

MPS50SL

Miniature Mechanical-Bearing Screw-Driven Linear Stage

- Compact 50 mm width, with travel to 50 mm
- Precision ground ball-screw or lead-screw drive
- DC servo or stepper motor
- Crossed-roller bearings
- High resolution (0.1 μm), repeatability ($\pm 0.75 \mu\text{m}$), and accuracy ($\pm 1.5 \mu\text{m}$)
- High vacuum capable
- Compact multi-axis configurations



The compact MPS50SL offers travels of 25 mm or 50 mm with $\pm 1.5 \mu\text{m}$ accuracy.

The MPS50SL is a compact, high-performance linear positioning stage that is perfect for the confines of the laboratory while providing the high reliability required in a production environment. It is the ideal choice for measurement, testing, accurate alignment, and component assembly in space-constrained applications.

High Accuracy

The precision ground ball-screw or lead screw provides exceptional accuracy, repeatability, and ultra-fine positioning resolution capability to 0.1 micron. The DC servomotor is equipped with a rotary encoder. The crossed-roller linear bearings provide smooth travel and excellent payload characteristics.

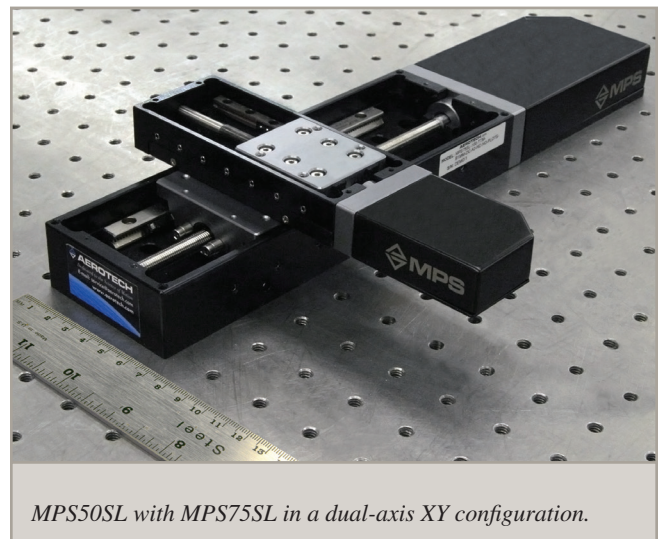
Optional Vacuum Preparation

The MPS50SL is available with optional vacuum preparation to 10^{-6} Torr. It is the perfect compact stage choice for today's demanding vacuum applications in markets such as semiconductor manufacturing and inspection, optics fabrication, and military/aerospace.

Highly Configurable

An optional breadboard mounting plate provides direct mounting to both English and metric breadboards. Any of the models can be mounted in an XY configuration and, with the right-angle L-bracket, in XYZ configurations. It can also be directly mounted to the larger MPS75SL stage.

The MPS50SL is a member of the MPS (Miniature Positioning Stage) family of linear, rotary, goniometer, and vertical lift and Z stages. Two or more stages can easily be mounted together in numerous combinations using standardized mounting patterns and adapter plates.

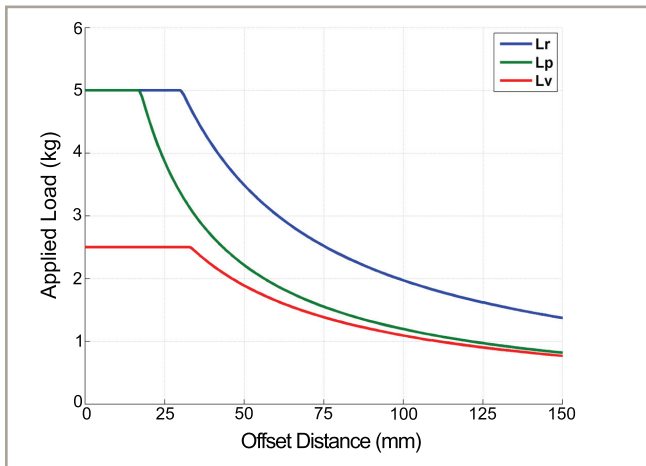


MPS50SL with MPS75SL in a dual-axis XY configuration.

