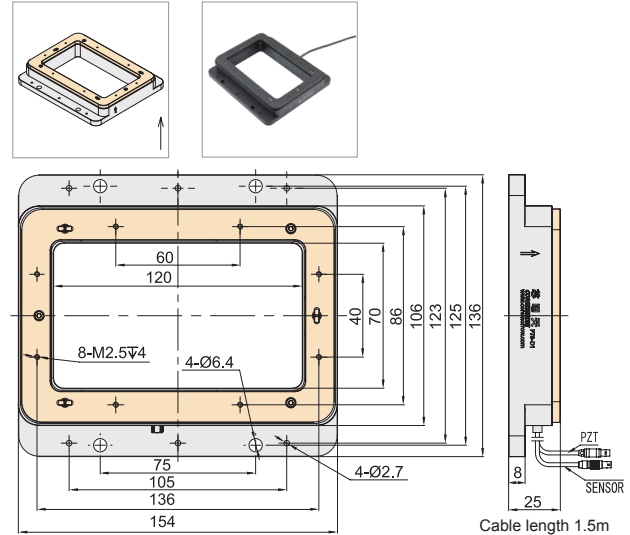
Note: Above parameters are measured with the E00/E01 series piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term use, the recommended driving voltage is 0~120V.

Step Time



Drawing

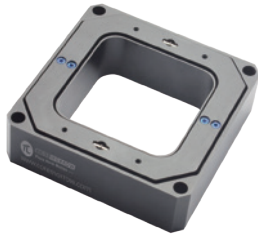
P78.Z100S/K



Recommended Controllers

E00/E01	E70	E53
1~3 channels Digital, analog Open/closed loop Ave. current 291mA	1~3 channels Digital, analog Open/closed loop Ave. current 291mA	1 channels Digital, analog Open/closed loop Ave. current 60mA
Note: Please see "Piezo Controller" for detailed information.		

P78.Z200/300 Piezo Z Microscope Scanner

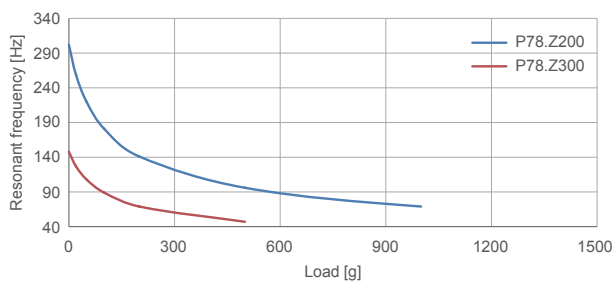


P78 piezo scanner is ideal for applications such as nanoscale alignment and measurement. Closed-loop sensor with bridge configuration can be selected to eliminate temperature drift and ensure the positioning stability in the nanometer range.

► Characteristics

- Z motion
- Travel range to 187.5/262.5μm
- Resolution to 3nm
- Aperture: 64×64mm

► Frequency vs Load Curve



► Technical Data

Type	S-Closed loop K-Open loop	P78.Z200S P78.Z200K	P78.Z300S P78.Z300K	Units
Active axis		Z	Z	
Travel range (0~120V)		150	210	μm±10%
Travel range (0~150V)		187.5	262.5	μm±10%
Sensor		SGS/-	SGS/-	
Aperture		64×64	64×64	mm
Resolution		7/3	10/5	nm
Linearity		0.1/-	0.15/-	%F.S.
Repeatability		0.05/-	0.1/-	%F.S.
Pitch/yaw/roll		<20	<30	μrad
Push/pull force		50/8	30/5	N
Stiffness		0.35	0.15	N/μm±20%
Unloaded resonant frequency		270	200	Hz±20%
Unloaded step time		15/3.2	50/6.4	ms
Unloaded operating frequency	10% travel	80	30	Hz±20%
	100% travel	15	5	
Load capacity		1	0.5	kg
El. capacitance		7.2	14.4	μF±20%
Operating temperature		-20~80	-20~80	°C
Material		Aluminum	Aluminum	
Mass		340	340	g±5%
Cable length		1.5	1.5	m±10mm
Connector		LEMO	LEMO	

