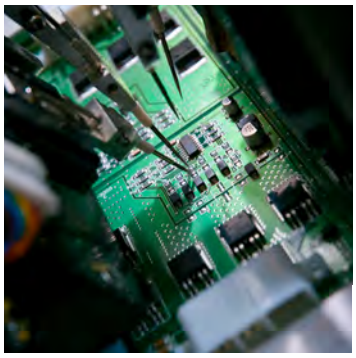
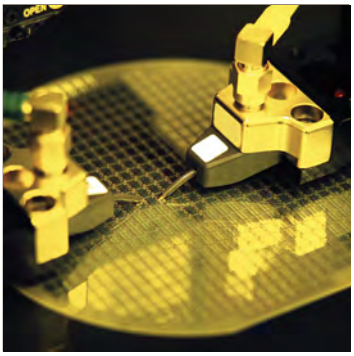
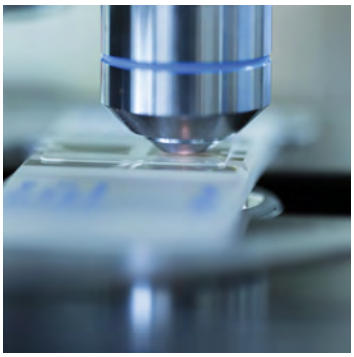
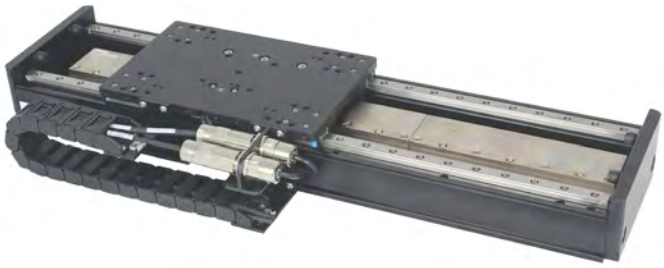


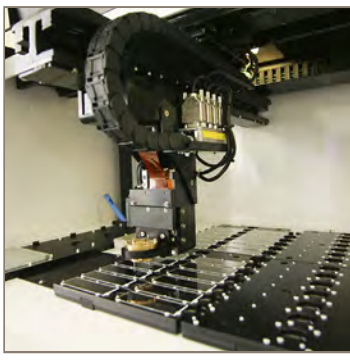






XLM Series

Linear Motor Stages for Positioning with Ultra-High Precision



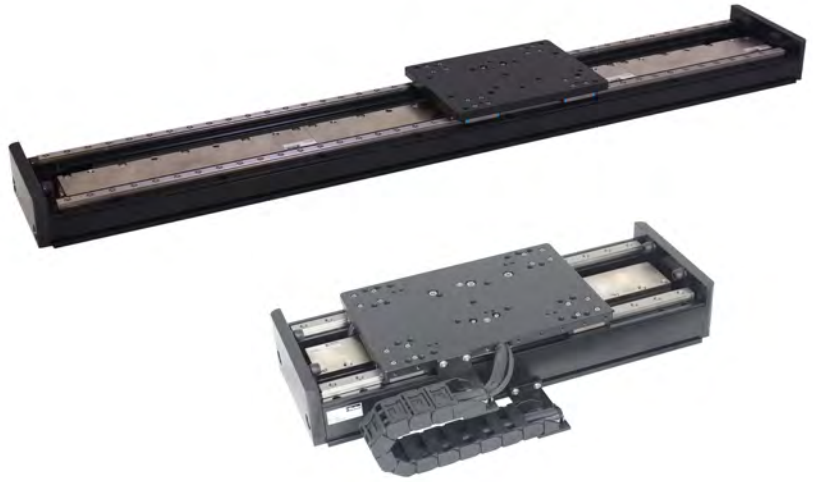
Parker

ENGINEERING YOUR SUCCESS.

XLM Series Linear Motor Stages

Maximize your accuracy while keeping a low profile

For machinery or instrument builders who need smooth motion and high precision, Parker offers the XLM series. The XLM is a linear positioner that provides micron level precision in three different profile widths from 125mm to 200 mm. Its modular design allows for easy assembly of multi-axis systems.



The XLM series is a precision machined, profiled guide linear positioner which is driven with linear servo motor technology, and utilizes selectable levels of linear encoder technology that are configured to match the application need.

Within each form factor, Parker offers three options:

- Open Design for the most cost effective and lowest profile solution
- Covered Design for protection where an open design is not practical
- Sealed Design for additional environmental protection

The XLM family of positioners are ideal for a variety of applications, ranging from imaging systems in digital pathology equipment to metrology instruments in semiconductor or electronics manufacturing. Designed with low Abbe error, consistently accurate positioning is provided.

Know that the XLM has been designed with typical instrument regulations and certifications in mind as all versions meet CE and RoHS requirements.

One of the biggest advantages offered by the XLM series is its modular design, allowing multiple axis systems to be assembled easily. Whether the application calls for a relatively simple X-Y configuration or a more complex multi-axis gantry. Integrated cable management helps to provide a clean and easy to install package, saving on the cost of additional components and the time to install them.

Finally, the XLM provides ease of connectivity. Parker's proven range of servo drives and controls are available for a complete solution from a single, trusted source, but the flexibility of the XLM allows the use of a wide range of drives and controls provided by others.

Features

- **Three form factors: 125mm, 145mm, and 200mm width**
- **Three enclosure options**
- **Six different linear encoder options**
- **Ironless linear motor technology**
- **Standard travel options ranging from 40mm to 1500mm stroke**
- **Efficient cable management system**
- **Integrated and adjustable limit sensing**
- **Complete error mapping on each unit with linear slope correction value provided**
- **CE and RoHS Compliance**

XLM Series Linear Motor Stages

Configurations for a variety of environments

Applications for precision machinery and instruments can vary from factory floor to clean room. In some cases the stage is protected inside machinery where an open design allows for maximum use of space, while in others it is subject to adverse conditions requiring integrated protection. These variables were taken into account in the design of the XLM family, resulting in three distinct product configurations to cover the gamut of possibilities.

Open Design - Type UA/UB

- **Lower profile**
- **Narrower width**
- **Less operating friction**

If the XLM will be installed in a protected area, the economical open design can be an attractive option. Lightest in weight and physically smallest of the three styles, the open design also operates with less friction for higher efficiency.

Covered Design - Type CA, CB, CC

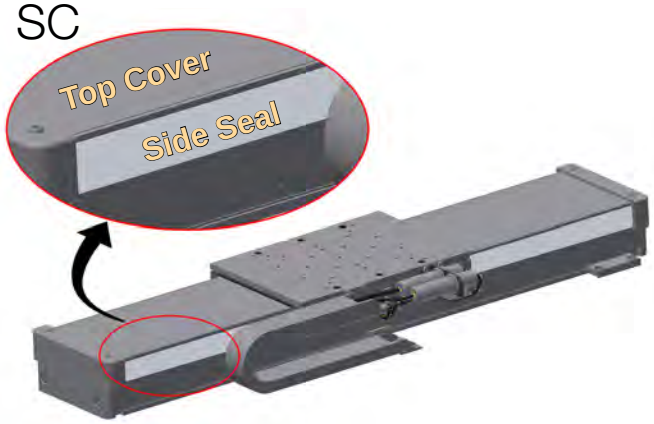
- **Solid top cover**
- **Protection against falling materials**
- **No increase in friction**

The covered design incorporates a solid **top cover** which provides effective protection against material or objects that may drop onto the stage. Friction is not increased by the cover, so operating efficiency is not affected.

Sealed Design - Type SA, SB, SC

- **IP30 environmental protection**
- **Protection against objects >2.5mm**

The sealed version of the XLM takes the covered version a step further with **side seals** in addition to a solid top cover. This provides ingress protection to IP30, preventing entry of foreign objects 2.5mm and larger.



XLM Series Linear Motor Stages

Maximize Instrument Performance — Not Its Size

The XLM linear positioner offers instrument builders optimized packaging of a linear motor, guidance and encoder, as well as limits in one complete solution. In addition, the XLM has been designed with typical instrument regulations and certification in mind, and is both CE and RoHS compliant for all standard products.

Best of Breed Encoder Technology

The XLM positioner offers instrument builders a variety of different encoding technologies and resolutions to select from.

Standard incremental optical resolutions range from one micron all the way down to ten nanometers. This optical encoder offers exceptionally low sub-divisional errors, allowing for very tight control over velocity ripple.

The analog (sine/cosine) encoder option is an ideal way to reach high resolution when paired with controls using interpolating technology to achieve high precision and high speed.

The BiSS-C encoder option provides feedback for applications requiring absolute positional information eliminating the needs for end of travel sensors.

XLM Series - Basic Specifications

	Units	XLM125	XLM145	XLM200
Size - Open style (W x H)	mm	125 x 55	145 x 65	200 x 77
Travel (Max)	mm	1010	1225	1500
Normal Load (Max)	kg	170	300	630
Thrust (Max, less friction)[3]				
Continuous	N	27.47	79.35	127.35
Peak	N	98.42	262.06	414.04
Acceleration (Max – no load)	G	3	3	3
Speed (Max – no load)	m/s	3	3	3
Rated Bus Voltage	VDC	330	330	330
Repeatability [1]	µm	+/- 0.5	+/- 0.5	+/- 0.5
Accuracy [1, 2]	µm	+/- 4	+/- 4	+/- 8
Straightness & Flatness [1]	µm	+/- 3	+/- 3	+/- 4
Feedback Compatibility				
1 µm Optical (incremental)		•	•	•
0.1 µm Optical (incremental)		•	•	•
0.01 µm Optical (incremental)		•	•	•
Analog Sine/Cosine		•	•	•
0.05 µm BiSS-C (absolute)		•	•	•
0.005 µm BiSS-C (absolute)		•	•	•

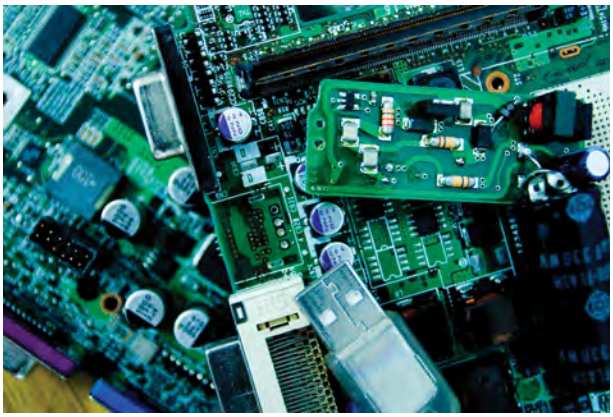
[1] Stage mounted to granite surface, 0.01 micron optical encoder
[2] Measurements taken at 35 mm above the center of the carriage, with linear slope correction.
[3] Please see tables on page 8 - 13 for more details.

Laser Grade Precision

Every XLM stage is thoroughly tested with a laser interferometer to ensure that it meets product specification. Parker also provides test data, which when used with controller compensation, can yield higher stage accuracy.

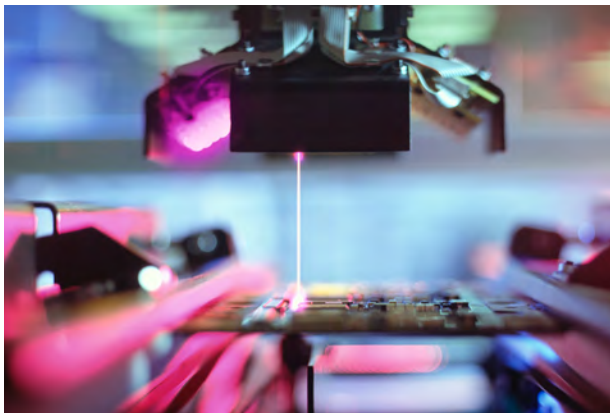
XLM Series Linear Motor Stages

XLM Application Solutions



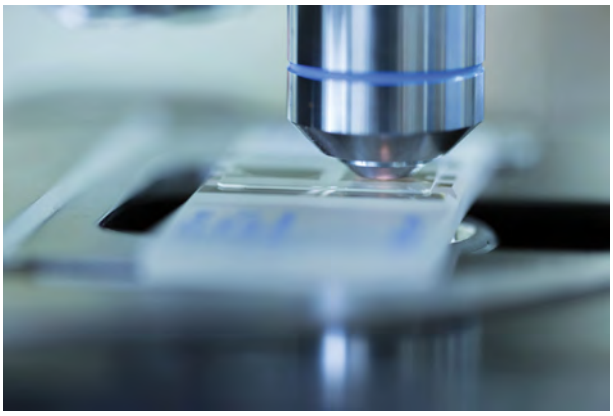
Electronics Manufacturing

The XLM is an ideal positioner for high throughput electronics manufacturing equipment, as its design combines high performance linear motor technology with a variety of high resolution feedback devices for quick, precise placement of miniature components. The XLM provides a robust solution for inspection systems, as its direct drive technology has been designed to stand the test of time.



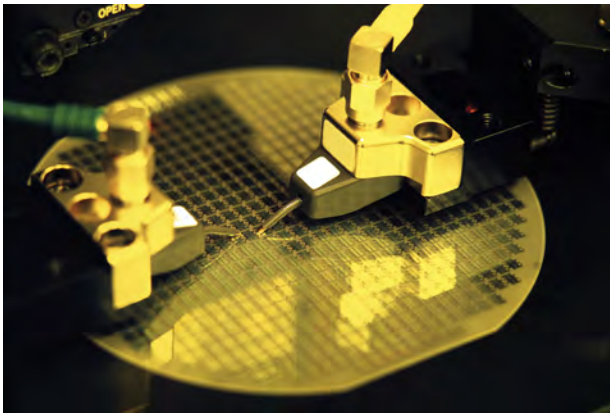
Metrology

Dynamic metrology applications where measurement data is collected while either the measurement sensor or the unit under measure are in motion have a low margin of tolerance for errors in positioning. The XLM offers a reliable and accurate platform for these as well as static metrology and focusing applications found in inspection, optical and laser profilometry, microscopy, and more.



Life Sciences

For the fields of digital pathology and cellular therapeutics, the XLM provides a high precision, miniature means of picking and placing cells for cell therapy instruments. These instruments require highly repeatable positioning to pick cells of interest and incubate them for future cell based therapies.



Semiconductor

Given the combination of its superior geometric performance and compact packaging, the XLM series positioner is ideal for semiconductor handling and metrology applications. Regardless of whether you are examining features on the micro or nano-scale, the XLM can be adapted to meet the need with its wide array of encoder options.

XLM Series Linear Motor Stages

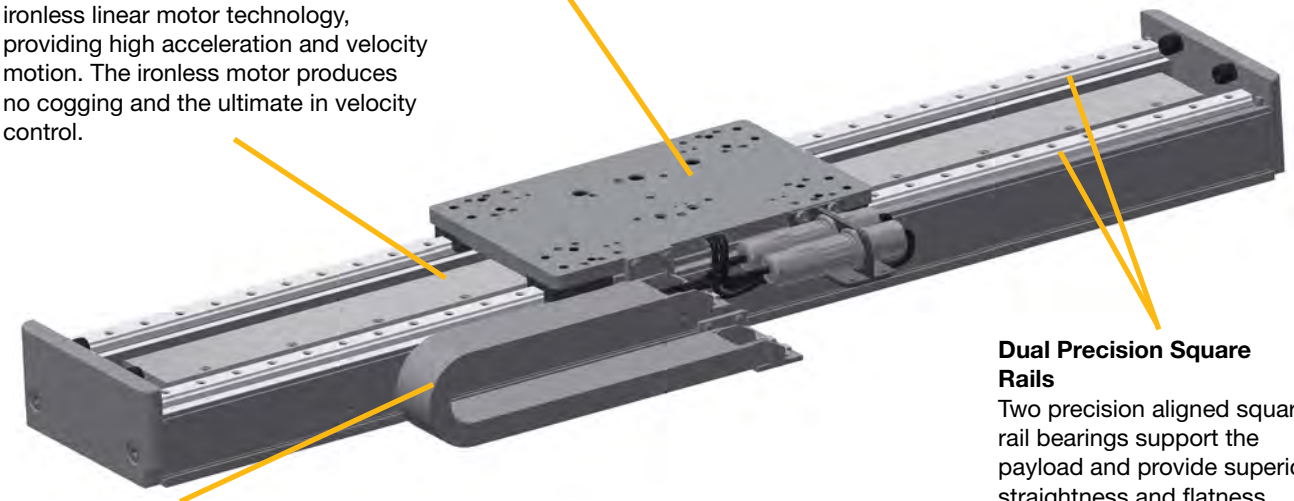
XLM Design Advantages
Open Style (U Version)

Tapped Holes and Dowel Pinning
The XLM has tapped holes in both the top and base for ease of mounting and dowel pins to ensure repeatable mounting.

Maximized Travel to Length Ratio
The compact design of the XLM results in a reduced stage footprint while maximizing performance.

Lower Profile
The open style design minimizes stage height, reducing Abbe error effects.

Center Driven Ironless Linear Motor
All XLM versions are driven using ironless linear motor technology, providing high acceleration and velocity motion. The ironless motor produces no cogging and the ultimate in velocity control.



Dual Precision Square Rails
Two precision aligned square rail bearings support the payload and provide superior straightness and flatness.

High Flex Cabling
The XLM uses high flex extension cables, routed through the stage carrier assembly

Integrated and Adjustable Limit Sensing
For incremental encoder versions, limit sensors have been integrated into the XLM encoder read head, and signals are passed through the same cable, minimizing the amount of cables requiring cable management.

SIX Different Linear Encoder Choices
The XLM provides maximum versatility with choice of three digital optical incremental encoder resolutions (1, 0.1, and 0.01 micron), a 1V p-p analog sine/cosine option, and two absolute Biss-C options (50nm and 5nm)

CE and RoHS Compliance
The XLM conforms to both CE and RoHS directives as standard.

