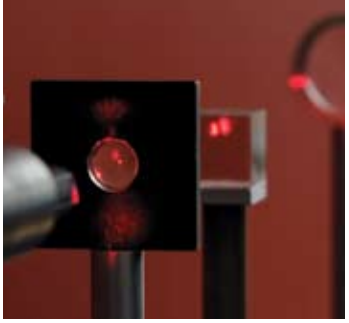
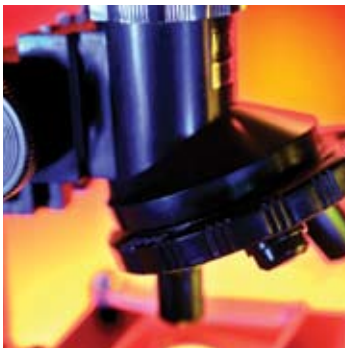


aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Daedal Manually Driven Positioning Slides and Stages

Parker

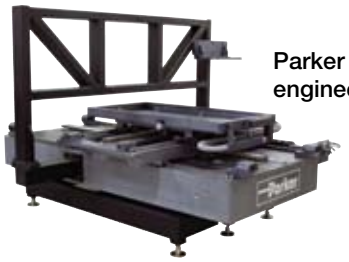
ENGINEERING YOUR SUCCESS.

Parker Hannifin Corporation

A Fortune 300 company with annual sales exceeding $12 billion and more than 400,000 customers in 43 countries, Parker Hannifin is the world's leading supplier of innovative motion control components and system solutions serving the industrial, mobile, and aerospace markets. We are the only manufacturer offering customers a choice of electromechanical, hydraulic, pneumatic, or computer-controlled motion systems.

Total System Solutions

Parker's team of highly qualified application engineers, product development engineers, and system specialists can turn pneumatic, structural, and electromechanical products into an integrated system solution. Moreover, our Selectable Levels of Integration™ allows you to choose the appropriate system, subsystem, or component to meet your specific need.



Parker offers complete engineered systems.

First in Delivery, Distribution, and Support

In today's competitive, fast-moving economy, what good is an application that isn't ready on time? This is especially true when compressed design cycles make the quick delivery of critical components essential. With factories strategically located on five continents, Parker offers an unrivaled delivery record, getting solutions out our door and onto your floor faster than ever.

Parker also has the industry's largest global distribution network, with more than 8,600 distributors worldwide. Each of these locations maintains ample product inventory to keep your downtime to a minimum. And many distributors have in-house design capabilities to support your system and subsystem requirements.

Throughout the design process, Parker's factory-trained electromechanical engineers work hand in hand with you and day or night at 1-800-C-Parker. Our operators will connect you with a live, on-call representative who will identify replacement parts or services for all motion technologies.

Parker world headquarters in Cleveland, Ohio.

Training

Parker's best-in-class technology training includes hands-on classes, Web-based instruction, and comprehensive texts for employees, distributors, and customers. Parker also provides computer-based training, PowerPoint presentations, exams, drafting and simulation software, and trainer stands.

parkermotion.com

Our award-winning Web site is your single source for

- Product information
- Downloadable catalogs
- Motion-sizing software
- 3D design files
- Training materials
- Product-configuration software
- RFQ capabilities
- Videos and application stories

24/7 Emergency Breakdown Support

The Parker product information center is available any time of the day or night at 1-800-C-Parker. Our operators will connect you with a live, on-call representative who will identify replacement parts or services for all motion technologies.

Table of Contents

To find a specific model, refer to the part number index on pages 136-142.

Welcome!

For over forty years, Parker Daedal has been the leader in supplying manual positioners to industries and laboratories around the world. These positioners are utilized for applications that include laser beam directing, fiber optics alignment, assembly fixturing, tooling, microscope specimen positioning, camera focusing, and many others — even experiments in outer space.

- Precision quality
- Budget friendly
- Largest selection
- Easy multi-axis configuration
- No maintenance
- Vacuum preparation and custom options

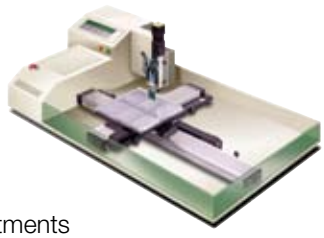
Parker Daedal has thousands of ball slides, crossed roller slides and linear and rotary manual positioning stages. All Parker Daedal slides and stages are precision grade products, offering low friction, accurate, and smooth linear motion.

Parker Daedal free-travel linear slides and precision point-to-point positioners are available in sizes ranging from less than half of an inch wide to 6 inches wide, travels from 1 to 30+ inches, and payload capacities to hundreds of pounds. They are available as single axis units or two and three axis systems — all offered by model number and delivered complete, with no assembly required. Rotary stages are also available for easy configuration of linear/rotary combinations.

Parker Electromechanical Automation offers one of the broadest manual positioning lines in the industry. The following pages of this product guide will help you find the best fit for every application. If you cannot find what you are looking for in these pages, please do not hesitate to call our application team at 724-861-8200. Parker Electromechanical Automation Division has extensive machining and testing capabilities to produce a solution for your application even if it is not shown in the product guide.

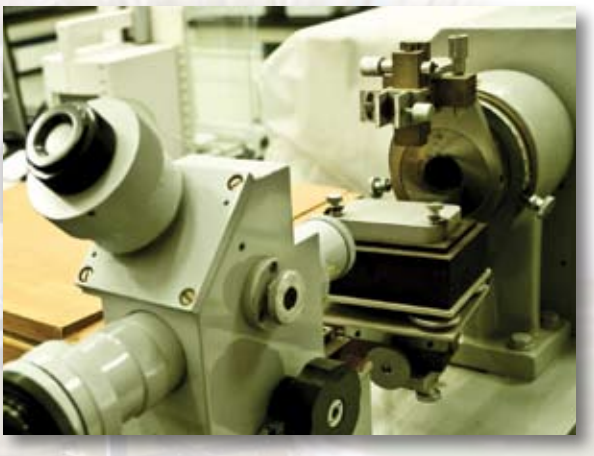
Today's positioning applications demand performance in quality, throughput, productivity and precision. Miniaturization of semiconductor, electronics and life science applications have created the need to partner with companies that have the experience and products to meet stringent specifications for smaller, more precise motion positioning solutions.

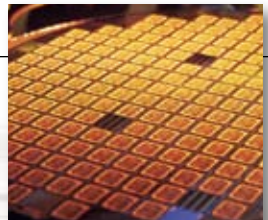
Parker's dedicated electromechanical business leads the way for manual positioning to efficiently assist in many industries including:



- Semiconductor
- Electronics
- Packaging
- Life science
- Medical equipment
- Laboratory research
- Optical inspection & adjustments
- Laser cutting & marking
- Automotive manufacturing and assembly
- Printing
- Material handling
- Military applications

Since 1969 Parker has been producing these precision slides in Pennsylvania. These slides are precision grade products, offering low friction, accurate, and smooth linear motion. The stages offer digital micrometers, imperial and metric micrometers, knobs, cranks, hand wheels, and fine lead screws for drives. Each of these precision machined assemblies is offered with either cross roller bearings for high load capacities or caged ball bearings for smooth motion.





Customization and Services

Parker has a Custom Systems Group staffed by experienced engineers and technicians who utilize systematic processes for handling component modifications or complete one-of-a-kind systems.

The System is the Product

Many of the components shown in this catalog are modified specifically to customer request and need. Parker system customers can receive many optional services such as:

- 3-D custom assembly drawings
- Electronics integration
- Finite element analysis
- Life load testing
- Integration with the breadth of Parker product

Our advanced manufacturing and assembly process allows us to build quality and consistency into every element of your motion system. Each mechanical system is fully assembled prior to shipment and each component is properly handled to protect finish and appearance. Performance and specifications are verified with state-of-the-art testing, including:

Cleanroom Testing

Parker is equipped with particulate testing to certify materials for cleanroom ratings.

EMI Testing

Parker has an EMI test chamber, which allows us to test equipment to verify levels of electromagnetic interference.

Precision Metrology Lab

When precision is critical to your process, you need validated, proven performance data. Parker certifies all precision-grade positioners using state-of-the-art laser interferometers, and provides reports to validate accuracy and bidirectional repeatability.

24/7 Emergency Breakdown Referrals

The Parker product information center at 800-C-PARKER offers live operators 24/7 to help identify replacement parts or services.

Parker Automation Technology Centers

Parker Automation Technology Centers are a network of premier product and service providers who can serve you locally for your automation needs. Each Automation Technology Center is certified to have completed significant product training and has the ability to provide subsystem solutions with local support.

Industry's Best Lead Times

#1 rated, industry-leading, on-time delivery to customer-requested ship dates. For more than 3 years and over 100 thousand manual products, we have delivered 100% on-time to our agreed upon customer request delivery date for the Parker manual slide and stage product lines.

www.parkermotion.com

The Parker Electromechanical Automation site offers the most extensive online support tools in the industry, including:

- Complete online catalog
- FAQ database with more than 500 answers to common questions
- Interactive product sizing and selection tool
- Comprehensive CAD drawings and 3-D models for electronic and mechanical products
- User guides and detailed product specifications
- Latest software and firmware revisions
- Application case studies and videos
- Custom solutions photo library
- Innovative technology white papers

One-on-One with a Motion Control Expert

Toll-Free Applications Engineering Assistance

When you have urgent questions, expert answers are only a phone call away. Our team of experienced engineers is ready to take your call. These engineers have practical field experience and can provide you with application and product assistance throughout the stages of your project and for the life of the product. For presale support, including sizing and selecting systems, call 800-245-6903 (724-861-8200 outside the US). For post-sale support with technical questions on programming and troubleshooting, call 800-358-9070 (707-584-7558 outside the US). Our staffing and support tools allow us to resolve most issues and get your project rolling in less than one hour.

Parker Products and Technologies

Whether using one component or an entire system, Parker has the right solution. In addition to the Parker manual positioning slides and stages, Parker Electromechanical Automation Division offers a vast array of motion and control products including:

To request a catalog or for complete on-line information, go to www.parkermotion.com

HMI (Human-Machine Interface)

Catalog #8500

Parker offers HMI solutions for any application from simple pushbutton replacement to sophisticated networking, multimedia and data logging requirements. Parker pre-loads Interact or InteractX HMI software on PowerStation industrial computers to provide a ready-to-go HMI solution. This bundled approach reduces development and integration time for your HMI project.

Motion Controllers

Catalog #8500

Parker motion controllers are powerful designs that have the processing power to coordinate multiple axes of motion. Parker controllers have advanced features built in, such as kinematics transformation for the control of robots and other non-linear functions. Each Parker controller comes with free libraries for Visual Basic® and Visual C++®.

Drives

Catalog #8500

Parker drives are digital designs that deliver a maximum amount of power output and performance in minimal package size. These drives have industry-leading power density and smart digital designs with features to ease integration and start-up.

Motors

Catalog #8500

Using advanced technologies, Parker rotary motors provide maximum performance and value. Our exposed-lamination designs provide maximum torque per package size, and the motor designs provide cog-free rotary motion for the best low-speed smoothness. Patented linear motor designs provide the greatest winding uniformity and accuracy in the industry, and range from the smallest linear motor on the market to the largest force capacity.

Gearheads

Catalog #1810

High-precision designs, Parker gearheads have less than three arc-min of backlash. They have an industry-leading two-year warranty.

Positioning Tables

Catalog #8092

Parker multi-axis positioning tables integrate linear motors or ground ballscrews. The designs combine the low cost of extruded aluminum with machined bases allowing "out of the box" submicron precision. Our positioning tables are modular designs that easily accommodate flexible configurations such as XY and XYZ.

Actuators

Catalog #AU03 1894-2/US

Parker actuators are modular single-axis actuators that can be easily configured in multi-axis systems. These actuators are screw- or belt-driven and give the designer a great deal of flexibility to apply the right actuator technology to meet the application needs for accuracy, speed and distance.

End Effectors

Catalog #0900P-4

With the broadest range of automation products in the industry, Parker provides pneumatic grippers, rotary actuators and vacuum components for a wide range of applications.

Structural Framing

Catalog #1816-2

Parker Industrial Profile Systems provide full engineering, fabrication and assembly for any structural design. We provide the profiles, fasteners and accessories to complete any system. The only limitation is your imagination.

I/O

Catalog #8500

The Parker I/O system is a modular and flexible remote I/O system designed to work with today's common fieldbuses. The modular design of the Parker I/O allows the user to choose the number and type of I/O points that best suit each application.

Systems

Catalog #8092

Parker's systems combine the breadth of our motion control solutions into XY systems, Cartesian robots, gantry systems, or completely custom configurations.

Parker Selectable Levels of Integration™

Parker's Selectable Levels of Integration™ is a philosophy of product development and management that allows the machine builder to select an appropriate system, subsystem, or component to meet a specific need.

Parker has solutions for machine builders of all types, from those who want a complete integrated system to those who want to build their own system from "best of breed" components.

Systems

Machine builders and OEMs often choose to integrate more than a manual slide or stage into their machine. They have confidence in knowing that our knowledge, experience, and support will ensure that their goals are met. Minimal design engineering ensures component compatibility from a single source.

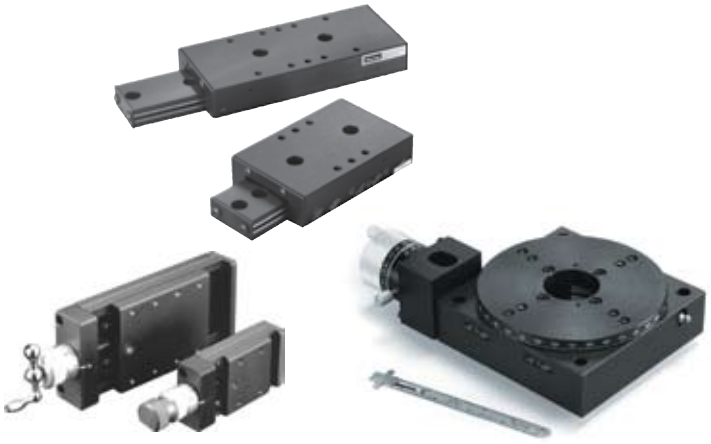
Subsystems and Bundled Products

For a cost-effective and efficient solution, Parker offers bundled or kitted systems. We offer multi-axis solutions to deliver a configured subsystem ready for installation. If electromechanical motion is included, Parker configuration and setup software accommodates the rest of the product line, making start-up a snap. Combining this with our custom product modification capabilities gives the machine builder an economical custom-fit solution, with reduced engineering effort, straightforward integration, and modular compatibility.

Component Products

Parker Daedal has thousands of ball slides, cross roller slides and linear and rotary manual positioning stages. If you have the capability and experience to develop your own systems, our innovative, easy-to-use products will help you get the job done. Parker provides short lead times, large selection, and proven reliability. All Parker Daedal slides and stages are precision machined and easy to install.

Please review the next several pages for a technical overview of our manual product line.



Visit our Website

Complete up-to-date technical assistance can be found on the web at www.parkermotion.com. This includes all the latest information on current products, new product introductions, local assistance and support, plus a comprehensive “Engineering Reference Library.”

- Complete product catalogs
- Product selection wizards
- Performance charts and graphs
- Engineering data and calculations
- CAD drawings
- Local service and support directory
- On-line purchasing
- Application stories and videos

Using our Catalog

This catalog is divided into several sections based on primary distinguishing characteristics such as drive technology, degree of precision, travel range, and load capacity. A brief overview and selection is provided on the following pages.

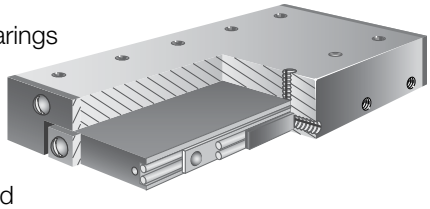
If you don’t find exactly what you are looking for, please contact us for information on other suitable Daedal and Parker products.

Manual Slides Overview

Ball Bearing Slides

Pages 13-34

Parker Daedal ball slides are mechanically simple linear bearings, which are designed and assembled to provide exceptional smoothness and linear straight line accuracy. This is achieved by the ball and rod linear bearing design.



The ball and rod bearings on Parker Daedal ball slides consist of two rows of hardened steel balls, each preloaded between four hardened ground steel rods. This design provides ultra-smooth, extremely low-friction motion by reducing the contact area between the balls and the ways. Additionally this design provides extremely good straight line and flatness accuracy. All Parker Daedal ball bearing slides incorporate 440C hardened stainless steel ball and rods to ensure corrosion resistance and long life.

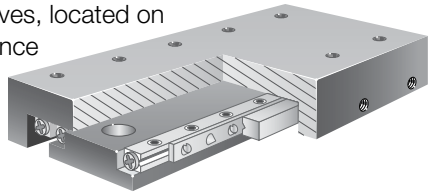
Both the top and base aluminum mounting surfaces are precision machined to ensure flatness. Most models are available in both Imperial and metric mounting configurations.

Ball slides are functionally much more reliable than simple dovetail slides, since there is no direct sliding contact of the top and bottom members. Ball slides eliminate the rapid wear problems, regular lubrication requirements, and “stiction” (skipping and jumping caused by the increased force needed to initiate movement) characteristic of dovetail slides.

Crossed Roller Slides

Pages 35-60

Crossed roller slides are very similar to ball slides, except the ball and rod linear bearing is replaced with a crossed roller slide bearing system composed of two rows of rollers. Each roller is alternately crossed at 90° with the next and captured in “V” grooves, located on the base and top. Since rollers provide a larger (line) contact surface than ball bearings, a crossed roller slide has higher load carrying capability than a ball slide of comparable size. These changes also significantly increase the stiffness by increasing the contact area of each bearing.



Crossed roller slides are preloaded during the manufacturing process to eliminate any side play and to provide a uniform coefficient of friction. Like the ball slide, the crossed roller slide is not suggested for use in shock load applications.

The crossed roller slide top and base are designed the same as ball bearing slide. Crossed roller slides are constructed of corrosion-resistant black anodized aluminum and high carbon steel. These building materials provide optimized stiffness and thermal stability without excessive mass. Members are precision machined to assure flatness and parallelism for both top and bottom mounting surfaces. Crossed roller slides are available in imperial and metric mounting configurations depending on model selection.

Functional Comparison

	Smoothness	Friction	Straightness/ Flatness Accuracy	Load Capacity
Ball Bearing Slide	Exceptional	Extremely Low	Very Good	Moderate
Crossed Roller Slide	Very Good	Very Low	Very Good	High

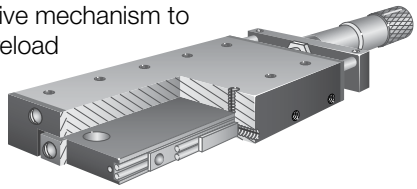
				Ball Bearing Slides					Crossed Roller Slides				
	Width	Travel		Normal Load		Mounting			Normal Load		Mounting		
Series	in (mm)	in	(mm)	lbs	(kg)	Imperial	Metric	Page	lbs	(kg)	Imperial	Metric	Page
3500 3900	≤1.25 (≤31,8)	0.5	(12,7)	4.9	(2,2)	•		16					
				5.0	(2,3)	•		17					
				17.0	(7,6)	•		18					
				6.0	(2,7)	•	•	20					
		0.75	(19,1)	14.6	(6,6)	•		19					
		1.00	(25,4)	10.3	(4,6)	•		16-17					
				29.0	(13,1)	•		18					
		1.50	(38,1)	24.3	(11,0)	•		19					
		2.00	(50,8)	14.0	(6,3)	•		16-17					
				36.0	(16,3)	•		18-19					
		3.00	(76,2)	23.0	(10,3)	•		16-17					
				43.0	(19,5)	•		19					
		4.00	(101,6)	56.0	(25,4)	•		19					
SW038	1.496 (38,0)	0.98	(25)						175	(97)		•	39
		1.97	(50)						263	(119)		•	39
		2.95	(75)						351	(159)		•	39
		3.94	(100)						439	(199)		•	39
		4.92	(125)						528	(239)		•	39
		5.91	(150)						614	(278)		•	39
		7.87	(200)						789	(358)		•	39
4000 4100 4200 4300	1.75 (44,5)	1.00	(25,4)	25	(11)	•	•	21	81	(36)	•		40
				28	(13)	•	•	22	81	(36)	•		41
		2.00	(50,8)	40	(18)	•	•	22	121	(54)	•		41
		3.00	(76,2)	55	(25)	•	•	22	131	(59)	•		41
SE050 SP050	1.97 (50,0)	0.98	(25)						175	(80)		•	42-43
		1.97	(50)						263	(119)		•	42-43
		2.95	(75)						351	(159)		•	42-43
		3.94	(100)						439	(199)		•	42
		4.92	(125)						526	(239)		•	42
		5.91	(150)						614	(278)		•	42
		6.89	(200)						789	(358)		•	42
4500 4600 4700 4800	2.62 (66,5)	1.0	(25,4)	62	(28)	•	•	23	111	(50)	•		44
		2.0	(50,8)	88	(40)	•	•	24	151	(69)	•		45
		3.0	(76,2)	106	(48)	•	•	24	201	(91)	•		45
		4.0	(101,6)	123	(56)	•	•	24	252	(114)	•		45
		6.0	(152,4)	154	(70)	•		25					
		9.0	(228,6)	192	(87)	•		25					
		12.0	(304,8)	205	(93)	•		25					
		15.0	(381,0)	243	(110)	•		25					
		18.0	(457,2)	281	(128)	•		25					
		21.0	(533,4)	332	(151)	•		25					
		24.0	(609,6)	371	(168)	•		25					
		27.0	(685,8)	410	(186)	•		25					
		30.0	(762,0)	448	(203)	•		25					
SE075 SP075	2.95 (75,0)	1.97	(50)						203	(119)		•	46
									351	(159)		•	47
		2.95	(75)						351	(159)		•	46
									439	(199)		•	47
		3.94	(100)						439	(199)		•	46
		4.92	(125)						526	(239)		•	46
		5.91	(150)						614	(278)		•	46
		6.89	(200)						789	(358)		•	46
SE100 SP100	3.94 (100,0)	0.98	(25)						439	(199)		•	49
		1.97	(50)						520	(239)		•	49
		2.95	(75)						795	(361)		•	48
									614	(278)		•	49
		3.94	(100)						702	(318)		•	49
		4.92	(125)						1236	(561)		•	48
		7.87	(200)						2031	(921)		•	48
		11.81	(300)						2738	(1242)		•	48
4400 4900	5.0 (127,0)	2.0	(50,8)	77	(35)	•	•	27					
		3.0	(75,0)	106	(48)	•	•	26	201	(90)	•		50
4900	6.0 (152,4)	4.0	101,6	100	(45)	•	•	28	423	(191)	•		51
		6.0	152,4	154	(70)	•	•	28	719	(350)	•		51
		8.0	203,2	205	(93)	•	•	28	1057	(475)	•		51
		10.0	254,0	243	(110)	•	•	28	1395	(633)	•		51
		12.0	304,8	294	(133)	•	•	28	1733	(786)	•		51

Manual Linear Positioners/Stage Overview

Ball Bearing Positioners

Pages 61-88

Parker Daedal ball bearing positioners combine a ball slide with a drive mechanism. The ball slide is spring loaded against the drive mechanism to provide a constant preload between the drive and the slide. These positioners are available with a number of different drive mechanisms including fine adjustment screw, differential screw, imperial and metric micrometer heads, and digital micrometer heads.



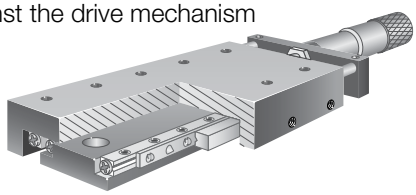
The ball and rod bearings on the ball bearing positioners consist of two rows of hardened steel balls, each preloaded between four hardened ground steel rods. This design provides ultra-smooth, extremely low-friction motion by reducing the contact area between the balls and the ways Additionally this design provides extremely good straight line and flatness accuracy. All Parker Daedal ball bearing slide positioners incorporate 440C hardened stainless steel ball and rods to ensure corrosion resistance and long life.

Both the top and base aluminum mounting surfaces are precision machined to ensure flatness. Most models are available in both imperial and metric mounting configurations.

Crossed Roller Positioners

Pages 89-114

Parker Daedal crossed roller positioners combine a crossed roller slide with a drive mechanism. The crossed roller slide is spring loaded against the drive mechanism to provide a constant preload between the drive and the slide. These positioners are available with a number of different drive mechanisms including fine adjustment screw, differential screw, imperial and metric micrometer heads, and digital micrometer heads.



The crossed roller bearing system is composed of two rows of rollers. Each roller is alternately crossed at 90° with the next and captured in “V” grooves, located on the base and top. Since rollers provide a larger (line) contact surface than ball bearings, a crossed roller positioner has higher load carrying capability than a ball bearing positioner of comparable size. These changes also significantly increase the stiffness by increasing the contact area of each bearing. Crossed roller positioners are preloaded to eliminate any side play and to provide a uniform coefficient of friction.

Crossed roller positioners are constructed of corrosion-resistant black anodized aluminum and high carbon steel. Members are precision machined to assure flatness and parallelism for both top and bottom mounting surfaces. Crossed roller positioners are available in imperial and metric mounting configurations depending on model selection.

Functional Comparison

	Smoothness	Friction	Straightness/ Flatness Accuracy	Load Capacity
Ball Bearing Positioner	Exceptional	Extremely Low	Very Good	Moderate
Crossed Roller Positioner	Very Good	Very Low	Very Good	High

Ball Bearing Positioners

Series	Width in (mm)	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Drive Orientation Center	Drive Orientation Side	Special Configurations Digital Micrometer	Special Configurations Multiaxis Capability	Special Configurations Leadscrew Drive	Mounting Imperial	Mounting Metric	Page
MM-1	≤1.25 (≤31,8)	0.125	(3,2)	0.5	(0,25)	•			•		•		64-65
MM-3		0.50	(12,7)	0.75	(0,34)	•			•		•		64-65
3900				6	(2,7)	•	•		•		•	•	66-67
4000	1.75 (44,5)	1.00	(25,4)	25	(11)	•	•	•	•		•	•	68-69,72
4100				29	(13)	•		•	•		•	•	70-71, 73
4200				42	(18)	•		•	•		•	•	70-71, 73
4300				55	(25)	•		•	•		•	•	70-71, 73
4500	2.62 (66,5)	1.00	(25,4)	62	(28)	•	•	•	•		•	•	74-75, 78
4600				88	(40)	•		•	•		•	•	76-77, 79
4700				166	(48)	•		•	•		•	•	76-77, 79
4800				123	(56)	•		•	•		•	•	76-77, 79
4400	5.0 (127,0)	1.0	(25.4)	106	(48)	•	•	•	•		•	•	80-83
		2.0	(50,8)	106	(48)	•	•	•	•		•	•	80-83
4900	6.0 (152,4)	1.0	(25,4)	102	(46)	•			•		•	•	84-85
		2.0	(50,8)	102	(46)	•		•	•		•	•	84-85
		4.0	(100,0)	102	(46)	•			•	•	•	•	86
		6.0	(150,0)	154	(70)	•			•	•	•	•	86
		8.0	(200,0)	205	(93)	•			•	•	•	•	86
		10.0	(250,0)	243	(110)	•			•	•	•	•	86
		12.0	(300,0)	294	(133)	•			•	•	•	•	86

Crossed Roller Positioners

Series	Width in (mm)	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Drive Orientation Center	Drive Orientation Side	Special Configurations Digital Micrometer	Special Configurations Multiaxis Capability	Special Configurations Leadscrew Drive	Mounting Imperial	Mounting Metric	Page
CR4000	1.75 (44,5)	1.00	(25,4)	81	(36)	•	•	•	•		•		92-94
CR4100				81	(36)	•		•	•		•		95-96
CR4200				121	(54)	•		•	•		•		95-96
CR4300				131	(59)	•		•	•		•		95-96
SC050	1.97 (50)	0.98	(25)	175	(80)	•			•	•		•	
SK050		1.97	(50)	263	(119)	•			•	•		•	97
		2.95	(75)	351	(159)	•			•	•		•	
CR4500	2.62 (66,5)	1.00	(25,4)	111	(50)	•	•	•	•		•		98-99, 101
CR4600				151	(69)	•		•	•		•		100-101
CR4700				201	(91)	•		•	•		•		100-101
CR4800				252	(114)	•		•	•		•		100-101
SC075	2.95 (75)	0.98	(25)	351	(159)	•			•	•		•	
SK075		1.97	(50)	439	(199)	•			•	•		•	102
		2.95	(75)	526	(239)	•			•	•		•	
SC100	3.94 (100)	0.98	(25)	439	(199)	•			•	•		•	
SK100		1.97	(50)	526	(239)	•			•	•		•	103
		2.95	(75)	614	(278)	•			•	•		•	
		3.94	(100)	702	(318)	•			•	•		•	
CR4400	5.0 (127,0)	1.00	(25,4)	201	(90)	•	•	•	•		•		104-107
		2.00	(50,8)	201	(90)	•	•	•	•		•		104-107
CR4900	6.0 (152,4)	1.00	(25,4)	150	(68)	•			•		•		108-109
		2.00	(50,8)	220	(100)	•		•	•		•		108-109
		4.00	(100,0)	423	(199)	•			•	•	•		110
		6.00	(150,0)	719	(318)	•			•	•	•		110
		8.00	(200,0)	1057	(410)	•			•	•	•		110
		10.00	(250,0)	1395	(635)	•			•	•	•		110
		12.00	(300,0)	1733	(786)	•			•	•	•		110

Rotary Positioners

Pages 115-122

Parker Daedal rotary stages are designed to produce precision rotary motion. The basic components in these stages are a base, main bearing, drive mechanism and top (load platform). The base of all the units house the main bearing and drive mechanism and is designed to be mounted to a stationary surface. The main bearings provide low friction contact between the base and top. The drive mechanisms used are either tangent arms or worm gears. The table top provides a mounting surface for mounting payloads.

Tangent Arm Drive

Tangent arm drives produce very fine resolution over a limited rotary travel range. Angular rotation is controlled by three control knobs. The release knob disengages the shaft from the drive, freeing the table to be rotated by hand to a desired location. The release knob is then tightened to re-engage the drive mechanism and transfer control to the adjustment knob which, when rotated, produces precise angular positioning of the shaft and table top. The locking knob can then be used to positively lock the table at the desired setting.

Worm Gear Drive

A precision worm gear drive mechanism consists of a worm wheel (gear) and worm drive. Controlled rotation of the worm drive shaft creates precise angular rotation of the worm wheel and table top. The worm gear and shaft are matched sets and are preloaded to remove backlash. This type of drive provides high resolution (180:1) and continuous angular positioning over a full 360° range..

Model Series	Table Diameter	Drive Mechanism	Normal Load	Mounting		Page
				Imperial	Metric	
2500 M2500	1.88 –2.62 in 47,7 – 66,5 mm	Tangent Arm	10 lb 4,5 kg	•	•	117
4575* M4575*	2.38 in 60,5 mm	Tangent Arm	5 lbs 2,25 kg	•	•	118
10000-20000 M10000-M20000	2.75 – 4.75 in 69,8 – 120,6 mm	Worm Gear	50 lbs 22,0 kg	•	•	119
30000 M30000	5.00 – 12.00 in 127,0 – 305,0 mm	Worm Gear	25 – 200 lbs 11,5 – 90,0 kg	•	•	120-121

* Models 4575/M4575 are combination rotary and linear stages which also provide 0.50 in (12,7 mm) of linear travel.

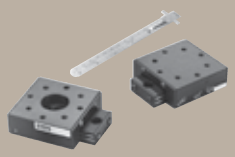
Accessories

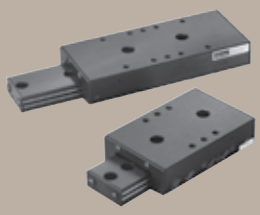
Pages 123-132

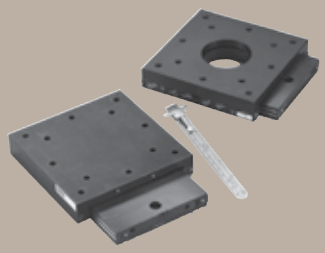
Z-Axis Brackets enable ball bearing and cross roller stages to be configured into a variety of three axis positioning systems.

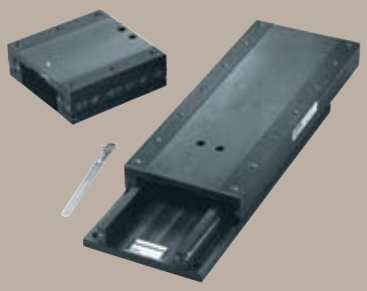
Drive Mechanisms are available in a choice of drive mechanisms including imperial and metric micrometer heads, digital micrometers, fine adjustment screws and differential screws

Optical Mounts are available as a ready made bolt down accessory compatible with most any manual positioning slide or stage.









Ball Bearing Slides
miniature and standard

Parker Daedal miniature and standard size ball bearing slides are a popular solution for most applications requiring inexpensive yet accurate and reliable linear motion. Parker Daedal ball slides are offered in many different sizes and styles. Proper sizing and selection is based on travel, load, dimensional and mounting requirements, open aperture or solid top configurations, etc. Based on our large scale production and inventory capabilities, Parker Daedal offers exclusively precision grade ball slides at prices comparable to other brands of commercial quality products.

Contents

Miniature and Standard Size Ball Bearings Slides

- Precision quality
- Budget friendly
- Largest selection
- Easy multi-axis configuration
- No maintenance
- Vacuum preparation and custom options

Ball Slide Design Principles

Parker Daedal ball slides are mechanically simple linear motion devices comprised of a stationary base member with a mobile carriage riding on top. Two rows of hardened steel balls on both sides of the base provide the smooth, accurate, low friction sliding motion between the stationary base and the top slide. Each row of bearings is contained between four hardened and precision ground steel rods. These bearing assemblies are factory preloaded to eliminate wobble and unwanted play in the system.

Ball slides are functionally much more reliable than simple dovetail slides, since there is no direct sliding contact of the top and bottom members. Ball slides eliminate the rapid wear problems, regular lubrication requirements, and “stiction” (skipping and jumping caused by the increased force needed to initiate movement) characteristic of dovetail slides. Parker Daedal also offers a high load capacity, long life crossed roller slides for applications requiring maximum load and life performance.

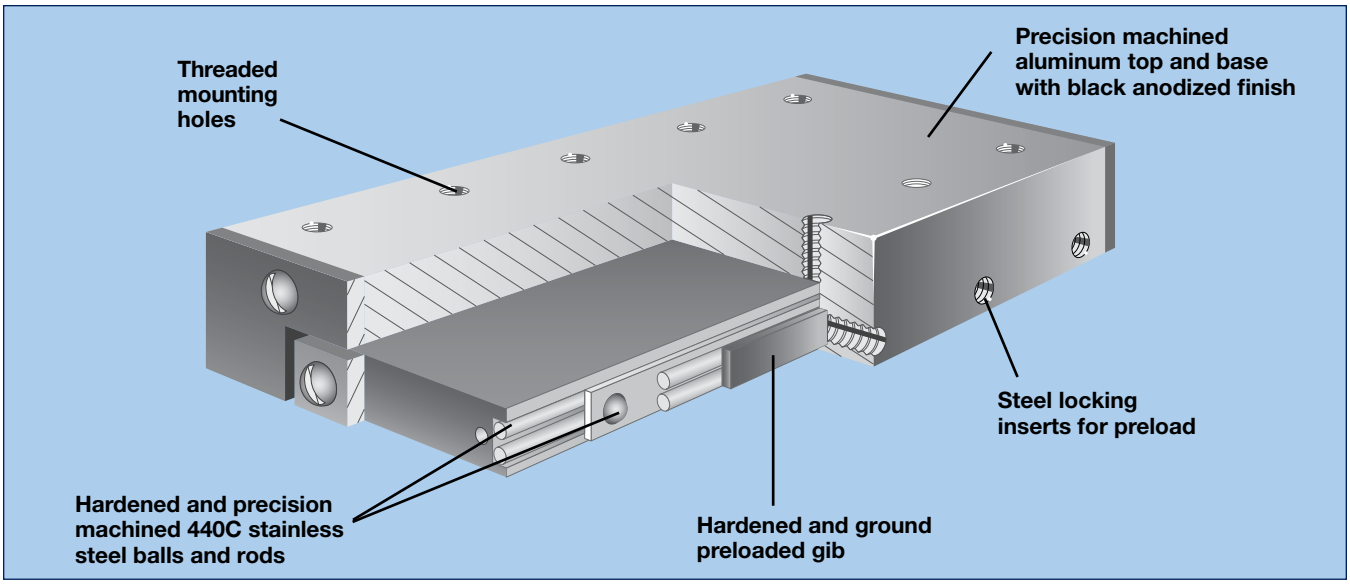
Standard Features

All models offer high quality construction features as standard:

- Straight line accuracy of 0.00008 inches per inch of travel (0.00025 inches per inch of travel for miniatures)
- Precision machined mounting surfaces to assure flatness and parallelism
- Factory preloaded to precision specifications to eliminate any side play and provide a uniform coefficient of friction
- Factory threaded mounting holes on the top for easy payload mounting
- Factory machining services for special hole configurations and custom modifications
- Locking thread inserts on preloaded screws for maintenance-free life without loss of preload
- Hardened and precision machined 440C stainless steel balls and rods

How to Order

Use the overview chart on the following page to select the appropriate ball slide. Refer to the individual specifications page for complete performance and mechanical specifications. To order ball slides, use the model number corresponding to the specific size and travel length selected. A variety of modifications to standard models are available to meet custom requirements. Contact our application engineering department with your design specifications.