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

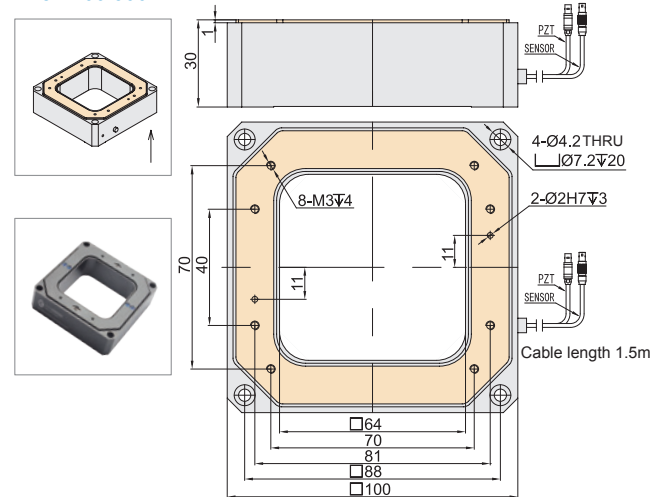
► Long Travel, High Resolution

P78 adopts amplification mechanism to realize stroke of 187.5/262.5μm. Excellent flexible hinge guiding mechanism is optimized by FEA to achieve nanometer resolution and millisecond response time.

Aperture in the center is 64×64mm, which is suitable for applications such as interference and surface inspection.

► Drawing

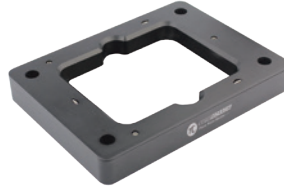
P78.Z200/300



► Recommended Controllers

E00/E01	E70	E53
1~3 channels Digital, analog Open/closed loop Ave. current 291mA	1~3 channels Digital, analog Open/closed loop Ave. current 291mA	1 channels Digital, analog Open/closed loop Ave. current 60mA
Note: Please see "Piezo Controller" for detailed information.		

P79 Piezo Z Microscope Scanner(Amplified Drive)



P79 series piezoelectric Z microscope scanner is a Z-axis micro-motion platform, mainly used for supporting macro-motion XY-axis micro-scanning stages and piezoelectric motor platforms on the market. P79 platform can perform fast Z-axis focus adjustments with milliseconds step time.

► Characteristics

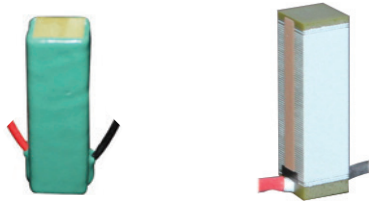
- Travel to 50, 100μm of 187.5μm
- Load capacity to 2kg
- Aperture size: 83×65mm
- High closed-loop repeatability
- Z or XYZ version
- UHV version available

► Customized Petri Dish Rack

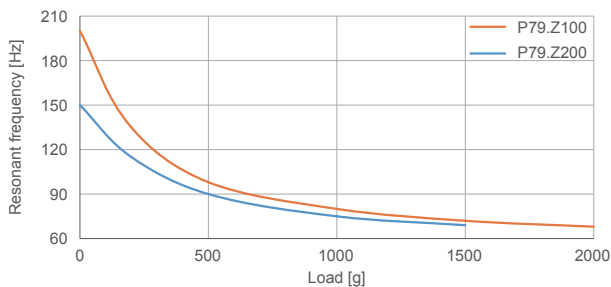


► Surface-Insulated Piezo Actuator

The Z piezoelectric scanner adopts high-consistent and high-stability surface-insulated piezoelectric actuator with high ability to resist the external environment and there is no leakage.



► Frequency vs Load Curve



► Typical Applications

- Fluorescence/confocal microscopy
- 3D imaging
- Biotechnology
- Autofocus system
- Sample detection

► Fast Focusing, Ultra High Precision

P79 has a large-aperture design that is mainly to meet a variety of sample clamping structure, such as multi-well control panel.

Piezoelectric ceramic drive has an ultra-fast response speed, and the Z-axis stepping speed and settling time are only 1/20 of the motor drive, which greatly improves the imaging capture capability and productivity.

For applications requiring positioning accuracy and stability, SGS sensor can be configured to fit in the most suitable position of the platform to provide high-resolution, fast-responding sensing voltage signals to the piezo controller. The full bridge design avoids temperature drift and ensures that the positioning accuracy is nanoscale.