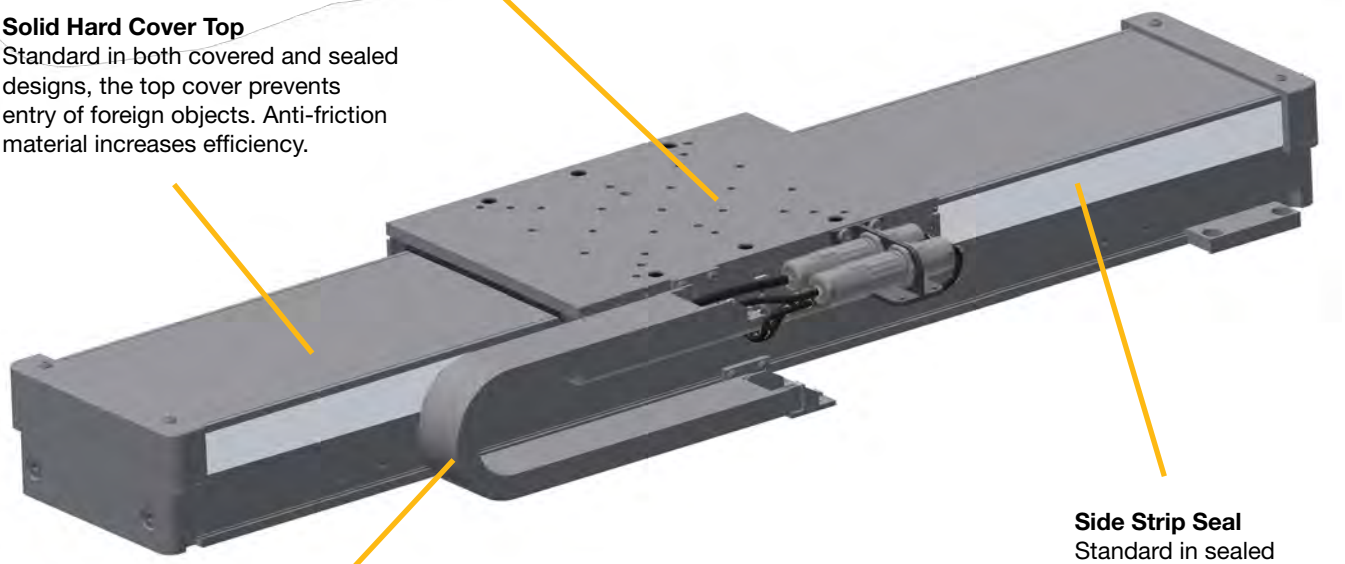
XLM Series Linear Motor Stages

XLM Design Advantages
Covered/Sealed Style (C, S Versions)

Tapped Holes and Dowel Pinning
The XLM has tapped holes in both the top and base for ease of mounting and dowel pins to ensure repeatable mounting.

Center Driven Ironless Linear Motor
All XLM versions are driven using ironless linear motor technology, providing high acceleration and velocity motion. The ironless motor produces no cogging and the ultimate in velocity control.

Solid Hard Cover Top
Standard in both covered and sealed designs, the top cover prevents entry of foreign objects. Anti-friction material increases efficiency.



Side Strip Seal
Standard in sealed version, these provide enhanced ingress protection to IP30 standard.

High Flex Cabling
The XLM uses high flex extension cables, routed through the stage carrier assembly

Integrated and Adjustable Limit Sensing
For incremental encoder versions, limit sensors have been integrated into the XLM encoder read head, and signals are passed through the same cable, minimizing the amount of cables requiring cable management.

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CE and RoHS Compliance
The XLM conforms to both CE and RoHS directives as standard.

XLM Series Linear Motor Stages

Performance Specifications - XLM125

Specification	Units												
Travel (U Version)	mm	110	160	210	260	310	410	510	610	710	810	910	1010
Travel (C, S Versions)	mm	100	150	200	250	300	400	500	600	700	800	900	1000
Accuracy [1]	+/-µm	4	6	8	9	10	12	14	16	18	20	22	24
Resolution	µm	Encoder Dependent (See Encoder Specification)											
Bidirectional Repeatability (Resolution Dependant)[1]	+/-µm	0.5 + Encoder Resolution											
Horizontal Straightness[1]	+/-µm	3	4	4	5	6	8	9	10	12	13	14	15
Vertical Straightness[1]	+/-µm	3	4	4	5	6	8	9	10	12	13	14	15
Pitch[1]	arc sec	≤ 30											
Yaw[1]	arc sec	≤ 30											
Total Stage Mass (U Version)[3]	Kg	5.3	5.9	6.2	6.8	7.3	8.5	9.3	10.5	11.6	12.5	13.7	14.8
Total Stage Mass (C, S Versions)[3]	Kg	8.3	8.9	9.4	10	10.7	12	13	14.4	15.7	16.8	18	19.4

Motor Type		P2
Moving Mass	Kg	0.8 (U), 2.4 (C,S)
Continuous Force[2]	N	27.47 (U, C), 19.47 (S)
Peak Force[2]	N	98.42 (U, C), 90.42 (S)
Max Speed	m/s	Feedback and Load Dependent (Max 3m/sec)
Max Acceleration	g's	Feedback and Load Dependent (Max 3g)

[1] Specifications based on following conditions: Single axis, fully bolted or clamped to AA granite mounting surface, ambient and stage temperature at 20° C, point of measurement centered in carriage, 35mm above the carriage mounting surface.

[2] Continuous and Peak forces shown equal the motor Continuous or Peak force less the RMS frictional resistance of the stage.

[3] Masses include cable management assembly

Mechanical Specifications - XLM125

Specification	Units	P2 Motor
Maximum Load	Kg	170[1]
Maximum Pitch Moment Load	Nm	88
Maximum Roll Moment Load	Nm	70
Maximum Yaw Moment Load	Nm	75
Pitch Torsional Spring Rate (C, S Versions)	arc-sec/Nm	1.14
Yaw Torsional Spring Rate (C, S Versions)	arc-sec/Nm	0.60
Roll Torsional Spring Rate (C, S Versions)	arc-sec/Nm	1.62
Pitch Torsional Spring Rate (U Version)	arc-sec/Nm	0.40
Yaw Torsional Spring Rate (U Version)	arc-sec/Nm	0.73
Roll Torsional Spring Rate (U Version)	arc-sec/Nm	1.34
Base Moment of Inertia (Narrow dimension)	kg-mm²	28,400
Base Moment of Inertia (Wide dimension)	kg-mm²	32,400
Running Friction RMS value over travel (U, C Versions)	N	8
Running Friction Peak value over travel (U, C Versions)	N	12
Running Friction RMS value over travel (S Version)	N	16
Running Friction Peak value over travel (S Version)	N	24
IP Rating		U (Uncovered) version: IP00 C (Covered) version: IP10 S (Sealed) version: IP30[2]

[1] Normal load centered on carriage with stage in horizontal orientation

[2] IP30 rating requires user to seal all unused mounting holes in carriage and base

XLM Series Linear Motor Stages

Motor Specifications - XLM125

	Units	P2
Stall Force Continuous [1]	N	35.47
Stall Current Continuous [1, 4, 8]	Amps (Peak of sine)	5.19
Stall Current Continuous [1, 7]	Amps (DC)	4.49
Stall Current Continuous [1]	Amps (RMS)	3.67
Peak Force [6]	N	106.42
Peak Current [4, 6, 8]	Amps (Peak of sine)	15.56
Peak Current [6, 7]	Amps (DC)	13.47
Peak Current [6]	Amps (RMS)	11
Voltage Constant [3, 4]	Volts/m/s	7.9
Force Constant [9]	N/ Amps (Peak of sine)	6.84
Force Constant [3, 4]	N/Amps (DC)	7.9
Force Constant [3]	N/Amps (RMS)	9.68
Resistance [14]	Ohms	1.71
Inductance [5]	mH	0.5
Maximum Bus Voltage	Volts DC	330
Thermal Resistance Winding-Ambient	°C/watt	1.68
Thermal Resistance Winding-Case	°C/watt	1.04
Thermal Resistance Case-Ambient	°C/watt	0.64
Motor Thermal Time Constant [12]	Minutes	25
Winding Thermal Time Constant [13]	Minutes	1.2
Electrical Time Constant[11]	Millisecs	0.29
Electrical Pitch [10]	mm	60.96
Rated Winding Temperature	°C	100

[1] @ 25°C ambient, 100°c winding temperature

[2] Measured with a 0.76 mm gap

[3] Measured Line to Line, +/- 10%

[4] Value is measured peak of sine wave

[5] +/-30%, Line-to-Line, inductance bridge measurement @1 Khz

[6] Initial winding temperature must be 60°C or less before Peak Current is Applied

[7] DC current through a pair of motor phases of a trapezoidal (six state) commutated motor

[8] Peak of the sinusoidal current in a phase for a sinusoidal commutated motor

[9] Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%

[10] The distance from the leading edge of a north pole to the leading edge of the next north pole

[11] Time for motor value to reach 63% of its final current after a step change in voltage

[12] Time the motor takes to reach 63% of its final temperature, given constant power

[13] Time for the winding to reach 63% of its final temperature rise above the rest of the motor, given constant power

[14] Measured between any 2 motor leads with delta connection at 25°C. At 100°C, multiply resistance by 1.295 (75°C rise* 0.393%/°C)

XLM Series Linear Motor Stages

Performance Specifications - XLM145

Specification	Units													
Travel (U Version, P3 Motor)	mm	125	175	225	275	325	425	525	625	725	825	925	1025	1225
Travel (C, S Versions, P3 Motor)	mm	100	150	200	250	300	400	500	600	700	800	900	1000	1200
Travel (U Version, P4 Motor)	mm	65	115	165	215	265	365	465	565	665	765	865	965	1165
Travel (C, S Versions, P4 Motor)	mm	40	90	140	190	240	340	440	540	640	740	840	940	1140
Accuracy [1]	+/-µm	4	6	8	9	10	12	14	16	18	20	22	24	26
Resolution	µm	Encoder Dependent (See Encoder Specification)												
Bidirectional Repeatability (Resolution Dependant)[1]	+/-µm	0.5 + Encoder Resolution												
Horizontal Straightness[1]	+/-µm	3	4	4	5	6	8	9	10	12	13	14	15	20
Vertical Straightness[1]	+/-µm	3	4	4	5	6	8	9	10	12	13	14	15	20
Pitch[1]	arc sec	≤ 30												
Yaw[1]	arc sec	≤ 30												
Total Stage Mass (U, P3 Motor)[3]	Kg	9.9	11	11.5	12.7	13.7	15.8	17.4	19.6	21.7	23.4	25.5	27.1	31.3
Total Stage Mass (C, S, P3 Motor)[3]	Kg	14.6	15.1	15.8	16.9	18.1	20.4	22.2	24.6	26.9	28.7	31	32.8	37.5
Total Stage Mass (U, P4 Motor)[3]	Kg	10.2	11.2	11.8	12.7	13.9	16	17.7	19.8	22	23.6	25.7	27.4	31.6
Total Stage Mass (C, S, P4 Motor)[3]	Kg	15.2	16.3	17	18.2	19.3	21.6	23.5	25.8	28.1	29.9	32.2	34.1	38.7

Motor Type		P3	P4
Moving Mass	Kg	1.3 (U), 4.0 (C, S)	1.5 (U), 4.5 (C, S)
Continuous Force[2]	N	58.60 (U, C), 50.60 (S)	79.35 (U, C), 71.35 (S)
Peak Force[2]	N	199.81 (U, C), 191.81 (S)	262.06 (U, C), 254.06 (S)
Max Speed	m/s	Feedback and Load Dependent (Max 3m/sec)	
Max Acceleration	g's	Feedback and Load Dependent (Max 3g)	

[1] Specifications based on following conditions: Single axis, fully bolted or clamped to AA granite mounting surface, ambient and stage temperature at 20° C, point of measurement centered in carriage, 35mm above the carriage mounting surface.
[2] Continuous and Peak forces shown equal the motor Continuous or Peak force less the RMS frictional resistance of the stage.
[3] Masses include cable management assembly.

Mechanical Specifications - XLM145

Specification	Units	P3 Motor	P4 Motor
Maximum Load	Kg	300[1]	300[1]
Maximum Pitch Moment Load	Nm	230	310
Maximum Roll Moment Load	Nm	140	140
Maximum Yaw Moment Load	Nm	190	250
Pitch Torsional Spring Rate (C, S Versions)	arc-sec/Nm	0.71	0.62
Yaw Torsional Spring Rate (C, S Versions)	arc-sec/Nm	0.30	0.20
Roll Torsional Spring Rate (C, S Versions)	arc-sec/Nm	1.82	2.22
Pitch Torsional Spring Rate (U Version)	arc-sec/Nm	0.36	0.31
Yaw Torsional Spring Rate (U Version)	arc-sec/Nm	0.32	0.21
Roll Torsional Spring Rate (U Version)	arc-sec/Nm	2.09	2.53
Base Moment of Inertia (Narrow dimension)	kg-mm²	71,800	71,800
Base Moment of Inertia (Wide dimension)	kg-mm²	81,900	81,900
Running Friction RMS value over travel (U, C Versions)	N	12	12
Running Friction Peak value over travel (U, C Versions)	N	16	16
Running Friction RMS value over travel (S Version)	N	20	20
Running Friction Peak value over travel (S Version)	N	28	28
IP Rating		U (Uncovered) version: IP00 C (Covered) version: IP10 S (Sealed) version: IP30[2]	

[1] Normal load centered on carriage with stage in horizontal orientation
[2] IP30 rating requires user to seal all unused mounting holes in carriage and base.

XLM Series Linear Motor Stages

Motor Specifications - XLM145

	Units	P3	P4
Stall Force Continuous [1]	N	70.60	91.35
Stall Current Continuous [1, 4, 8]	Amps (Peak of sine)	4.31	4.19
Stall Current Continuous [1, 7]	Amps (DC)	3.74	3.63
Stall Current Continuous [1]	Amps (RMS)	3.05	2.96
Peak Force [6]	N	211.81	274.06
Peak Current [4, 6, 8]	Amps (Peak of sine)	12.94	12.56
Peak Current [6, 7]	Amps (DC)	11.21	10.88
Peak Current [6]	Amps (RMS)	9.15	8.88
Voltage Constant [3, 4]	Volts/m/s	18.9	25.2
Force Constant [9]	N/ Amps (Peak of sine)	16.37	21.82
Force Constant [3, 4]	N/Amps (DC)	18.90	25.20
Force Constant [3]	N/Amps (RMS)	23.15	30.86
Resistance [14]	Ohms	4.03	5.51
Inductance [5]	mH	1.80	2.40
Maximum Bus Voltage	Volts DC	330	330
Thermal Resistance Winding-Ambient	°C/watt	1.03	0.80
Thermal Resistance Winding-Case	°C/watt	0.52	0.28
Thermal Resistance Case-Ambient	°C/watt	0.51	0.52
Motor Thermal Time Constant [12]	Minutes	41.67	36.67
Winding Thermal Time Constant [13]	Minutes	1.00	1.00
Electrical Time Constant[11]	Millisecs	0.45	0.44
Electrical Pitch [10]	mm	60.96	60.96
Rated Winding Temperature	°C	100	100

[1] @ 25°C ambient, 100°c winding temperature

[2] Measured with a 0.76 mm gap

[3] Measured Line to Line, +/- 10%

[4] Value is measured peak of sine wave

[5] +/-30%, Line-to-Line, inductance bridge measurement @1 Khz

[6] Initial winding temperature must be 60°C or less before Peak Current is Applied

[7] DC current through a pair of motor phases of a trapezoidal (six state) commutated motor

[8] Peak of the sinusoidal current in a phase for a sinusoidal commutated motor

[9] Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%

[10] The distance from the leading edge of a north pole to the leading edge of the next north pole

[11] Time for motor value to reach 63% of its final current after a step change in voltage

[12] Time the motor takes to reach 63% of its final temperature, given constant power

[13] Time for the winding to reach 63% of its final temperature rise above the rest of the motor, given constant power

[14] Measured between any 2 motor leads with delta connection at 25°C. At 100°C, multiply resistance by 1.295 (75°C rise* 0.393%/°C)

XLM Series Linear Motor Stages

Performance Specifications - XLM200

Specification	Units												
Travel (U, C, S Versions, P3 Motor)	mm	200	300	400	500	600	700	800	900	1000	1200	1350	1500
Travel (C, S Versions, P4 Motor)	mm	140	240	340	440	540	640	740	840	940	1140	1290	1440
Travel (U Version, P4 Motor)	mm	160	260	360	460	560	660	760	860	960	1160	1310	1460
Accuracy [1]	+/-µm	8	10	12	14	16	17	18	19	20	24	26	30
Resolution	µm	Encoder Dependent (See Encoder Specification)											
Bidirectional Repeatability (Resolution Dependant)[1]	+/-µm	0.5 + Encoder Resolution											
Horizontal Straightness[1]	+/-µm	4	6	6	7	7	8	9	10	10	12	13	15
Vertical Straightness[1]	+/-µm	4	6	6	7	7	8	9	10	10	12	13	15
Pitch[1]	arc sec	≤ 30											
Yaw[1]	arc sec	≤ 30											
Total Stage Mass (U, P3 Motor)[3]	Kg	19.8	22.3	25.5	28	31.3	34.5	37	40.2	42.7	49	53.2	58
Total Stage Mass (C, S, P3 Motor)[3]	Kg	26.7	29.5	33	35.8	39.4	42.9	45.7	49.2	52	59.1	63.7	69
Total Stage Mass (U, P4 Motor)[3]	Kg	20.2	22.7	25.9	28.4	31.6	34.8	37.3	40.5	43	49.4	53.5	58.3
Total Stage Mass (C, S, P4 Motor)[3]	Kg	28.1	31	34.5	37.3	40.8	44.3	47.2	50.7	53.5	60.6	65.1	70.4

Motor Type		P3	P4
Moving Mass	Kg	2.9 (U), 6.1 (C, S)	3.2 (U), 7.5 (C, S)
Continuous Force[2]	N	102.53 (U, C), 88.53 (S)	127.35 (U, C), 113.35 (S)
Peak Force[2]	N	339.60 (U, C), 325.60 (S)	414.04 (U, C), 400.04 (S)
Max Speed	m/s	Feedback and Load Dependent (Max 3m/sec)	
Max Acceleration	g's	Feedback and Load Dependent (Max 3g)	

[1] Specifications based on following conditions: Single axis, fully bolted or clamped to AA granite mounting surface, ambient and stage temperature at 20° C, point of measurement centered in carriage, 35mm above the carriage mounting surface.
[2] Continuous and Peak forces shown equal the motor Continuous or Peak force less the RMS frictional resistance of the stage.
[3] Masses include cable management assembly.