MPS50SL SPECIFICATIONS

| Mechanical Specifications | | | MPS50SL-025 | MPS50SL-050 |
|---|-----------------------|---------------------------|------------------------|-------------|
| Travel | | | 25 mm | 50 mm |
| Accuracy | 1.0mm/revBallScrew | Uncalibrated | ±3.0 μm | ±4.0 μm |
| | | Calibrated ⁽¹⁾ | ±1.5 μm | ±1.5 μm |
| | 0.5 mm/rev Lead Screw | Uncalibrated | ±5.0 μm | ±7.5 μm |
| | | Calibrated ⁽¹⁾ | ±2.0 μm | ±2.5 μm |
| Resolution (Minimum Incremental Motion) | 1.0 mm/rev Ball Screw | 0.1 μm | 0.1 μm | |
| | 0.5 mm/rev Lead Screw | 0.1 μm | 0.1 μm | |
| Repeatability (Bi-Directional)⁽¹⁾ | 1.0 mm/rev Ball Screw | ±0.75μm | ±0.75 μm | |
| | 0.5 mm/rev Lead Screw | ±1.5 μm | ±1.5 μm | |
| Straightness | | | ±2.0 μm | ±3.0 μm |
| Flatness | | | ±2.0 μm | ±3.0 μm |
| Maximum Speed | 1.0mm/revBallScrew | DC Motor (-M1) | 5 mm/s | 5 mm/s |
| | | Stepper Motor (-M2) | 1 mm/s | 1 mm/s |
| | 0.5 mm/rev Lead Screw | DC Motor (-M1) | 2.5 mm/s | 2.5 mm/s |
| | | Stepper Motor (-M2) | 0.5 mm/s | 0.5 mm/s |
| Load Capacity ⁽²⁾ | Horizontal | | 5 kg | 5 kg |
| | Side | | 5 kg | 5 kg |
| | Vertical | | 2.5 kg | 2.5 kg |
| Stage Mass | | | 0.85 kg | 0.9 kg |
| Material | | | Anodized Aluminum Body | |

- Notes:
1. With Aerotech controllers.
 2. Payload specifications are single-axis system.
 3. Excessive duty cycle may impact stage accuracy.
 4. Specifications are for single-axis systems, measured 25 mm above the tabletop.



MPS50SL load curves.