► Recommended Controllers

E01	E52	E53
		
1~3 channels Digital, analog Open/closed loop Ave. current 291mA	1 channel Analog control Open/closed loop Ave. current 300mA	1 channels Digital, analog Open/closed loop Ave. current 60mA
Note: Please see "Piezo Controller" for detailed information.		

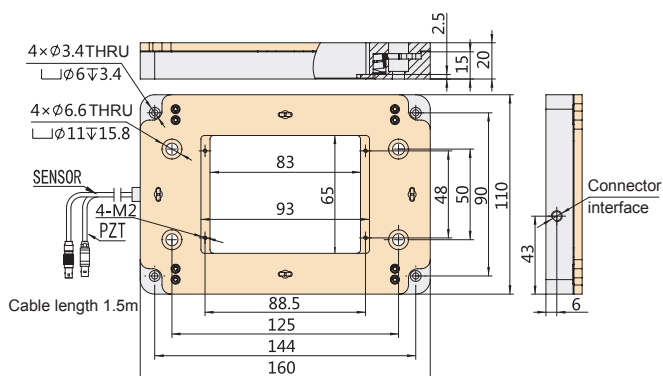
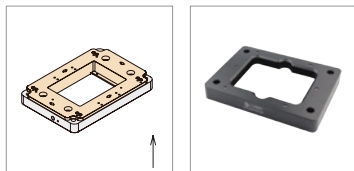
► Technical Data

Type	S-Closed loop K-Open loop	P79.Z100S P79.Z100K	P79.Z200S P79.Z200K	P79.XYZ50S P79.XYZ50K	Units
Active axes		Z	Z	X, Y, Z	
Travel range(0~120V)		80	150	40/axis	$\mu\text{m}\pm 20\%$
Travel range(0~150V)		100	187.5	50/axis	$\mu\text{m}\pm 20\%$
Sensor		SGS/-	SGS/-	SGS/-	
Aperture		83×65	83×65	84×65	mm
Resolution		7/3	8/5	5/1	nm
Linearity		0.1/-	0.15/-	0.1/-	%F.S.
Repeatability		0.05/-	0.1/-	0.05/-	%F.S.
Pitch/yaw/roll		<15	<20	<20	μrad
Push/pull force		30/15	42/18	25/-	N
Stiffness		0.3	0.2	0.5	N/ $\mu\text{m}\pm 20\%$
Unloaded resonant frequency		200	150	X525/Y630/Z490	Hz $\pm 20\%$
Unloaded step time		15/3.2	25/5	30/6	ms $\pm 20\%$
Unloaded operating frequency	10% travel	50	25	80	Hz $\pm 20\%$
	100% travel	15	5	7	
Load capacity		2	1.5	0.5	kg
El. capacitance		5.4	11	3.2/axis	$\mu\text{F}\pm 20\%$
Material		Steel, Al	Steel, Al	Steel, Al	
Mass		700	800	750	g $\pm 5\%$

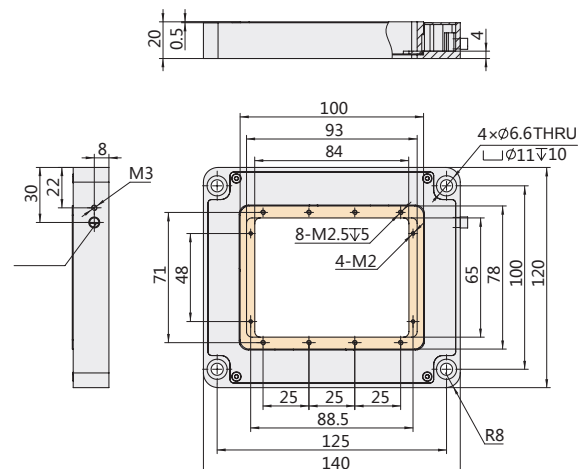
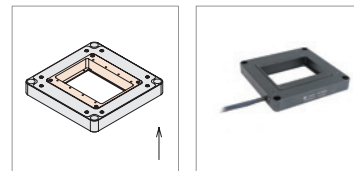
Note: Above parameters are measured with the E00/E01 series piezo controller. The maximum driving voltage can be -20V~150V; For high-reliability and long-term use, the recommended driving voltage is 0~120V.

