

Ultra-high Precision Direct Drive Vertical Linear Stage

XMS100V



The XMS-V family achieves ultra precision vertical motion by adding a counterbalance mechanism to the proven XMS design. Of all of the vertical stages, the XMS-V has the best MIM and bi-directional repeatability and highest speed.

High Precision and Smooth Motion

The ironless direct drive technology allows highly dynamic motion with essentially no backlash, hysteresis, wind-up or stiction; leading to consistently lower and more repeatable run-out. In addition, the absence of drive screws, leads to outstanding ripple-free motion required in high precision positioning

High Accuracy Linear Encoder

Precision position feedback is supplied by a high accuracy, glass, linear encoder, allowing for outstanding MIM of 50 nm. The precision alignment and mounting of this low thermal expansion scale minimizes the impact of temperature changes on stage repeatability and accuracy.

Counterbalance Options

The direct drive motor, aided by counterbalancing the load, negates the effect of gravity, alleviating work from the motor and gaining all of the benefits of a linear motor. The pneumatic counterbalance option is adjustable for different loads. The magnetic counterbalance option prevents the carriage from drifting down, even when the power to the motor is cut.

Magnetic counterbalance

Compared to wedge designs, the direct vertical guide, composed of matched pairs of anti-creep crossed roller bearings, leads to outstanding ripple-free motion required in high-sensitivity operations while preventing cage migration.

- Ultra-high performance vertical stage with superior accuracy, repeatability and MIM
- Non-contact, direct-drive system with counterbalance for ultra-precision, high dynamic motion and reliable operation
- Extra-large, ironless, high-efficiency linear motor minimizes heat generation
- Ultra-quiet anti-creep crossed roller bearings assure ripple-free motion without cage migration
- Highest maximum speed at 300 mm/s
- Two types of counterbalances available: pneumatic or fail-safe, magnetic

SPECIFICATIONS

	XMS100V
Travel Range (mm)	100
Minimum Incremental Motion (μm)	0.05
Bi-directional Repeatability, Guaranteed ⁽¹⁾ (μm)	± 0.05
Accuracy, Guaranteed ⁽¹⁾ (μm)	± 0.75
Maximum Speed (mm/s)	300
Straightness, Flatness, guaranteed ⁽¹⁾⁽²⁾ (μm)	± 0.75
Pitch ⁽¹⁾⁽²⁾ (μrad) ⁽³⁾	75 or ± 37.5
Yaw ⁽¹⁾⁽²⁾ (μrad) ⁽³⁾	50 or ± 25
MTBF (h)	20,000
Weight (kg)	8.8

¹⁾ Shown are peak to peak, guaranteed specifications or \pm half the value as sometimes shown. For the definition of typical specifications which are about 2X better than the guaranteed values, visit www.newport.com for the Motion Control Metrology Primer.

²⁾ Middle 80% of travel.

³⁾ To obtain arcsec units, divide the mrad value by 4.8.

Operating parameters to be determined after load and counterbalance pressure are set.

Metrology Report Included at No Additional Cost

Newport guarantees specification values which are measured and recorded following ASME B5.57 and ISO 230-2 standards. The typical performance values are two times better than the guaranteed specifications.

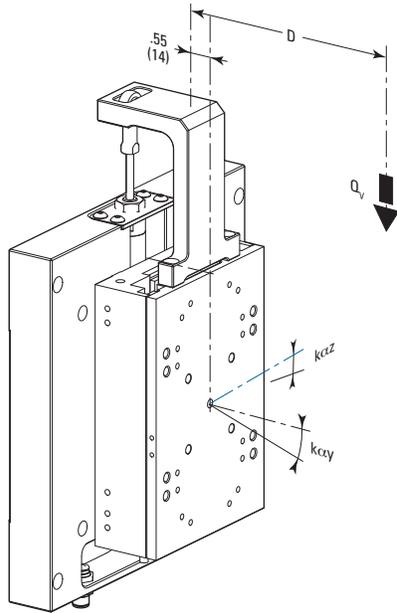
Extending the Capabilities of Vertical Stages

Only the XMS-V reaches new heights in vertical stage performance via higher precision and improved dynamic motion. Due to its enhanced performance, it addresses a broader base of challenging applications.