Mechanical Specifications - XLM200

Specification	Units	P3 Motor	P4 Motor
Maximum Load	Kg	630[1]	630[1]
Maximum Pitch Moment Load	Nm	450	600
Maximum Roll Moment Load	Nm	400	400
Maximum Yaw Moment Load	Nm	360	485
Pitch Torsional Spring Rate (C, S Versions)	arc-sec/Nm	0.85	0.74
Yaw Torsional Spring Rate (C, S Versions)	arc-sec/Nm	0.25	0.17
Roll Torsional Spring Rate (C, S Versions)	arc-sec/Nm	0.71	0.86
Pitch Torsional Spring Rate (U Version)	arc-sec/Nm	0.51	0.45
Yaw Torsional Spring Rate (U Version)	arc-sec/Nm	0.20	0.15
Roll Torsional Spring Rate (U Version)	arc-sec/Nm	0.48	0.61
Base Moment of Inertia (Narrow dimension)	kg-mm²	151,600	151,600
Base Moment of Inertia (Wide dimension)	kg-mm²	181,200	181,200
Running Friction RMS value over travel (U, C Versions)	N	16	16
Running Friction Peak value over travel (U, C Versions)	N	24	24
Running Friction RMS value over travel (S Version)	N	30	30
Running Friction Peak value over travel (S Version)	N	48	48
IP Rating		U (Uncovered) version: IP00 C (Covered) version: IP10 S (Sealed) version: IP30[2]	

[1] Normal load centered on carriage with stage in horizontal orientation
[2] IP30 rating requires user to seal all unused mounting holes in carriage and base.

XLM Series Linear Motor Stages

Motor Specifications - XLM200

	Units	P3	P4
Stall Force Continuous [1]	N	118.53	143.35
Stall Current Continuous [1, 4, 8]	Amps (Peak of sine)	5.80	5.25
Stall Current Continuous [1, 7]	Amps (DC)	5.02	4.55
Stall Current Continuous [1]	Amps (RMS)	4.10	3.72
Peak Force [6]	N	355.60	430.04
Peak Current [4, 6, 8]	Amps (Peak of sine)	17.40	15.76
Peak Current [6, 7]	Amps (DC)	15.07	13.65
Peak Current [6]	Amps (RMS)	12.30	11.15
Voltage Constant [3, 4]	Volts/m/s	23.60	31.50
Force Constant [9]	N/ Amps (Peak of sine)	20.44	27.28
Force Constant [3, 4]	N/Amps (DC)	23.60	31.50
Force Constant [3]	N/Amps (RMS)	28.90	38.58
Resistance [14]	Ohms	2.67	3.78
Inductance [5]	mH	2.30	3.00
Maximum Bus Voltage	Volts DC	330	330
Thermal Resistance Winding-Ambient	°C/watt	0.86	0.74
Thermal Resistance Winding-Case	°C/watt	0.50	0.40
Thermal Resistance Case-Ambient	°C/watt	0.36	0.34
Motor Thermal Time Constant [12]	Minutes	48.33	53.33
Winding Thermal Time Constant [13]	Minutes	2.17	2.17
Electrical Time Constant[11]	Millisecs	0.86	0.79
Electrical Pitch [10]	mm	60.96	60.96
Rated Winding Temperature	°C	100	100

[1] @ 25°C ambient, 100°c winding temperature

[2] Measured with a 0.76 mm gap

[3] Measured Line to Line, +/- 10%

[4] Value is measured peak of sine wave

[5] +/-30%, Line-to-Line, inductance bridge measurement @1 Khz

[6] Initial winding temperature must be 60°C or less before Peak Current is Applied

[7] DC current through a pair of motor phases of a trapezoidal (six state) commutated motor

[8] Peak of the sinusoidal current in a phase for a sinusoidal commutated motor

[9] Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%

[10] The distance from the leading edge of a north pole to the leading edge of the next north pole

[11] Time for motor value to reach 63% of its final current after a step change in voltage

[12] Time the motor takes to reach 63% of its final temperature, given constant power

[13] Time for the winding to reach 63% of its final temperature rise above the rest of the motor, given constant power

[14] Measured between any 2 motor leads with delta connection at 25°C. At 100°C, multiply resistance by 1.295 (75°C rise* 0.393%/°C)

XLM Series Linear Motor Stages

Encoder Specifications - XLM Series

Encoder	Type	Resolution (µm)	Word Length (bit)	Scale Accuracy, un-mapped (+/-µm/m)	Max Speed (m/sec)	Clock Speed (MHz)	Supply Voltage (V)	Current (mA)	Scale Thermal Expansion (µm/m/°C)
E1	Digital Incremental (Differential)	1	n/a	5	> 3	8	5 +/- 5%	230	10.1
E2	Digital Incremental (Differential)	0.1	n/a	5	0.6	8	5 +/- 5%	230	10.1
E3	Digital Incremental (Differential)	0.01	n/a	5	0.06	8	5 +/- 5%	230	10.1
SC	1V P-P Sin/Cos Incremental (Differential)	20 / Controller DAC	n/a	5	> 3	n/a	5 +/- 5%	120	10.1
R1 / R3	Absolute (Biss-C)	0.05	32	5	> 3	n/a	5 +/- 5%	280	10.1
R2 / R4	Absolute (Biss-C)	0.005	32	5	> 3	n/a	5 +/- 5%	280	10.1

XLM Series Linear Motor Stages

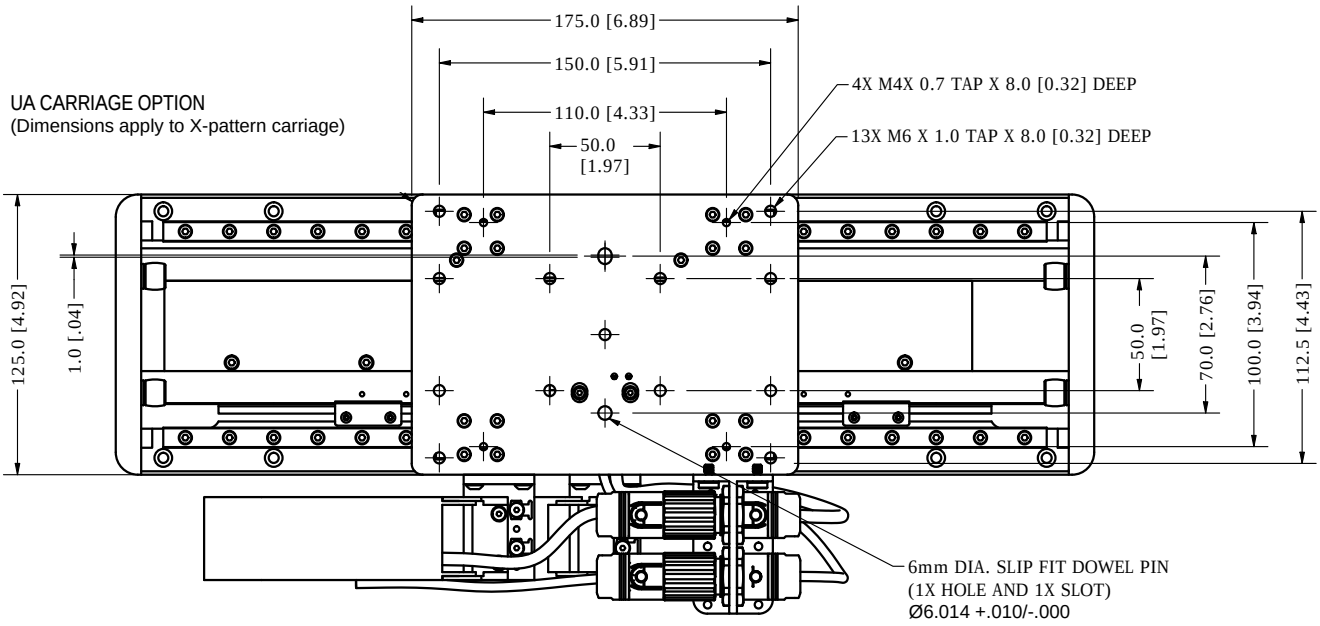
Sensor Specifications - XLM Series

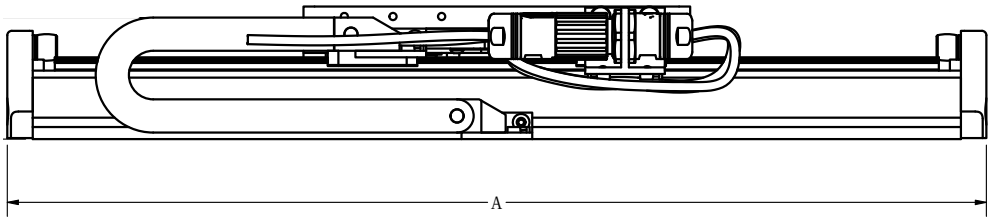
Sensor Type	Supply Voltage (V)	Current (mA)	Output Type	Signal Voltage Range (V)	Max Current per Output (mA)
Hall	5	50	Single ended, NPN Open Collector	5 +/- 5%	15
End of Travel Limit (NPN output) **Not available with Absolute Encoder options.[1]**	5 (powered by encoder supply)	Sames as encoder supply	Single ended, NPN Open Collector	5 to 24 +/- 5%	20
End of Travel Limit (PNP output) **Not available with Absolute Encoder options.[1]**	5 (powered by encoder supply)	Sames as encoder supply	Single ended, PNP Open Emitter	24 +/- 5%	20

[1] PNP output only available with C3, C4, C5, and C6 cable options. Not available with C1 or C2, direct-from-carriage cabling.

XLM Series Linear Motor Stages

XLM125 Dimensions (Open) – mm [in]

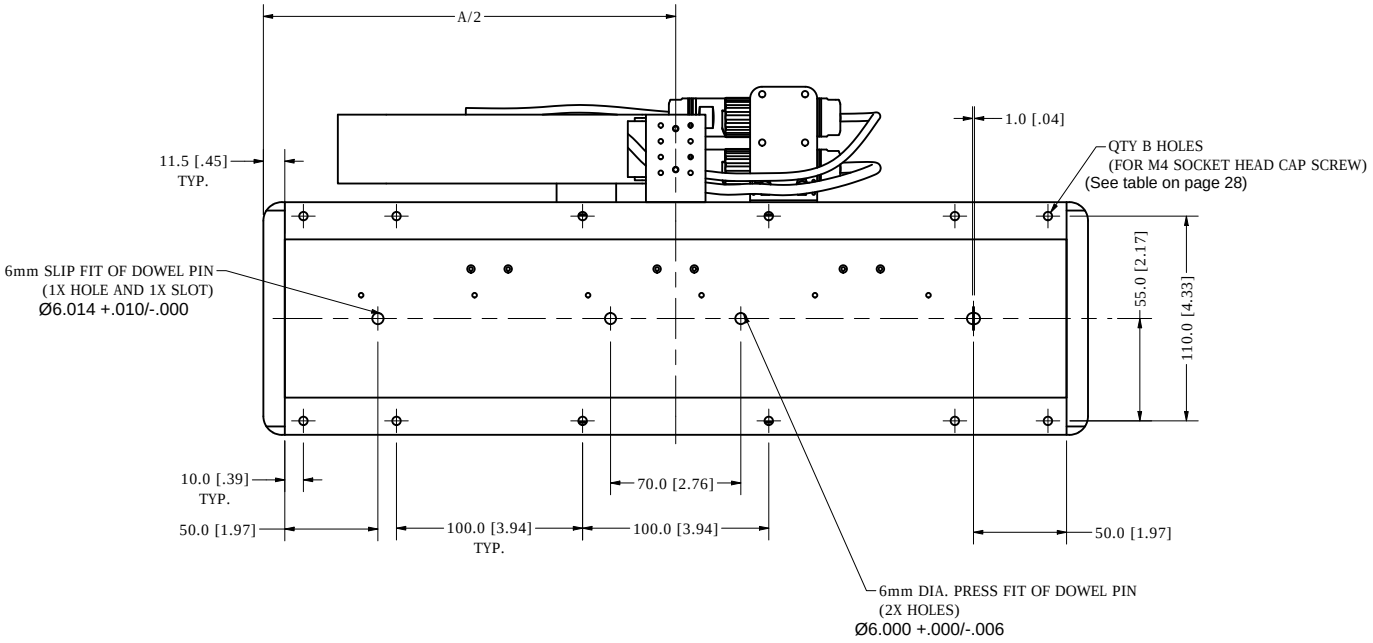


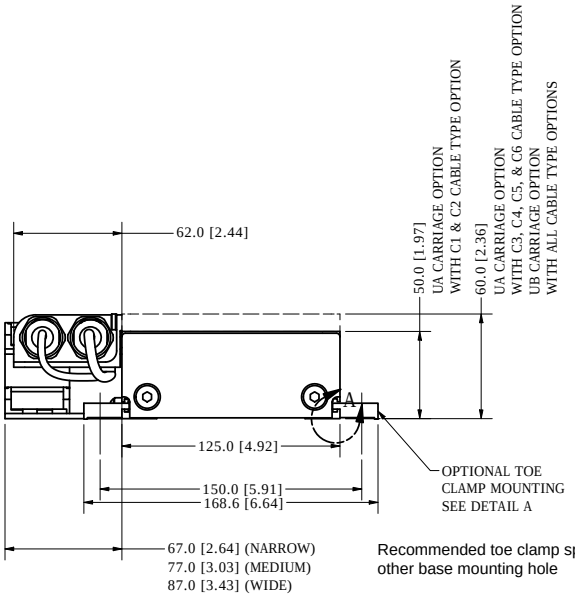


See table on page 28 for “A” dimension

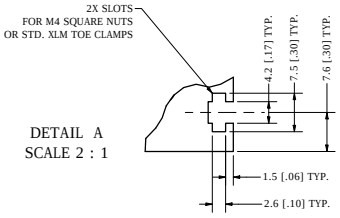
XLM Series Linear Motor Stages

XLM125 Dimensions (Open) – mm [in]





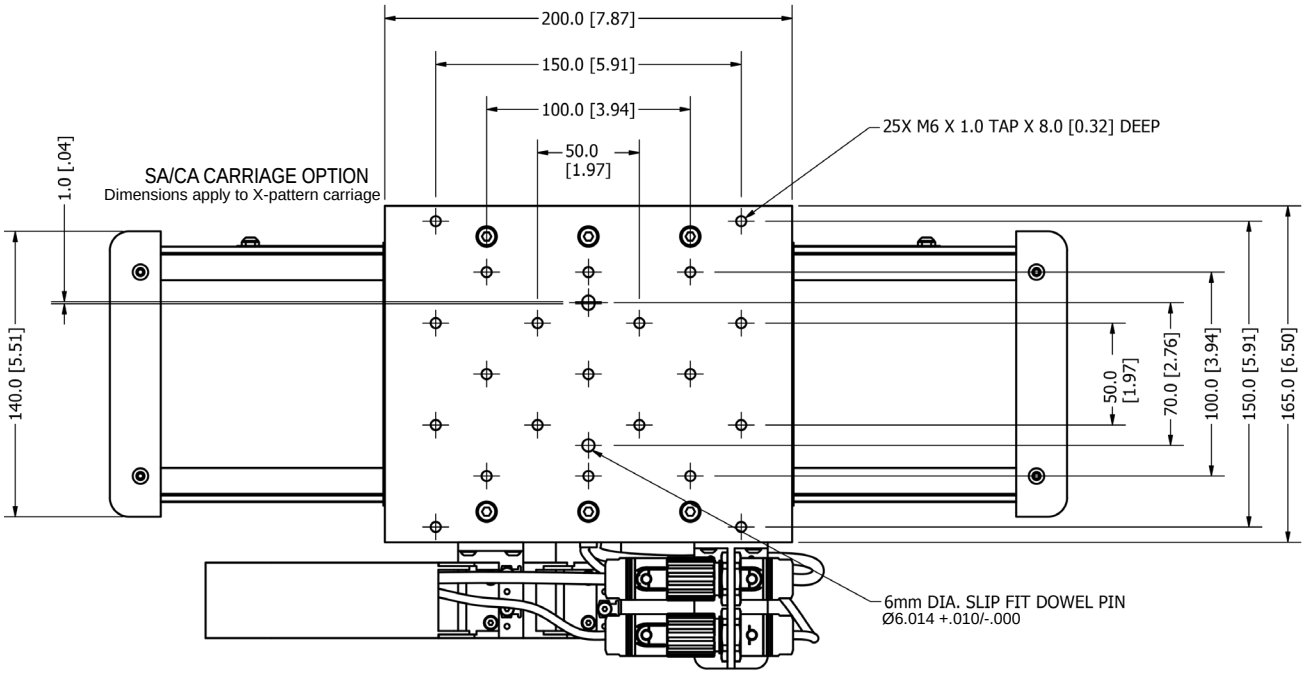
Recommended toe clamp spacing: Every other base mounting hole