► Drawings

P79.Z100/200



P79.XYZ50



XP-780 Piezo Scanners(Amplified Drive)



XP-780 piezo scanner adopts amplification mechanism, flexible hinge design and high-reliability piezo actuator to realize displacement of X-axis up to 200μm, and could be configured with closed-loop sensor for high-precision scanning and positioning. The size of aperture is 25mm x 25mm. It could realize 2 or 3 axes motion by superimposing.

► Characteristics

- Max stroke to 200μm
- Max load to 5kg
- Aperture: 25×25mm
- Available UHV version
- Open/closed loop is optional
- Closed-loop version for high repeatability

► Applications

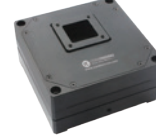
- Biotechnology
- Interference
- Wafer positioning
- SPM
- Measurement
- Surface structure analysis

► 1~3 axes

There are X, XY, XZ, XYZ versions in XP-780 family.



XP-780.X

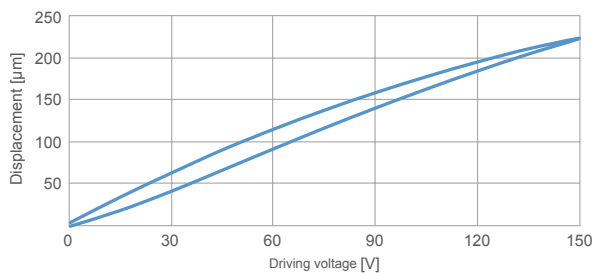


XP-780.XY

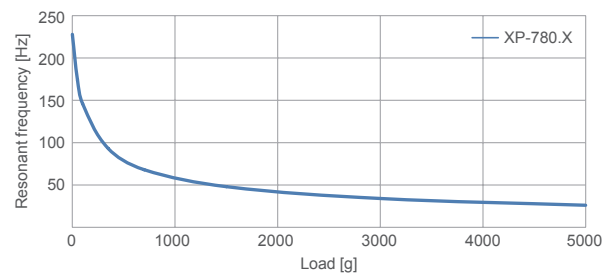


XP-780.XYZ

► Open Loop Curve



► Frequency vs Load Curve



► Large Stroke, Large Load Capacity

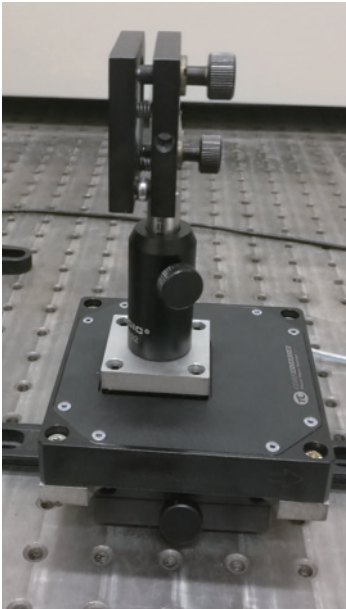
XP-780 adopts amplification mechanism, which could realize stroke up to 200μm. Flexible guide mechanism without friction makes it have high resolution. The aperture makes it suitable for applications such as optical micro scanning.

The excellent structure features very high rigidity and large load capacity, and could load 5kg for precise positioning.

► Recommended Controllers

E00/E01	E70	E53
1~3 channels Analog, digital Open/closed loop Ave. current: 291mA	3 channels Analog, digital Open/closed loop Ave. current: 70mA	1 channel Analog, digital Open/closed loop Ave. current: 60mA
Note: For technical data, please refer to "Piezo Controllers".		

► Application Example



Michelson interferometer

► Technical Data

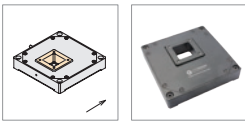
Type	S-Closed loop K-Open loop	XP-780.XS	XP-780.XK	Units
Active axes		X	X	
Travel range(0~120V)		160	160	$\mu\text{m}\pm 10\%$
Travel range(0~150V)		200	200	$\mu\text{m}\pm 10\%$
Sensor		SGS	-	
Aperture		25×25	25×25	mm
Closed/open loop resolution		10	5	nm
Closed-loop linearity		0.1	-	%F.S.
Repeatability		0.05	-	%F.S.
Pitch/yaw/roll		<50	<50	μrad
Push/pull force		80/40	80/40	N
Stiffness		0.5	0.5	N/ $\mu\text{m}\pm 20\%$
Unloaded resonant frequency		200	200	Hz $\pm 20\%$
Closed/open-loop unloaded step time		20	5	ms $\pm 20\%$
Unloaded operating frequency	10% travel	50	50	Hz $\pm 20\%$
	100% travel	15	15	
Load capacity		5	5	kg
El. capacitance		11	11	$\mu\text{F}\pm 20\%$
Material		Aluminum	Aluminum	
Mass		240	240	g $\pm 5\%$