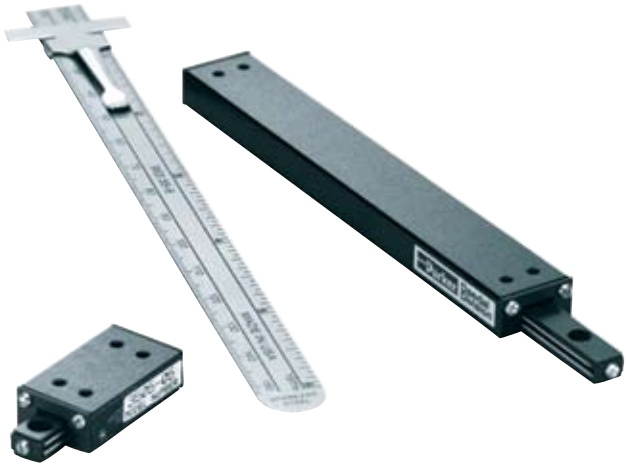


Selection

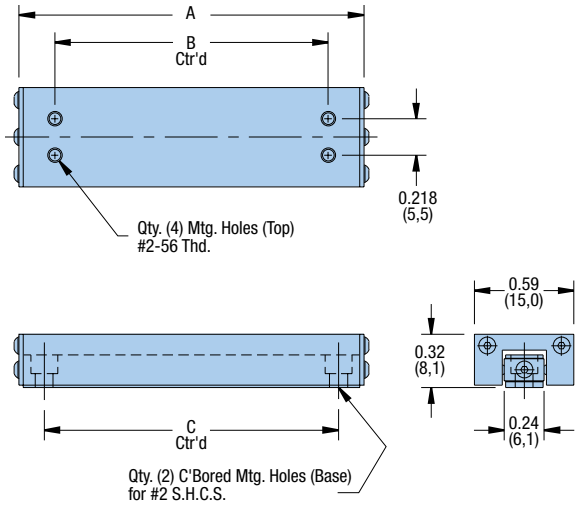
Series	Width in (mm)	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Mounting Imperial	Mounting Metric	Page
3500 3900	≤1.25 (≤31,8)	0.5	(12,7)	4.9	(2,2)	•		16
				5.0	(2,3)	•		17
				17.0	(7,6)	•		18
				6.0	(2,7)		•	20
		0.75	(19,1)	14.6	(6,6)	•		19
		1.00	(25,4)	10.3	(4,6)	•		16-17
				29.0	(13,1)	•		18
		1.50	(38,1)	24.3	(11,0)	•		19
		2.00	(50,8)	14.0	(6,3)	•		16-17
				36.0	(16,3)	•		18-19
		3.00	(76,2)	23.0	(10,3)	•		16-17
				43.0	(19,5)	•		19
		4.00	(101,6)	56.0	(25,4)	•		19
4000 4100 4200 4300	1.75 (44,5)	1.00	(25,4)	25	(13)	•	•	21
				28	(13)	•	•	22
		2.00	(50,8)	40	(18)	•	•	22
		3.00	(76,2)	55	(25)	•	•	22
4500 4600 4700 4800	2.62 (66,5)	1.0	(25,4)	62	(28)	•	•	23
		2.0	(50,8)	88	(40)	•	•	24
		3.0	(76,2)	106	(48)	•	•	24
		4.0	(101,6)	123	(56)	•	•	24
		6.0	(152,4)	154	(70)	•		25
		9.0	(228,6)	192	(87)	•		25
		12.0	(304,8)	205	(93)	•		25
		15.0	(381,0)	243	(110)	•		25
		18.0	(457,2)	281	(128)	•		25
		21.0	(533,4)	332	(151)	•		25
		24.0	(609,6)	391	(168)	•		25
		27.0	(685,8)	410	(186)	•		25
		30.0	(762,0)	448	(203)	•		25
4400 4900	5.0 (127,0)	2.0	(50,8)	77	(35)	•	•	27
		3.0	(75,0)	106	(48)	•	•	26
4900	6.0 (152,4)	4.0	(100,0)	100	(45)	•	•	28
		6.0	(150,0)	154	(70)	•	•	28
		8.0	(200,0)	205	(93)	•	•	28
		10.0	(250,0)	243	(110)	•	•	28
		12.0	(300,0)	294	(133)	•	•	28

3505 Series

Specifications	
Travel:	0.5 – 3.0 in
Size:	
Width	0.59 in
Length	1.12 – 4.12 in
Height	0.32 in
Load:	
Normal	4.9 – 23.0 lbs
Moment: Yaw, Pitch, Roll	See page 29
Straight line accuracy:	0.00025 in/in of travel
Metric thread option:	M2 x 0,4 (consult factory)
Construction:	Aluminum top and base/ 440C stainless steel bearings
Mounting surface:	Precision machined
Finish:	Black anodize



Dimensions in (mm)

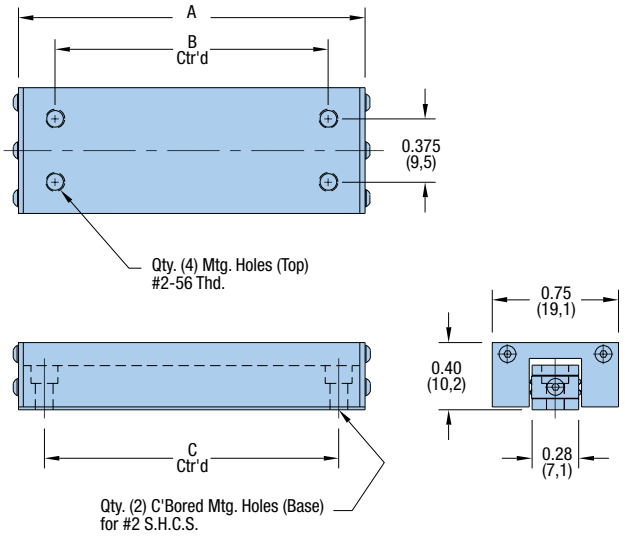


		Travel		Normal Load		Weight		Dimensions A		B		C	
	Model	in	(mm)	lbs	(kg)	lbs	(kg)	in	(mm)	in	(mm)	in	(mm)
Imperial	3505-05	0.5	(12,7)	4.9	(2,2)	0.03	(0,01)	1.12	(28,4)	0.63	(16,0)	0.75	(19,1)
	3505-10	1.0	(25,4)	10.3	(4,6)	0.04	(0,02)	2.12	(53,8)	1.63	(41,4)	1.38	(35,1)
	3505-20	2.0	(50,8)	14.0	(6,3)	0.06	(0,03)	3.12	(79,2)	2.63	(66,8)	2.38	(60,5)
	3505-30	3.0	(76,2)	23.0	(10,3)	0.08	(0,04)	4.12	(104,6)	3.63	(92,2)	3.38	(85,9)

3507 Series

Specifications	
Travel:	0.5 – 3.0 in
Size:	
Width	0.75 in
Length	1.12 – 4.12 in
Height	0.40 in
Load:	
Normal	5.0 – 23.0 lbs
Moment: Yaw, Pitch, Roll	See page 29
Straight line accuracy:	0.00025 in/in of travel
Metric thread option:	M2 x 0,4 (consult factory)
Construction:	Aluminum top and base/ 440C stainless steel bearings
Mounting surface:	Precision machined
Finish:	Black anodize

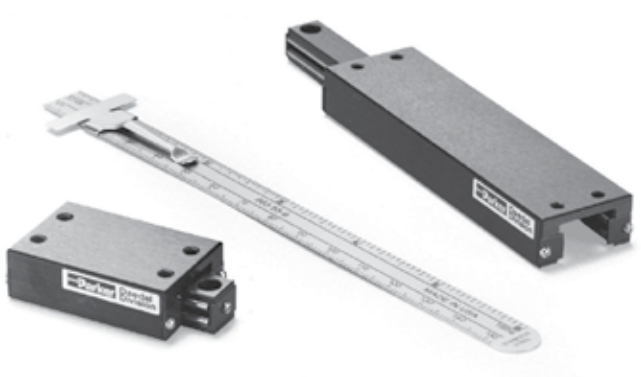
Dimensions in (mm)



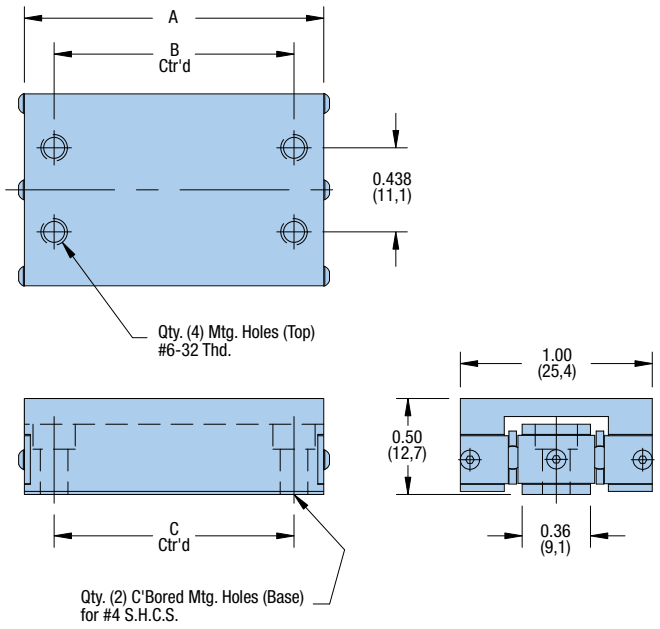
		Travel		Normal Load		Weight		Dimensions A		B		C	
	Model	in	(mm)	lbs	(kg)	lbs	(kg)	in	(mm)	in	(mm)	in	(mm)
Imperial	3507-05	0.5	(12,7)	5.0	(2,3)	0.04	(0,02)	1.12	(28,4)	0.63	(16,0)	0.75	(19,1)
	3507-10	1.0	(25,4)	10.3	(4,6)	0.06	(0,03)	2.12	(53,8)	1.63	(41,4)	1.38	(35,1)
	3507-20	2.0	(50,8)	14.0	(6,3)	0.08	(0,04)	3.12	(79,2)	2.63	(66,8)	2.38	(60,5)
	3507-30	3.0	(76,2)	23.0	(10,3)	0.10	(0,05)	4.12	(104,6)	3.63	(92,2)	3.38	(85,9)

3510 Series

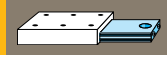
Specifications	
Travel:	0.5 – 2.0 in
Size:	
Width	1.00 in
Length	1.68 – 3.68 in
Height	0.50 in
Load:	
Normal	17 – 36 lbs
Moment: Yaw, Pitch, Roll	See page 30
Straight line accuracy:	0.00025 in/in of travel
Metric thread option:	M2 x 0,4 (consult factory)
Construction:	Aluminum top and base/ 440C stainless steel bearings
Mounting surface:	Precision machined
Finish:	Black anodize



Dimensions in (mm)



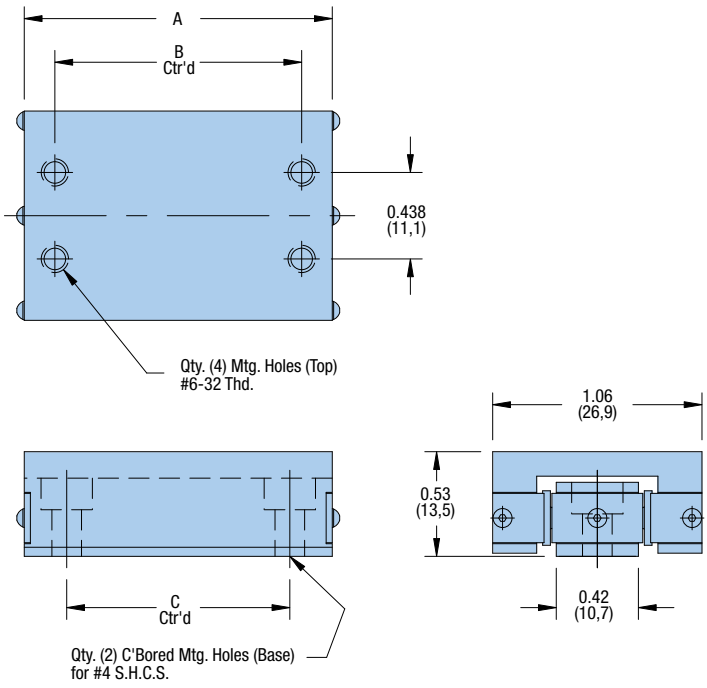
		Travel		Normal Load		Weight		Dimensions A		B		C	
	Model	in	(mm)	lbs	(kg)	lbs	(kg)	in	(mm)	in	(mm)	in	(mm)
Imperial	3510-05	0.5	(12,7)	17.0	(7,6)	0.10	(0,045)	1.68	(42,7)	1.25	(31,8)	1.25	(31,8)
	3510-10	1.0	(25,4)	29.0	(13,1)	0.12	(0,054)	2.68	(68,1)	2.25	(57,2)	2.25	(57,2)
	3510-20	2.0	(50,8)	36.0	(16,3)	0.14	(0,064)	3.68	(93,5)	3.25	(82,6)	3.25	(82,6)



3511 Series

Specifications	
Travel:	0.75 – 4.0 in
Size:	
Width	1.06 in
Length	1.68 – 6.68 in
Height	0.53 in
Load:	
Normal	14.6 – 56 lbs
Moment: Yaw, Pitch, Roll	See page 30
Straight line accuracy:	0.00025 in/in of travel
Metric thread option:	M2 x 0,4 (consult factory)
Construction:	Aluminum top and base/ 440C stainless steel bearings
Mounting surface:	Precision machined
Finish:	Black anodize

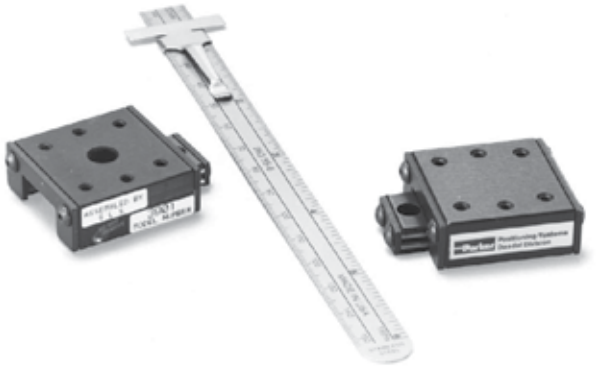
Dimensions in (mm)



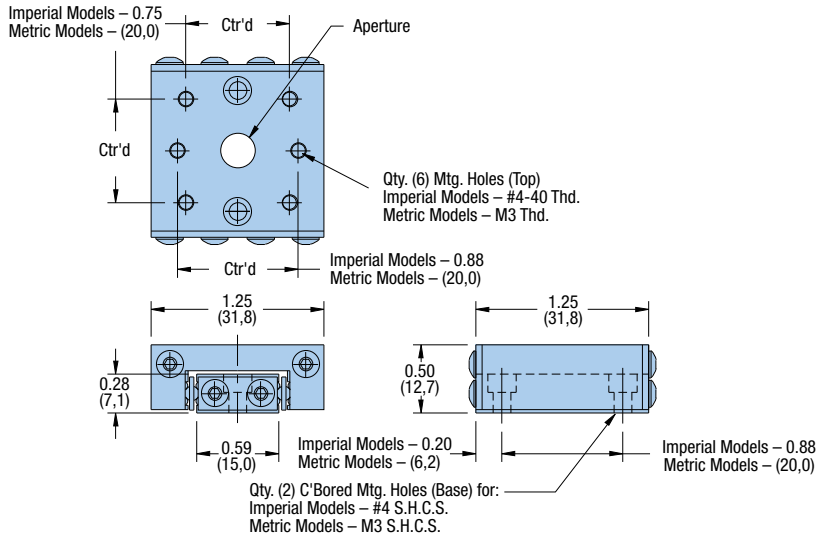
		Travel		Normal Load		Weight		Dimensions A		B		C	
	Model	in	(mm)	lbs	(kg)	lbs	(kg)	in	(mm)	in	(mm)	in	(mm)
Imperial	3511-07	0.75	(19,1)	14.6	(6,6)	0.08	(0,036)	1.68	(42,7)	1.25	(31,8)	1.13	(28,7)
	3511-15	1.5	(38,1)	24.3	(11,0)	0.14	(0,064)	2.68	(68,1)	2.25	(57,2)	2.13	(54,1)
	3511-20	2.0	(50,8)	36.0	(16,3)	0.20	(0,091)	3.68	(93,5)	3.25	(82,6)	3.13	(79,5)
	3511-30	3.0	(76,2)	43.0	(19,5)	0.26	(0,118)	4.68	(118,9)	4.00	(101,6)	3.25	(82,6)
	3511-40	4.0	(101,6)	56.0	(25,4)	0.32	(0,145)	6.68	(169,7)	5.50	(139,7)	4.00	(101,6)

3900/M3900 Series

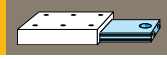
Specifications	Imperial	Metric
Travel:	0.5 in	12,7 mm
Size:		
Width	1.25 in	31,8 mm
Length	1.25 in	31,8 mm
Height	0.50 in	12,7 mm
Load:		
Normal	6 lbs	2,7 kg
Moment: Yaw, Pitch, Roll	See page 31	See page 31
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	0.1 lbs	0,05 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	



Dimensions in (mm)



Model		Travel	Aperture
Imperial	3901	0.5 in	0.25 in
	3905	0.5 in	—
Metric	M3901	12,7 mm	6,35 mm
	M3905	12,7 mm	—

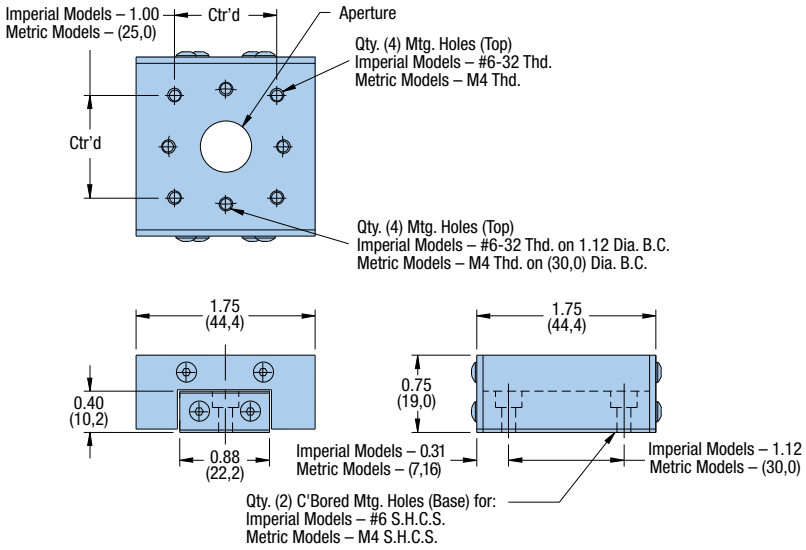


4000/M4000 Series

Specifications	Imperial	Metric
Travel:	1.0 in	25,4 mm
Size:		
Width	1.75 in	44,5 mm
Length	1.75 in	44,5 mm
Height	0.75 in	19,0 mm
Load:		
Normal	25 lbs	11 kg
Moment: Yaw, Pitch, Roll	See page 31	See page 31
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	0.2 lbs	0,09 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Dimensions

in (mm)

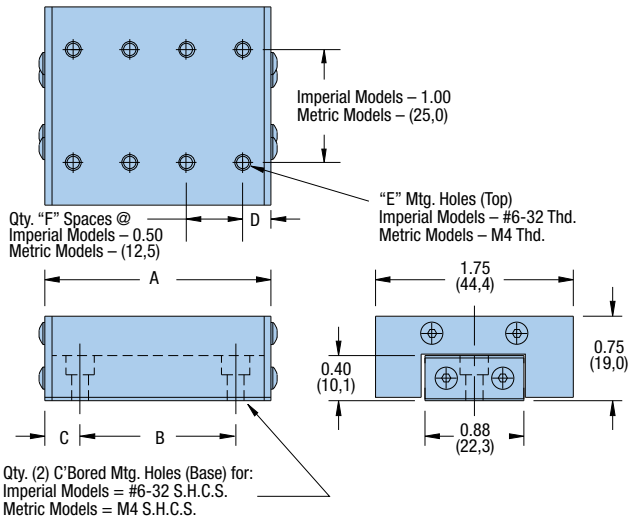


Model		Travel	Aperture
Imperial	**4001**	1.0 in	0.50 in
	4005	1.0 in	—
Metric	**M4001**	25,4 mm	12,7 mm
	M4005	25,4 mm	—

4100/M4100, 4200/M4200, 4300/M4300 Series

Specifications	Imperial	Metric
Travel:	1.0 – 3.0 in	25,4 – 76,2 mm
Size:		
Width	1.75 in	44,5 mm
Length	2.00 – 4.00 in	50,8 – 101,6 mm
Height	0.75 in	19,0 mm
Load:		
Normal	28 – 55 lbs	13 – 25 kg
Moment: Yaw, Pitch, Roll	See page 31	See page 31
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	0.2 – 0.6 lbs	0,09 – 0,27 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

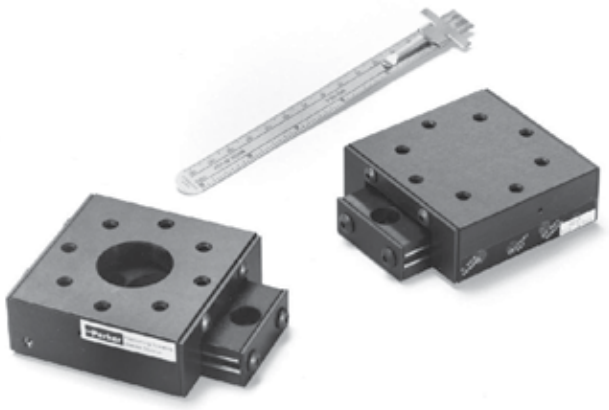
Dimensions in (mm)



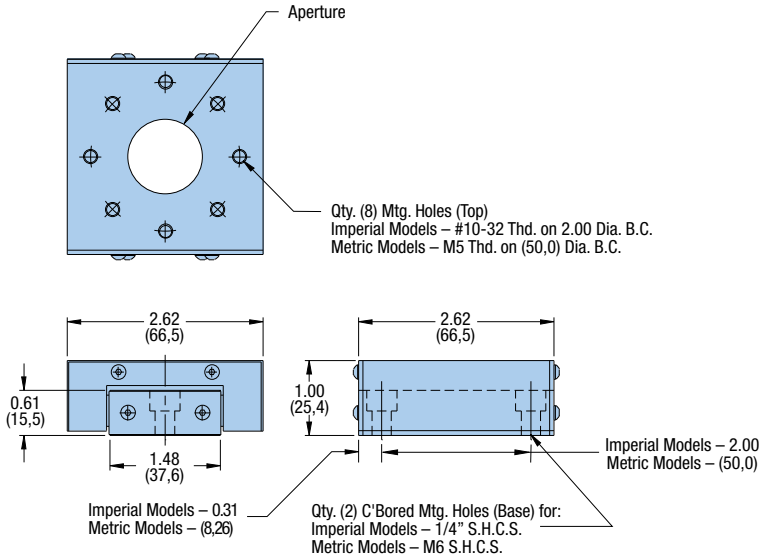
Model		Travel	Normal Load	Weight	Dimensions A	B	C	D	E	F
Imperial	**4101**	1.0 in	28 lbs	0.2 lbs	2.00 in	1.38 in	0.31 in	0.25 in	8	3
	4201	2.0 in	40 lbs	0.4 lbs	3.00 in	2.38 in	0.31 in	0.25 in	12	5
	4301	3.0 in	55 lbs	0.6 lbs	4.00 in	3.38 in	0.31 in	0.25 in	16	7
Metric	**M4101**	25,4 mm	13 kg	0,09 kg	50,8 mm	35,0 mm	7,8 mm	12.9 mm	6	2
	M4201	50,8 mm	18 kg	0,18 kg	76,2 mm	60,0 mm	8,1 mm	13,1 mm	10	4
	M4301	76,2 mm	25 kg	0,27 kg	101,6 mm	85,0 mm	8,3 mm	13,3 mm	14	6

4500/M4500 Series

Specifications	Imperial	Metric
Travel:	1.0 in	25,4 mm
Size:		
Width	2.62 in	66,5 mm
Length	2.62 in	66,5 mm
Height	1.00 in	25,4 mm
Load:		
Normal	62 lbs	28 kg
Moment: Yaw, Pitch, Roll	See page 31	See page 31
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	4501 – 0.6 lbs 4505 – 0.5 lbs	M4501 – 0,27 kg M4505 – 0,23 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	



Dimensions in (mm)

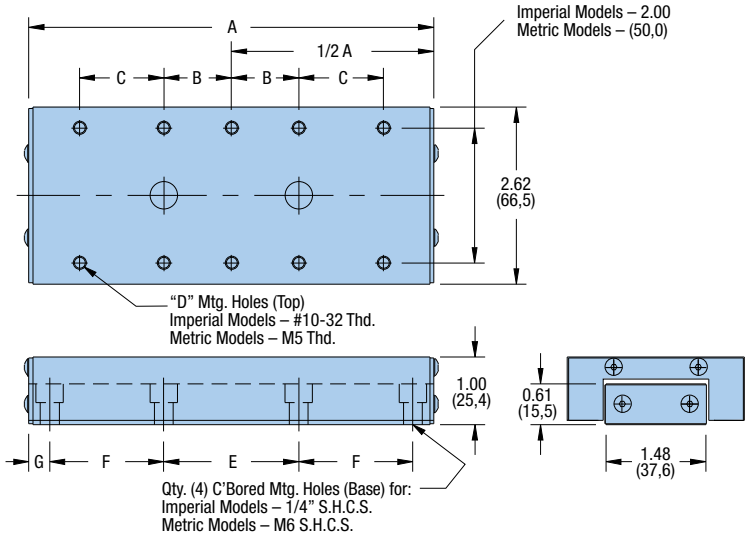


Model		Travel	Aperture
Imperial	**4501**	1.0 in	—
	4505	1.0 in	1.00 in
Metric	**M4501**	25,4 mm	—
	M4505	25,4 mm	25,4 mm

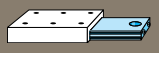
4600/M4600, 4700/M4700, 4800/M4800 Series

Specifications	Imperial	Metric
Travel:	2.0 – 4.0 in	50,8 – 101,6 mm
Size:		
Width	2.62 in	66,5 mm
Length	4.00 – 6.00 in	101,6 – 152,4 mm
Height	1.00 in	25,4 mm
Load:		
Normal	88 – 123 lbs	40 – 56 kg
Moment: Yaw, Pitch, Roll	See page 32	See page 32
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	0.9 – 1.4 lbs	0,41 – 0,64 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Dimensions in (mm)



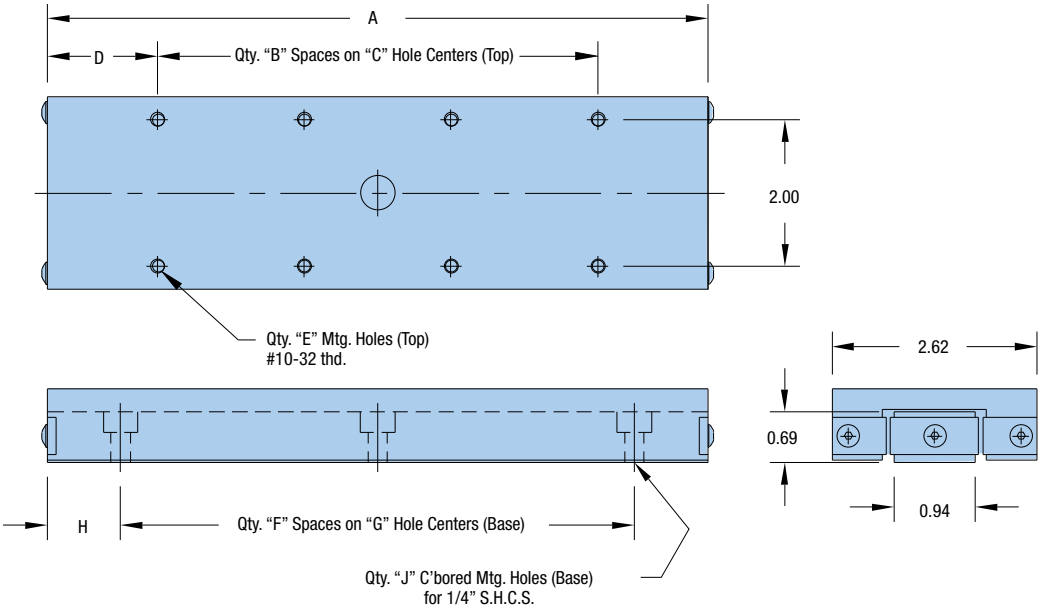
Model		Travel	Normal Load	Weight	Dimensions A	B	C	D	E	F	G
Imperial	4601	2.0 in	88 lbs	0.9 lbs	4.00 in	0.5 in	—	6	2.00 in	0.69 in	0.31 in
	4701	3.0 in	100 lbs	1.1 lbs	5.00 in	1.0 in	—	6	2.00 in	1.19 in	0.31 in
	4801	4.0 in	123 lbs	1.4 lbs	6.00 in	0.5 in	1.0 in	10	2.00 in	1.69 in	0.31 in
Metric	M4601	50,8 mm	40 kg	0,41 kg	101,6 mm	12,5 mm	—	6	50,0 mm	12,5 mm	13,3 mm
	M4701	76,2 mm	48 kg	0,50 kg	127,0 mm	25,0 mm	—	6	50,0 mm	25,0 mm	13,5 mm
	M4801	101,6 mm	56 kg	0,64 kg	152,4 mm	12,5 mm	25,0 mm	10	50,0 mm	25,0 mm	26,2 mm



4600 Series

Specifications	
Travel:	6.0 – 30.0 in
Size:	
Width	2.62 in
Length	9.00 –33.00 in
Height	1.00 in
Load:	
Normal	154 – 448 lbs
Moment: Yaw, Pitch, Roll	See page 32-33
Straight line accuracy:	0.00008 in/in of travel
Weight:	2.3 – 8.9 lbs
Construction:	Aluminum top and base/ 440C stainless steel bearings
Mounting surface:	Precision machined
Finish:	Black anodize

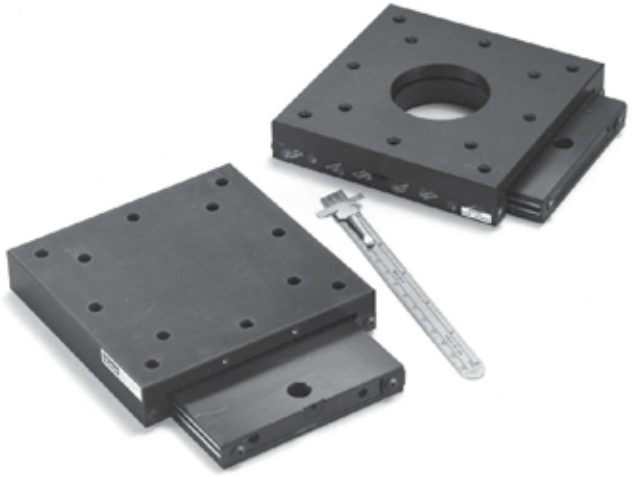
Dimensions in (mm)



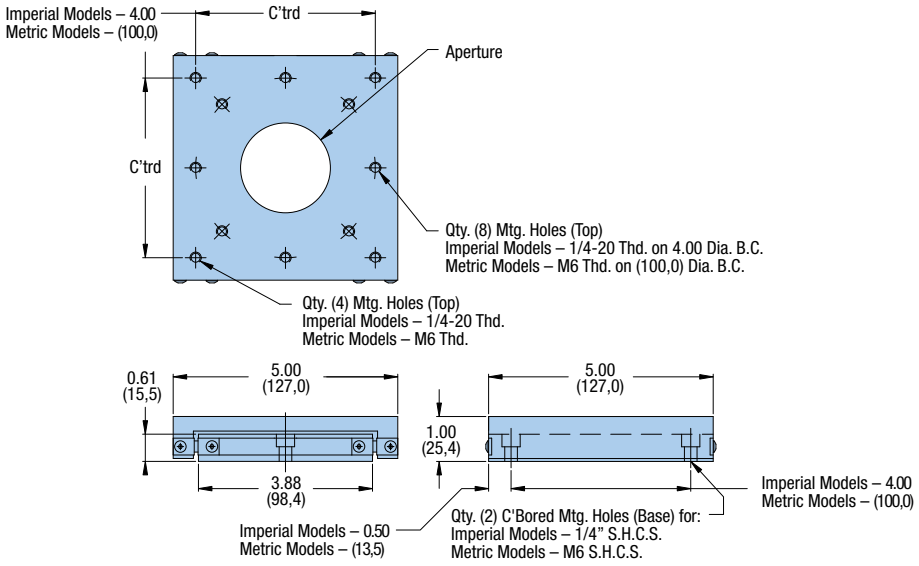
	Model	Travel in	Normal Load lbs	Weight lbs	Dimensions – in A	B	C	D	E	F	G	H	J
Imperial	**4606**	6.0	154	2.3	9.00	3	2.00	1.50	8	2	3.50	1.00	3
	4609	9.0	192	3.1	12.00	5	2.00	1.00	12	2	5.00	1.00	3
	4612	12.0	205	3.9	15.00	6	2.00	1.50	14	4	3.25	1.00	5
	4615	15.0	243	4.7	18.00	8	2.00	1.00	18	4	4.00	1.00	5
	4618	18.0	281	5.6	21.00	9	2.00	1.50	20	4	4.75	1.00	5
	4621	21.0	332	6.5	24.00	11	2.00	1.00	24	4	5.50	1.00	5
	4624	24.0	371	7.3	27.00	6	4.00	1.50	14	6	4.00	1.50	7
	4627	27.0	410	8.2	30.00	7	4.00	1.00	16	6	4.50	1.50	7
	4630	30.0	448	8.9	33.00	8	4.00	0.50	18	6	5.00	1.50	7

4400/M4400 Series

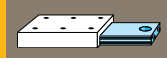
Specifications	Imperial	Metric
Travel:	3.0 in	76,2 mm
Size:		
Width	5.00 in	127,0 mm
Length	5.00 in	127,0 mm
Height	1.00 in	25,4 mm
Load:		
Normal	106 lbs	48 kg
Moment: Yaw, Pitch, Roll	See page 31	See page 31
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	4410 – 2.2 lbs 4450 – 1.7 lbs	M4410 – 1,00 kg M4450 – 0,77 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	



Dimensions in (mm)



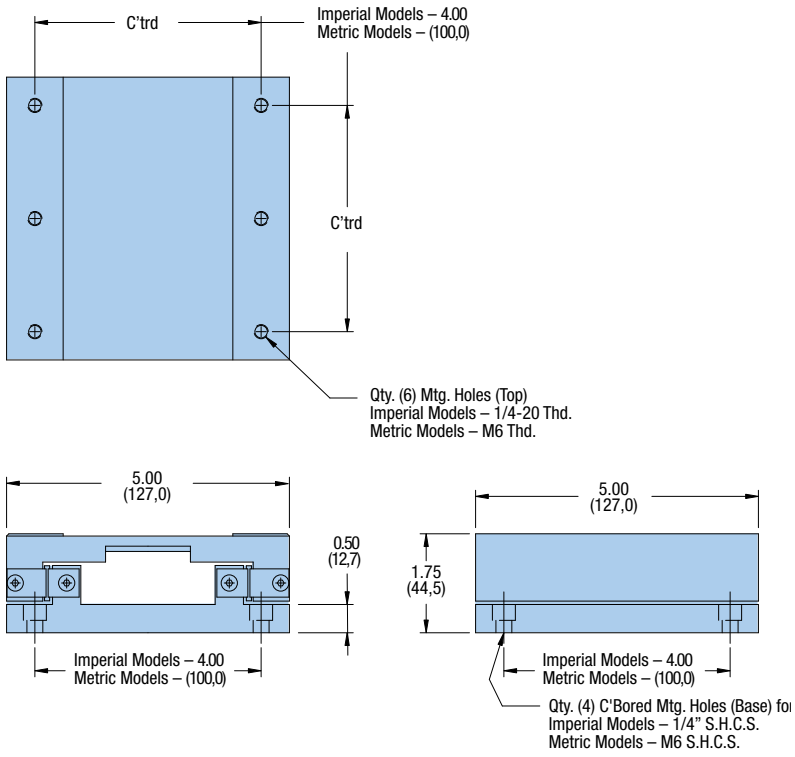
Model		Travel	Aperture
Imperial	4410	3.0 in	—
	4450	3.0 in	2.00 in
Metric	M4410	76,2 mm	—
	M4450	76,2 mm	50,8 mm



