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Find the *Queensgate / SIFAM NPS3220* at our website: ***Click HERE***

Technical Datasheet

Nano Mechanisms - NPS-XY-100A

Product Description

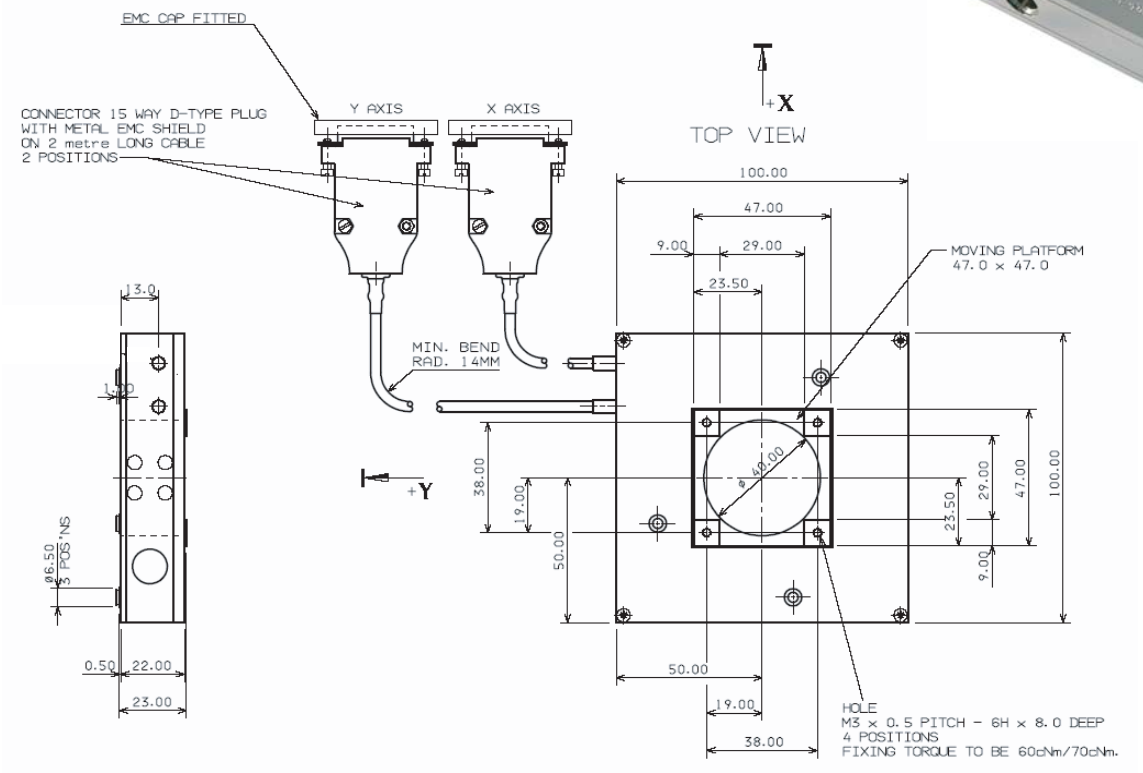
The NPS-XY-100A is a piezo scanned flexure guided stage with integrated capacitance position sensors. It is capable of sub-nanometer resolution and reproducibility. Finite element analysis of the flexure guidance mechanisms has reduced parasitic angular motions to less than 25 micro-radians over the full 100 micron range.
The Super Invar construction (CTE 0.3ppm K-1, c.f. Al at 23ppm K-1) minimizes thermal drift, which on a nanometer scale is very important. The unique isostatic mounting system ensures that stresses from the mounting system are properly relieved and establishes the center of the stage as the co-ordinate reference point.

Features

- 100 µm x 100 µm range
- Sub-nanometer reproducibility
- Linearity error less than 0.02%
- Parasitic motions less than 25 micro-radians
- Super-Invar construction
- Adaptable to XYZ positioning
- Built in electronic data sheet
- 40mm clear aperture
- Controlled by NPS3220



Installation Drawing



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Nano Mechanisms - NPS-XY-100A

Specification

Parameter	Symbol	Value			Units	Comments
Static Physical						
		Minimum	Typical	Maximum		
Material		Super Invar (Bright Nickel Plated)				
Size		100 x 100 x 23			mm	Note 1
***Range**	$d_{xp\cdot max}$	50	55		µm	
***Scale factor**	b_{x1}		1		µm	Note 2
Scale factor error (1σ)	$\delta\, b_{x1}$			0.1	%	
Static Stiffness	k_x		1		$N{\cdot}\mu m^{-1}$	
Resonant frequency : 0g load	$f_{0\cdot 0}$		350		Hz	
50g load	$f_{0\cdot 50}$		260		Hz	
1000g load	$f_{0\cdot 1000}$		120		Hz	
Maximum load				1	Kg	Note 3
Dynamic Physical (Typical Values)						
Loop Setting:		Fast	Medium	Slow		Note 4
Bandwidth	$B_{x\cdot p}$	53	20	4	Hz	
***Small signal settle time**	$t_{xs\cdot s}$	15	30	130	Ms	Note 5
***Position noise (1σ)**	$\delta\, x_{p\cdot n}$	0.7	0.5	0.25	Nm	Note 6
Slew rate	$u_{xp\cdot max}$	3	2	0.5	$\mu m{\cdot}ms^{-1}$	Note 7
Error Terms						
		Minimum	Typical	Maximum		
***Hysteresis (peak to peak)**	$\delta\, x_{p\cdot hyst}$		0.005	0.01	%	Note 8
***Linearity error (peak)**	$\delta\, x_{p\cdot lin}$		0.01	0.02	%	Note 9
***Rotational error**	$\delta\phi$		10	25	µrad	Note 10
***Rotational error**	$\delta\theta$		5	10	µrad	Note 10
***Rotational error**	$\delta\gamma$		5	10	µrad	Note 10
Orthogonality	$\delta\, \phi_{orth}$		8		mrad	

*These parameters are measured and supplied with each mechanism.

1. With 40 mm diameter central aperture.
2. All position commands are given in micrometers with 7 digit resolution.
3. Depends on orientation. 1 kg is the maximum load for gravity acting in the Z direction. 0.5 kg is the maximum load for gravity acting in the X or Y axes. Loads greater than 5 kg can cause damage to the flexure mechanism.
4. For dynamic operation the servo loop parameters are preset for different performances; the parameters are user settable via software control. Fast means the fastest the stage can stably move with less than 50 grams load. Medium means the maximum speed for loads up to 200 grams. Slow means the speed at which the servo loop is stable for all masses up to the maximum allowed mass - equivalently low noise setting.
5. This is the 2% settle time. It is a function of the servo loop parameters which are user controllable. The test step size is 500nm.
6. The actual position noise of the stage.
7. The highest rate of change of true position with time that can be achieved. It is limited by the closed loop parameters; the absolute maximum value is (in open loop operation) ~10 µm•ms-1.
8. Percent of the displacement. The hysteresis specification for a displacement of less than 1 µm amplitude is 0.1 nm.
9. Percent error over the full range of motion.
10. Angular motion over the full range of the stage. These rotational errors are rotational errors around the Z, Y, and X axes respectively

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