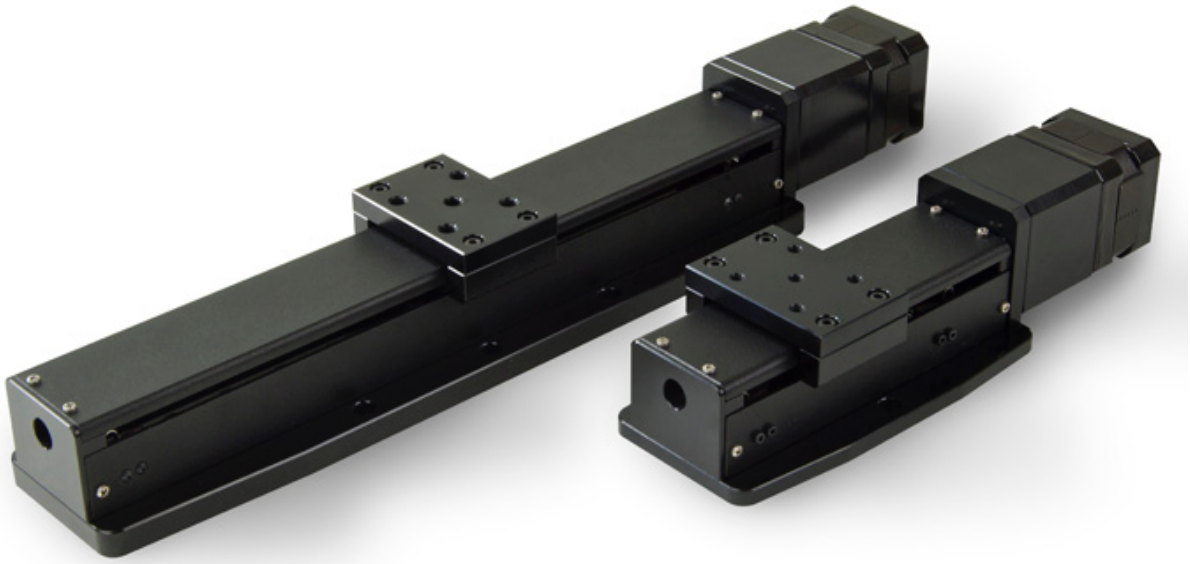
newmark
systems inc

MSL SERIES
LINEAR STAGE



The MSL linear stages are designed for a variety of applications in research & development, automation, and other industrial areas requiring quick positioning of light payloads.

The MSL offers travel lengths from 25mm to 200mm and two lead screw pitches: 2mm & 10mm. The MSL comes standard with a high torque size 17 stepper motor or optionaly, a MDrive intelligent stepper motor. Both motor options are also available with rotary encoders. End of travel limit switches come standard on the MSL linear stage.

The drive system utilizes a stainless steel ACME lead screw with internally lubricated plastic drive nut. The drive nut offers zero backlash operation that automatically adjusts for wear to insure zero backlash for the life of the stage.

The carriage on the MSL is supported over the entire range of travel using a single preloaded linear guide bearing.

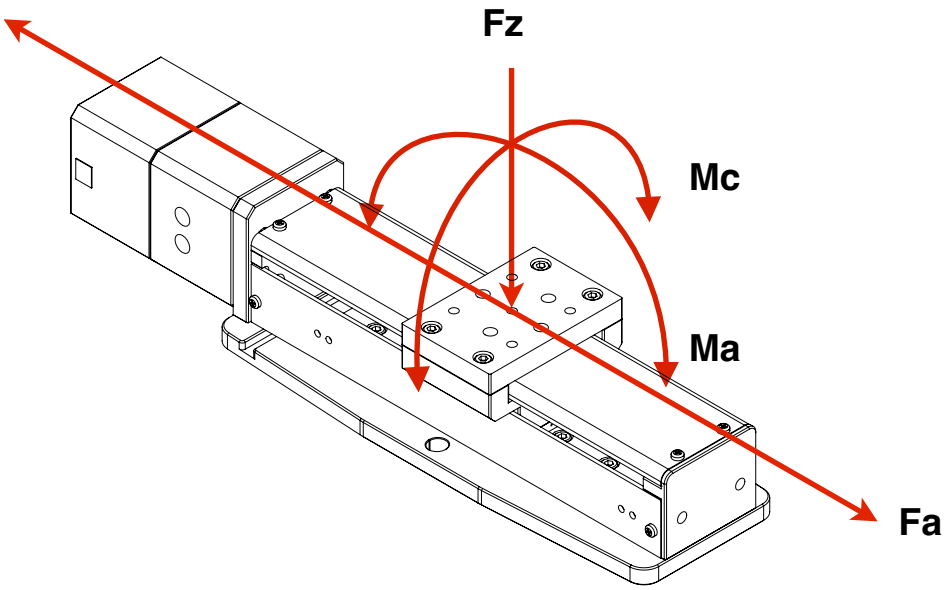
The MSL is available as an XY linear stage using the XY adapter plate option, P/N: 250093.

