

LIFT STAGES MPS-SV SERIES



The compact MPS50SV and MPS75SV lift stages are available for 10-6 torr vacuum applications.

Aerotech's MPS-SV series lift stages provide high-performance elevation motion in a compact, cost-effective design. Offered in two sizes (MPS50SV and MPS75SV), these lift stages are perfect for applications ranging from light-duty laboratory research to high-duty-cycle production processes. Multi-axis stage configurations can be assembled easily with other MPS linear and rotary stages using the multitude of adapter brackets and mounting compatibility inherent in the entire MPS stage family designs.

High-Accuracy Construction

All MPS-SV stages feature a precision-ground ball screw and preloaded crossed-roller bearings providing smooth and accurate geometric performance, exceptional accuracy and repeatability, and 0.05 μm minimum incremental motion capabilities. The MPS50SV is also offered with a lead-screw drive option for more cost-sensitive applications.

MPS-SV motor options include a DC servomotor with rotary encoder and a stepper motor. A precision-machined wedge design and lateral constraint system provide high stiffness and

load capacity while at the same time providing proper constraint of lateral motions.

Vacuum and Mounting Options

As with all MPS-series stages, the MPS-SV stages are available in an optional vacuum preparation to 10-6 torr that includes a vacuum-rated connector.

An optional mounting plate provides direct mounting to both English and metric optical breadboard tables. The inherent mounting compatibility of all MPS stages allows for simple mounting in multi-axis arrangements.



A multi-axis stage stack using Aerotech's MPS50SV and MPS50SL stages.

PRODUCT HIGHLIGHTS

Compact, high-performance elevation stage

Precision-ground ball screw or lead screw

DC or stepper motor options

High-vacuum capable

Precision crossed-roller bearings

Multi-axis configurations available with MPS linear and rotary stages
Follows the 2011/65/EU RoHS 2 Directive

MPS-SV Series **Specifications**

Mechanical Specifications			MPS50SV-5	MPS75SV-5
Travel			5 mm	5 mm
Motor Supply/Bus Voltage	1.0 mm/rev Ball Screw	Standard	±2.5 µm	±2.0 µm
		Calibrated ¹	±1.0 µm	±1.0 µm
	0.5 mm/rev Lead Screw	Standard	±3.0 µm	N/A
		Calibrated ¹	±1.25 µm	N/A
Resolution (Minimum Incremental Motion)			0.05 µm	0.05 µm
Repeatability (Bidirectional) ¹	1.0 mm/rev Ball Screw		±0.75 µm	±0.75 µm
	0.5 mm/rev Lead Screw		±1.5 µm	N/A
Straightness			±3.0 µm	±3.0 µm
Wedge Ratio			6.82:1	8.34:1
Maximum Speed	1.0 mm/rev Ball Screw	DC Motor	0.8 mm/s	5.5 mm/s
		SM Motor	0.15 mm/s	3.0 mm/s
	0.5 mm/rev Lead Screw	DC Motor	0.4 mm/s	N/A
		SM Motor	0.1 mm/s	N/A
Load Capacity ²			6 kg	12 kg
Drive Array Memory ³			1.4 kg	2.8 kg
Material			Stainless-steel carriage; anodized aluminum body	

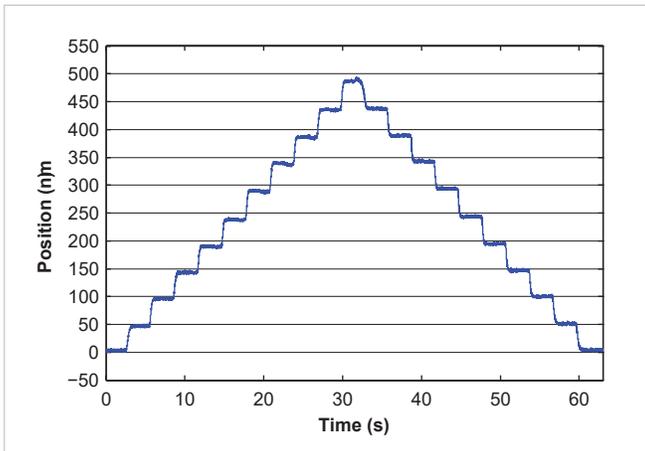
¹ With Aerotech controllers.