Note: Max driving voltage could be -20V~150V, recommended voltage 0~120V for long-term and high-reliable operation.

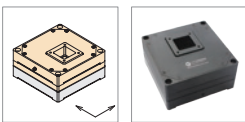
Technical data are measured by CoreMorrow E00/E01 series piezo controller.

► Drawing

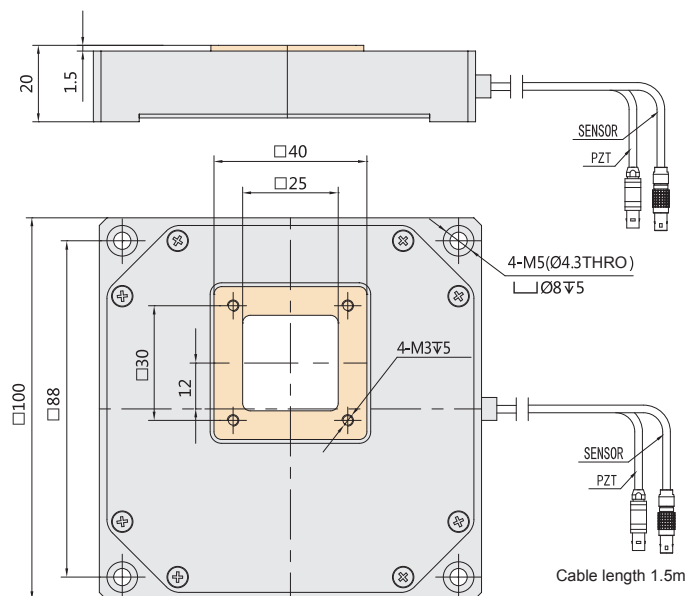
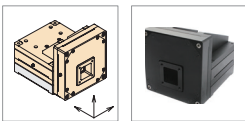
XP-780.X



XP-780.XY

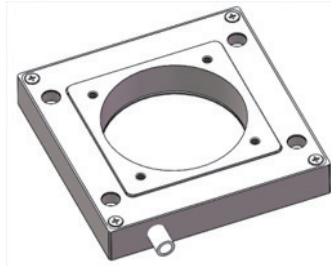


XP-780.XYZ



* For drawings of XP-780.XY, XP-780.XYZ, please refer to CoreMorrow website or consult sales engineer.

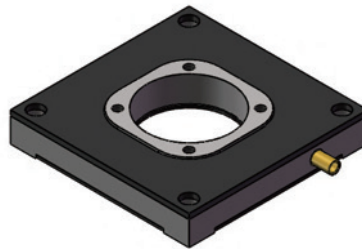
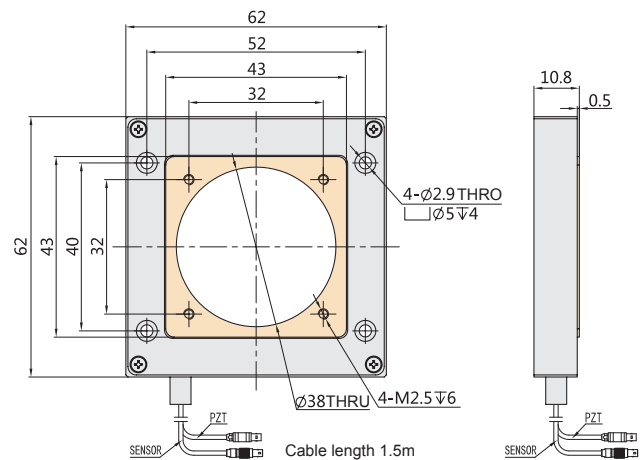
20142 XY Piezo Scanner



