

compact 2-axis translation stages

series PXY AP

- variable travel range selection per axis based on VTRselect - concept
- extremely flat design for microscopy
- XY-motion up to 700 x 700 μm
- bi-directional actuating nanoX® design for high dynamic range
- central aperture 100 x 100 mm
- integrated feedback sensors
- with series MIPOS XYZ solution

applications:

- microscopy / lithography
- nanopositioning and scanning
- materials research
- wafer handling and mask alignment
- semiconductor testing equipment
- biotechnology

Concept

The series PXY AP is designed as an extremely flat scanning stage with an extra large aperture. Key features are the variable motion generating elements – **VTR** *select* concept- which offers flexible motion in the range from 24 μ m up to 700 μ m for each axis. The required motion per axis can be preselected. These systems offer excellent dynamic properties during use, which are needed for certain applications.

To get the best results for high dynamic and high precision scanning applications, the flexure hinges are made with the unique nanoX® technology. Setting and resetting forces are generated by two different actuating systems. This provides the user a microsec settling time and a high stiffness under heavy even loads. Overshooting is actively minimized. To avoid crosstalk, the motion is monitored by independent sensor systems in real time.

In combination with the series MIPOS - objective positioning systems for z-axis motion – a XYZ solution with sub-nm accuracy can be offered.

Specials

The FEA - optimized parallel kinematics of the actuator guarantee high guidance accuracy without any mechanical play. Based on the load optimized actuating system, the shortest settling time can be achieved. In combination with an integrated high resolution sensor system the PXY AP "CAP" series - very accurate position stability can be achieved. The sensor system is designed for non-contact direct metrology. High resolution capacitive sensors measure the motion of the moving platform.

This enables the system to operate with outstanding performance during high dynamic scans.

An additional stage insert is available (part no. T-240-99) which can be used to hold 3inch standard slides, Petri dishes, Lab-Tek[™]-Holder and PH2-Incubators.

Upon request the series PXY AP can be offered in a vacuum compatible version and as well as a cryogenic version. The stage body also can be made of titanium or thermally stable material Invar.

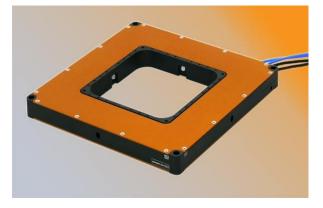


fig.: PXY 500 AP

Mounting/Installation

The raster tapped and thru holes allow for an easy integration of this stage into any application and mechanical setup. As a piggyback solution, the series of PXY AP stages can be assembled with motorized XY scanning stages with long travel range.

The resolution of the piezo electrical system is only limited by the noise of the applied electronics signal. The piezo amplifier and controller systems from piezosystem jena are especially designed for this.

Piezo electrical actuating systems can operate independent of magnetic fields.

When using under vacuum conditions please note the low insulation behavior of gas by 0.01 hPa up to 100hPa.





technical data:

series PXY AP	unit	PXY 24 AP	PXY 500 AP	
part no.	-	T-242-xx	T-250-xx	
actuating elements		nanoX® – design with applied resetting forces		
motion per axis open loop (±10%)*	μm	30	700	
motion per axis with feedback sensor (±0.2%)*	μm	24	500	
capacitance per axis (±20%)**	μF	3	12	
resolution*** open loop	nm	0.06	1.4	
resonant frequency @ 100g	Hz	300/300	120/120	
stiffness	N/µm	1.5	0.15	
push/pull force open loop	Ν	45/45	150/150	
max. load in z	Ν	100		
voltage range	V	-20+130		
cabel length (±10%)	m	1.2		
material	-	aluminium/stainless steel		
dimension (I x w x h)	mm	185 x 1	85 x 15	
free aperture	mm	100 x 100		
weight	g	480	850	
series PXY AP with integrated measurement system	unit			
integrated feedback system	-	capacitive		
resolution*** closed loop	nm	tbd	tbd	
typ. repeatability	nm	5	20	
push/pull force closed loop	Ν	4.5/4.5	12.5/12.5	
cable length	m	2		
PXY AP –Y-axis drive module		P*Y 24 AP	P*Y 500 AP	
part no.	-	T-242-MY	T-250-MY	
actuating elements		nanoX® – design with applied resetting forces		
motion per axis open loop (±10%)*	μm	30	700	
motion per axis with feedback sensor (±0.2%)*	μm	24	500	

* typical value measured with 30V300 nanoX amplifier

typical value for small electrical field strength

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

Please note: The existing line of scanning stage PXY AP will be extended permanently The current status is updated on our web site <u>www.piezojena.com</u> in the area "PXY AP series".

Pay attention please to the "handling instructions" you can download from our homepage.



VTRselect

Variable Travel Range selection allows the user to select a combination of different motion ranges for each axis. By selecting the travel range according to the user's required range of motion, the best dynamic properties for each axis can be achieved! The selection of 3 part numbers generates a customized stage configuration

Ordering procedure

- Step 1: selection of part 1 basic stage module according to user's required motion range
- Step 2: selection of part 2 y-axis module according to required motion range
- Step 3: selection of part 3 sensor / connector module according to piezo controller unit

1. basi	c stage modu	le with X-axi	s drive	2. Y-axis driv	e module	
typ	description	motion ¹⁾	part.no.	description	motion ¹⁾	part.no.
Standard				P*Y 00 AP	without Y-axis	Т-240-МҮ
Vacuum				FIUUAF	WILLIOUL T-AXIS	1-240-141 1
Standard	PX* 24 AP	24/30µm	T-242-X0			
Vacuum	PX* 24 AP V	24/30µm	T-242-X2	P*Y 24 AP	24/30µm	T-242-MY
Standard	PX* 100 AP	100/120µm	T-244-X0	P*Y 100 AP	100/12000	Т-244-МҮ
Vacuum	PX* 100 AP V	100/120µm	T-244-X2	PTIUDAP	100/120µm	1-244-IVI 1
Standard	PX* 200 AP	200/250µm	T-246-X0	P*Y 200 AP	200/250.00	Т-246-МҮ
Vacuum	PX* 200 AP V	200/250µm	T-246-X2	P 1 200 AP	200/250µm	I -240-IVI I
Standard	PX* 300 AP	300/350µm	T-248-X0		200/250	Т-248-МҮ
Vacuum	PX* 300 AP V	300/350µm	T-248-X2	P*Y 300 AP	300/350µm	I -240-IVI I
Standard	PX* 500 AP	500/700µm	T-250-X0		F00/700.um	T 250 MV
Vacuum	PX* 500 AP V	500/700µm	T-250-X2	P*Y 500 AP	500/700µm	Т-250-МҮ

¹⁾ motion range depends from the chosen feedback option (with or without feedback control)

	ana	alogue controller sy	vstem	
	part.no.	connector		
		voltage	sensor	
without feedback sensor	T-24M-00	ODU 3pin	—	
with feedback sensor	T-24M-06E	ODU 3pin	ODU 4pin	
	d	igital controller sys	tem	
	part no	conne	ector	
	part.no.	conne voltage	ector sensor	
without feedback sensor	part.no. T-24M-00D			