² Payload specifications are for a single-axis system.

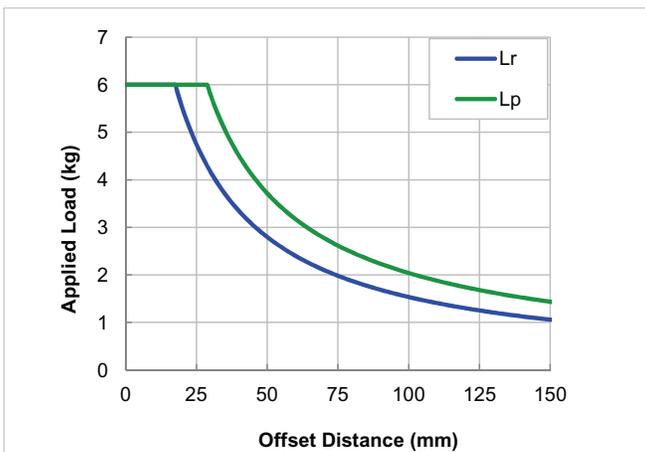
Electrical Specifications		MPS50SV DC Servomotor (-M1)	MPS50SV Stepper Motor (-M2)	MPS75SV DC Servomotor (-M1)	MPS75SV Stepper Motor (-M2)
Drive System		DC brush servomotor with 14:1 gearbox	24 VDC bipolar stepper motor with 43:1 gearbox	DC brush servomotor	24 VDC bipolar stepper motor
Feedback		512 lines/rev rotary encoder	N/A	10,000 lines/rev rotary encoder	N/A
Electronic Resolution	1.0 mm/rev Ball Screw	0.0051 µm	0.0071 µm @ 480 steps/rev motor resolution	0.0028 µm	0.0028 µm @ 40,000 steps/rev motor resolution
	0.5 mm/rev Lead Screw	0.0026 µm	0.0035 µm @ 480 steps/rev motor resolution	N/A	N/A
Maximum Bus Voltage		48 VDC	48 VDC ¹	48 VDC	48 VDC ¹
Limit Switches		5 V, normally closed			

Recommended Controller		DC Servomotor (-M1) and Stepper Motor (-M2)
Multi-Axis	A3200	Npaq/Npaq MR/Ndrive MP
	Ensemble	Ensemble LAB/Epaq/Epaq MR/Ensemble MP
Single Axis	Soloist	Soloist MP

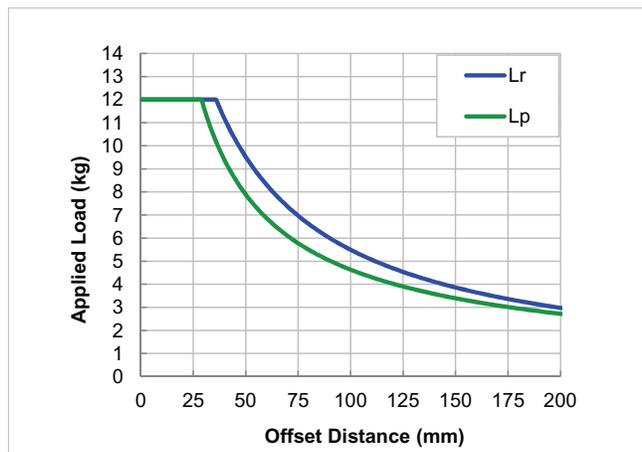
MPS-SV Series Specifications



The MPS-SV series exhibit a best-in-class minimum incremental motion (resolution) of 50 nm. Shown is a 50 nm bidirectional step plot of a MPS75SV-5-BS-M1 stage.