4900/M4900 Series

Specifications	Imperial	Metric
Travel:	2.0 in	50,8 mm
Size:		
Width	5.00 in	127,0 mm
Length	5.00 in	127,0 mm
Height	1.75 in	44,5 mm
Load:		
Normal	77 lbs	35 kg
Moment: Yaw, Pitch, Roll	See page 34	See page 34
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	3.0 lbs	1,4 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Dimensions in (mm)

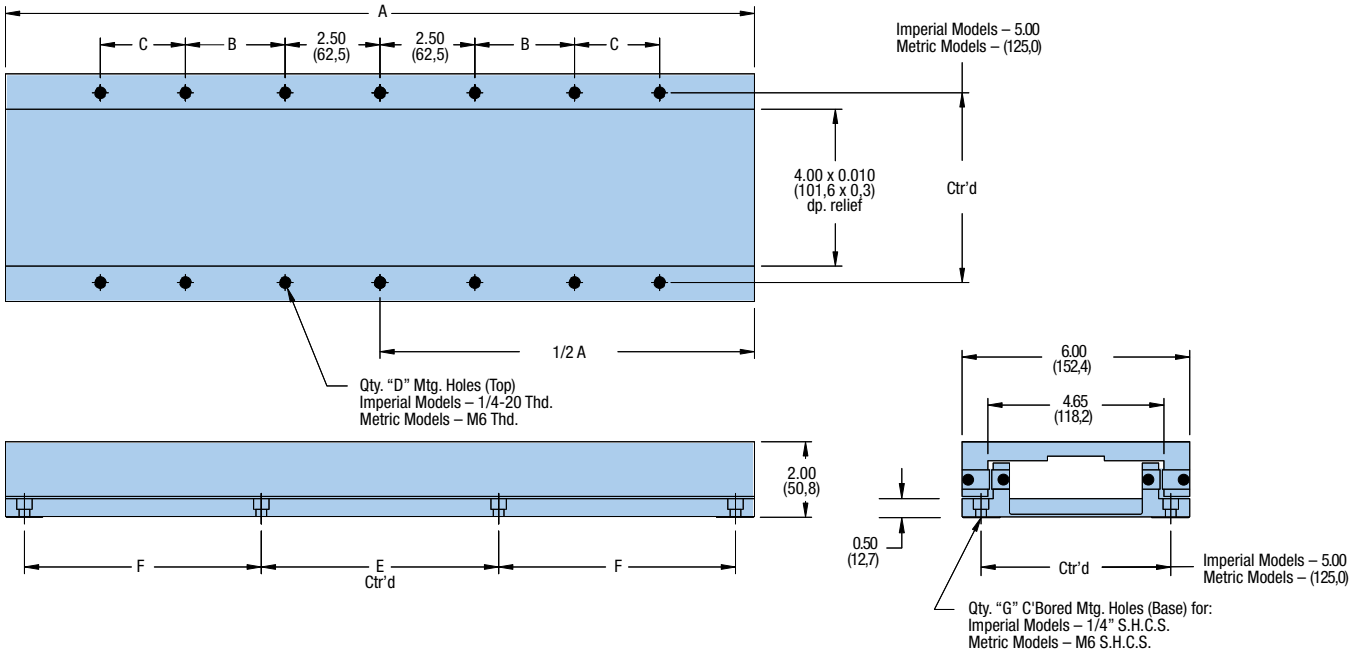


	Model	Travel
Imperial	**4900-02**	2.0 in
Metric	**M4900-02**	50,8 mm

4900/M4900 Series

Specifications	Imperial	Metric
Travel:	4.0 – 12.0 in	101,6 – 304,8 mm
Size:		
Width	6.00 in	152,4 mm
Length	6.00 – 18.00 in	152,4 – 457,2 mm
Height	2.00 in	50,8 mm
Load:		
Normal	100 – 294 lbs	45 – 133 kg
Moment: Yaw, Pitch, Roll	See page 34	See page 34
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Weight:	5.0 – 13.0 lbs	2,3 – 6,0 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

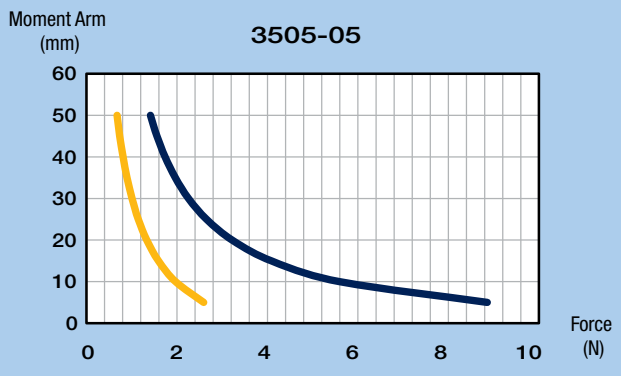
Dimensions in (mm)

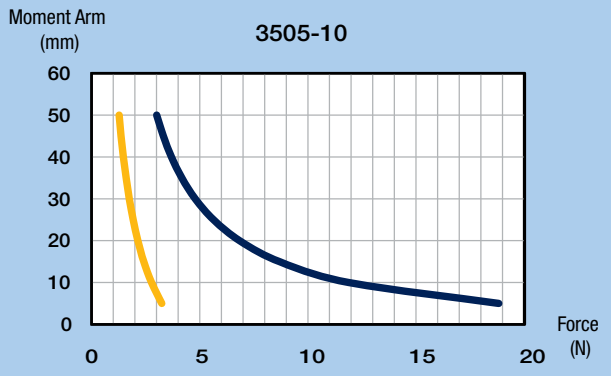


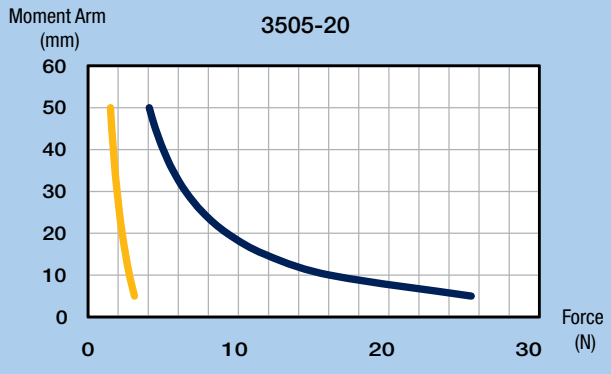
	Model	Travel	Normal Load	Weight	Dimensions A	B	C	D	E	F	G
	4900-04	4.0 in	100 lbs	5.0 lbs	6.00 in	—	—	6	5.00 in	—	4
	4900-06	6.0 in	154 lbs	7.0 lbs	9.00 in	1.50 in	—	10	5.00 in	1.50 in	8
Imperial	**4900-08**	8.0 in	205 lbs	9.0 lbs	12.00 in	2.50 in	—	10	5.00 in	3.00 in	8
	4900-10	10.0 in	243 lbs	11.0 lbs	15.00 in	2.50 in	2.00 in	14	6.00 in	4.00 in	8
	4900-12	12.0 in	294 lbs	13.0 lbs	18.00 in	5.00 in	1.00 in	14	7.00 in	5.00 in	8
	4900-04	101,6 mm	45 kg	2,3 kg	152,4 mm	—	—	6	125,0 mm	—	4
	4900-06	152,4 mm	70 kg	3,0 kg	228,6 mm	37,5 mm	—	10	125,0 mm	37,5 mm	8
Metric	**4900-08**	203,2 mm	93 kg	4,0 kg	304,8 mm	62,5 mm	—	10	125,0 mm	75,0 mm	8
	4900-10	254,0 mm	110 kg	5,0 kg	381,0 mm	62,5 mm	50,0 mm	14	150,0 mm	100,0 mm	8
	4900-12	304,8 mm	133 kg	6,0 kg	457,2 mm	125,0 mm	25,0 mm	14	175,0 mm	125,0 mm	8

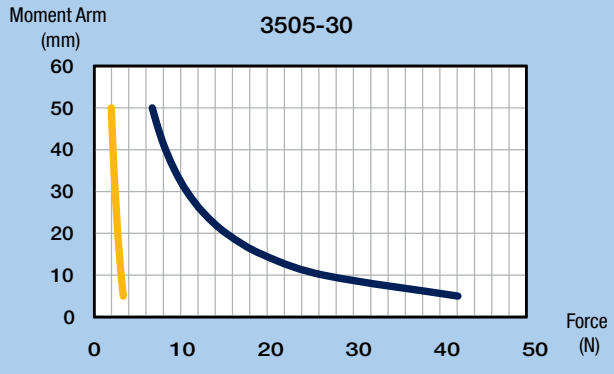
Yaw, Pitch, Roll

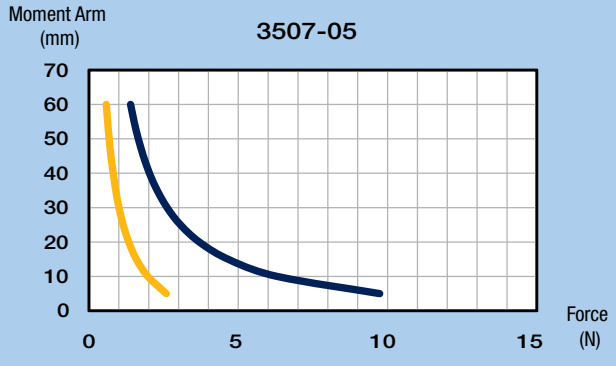
Yaw & Pitch Roll

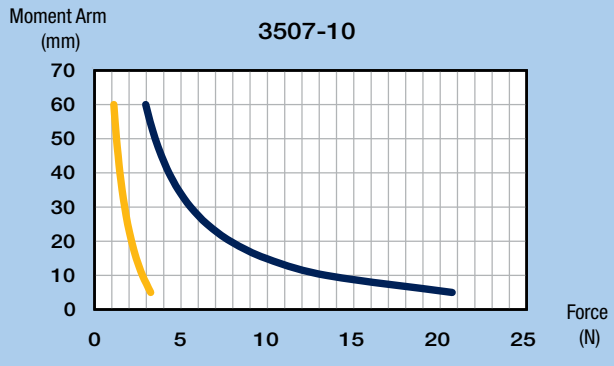


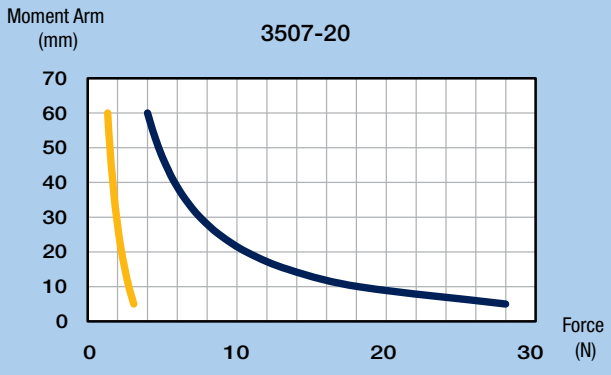


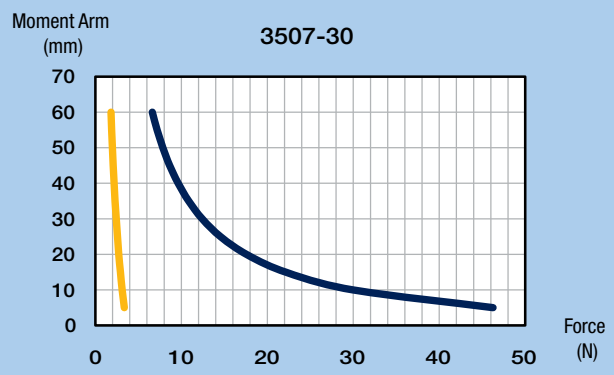




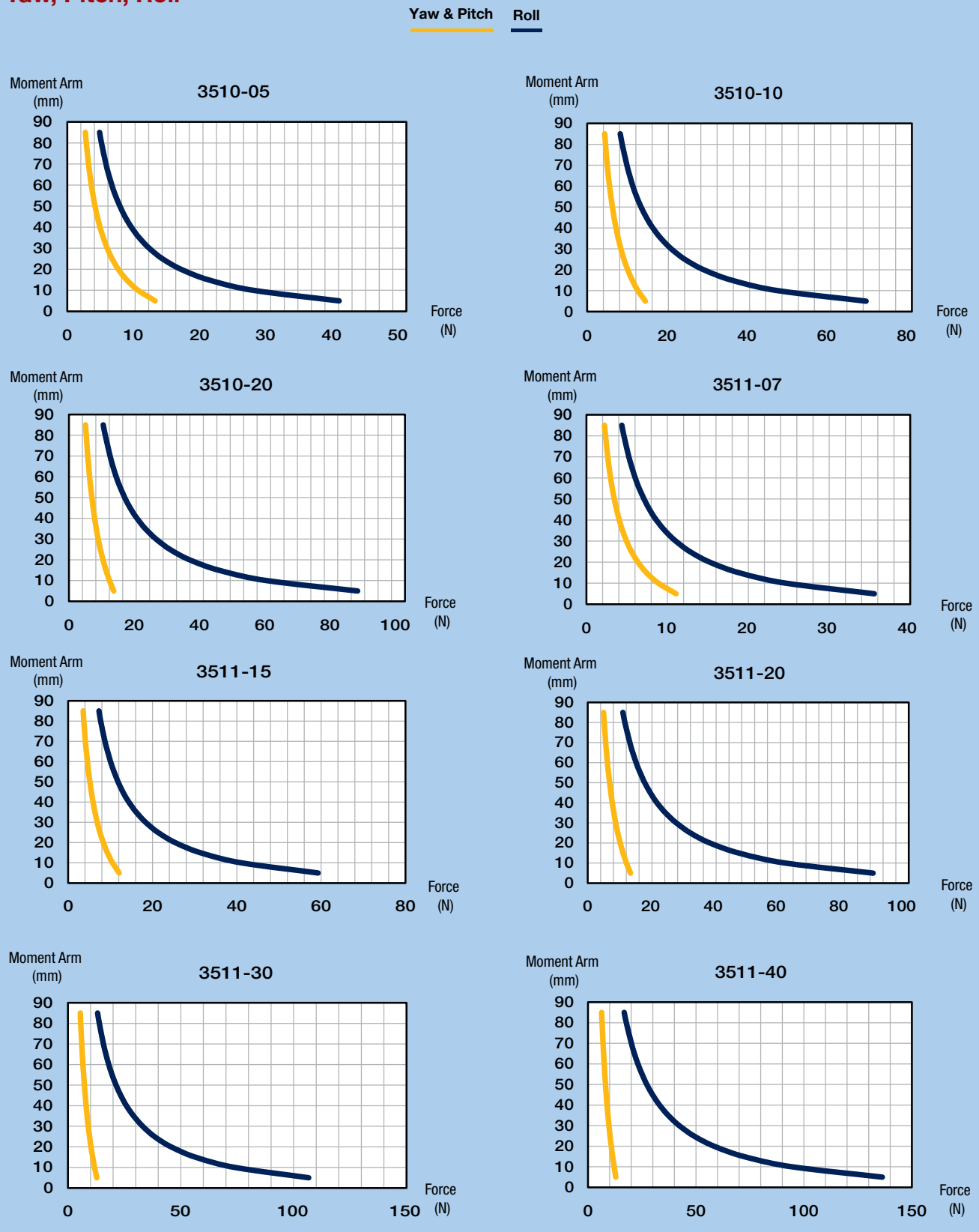








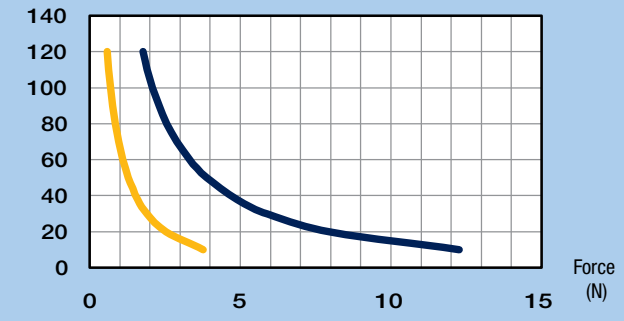
Yaw, Pitch, Roll



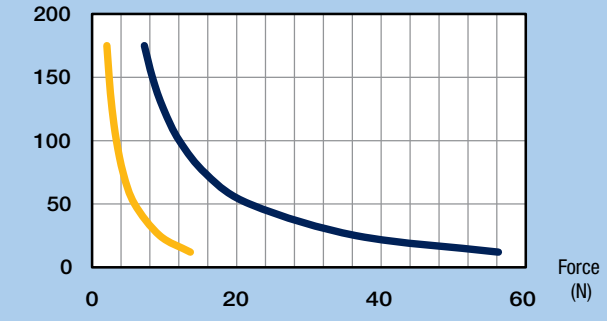
Yaw, Pitch, Roll

Yaw & Pitch Roll

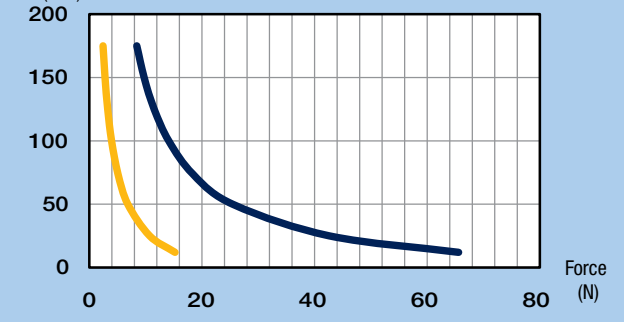
3901/M3901 & 3905/M3905



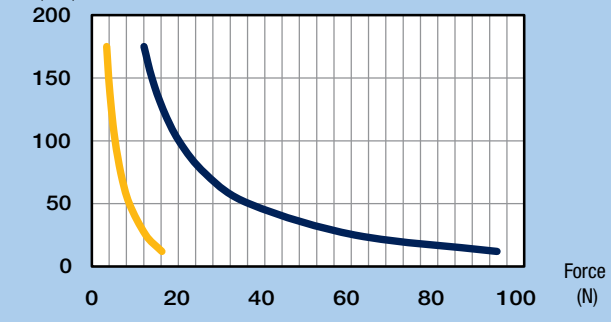
4001/M4001 & 4005/M4005



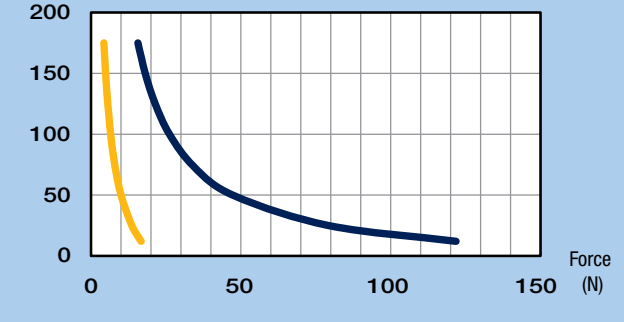
4101/M4101 & 4005/M4005



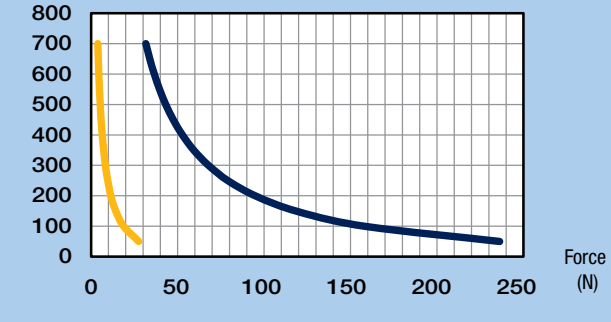
4201/M4201



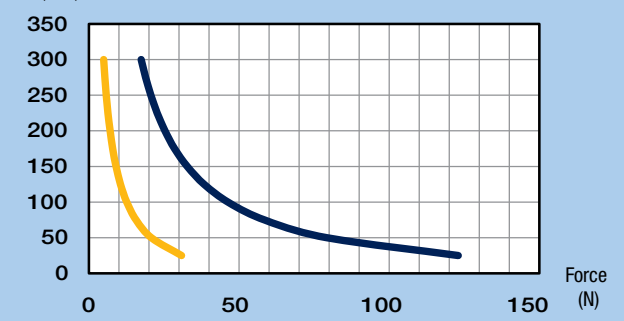
4301/M4301



4410/M4410 & 4450/M4450



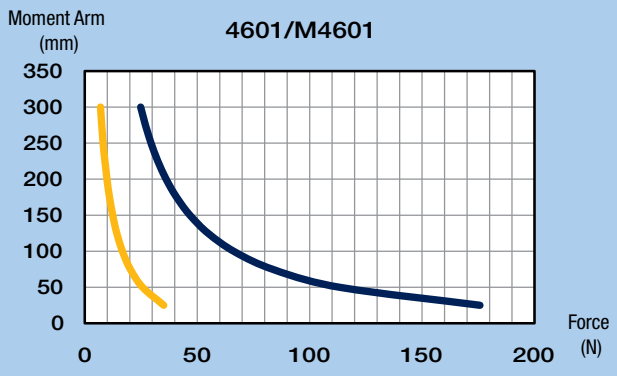
4501/M4501 & 4505/M4505

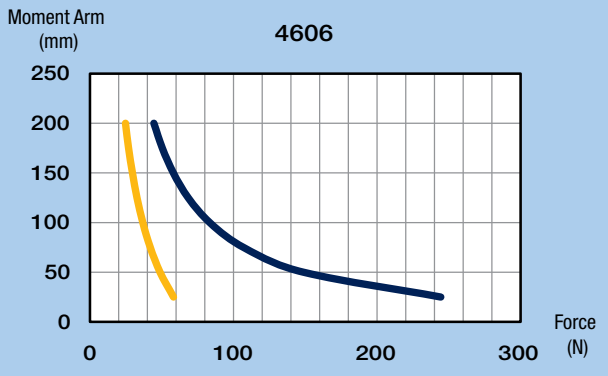


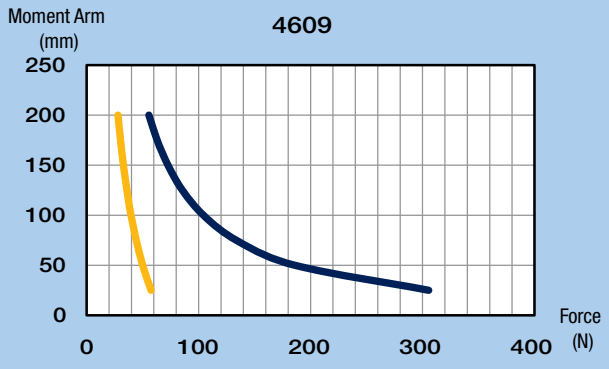
Ball Bearing Slides Performance

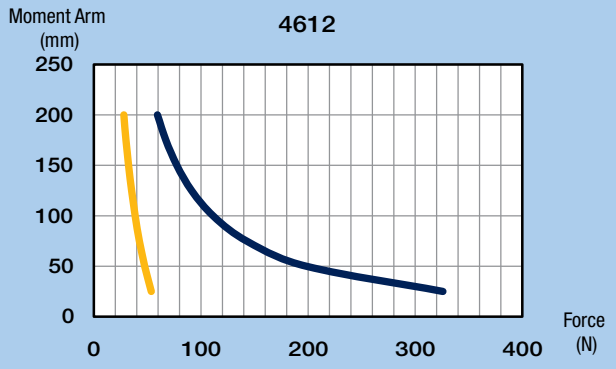
Yaw, Pitch, Roll

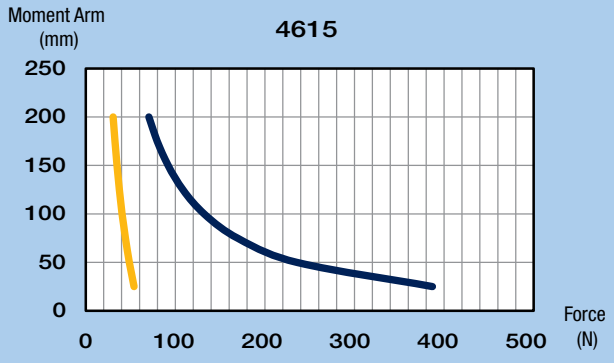
Yaw & Pitch Roll

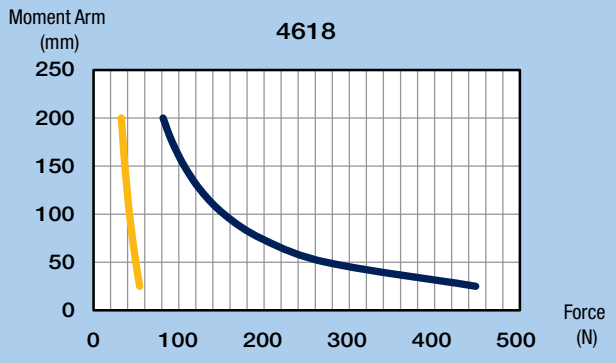


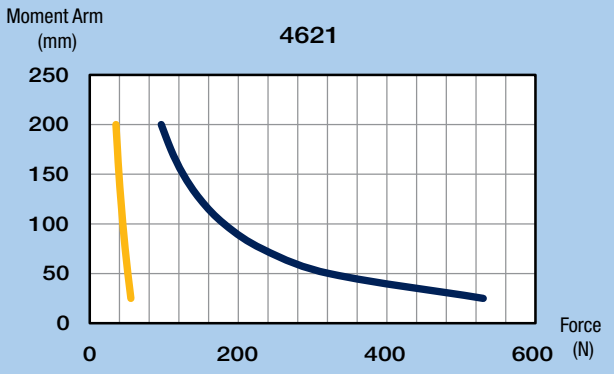


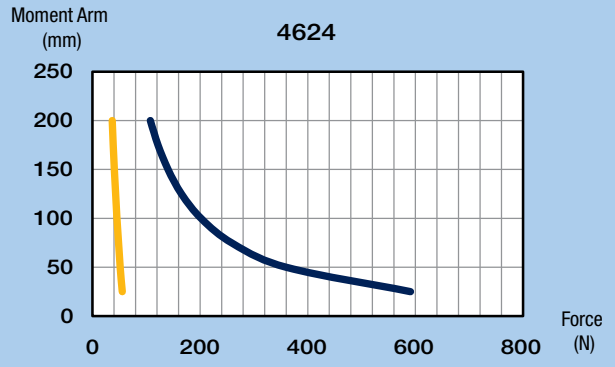






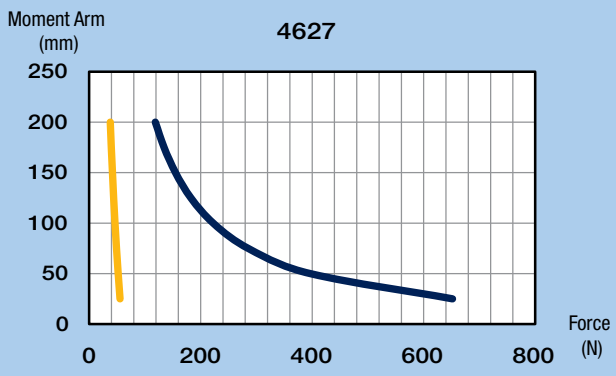


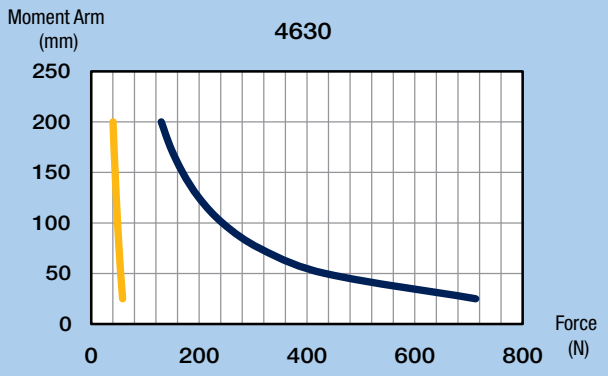


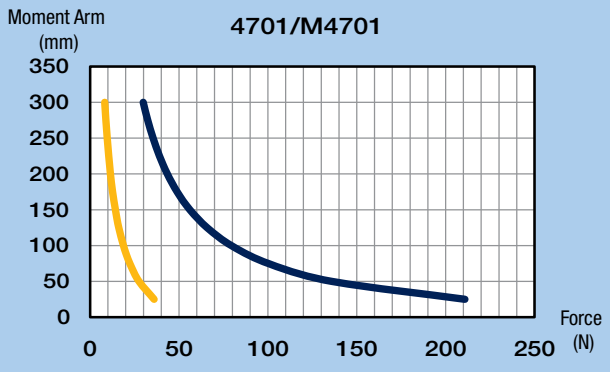


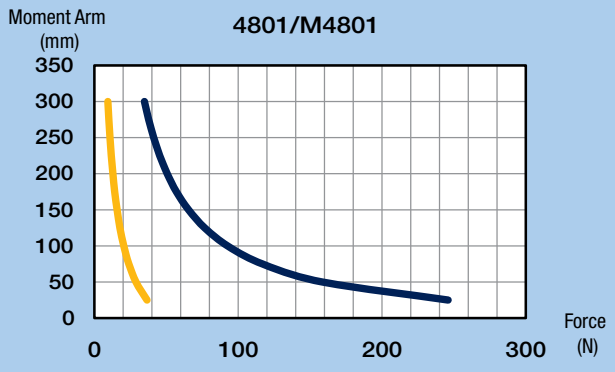
Yaw, Pitch, Roll

Yaw & Pitch Roll



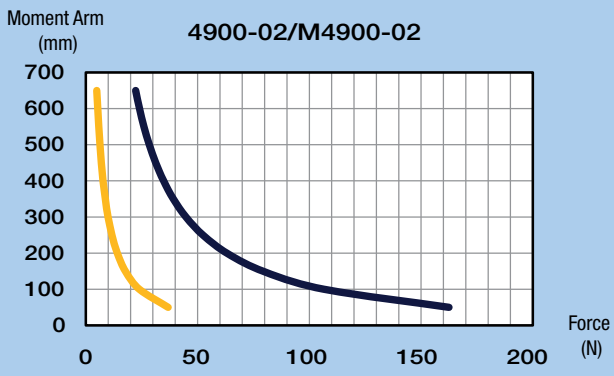


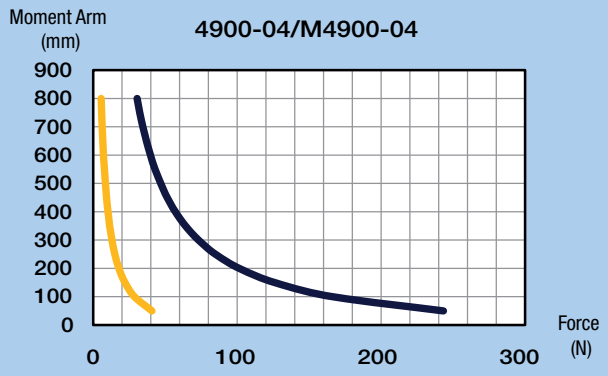


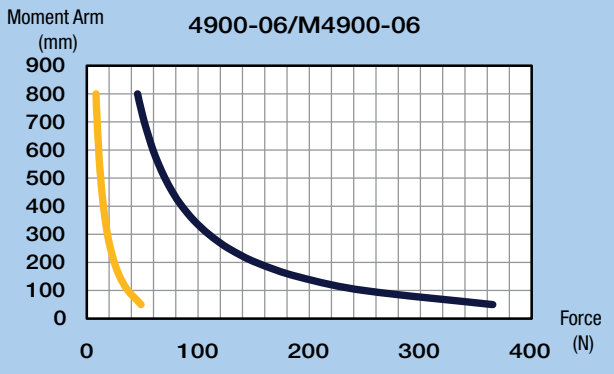


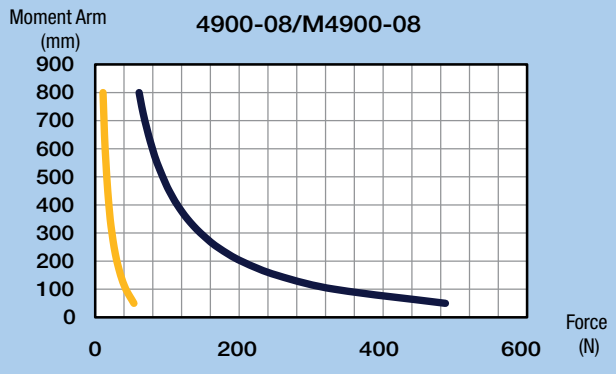
Yaw, Pitch, Roll

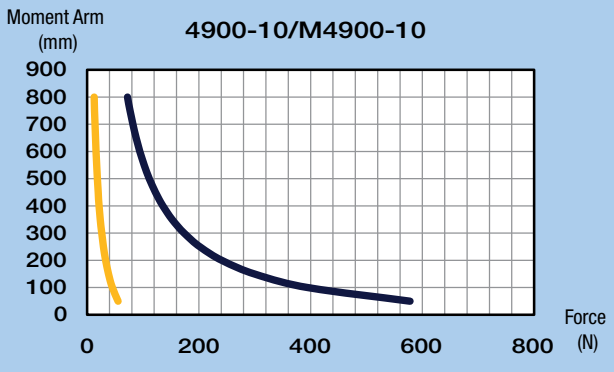
Yaw & Pitch Roll

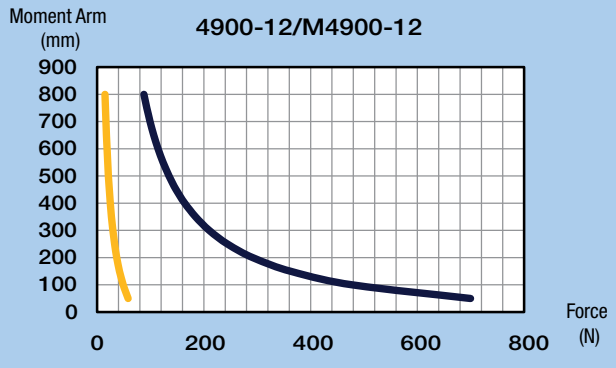


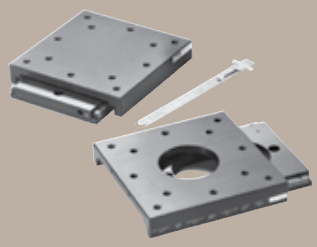












Crossed Roller Slides

heavy load capacity, long life

Crossed roller slides offer exceptional load carrying capability, approximately twice that of comparably sized ball slides. Additionally, crossed roller slides provide up to five times the life expectancy of ball slides without degradation to performance. Parker Daedal crossed roller slides are rated for over 100 million inches of travel at specified load.

Contents

Heavy Load Capacity Crossed Roller Slides

- Precision quality
- Budget friendly
- Largest selection
- Easy multi-axis configuration
- No maintenance
- Vacuum preparation and custom options

Crossed Roller Slide Design Principles

The crossed roller slide bearing system is composed of two rows of rollers. Each roller is alternately crossed at 90° with the next and captured in “V” grooves, located on the base and top. Since rollers provide a larger (line) contact surface than ball bearings, a crossed roller slide has higher load carrying capability than a ball slide of comparable size.

Crossed roller slides are constructed of corrosion-resistant black anodized aluminum and high carbon steel. These building materials provide optimized stiffness and thermal stability without excessive mass. Members are precision machined to assure flatness and parallelism for both top and bottom mounting surfaces.

Crossed roller slides are preloaded during the manufacturing process to eliminate any side play and to provide a uniform coefficient of friction. Like the ball slide, the crossed roller slide is not suggested for use in shock load applications.

Our large-scale manufacturing enables us to offer precision quality crossed roller slides at commercial quality prices.