► Technical Data

Type	20142-1	Units
Active axes	X, Y	
Travel range(0~150V)	10/axis	$\mu\text{m} \pm 20\%$
Resolution	5	nm
Unloaded resonant frequency	>500	$\text{Hz} \pm 20\%$
Resonant frequency@100g load	>200	$\text{Hz} \pm 20\%$
El. capacitance	1.6/axis	$\mu\text{F} \pm 20\%$
Load capacity	200	g
Response time @100g load	2	$\text{ms} \pm 20\%$
Material	Steel	
Mass(with cable)	190	$\text{g} \pm 5\%$
Cable length	1.5	$\text{m} \pm 10\text{mm}$

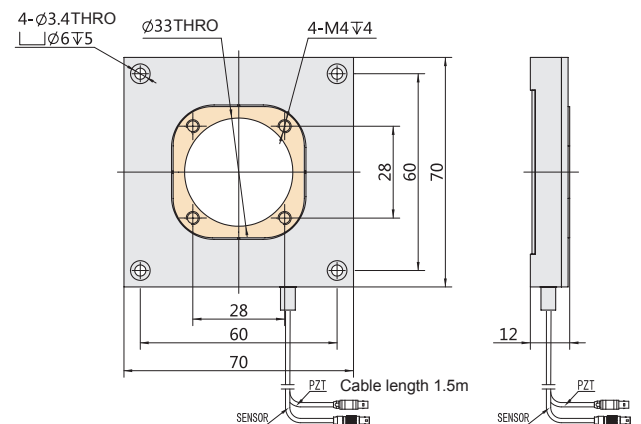
► Drawing



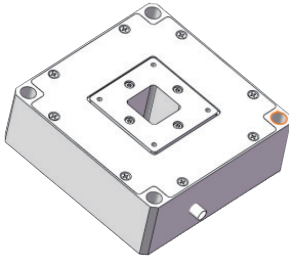
► Technical Data

Type	20142-2	Units
Active axes	X, Y	
Travel range(0~150V)	10/axis	$\mu\text{m} \pm 20\%$
Unloaded resonant frequency	≥ 500	$\text{Hz} \pm 20\%$
Resonant frequency@100g load	≥ 200	$\text{Hz} \pm 20\%$
El. capacitance	1.6/axis	$\mu\text{F} \pm 20\%$
Load capacity	150	g
Response time@100g load	≤ 2.5	$\text{ms} \pm 20\%$
Material	Steel, Aluminum	
Mass(with no cable)	250	$\text{g} \pm 5\%$

► Drawing



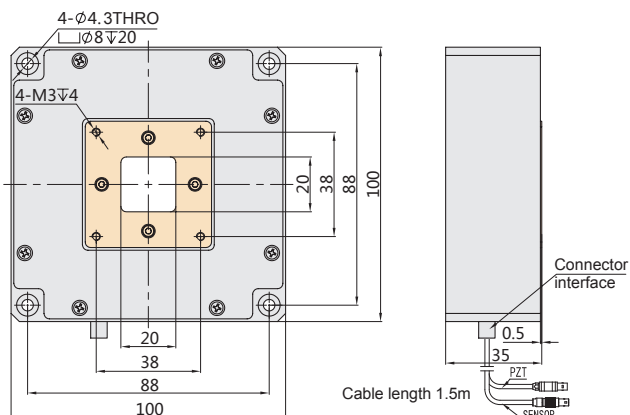
20180 XYZ Piezo Stage



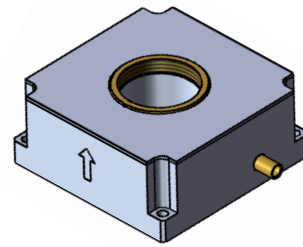
► Technical Data

Type	20180	Units
Active axes	X, Y, Z	
X/Y/Z travel range(0~150V)	$\pm 40/\pm 40/15$	$\mu\text{m} \pm 20\%$
Integrated sensor	SGS	
Resolution	10.7(@20mV ripple)	nm
Closed-loop linearity	0.2	%F.S.
Repeatability	0.1	%F.S.
X/Y/Z Unloaded resonant frequency	470/590/900	Hz $\pm 20\%$
X/Y/Z resonant frequency@120g load	300/340/600	Hz $\pm 20\%$
Load capacity	500	g
Step time @120g load	<30	ms $\pm 20\%$
X/Y/Z El. capacitance	5.4/5.4/3.6	$\mu\text{F} \pm 20\%$
Material	Steel, Aluminum	