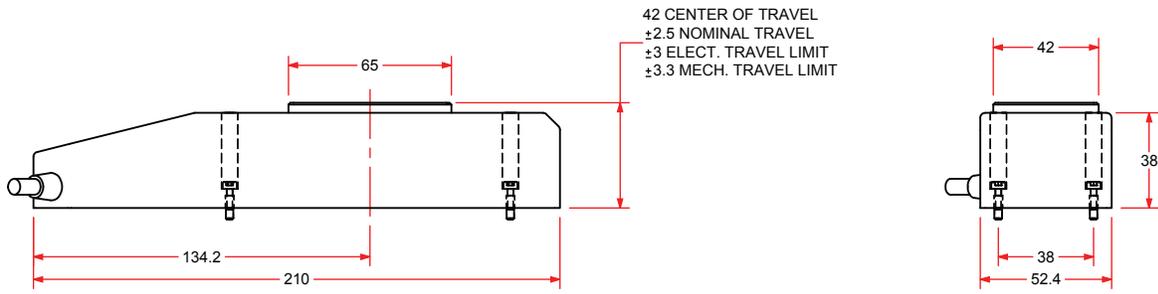
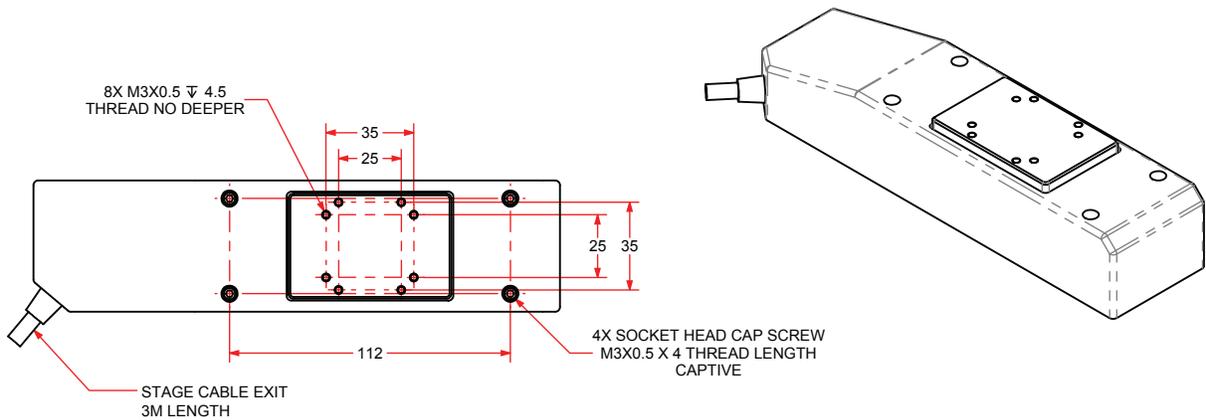
MPS50SV load curves