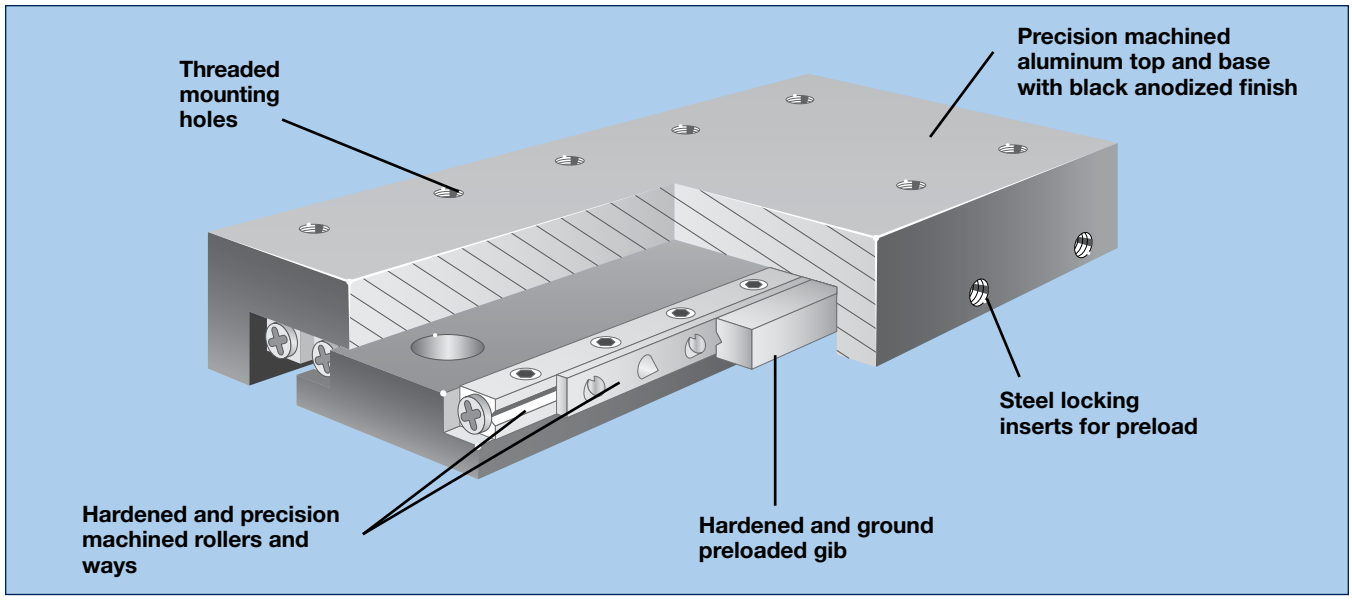
Standard Features

All models offer high-quality construction features as standard:

- Straight line accuracy of 0.00008 inches per inch of travel (0.00025 inches per inch of travel for miniatures)
- Precision machined mounting surfaces to assure flatness and parallelism
- Factory preloaded to precision specifications to eliminate any side play and provide a uniform coefficient of friction
- Factory threaded mounting holes on the top for easy payload mounting
- Factory machining services for special hole configurations and custom modifications
- Locking thread inserts on preloaded screws for maintenance-free life without loss of preload
- Hardened and precision machined rollers and ways

How to Order

Use the overview chart on the following page to select the appropriate crossed roller slide series with the appropriate load and travel. Refer to the series specification page for complete performance and mechanical information. To order, use the model number corresponding to the travel length required. A variety of modifications to standard models are available to meet custom requirements. Contact our application engineering department with your design specifications.



Product Configurations

(see following page for selection overview)

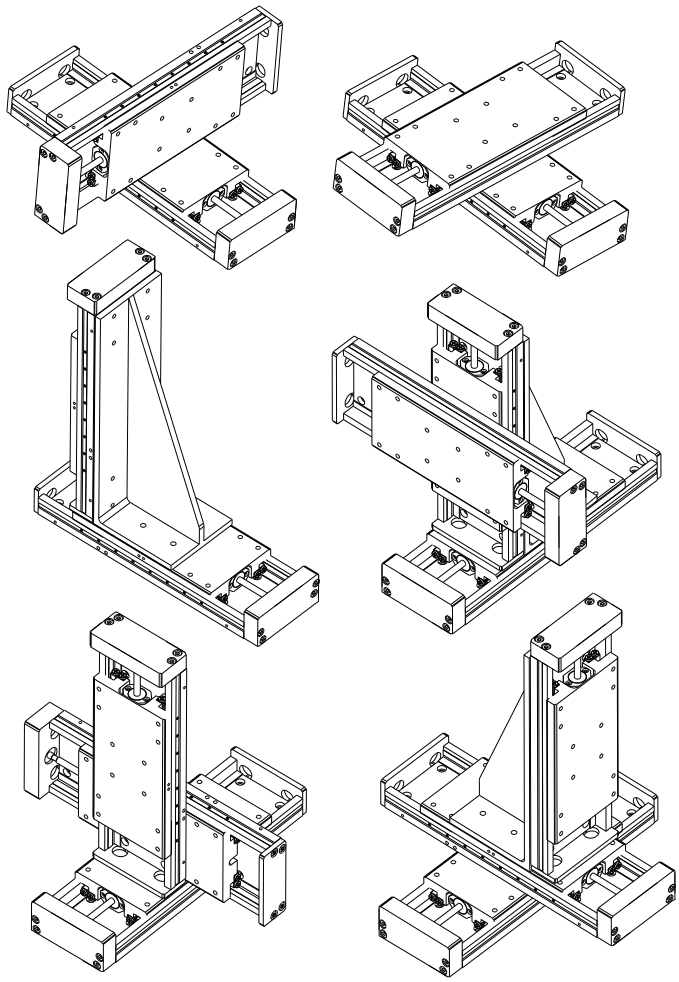
SW Series
Double "V" Low Profile Slides
Metric Mounting Only

CR and SE Series
Extended Travel Slides
Imperial Mounting (CR)
Metric Mounting (SE)

SP Series
Limited Travel Slides
Metric Mounting Only

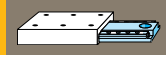
Mounting Orientations

(see Accessory section for details for Z-brackets)



Selection

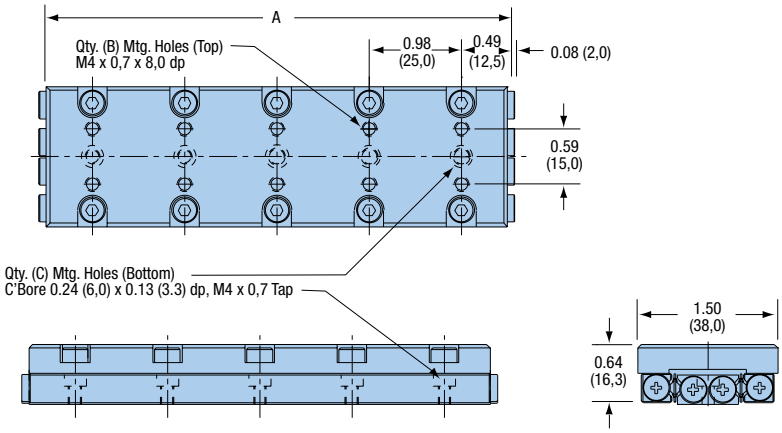
Series	Width in (mm)	Travel		Normal Load		Mounting		Page
		in	(mm)	lbs	(kg)	Imperial	Metric	
SW038	1.496 (38,0)	0.98	(25)	213	(97)		•	39
		1.97	(50)	263	(119)		•	39
		2.95	(75)	351	(159)		•	39
		3.94	(100)	439	(199)		•	39
		4.92	(125)	527	(239)		•	39
		5.91	(150)	614	(278)		•	39
		7.87	(200)	789	(358)		•	39
CR4000 CR4100 CR4200 CR4300	1.75 (44,5)	1.00	(25,4)	81	(37)	•		40-41
		2.00	(50,8)	121	(55)	•		41
		3.00	(76,2)	131	(59)	•		41
SE050 SP050	1.97 (50,0)	0.98	(25)	175	(80)		•	42-43
		1.97	(50)	263	(119)		•	42-43
		2.95	(75)	351	(159)		•	42-43
		3.94	(100)	439	(199)		•	42
		4.92	(125)	527	(239)		•	42
		5.91	(150)	614	(278)		•	42
		7.87	(200)	789	(358)		•	42
CR4500 CR4600 CR4700 CR4800	2.62 (66,5)	1.0	(25,4)	111	(50)	•		44
		2.0	(50,8)	151	(69)	•		45
		3.0	(76,2)	201	(91)	•		45
		4.0	(101,6)	252	(114)	•		45
SE075 SP075	2.95 (75,0)	1.97	(50)	263 348	(119) (158)		• •	46 47
		2.95	(75)	351 439	(159) (199)		• •	46 47
		3.94	(100)	439	(199)		•	46
		4.92	(125)	527	(239)		•	46
		5.91	(150)	614	(278)		•	46
		7.87	(200)	789	(358)		•	46
SE100 SP100	3.94 (100.0)	0.98	(25)	439	(199)		•	49
		1.97	(50)	527	(239)		•	49
		2.95	(75)	795 614	(361) (278)		• •	48 49
		3.94	(100)	702	(318)		•	49
		4.92	(125)	1236	(561)		•	48
		7.87	(200)	2031	(921)		•	48
		11.81	(300)	2738	(1242)		•	48
CR4400	5.0 (127,0)	3.0	(76,2)	201	(90)	•		50
CR4900	6.0 (152,4)	4.0	(101,6)	423	(192)	•		51
		6.0	(152,4)	719	(326)	•		51
		8.0	(203,2)	1052	(477)	•		51
		10.0	(254,0)	1395	(633)	•		51
		12.0	(304,8)	1733	(786)	•		51



SW038 Series

Specifications	
Travel:	0.98 – 7.87 in (25 – 200 mm)
Size:	
Width	1.496 in (38,0 mm)
Length	2.13 – 9.02 in (54,1 – 229,1 mm)
Height	0.63 in (16,0 mm)
Load:	
Normal	213 – 789 lbs (97 – 358 kg)
Moment: Yaw, Pitch, Roll	See page 52
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	0.35 – 1.59 lbs (0,16 – 0,72 kg)
Construction:	Aluminum top; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Anodize

Dimensions in (mm)

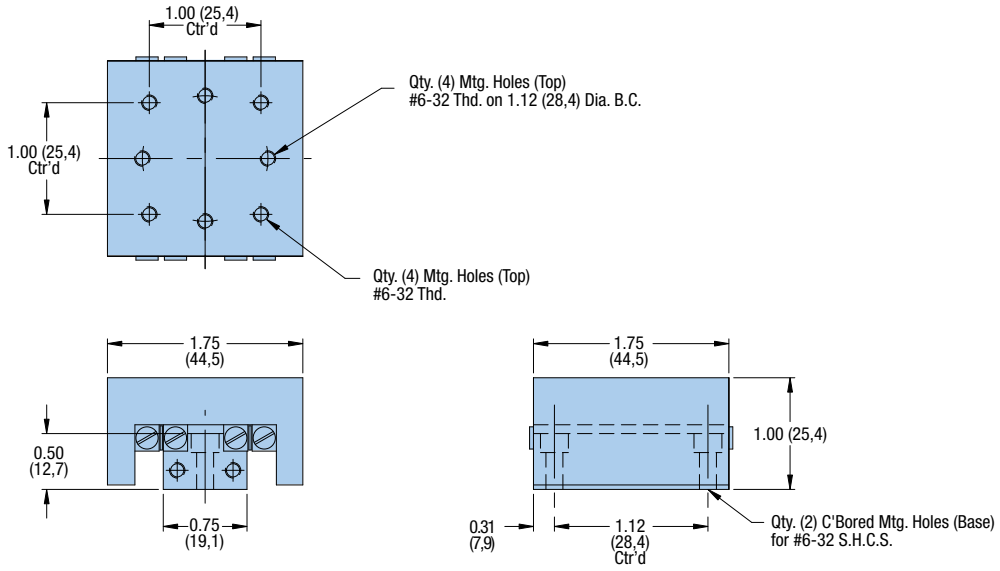


Model	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Weight lbs	Weight (kg)	Dimension A in	Dimension A (mm)	Qty B	Qty C
SW038A-050	0.98	(25)	213	(97)	0.35	(0,16)	1.97	(50,0)	4	2
SW038A-075	1.97	(50)	263	(119)	0.52	(0,24)	2.95	(75,0)	6	3
SW038A-100	2.95	(75)	351	(159)	0.71	(0,32)	3.94	(100,0)	8	4
SW038A-125	3.94	(100)	439	(199)	0.88	(0,40)	4.92	(125,0)	10	5
SW038A-150	4.92	(125)	527	(239)	1.06	(0,48)	5.91	(150,0)	12	6
SW038A-175	5.91	(150)	684	(298)	1.24	(0,56)	6.89	(175,0)	14	7
SW038A-225	7.87	(200)	789	(358)	1.59	(0,72)	8.86	(225,0)	18	9

CR4000 Series

Specifications	
Travel:	1.0 in (25,4 mm)
Size:	
Width	1.75 in (44,5 mm)
Length	1.75 in (44,5 mm)
Height	1.00 in (25,4 mm)
Load:	
Normal	81 lbs (37 kg)
Moment: Yaw, Pitch, Roll	See page 53
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	0.2 lbs
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Dimensions in (mm)

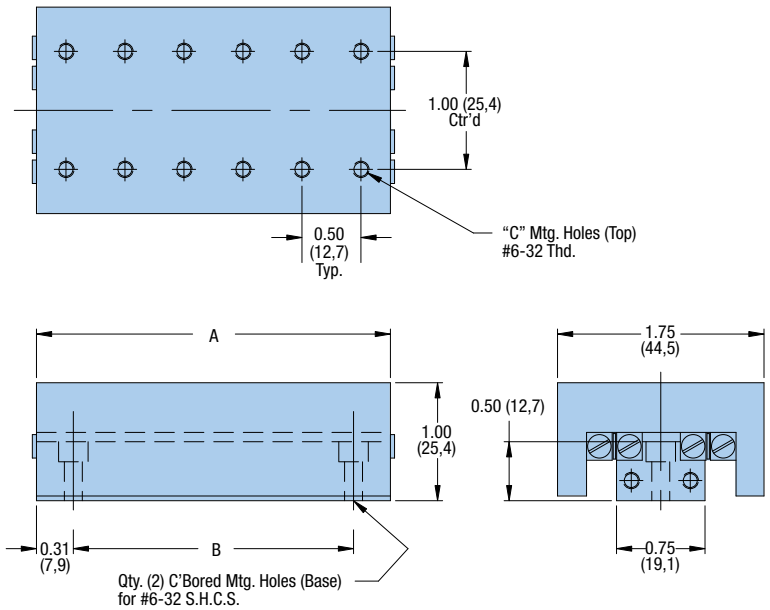


Model	Travel
CR4001	1.0 in (25,4 mm)

CR4100, CR4200, CR4300 Series

Specifications	
Travel:	1.0 – 3.0 in (25,4 – 76,2 mm)
Size:	
Width	1.75 in (44,5 mm)
Length	2.00 – 4.00 in (50,8 – 101,6 mm)
Height	1.00 in (25,4 mm)
Load:	
Normal	81 – 131 lbs
Moment: Yaw, Pitch, Roll	See page 53
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	0.2 – 0.6 lbs
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

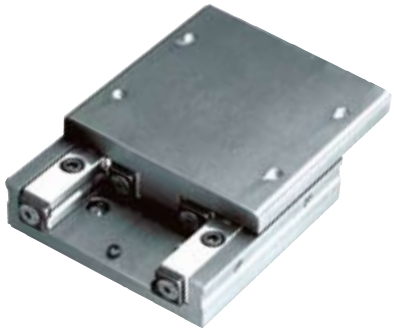
Dimensions in (mm)



Model	Travel in (mm)	Normal Load lbs (kg)	Weight lbs (kg)	Dimensions – in (mm) A	Dimensions – in (mm) B	Qty C
CR4101	1.0 (25,4)	81 (37)	0.2 (0,09)	2.00 (50,8)	1.38 (35,1)	8
CR4201	2.0 (50,8)	121 (55)	0.4 (0,18)	3.00 (76,2)	2.38 (60,5)	12
CR4301	3.0 (76,2)	131 (59)	0.6 (0,27)	4.00 (101,4)	3.38 (85,9)	16

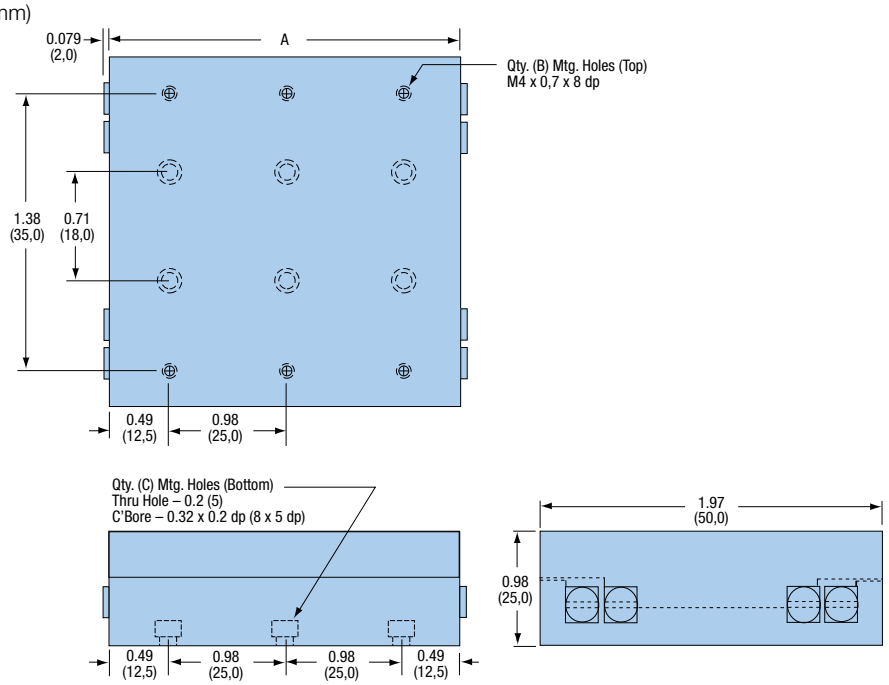
SE050 Series

Specifications	
Travel:	0.98 – 7.87 in (25 – 200 mm)
Size:	
Width	1.97 in (50,0 mm)
Length	2.13 – 9.02 in (54,1 – 229,1 mm)
Height	0.98 in (25,0 mm)
Load:	
Normal	175 – 789 lbs (80 – 358 kg)
Moment: Yaw, Pitch, Roll	See page 54
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	0.65 – 2.92 lbs (0,30 – 1,35 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize



Dimensions

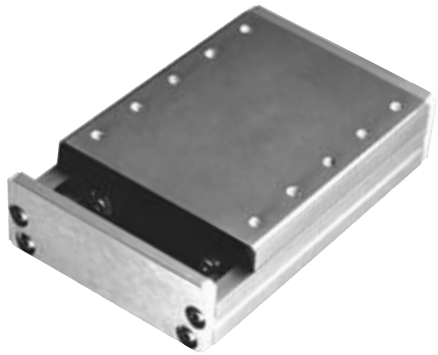
in (mm)



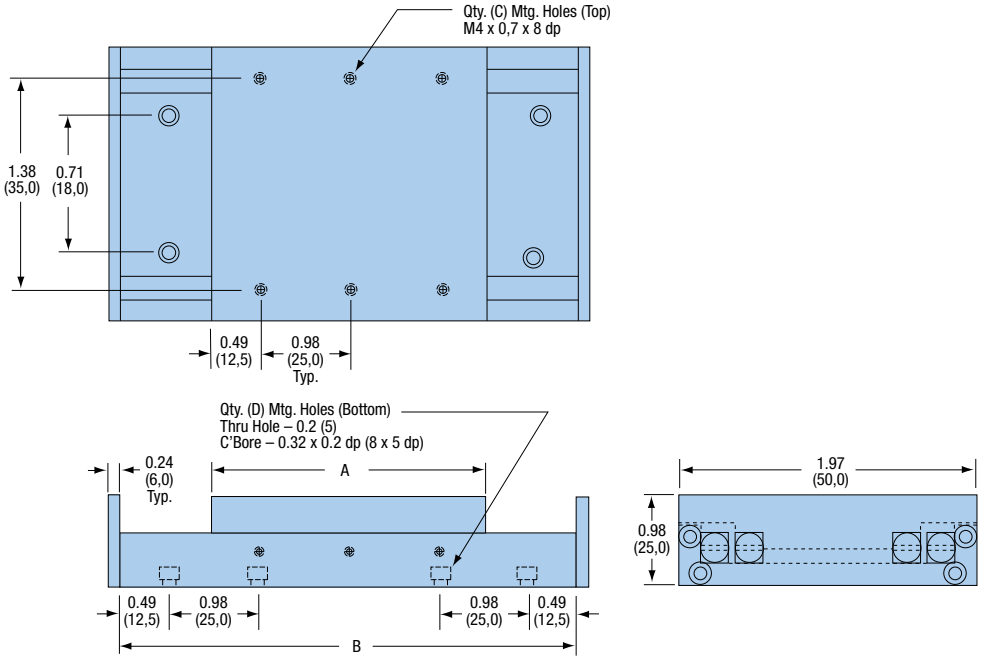
Model	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Weight lbs	Weight (kg)	Dimension A in	Dimension A (mm)	Qty B	Qty C
SE050A-050	0.98	(25)	175	(80)	0.65	(0,30)	1.97	(50,0)	4	4
SE050A-075	1.97	(50)	263	(119)	0.97	(0,45)	2.95	(75,0)	6	6
SE050A-100	2.95	(75)	351	(159)	1.30	(0,60)	3.94	(100,0)	8	8
SE050A-125	3.94	(100)	439	(199)	1.62	(0,75)	4.92	(125,0)	10	8
SE050A-150	4.92	(125)	527	(239)	1.95	(0,90)	5.91	(150,0)	12	8
SE050A-175	5.91	(150)	614	(278)	2.21	(1,05)	6.89	(175,0)	14	8
SE050A-225	7.87	(200)	789	(358)	2.92	(1,35)	8.86	(225,0)	18	8

SP050 Series

Specifications	
Travel:	0.98 – 2.95 in (25 – 75 mm)
Size:	
Width	1.97 in (50,0 mm)
Length	3.43 – 7.37 in (87,1 – 187,2 mm)
Height	0.98 in (25,0 mm)
Load:	
Normal	175 – 351 lbs (80 – 159 kg)
Moment: Yaw, Pitch, Roll	See page 55
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	0.86 – 2.00 lbs (0,39 – 0,91 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize



Dimensions in (mm)

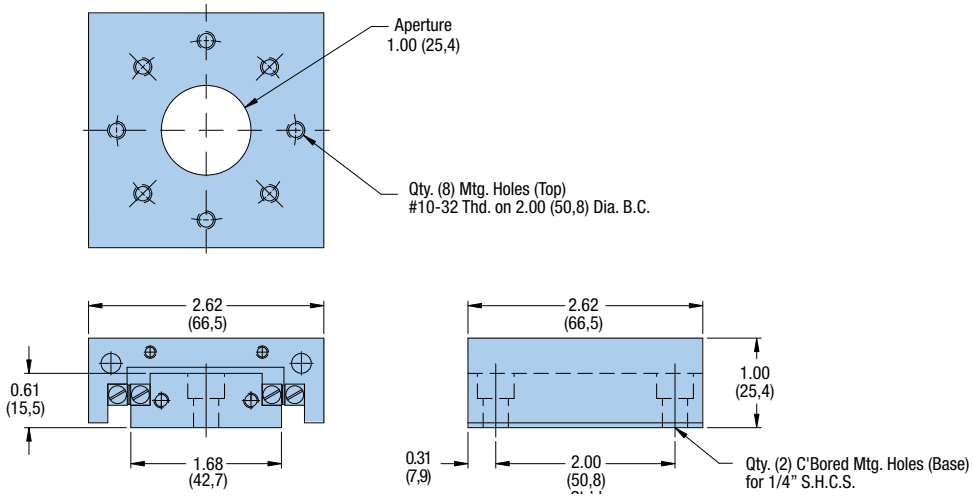


Model	Travel in	Travel (mm)	Normal Load lbs	Normal Load kg	Weight lbs	Weight (kg)	Dimension A in	Dimension A (mm)	Dimension B in	Dimension B (mm)	Qty C	Qty D
SP050A-075	0.98	(25)	175	(80)	0.86	(0,39)	1.97	(50,0)	2.95	(75,0)	4	6
SP050A-125	1.97	(50)	263	(119)	1.43	(0,65)	2.95	(75,0)	4.92	(125,0)	6	8
SP050A-175	2.95	(75)	351	(159)	2.00	(0,91)	3.94	(100,0)	6.89	(175,0)	8	8

CR4500 Series

Specifications	
Travel:	1.0 in (25,4)
Size:	
Width	2.62 in (66,5 mm)
Length	2.62 in (66,5 mm)
Height	1.00 in (25,4 mm)
Load:	
Normal	111 lbs (50 kg)
Moment: Yaw, Pitch, Roll	See page 53
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	CR4501 – 0.8 lbs (0,36 kg) CR4505 – 0.7 lbs (0,32 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Dimensions in (mm)



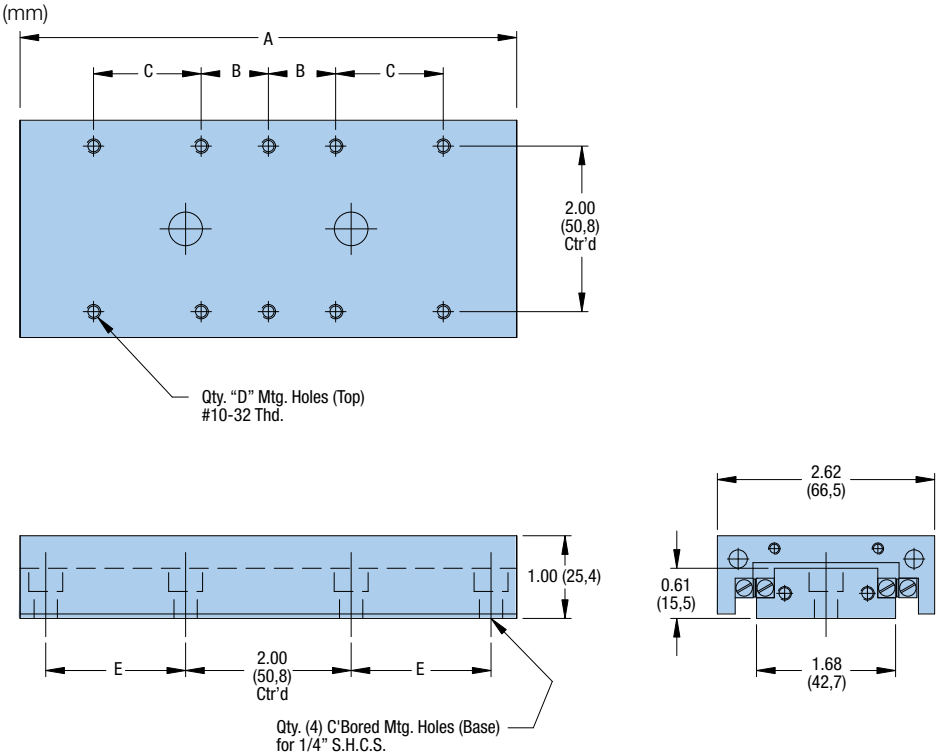
Model	Travel in (mm)	Aperture in (mm)
CR4501	1.0 (25,4)	—
CR4505	1.0 (25,4)	1.00 (25,4)

CR4600, CR4700, CR4800 Series

Specifications	
Travel:	2.0 – 4.0 in (50,8 – 101,6 mm)
Size:	
Width	2.62 in (66,5 mm)
Length	4.00 – 6.00 in (101,6 – 152,4 mm)
Height	1.00 in (25,4)
Load:	
Normal	151 – 252 lbs (69 – 114 lg)
Moment: Yaw, Pitch, Roll	See page 53
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	0.9 – 1.4 lbs (0,4 – 0,6 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Dimensions

in (mm)



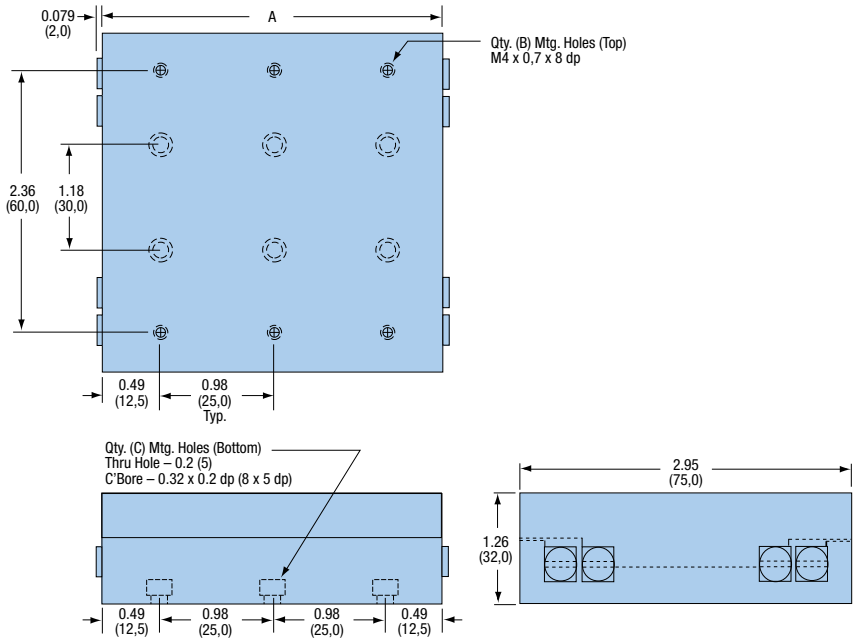
Model	Travel in (mm)	Normal Load lbs (kg)	Weight lbs (kg)	Dimensions — in (mm) A	B	C	D	E
CR4601	2.0 (50,8)	151 (69)	0.9 (0,4)	4.00 (101,6)	0.5 (12,7)	—	6	0.69 (17,5)
CR4701	3.0 (76,2)	201 (91)	1.1 (0,5)	5.00 (127,0)	1.0 (25,4)	—	6	1.19 (30,2)
CR4801	4.0 (101,6)	252 (114)	1.4 (0,6)	6.00 (152,4)	0.5 (12,7)	1.0 (12,7)	10	1.69 (42,9)

SE075 Series

Specifications	
Travel:	1.97 – 7.87 in (50 – 200 mm)
Size: **Width** **Length** **Height**	 2.95 in (75,0 mm) 3.11 – 9.02 in (79,0 – 229,1 mm) 1.26 in (32,0 mm)
Load: **Normal** **Moment: Yaw, Pitch, Roll**	 263 – 789 lbs (119 – 358 kg) See page 56
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	1.50 – 4.52 lbs (0,69 – 2,07 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Dimensions

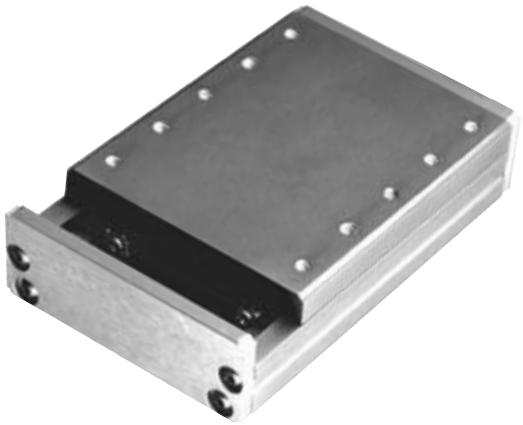
in (mm)



Model	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Weight lbs	Weight (kg)	Dimension A in	Dimension A (mm)	Qty B	Qty C
SE075A-075	1.97	(50)	263	(119)	1.50	(0,69)	2.95	(75,0)	6	6
SE075A-100	2.95	(75)	351	(159)	2.01	(0,92)	3.94	(100,0)	8	8
SE075A-125	3.94	(100)	439	(199)	2.51	(1,15)	4.92	(125,0)	10	8
SE075A-150	4.92	(125)	527	(239)	3.01	(1,38)	5.91	(150,0)	12	8
SE075A-175	5.91	(150)	614	(278)	3.51	(1,61)	6.89	(175,0)	14	8
SE075A-225	7.87	(200)	789	(358)	4.52	(2,07)	8.86	(225,0)	18	8

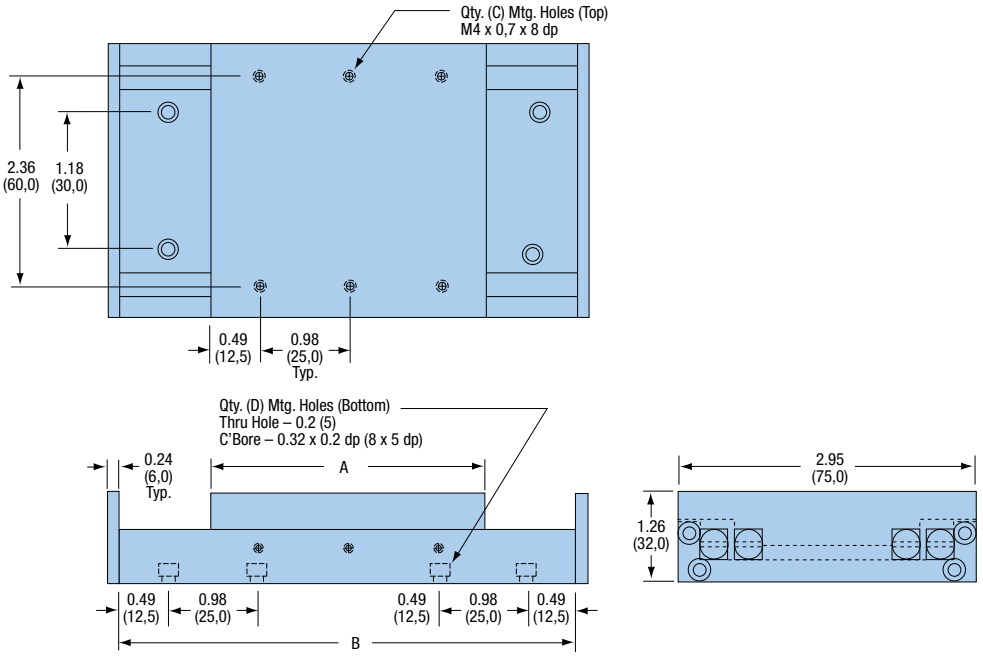
SP075 Series

Specifications	
Travel:	0.98 – 2.95 in (25 – 75 mm)
Size:	
Width	2.95 in (75,0 mm)
Length	4.42 – 8,35 in (112.3 – 212,1 mm)
Height	1.26 in (32,0 mm)
Load:	
Normal	348 – 439 lbs (158 – 199 kg)
Moment: Yaw, Pitch, Roll	See page 57
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	1.54 – 3.07 lbs (0,72 – 1,44 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize



Dimensions

in (mm)

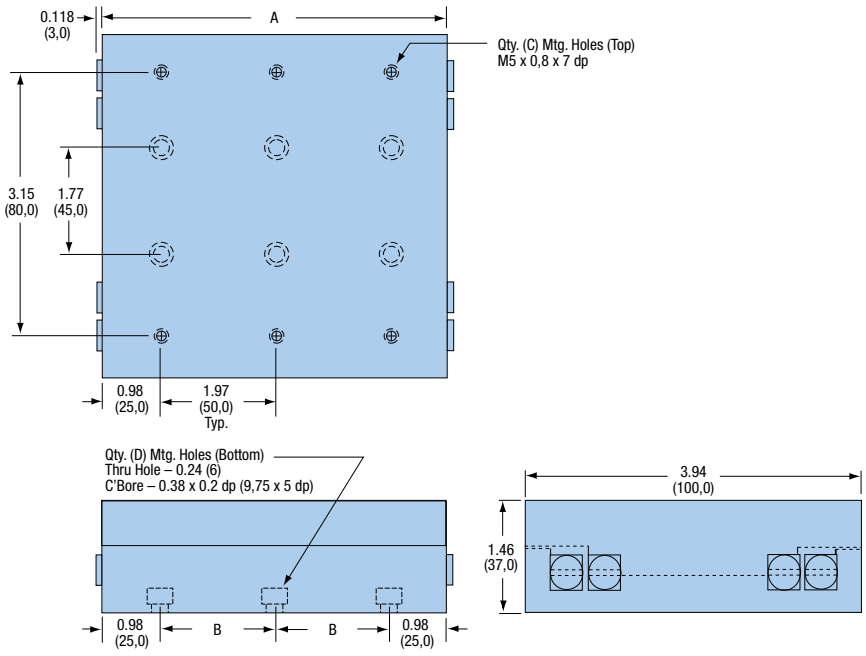


Model	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Weight lbs	Weight (kg)	Dimension A in	Dimension A (mm)	Dimension B in	Dimension B (mm)	Qty C	Qty D
SP075A-150	1.97	(50)	348	(158)	2.30	(1,08)	3.94	(100,0)	5.91	(150,0)	8	8
SP075A-200	2.95	(75)	439	(199)	3.07	(1,44)	4.92	(125,0)	7.87	(200,0)	10	8