MPS50SL SPECIFICATIONS

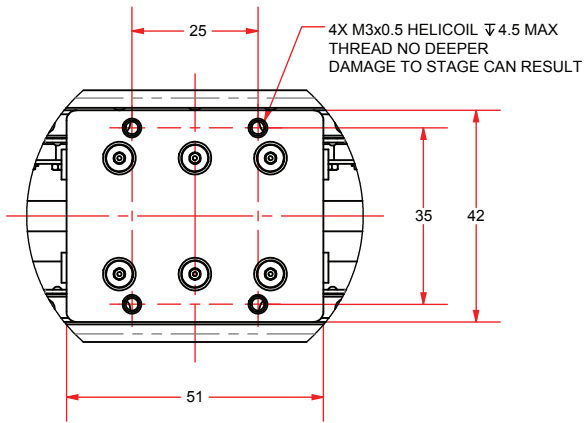
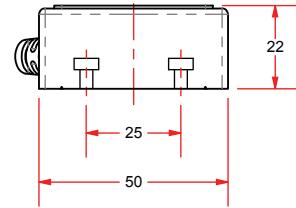
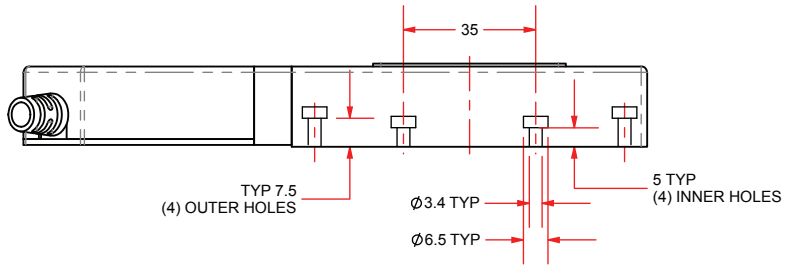
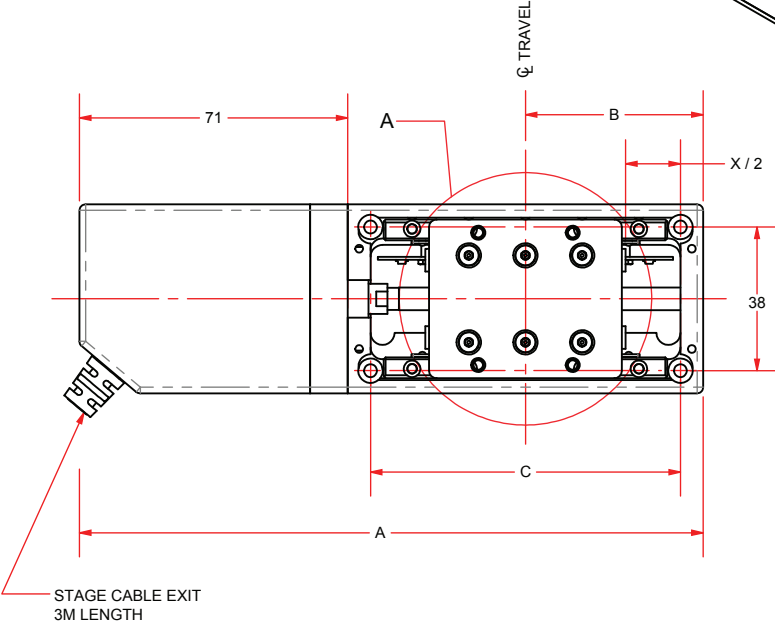
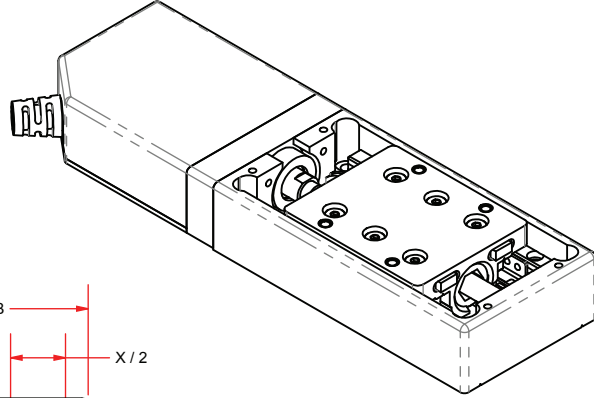
| Electrical Specifications | | DC Motor (-M1) (Standard and VAC) | Stepper Motor (-M2) (Standard and VAC) |
|---------------------------|-----------------------|--|--|
| Drive System | | DC Brush Servomotor with 14:1 Gearbox | 24 VDC Bipolar Stepper Motor with 43:1 Gearbox |
| Feedback | | 512 lines/rev Rotary Encoder | N/A |
| Electronic Resolution | 1.0 mm/rev Ball Screw | 0.0348 μm | 0.0484 μm @ 480 steps/rev Motor Resolution |
| | 0.5 mm/rev Lead Screw | 0.0174 μm | 0.0242 μm @ 480 steps/rev Motor Resolution |
| Maximum Bus Voltage | | 48 VDC | 48 VDC* |
| Limit Switches | | 5 V, Normally Closed | 5 V, Normally Closed |

*With Aerotech control System.

| Recommended Controller | | | |
|------------------------|----------|--|---------------------------------------|
| Multi-Axis | A3200 | | Npaq/Npaq MR/Ndrive MP |
| | Ensemble | | Ensemble LAB/Epaq/Epaq MR/Ensemble MP |
| Single Axis | Soloist | | Soloist MP |