► Drawing



20091 Piezo Stage



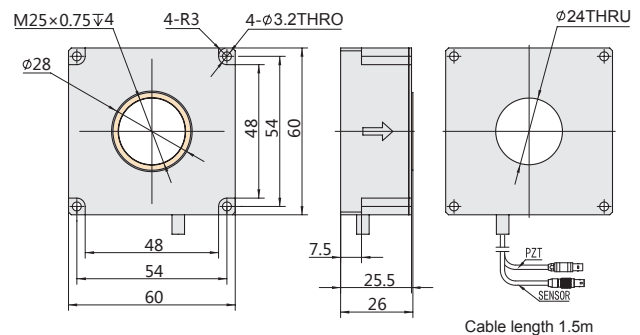
► Characteristics

- Motion in Z
- Travel to 50 μm
- Load capacity up to 200g
- Suitable for objective lens positioning/scanning

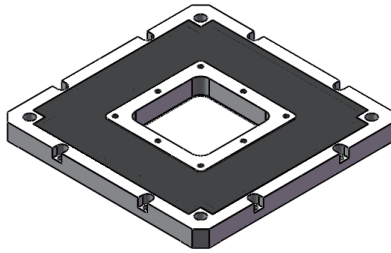
► Technical Data

Type	20091	Units
Active axes	Z	
Travel range	50	$\mu\text{m} \pm 20\%$
Driving voltage	0~150	V
Integrated sensor	SGS, Closed loop	
Unloaded resonant frequency	1200	Hz $\pm 20\%$
Resonant frequency@120g load	530	Hz $\pm 20\%$
El. capacitance	7.2	$\mu\text{F} \pm 20\%$
Load capacity	200	g
Material	Aluminum	

► Drawing



20190 XY Large Load Piezo Scanner

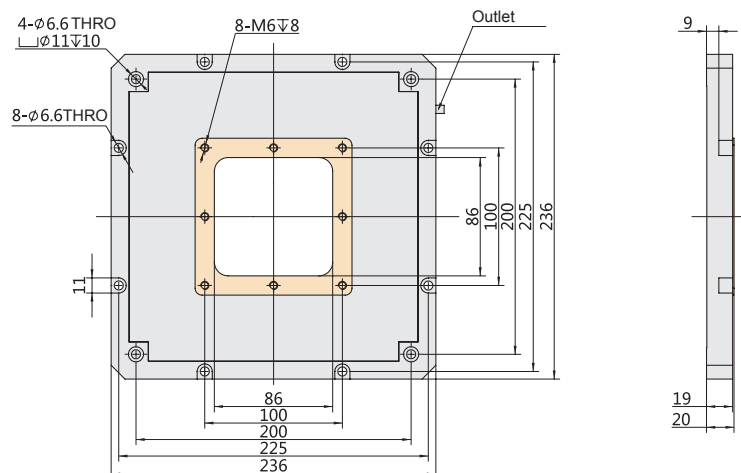
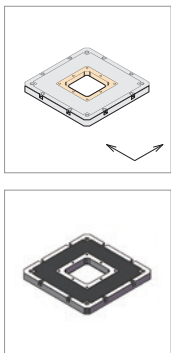


► Technical Data

Type	20190	Units
Active axes	X, Y	
Travel range(0~150V)	200/axis	$\mu\text{m}\pm 20\%$
Unloaded resonant frequency	160	$\text{Hz}\pm 20\%$
Resonant frequency @ 40kg load	30	$\text{Hz}\pm 20\%$
El. capacitance	43.2/axis	$\mu\text{F}\pm 10\%$
Load capacity	40	kg
Material	Steel, Aluminum	
Mass	4.7	$\text{kg}\pm 10\%$

► Drawing

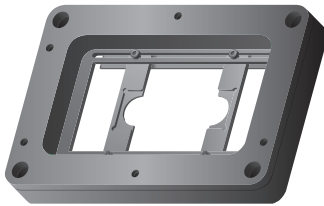
20190



Piezo Stage (Custom Version)