MPS75SV load curves

MPS-SV Series Dimensions

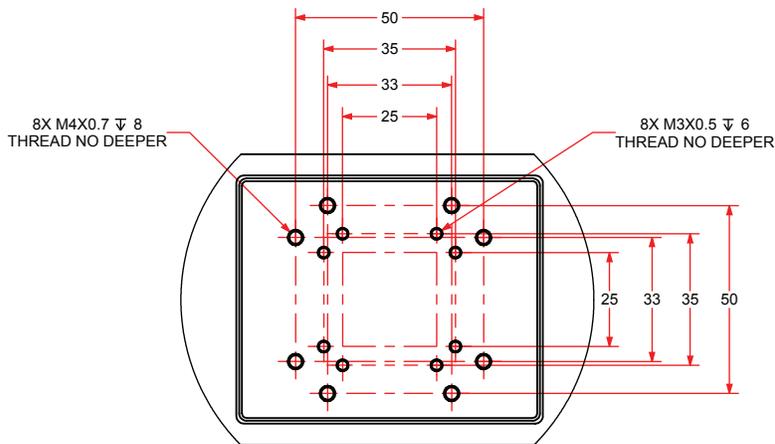
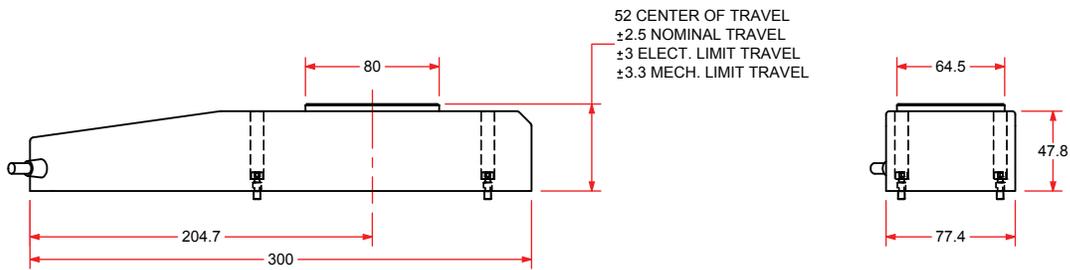
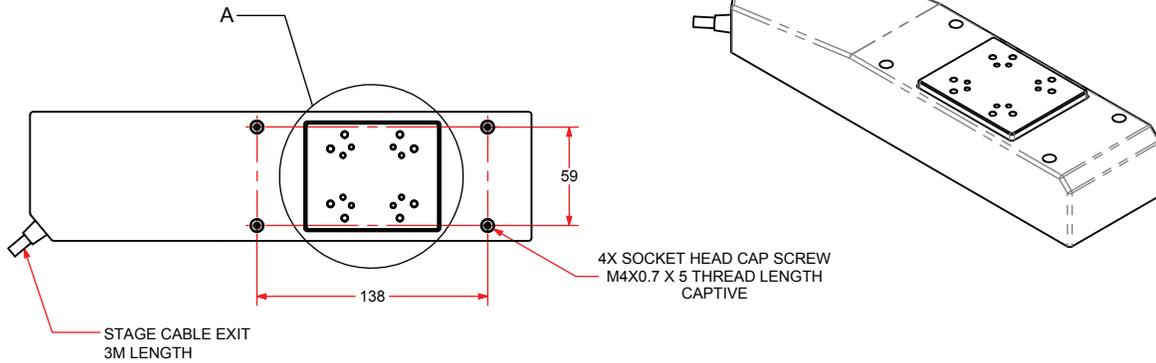
MPS50SV