SE100 Series

Specifications	
Travel:	2.95 – 11.81 in (75 – 300 mm)
Size: **Width** **Length** **Height**	 3.94 in (100,0 mm) 4.10 – 13.94 in (104,1 – 354,1 mm) 1.46 in (37,0 mm)
Load: **Normal** **Moment: Yaw, Pitch, Roll**	 795 – 2758 lbs (631 – 1242 kg) See page 58
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	3.08 – 13.64 lbs (1,4 – 6,3 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

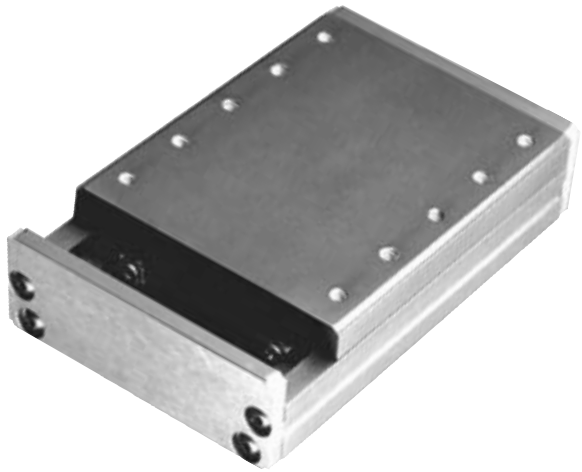
Dimensions in (mm)



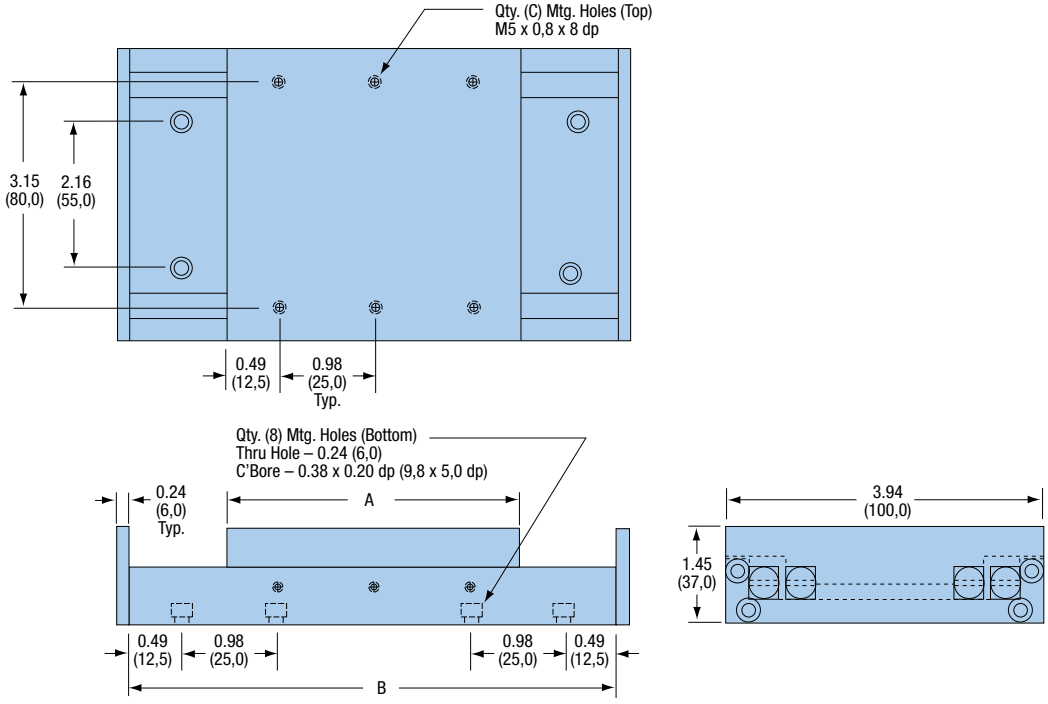
Model	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Weight lbs	Weight (kg)	Dimension A in	Dimension A (mm)	Dimension B in	Dimension B (mm)	Qty C	Qty D
SE100A-100	2.95	(75)	795	(361)	3.08	(1,4)	3.94	(100,0)	1.97	(50,0)	4	4
SE100A-150	4.92	(125)	1236	(561)	4.55	(2,1)	5.91	(150,0)	1.97	(50,0)	6	6
SE100A-250	7.87	(200)	2031	(921)	7.58	(3,5)	9.84	(250,0)	1.97	(50,0)	10	8
SE100A-350	11.81	(300)	2738	(1242)	10.61	(4,9)	13.78	(350,0)	3.94	(100,0)	14	8

SP100 Series

Specifications	
Travel:	0.98 – 3.94 in (25 – 100 mm)
Size:	
Width	3.94 in (100,0 mm)
Length	6.39 – 12.29 in (162,3 – 312,2 mm)
Height	1.46 in (37,0 mm)
Load:	
Normal	439 – 702 lbs (149 – 318 kg)
Moment: Yaw, Pitch, Roll	See page 59
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	3.66 – 7.32 lbs (1,68 – 3,38 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize



Dimensions in (mm)

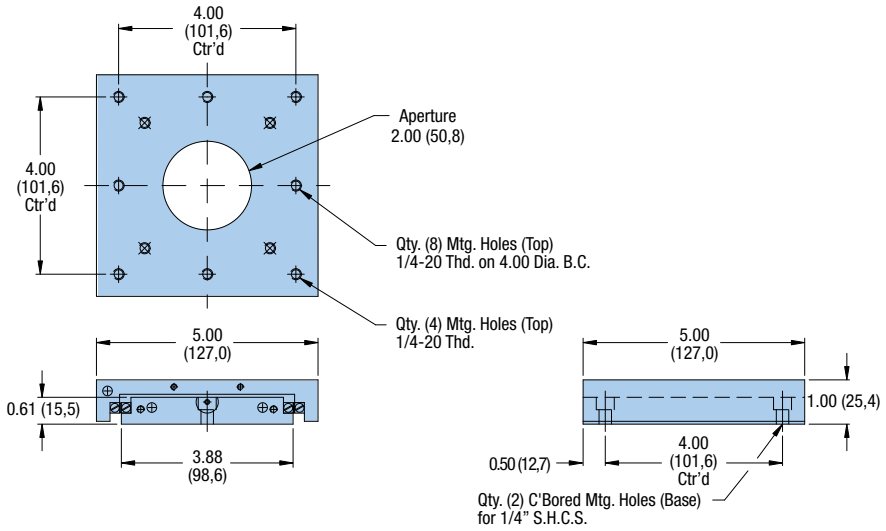


Model	Travel in	Travel (mm)	Normal Load lbs	Normal Load (kg)	Weight lbs	Weight (kg)	Dimension A in	Dimension A (mm)	Dimension B in	Dimension B (mm)	Qty C
SP100A-150	0.98	(25)	439	(199)	3.66	(1,68)	4.92	(125,0)	5.91	(150,0)	10
SP100A-200	1.97	(50)	527	(239)	4.88	(2,24)	5.91	(150,0)	7.87	(200,0)	12
SP100A-250	2.95	(75)	614	(278)	6.10	(2,80)	6.89	(175,0)	9.84	(250,0)	14
SP100A-300	3.94	(100)	702	(318)	7.32	(3,36)	7.87	(200,0)	11.81	(300,0)	16

CR4400 Series

Specifications	
Travel:	3.0 in (76,2 mm)
Size:	
Width	5.00 in (127,0 mm)
Length	5.00 in (127,0 mm)
Height	1.00 in (25,4 mm)
Load:	
Normal	201 lbs (90 kg)
Moment: Yaw, Pitch, Roll	See page 60
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	CR4410 – 2.2 lbs (l kg) CR4450 – 1.7 lbs (0,8 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Dimensions in (mm)



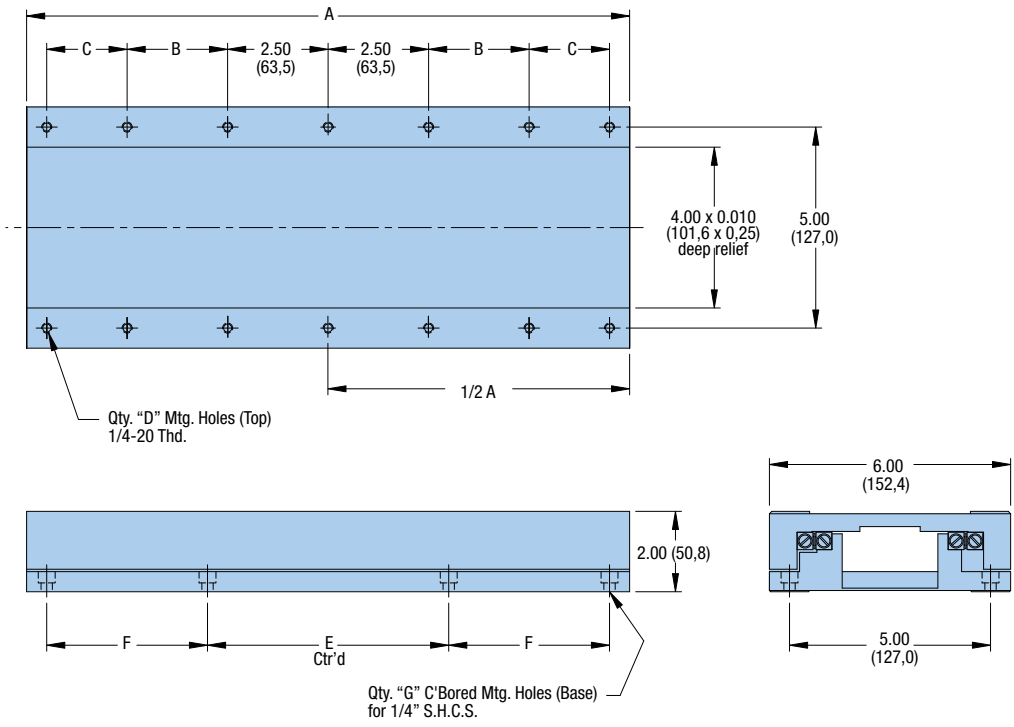
Model	Travel in (mm)	Aperture in (mm)
CR4410	3.0 (76,2)	—
CR4450	3.0 (76,2)	2.00 (50,8)

CR4900 Series

Specifications	
Travel:	4.0 – 12.0 in (101,6 – 304,8 mm)
Size:	
Width	6.00 in (152,4 mm)
Length	6.00 – 18.00 in (152,4 –457,2 mm)
Height	2.00 in
Load:	
Normal	423 – 1733 lbs (192 – 786 kg)
Moment: Yaw, Pitch, Roll	See page 60
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	5.0 – 13.0 lbs (2,3 – 5,9 kg)
Construction:	Aluminum top and base; steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Dimensions

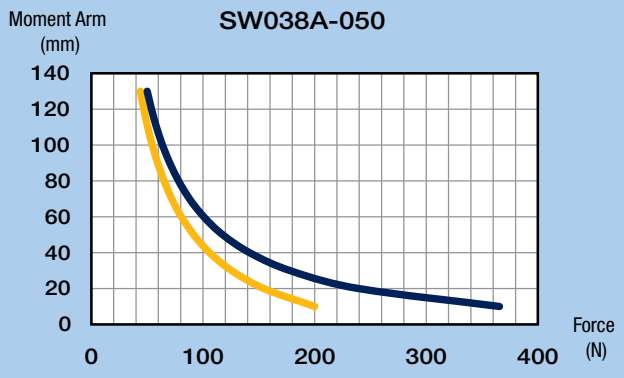
in (mm)

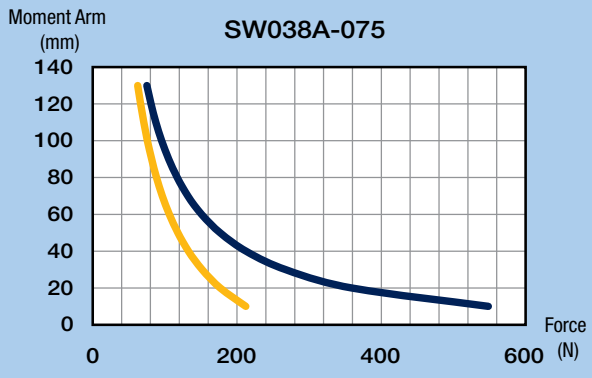


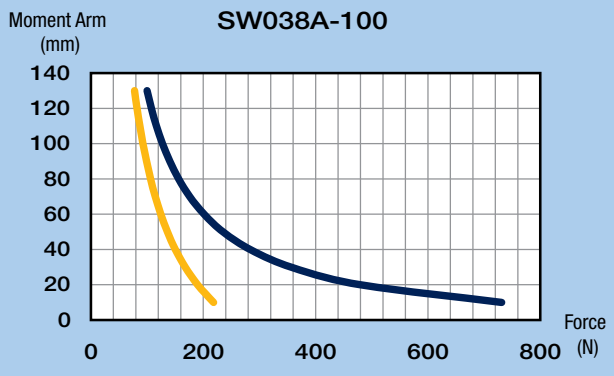
Model	Travel in (mm)	Normal Load lbs (kg)	Weight lbs (kg)	Dimensions — in (mm) A	B	C	D	E	F	G
CR4900-04	4.0 in	423 (192)	5.0 (2,3)	6.00 (152,4)	—	—	6	5.00 (127,0)	—	4
CR4900-06	6.0 in	719 (326)	7.0 (3,2)	9.00 (228,6)	1.50 (38,1)	—	10	5.00 (127,0)	1.50 (38,1)	8
CR4900-08	8.0 in	1052 (477)	9.0 (4,1)	12.00 (304,8)	2.50 (63,5)	—	10	5.00 (127,0)	3.00 (76,2)	8
CR4900-10	10.0 in	1395 (633)	11.0 (5,0)	15.00 (381,0)	2.50 (63,5)	2.00 (50,8)	14	6.00 (152,4)	4.00 (101,6)	8
CR4900-12	12.0 in	1733 (786)	13.0 (5,9)	18.00 (457,2)	5.00 (127,0)	1.00 (25,4)	14	7.00 (177,8)	5.00 (127,0)	8

