

# Vacuum Compatible Precision Rotation Stages

## URS-BPPV6 SERIES

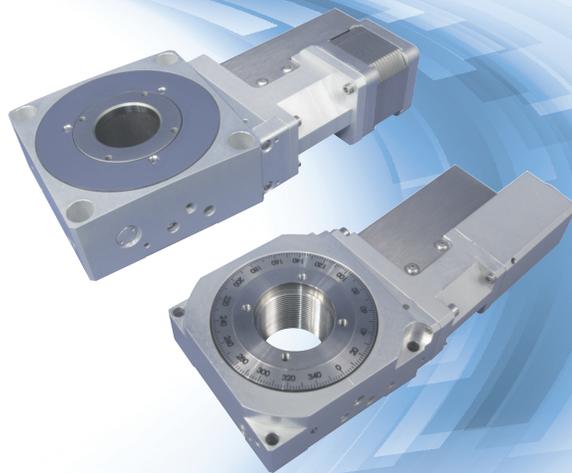


The URS-BPPV6 rotation stages features an enhanced, lower profile package providing easier top down mounting that is directly compatible with our vacuum compatible stages.

When using with our XPS or ESP301 motion controllers with high micro-step capability, low noise operation and very small incremental motions are guaranteed. The URS-BPPV6 rotation stage does not use encoder feedback, but calculates position by the number of commanded steps and micro-steps. For this purpose, the stepper motor is directly attached to the worm screw with a proprietary bellow coupling with high torsional stiffness and no gear or belt drive in between. Furthermore, the high output torque of the stepper motor minimizes the risk of lost steps and provides optimum motion sensitivity with good linearity between commanded micro-step and the actual motion of the stage.

### DESIGN DETAILS

Base Material	Hardened steel with aluminum body
Bearings	Large diameter ball bearings
Drive Mechanism	Grinded worm gear with self-compensating preload
Worm Gear Ratio	URS50BPPV6: 1:80 URS75BPPV6: 1:90
Feedback	URS50BPPV6: Motor Mounted Rotary Encoder, 48 pts/rev. URS75BPPV6: None
Limit Switches	URS50BPPV6: None URS75BPPV6: Two independently adjustable optical limit switches
Origin	Optical, fixed at position 0°. Typical 0.04° repeatability
Manual Adjustment	Via Allen wrench (included) at the end of the worm screw
Motor	Stepper Motr
Cable Length	SUB-D15F/SUB-D25M cable, length 3 m Not Vacuum compatible



- Vacuum compatible up to 10<sup>-6</sup> hPa (0.7 10<sup>-7</sup> Torr)
- Proprietary 4-contact point and 2 pc ball bearing design for stiffness and low runout
- Backlash-free drive for excellent repeatability and reliability
- Stepper motors for fine MIM and minimal heating

The URS-BPPV6 rotation stages features a proprietary 4-contact point ball bearing. The unique, 2-piece design of the URS-BPPV6 provides a low-profile compact stage with exceptional stiffness, high reliability and outstanding wobble and eccentricity. The tilted worm screw arrangement allows for 4 symmetric mounting holes as compared to other designs that only feature 2 or 3 mounting holes. As a result, the URS-BPPV6 stages provides a higher stiffness for better support of higher or off-centered loads.

Additionally, the flexible preloading system for the worm gear has been improved to guarantee a backlash-free operation with an MTBF of 20,000 hours.

### RECOMMENDED CONTROLLERS/DRIVERS

Model	Description
<b>XPS-D</b>	1- to 8-axis universal high-performance motion controller/driver
<b>XPS-DRV11</b>	Universal digital driver card for stepper, DC and direct motors
<b>XPS-RL</b>	1- to 4-axis universal high-performance motion controller/driver
<b>XPS-DRV01</b>	PWM drive module for DC brush and stepper motors, 3 A/43 V max.
<b>ESP301</b>	1- to 3-axis motion controller/driver
<b>SMC100PP</b>	Single-axis stepper motor controller/driver

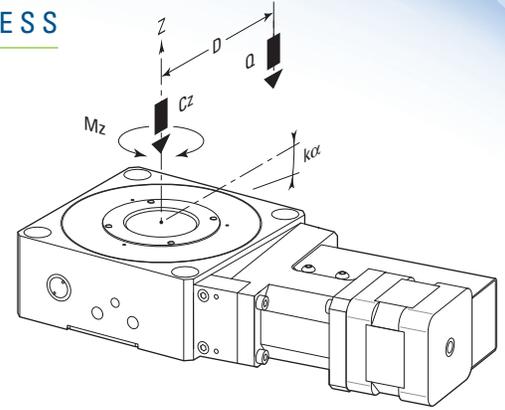
SPECIFICATIONS

	URS50BPPV6	URS75BPPV6
Travel Range (°)	360 continuous	360 continuous <sup>(1)</sup>
Minimum Incremental Motion (°)	0.0002	0.0002
	(0.0005 in open loop mode)	
Uni-directional Repeatability <sup>(2)</sup> , (°)	±0.00075	±0.00035
Typical (Guaranteed) (°)	(±0.002)	(±0.001)
Bi-directional Repeatability <sup>(2)</sup> , (°)	±0.0012	±0.0044
Typical (Guaranteed) (°)	(±0.003)	(±0.006)
Accuracy <sup>(2)</sup> , (°)	±0.012	±0.008
Typical (Guaranteed) (°)	(±0.020)	(±0.015)
Max. Speed (°/s)	4	20
Wobble <sup>(2)</sup> , Typical (Guaranteed) (μrad)	±12 (±25)	
Eccentricity <sup>(2)</sup> , Typical (μm)	±3.0	±0.3
MTBF	20000 h at 25% load and with a 30% duty cycle	

<sup>1)</sup> With disabled limit switches.