DIMENSIONS: MILLIMETERS

MPS-SV Series Dimensions

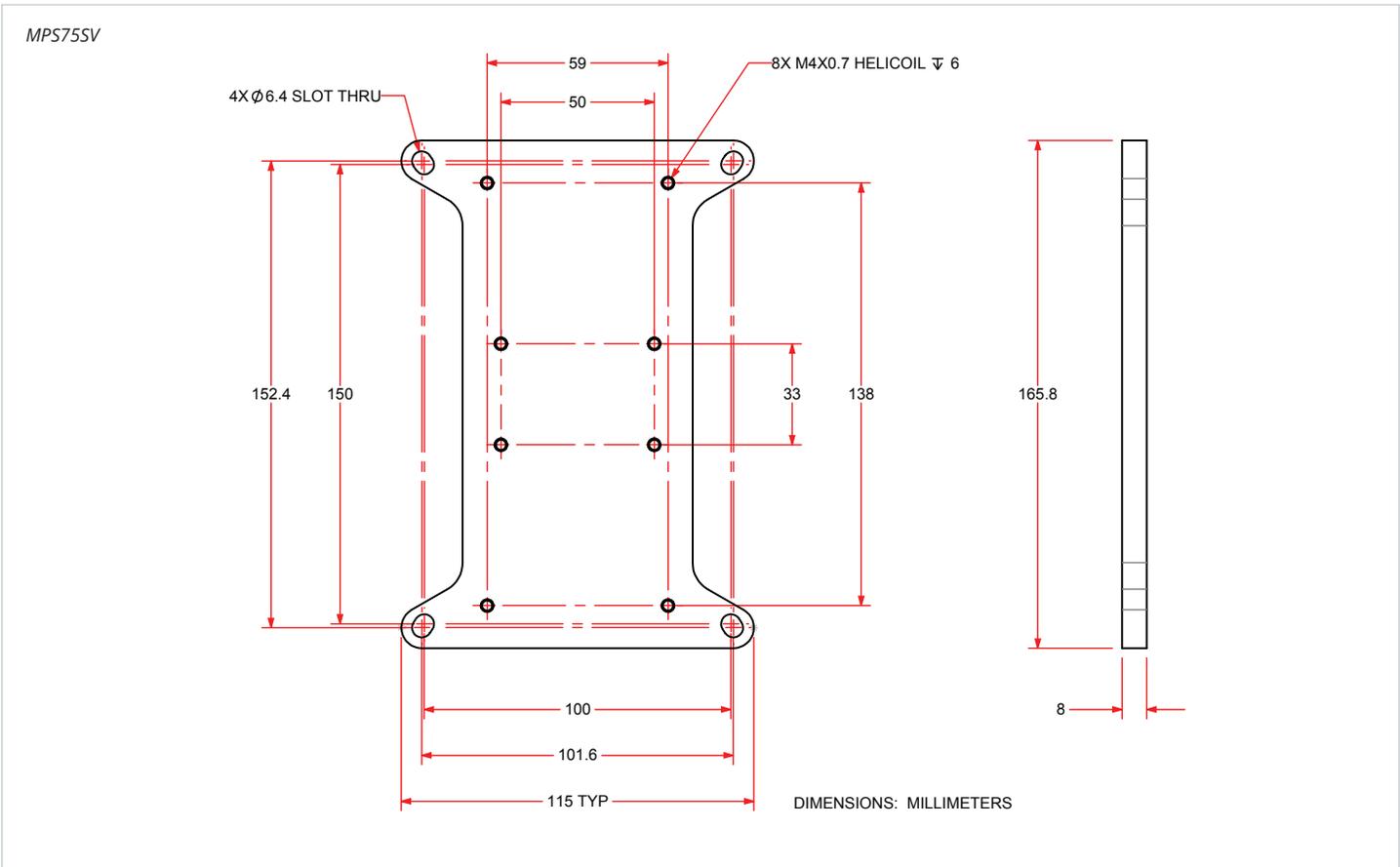
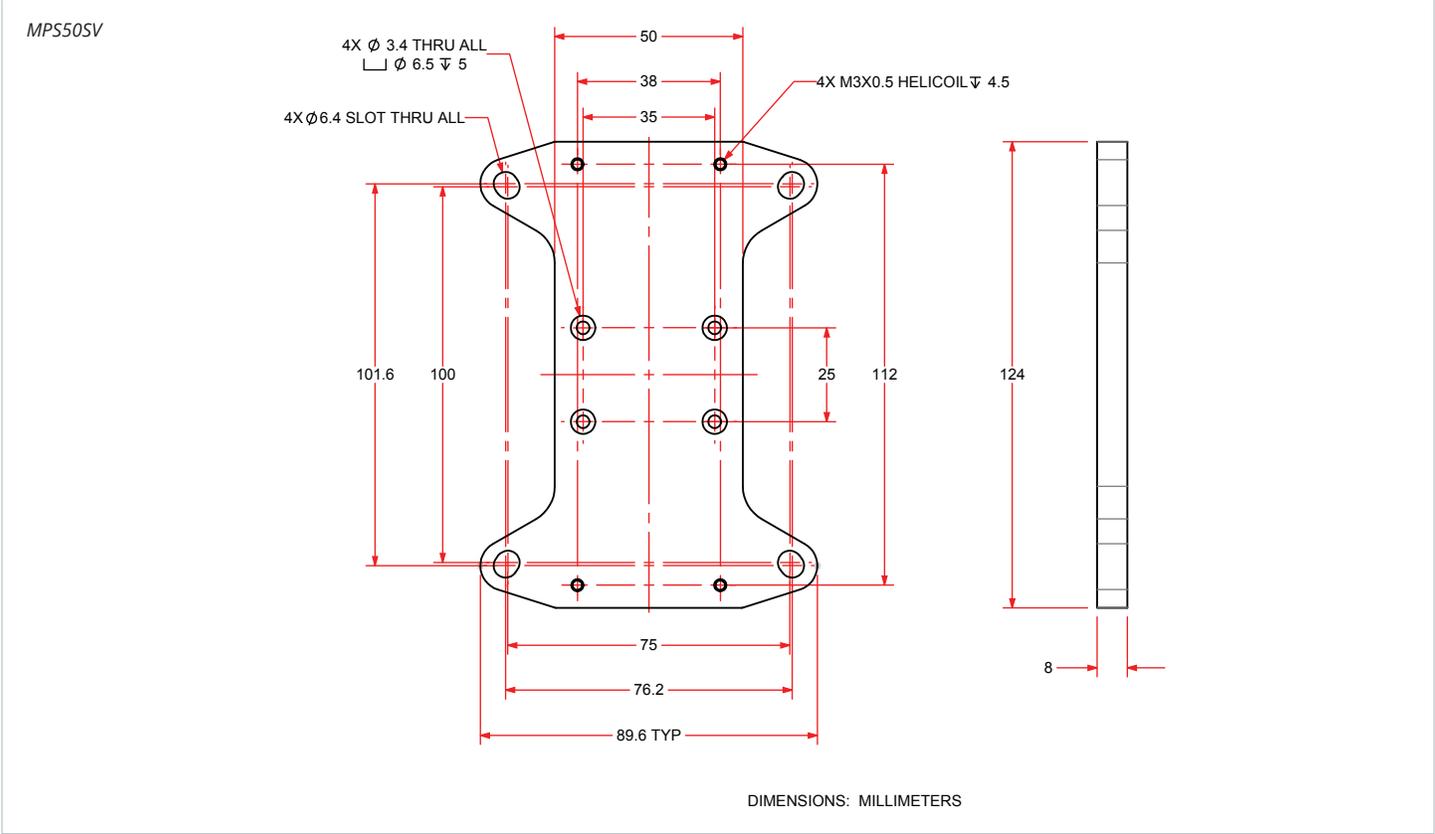
MPS75SV