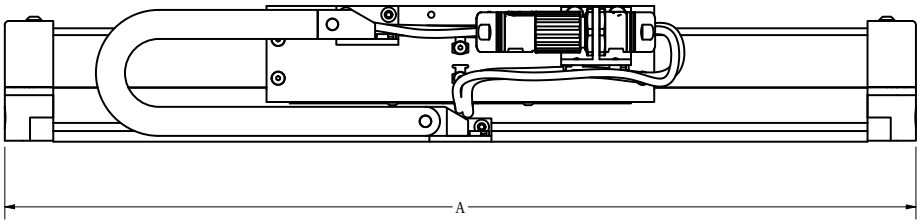


VIEW SHOWING SLOTS IN BASE

XLM Series Linear Motor Stages

XLM125 Dimensions (Covered/Sealed) – mm [in]

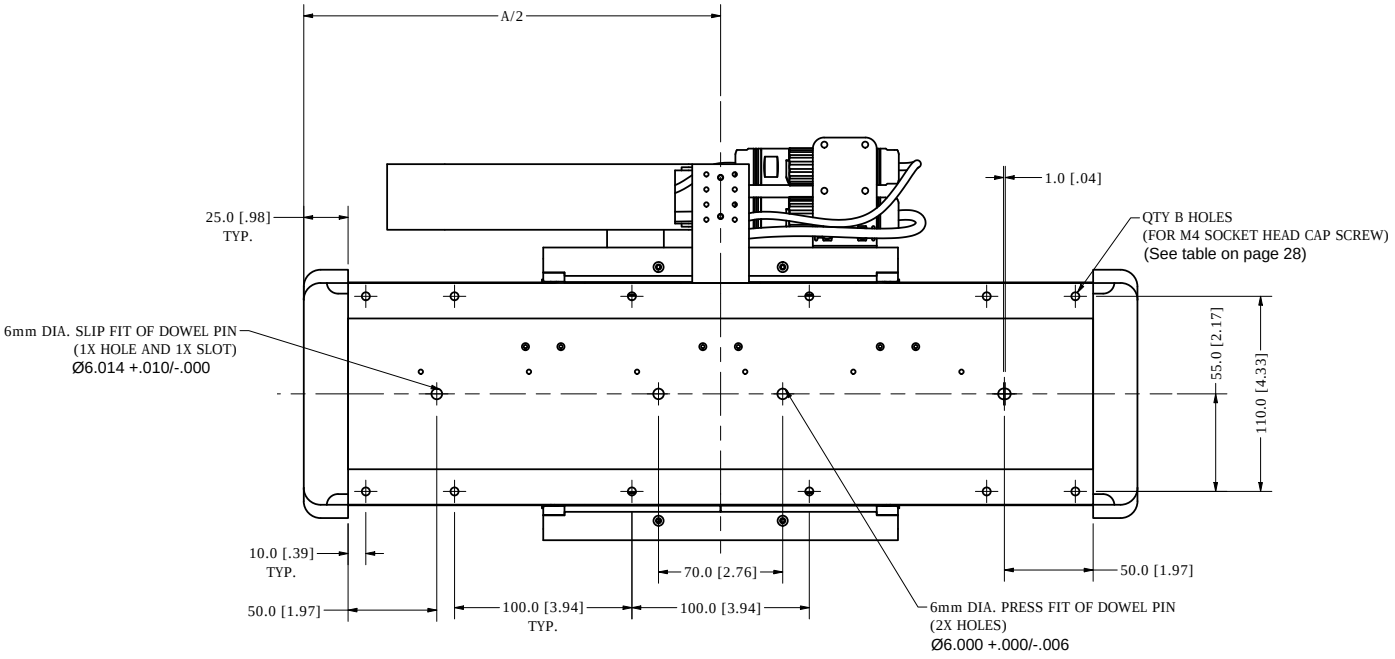


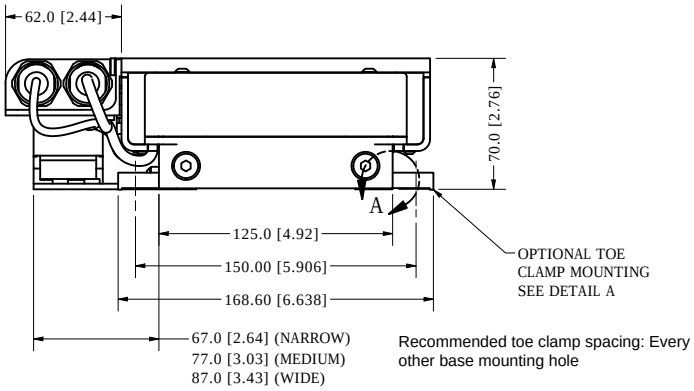


See table on page 28 for “A” dimension

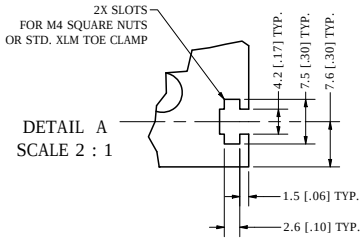
XLM Series Linear Motor Stages

XLM125 Dimensions (Covered/Sealed) – mm [in]





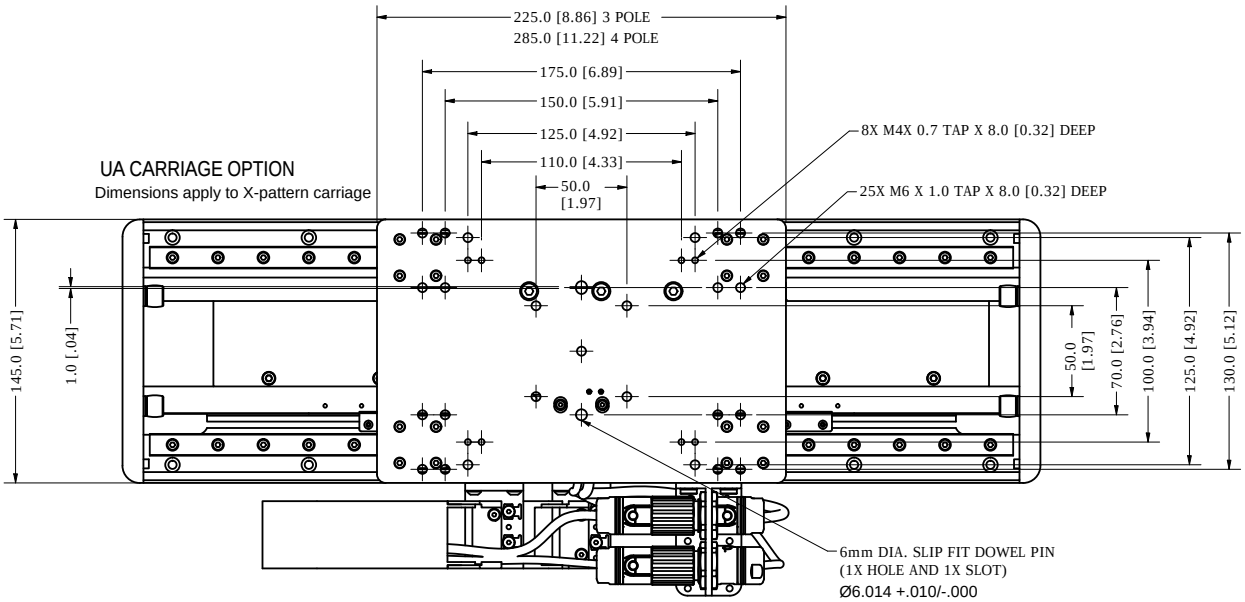
Recommended toe clamp spacing: Every other base mounting hole

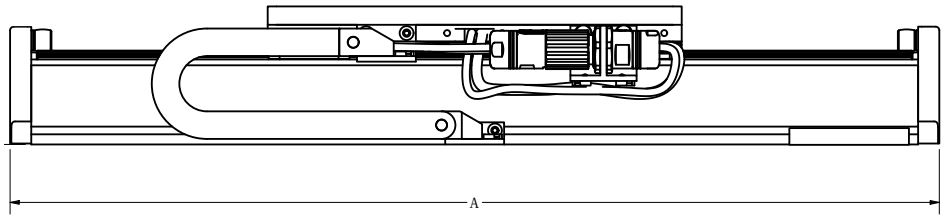


VIEW SHOWING SLOTS IN BASE

XLM Series Linear Motor Stages

XLM145 Dimensions (Open) – mm [in]

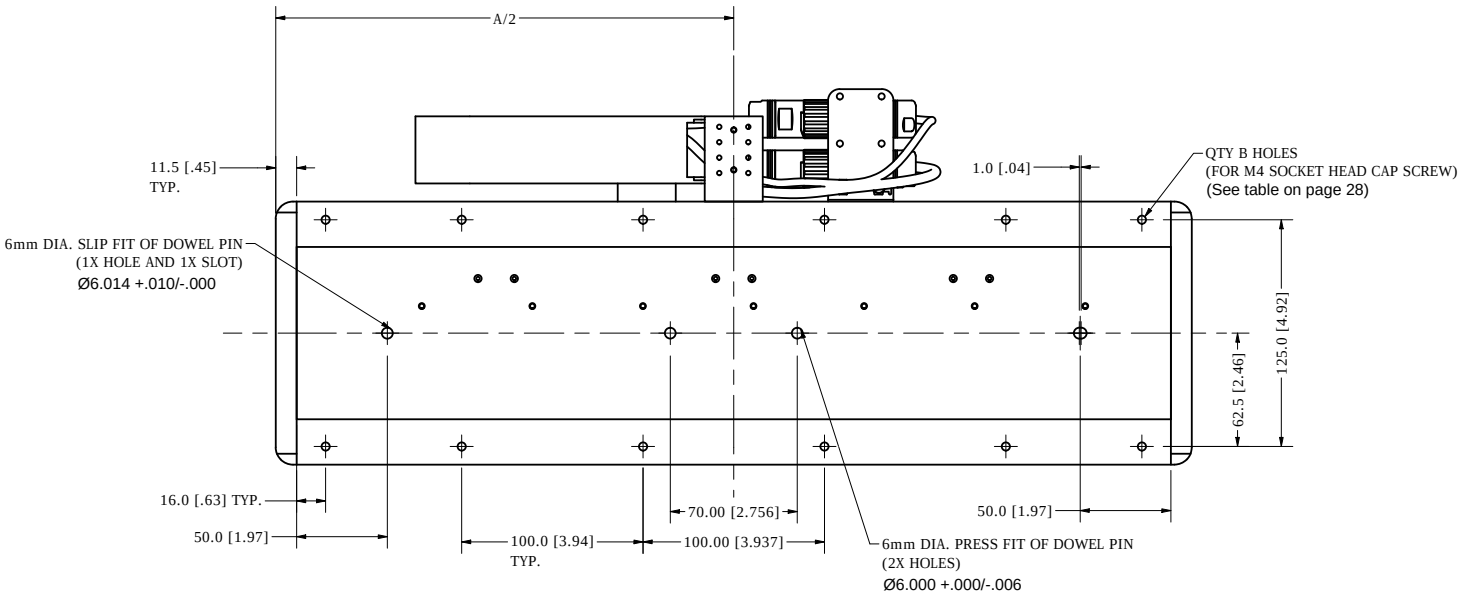


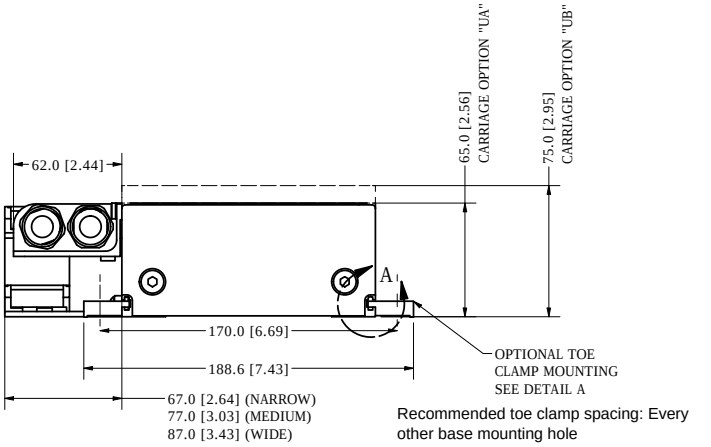


See table on page 28 for “A” dimension

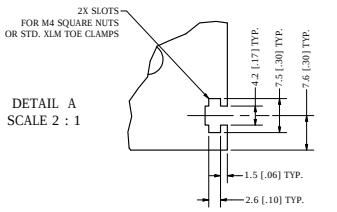
XLM Series Linear Motor Stages

XLM145 Dimensions (Open) – mm [in]





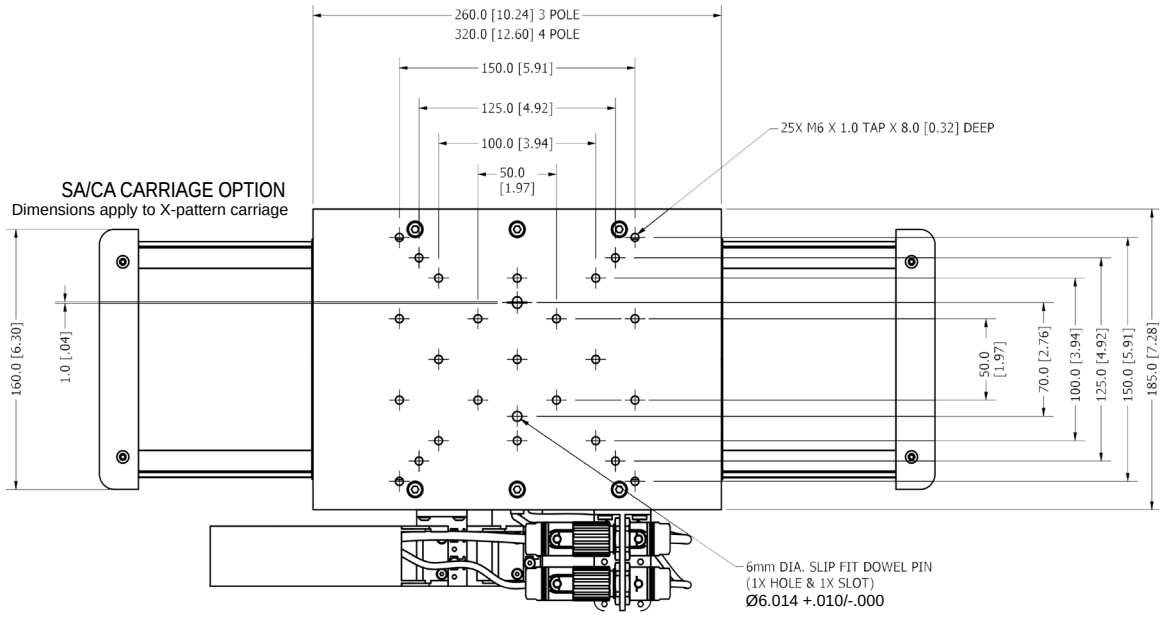
Recommended toe clamp spacing: Every other base mounting hole

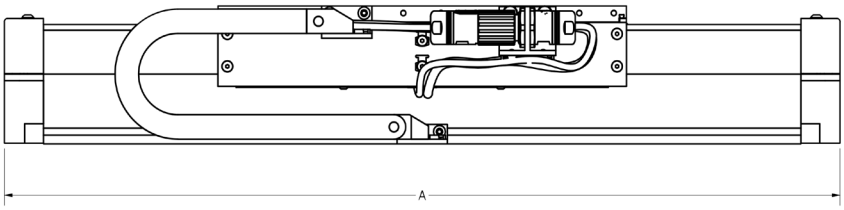


VIEW SHOWING SLOTS IN BASE

XLM Series Linear Motor Stages

XLM145 Dimensions (Covered/Sealed) – mm [in]

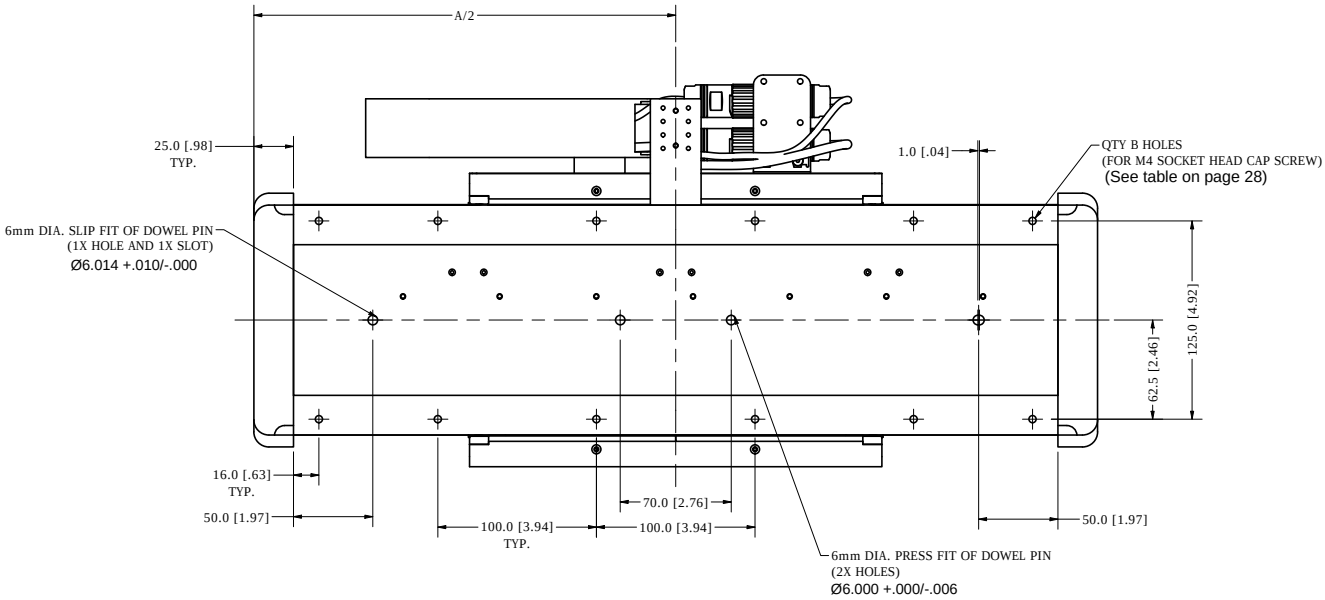


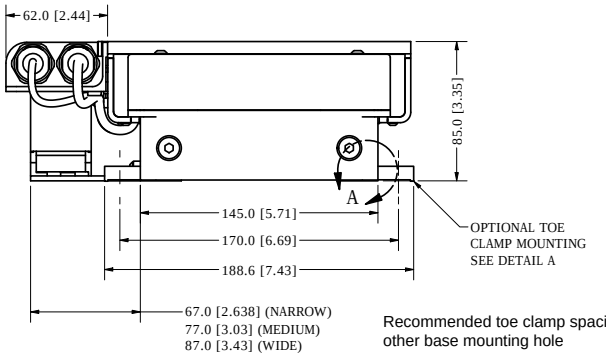


See table on page 28 for “A” dimension

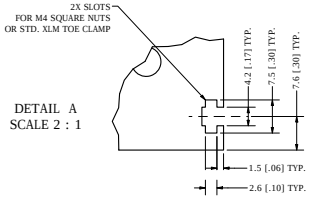
XLM Series Linear Motor Stages

XLM145 Dimensions (Covered/Sealed) – mm [in]





