

PXY D12 Piezo Scanner

Piezo XY-Positioner

Concept:

The elements in the PXY D12 series were developed for STM and AFM applications. These systems are optimized for high resonant frequency and high stiffness in both axes.

As an option for applications like AFM microscopy the systems can be equipped with a z-axis stage.

The PZ D12 element provides a motion of 8 μ m or 20 μ m in z-direction. Equipped with a special adapter, it can be mounted directly onto the PXY D12 element. The PZ D12 elements has a superior resonant frequency of more than 3 kHz.

Specials:

For special applications, the elements can be optimized for minimum z-motion of less than 30nm while moving in the x- and y- direction (part no. S-605-11).

The elements in the PXY D12 series can be equipped with an integrated measurement system. As a result, the effects of creep and hysteresis will be overcome.

Also, the systems may be specially prepared for vacuum and/or cryogenic applications.

Mounting:

For stage mounting there are 4 through holes and 2 pin holes available. Another 2 tapped holes are available to mount components.



Image: PXY 80 D12

Product Highlights:

- high resolution XY positioning
- up to 200 μ m motion range in XY
- optimized for minimum z motion
- high dynamic range
- with z-axis actuator extension for XYZ-Scanner systems
- option: high resolution feed back sensors

Applications:

- Scanning systems
- STM and AFM microscopy
- wafer handling
- electronics & robotics

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Technical Data:

series PXY D12 + z-axis extension PZ D12	unit	PXY 40D12	PXY 80 D12	PXY 200 D12	PZ 8 D12	PZ 20 D12
part no	-	S-605-37	S-605-10	S-605-20	S-605-60	S-605-63
axes	-	x, y	x, y	x, y	z	z
motion open loop ($\pm 10\%$)*	μm	40	80	200	8	20
electrical capacitance ($\pm 20\%$ **)	μF	0.7	1.7	2.6	0.7	0.7
resolution open loop***	nm	0.08	0.16	0.4	0.02	0.04
resonant frequency	x/y z	Hz Hz	1100 / 1300 -	900 / 1200 -	400 / 600 -	- 3000
stiffness (per axis)	N/ μm	1.5 / 1.8	0.8 / 0.55	0.3 / 0.2	4.7	3.3
max. push force (per axis)	N	60/72	64/44	60/40	37.6	66
max. pull force (per axis)	N	6/7	6/4	6/4	4	7
voltage range				-20 ... +130		
connector****	voltage	-	-	LEMO 05.302		
cable length	m			1.0		
material	-			stainless steel		
dimensions (l x w x h)	mm	54x53.5x20	54x53.5x16	57.5x64x16	21x26x15	20.5x26x15
weight	g	90	90	160	13	15

series PXY D12 + z-axis extension PZ D12 with SG feed back sensor	unit	-	PXY 80 D12 SG	PXY 200 D12 SG	PZ 8 D12 SG	PZ 20 D12 SG
part no	-	-	S-605-14	S-605-21	S-605-61	S-605-64
motion open loop ($\pm 10\%$)* per axis	μm	-	80	200	8	20
motion closed loop ($\pm 0.2\%$)* per axis	μm	-	65	160	6.4	16
integrated feed back sensors	-	-			strain gage	
resolution closed loop***	nm	-	1.6	4	0.16	0.4
typ. repeatability	nm	-	16	43	22	7
max. push force (per axis)	x/y	N	-	64/44	60/40	37.6
max. pull force (per axis)	x/y	N	-	6/4	6/4	4
connector****	voltage	-	-	LEMO 05.302		
	sensor	-	-	LEMO 05.304		
cable length	m	-	-	1.2		
weight	g	-	90	160	30	45

series PXY D12 + z-axis extension PZ D12 with CAP feed back sensor	unit	-	PXY 80 D12 CAP	PXY 200 D12 CAP
part no	-	-	S-605-16	S-605-26
motion open loop ($\pm 10\%$)* per axis	μm	-	80	200
motion closed loop* per axis	μm	-	65	160
integrated feed back sensors	-	-	capacitive sensor	
typ. resolution closed loop***	nm	-	1	
typ. repeatability	nm	-	15	20
max. push force (per axis)	x/y	N	-	64/44
max. pull force (per axis)	x/y	N	-	6/4
connector****	voltage	-	LEMO 05.302	
	sensor	-	LEMO 05.605	
cable length	m	-	1.6	
dimensions (l x w x h)	mm	-	64x63.5x22	75.5x69x27
weight	g	-	155	225

* typical value measured with NV 40/3 amplifier (closed loop: NV 40/3 CLE amplifier)

** typical value for small electrical field strength

*** the resolution is only limited by the noise of the power amplifier and metrology.

**** connector valid for standard version only; digital and external versions are supplied with special connector style

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