MPS50SL Series DIMENSIONS

MPS50SL



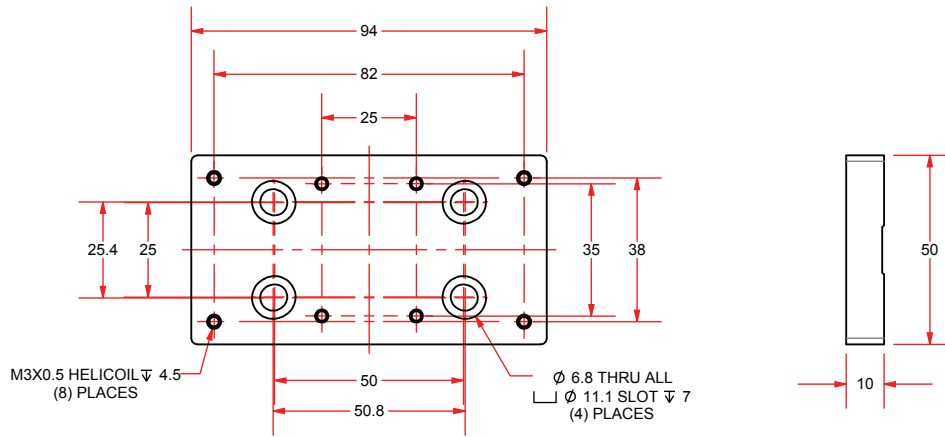
DETAIL A
SCALE 1 : 1.5

| BASIC MODEL | A | B | C | X NOMINAL TRAVEL | X ELECTRICAL LIMIT TRAVEL | X MECHANICAL LIMIT TRAVEL |
|-------------|-----|----|-----|------------------|---------------------------|---------------------------|
| MPS50SL-025 | 165 | 47 | 82 | 25 | 27 | 29 |
| MPS50SL-050 | 195 | 62 | 112 | 50 | 52 | 59 |