All MSL linear stages are machined from 6061 aluminum alloy and black anodized.

Specifications	
Travel Range	25 mm, 50 mm, 100 mmm, 150 mm, 200 mm
Resolution	0.04 μm (2 mm pitch lead screw) 0.2 μm (10 mm pitch lead screw)
Accuracy	0.0006 mm/mm
Max. Speed	25 mm/sec (2 mm pitch lead screw) 100 mm/sec (10 mm pitch lead screw)
Unidirectional Repeatability	2 μm
Bidirectional Repeatability	15 μm
Max Load	6.8 kg (15 lbs)
Encoder	Optical rotary encoder mounted to read of motor, 4000 CPR with index (Optional)
Limit Switches	Mechanical
Lead Screw Pitch	2 mm and 10 mm
Stage Weight	MSL-25: 0.73 kg (1.6 lbs) / MSL-200: 1.13 kg (2.5 lbs)
Material	Aluminum Alloy Construction
Finish	Black Anodize

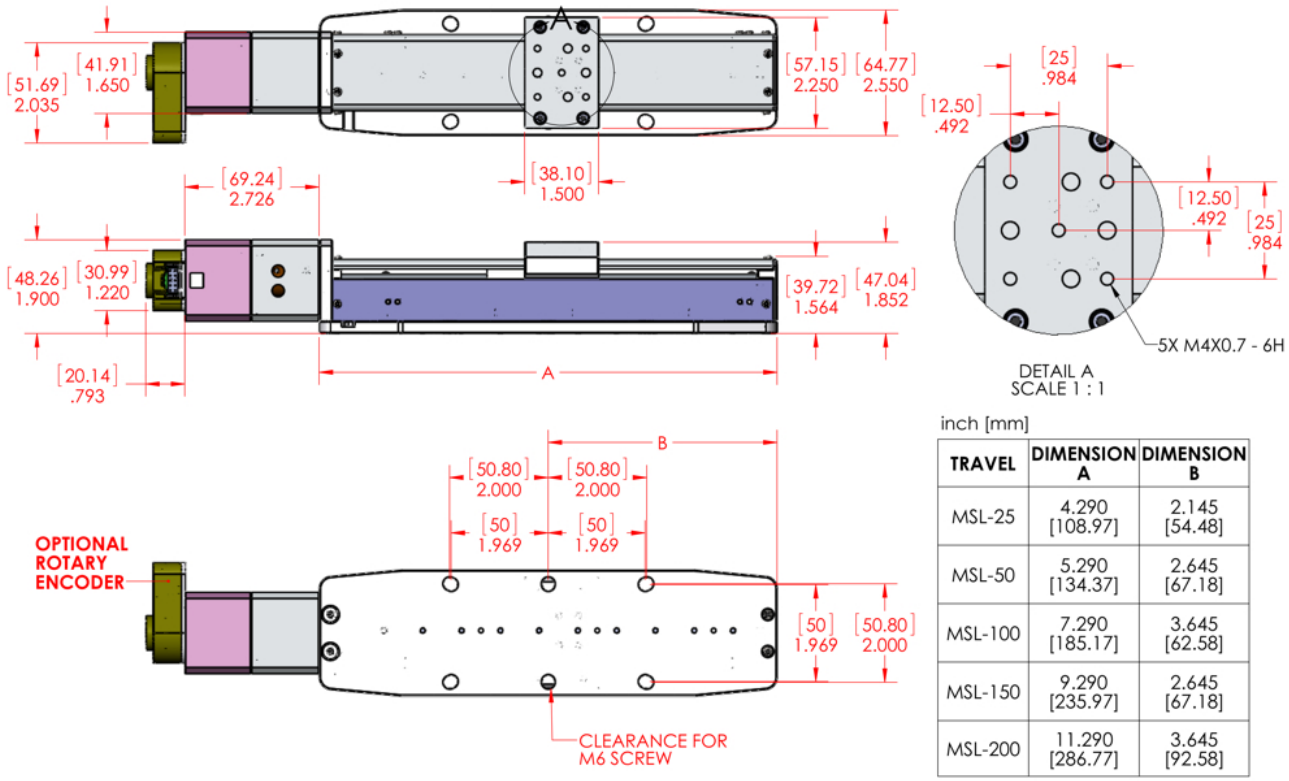
Load Characteristics

Normal Load Fz	6.8 Kg (15 lbs)
Axial Load Fa	2 mm pitch lead screw = 4.5 Kg (10 lb) 10 mm Pitch lead screw = 2.7 Kg (6 lb)
Moment Load Ma	8 Nm (5.9 lb-ft)
Moment Load Mc	8 Nm (5.9 lb-ft)