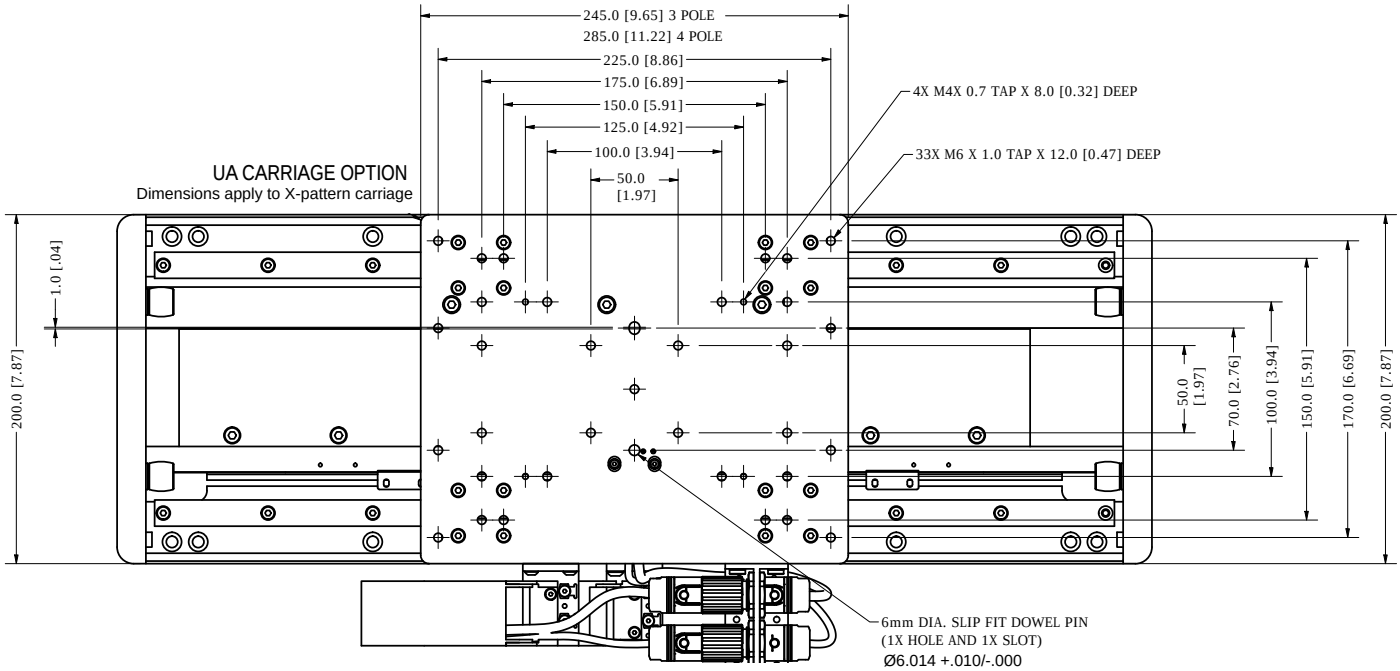
Recommended toe clamp spacing: Every other base mounting hole

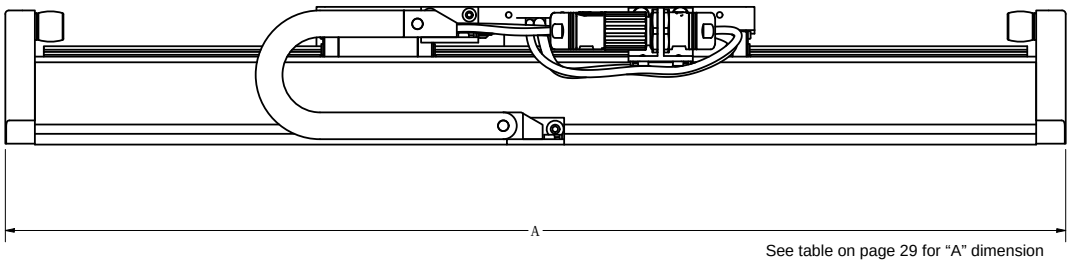


VIEW SHOWING SLOTS IN BASE

XLM Series Linear Motor Stages

XLM200 Dimensions (Open) – mm [in]

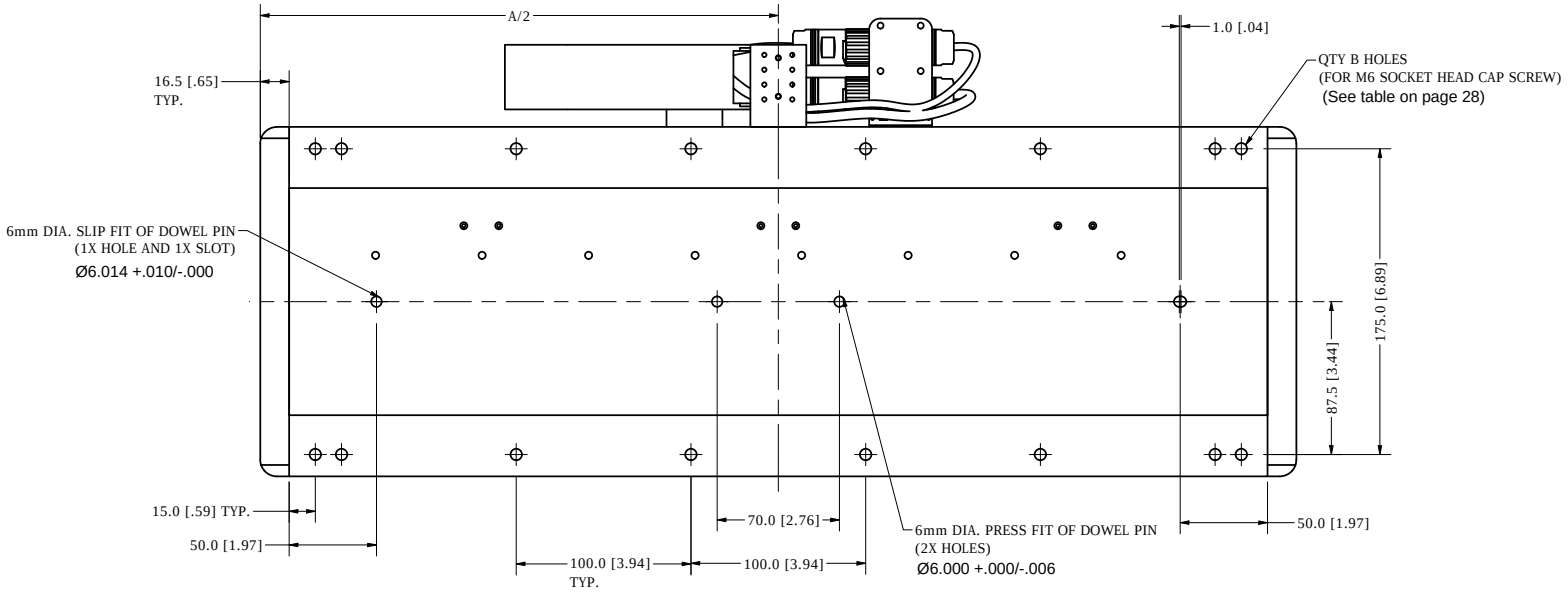


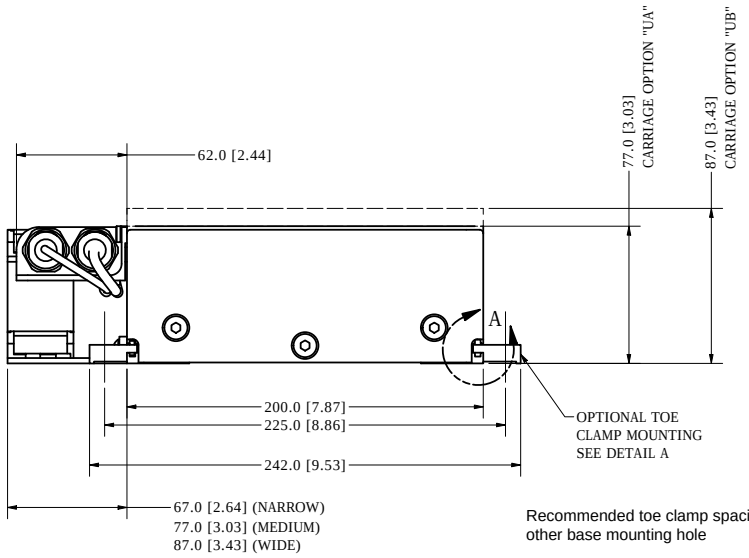


See table on page 29 for “A” dimension

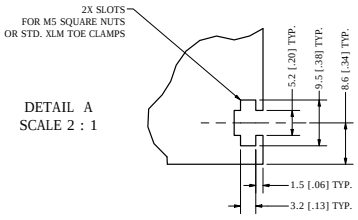
XLM Series Linear Motor Stages

XLM200 Dimensions (Open) – mm [in]





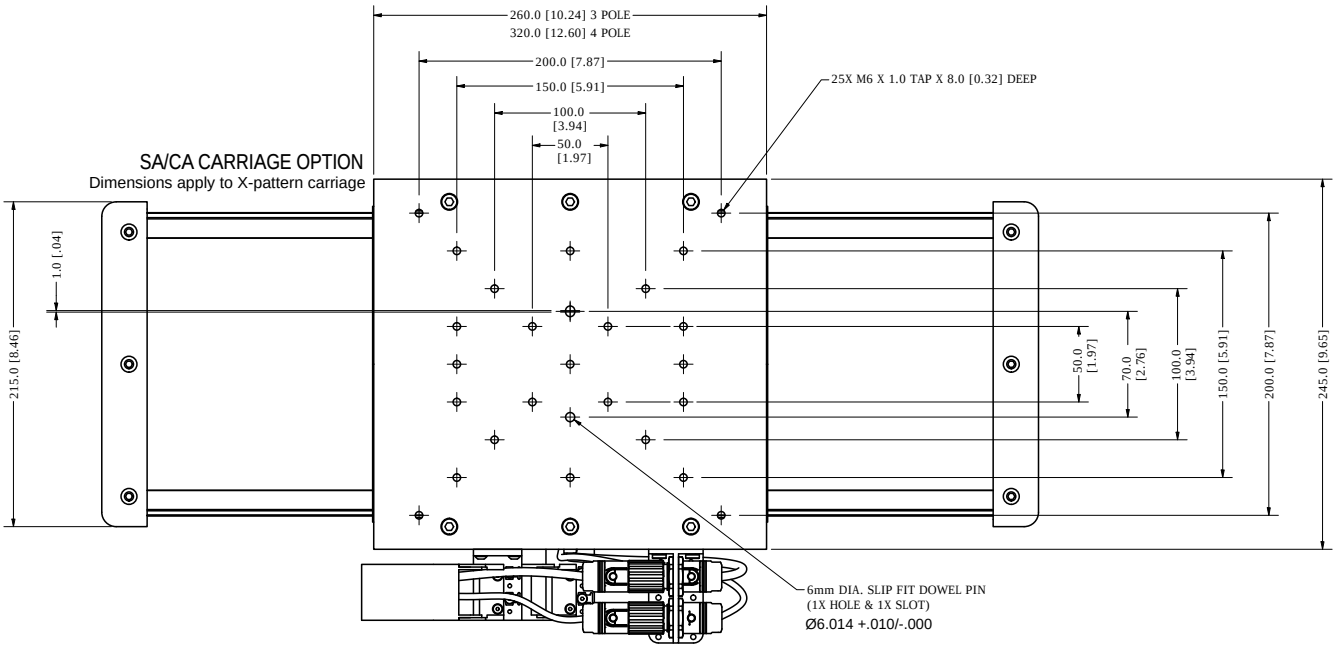
Recommended toe clamp spacing: Every other base mounting hole

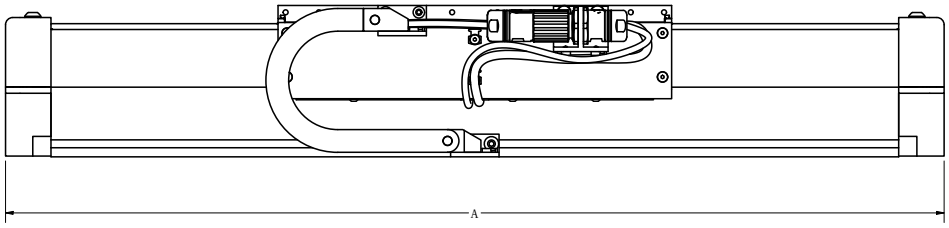


VIEW SHOWING SLOTS IN BASE

XLM Series Linear Motor Stages

XLM200 Dimensions (Covered/Sealed) – mm [in]

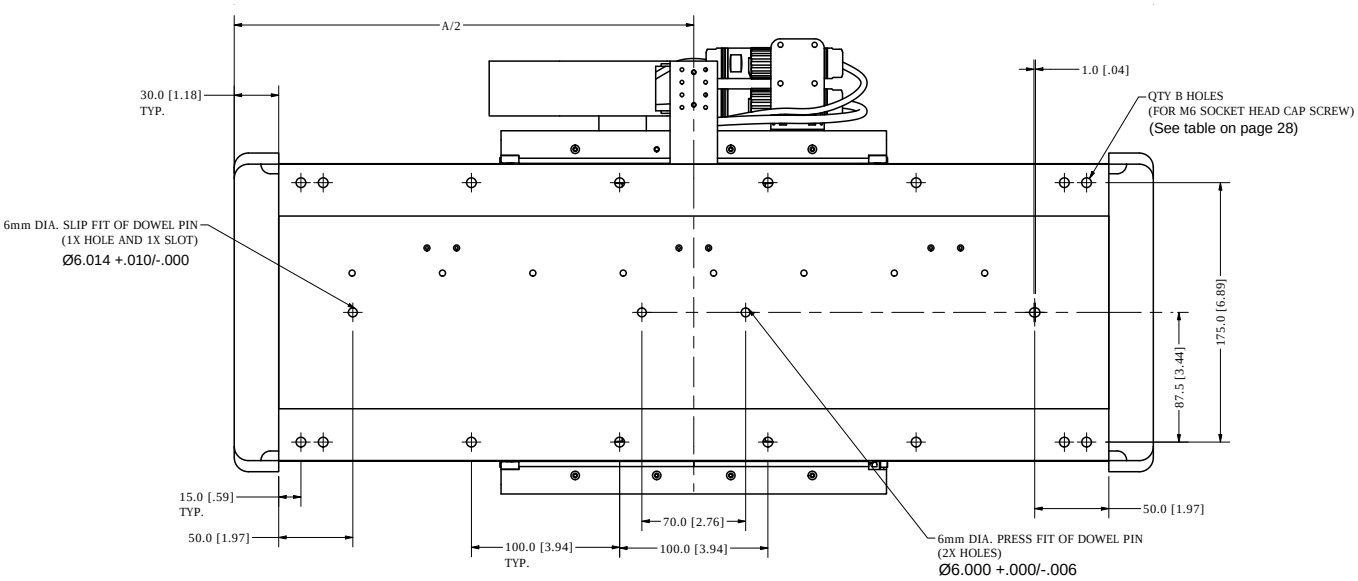


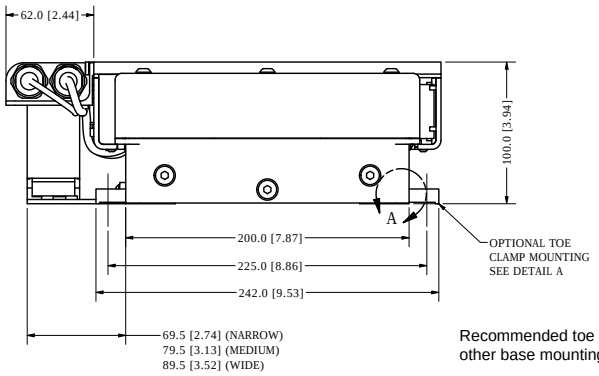


See table on page 29 for “A” dimension

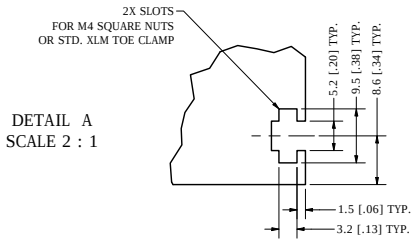
XLM Series Linear Motor Stages

XLM200 Dimensions (Covered/Sealed) – mm [in]