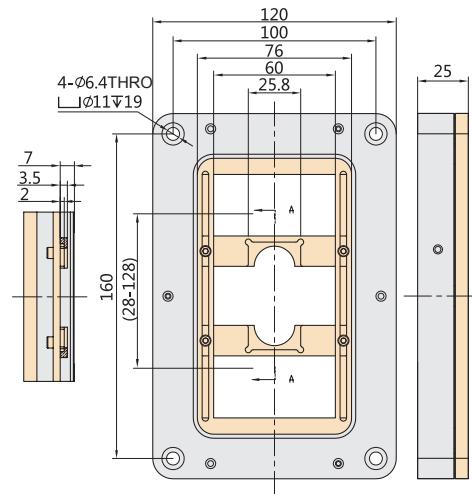
18130 Piezo Stage

► Technical Data



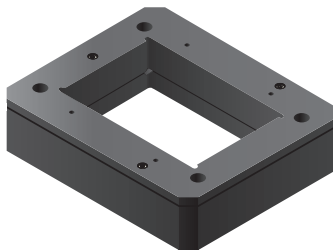
Active axes	Z
Travel (@150V)	90μm±20%
Sensor	SGS
El. capacitance	5.4μF±20%

► Drawing



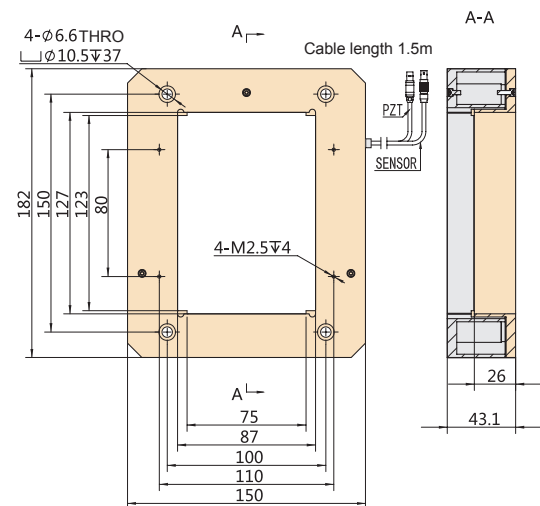
19113 Piezo Stage

► Technical Data



Active axes	Z
Travel (150V)	500μm±20%
El. capacitance	16μF±20%
Load capacity	600g

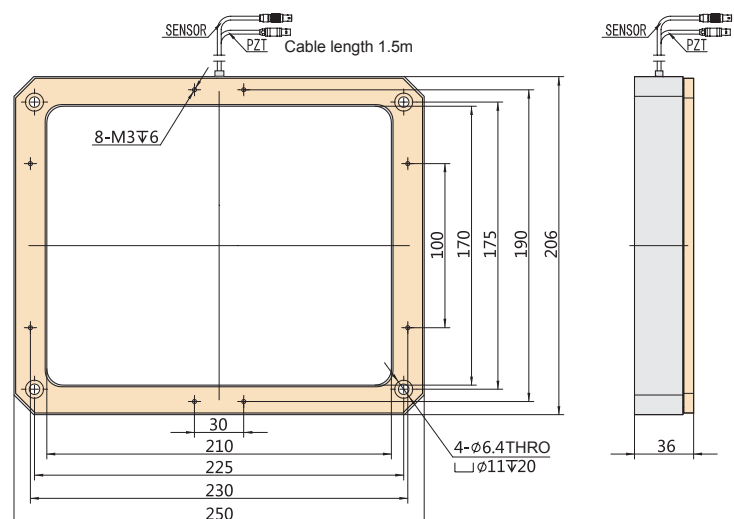
► Drawing



18068 Piezo Stage



► Drawing



► Technical Data

El. capacitance	32.4μF±20%
Z displacement (150V)	500μm±20%
Unload resonant frequency	100Hz
Resolution	17nm (5mV ripple)
Mass	About 1.2kg

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

Harbin Core Tomorrow Science & Technology Co., Ltd.

Tel : +86-451-86268790 +86-18944636468

Fax : 0451-86267847

Postcode : 150086

Email : info@coremorrow.com

Web : www.coremorrow.com

Address : Building I2, No.191 Xuefu Road, Nangang District, Harbin



Wechat



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