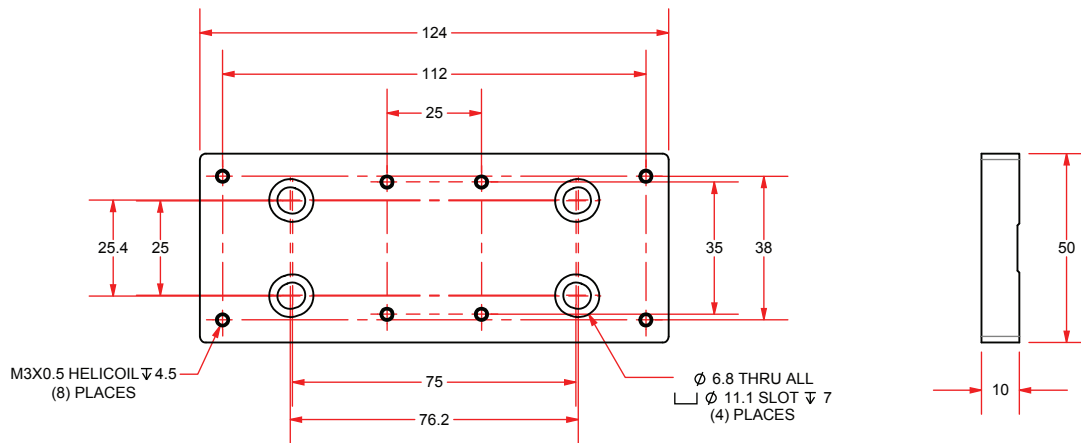
DIMENSIONS: MILLIMETERS

MPS50SL Mounting Plate DIMENSIONS

MPS50SL-025



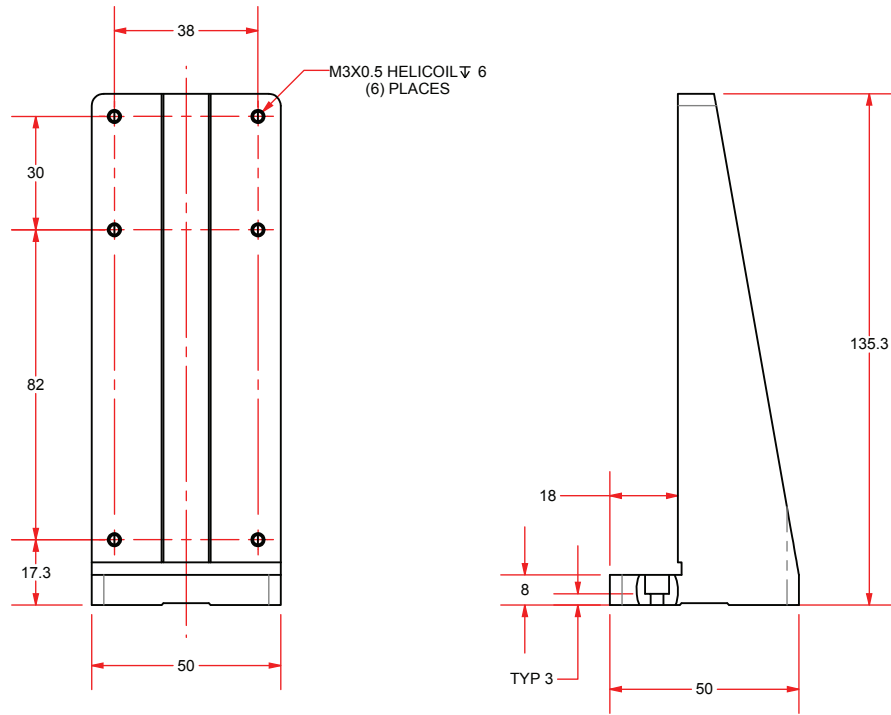
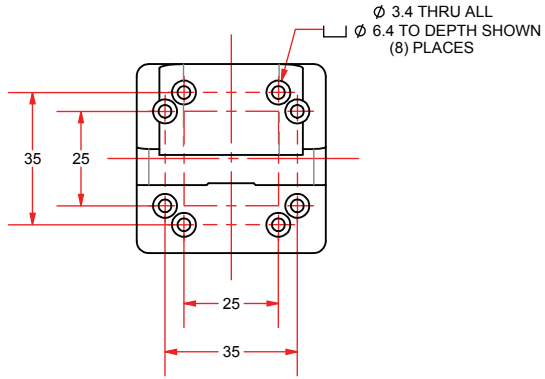
MPS50SL-050



DIMENSIONS: MILLIMETERS

HDZ-MPS50SL L-Bracket DIMENSIONS

HDZ L-Bracket



DIMENSIONS: MILLIMETERS

MPS50SL Series ORDERING INFORMATION

MPS50SL Miniature Mechanical-Bearing Screw-Driven Linear Stage

Travel (Required)

| | |
|------|--------------------|
| -025 | 25 mm travel stage |
| -050 | 50 mm travel stage |

Drive Screw (Required)

| | |
|-----|---|
| -BS | Precision-ground ball screw, 1 mm/rev |
| -LS | Precision-ground lead screw, 0.5 mm/rev |

Vacuum Preparation (Optional)

| | |
|-----|---|
| -HV | High vacuum preparation to 10^{-6} Torr |
|-----|---|

Motor (Required)

| | |
|-----|---------------|
| -M1 | DC servomotor |
| -M2 | Stepper motor |

Mounting Plate (Optional)

| | |
|-----|------------------------------|
| -MP | Optical table mounting plate |
|-----|------------------------------|

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 that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system. |

Accessories (to be ordered as separate line item)

| | |
|----------------|---|
| HDZ-MPS50SL | Right angle bracket, MPS50SL |
| HDZ-MPS50SL-HV | Right angle bracket, MPS50SL, high vacuum preparation to 10^{-6} Torr |