Recommended toe clamp spacing: Every other base mounting hole



VIEW SHOWING SLOTS IN BASE

XLM Series Linear Motor Stages

XLM125 Nominal Travel Lengths/Base Holes

XML125 - Open (U)		
Nominal Travel (mm)	**A (mm)**	**B**
110	343	8
160	393	12
210	443	12
260	493	12
310	543	12
410	643	16
510	743	16
610	843	20
710	943	20
810	1043	24
910	1143	24
1010	1243	28

C (mm):
71.1 Carriage: UA with Cable Type: C3, C4, C5, or C6

60.0 Carriage: UB with Cable Type: C1, or C2

XML125 - Covered and Sealed (C, S)		
Nominal Travel (mm)	**A (mm)**	**B**
100	370	8
150	420	12
200	470	12
250	520	12
300	570	12
400	670	16
500	770	16
600	870	20
700	970	20
800	1070	24
900	1170	24
1000	1270	28

B = Number of Base Holes

XLM145 Nominal Travel Lengths/Base Holes

XML145 - Open (U)			
Nominal Travel (mm)			
3-Pole	**4-Pole**	A (mm)	B
125	**65**	405	12
175	**115**	455	12
225	**165**	505	12
275	**215**	555	12
325	**265**	605	16
425	**365**	705	16
525	**465**	805	20
625	**565**	905	20
725	**665**	1005	24
825	**765**	1105	24
925	**865**	1205	28
1025	**965**	1305	28
1225	**1165**	1505	32

XML145 - Covered and Sealed (C, S)			
Nominal Travel (mm)			
3-Pole	**4-Pole**	A (mm)	B
100	**40**	432	12
150	**90**	482	12
200	**140**	532	12
250	**190**	582	12
300	**240**	632	16
400	**340**	732	16
500	**440**	832	20
600	**540**	932	20
700	**640**	1032	24
800	**740**	1132	24
900	**840**	1232	28
1000	**940**	1332	28
1200	**1140**	1532	32

B = Number of Base Holes

XLM Series Linear Motor Stages

XLM200 Nominal Travel Lengths/Base Holes

XML200 - Open (U)			
Nominal Travel (mm)			
3-Pole	4-Pole	A (mm)	B
200	160	543	12
300	260	643	16
400	360	743	16
500	460	843	20
600	560	943	20
700	660	1043	24
800	760	1143	24
900	860	1243	28
1000	960	1343	28
1200	1160	1543	32
1350	1310	1693	36
1500	1460	1843	40

XML200 - Covered and Sealed (C, S)			
Nominal Travel (mm)			
3-Pole	4-Pole	A (mm)	B
200	140	570	12
300	240	670	16
400	340	770	16
500	440	870	20
600	540	970	20
700	640	1070	24
800	740	1170	24
900	840	1270	28
1000	940	1370	28
1200	1140	1570	32
1350	1290	1720	36
1500	1440	1870	40

B = Number of Base Holes

XLM Series Linear Motor Stages

XLM Ordering Information

Fill in an order code from each of the numbered fields to create a complete part number

Order Example:

①	②	③	④	⑤	⑥	⑦	⑧	⑨
XLM	200	– P3	UA	– 0300	– E3	S	– C1	K0

① Series

XLM	Series

② Base Size (width in mm)

125	125 mm wide profile
145	145 mm wide profile
200	200 mm wide profile

③ Winding & Pole Length

P2	Parallel, 2 pole length
P3	Parallel, 3 pole length
P4	Parallel, 4 pole length

④ Sealing and Carriage Type

UA	Uncovered with Carriage A Mount
UB	Uncovered with Carriage B Mount
CA	Covered with Carriage A Mount
CB	Covered with Carriage B Mount
CC	Covered with Carriage C Mount
SA	Sealed with Carriage A Mount
SB	Sealed with Carriage B Mount
SC	Sealed with Carriage C Mount

⑤ Travel (mm) - See table on page 31 for available travel lengths by base size and features.

⑥ Encoder

E1	1µ optical incremental
E2	0.1µ optical incremental
E3	0.01µ optical incremental
SC	Sine/Cosine 1V p-p
R1	Absolute BiSS-C 50 nm, 32 Bit, value increases right to left
R2	Absolute BiSS-C 5 nm, 32 Bit, value increases right to left
R3	Absolute BiSS-C 50 nm, 32 Bit, value increases left to right
R4	Absolute BiSS-C 5 nm, 32 Bit, value increases left to right

⑦ Scale

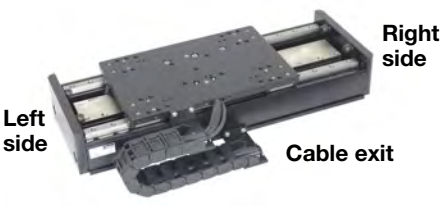
S	Steel

⑧ Cable Type

C1	3 meter cable direct from carriage, no connectors
C2	5 meter cable direct from carriage, no connectors, Sine/Cosine and Absolute ONLY (SC, R1, R2, R3, & R4)
C3	Carriage-mounted connectors with 3m universal extension cables
C4	Carriage-mounted connectors with 5m universal extension cables
C5	Carriage-mounted connectors with 3m P-Drive extension cables (Not available with SC, R1, R2, R3, and R4 configurations)
C6	Carriage-mounted connectors with 5m P-Drive extension cables (Not available with SC, R1, R2, R3, and R4 configurations)

⑨ Cable Carrier

K0	None
K1	Side carrier, narrow, cable exit to right
K2	Side carrier, medium, cable exit to right
K3	Side carrier, wide, cable exit to right
K4	Side carrier, narrow, cable exit to left
K5	Side carrier, medium, cable exit to left
K6	Side carrier, wide, cable exit to left



XLM Series Linear Motor Stages

XLM Standard Travel Lengths

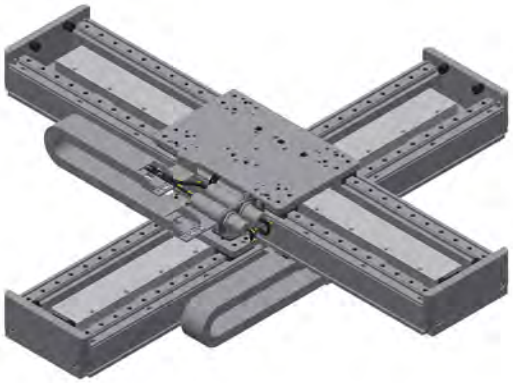
Use the following four-digit travel lengths for position ⑤ in the part number.

Series	XLM125		XLM145				XLM200			
Winding & Pole Length	P2		P3		P4		P3		P4	
Sealing	UA,UB	CA,CB,CC SA,SB,SC	UA,UB	CA,CB,CC SA,SB,SC	UA,UB	CA,CB,CC SA,SB,SC	UA,UB	CA,CB,CC SA,SB,SC	UA,UB	CA,CB,CC SA,SB,SC
Travel (mm) ⑤	0110	0100	0125	0100	0065	0040	0200	0200	0160	0140
	0160	0150	0175	0150	0115	0090	0300	0300	0260	0240
	0210	0200	0225	0200	0165	0140	0400	0400	0360	0340
	0260	0250	0275	0250	0215	0190	0500	0500	0460	0440
	0310	0300	0325	0300	0265	0240	0600	0600	0560	0540
	0410	0400	0425	0400	0365	0340	0700	0700	0660	0640
	0510	0500	0525	0500	0465	0440	0800	0800	0760	0740
	0610	0600	0625	0600	0565	0540	0900	0900	0860	0840
	0710	0700	0725	0700	0665	0640	1000	1000	0960	0940
	0810	0800	0825	0800	0765	0740	1200	1200	1160	1140
	0910	0900	0925	0900	0865	0840	1350	1350	1310	1290
	1010	1000	1025	1000	0965	0940	1500	1500	1460	1440
			1225	1200	1165	1140				

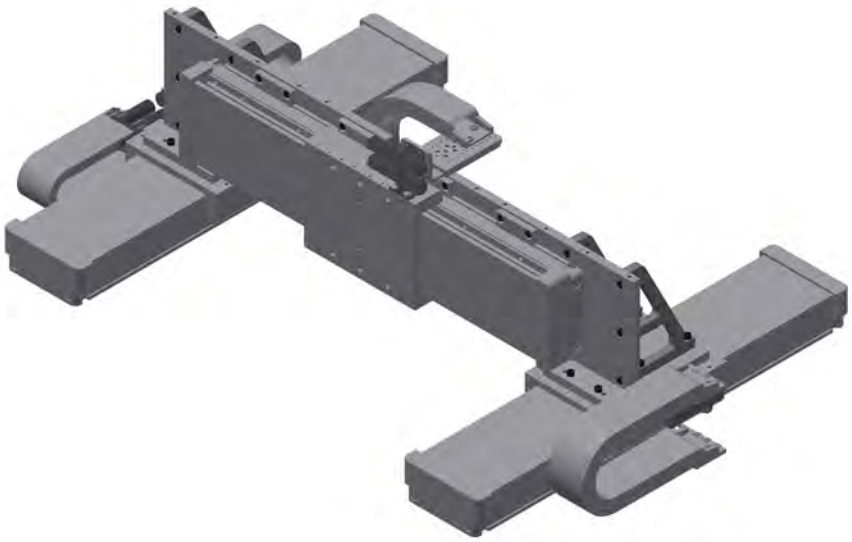
XLM Series Linear Motor Stages

XLM Modular Connectivity for Multi-Axis Systems

The XLM series was designed to be highly modular such that it can easily be configured into multi-axis systems made out of other XLM positioners or mSR as the XLM uses the same bolt pattern. Since the entire series was designed with this common hole pattern in mind, X-Y systems can be developed without the need for an additional transition plate.



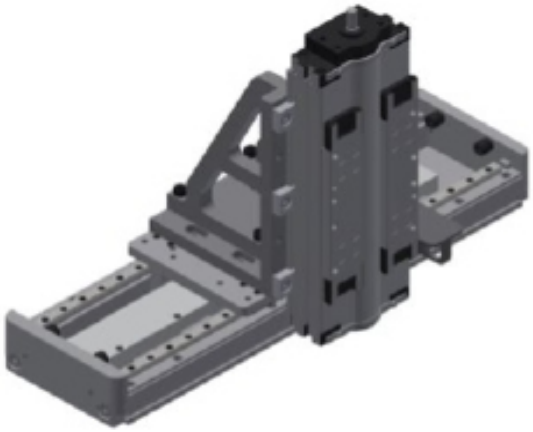
X-Y configuration using standard open version XLM stages



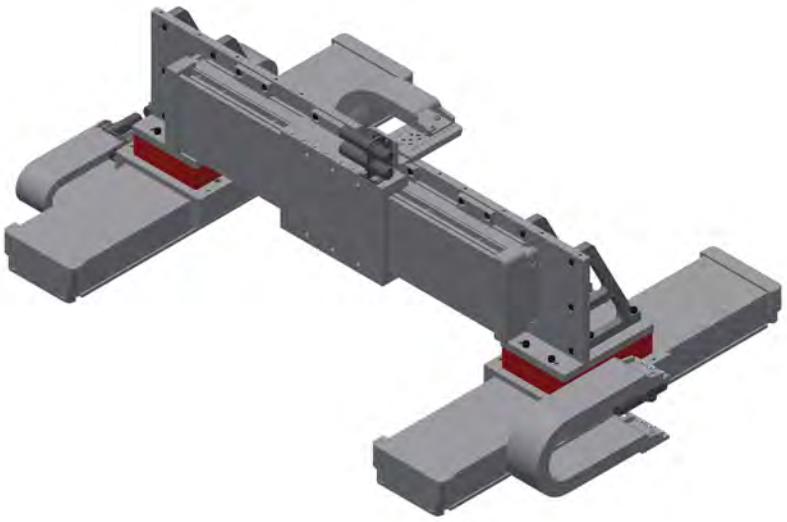
Three-axis X-X-Y system

XLM Series Linear Motor Stages

XLM Modular Connectivity for Multi-Axis Systems



X-Z configuration using open version XLM and Parker 404XR stage on universal Z-bracket



Multi-axis system using RTR Modules

XLM Series Linear Motor Stages

Multi-axis Compatibility Table

One of the key features of the XLM series is the capability to build multi-axis systems by coupling additional XLM or other selected Parker stages. This table indicates which secondary axis and accessories can be mounted to the base XLM axis by size, enclosure style, and motor type.

			Second Axis (Y)										
			XLM125 and Accessories			XLM145 and Accessories				XML200 and Accessories			
			XLM125 (Base Holes) (XY Only)	Toe Clamps (XY Only)	Gantry Brackets	XLM145 (Base Holes) (XY Only)	Toe Clamps (XY Only)	Z-Brackets	Gantry Brackets	XLM200 (Base Holes) (XY Only)	Toe Clamps (XY Only)	Z-Brackets	Gantry Brackets
Base Axis (X)	XLM125	SA/CA			✓			✓					
		SB/CB	✓	✓									
		SC/CC											
		UA	✓	✓	✓			✓					
		UB											
	XLM145	SA/CA			✓			✓	✓				
		SB/CB	✓	✓		✓	✓						
		SC/CC											
		UA	✓	✓	✓	✓	✓	✓	✓				
		UB											
	XLM200	SA/CA			✓				✓			✓	✓
		SB/CB				✓	✓			✓	✓		
		SC/CC		✓									
		UA			✓	✓	✓		✓	✓	✓	✓	✓
		UB	✓										

How to use the compatibility chart:
Select the size and style of the base axis (X) from leftmost column.
Items with check marks can be mounted to the base axis selected to add a second (Y) axis.

XLM Series Linear Motor Stages

Multi-axis Compatibility Table

One of the key features of the XLM series is the capability to build multi-axis systems by coupling additional XLM or other selected Parker stages. This table indicates which secondary axis and accessories can be mounted to the base XLM axis by size, enclosure style, and motor type.

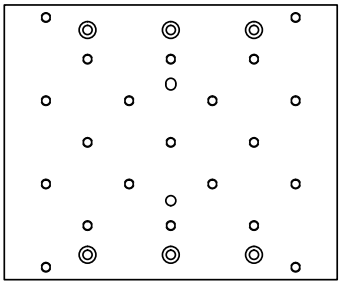
			Second Axis (Y)											
				RTR Modules			XE Series			XR Series			mSR	mPR
			Customer "X" Pattern	RTR 125	RTR 145	RTR 200	402XE Center Mounting Holes (XY Only)	403XE Center Mounting Holes (XY Only)	Z-Brackets	404XR Toe Clamps	406XR Toe Clamps	Z-Brackets	mSR100 Base Holes	mPR100
Base Axis (X)	XLM125	SA/CA	✓	✓					✓			✓		
		SB/CB												
		SC/CC					✓	✓		✓	✓		✓	✓
		UA	✓	✓					✓			✓		
		UB					✓	✓		✓			✓	✓
	XLM145	SA/CA	✓	✓	✓				✓			✓		
		SB/CB												
		SC/CC					✓	✓		✓	✓		✓	✓
		UA	✓	✓	✓				✓			✓		
		UB					✓	✓		✓	✓		✓	✓
	XLM200	SA/CA	✓	✓	✓	✓								
		SB/CB												
		SC/CC						✓		✓	✓			✓
		UA	✓	✓	✓	✓								
		UB						✓		✓	✓			✓

How to use the compatibility chart:
Select the size and style of the base (X) axis from leftmost column.
Items with check marks can be mounted to the base axis selected to add a second (Y) axis.

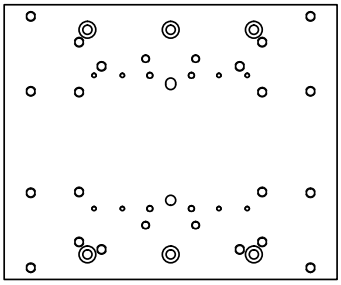
XLM Series Linear Motor Stages

Carriage Options

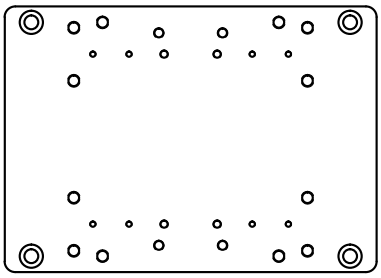
A number of standard and optional carriage choices are available for each XLM size. Carriages are available with standard “X” pattern holes to accomodate XLM Z-brackets, toe clamps, or RT/R adapters, with base holes for additional XLMs in a multi-axis configuration, and with hole patterns for other Parker positioners. These include,the mSR100 and mPR100, the 402/403XE, and 404/406XR, some examples of which are shown below.



X Pattern



XE/XR Pattern



mSR/mPR Pattern

Easily couple the XLM with these Parker positioners:

XE Series Positioner

XR Series Positioner

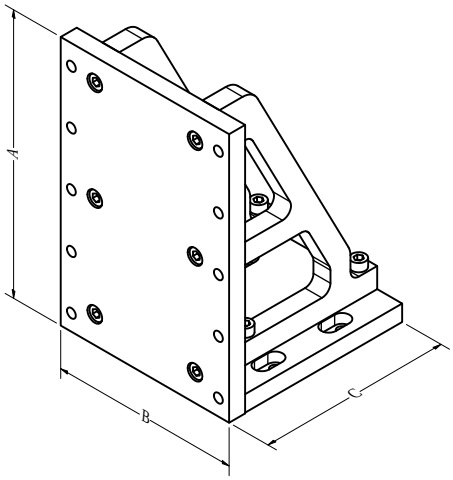
mPR100 Rotary Positioner

mSR100 Miniature Positioner

XLM Series Linear Motor Stages

XLM Accessories - Z-Brackets

Multiple styles of Z-Brackets are available for additional flexibility of carriage configuration or building multi-axis systems. The brackets can mount at 3, 6, 9, and 12 o'clock positions, and can mount directly to XLM125 and XLM145 open, closed, and sealed versions. Z-Brackets can accept Parker 401XE, 402XE, 403XE, 404XE, and 404XR stages. See tables on pages 34 and 35 for compatibility.