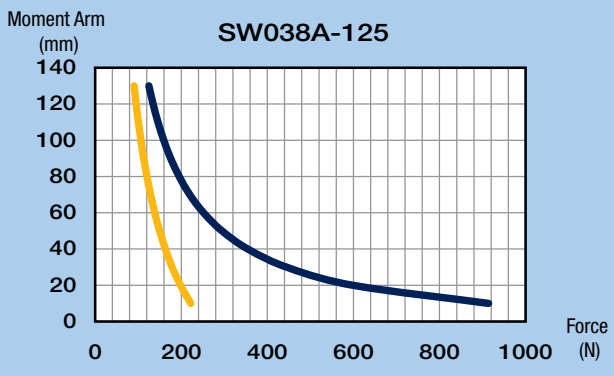
Yaw, Pitch, Roll

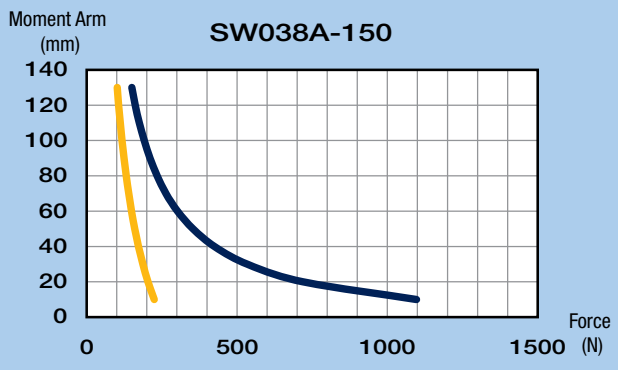
Yaw & Pitch Roll

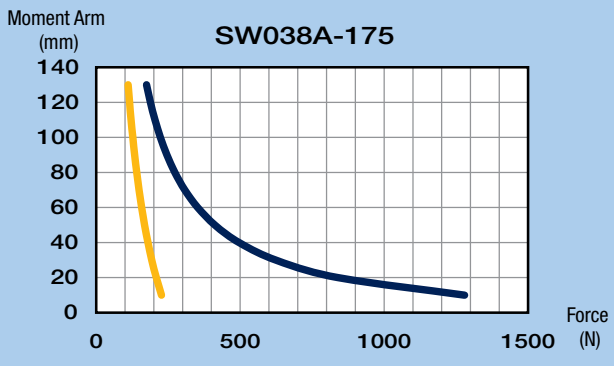


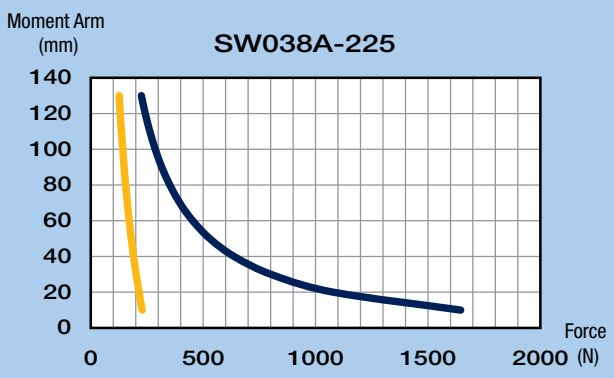






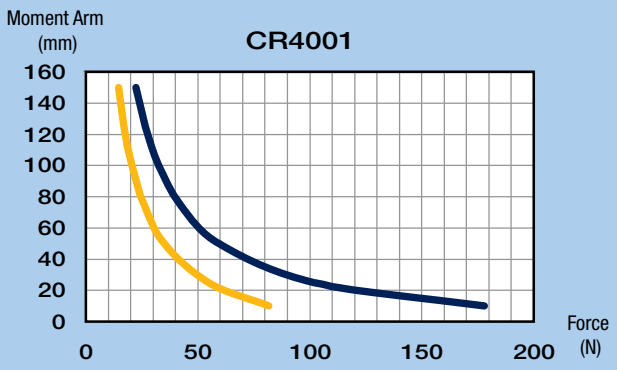


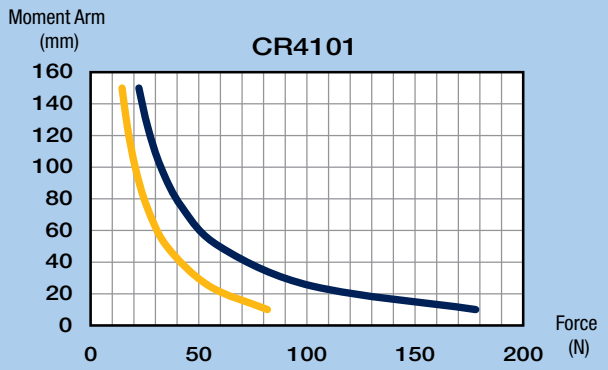


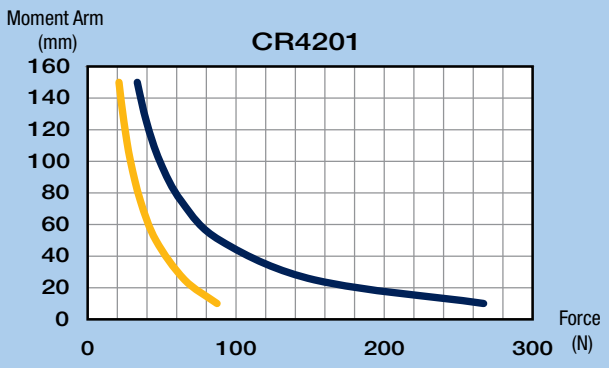


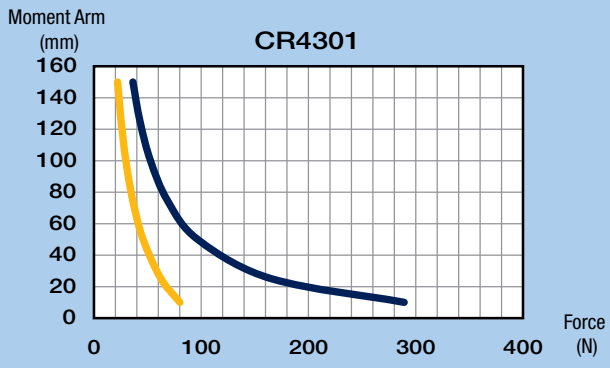
Yaw, Pitch, Roll

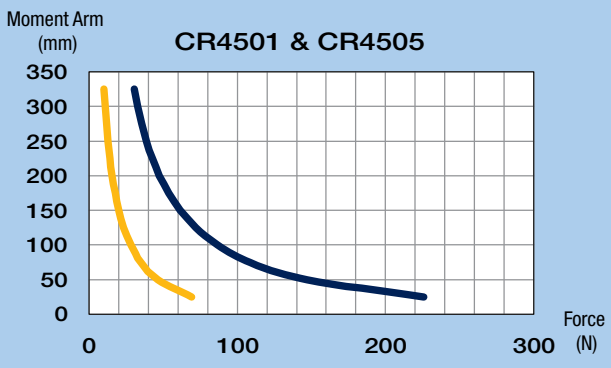
Yaw & Pitch Roll

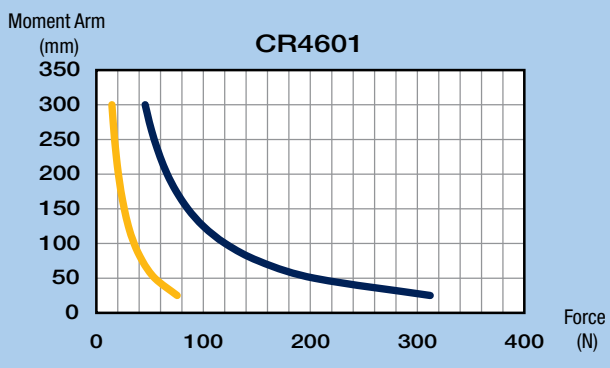


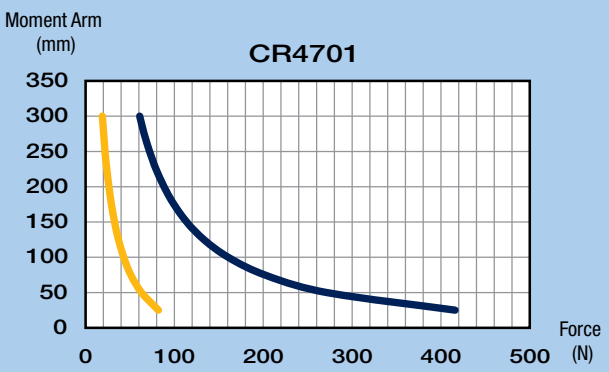


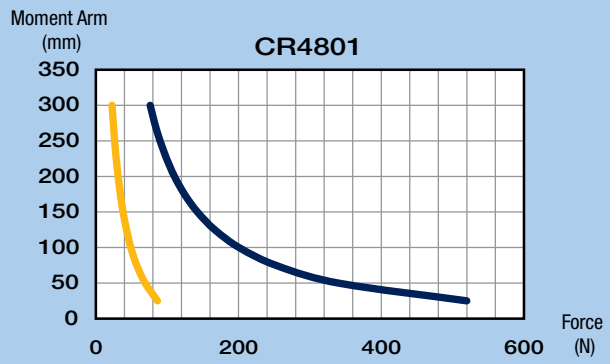






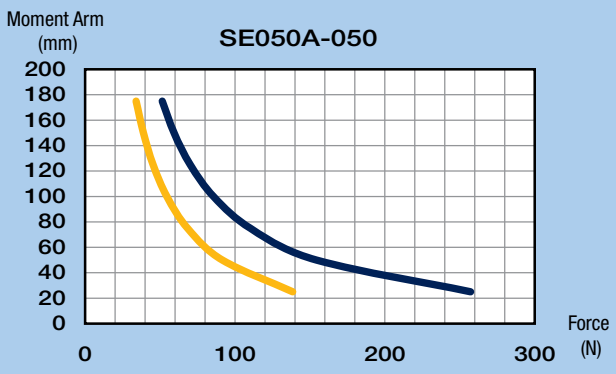


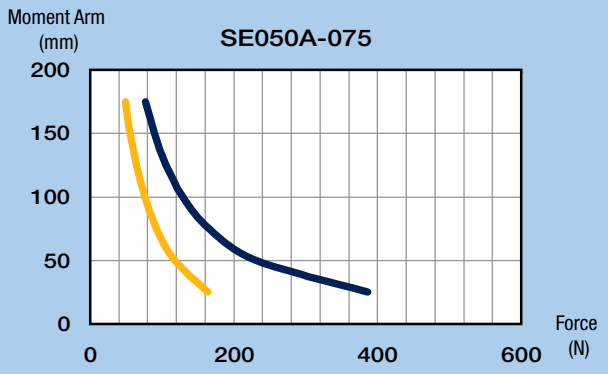


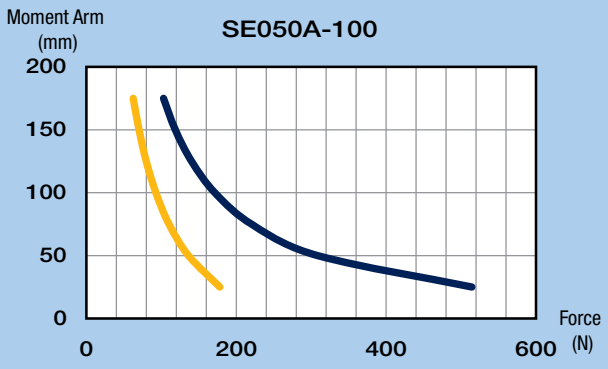


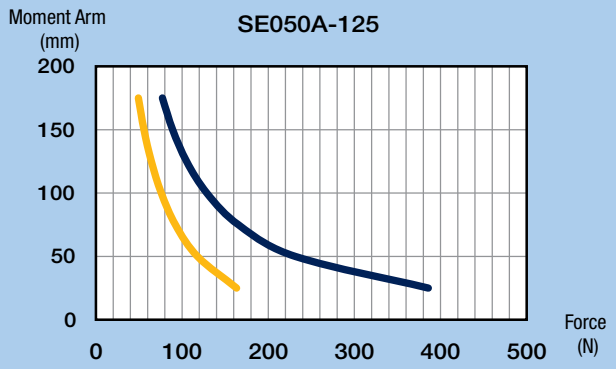
Yaw, Pitch, Roll

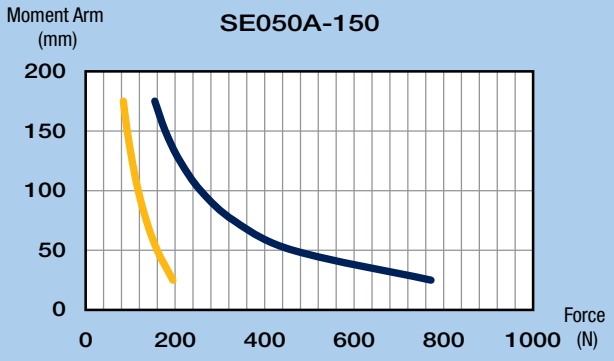
Yaw & Pitch Roll

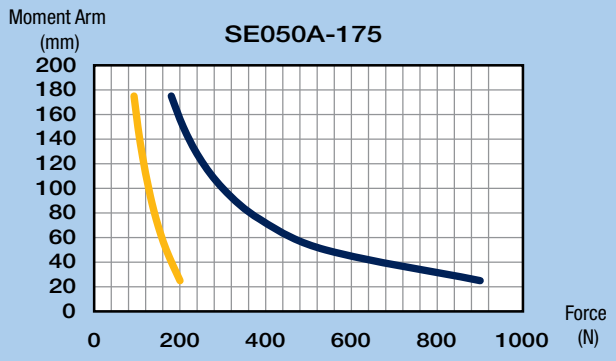


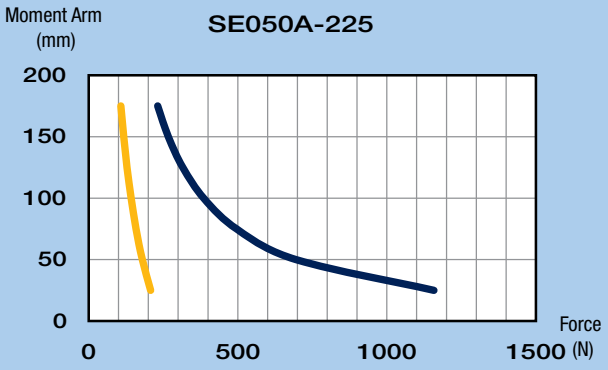






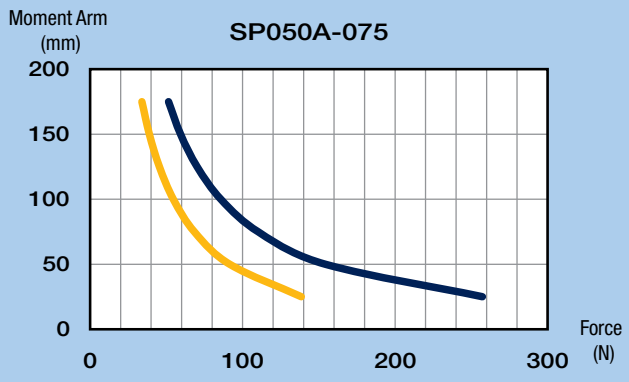


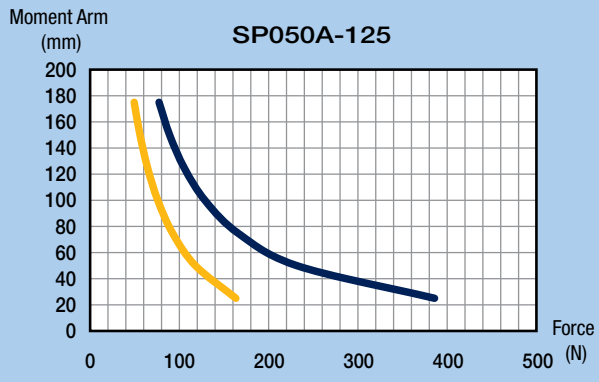


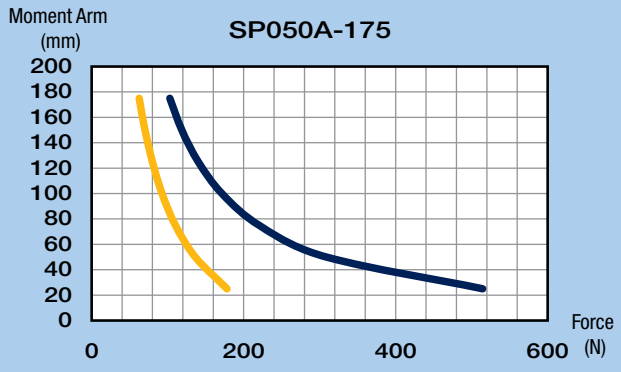


Yaw, Pitch, Roll

Yaw & Pitch Roll

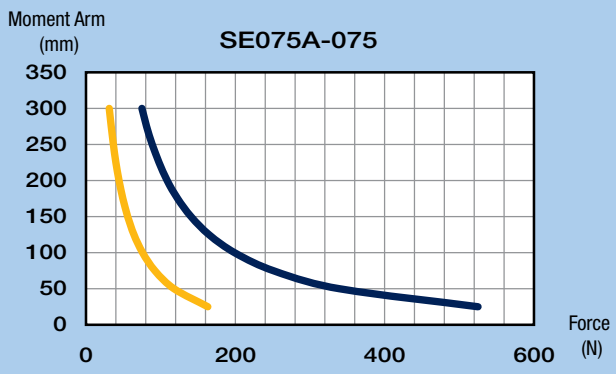


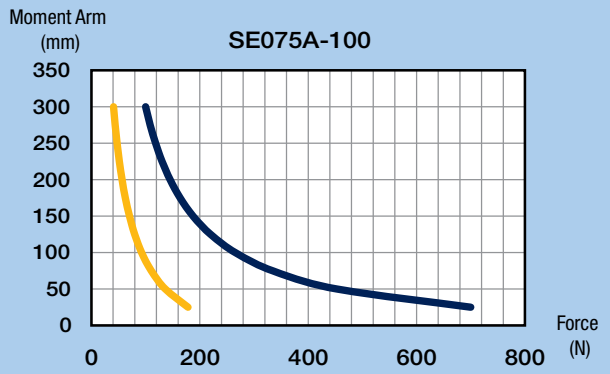


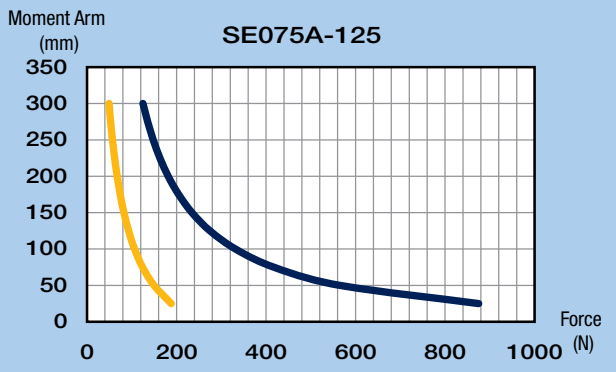


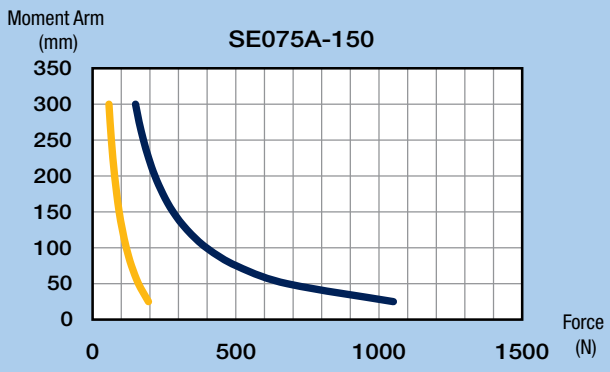
Yaw, Pitch, Roll

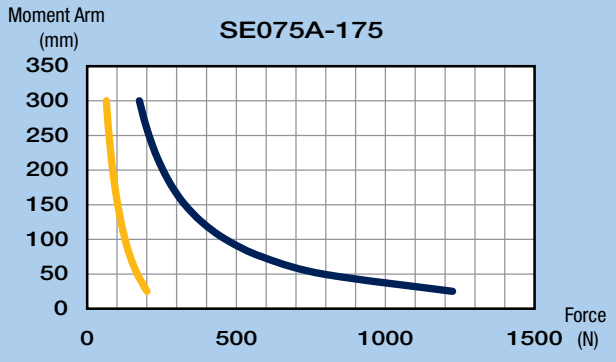
Yaw & Pitch Roll

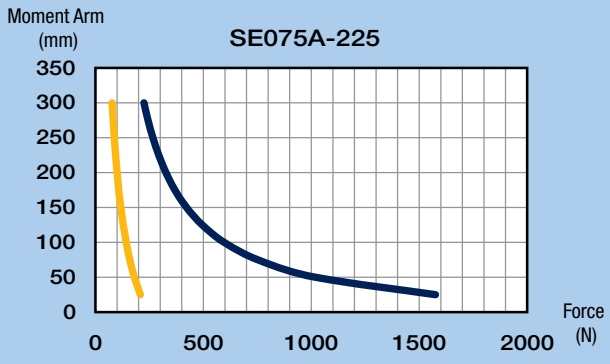






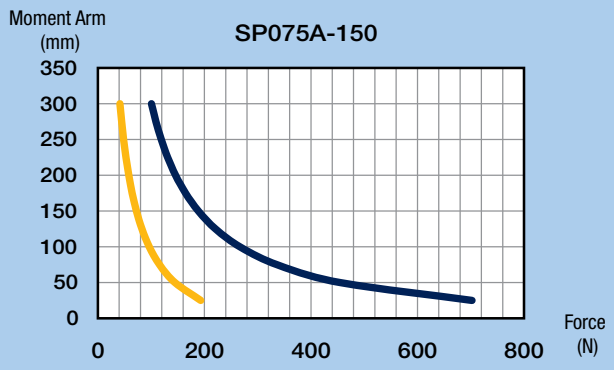


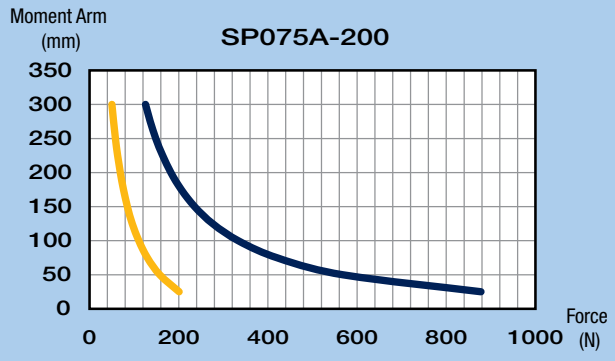




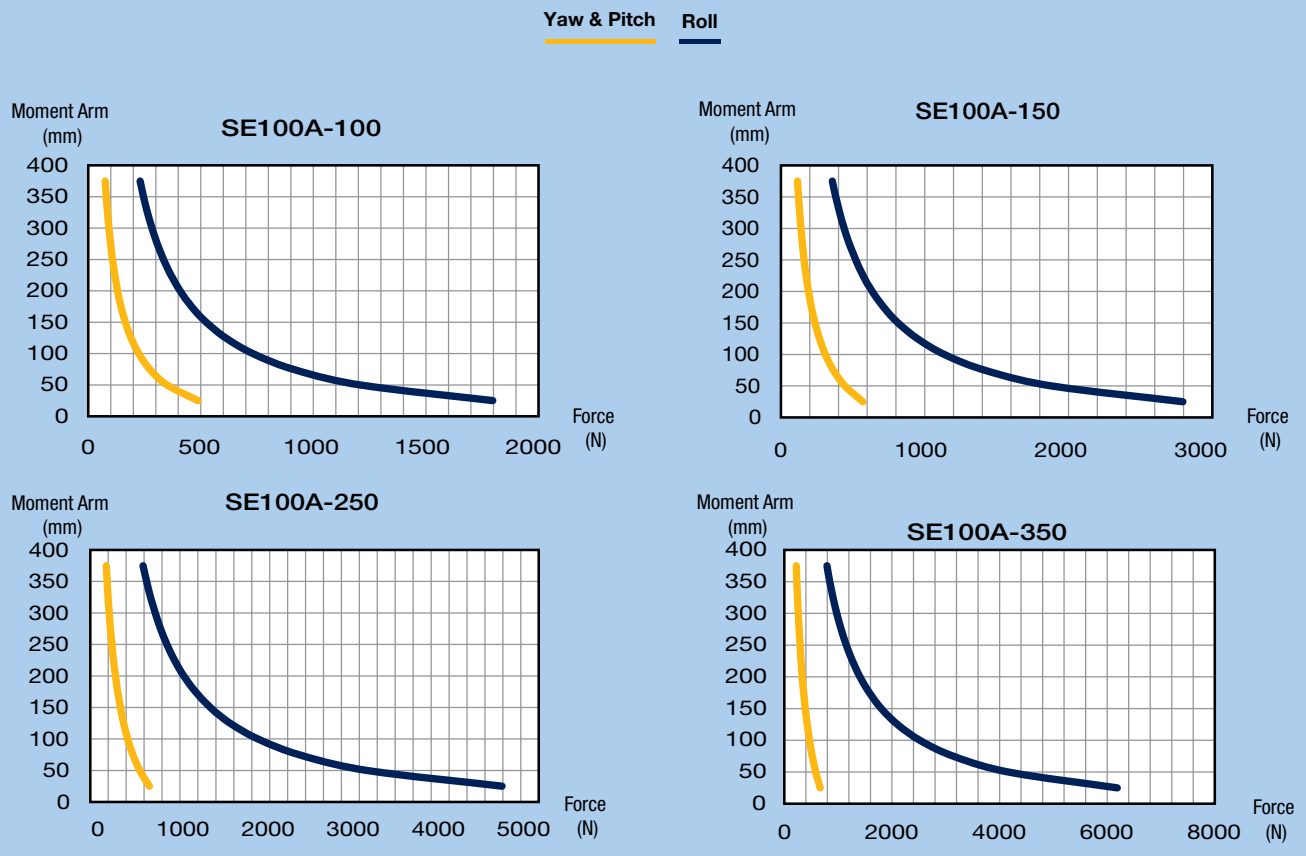
Yaw, Pitch, Roll

Yaw & Pitch Roll



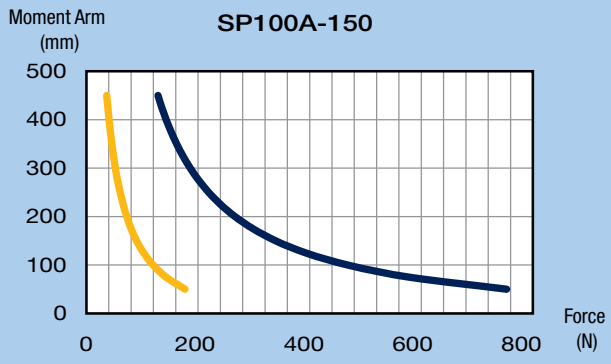


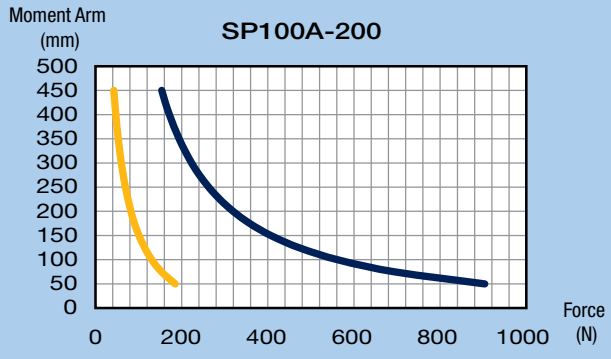
Yaw, Pitch, Roll

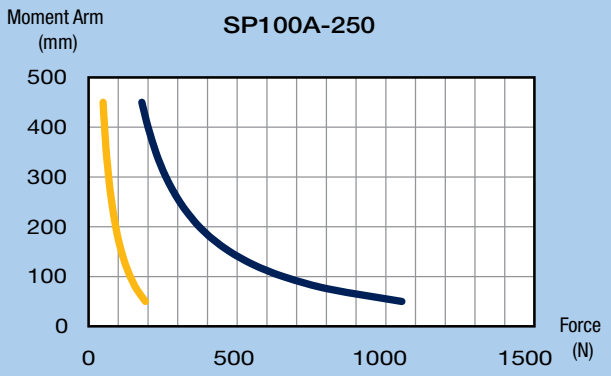


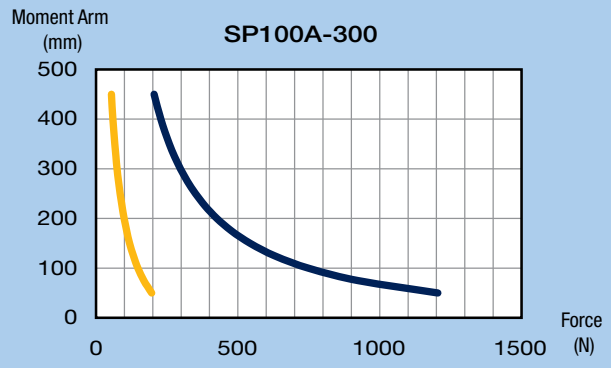
Yaw, Pitch, Roll

Yaw & Pitch Roll



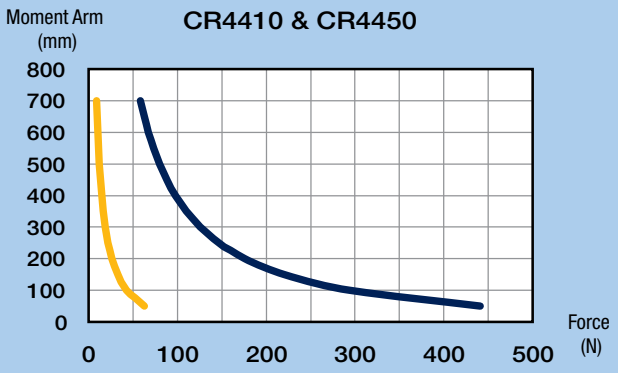


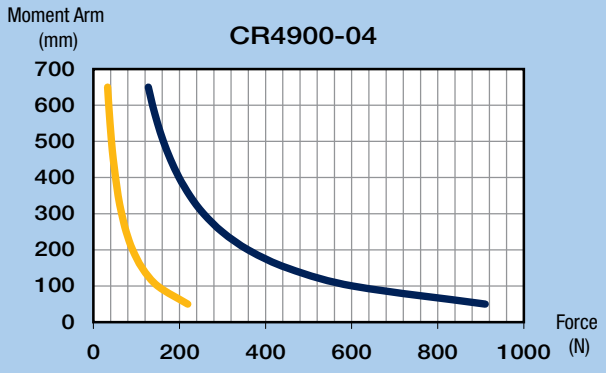


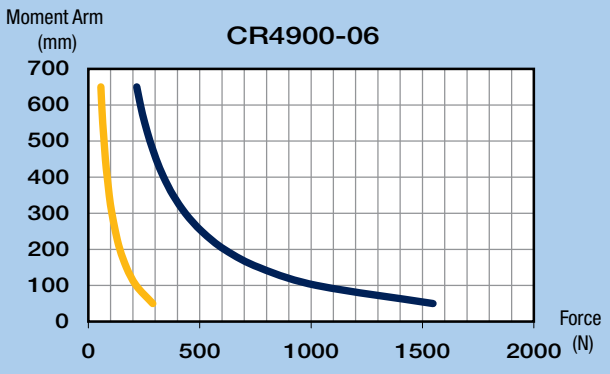


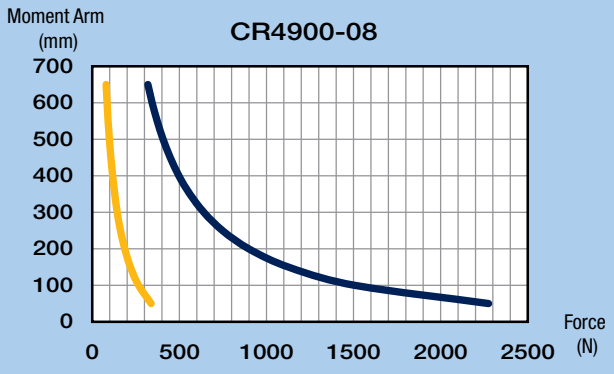
Yaw, Pitch, Roll

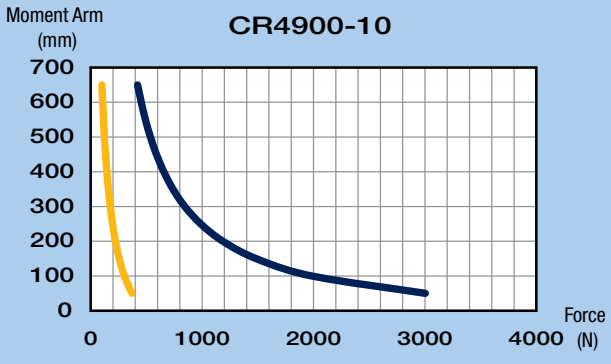
Yaw & Pitch Roll

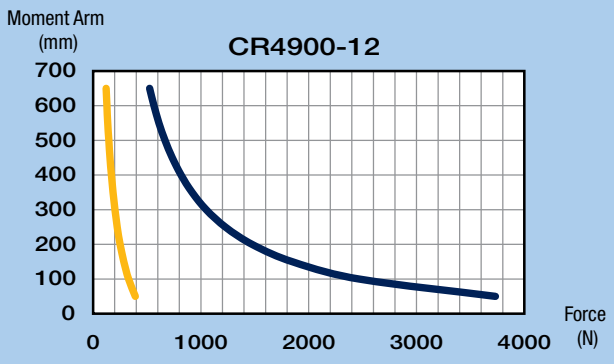




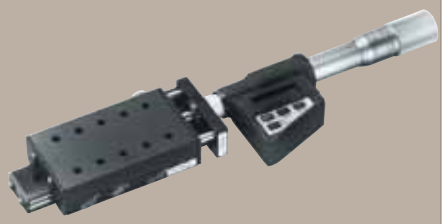








Ball Bearing Positioners
miniature and standard



Parker Daedal precision linear stages provide controlled, precise point-to-point positioning along a linear axis. Stages are comprised of two basic components: a precision linear ball slide which serves as a linear bearing and guide, and a drive mechanism which accurately moves and positions the slide top along the linear axis.

Contents

Miniature and Standard Size Ball Bearings Positioners

- Precision Quality
- Budget Friendly
- Largest Selection
- Easy multi-axis configuration
- No maintenance
- Vacuum preparation and custom options

Ball Bearing Positioner Design Principles

Parker Daedal precision linear stages provide controlled, precise point-to-point positioning along a linear axis. Stages are comprised of two basic components: a precision linear ball slide which serves as a linear bearing and guide, and a drive mechanism which accurately moves and positions the slide top along the linear axis.

Three types of drive mechanisms are available: a fine screw, a micrometer, and a differential screw. The fine screw is used for fine resolution positioning. The micrometer is used whenever a position readout is required. The differential screw is used for applications requiring extremely fine resolution positioning. Ball bearing positioning stages are available in a straight stage/drive configuration as well as a side-drive configuration.

The linear positioner operates in a simple manner: a bracket which supports the drive screw is attached to the slide base. The end of the drive screw rests against the end of the moveable top. There are two extended springs “pulling” the slide top toward the screw so that the top will always be held firmly against the screw end. When the screw is turned clockwise, it advances and pushes the slide top along the linear axis. When turned counter clockwise, the screw retracts and the slide top follows because of the spring pressure holding the top against the screw end. The result is a very smooth linear motion, accurately controlled by rotation of the drive mechanism.

Standard Features

Exacting manufacturing techniques, combined with demanding quality control standards, permit Parker Daedal to offer precision stages of unsurpassed quality. Selection can be made easily, based on required travel, load, and mounting surface requirements. Stages are available in single or multi-axis configurations (XY, XZ, and XYZ), and all have built-in quality features including:

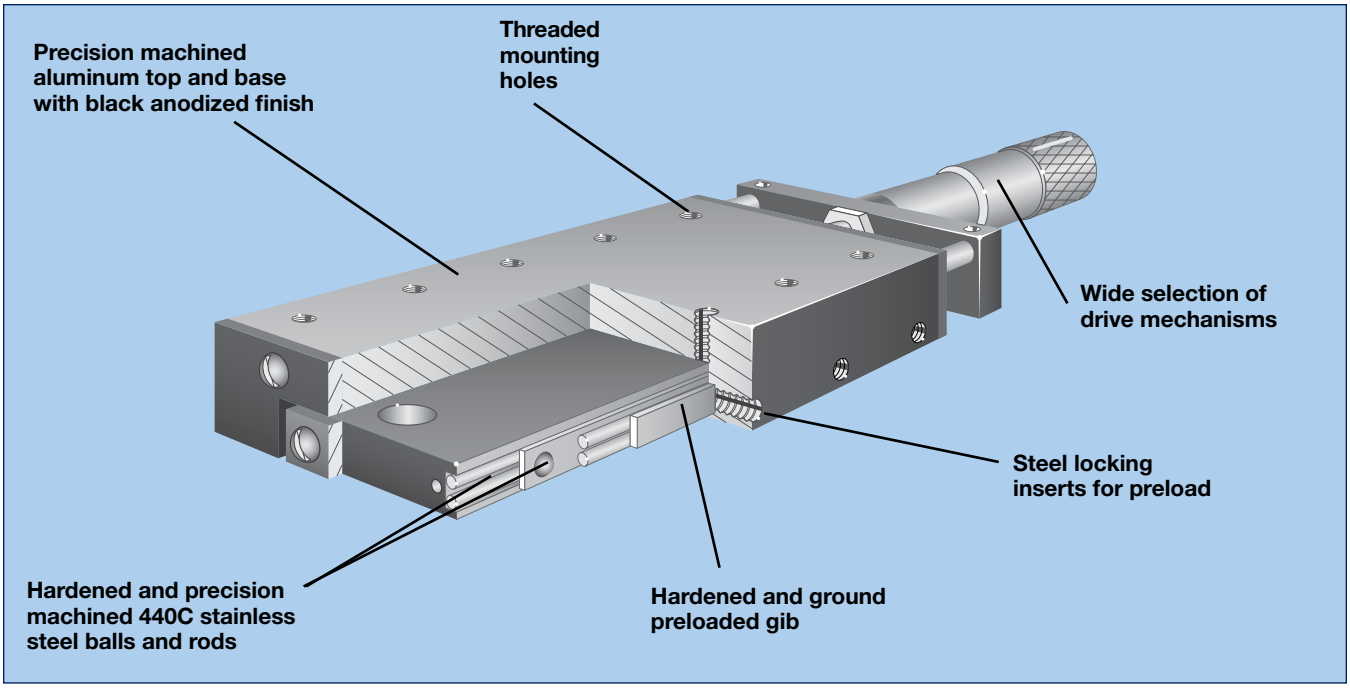
- Aluminum top and base and stainless steel bearings
- Low friction linear adjustment with no backlash or side play
- Factory preloaded to provide dynamic stability and minimum runout
- Both top and bottom mounting surfaces are precision machined to provide flat mounting surfaces
- Locking screw to positively lock stage without affecting position (standard on most models)
- Straight line accuracy of 0.00008 in/in of travel
- Selectable drive mechanisms: Micrometer (Imperial or metric), Fine screw (64 pitch), Differential screw, Digital micrometers (Imperial and Metric)

Digital Micrometers

The 1.0” (25 mm) travel micrometer provides an LCD readout to 0.00005 in (0,001 mm) resolution and features incremental and/or absolute positioning modes and automatic shutdown to conserve the integral battery. The battery will power the unit for 500 hours of use. The 2.0” (51 mm) micrometer is accurate to ±0.0001 in (±2 microns) with a resolution and LCD reading to 0.00005 in (1 micron). The batteries will power the unit up to 500 hours.

How to Order

Use the overview chart on the following page to select the appropriate ball bearing positioner. Refer to the individual specifications page for complete performance and mechanical specifications. To order ball bearing positioners, use the model number corresponding to the specific size and travel length selected. A variety of modifications to standard models are available to meet custom requirements. Contact our application engineering department with your design specifications.



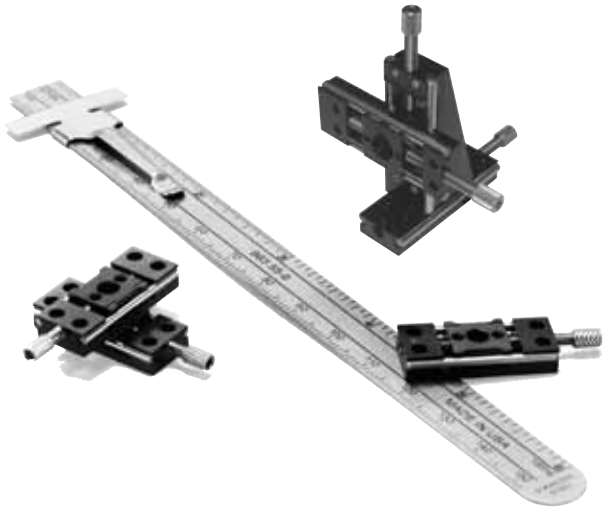
Selection

Series	Width in (mm)	Travel		Normal Load		Drive Orientation		Mounting		Page
		in	(mm)	lbs	(kg)	Center	Side	Imperial	Metric	
MM-1	**≤1.25 (≤31,8)**	0.125	(3,2)	0.5	(0,25)	•		•		64-65
MM-3		0.50	(12,7)	0.75	(0,34)	•		•		64-65
3900				6	(2,7)	•	•	•	•	66-67
4000	**1.75 (44,5)**	0.50 or 1.00	(12,7 or 25,4)	25	(11)	•	•	•	•	68-69,72
4100				30	(13)	•		•	•	70-71, 73
4200				42	(19)	•		•	•	70-71, 73
4300				55	(25)	•		•	•	70-71, 73
4500	**2.62 (66,5)**	1.00	(25,4)	62	(28)	•	•	•	•	74-75, 78
4600				88	(40)	•		•	•	76-77, 79
4700				106	(48)	•		•	•	76-77, 79
4800				123	(56)	•		•	•	76-77, 79
4400	**5.0 (127,0)**	1.0	(25,4)	105	(48)	•	•	•	•	80-83
		2.0	(50,8)	105	(48)	•	•	•	•	80-83
4900	**6.0 (152,4)**	1.0	(25,4)	100	(45)	•		•	•	84-85
		2.0	(50,8)	100	(45)	•		•	•	84-85
		4.0	(100,0)	100	(45)	•		•	•	86
		6.0	(150,0)	154	(70)	•		•	•	86
		8.0	(200,0)	205	(93)	•		•	•	86
		10.0	(250,0)	243	(110)	•		•	•	86
		12.0	(300,0)	294	(133)	•		•	•	86

MM-1 & MM-3 Series

Specifications	MM-1	MM-3
Travel:	0.125 in (3,175 mm)	0.5 in (12,7 mm)
Size:		
Width	0.44 in (11,2 mm)	0.66 in (16,8 mm)
Length (mid-travel)	1.405 in (35,7mm)	2.365 in (60,1 mm)
Height	0.20 in (5,1 mm)	0.28 in (7,1 mm)
Load:		
Normal	9 oz	12 oz
Moment:		
Yaw	1.5 in-oz	3.0 in-oz
Pitch	3.0 in-oz	6.0 in-oz
Roll	3.0 in-oz	6.0 in-oz
Straight line accuracy:	1 µm	1.5 µm
Maximum wobble:	0.01 mrad	0.01 mrad
Weight:	3 g/axis	16 g/axis
Construction:	Aluminum body, stainless steel rails	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Series	Model	Configurarion
	MM-1	Single axis
MM-1	**MM-1 X-Y**	Two axis
	MM-1 X-Y-Z	Three axis
	MM-3	Single axis
MM-1	**MM-3 X-Y**	Two axis
	MM-3 X-Y-Z	Three axis



Parker Daedal precision miniature linear stages provide controlled, precise point-to-point positioning along a linear axis at a micron level of accuracy. Our smallest MM Series are driven along stainless steel rails by a fine 2-80 thread drive screw. Parker Daedal miniature positioning stages are a dimensional breakthrough in miniature positioning. The 0.125” travel MM–1 and 0.5” travel MM–3 are precision instruments designed to eliminate many research and design problems for space limited applications.

Applications

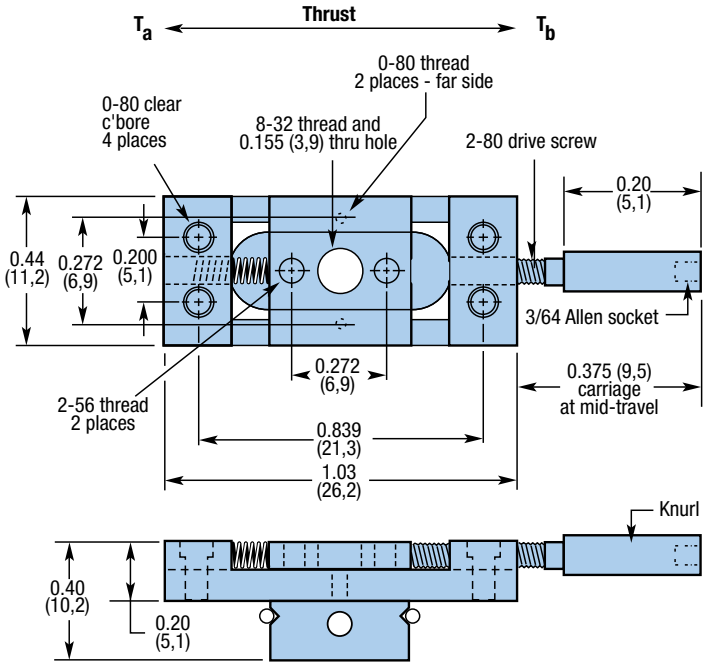
Applications include frequent or one-time fine adjustments, pinhole micrometer positioning (piggyback on a larger work stage), adjustable slit construction, fiber optics, R & D optical and electro-optical equipment, spatial filters, positioning probes and fine gas purges, turrents, individual positioning of elements, suspending ends of small gas lasers, and axial alignment of tubes and rods.

Features

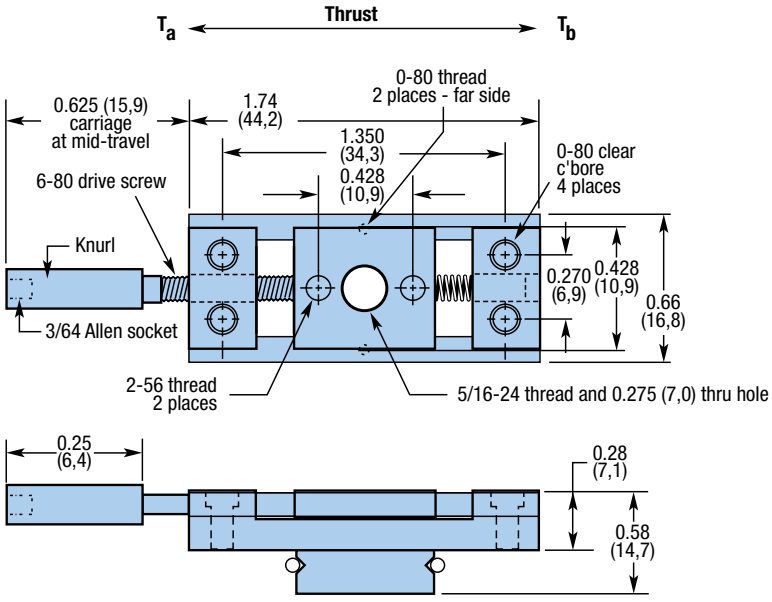
- Black anodized aluminum body with stainless steel rails
- Precise, smooth motion
- Aperture accommodates pinhole adapters
- No backlash; positive spring-loaded carriage
- Fine 80 TPI screw adjustment with Allen socket
- Sturdy one-piece base, three-piece construction
- Includes ball driver
- Compact size:
  MM–1 single stage is only 0.20” x 0.44” x 1.03” long;
  MM–3 is 0.28” x 0.66” x 1.74” long
- Easily configured into X-Y setups without special adapters

Dimensions in (mm)

MM-1



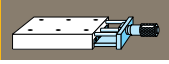
MM-3



3900/M3900 Series

Specifications	Imperial	Metric
Travel:	0.5 in	13 mm
Size:		
Width	1.25 in	31,8 mm
Length (mid-travel)	3.34 in	84,8 mm
Height	0.50 in	12,7 mm
Load:		
Normal	6 lbs	3 kg
Thrust – T_a	10 lbs	4,5 kg
Thrust – T_b	3 lbs	1,4 kg
Moment – Yaw, Pitch, Roll	See page 88	See page 88
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.001 in	0,01 mm
Fine screw:	64 pitch	64 pitch
Weight:	0.16 lbs/axis	0,078 kg/axis
Z-Axis bracket options: (See page 124-127)		
Center drive low profile	3909	M3909
Center drive standard	3910	M3910
Side drive low profile	3959	M3959
Side drive standard	3960	M3960
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

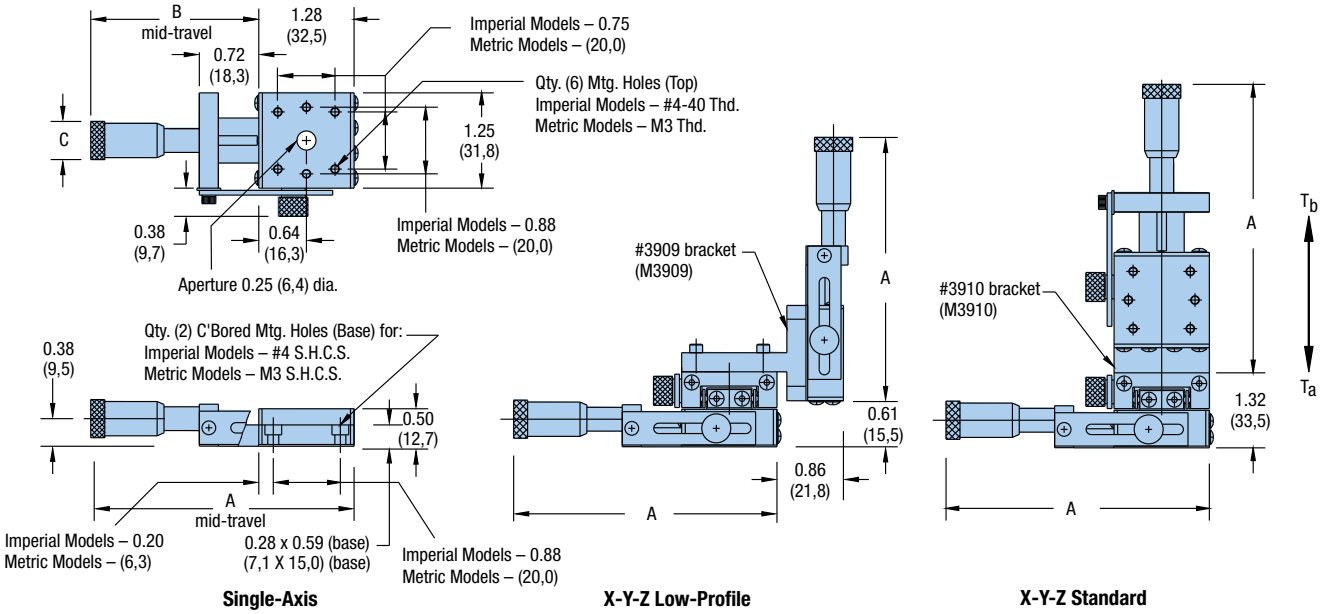
	Style	Drive Mechanism	Travel	Center Drive Models: Single Axis	Center Drive Models: Two Axis	Center Drive Models: X-Y-Z Low Profile	Center Drive Models: X-Y-Z Standard	Side Drive Models: Single Axis	Side Drive Models: Two Axis	Side Drive Models: X-Y-Z Low Profile	Side Drive Models: X-Y-Z Standard
Imperial	Solid Top	Imperial Micrometer	0.50 in	3902	3922	3932	3942	3952	3972	3982	3992
		Metric Micrometer	13 mm	3902M	3922M	3932M	3942M	3952M	3972M	3982M	3992M
		Fine Screw	0.50 in	3903	3923	3933	3943	–	–	–	–
	Aperture (0.5 in)	Imperial Micrometer	0.50 in	3906	3926	3936	3946	3956	3976	3986	3996
		Metric Micrometer	13 mm	3906M	3926M	3936M	3946M	3956M	3976M	3986M	3996M
		Fine Screw	0.50 in	3907	3927	3937	3947	–	–	–	–
Metric	Solid Top	Metric Micrometer	13 mm	M3902M	M3922M	M3932M	M3942M	M3952M	M3972M	M3982M	M3992M
		Imperial Micrometer	0.50 in	M3902	M3922	M3932	M3942	M3952	M3972	M3982	M3992
		Fine Screw	12,7 mm	M3903	M3923	M3933	M3943	–	–	–	–
	Aperture (12,7 mm)	Metric Micrometer	13 mm	M3906M	M3926M	M3936M	M3946M	M3956M	M3976M	M3986M	M3996M
		Imperial Micrometer	0.50 in	M3906	M3926	M3936	M3946	M3956	M3976	M3986	M3996
		Fine Screw	12,7 mm	M3907	M3927	M3937	M3947	–	–	–	–



Dimensions in (mm)

For additional end view dimensions, refer to the 3900/M3900 ball slide drawing, page 20. Consult factory for critical dimension concerns.

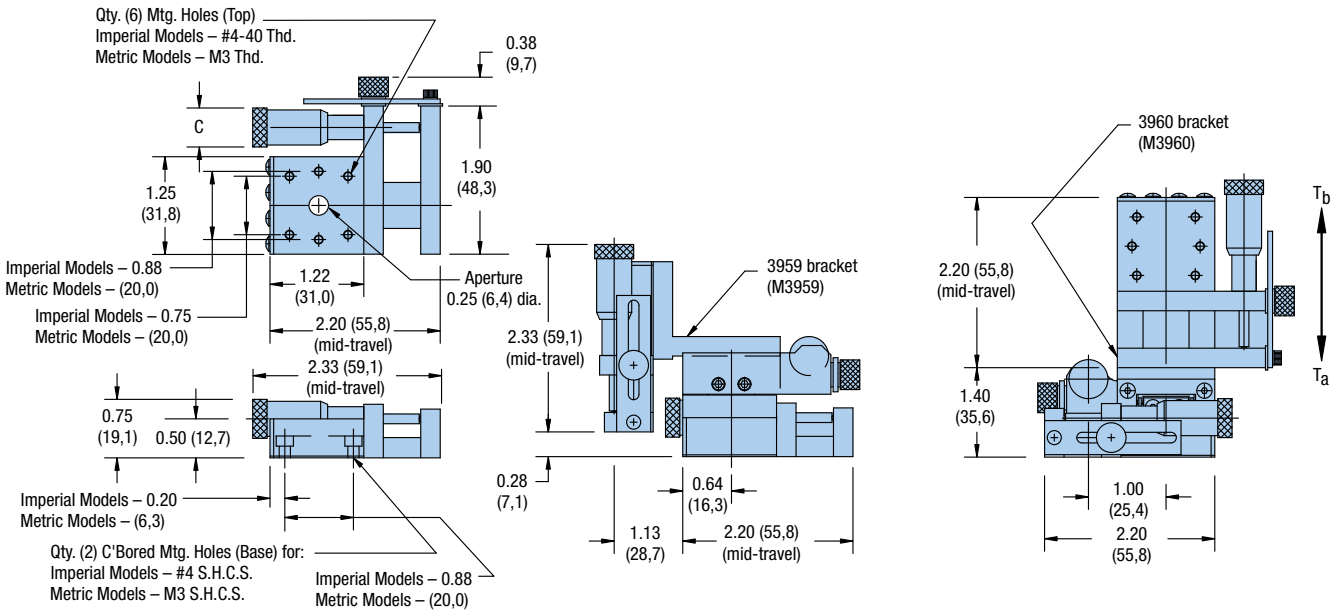
Center Drive



Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

Style	Drive Mechanism	Travel	Imperial Model Dimensions — in A	B	C	Metric Model Dimensions — mm A	B	C
Solid Top	Imperial Micrometer	0.50 in	3.35	2.06	0.54	85,0	52,4	0.54
	Metric Micrometer	13 mm	3.35	2.06	0.54	85,0	52,4	0.54
	Fine Screw	0.50 in	2.32	1.03	0.58	58,3	25,9	0.58
Aperture	Imperial Micrometer	0.50 in	3.35	2.06	0.54	85,0	52,4	0.54
	Metric Micrometer	13 mm	3.35	2.06	0.54	85,0	52,4	0.54
	Fine Screw	0.50 in	2.32	1.03	0.58	58,3	25,9	0.58

Side Drive

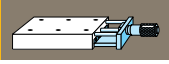


Single Axis **X-Y-Z Low Profile** **X-Y-Z Standard**

4000/M4000 Series

Specifications	Imperial	Metric
Travel:	0.5 – 1.0 in	12,7 – 25,4 mm
Size:		
Width	1.75 in	44,4 mm
Length (mid-travel)	2.63 – 6.03 in	68 – 153 mm
Height	0.75 in	19,0 mm
Load:		
Normal	25 lbs	11 kg
Thrust – T_a	10 lbs	4,5 kg
Thrust – T_b	5 lbs	2,3 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.001 in	0,01 mm
Differential screw:		
Coarse Adjustment	48 pitch	48 pitch
Fine Adjustment	336 pitch	336 pitch
Fine screw:	64 pitch	64 pitch
Weight:	0.5 lbs/axis	0,23 kg/axis
Z-Axis bracket options: (See page 124-127)		
Center drive low profile	4009	M4009
Center drive standard	4010	M4010
Side drive low profile	4059	M4059
Side drive standard	4060	M4060
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

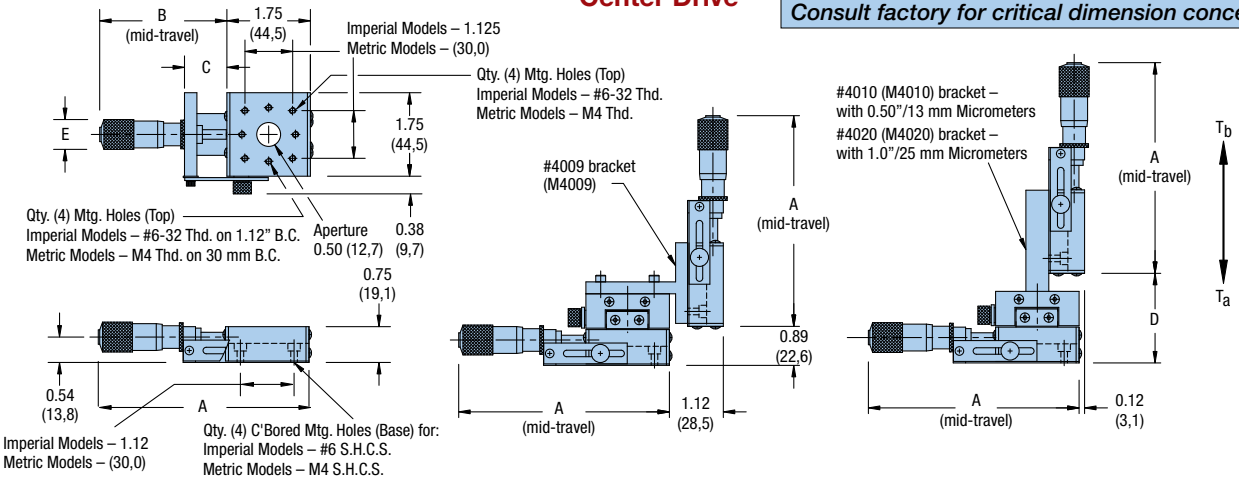
	Style	Drive Mechanism	Travel	Center Drive Models: Single Axis	Center Drive Models: Two Axis	Center Drive Models: X-Y-Z Low Profile	Center Drive Models: X-Y-Z Standard	Side Drive Models: Single Axis	Side Drive Models: Two Axis	Side Drive Models: X-Y-Z Low Profile	Side Drive Models: X-Y-Z Standard
Imperial	Solid Top	Imperial Micrometer	0.50 in	4002	4022	4032	4042	4052	4072	4082	4092
			1.0 in	4004	4024	4034	4044	4054	4074	4084	4094
		Metric Micrometer	13 mm	4002M	4022M	4032M	4042M	4052M	4072M	4082M	4092M
			25 mm	4004M	4024M	4034M	4044M	4054M	4074M	4084M	4094M
		Differential Screw	0.08/0.3 in	4002D	4022D	4032D	4042D	4052D	4072D	4082D	4092D
		Fine Screw	0.75 in	4003	4023	4033	4043	4053	4073	4083	4093
	Aperture (0.5 in)	Imperial Micrometer	0.50 in	4006	4026	4036	4046	4056	4076	4086	4096
		Metric Micrometer	13 mm	4006M	4026M	4036M	4046M	4056M	4076M	4086M	4096M
		Differential Screw	0.08/0.3 in	4006D	4026D	4036D	4046D	4056D	4076D	4086D	4096D
		Fine Screw	0.75 in	4007	4027	4037	4047	4057	4077	4087	4097
Metric	Solid Top	Metric Micrometer	13 mm	M4002M	M4022M	M4032M	M4042M	M4052M	M4072M	M4082M	M4092M
			25 mm	M4004M	M4024M	M4034M	M4044M	M4054M	M4074M	M4084M	M4094M
		Imperial Micrometer	0.50 in	M4002	M4022	M4032	M4042	M4052	M4072	M4082	M4092
			1.0 in	M4004	M4024	M4034	M4044	M4054	M4074	M4084	M4094
		Differential Screw	2/8 mm	M4002D	M4022D	M4032D	M4042D	M4052D	M4072D	M4082D	M4092D
		Fine Screw	19 mm	M4003	M4023	M4033	M4043	M4053	M4073	M4083	M4093
	Aperture (12,7 mm)	Metric Micrometer	13 mm	M4006M	M4026M	M4036M	M4046M	M4056M	M4076M	M4086M	M4096M
		Imperial Micrometer	0.50 in	M4006	M4026	M4036	M4046	M4056	M4076	M4086	M4096
		Differential Screw	2/8 mm	M4006D	M4026D	M4036D	M4046D	M4056D	M4076D	M4086D	M4096D
		Fine Screw	19 mm	M4007	M4027	M4037	M4047	M4057	M4077	M4087	M4097



Dimensions in (mm)

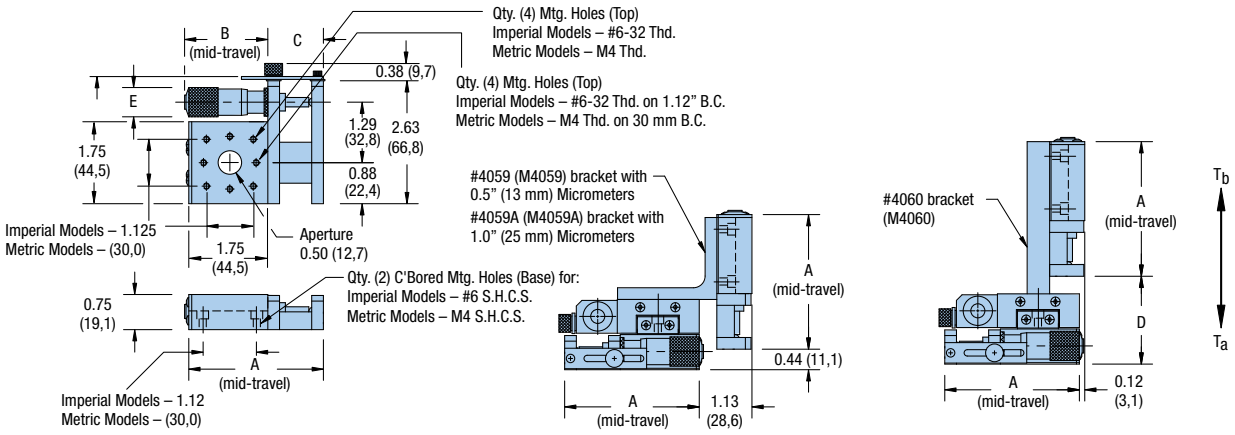
For additional end view dimensions, refer to the 4000/M4000 ball slide drawing, page 21. Consult factory for critical dimension concerns.