T-shaped Carriage

The T-shaped carriage used on the XMS-V is optimized for stiffness and makes it more tolerant to cantilevered loads when compared to stages with a C-shaped carriage design. The improved stiffness is a requirement for maintaining the stage preload.

LOAD CHARACTERISTICS AND STIFFNESS



$K_{\alpha x}$	Compliance in roll	2.0 $\mu\text{rad}/\text{Nm}$
$K_{\alpha y}$	Compliance in pitch	2.5 $\mu\text{rad}/\text{Nm}$
$K_{\alpha z}$	Compliance in yaw	3.5 $\mu\text{rad}/\text{Nm}$
Q_v	Off-center load (N)	$Q_v \leq 100 \div (1 + D/109)$
Where D = Cantilever distance in mm between the center of mass of the load and the bearings center (mm)		
Distance between top surface and the bearings center		14 mm

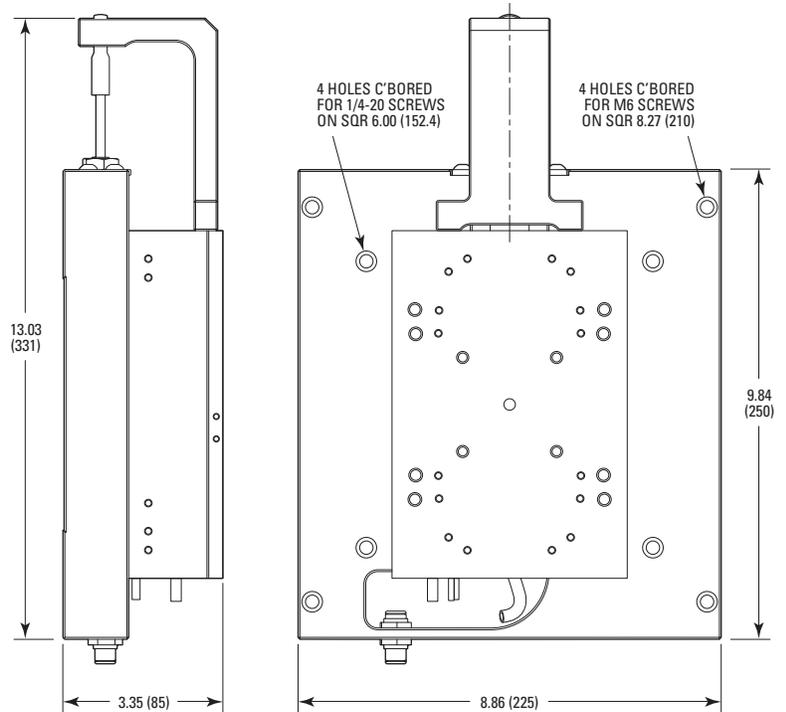
RECOMMENDED CONTROLLERS/DRIVERS

Model	Description
XPS-D	1- to 8-axis universal high-performance motion controller/driver
XPS-DRV11	Universal digital driver card for stepper, DC, brushless and direct motors
XPS-RL	1- to 4-axis universal high-performance motion controller/driver
XPS-EDBL	High-power, 3-phase, sinusoidal DC brushless motor driver
XPS-DRV02	PWM drive module for brushless motors, 5 A/44 VPP max.

ORDERING INFORMATION

Model	Description
XMS100V	Ultra-Precision Vertical Linear Motor Stage, 100 mm Travel, 100 N Load

DIMENSIONS



MODEL SHOWN: XMS100V
DIMENSIONS IN INCHES (AND MILLIMETERS)

NOTE:
FOR DIMENSIONS AND HOLES PATTERN OF THE STAGE, SEE XMS100 DRAWING.



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