Part #	A (mm)	B (mm)	C (mm)	X Axis	Z Axis
002-4280-02	187	126	130	XLM125, XLM145	404XR, 404XE
002-4280-03					401XE, 402XE, 403XE
002-4280-12	337	126	130	XLM125, XLM145	404XR, 404XE
002-4280-13					401XE, 402XE, 403XE
002-4281-02	187	187	202	XLM200	404XR, 404XE
002-4281-03					406XR
002-4281-12	337	187	202	XLM200	404XR, 404XE
002-4281-13					406XR

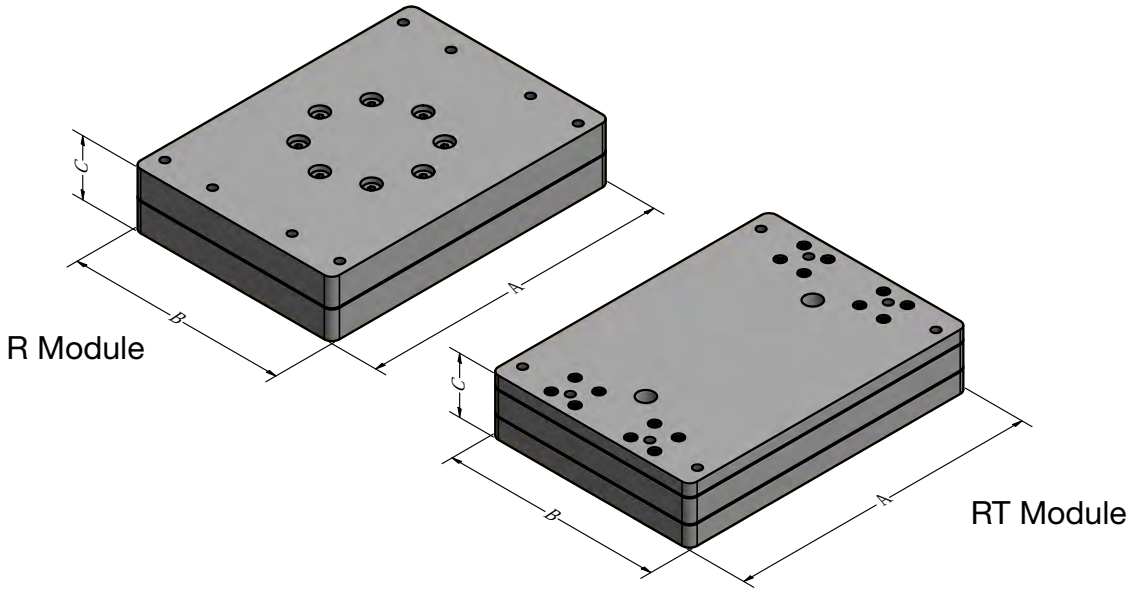
Note: Z-Brackets can be mounted every 90 degrees on X axis. All brackets include mounting hardware.

002-4280-03 and 002-4280-13 also include adjustable adapter plate to mount to XE.

XLM Series Linear Motor Stages

XLM Accessories - RTR Modules

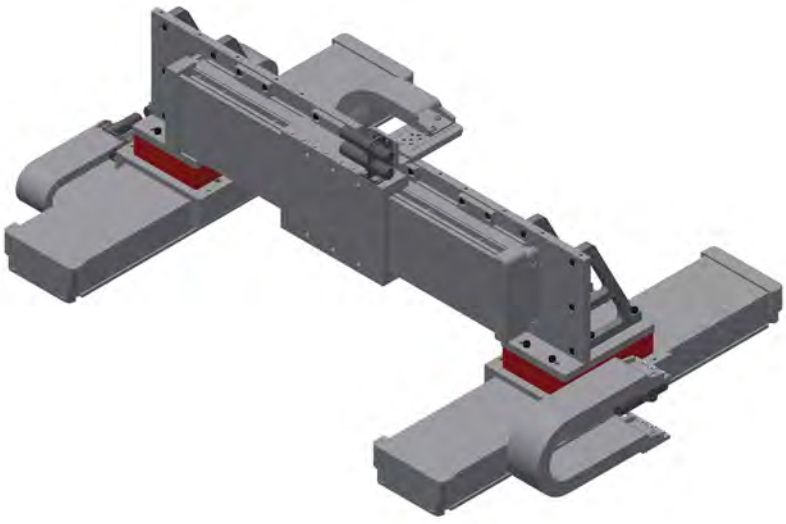
These accessory assemblies are used to mechanically couple multiple XLM units and allow for flexibility in the geometry of the system. The “R” module allows for rotation between axes, while the “RT” incorporates both rotation and translation. Compatibliity of the RTR modules is shown in the table below.



RTR Size	Part #	A (mm)	B (mm)	C (mm)	Angular Travel (deg)	Mounts onto	XLMs that mount onto RTR
125	002-4214-01	175	125	35	7.5	XLM125, 145, 200	XLM125
145	002-4234-01	225	145	40	7.5	XLM145, 200	XLM145
200	002-4254-01	245	200	60	6.25	XLM200	XLM200

RT Module

R Module

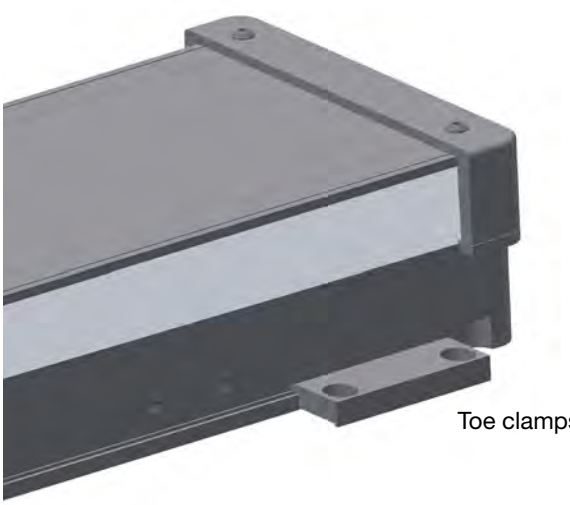


Multi-axis X-X-Y system using RTR Modules

XLM Series Linear Motor Stages

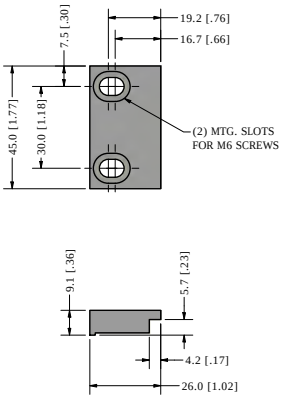
XLM Accessories - Toe Clamps

A range of Toe Clamps can be used to connect multiple XLM units together to create a multi-axis system. They are also recommended for covered and sealed versions to eliminate the need to open the unit for mounting. All hardware is included with Toe Clamps.



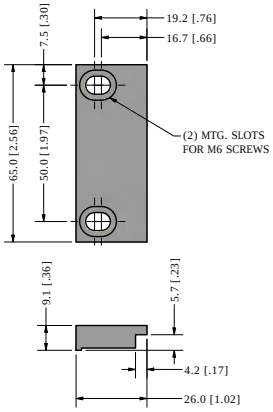
Toe clamps fit into slots in base of XLM.

XLM125 & 145
002-4283-01



USE WHEN:
MOUNTING XLM125 & 145 Y AXIS TO
XLM125 & 145 OPEN VERSION X AXIS

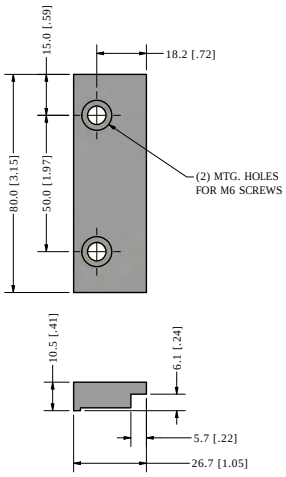
XLM125 & 145
002-4283-10



USE WHEN:
MOUNTING XLM125 & 145 Y AXIS TO
XLM125 & 145 SEALED/COVERED VERSION X AXIS

MOUNTING ALL XLM125 & 145 X AXIS

XLM200
002-4283-20



USE WHEN:
ALL VERSIONS OF XLM200

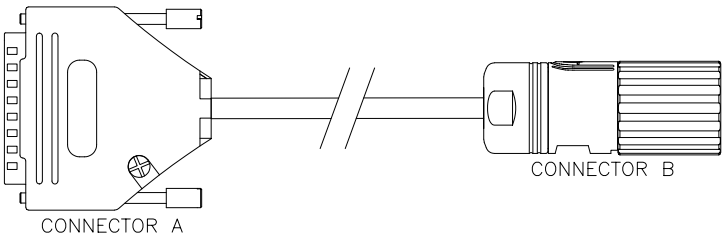
It is recommended that a toe clamp be installed every other base mounting hole.

XLM Series Linear Motor Stages

XLM Feedback Extension Cable Specifications

Type **C3** **C4** **C5** **C6**

006-2862-03.00
006-2862-05.00
Digital Encoder (E1, E2, E3)
or Absolute Encoder (R1, R2, R3, R4)



Connector A

Male 25 Pin D-SUB	
Function	**Pin #**
24VDC PNP Supply	1
Reserved	2
LIMIT- PNP-NC (Digital only)	3
LIMIT+ PNP-NC (Digital only)	4
+5 Volts DC	5
Reserved	6
A+ /MA+	7
A- / MA-	8
B+	9
B-	10
Z+ / SLO+	11
Z- / SLO-	12
CAL (Digital only)	13
Reserved	14
LIMIT- NPN-NC (Digital only)	15
LIMIT+ NPN-NC (Digital only)	16
GND Encoder/Halls	17
GND NPN / PNP	18
TEMP+	19
TEMP-	20
HALL 1	21
HALL 2	22
HALL 3	23
Reserved	24
Reserved	25
SHLD	SHLD

Connector B

17 Pin Series 617 Connector	
Function	**Pin #**
+5 Volts DC	1
GND	2
A+ /MA+	3
A- / MA-	4
B+	5
B-	6
Z+ / SLO+	7
Z- / SLO-	8
LIMIT+ (Digital only)	9
LIMIT- (Digital only)	10
Reserved	11
CAL	12
HALL 1	13
HALL 2	14
HALL 3	15
TEMP+	16
TEMP-	17
SHLD	SHLD

XLM Feedback Extension Cables Electrical Specifications

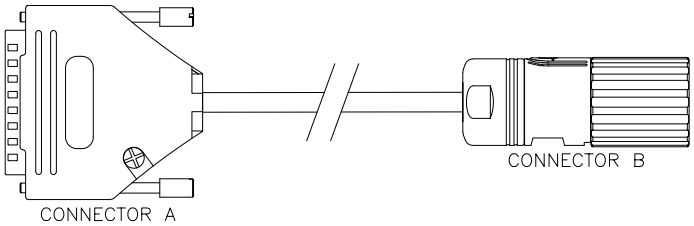
Description	Specification
+5VDC Supply Voltage	+/-5% with a maximum current of 300mA (Encoder Dependent)
PNP 24VDC Supply Voltage	+5% / -20% with a maximum current of 100mA
NPN Output	Normally Closed, Current Sinking, Open Collector +5 to +24 VDC, 20mA Max
PNP Output	Normally Closed, Current Sourcing, 20mA Max
Hall Output	See Phase-Hall Alignment Diagrams

XLM Series Linear Motor Stages

XLM Feedback Extension Cable Specifications

Type **C3** **C4** **C5** **C6**

006-2863-03.00
006-2863-05.00
Analog Encoder (SC)



Connector A

Male 25 Pin D-SUB	
Function	**Pin #**
24VDC PNP Supply	1
Reserved	2
LIMIT- PNP-NC	3
LIMIT+ PNP-NC	4
+5 Volts DC	5
Reserved	6
SIN+	7
SIN-	8
COS+	9
COS-	10
Z+	11
Z-	12
CAL	13
Reserved	14
LIMIT- NPN-NC	15
LIMIT+ NPN-NC	16
GND Encoder/Halls	17
GND NPN / PNP	18
TEMP+	19
TEMP-	20
HALL 1	21
HALL 2	22
HALL 3	23
SETUP	24
Reserved	25
SHLD	SHLD

Connector B

17 Pin Series 617 Connector	
Function	**Pin #**
+5 Volts DC	1
GND	2
SIN+	3
SIN-	4
COS+	5
COS-	6
Z+	7
Z-	8
LIMIT+	9
LIMIT-	10
SETUP	11
CAL	12
HALL 1	13
HALL 2	14
HALL 3	15
TEMP+	16
TEMP-	17
SHLD	SHLD

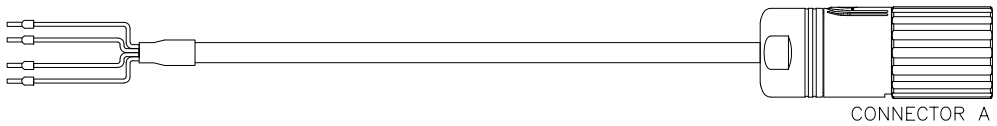
XLM Feedback Extension Cables Electrical Specifications

Description	Specification
+5VDC Supply Voltage	+/-5% with a maximum current of 300mA (Encoder Dependent)
PNP 24VDC Supply Voltage	+5% / -20% with a maximum current of 100mA
NPN Output	Normally Closed, Current Sinking, Open Collector +5 to +24 VDC, 20mA Max
PNP Output	Normally Closed, Current Sourcing, 20mA Max
Hall Output	See Phase-Hall Alignment Diagrams

XLM Series Linear Motor Stages

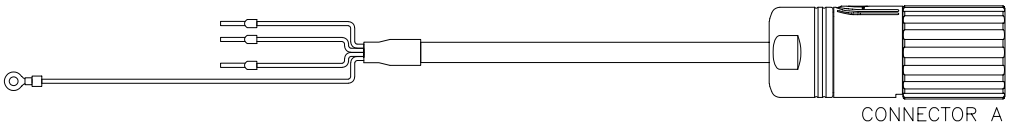
XLM Cable Specifications - Type C3 C4 C5 C6

006-2865-03.00
006-2865-05.00 - XLM Power Extension Cable, Flying Leads, Universal



C3 C4

006-2877-03.00
006-2877-05.00 - XLM Power Extension Cable, Flying Leads, P Series Drive

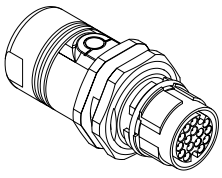


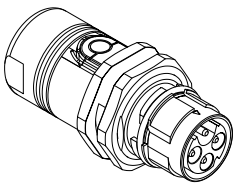
C5 C6

4-Position Series 917 Connector A			
Function	**AWG**	**Color**	**Pin #**
U*	20	Red/Yellow	1
V*	20	Brown/Yellow	2
W	20	Orange/Yellow	3
GND	20	Green/Yellow	E
Shield	Shield	Shield	Case

*For R3/R4 options U = Brown/Yellow, V = Red/Yellow

XLM Table Side Connector Pinouts C3 C4 C5 C6





Motor Power Connector

4 Position Series 917 Connector	
Function	**Pin #**
U	1
V	2
W	3
PE GND	E
SHLD	SHLD

Motor Feedback: Digital & Absolute

17 Pin Series 617 Connector	
Function	**Pin #**
+5 Volts DC	1
GND	2
A+ / MA+	3
A- / MA-	4
B+	5
B-	6
Z+ / SLO+	7
Z- / SLO-	8
LIMIT+ (Digital only)	9
LIMIT- (Digital only)	10
Reserved	11
CAL	12
HALL 1	13
HALL 2	14
HALL 3	15
TEMP+	16
TEMP-	17
SHLD	SHLD

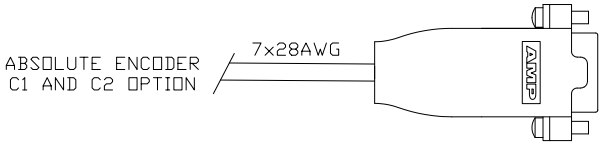
Motor Feedback: Analog

17 Pin Series 617 Connector	
Function	**Pin #**
+5 Volts DC	1
GND	2
SIN+	3
SIN-	4
COS+	5
COS-	6
Z+	7
Z-	8
LIMIT+	9
LIMIT-	10
SETUP	11
CAL	12
HALL 1	13
HALL 2	14
HALL 3	15
TEMP+	16
TEMP-	17
SHLD	SHLD

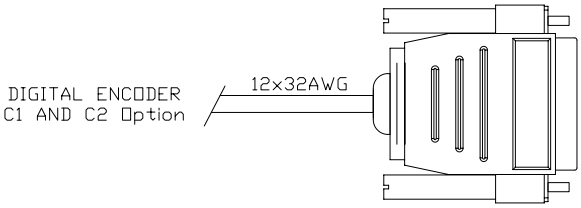
XLM Series Linear Motor Stages

XLM Feedback Cable Specifications - Type C1 C2

XLM C1, C2 OPTIONS
ABSOLUTE ENCODER PINOUT



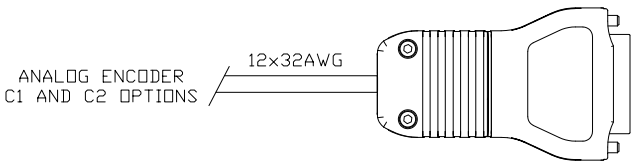
XLM C1, C2 OPTIONS
DIGITAL ENCODER PINOUT



Absolute Encoder with 9-Pin Male D-SUB			
Function	**AWG**	**Color**	**Pin #**
5VDC	28	Brown	4, 5
0V	28	White	8
0V	28	Green	9
MA+	28	Violet	2
MA-	28	Yellow	3
SLO+	28	Gray	6
SLO-	28	Pink	7
Inner Shield		Shield	1
Outer Shield		Shield	Case