Dimensions

Stepper Motor Version

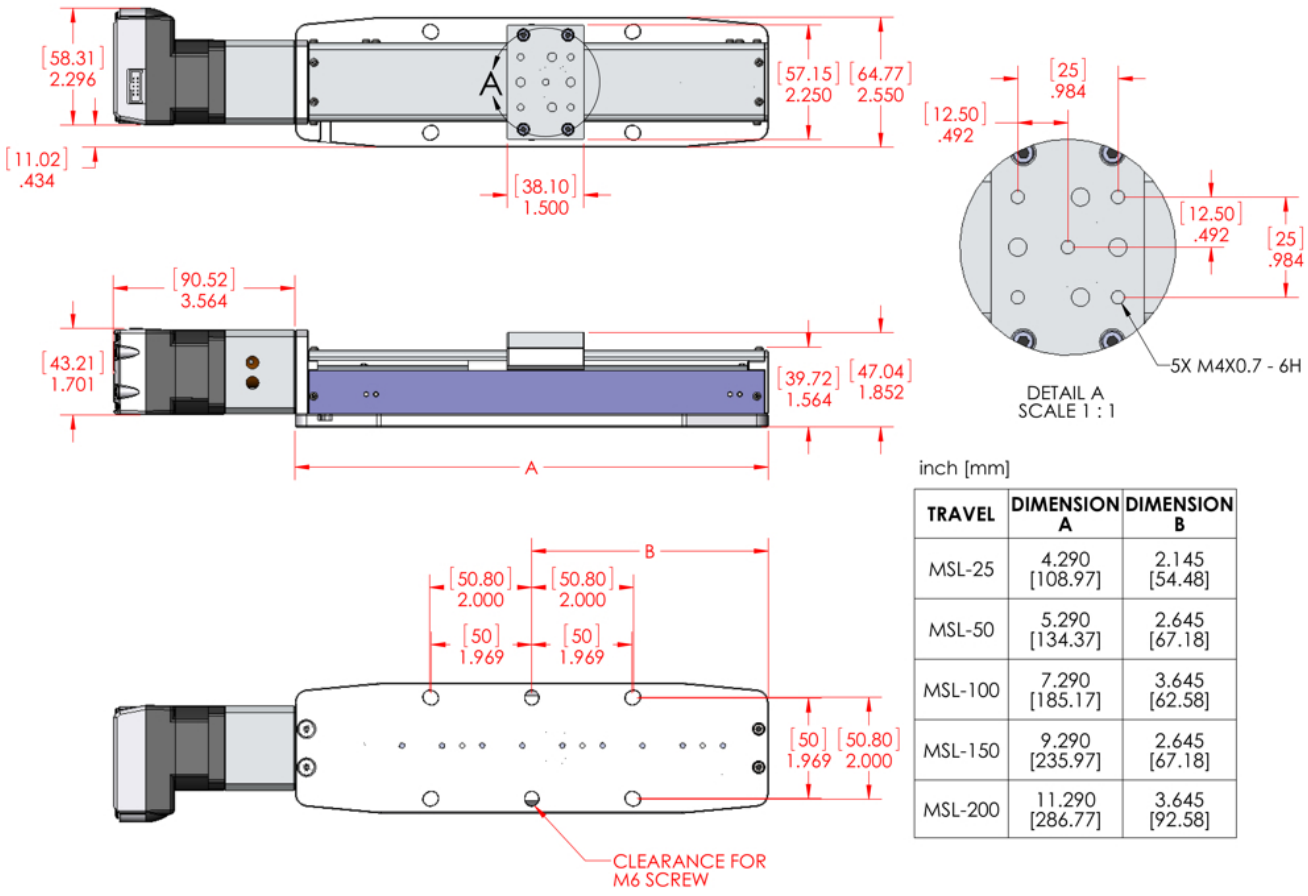


inch [mm]

TRAVEL	DIMENSION A	DIMENSION B
MSL-25	4.290 [108.97]	2.145 [54.48]
MSL-50	5.290 [134.37]	2.645 [67.18]
MSL-100	7.290 [185.17]	3.645 [62.58]
