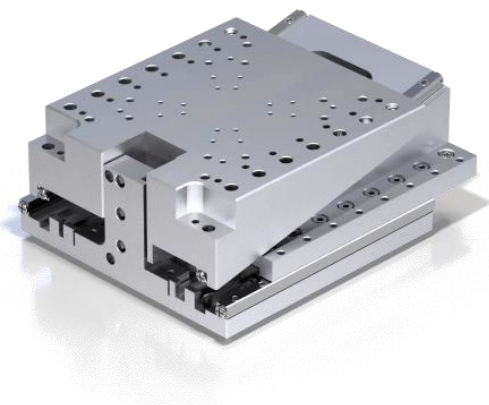




XVP series

Precise vertical piezo stage with high force

The XVP series are precise vertical stages driven by two ultrasonic piezo motors. They are specifically designed to handle large payloads in the vertical direction. These stages combine high-speed positioning with nanometre precision and generate a high force output within a small volume. Xeryon's ultrasonic piezo motor ensures you a long lifetime, noiseless and vibration-free operation. In addition, the self-locking piezo motor holds the position of the stage when powered off. The reduced heat dissipation leads to a very stable nano-positioning system. The XVP is often used in metrology applications, e.g. for part alignment or sample manipulation. The XVP can be easily stacked into an XZ- or XYZ-assembly.

KEY FEATURES

drive principle	patented Crossfixx™ ultrasonic piezo technology (2x)
bearings	precision crossed-roller
lifetime distance	> 1000 km (horizontal movement) / typ. 20 million cycles
control principle	closed-loop position control

MODEL CODE STRUCTURE

BASE SPECIFICATION		OPTIONAL		CONNECTOR/CABLE	
stage type	encoder resolution (nm)	vacuum compatibility	light shield ¹	connector type	cable length
XVP-80	-1250	-HV (10 ⁻⁶ mbar) -UHV (10 ⁻⁹ mbar)	-LS	see tables below	
	-312				
	-78				
	-5				

¹ light shield around optical encoder to reduce light scattering

CONNECTOR OPTION	stage environment		
	standard	-HV	-UHV
-C0 (OEM)	not available	not recommended	
-C1 (scientific)	15p D-sub HD male	15p D-sub LD female	
-C2	12p Fischer (S 103 Z062-130+)		not possible

CABLE LENGTH OPTION	length
-L150 (standard)	150 cm

ENVIRONMENTAL COMPATIBILITY

temperature range	-30°C to +70°C
humidity range	20% to 90% RH (non-condensing)
heat dissipation (motor only)	< 10 W
mounting surface flatness	< 20 µm
internal operation voltage	48 V (XD-C, XD-M and XD-19 controller) 60 V (XD-OEM controller)

MOTION PERFORMANCE

resolution			XVP-80				unit	tolerance
			-1250	-312	-78	-5		
ENCODER	type		optical, incremental					
	grating period		79.8 318		20 1270		µm LPI	
	resolution	rounded effective	1250 1248.035	312 312.009	78 78.125	5 5	nm	
	index		1 per full stroke					
STAGE	positioning	resolution = min. step size = min. incremental motion (MIM)	1250	350	80	50	nm	typ.
		unidirectional repeatability	± 1250	± 350	± 80	± 50	nm	typ.
		bidirectional repeatability	± 2500	± 700	± 160	± 100	nm	typ.
	speed	max. speed (for -HV/-UHV)	10				mm/s	typ.
		max. speed	50				mm/s	typ.
		min. speed	5			2	µm/s	typ.
		stability (at typical speed of 10 mm/s)	± 1				%	typ.
		point-to-point positioning time for a 1 mm step ¹	0 g load 300 g load	600 1000			1000 1300	msec msec
		operation duty cycle (for -HV/-UHV)	50 120				% sec	max. max.

¹ settling within bidirectional repeatability range

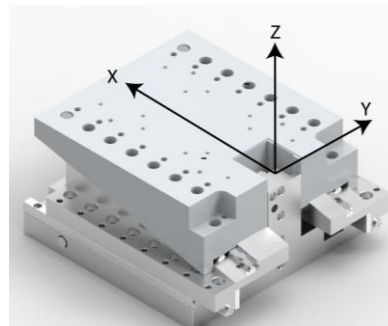
Note: a detailed description of the technical terms used in this datasheet can be found on the Terminology page of our website.

MECHANICAL PROPERTIES

resolution		XVP-80		unit	tolerance
		-1250 and -312	-78 and -5		
dimensions	length	80		mm	± 0.1
	width	80			
	height	41.7			
stroke/travel range	vertical	10		mm	± 0.1
	horizontal	50			
max. acceleration		5		m/s²	typ.
mass (w/o connector)		572		g	± 5%
payload limitation		1.5	0.75	kg	max.
holding force		30		N	min.
driving force		30		N	min.
stage material	slider/base coating bearings	aluminium none (blank) stainless steel 440C			
cable	length	150 (standard)		cm	± 5
	type	3x shielded cable, PFA insulation and sheat (standard/-HV) 3x shielded cable, PFA insulation w/o sheat (-UHV)			
	diameter	Ø1.7 (standard and -HV) Ø1.4 (-UHV)		mm	± 0.2

ERROR MOTION

		XVP-80	unit	tolerance
error motion	x-straightness	± 2	µm	max.
	y-straightness	± 2	µm	max.
	pitch (θ_y)	140 29	µrad arcsec	max.
	roll (θ_z)	35 7	µrad arcsec	max.
	yaw (θ_x)	60 12	µrad arcsec	max.



CONTROLLER/SOFTWARE

The XVP series linear stages are compatible with the XD-C, XD-M, XD-19 and XD-OEM controller. Stages with resolution -5 need to be connected to an XD-M controller. Controlling of the stage is done with:

- easy-to-use Windows interface
- LabVIEW interface program (compiled program or source)
- MATLAB interface script
- C++ and Python libraries

DRAWINGS (STEP-FILES ARE AVAILABLE ON OUR WEBSITE)

XVP assy B