Center Drive



Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

Side Drive



Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

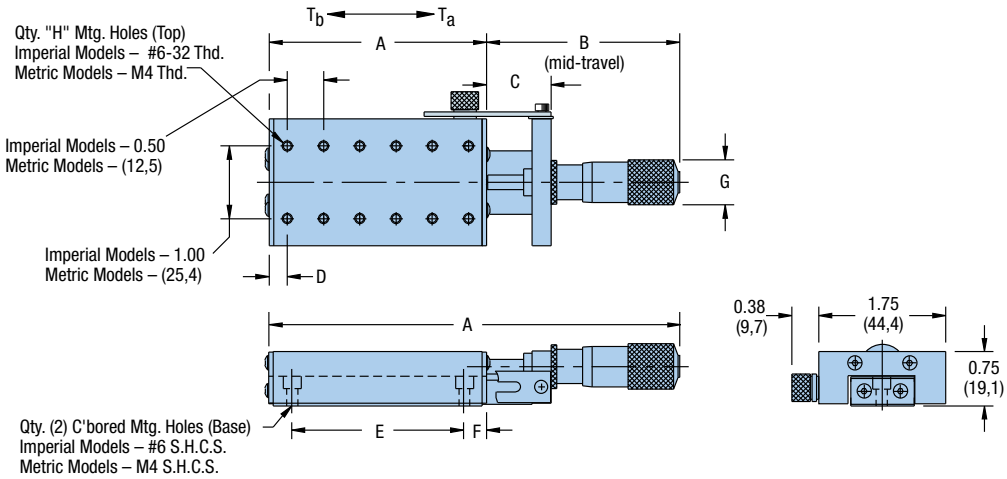
	Style	Drive Mechanism	Travel	Center Drive Dimensions — in (mm) A	B	C	D	E	Side Drive Dimensions — in (mm) A	B	C	D	E
Imperial	Solid Top	Imperial Micrometer	0.50 in	4.42	2.68	0.90	1.88	0.54	2.97	1.78	1.19	1.88	0.54
			1.0 in	6.03	4.28	1.18	2.13	0.71	4.53	3.10	1.44	1.63	0.71
		Metric Micrometer	13 mm	4.42	2.68	0.90	1.88	0.54	2.97	1.78	1.19	1.88	0.54
			25 mm	6.03	4.28	1.18	2.13	0.71	4.53	3.10	1.44	1.63	0.71
		Differential Screw	0.08/0.3 in	4.12	2.37	0.88	1.88	0.62	2.97	1.44	1.19	1.88	0.62
		Fine Screw	0.75 in	4.33	2.57	0.88	1.88	0.58	2.69	1.62	1.19	1.88	0.58
	Aperture	Imperial Micrometer	0.50 in	4.42	2.68	0.90	1.88	0.54	2.97	1.78	1.19	1.88	0.54
		Metric Micrometer	13 mm	4.42	2.68	0.90	1.88	0.54	2.97	1.78	1.19	1.88	0.54
		Differential Screw	0.08/0.3 in	4.12	2.37	0.88	1.88	0.62	2.97	1.44	1.19	1.88	0.62
		Fine Screw	0.75 in	4.33	2.57	0.88	1.88	0.58	2.69	1.62	1.19	1.88	0.58
Metric	Solid Top	Metric Micrometer	13 mm	(112)	(68)	(23)	(47,8)	(13,6)	(75,5)	(45,2)	(30,2)	(47,8)	(13,6)
			25 mm	(153)	(109)	(30)	(54,1)	(17,9)	(115)	(79,0)	(36,5)	(40,8)	(17,9)
		Imperial Micrometer	0.50 in	(112)	(68)	(23)	(47,8)	(13,6)	(75,5)	(45,2)	(30,2)	(47,8)	(13,6)
			1.0 in	(153)	(109)	(30)	(54,1)	(17,9)	(115,0)	(79,0)	(36,5)	(40,8)	(17,9)
		Differential Screw	2/8 mm	(105)	(60)	(22)	(47,8)	(15,7)	(75,5)	(36,0)	(30,0)	(47,8)	(15,7)
		Fine Screw	19 mm	(110)	(65)	(22)	(47,8)	(14,7)	(68,0)	(41,0)	(25,0)	(47,8)	(14,7)
	Aperture	Metric Micrometer	13 mm	(112)	(68)	(23)	(47,8)	(13,6)	(75,5)	(45,2)	(30,0)	(47,8)	(13,6)
		Imperial Micrometer	0.50 in	(112)	(68)	(23)	(47,8)	(13,6)	(75,5)	(45,2)	(30,0)	(47,8)	(13,6)
		Differential Screw	2/8 mm	(105)	(60)	(22)	(47,8)	(15,7)	(75,5)	(36,0)	(30,0)	(47,8)	(15,7)
		Fine Screw	19 mm	(110)	(65)	(22)	(47,8)	(14,7)	(68,0)	(41,0)	(25,0)	(47,8)	(14,7)

4100/M4100, 4200/M4200, 4300/M4300 Series

Specifications	Imperial	Metric
Travel:	0.5 – 1.0 in	13 – 25 mm
Size:		
Width	1.75 in	44,4 mm
Length (mid-travel)	4.60 – 8.28 in	114,3 – 210,3 mm
Height	0.75 in	19,0 mm
Load:		
Normal	30 – 55 lbs	13 – 25 kg
Thrust – T_a	10 lbs	4,5 kg
Thrust – T_b	3 lbs	1,4 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.001 in	0,01 mm
Fine screw:	64 pitch	64 pitch
Weight:	0.5 –0.8 lbs/axis	0,2 – 0,4 kg/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Dimensions in (mm)

For additional end view dimensions, refer to the 4100-4300/M4100-4300 ball slide drawing, page 22. Consult factory for critical dimension concerns.



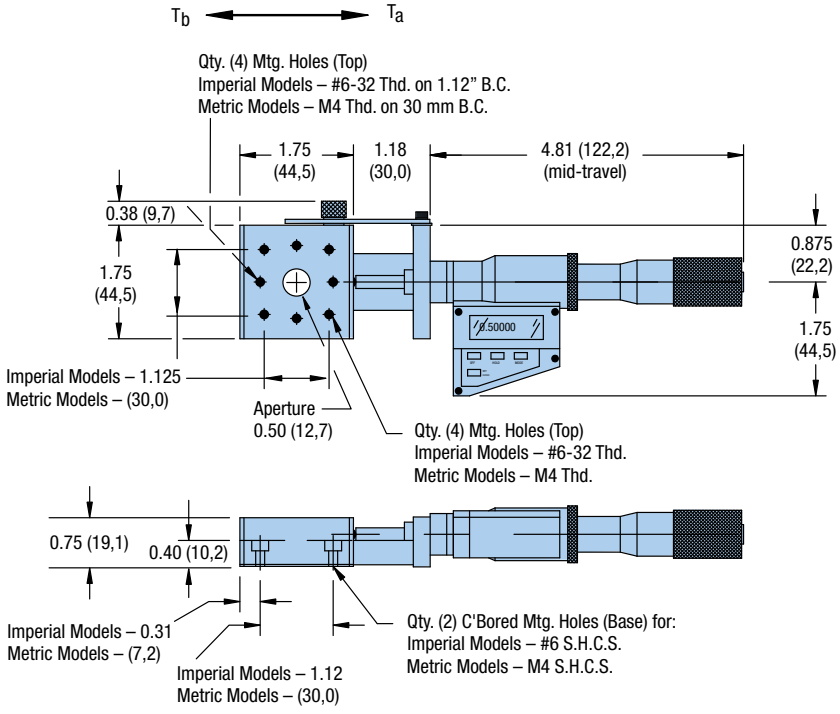
	Drive Mechanism	Travel	Model	Load	Weight	Dimensions — in (mm) A	B	C	D	E	F	G	Qty H
Imperial	Imperial Micrometer	0.50 in	**4102**				2.68	0.89				0.54	
		1.0 in	**4104**				4.28	1.18				0.71	
	Metric Micrometer	13 mm	**4102M**	30 lbs	0.5 lbs	2.00	2.68	0.89	0.25	1.38	0.31	0.54	8
		25 mm	**4104M**				4.28	1.18				0.71	
	Fine Screw	0.75 in	**4103**				2.60	0.89				0.58	
	Imperial Micrometer	0.50 in	**4202**				2.68	0.89				0.54	
		1.0 in	**4204**				4.28	1.18				0.71	
	Metric Micrometer	13 mm	**4202M**	42 lbs	0.6 lbs	3.00	2.68	0.89	0.25	2.38	0.31	0.54	12
		25 mm	**4204M**				4.28	1.18				0.71	
	Fine Screw	0.75 in	**4203**				2.60	0.89				0.58	
	Imperial Micrometer	0.50 in	**4302**				2.68	0.89				0.54	
		1.0 in	**4304**				4.28	1.18				0.71	
	Metric Micrometer	13 mm	**4302M**	55 lbs	0.8 lbs	4.00	2.68	0.89	0.25	3.38	0.31	0.54	16
		25 mm	**4304M**				4.28	1.18				0.71	
	Fine Screw	0.75 in	**4303**				2.60	0.89				0.58	
Metric	Metric Micrometer	13 mm	**M4102M**				(67,7)	(22,6)				(13,6)	
		25 mm	**M4104M**				(108,7)	(30,0)				(17,9)	
	Imperial Micrometer	0.50 in	**M4102**	13 kg	0,2 kg	(50,8)	(67,7)	(22,6)	(12,9)	(35,0)	(7,8)	(13,6)	6
		1.0 in	**M4104**				(108,7)	(30,0)				(17,9)	
	Fine Screw	0.75 in	**M4103**				(63,5)	(22,6)				(14,7)	
	Metric Micrometer	13 mm	**M4202M**				(67,7)	(22,6)				(13,6)	
		25 mm	**M4204M**				(108,7)	(30,0)				(17,9)	
	Imperial Micrometer	0.50 in	**M4202**	19 kg	0,3 kg	(76,2)	(67,7)	(22,6)	(13,1)	(60,0)	(8,1)	(13,6)	10
		1.0 in	**M4204**				(108,7)	(30,0)				(17,9)	
	Fine Screw	0.75 in	**M4203**				(63,5))	(22,6)				(14,7)	
	Metric Micrometer	13 mm	**M4302M**				(67,7)	(22,6)				(13,6)	
		25 mm	**M4304M**				(108,7)	(30,0)				(17,9)	
	Imperial Micrometer	0.50 in	**M4302**	25 kg	0,4 kg	(101,6)	(67,7)	(22,6)	(13,3)	(85,0)	(8,3)	(13,6)	14
		1.0 in	**M4304**				(108,7)	(30,0)				(17,9)	
	Fine Screw	0.75 in	**M4303**				(63,5)	(22,6)				(14,7)	

4000-DM/M4000-DM Series

Specifications	Imperial	Metric
Travel:	1.0 in	25,0 mm
Size:		
Width	1.75 in	44,4 mm
Length (mid-travel)	in	mm
Height	0.75 in	19,0 mm
Load:		
Normal	25 lbs	11 kg
Thrust – T_a	10 lbs	4,5 kg
Thrust – T_b	5 lbs	2,3 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.00005 in	0,001 mm
Weight:		
Solid Top	1.0 lb	0,45 kg
Aperture	0.8 lb	0,36 kg
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

For additional end view dimensions, refer to the 4000/M4000 ball slide drawing, page 21. Consult factory for critical dimension concerns.

Dimensions in (mm)



	Style	Model
Imperial	Solid Top	4004-DM
	Aperture (0.50 in)	4008-DM
Metric	Solid Top	M4004-DM
	Aperture (12,7 mm)	M4008-DM

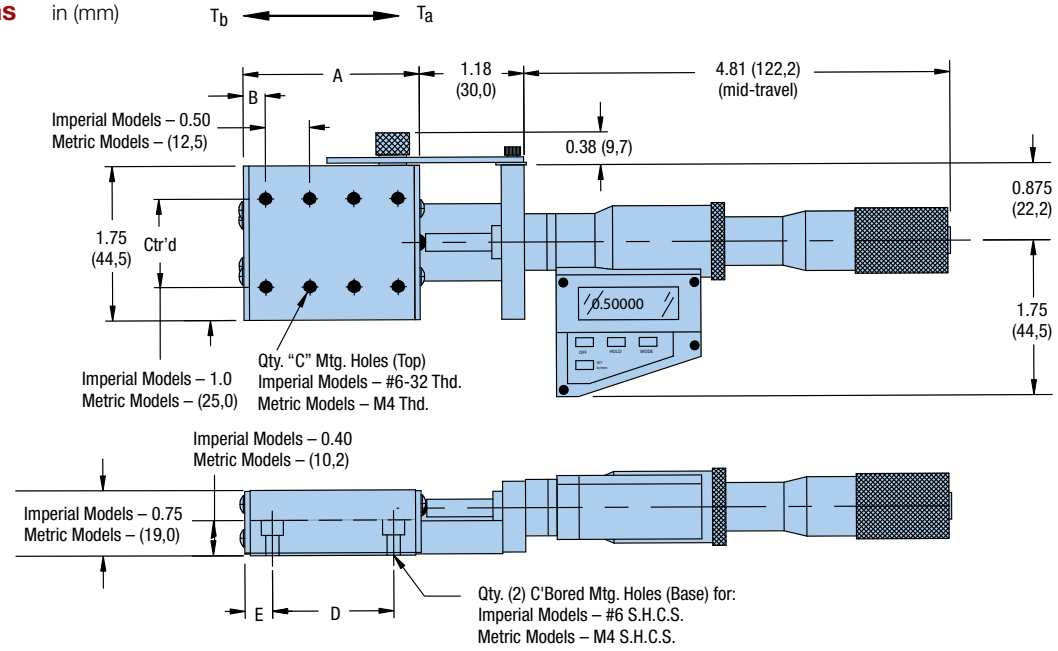
4100-DM/M4100-DM, 4200-DM/M4200-DM, 4300-DM/M4300-DM Series

Specifications	Imperial	Metric
Travel:	1.0 in	25 mm
Size:		
Width	1.75 in	44,4 mm
Length (mid-travel)	7.99 – 9.99 in	202,9 – 253,7 mm
Height	0.75 in	19,0 mm
Load:		
Normal	28 – 55 lbs	13 – 25 kg
Thrust – T_a	10 lbs	4,5 kg
Thrust – T_b	3 lbs	1,4 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.00005 in	0,001 mm
Weight:	0.9 – 1.3 lbs/axis	0,4 – 0,6 kg/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

For additional end view dimensions, refer to the 4100-4300/M4100-4300 ball slide drawing, page 22. Consult factory for critical dimension concerns.

Dimensions

in (mm)



	Model	Normal Load	Weight	Dimensions — in (mm) A	B	C	D	E
Imperial	**4104-DM**	30 lbs	0.9 lbs	2.0	0.25	8	1.38	0.31
	4204-DM	42 lbs	1.0 lbs	3.0	0.25	12	2.38	0.31
	4304-DM	50 lbs	1.3 lbs	4.0	0.25	16	3.38	0.31
Metric	**M4104-DM**	13 kg	0,4 kg	(50,8)	(12,9)	6	(35,0)	(7,8)
	M4204-DM	19 kg	0,5 kg	(76,2)	(13,1)	10	(60,0)	(8,1)
	M4304-DM	25 kg	0,6 kg	(101,6)	(13,3)	14	(85,0)	(8,3)

4500/M4500 Series

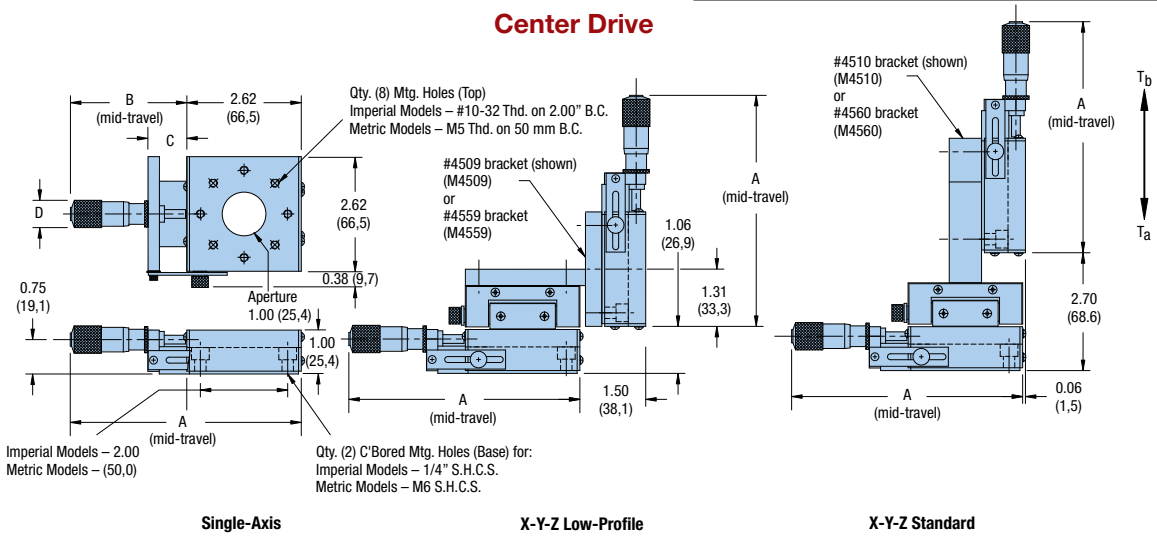
Specifications	Imperial	Metric
Travel:	0.5 – 1.0 in	13 – 25 mm
Size:		
Width	2.62 in	66,5 mm
Length (mid-travel)	3.75 – 6.88 in	95,5 – 174,4 mm
Height	1.00 in	25,4 mm
Load:		
Normal	62 lbs	28 kg
Thrust – T_a	10 lbs	4,5 kg
Thrust – T_b	2 lbs	0,9 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.001 in	0,01 mm
Differential screw:		
Coarse Adjustment	48 pitch	48 pitch
Fine Adjustment	336 pitch	336 pitch
Fine screw:	64 pitch	64 pitch
Weight:		
Center drive	0.72 lbs/axis	0,33 kg/axis
Side drive	0.92 lbs/axis	0,42 kg/axis
Z-Axis bracket options: (See page 124-127)		
Center drive low profile	4509	M4509
Center drive standard	4510	M4510
Side drive low profile	4559	M4559
Side drive standard	4560	M4560
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

	Style	Drive Mechanism	Travel	Center Drive Models: Single Axis	Center Drive Models: Two Axis	Center Drive Models: X-Y-Z Low Profile	Center Drive Models: X-Y-Z Standard	Side Drive Models: Single Axis	Side Drive Models: Two Axis	Side Drive Models: X-Y-Z Low Profile	Side Drive Models: X-Y-Z Standard
Imperial	Solid Top	Imperial Micrometer	0.50 in	4502	4522	4532	4542	4552	4572	4582	4592
			1.0 in	4504	4524	4534	4544	4554	4574	4584	4594
		Metric Micrometer	13mm	4502M	4522M	4532M	4542M	4552M	4572M	4582M	4592M
			25 mm	4504M	4524M	4534M	4544M	4554M	4574M	4584M	4594M
		Differential Screw	0.08/0.3 in	4502D	4522D	4532D	4542D	4552D	4572D	4582D	4592D
		Fine Screw	0.75 in	4503	4523	4533	4543	4553	4573	4583	4593
	Aperture (1.0 in)	Imperial Micrometer	0.50 in	4506	4526	4536	4546	4556	4576	4586	4596
		Metric Micrometer	13 mm	4506M	4526M	4536M	4546M	4556M	4576M	4586M	4596M
		Differential Screw	0.08/0.3 in	4506D	4526D	4536D	4546D	4556D	4576D	4586D	4596D
		Fine Screw	0.75 in	4507	4527	4537	4547	4557	4577	4587	4597
Metric	Solid Top	Metric Micrometer	13 mm	M4502M	M4522M	M4532M	M4542M	M4552M	M4572M	M4582M	M4592M
			25 mm	M4504M	M4524M	M4534M	M4544M	M4554M	M4574M	M4584M	M4594M
		Imperial Micrometer	0.50 in	M4502	M4522	M4532	M4542	M4552	M4572	M4582	M4592
			1.0 in	M4504	M4524	M4534	M4544	M4554	M4574	M4584	M4594
		Differential Screw	2/8 mm	M4502D	M4522D	M4532D	M4542D	M4552D	M4572D	M4582D	M4592D
		Fine Screw	19 mm	M4503	M4523	M4533	M4543	M4553	M4573	M4583	M4593
	Aperture (25,4 mm)	Metric Micrometer	13 mm	M4506M	M4526M	M4536M	M4546M	M4556M	M4576M	M4586M	M4596M
		Imperial Micrometer	0.50 in	M4506	M4526	M4536	M4546	M4556	M4576	M4586	M4596
		Differential Screw	2/8 mm	M4506D	M4526D	M4536D	M4546D	M4556D	M4576D	M4586D	M4596D
		Fine Screw	19 mm	M4507	M4527	M4537	M4547	M4557	M4577	M4587	M4597

Dimensions in (mm)

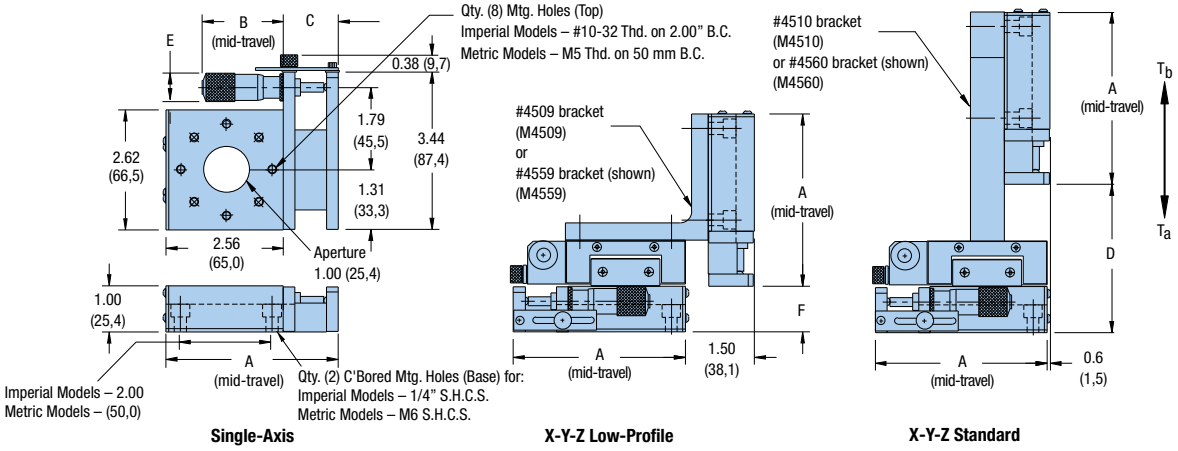
For additional end view dimensions, refer to the 4500/M4500 ball slide drawing, page 23. Consult factory for critical dimension concerns.

Center Drive



Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

Side Drive



Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

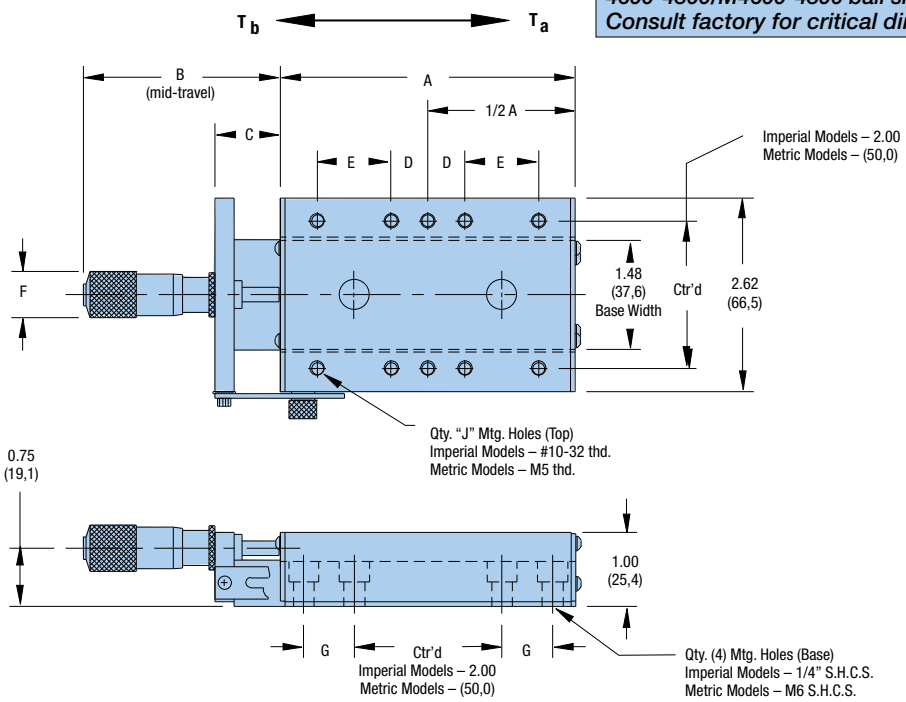
	Style	Drive Mechanism	Travel	Center Drive Dimensions in (mm) A	B	C	D	Side Drive Dimensions in (mm) A	B	C	D	E	F
Imperial	Solid Top	Imperial Micrometer	0.50 in	5.29	2.68	0.89	0.54	3.75	1.78	1.19	3.25	0.54	1.00
			1.0 in	6.88	4.24	1.15	0.71	4.03	3.10	1.47	3.00	0.71	0.75
		Metric Micrometer	13 mm	5.29	2.68	0.89	0.54	3.75	1.78	1.19	3.25	0.54	1.00
			25 mm	6.88	4.24	1.15	0.71	4.03	3.10	1.47	3.00	0.71	0.75
		Differential Screw	0.08/0.3 in	5.00	2.37	0.89	0.62	3.75	1.44	1.19	3.25	0.62	1.00
		Fine Screw	0.75 in	5.23	2.60	0.89	0.58	3.75	1.72	1.19	3.25	0.58	1.00
	Aperture	Imperial Micrometer	0.50 in	5.29	2.68	0.89	0.54	3.75	1.78	1.19	3.25	0.54	1.00
		Metric Micrometer	13 mm	5.29	2.68	0.89	0.54	3.75	1.78	1.19	3.25	0.54	1.00
		Differential Screw	0.08/0.3 in	5.00	2.37	0.89	0.62	3.75	1.44	1.19	3.25	0.62	1.00
		Fine Screw	0.75 in	5.23	2.60	0.89	0.58	3.75	1.72	1.19	3.25	0.58	1.00
Metric	Solid Top	Metric Micrometer	13 mm	(134,4)	(67,7)	(22,6)	(13,6)	(95,5)	(45,1)	(30,0)	(82,6)	(12,7)	(25,4)
			25 mm	(174,4)	(107,8)	(29,3)	(17,9)	(102,0)	(79,0)	(37,0)	(76,3)	(15.7)	(19,1)
		Imperial Micrometer	0.50 in	(134,4)	(67,7)	(22,6)	(13,6)	(95,5)	(45,1)	(30,0)	(82,6)	(12.7)	(25,4)
			1.0 in	(174,4)	(107,8)	(29,3)	(17,9)	(102,0)	(79.0)	(37,0)	(76,3)	(15,7)	(19,1)
		Differential Screw	2/8 mm	(127,0)	(60,0)	(22,0)	(15,7)	(95,5)	(36,0)	(30,0)	(82,6)	(15,7)	(25,4)
		Fine Screw	19 mm	(130,0)	(64,0)	(22,0)	(14,7)	(95,5)	(36,0)	(30,0)	(82,6)	(15,0)	(25,4)
	Aperture	Metric Micrometer	13 mm	(134,4)	(67,7)	(22,6)	(13,6)	(95,5)	(45,1)	(30,0)	(82,6)	(12,7)	(25,4)
		Imperial Micrometer	0.50 in	(134,4)	(67,7)	(22,6)	(13,6)	(95,5)	(45,1)	(30,0)	(82,6)	(12.7)	(25,4)
		Differential Screw	2/8 mm	(127,0)	(60,0)	(22,0)	(15,7)	(95,5)	(36,0)	(30,0)	(82,6)	(15,7)	(25,4)
		Fine Screw	19 mm	(130,0)	(64,0)	(22,0)	(14,7)	(95,5)	(36,0)	(30,0)	(82,6)	(15,0)	(25,4)

4600/M4600, 4700/M4700, 4800/M4800 Series

Specifications	Imperial	Metric
Travel:	0.5 – 1.0 in	13 – 25 mm
Size:		
Width	2.62 in	66,5 mm
Length (mid-travel)	6.50 – 10.28 in	164,1 – 261,1 mm
Height	1.00 in	25,4 mm
Load:		
Normal	88 – 123 lbs	40 – 56 kg
Thrust – T_a	30 lbs	13,6 kg
Thrust – T_b	2 lbs	0,9 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.001 in	0,01 mm
Fine screw:	64 pitch	64 pitch
Weight:	1.1 – 1.5 lbs/axis	0,5 – 0,7 kg/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Dimensions in (mm)

For additional end view dimensions, refer to the 4600-4800/M4600-4800 ball slide drawing, page 24. Consult factory for critical dimension concerns.



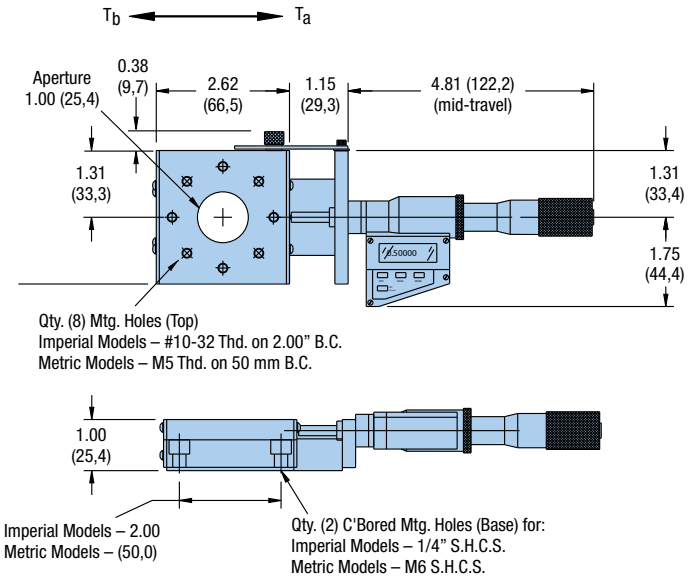
	Drive Mechanism	Travel	Model	Load lb (kg)	Weight lb (kg)	Dimensions — in (mm) A	B	C	D	E	F	G	Qty J
Imperial	Imperial Micrometer	0.50 in	**4602**				2.68	0.89			0.55		
		1.0 in	**4604**				4.28	1.18			0.62		
	Metric Micrometer	13 mm	**4602M**	88	1.1	4.00	2.68	0.89	0.50	—	0.55	0.69	6
		25 mm	**4604M**				4.28	1.18			0.62		
	Fine Screw	0.75 in	**4603**				2.50	0.88			0.59		
	Imperial Micrometer	0.50 in	**4702**				2.68	0.89			0.55		
		1.0 in	**4704**				4.28	1.18			0.62		
	Metric Micrometer	13 mm	**4702M**	106	1.2	5.00	2.68	0.89	1.00	—	0.55	1.19	6
		25 mm	**4704M**				4.28	1.18			0.62		
	Fine Screw	0.75 in	**4703**				2.50	0.88			0.59		
	Imperial Micrometer	0.50 in	**4802**				2.68	0.89			0.55		
		1.0 in	**4804**				4.28	1.18			0.62		
	Metric Micrometer	13 mm	**4802M**	123	1.5	6.00	2.68	0.89	0.50	1.00	0.55	1.69	10
		25 mm	**4804M**				4.28	1.18			0.62		
	Fine Screw	0.75 in	**4803**				2.50	0.88			0.59		
Metric	Metric Micrometer	13 mm	**M4602M**				(67,7)	(22,6)			(14,0)		
		25 mm	**M4604M**				(108,7)	(29,9)			(15,7)		
	Imperial Micrometer	0.50 in	**M4602**	(40)	(0,5)	(101,6)	(67,7)	(22,6)	(12,5)	—	(14,0)	(12,5)	6
		1.0 in	**M4604**				(108,7)	(29,9)			(15,7)		
	Fine Screw	0.75 in	**M4603**				(63,5)	(22,3)			(15,0)		
	Metric Micrometer	13 mm	**M4702M**				(67,7)	(22,6)			(14,0)		
		25 mm	**M4704M**				(108,7)	(29,9)			(15,7)		
	Imperial Micrometer	0.50 in	**M4702**	(48)	(0,6)	(127,0)	(67,7)	(22,6)	(25,0)	—	(14,0)	(25,0)	6
		1.0 in	**M4704**				(108,7)	(29,9)			(15,7)		
	Fine Screw	0.75 in	**M4703**				(63,5)	(22,3)			(15,0)		
	Metric Micrometer	13 mm	**M4802M**				(67,7)	(22,6)			(14,0)		
		25 mm	**M4804M**				(108,7)	(29,9)			(15,7)		
	Imperial Micrometer	0.50 in	**M4802**	(56)	(0,7)	(152,4)	(67,7)	(22,6)	(12,5)	(25,0)	(14,0)	(25,0)	10
		1.0 in	**M4804**				(108,7)	(29,9)			(15,7)		
	Fine Screw	0.75 in	**M4803**				(63,5)	(22,3)			(15,0)		

4500-DM/M4500-DM Series

Specifications	Imperial	Metric
Travel:	1.0 in	25 mm
Size:		
Width	2.62 in	66,5 mm
Length (mid-travel)	8.58 in	218,0 mm
Height	1.00 in	25,4 mm
Load:		
Normal	62 lbs	28 kg
Thrust – T_a	10 lbs	4,5 kg
Thrust – T_b	2 lbs	0,9 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.00005 in	0,001 mm
Weight:	1.4 lbs/axis	0,63 kg/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

For additional end view dimensions, refer to the 4500/M4500 ball slide drawing, page 23. Consult factory for critical dimension concerns.