MSL-150	9.290 [235.97]	2.645 [67.18]
MSL-200	11.290 [286.77]	3.645 [92.58]

Dimensions

MDrive Motor Version



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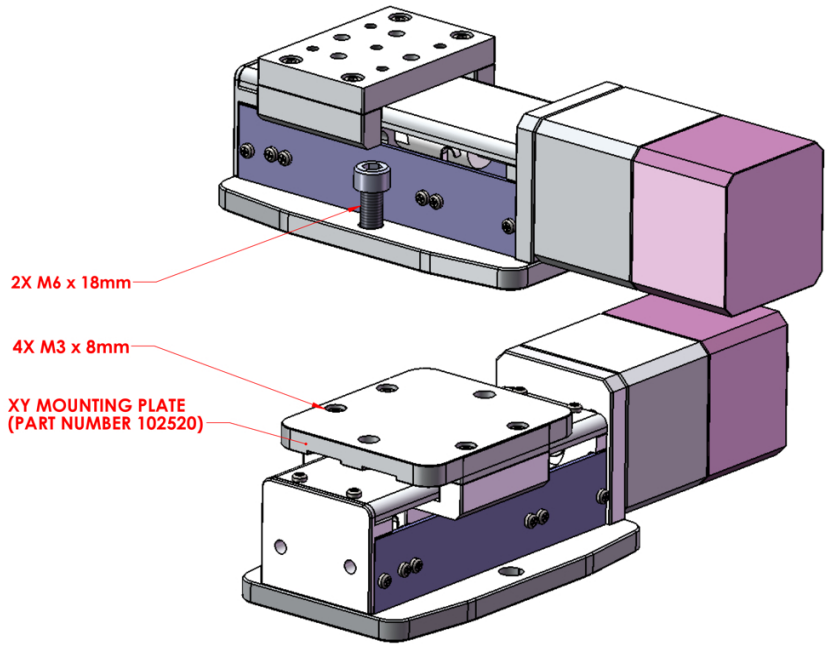
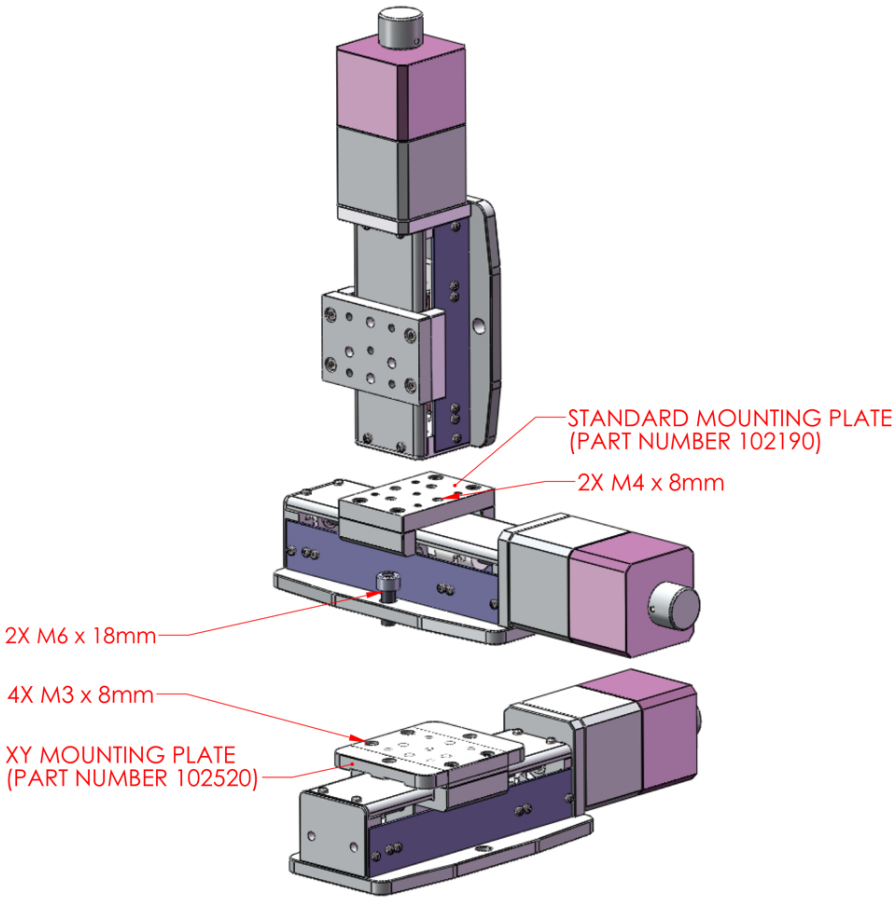
XY Assembly