DETAIL A
SCALE 1 : 2

DIMENSIONS: MILLIMETERS

MPS-SV Series Mounting Plate Dimensions



MPS-SV Series **Ordering Information**

MPS-SV Series Miniature Mechanical-Bearing Screw-Driven Lift Stage (Required)

MPS50SV-5	MPS50SV-5 miniature mechanical-bearing screw-driven lift stage, 5 mm travel
MPS75SV-5	MPS75SV-5 miniature mechanical-bearing screw-driven lift stage, 5 mm travel

Drive Screw (Required - MPS50SV-5 only)

-BS	Precision-ground ballscrew, 1 mm/rev
-LS	Precision-ground leadscrew, 0.5 mm/rev

Note: -LS Leadscrew option is valid only on MPS50SV-5.

Vacuum Preparation (Optional)

-HV	High vacuum preparation to $10e^{-6}$ torr
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Motor (Required)

-M1	DC servomotor
-M2	Stepper motor

Mounting Plate (Optional)

-MP	Optical table mounting plate
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Metrology (Required)

-PL0	No metrology performance plots
-PL1	Metrology, uncalibrated with performance plots
-PL2	Metrology, calibrated (HALAR) with performance plots

Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

-TAS	Integration - Test as system Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.
-TAC	Integration - Test as components Testing and integration of individual items as discrete components. This is typically used for spare parts, replacement parts, or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system.