Digital Encoder with 15-Pin Male D-SUB			
Function	**AWG**	**Color**	**Pin #**
5VDC	32	Brown	7, 8
0V	32	White	2, 9
A+	32	Red	14
A-	32	Blue	6
B+	32	Yellow	13
B-	32	Green	5
Z+	32	Voilet	12
Z-	32	Gray	4
Limit+	32	Pink	11
Limit-	32	Black	10
E	32	Orange	3
CAL	32	Clear	1
SHLD		SHLD	Case

XLM C1, C2 CABLES – ANALOG ENCODER PINOUT

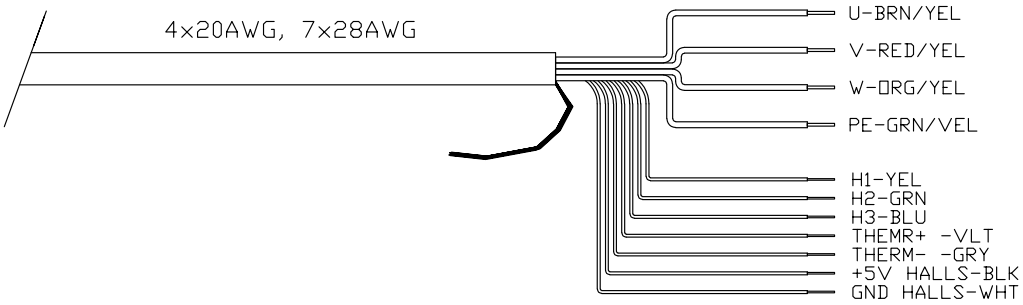


Analog Encoder with 15-Pin Male D-SUB			
Function	**AWG**	**Color**	**Pin #**
5 VDC	32	Brown	4, 5
0V	32	White	12, 13
SIN+	32	Red	9
SIN-	32	Blue	1
COS+	32	Yellow	10
COS-	32	Green	2
Z+	32	Violet	3
Z-	32	Gray	11
LIMIT+	32	Pink	7
LIMIT-	32	Black	8
CAL	32	Orange	14
SETUP	32	Clear	6
Inner Shield		Shield	
Outer Shield		Shield	Case

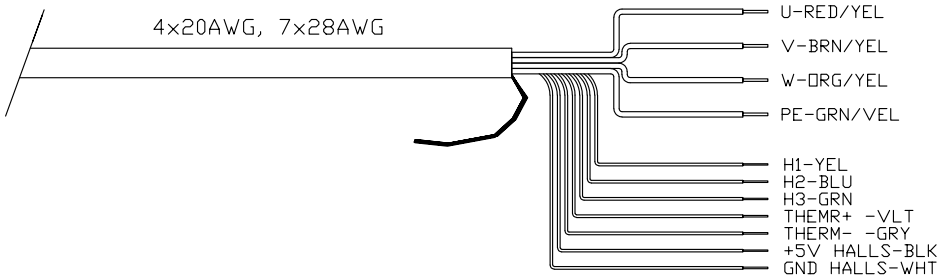
XLM Series Linear Motor Stages

XLM Motor Cable Specifications - Type C1 C2

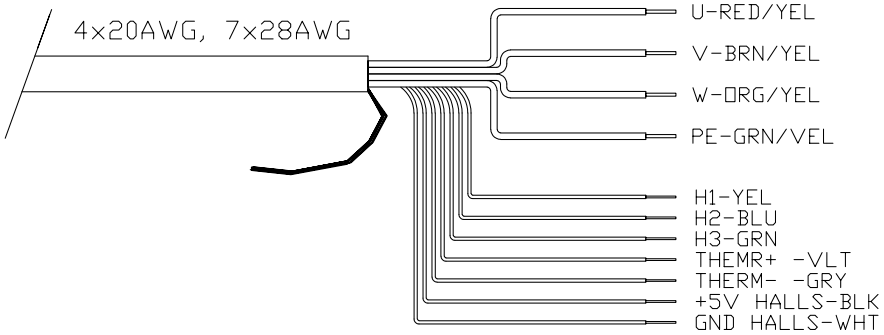
XLM125 P2 AND XLM200 P3 & P4 - R3 & R4 Options - MOTOR/HALLS/TEMP



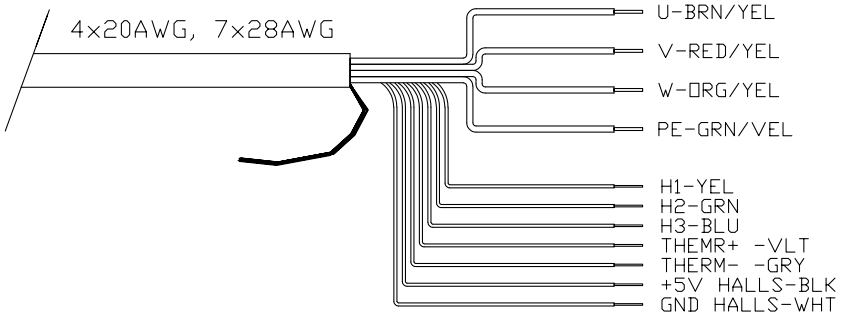
XLM125 P2 AND XLM200 P3 & P4 - E1, E2, E3, SC, R1 & R2 Options - MOTOR/HALLS/TEMP



XLM145 P3 & P4 - R3 & R4 Options - MOTOR/HALLS/TEMP



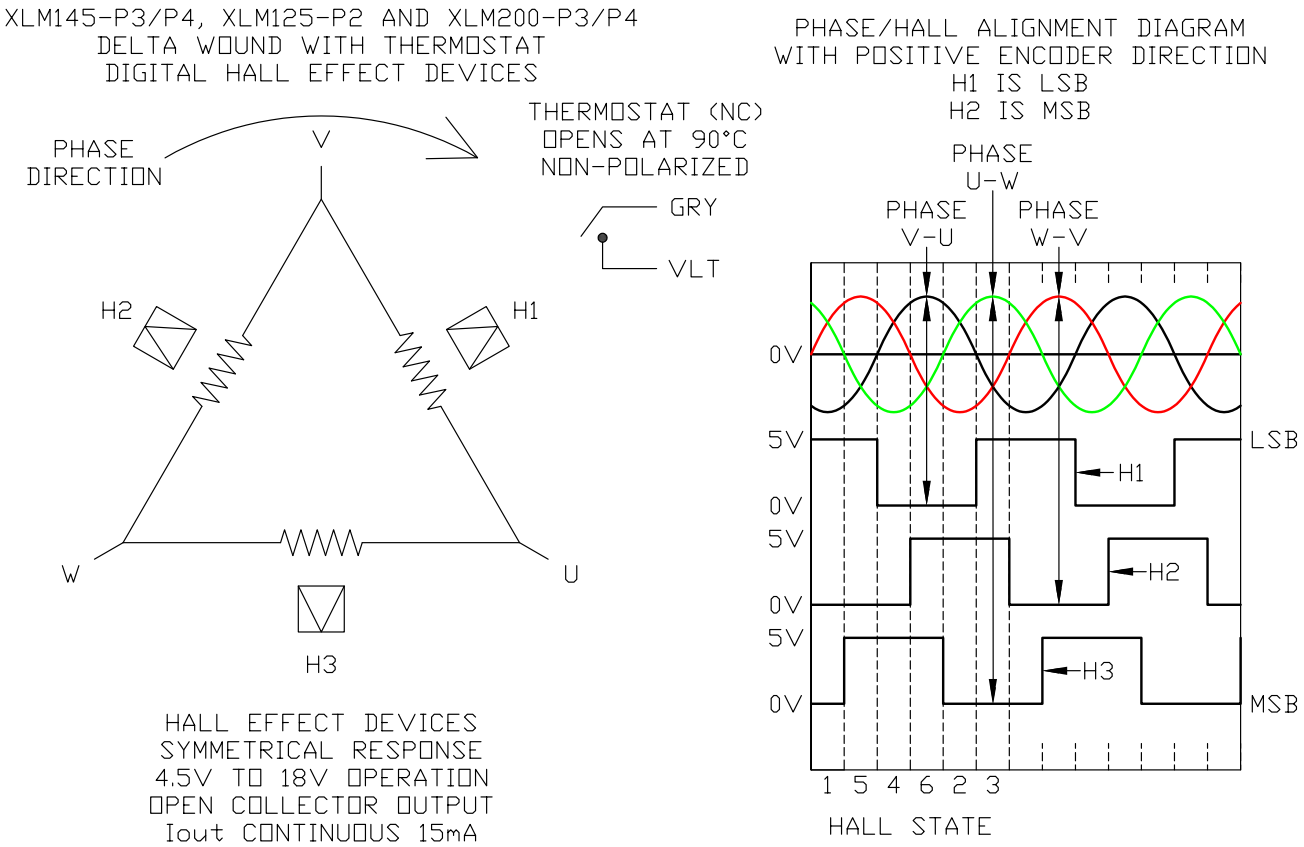
XLM145 P3 & P4 - E1, E2, E3, SC, R1 & R2 Options - MOTOR/HALLS/TEMP



XLM Series Linear Motor Stages

XLM Cable Specifications

PHASE-HALL ALIGNMENT DIAGRAM

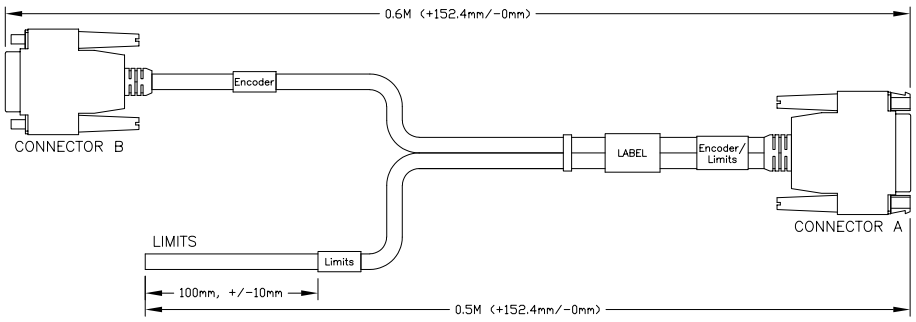


FOR R3 & R4 OPTIONS THE ENCODER DIRECTION IS NEGATIVE

XLM Series Linear Motor Stages

XLM Adaptor Cables - ACR7xV and IPA Drives

006-2866-01 - XLM to ACR7xV/IPA Adaptor Cable, Digital (E1, E2, E3) or Analog Encoder (SC)



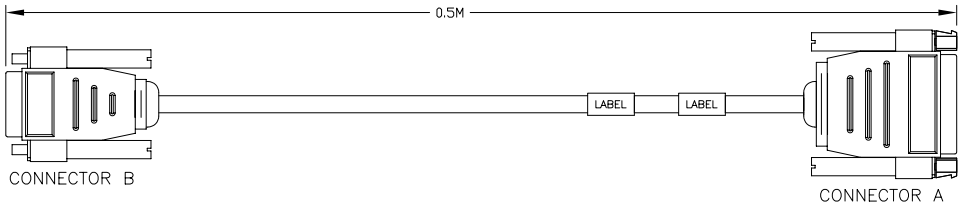
To be used with C3 C4

CONNECTOR B - Male 15 Pin HD-SUB	
ACR7xV/IPA	
Function	**Pin #**
Z+	1
Z-	2
GND Encoder/Halls	3
+5V	5
TEMP-	6
A-/SIN-	7
A+/SIN+	8
HALL 1	9
TEMP+	10
B-/COS-	11
B+/COS+	12
HALL 2	13
HALL 3	14
SHIELD	SHIELD

LIMITS	
Function	**Color**
24VDC PNP Supply	Red
RESERVED	Blue
LIMIT- PNP-N. C.	Brown
LIMIT+ PNP-N. C.	Green
RESERVED	Yellow
LIMIT- NPN-N. C.	Gray
LIMIT+ NPN-N. C.	Pink
GND NPN/PNP	White
SHIELD	SHIELD

CONNECTOR A - Female 25 Pin D-SUB	
Encoder/Limits	
Function	**Pin #**
24VDC PNP Supply	1
LIMIT- PNP-N. C.	3
LIMIT+ PNP-N. C.	4
+5V	5
A+/SIN+	7
A-/SIN-	8
B+/COS+	9
B-/COS-	10
Z+	11
Z-	12
LIMIT- NPN-N. C.	15
LIMIT+ NPN-N. C.	16
GND Encoder/Halls	17
GND NPN/PNP	18
TEMP+	19
TEMP-	20
HALL 1	21
HALL 2	22
HALL 3	23
SHIELD	SHIELD

006-2878-01 - XLM to ACR7xV/IPA Adaptor Cable, Absolute Encoder (R1, R2, R3, R4)



To be used with C3 C4

CONNECTOR B - Male 15 Pin HD-SUB		
IPA/ACR7 Absolute Encoder		
Function	**Color**	**Pin #**
SLO+	Green	1
SLO-	Orange	2
GND	White	3
+5V	Brown	5
MA+	Red	9
TEMP+	Yellow	10
MA-	Blue	13
TEMP-	Black	15
SHIELD	SHIELD	SHIELD

CONNECTOR A - Female 25 Pin D-SUB		
Absolute Encoder		
Function	**Color**	**Pin #**
+5V	Brown	5
MA+	Red	7
MA-	Blue	8
SLO+	Green	11
SLO-	Orange	12
GND	White	17
TEMP+	Yellow	19
TEMP-	Black	20
SHIELD	SHIELD	SHIELD

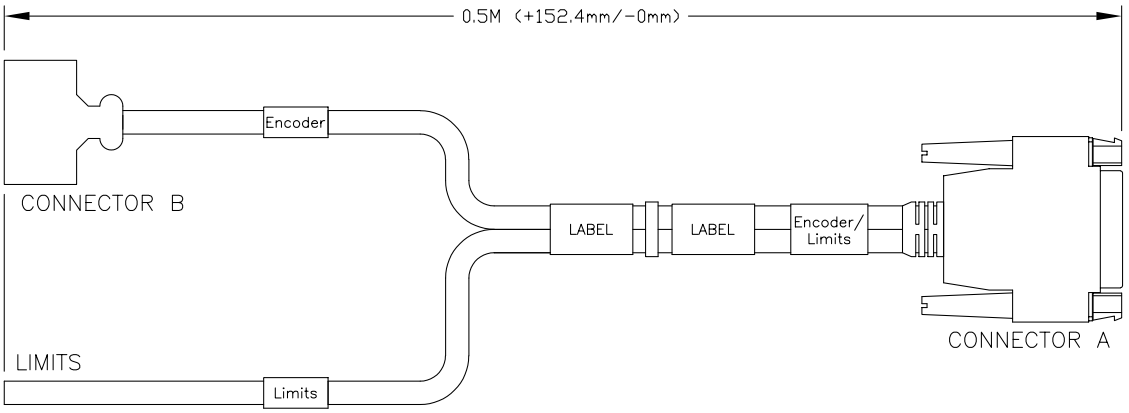
XLM Series Linear Motor Stages

XLM Adaptor Cables - P-Series Drive

006-2867-01 - XLM to P Series Adaptor Cable, Digital Encoder (E1, E2 & E3)

To be used with

C5 C6



P-SERIES DIGITAL ENCODER 006-2867-01	
CONNECTOR B - 14 POS MINI D RIBBON	
Function	**Pin #**
HALL 3	1
HALL 2	3
HALL 1	5
GND	7
Z-	8
Z+	9
B-	10
B+	11
A-	12
A+	13
+5V	14
SHIELD	SHIELD

LIMITS	
Function	**Color**
24VDC PNP Supply	Red
RESERVED	Blue
LIMIT- PNP-N. C.	Brown
LIMIT+ PNP-N. C.	Green
RESERVED	Yellow
LIMIT- NPN-N. C.	Gray
LIMIT+ NPN-N. C.	Pink
GND NPN/PNP	White

P-SERIES ENCODER CONNECTOR A - Female 25 Pin D-SUB	
Encoder/Limits	
Function	**Pin #**
24VDC PNP Supply	1
LIMIT- PNP-N. C.	3
LIMIT+ PNP-N. C.	4
+5V	5
A+/MA+	7
A-/MA-	8
B+	9
B-	10
Z+/ SLO+	11
Z-/ SLO-	12
LIMIT- NPN-N. C.	15
LIMIT+ NPN-N. C.	16
GND Encoder/Halls	17
GND NPN/PNP	18
HALL 1	21
HALL 2	22
HALL 3	23
SHIELD	SHIELD

XLM Series Linear Motor Stages

Drive/Control Solutions

The Intelligent Parker Amplifier or IPA, is an versatile servo drive/controller based on the ACR control platform.

The IPA provides a dual port Ethernet interface which gives the machine builder the flexibility needed to create cost effective motion control solutions.

The IPA operates as a fully programmable stand-alone motion controller with on-board I/O and virtual axis capability or can be integrated into a PLC or PC-based machine control solution.

Software tools are included to optimize motion performance and efficiently monitor and manage the application.

EtherNet/IP gives IPA users a popular connectivity option to PLCs for easy integration of servo motion in larger machine control application. The IPA is an EtherNet/IP adapter device supporting both I/O and Explicit Messaging. Add-On Instructions are available for seamless integration with Logix controllers.

The P-Series drives operate with a variety of machine control architectures and offer sophisticated servo functionality. Accurate and easy to use inertia detection leads to fast set-up of tuning parameters and minimal settling time.

Advanced filtering and gain switching features can be used to increase throughput and improve positioning performance.

For high speed, real-time network applications, the

P-Series is available with, EtherCAT, the fastest growing, most flexible industrial Ethernet protocol. Ideal for use with the Parker Automation Controller, the P-Series also follows the open standards for EtherCAT.

The Pulse version can be configured for step and direction control input and includes analog inputs for torque or velocity control. Select Indexer mode to create up to 64 position table entries triggered via inputs or over a RS422 interface.

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