XYZ Assembly



Pin Assignment

Standard Stepper Motor Version

Motor

DB-9 Male	Description
1.	Phase A
2.	Phase A Center
3.	Phase B
4.	Phase B Center
5.	Phase A’
6.	Phase B’

Motor Specifications

Step Size: 1.8°/step
Amps/Phase: 0.95
Resistance: 4.0 Ohm/Phase
Inductance: 3.1 mH/Phase

Signals (Encoder Option)

DB-9 Female	Description
1.	+ Limit Switch
2.	- Limit Switch (motor side)
3.	Limit Switch Ground

Limit switch wired normally closed

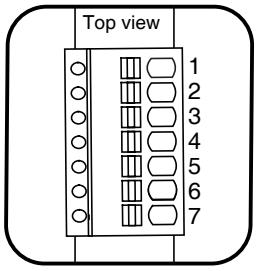
Signals (Encoder Option)

HD-15 Female	Description
1.	+ Limit Switch
2.	- Limit Switch
3.	Limit Switch Ground
4.	Encoder Ground
5.	+5V Encoder Power
6.	Ch. A
7.	Ch. A-
8.	Ch. B
9.	Ch. B-
10.	Index +
11.	Index -

Limit switch wired normally closed

Pin Assignment

MDrive Stepper Motor Version



7-Pin Pluggable Terminal

Power and I/O

7-Pin Terminal	Description
1	I/O 1
2	I/O 2
3	I/O 3
4	I/O 4
5	Analog Input
6	Power GND
7	+24V Motor Power

The forward limit switch is connected to I/O 1.
The reverse limit switch is connected to I/O 2.
Limit switches are wired normally closed.

RS-422 Communications

10-Pin IDC	Description
1	TX+
2	TX-
3	RX+
4	RX-
5	Aux-Logic
6	RX+
7	RX-
8	TX-
9	TX+
10	COMM GND

Connected to 7-Pin Terminal

DC Jack, 2.1mm	Description
Center	+24 VDC
Outside	Power Ground

Ordering Information

Part Number Configuration

MSL-XXX- X X

- XXX: Travel Length
- X: Lead Pitch
- X: Motor Option

Travel Length

25 mm
50 mm
100 mm
150 mm
200 mm

Lead Pitch

1 2 mm Pitch
2 10 mm Pitch

Motor Options

1 Stepper Motor
2 Stepper Motor with Encoder
4 MDrive Motor with Encoder

Motion Controllers

The following Newmark Systems, Inc. controllers are compatible with the MSL Stage.

NCS-A1 Series | NSC-A2L Series | NSC-G Series