<sup>2)</sup> For the definition of Typical and Guaranteed specifications see "Motion Basics Terminology & Standards" Tutorial at [www.newport.com](http://www.newport.com)

LOAD CHARACTERISTICS AND STIFFNESS



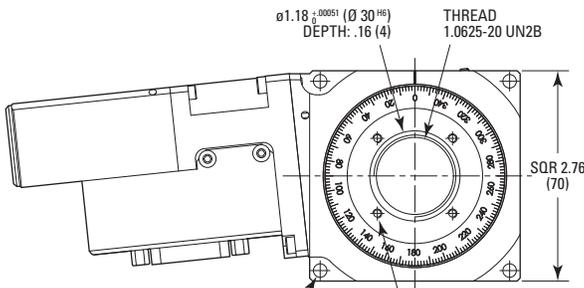
	URS50BPPV6	URS75BPPV6
Cz, Normal centered load capacity	50 N	100 N
Kα, Transversal compliance	100 μrad/Nm	30 μrad/Nm
Mz, Nominal torque	0.125 Nm	0.5 Nm
a, Construction parameter	20 mm	25 mm
Q, Off-center load (N)	$Q \leq Cz \div (1 + D/a)$	
	Where D = Cantilever distance (mm)	

ORDERING INFORMATION

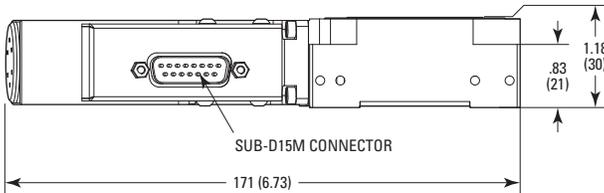
Model	Description
URS50BPPV6	Vacuum Compatible URS50BPP Precision Rotation Stages
URS75BPPV6	Vacuum Compatible URS75BPP Precision Rotation Stages

DIMENSIONS

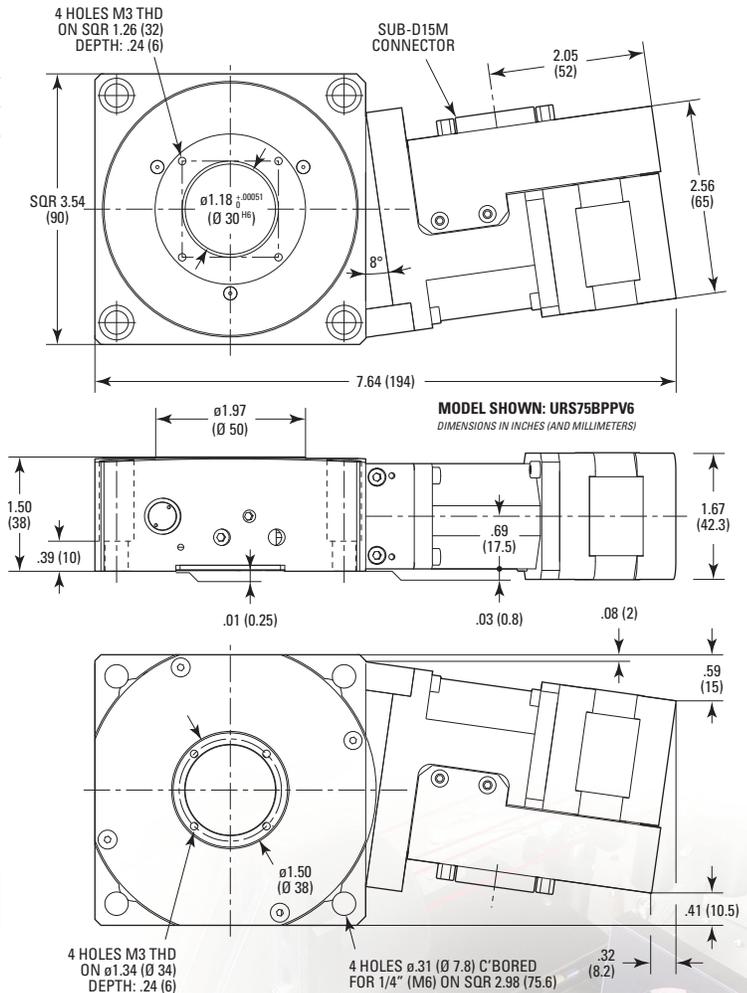
URS50BPPV6



MODEL SHOWN: URS50BPPV6  
DIMENSIONS IN INCHES (AND MILLIMETERS)



URS75BPPV6



MODEL SHOWN: URS75BPPV6  
DIMENSIONS IN INCHES (AND MILLIMETERS)



Newport Corporation, Global Headquarters  
1791 Deere Avenue, Irvine, CA 92606, USA

PHONE: 1-800-222-6440 1-949-863-3144 FAX: 1-949-253-1680 EMAIL: [sales@newport.com](mailto:sales@newport.com)  
Complete listings for all global office locations are available online at [www.newport.com/contact](http://www.newport.com/contact)

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