Dimensions in (mm)

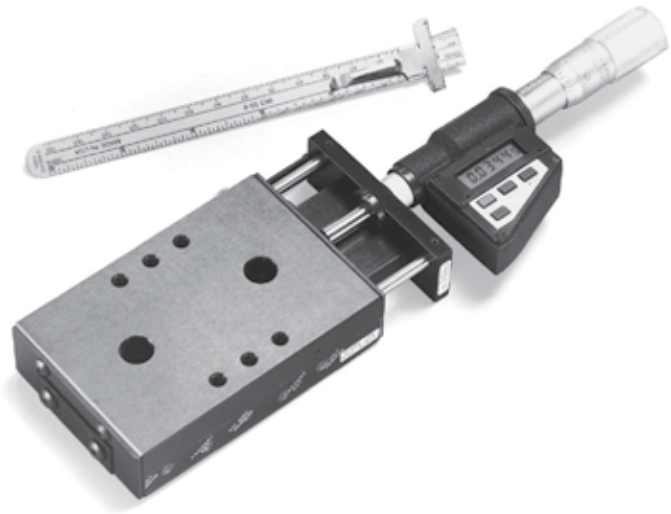


	Style	Model
Imperial	Solid Top	4504-DM
	Aperture (1.0 in)	4508-DM
Metric	Solid Top	M4504-DM
	Aperture (25,4 mm)	M4508-DM

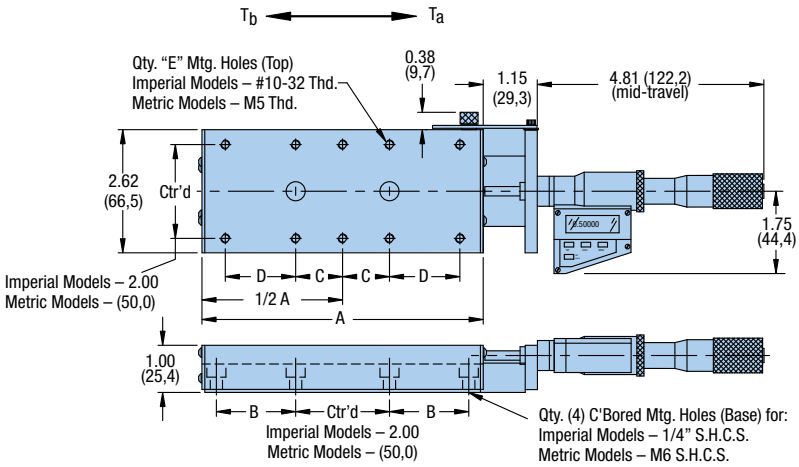
4600-DM/M4600-DM, 4700-DM/M4700-DM, 4800-DM/M4800-DM Series

For additional end view dimensions, refer to the 4600-4800/M4600-4800 ball slide drawing, page 24. Consult factory for critical dimension concerns.

Specifications	Imperial	Metric
Travel:	1.0 in	25 mm
Size:		
Width	2.62 in	66,5 mm
Length (mid-travel)	9.96 – 11.96 in	253,1 – 303,9 mm
Height	1.00 in	25,4 mm
Load:		
Normal	88 – 123 lbs	40 – 56 kg
Thrust – T_a	30 lbs	13,6 kg
Thrust – T_b	2 lbs	0,9 kg
Moment – Yaw, Pitch, Roll	See page 87	See page 87
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.00005 in	0,001 mm
Weight:	1.6 – 2.0 lbs/axis	0,73 – 0,91 kg/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	



Dimensions in (mm)



	Model	Load	Weight	Dimensions — in (mm) A	B	C	D	Qty E
Imperial	**4604-DM**	88 lbs	1.6 lbs	4.00	0.69	0.50	—	6
	4704-DM	106 lbs	1.8 lbs	5.00	1.19	1.00	—	6
	4804-DM	123 lbs	2.0 lbs	6.00	1.69	0.50	1.00	10
Metric	**M4604-DM**	40 kg	0,73 kg	(101,6)	(12,5)	(12,5)	—	6
	M4704-DM	48 kg	0,82 kg	(127,0)	(25,0)	(25,0)	—	6
	M4804-DM	56 kg	0,91 kg	(152,4)	(25,0)	(12,5)	(25,0)	10

4400/M4400 Series

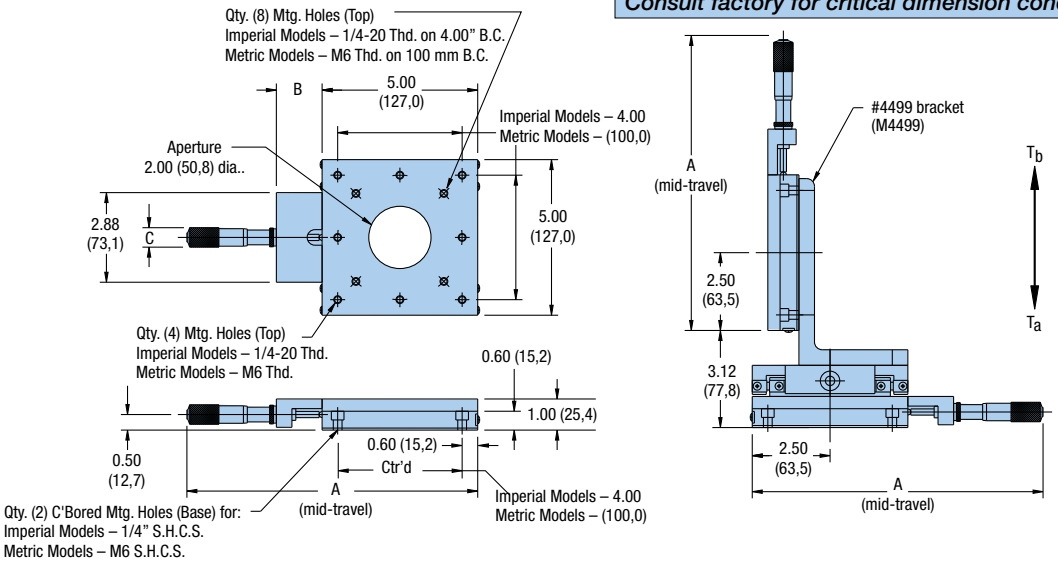
Specifications	Imperial	Metric
Travel:	1.0 – 2.0 in	25 – 50 mm
Size:		
Width	5.00 in	127,0 mm
Length (mid-travel)	6.0 – 11.28 in	152,4 – 286,0 mm
Height	1.00 in	25,4 mm
Load:		
Normal	105 lbs	48 kg
Thrust – T_a	30 lbs	13,6 kg
Thrust – T_b	2.5 lbs	1,1 kg
Moment – Yaw, Pitch, Roll	See page 88	See page 88
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.001 in	0,01 mm
Weight:	2.7 lbs/axis	1,2 kg/axis
Z-Axis bracket options: (See page 124-127)	4499	M4499
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

	Style	Drive Mechanism	Travel	Center Drive Models: Single Axis	Center Drive Models: Two Axis	Center Drive Models: Three Axis	Side Drive Models: Single Axis	Side Drive Models: Two Axis	Side Drive Models: Three Axis
Imperial	Solid Top	Imperial Micrometer	1.0 in	4411	4421	4431	4416	4426	4436
			2.0 in	4412	4422	4432	4417	4427	4437
		Metric Micrometer	25 mm	4413	4423	4433	4418	4428	4438
			50 mm	4414	4424	4434	4419	4429	4439
	Aperture (2.0 in)	Imperial Micrometer	1.0 in	4451	4461	4471	4456	4466	4476
			2.0 in	4452	4462	4472	4457	4467	4477
		Metric Micrometer	25 mm	4453	4463	4473	4458	4468	4478
			50 mm	4454	4464	4474	4459	4469	4479
Metric	Solid Top	Metric Micrometer	25 mm	M4413	M4423	M4433	M4418	M4428	M4438
			50 mm	M4414	M4424	M4434	M4419	M4429	M4439
		Imperial Micrometer	1.0 in	M4411	M4421	M4431	M4416	M4426	M4436
			2.0 in	M4412	M4422	M4432	M4417	M4427	M4437
	Aperture (50,8 mm)	Metric Micrometer	25 mm	M4453	M4463	M4473	M4458	M4468	M4478
			50 mm	M4454	M4464	M4474	M4459	M4469	M4479
		Imperial Micrometer	1.0 in	M4451	M4461	M4471	M4456	M4466	M4476
			2.0 in	M4452	M4462	M4472	M4457	M4467	M4477

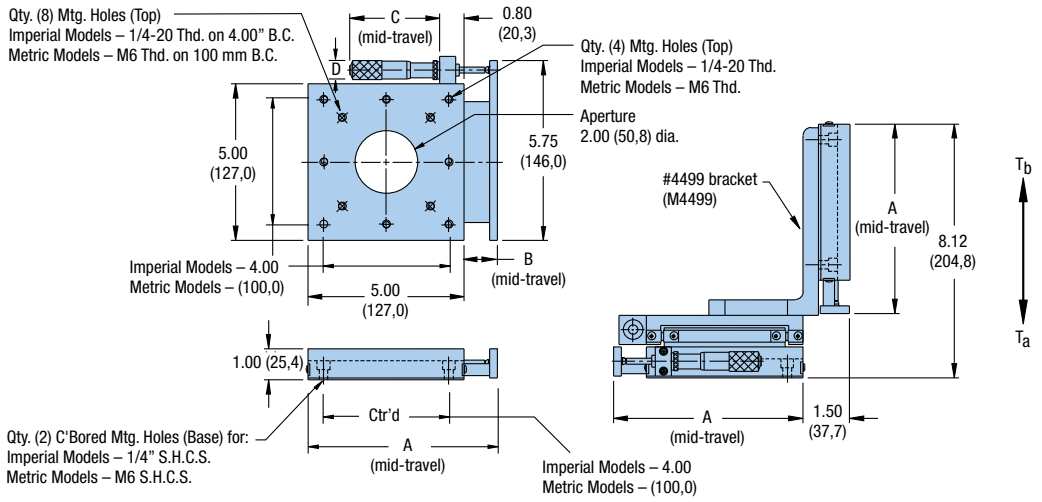
Dimensions in (mm)

For additional end view dimensions, refer to the 4400/M4400 ball slide drawing, page 26. Consult factory for critical dimension concerns.

Center Drive



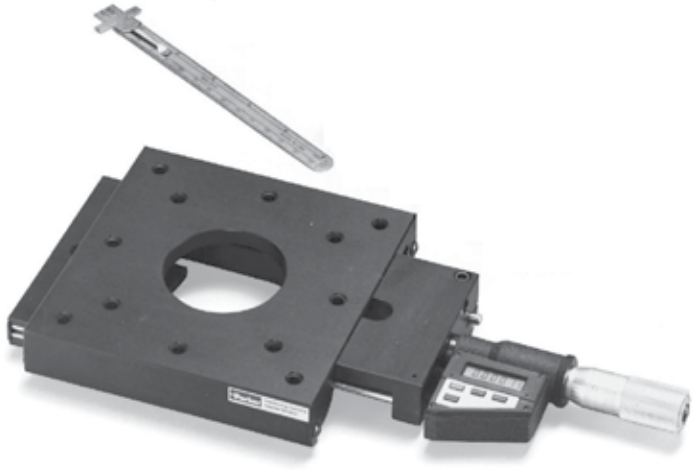
Side Drive



	Style	Drive Mechanism	Travel	Center Drive Dimensions – in (mm) A	B	C	Side Drive Dimensions – in (mm) A	B	C	D
Imperial	Solid Top	Imperial Micrometer	1.0 in	9.28	1.47	0.73	6.0	1.00	2.84	0.73
			2.0 in	11.26	1.98	0.63	6.5	1.53	4.36	0.63
		Metric Micrometer	25 mm	9.28	1.47	0.71	6.0	1.00	2.84	0.71
			50 mm	11.28	2.00	0.73	6.5	1.50	4.36	0.73
	Aperture	Imperial Micrometer	1.0 in	9.28	1.47	0.73	6.0	1.00	2.84	0.73
			2.0 in	11.28	2.00	0.63	6.5	1.50	4.36	0.63
		Metric Micrometer	25 mm	9.28	1.47	0.71	6.0	1.00	2.84	0.71
			50 mm	11.28	2.00	0.73	6.5	1.50	4.36	0.73
Metric	Solid Top	Metric Micrometer	25 mm	(236,0)	(37,4)	(18,5)	(152,4)	(25,4)	(72,0)	(18,5)
			50 mm	(286,0)	(50,3)	(16,0)	(166,0)	(38,9)	(110,8)	(16,0)
		Imperial Micrometer	1.0 in	(236,0)	(38,0)	(18,0)	(152,4)	(25,0)	(72,0)	(18,0)
			2.0 in	(286,0)	(50,0)	(18,5)	(166,0)	(38,0)	(110,8)	(18,5)
	Aperture	Metric Micrometer	25 mm	(236,0)	(38,0)	(18,5)	(152,4)	(25,0)	(72,0)	(18,5)
			50 mm	(286,0)	(50,0)	(16,0)	(166,0)	(38,0)	(110,8)	(16,0)
		Imperial Micrometer	1.0 in	(236,0)	(38,0)	(18,0)	(152,4)	(25,0)	(72,0)	(18,0)
			2.0 in	(286,0)	(50,0)	(18,5)	(166,0)	(38,0)	(110,8)	(18,5)

4400-DM/M4400-DM Series

Specifications	Imperial	Metric
Travel:	1.0 – 2.0 in	25 – 50 mm
Size:		
Width	5.00 in	127,0 mm
Length (mid-travel)		
1.0” (25 mm)	11.28 in	286.5 mm
2.0” (50 mm)	14.16 in	542.1 mm
Height	1.00 in	25,4 mm
Load:		
Normal	105 lbs	48 kg
Thrust – T_a	30 lbs	13,6 kg
Thrust – T_b	2.0 lbs	0,9 kg
Moment – Yaw, Pitch, Roll	See page 88	See page 88
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:	0.00005 in	0,001 mm
Weight:	3.1 lbs/axis	1,4 kg/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

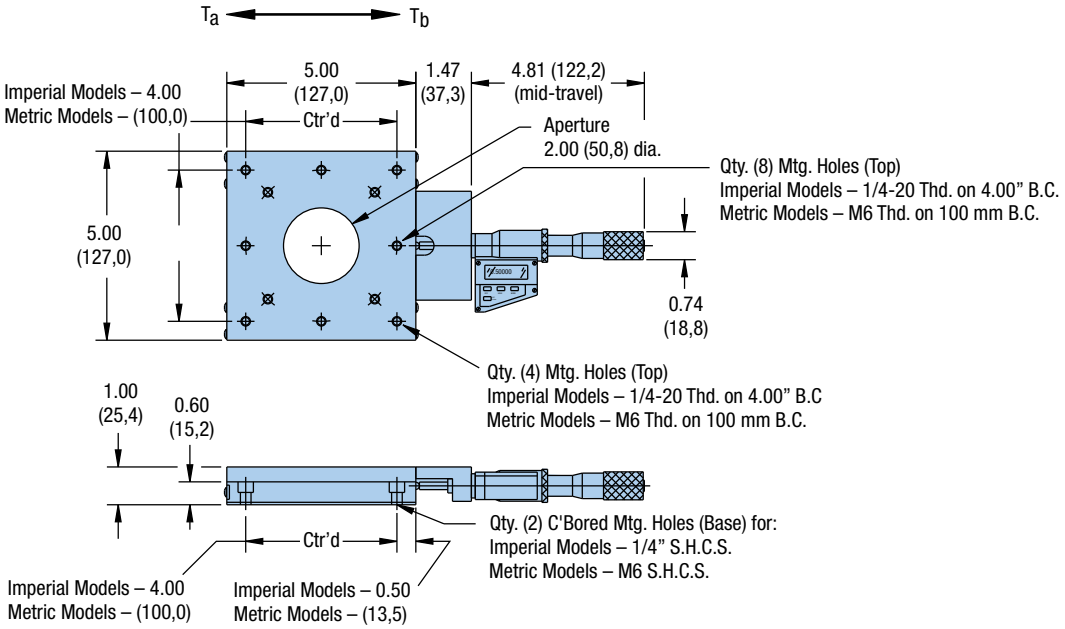


	Style	Model	Travel
Imperial	**Solid Top**	4410-DM	1.0 in
		4412-DM	2.0 in
	Aperture (1.0 in)	4450-DM	1.0 in
		4452-DM	2.0 in
Metric	**Solid Top**	M4410-DM	25 mm
		M4412-DM	50 mm
	Aperture (25,4 mm)	M4450-DM	25 mm
		M4452-DM	50 mm

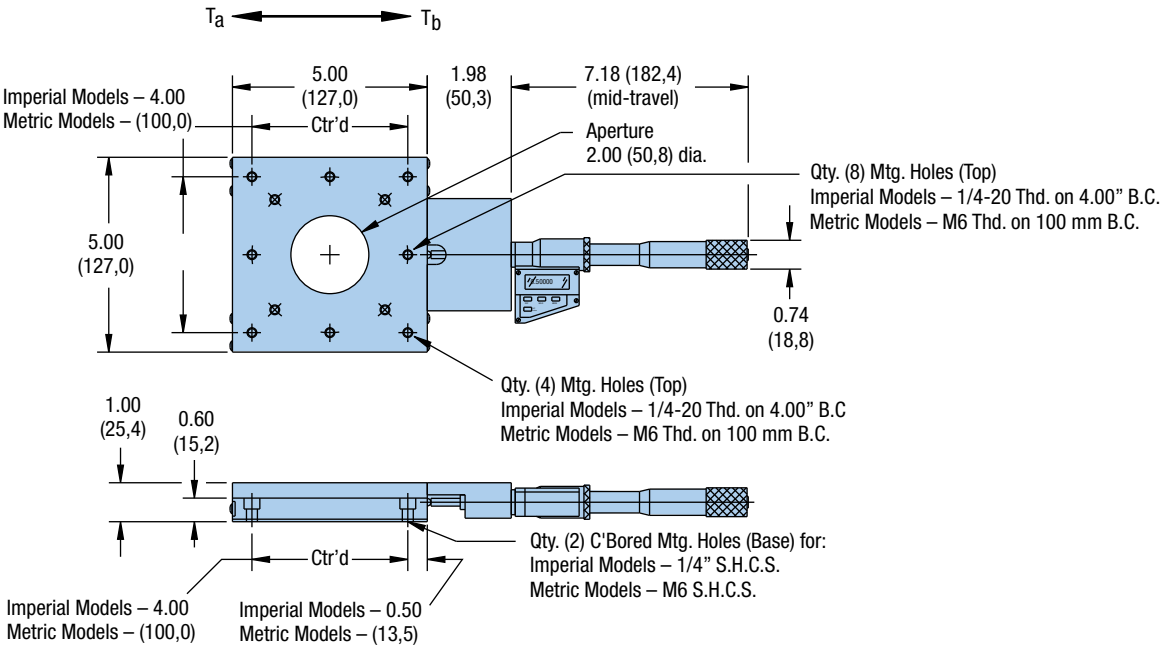
Dimensions in (mm)

For additional end view dimensions, refer to the 4400/M4400 ball slide drawing, page 26. Consult factory for critical dimension concerns.

1.0 in (25 mm) Travel Models



2.0 in (50 mm) Travel Models



4900/M4900 Series

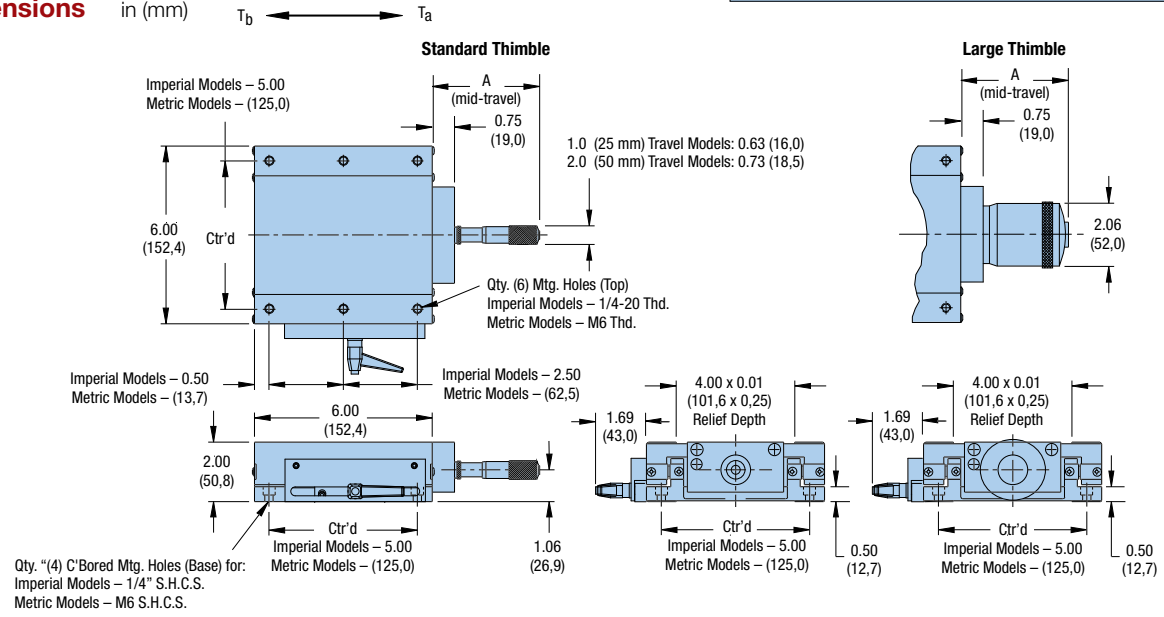
Specifications	Imperial	Metric
Travel:	1.0 – 2.0 in	25 – 50 mm
Size:		
Width	6.00 in	152,4 mm
Length (mid-travel)	9.59 – 11.11 in	243,6 – 282,2 mm
Height	2.00 in	50,8 mm
Load:		
Normal	100 lbs	45 kg
Thrust T_a (Std. thimble)	30 lbs	13,6 kg
Thrust – T_b (Std. thimble)	3.0 lbs	1,36 kg
Thrust T_a (Std. thimble)	50 lbs	23,0 kg
Thrust – T_b (Std. thimble)	3.0 lbs	1,36 kg
Moment – Yaw, Pitch, Roll	See page 88	See page 88
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:		
Standard thimble	0.001 in	0,01 mm 0,001 mm
Large thimble	0.0001 in	
Weight:	7 lbs/axis	1,4 kg/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Large thimble (left) and standard thimble with optional position lock (right). To order the optional lock, add -L to the model number selected from the chart below.

Consult factory for critical dimension concerns.

Dimensions

in (mm)



Drive Mechanism		Travel	Standard Thimble Model*	Standard Thimble Dimension A – in (mm)	Large Thimble Model*	Large Thimble Dimension A – in (mm)
Imperial	Imperial Micrometer	1.0 in	4914	3.59	4910	4.44
		2.0 in	4915	5.11	4911	5.94
	Metric Micrometer	25 mm	4916	3.59	4912	4.44
		50 mm	4917	5.11	4913	5.94
Metric	Metric Micrometer	25 mm	M4916	(91,2)	M4912	(112.8)
		50 mm	M4917	(1289,8)	M4913	(150,9)
	Imperial Micrometer	1.0 in	M4914	(91,2)	M4910	(112.8)
		2.0 in	M4915	(129,8)	M4911	(150,9)

* Add -L to model number for optional position lock.

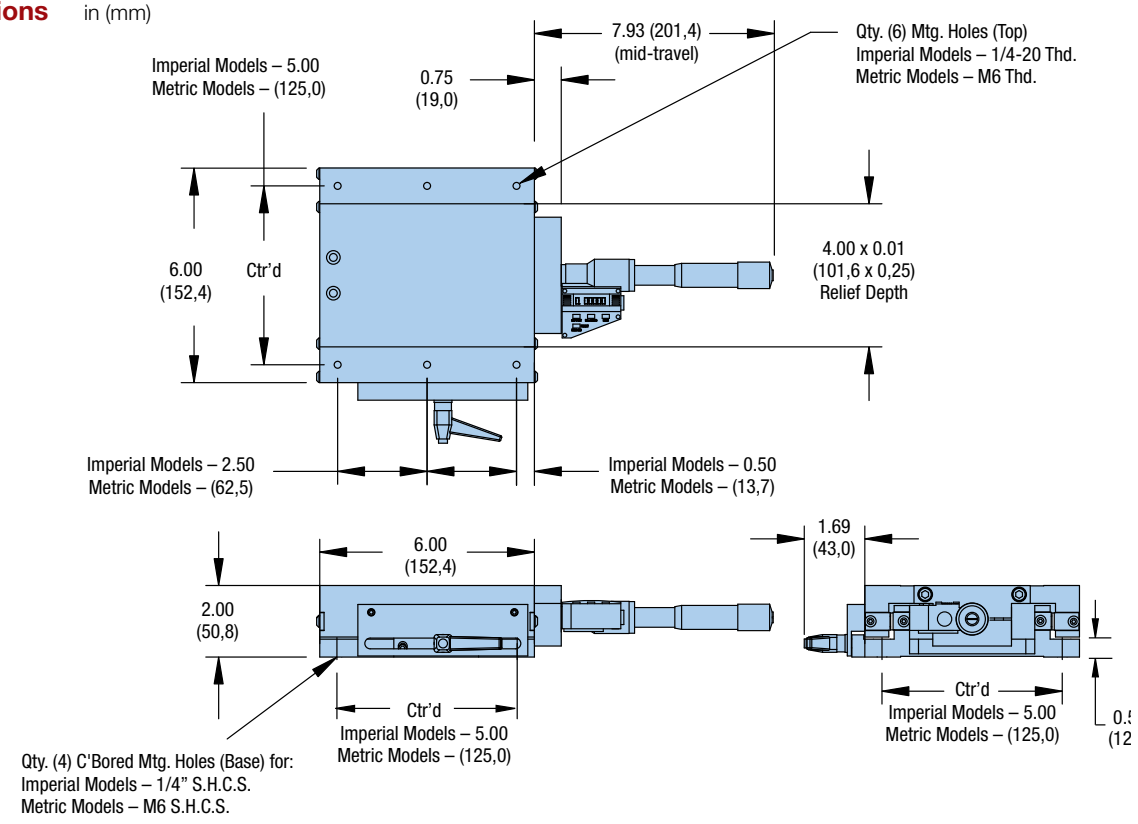
4900-DM/M4900-DM Series

Specifications	Imperial	Metric
Travel:	2.0 in	50 mm
Size:		
Width	6.00 in	152,4 mm
Length (mid-travel)	13.93 in	353,8 mm
Height	2.00 in	50,8 mm
Load:		
Normal	100 lbs	45 kg
Thrust T_a	50 lbs	23,0 kg
Thrust – T_b	3.0 lbs	1,36 kg
Moment – Yaw, Pitch, Roll	See page 88	See page 88
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Micrometer graduations:		
Large thimble	0.0001 in	0,001 mm
Weight:	7 lbs/axis	3,2 kg/axis
Z-Axis bracket options: (See page 124-127)	4990-04	M4990-04
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Digital micrometer positioner shown with optional position lock. To order the optional lock, add -L to the model number selected from the chart below.

Consult factory for critical dimension concerns.

Dimensions in (mm)



	Model*
Imperial	4911-DM
Metric	M4911-DM

* Add -L to model number for optional position lock.

Width: 6.00” (152,4 mm) Mounting: Imperial & Metric

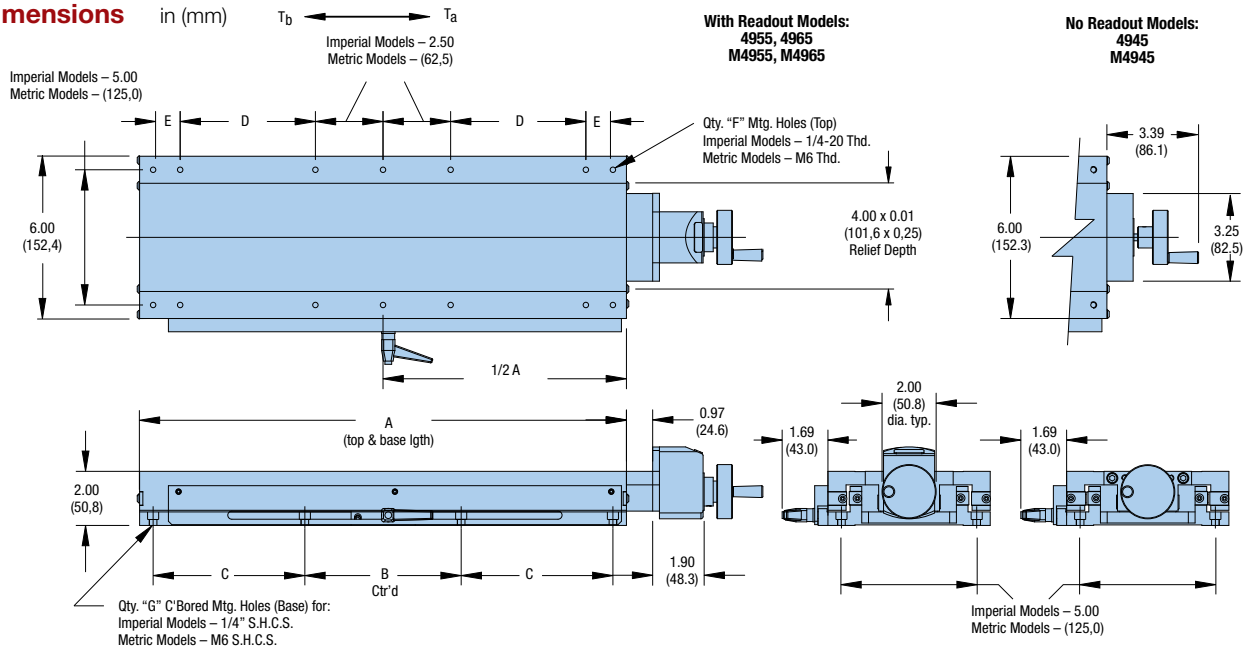
4900/M4900 Series

Specifications	Imperial	Metric
Travel:	4.0 – 12.0 in	100,0 – 300,0 mm
Size:		
Width	6.00 in	152,4 mm
Length	9.39 – in	mm
Height	2.00 in	50,8 mm
Load:		
Normal	100 – 294 lbs	45 – 133 kg
Thrust T_a	30 lbs	13,6 kg
Thrust – T_b	30 lbs	13,6 kg
Moment – Yaw, Pitch, Roll	See page 88	See page 88
Straight line accuracy:	0.00008 in/in of travel	2 µm/25 mm of travel
Readout graduations:	0.001 in	0,01 mm
Weight:	4 – 12 lbs/axis	1,8 – 5,4 kg/axis
Z-Axis bracket options: (See page 124-127)	4990-04/-12	M4990-04/-12
Construction:	Aluminum top and base/ 440C stainless steel bearings	
Mounting surface:	Precision machined	
Finish:	Black anodize	

Leadscrew drive positioner with readout (left); positioner with no readout and optional position lock (right). To order the optional lock, add -L to the model number selected from the chart below.

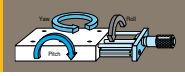
Consult factory for critical dimension concerns.

Dimensions in (mm)



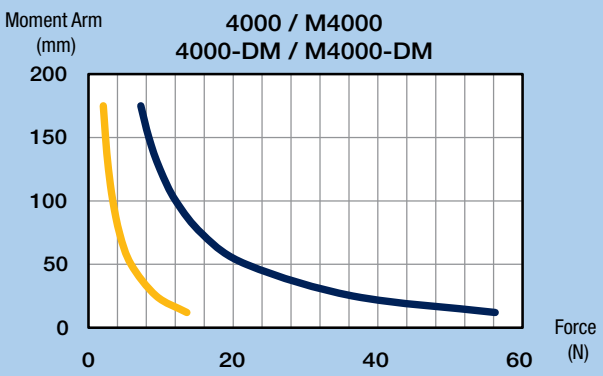
	No Readout Model*	Imperial Readout Model*	Metric Readout Model*	Travel in (mm)	Load lbs (kg)	Weight lbs (kg)	Dimensions – in (mm) A	B	C	D	E	Qty F	Qty G
Imperial	4945-04	4955-04	4965-04	4.0	100	4.0	6.00	5.00	—	—	—	6	4
	4945-06	4955-06	4965-06	6.0	154	6.0	9.00	5.00	1.50	1.50	—	10	8
	4945-08	4955-08	4965-08	8.0	205	8.0	12.00	5.00	3.00	2.50	—	10	8
	4945-10	4955-10	4965-10	10.0	243	10.0	15.00	6.00	4.00	2.50	2.00	14	8
	4945-12	4955-12	4965-12	12.0	294	12.0	18.00	7.00	5.00	5.00	1.00	14	8
Metric	M4945-04	M4955-04	M4965-04	(100,0)	(45)	(1,8)	(152,4)	(125,0)	—	—	—	6	4
	M4945-06	M4955-06	M4965-06	(150,0)	(70)	(2,7)	(228,6)	(125,0)	(37,5)	(37,5)	—	10	8
	M4945-08	M4955-08	M4965-08	(200,0)	(93)	(3,6)	(304,8)	(125,0)	(75,0)	(62,5)	—	10	8
	M4945-10	M4955-10	M4965-10	(250,0)	(110)	(4,5)	(381,0)	(150,0)	(100,0)	(62,5)	(50,0)	14	8
	M4945-12	M4955-12	M4965-12	(300,0)	(133)	(5,4)	(457,2)	(175,0)	(125,0)	(125,0)	(25,0)	14	8

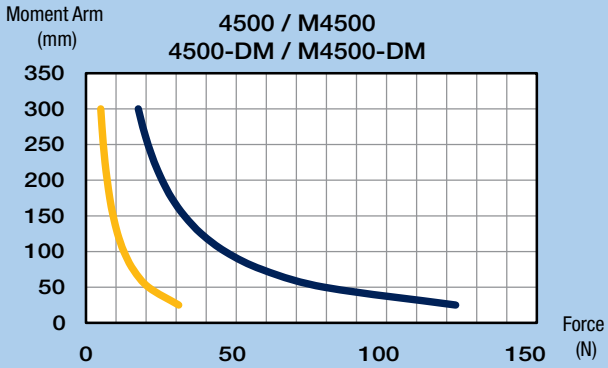
* Add -L to model number for optional position lock.

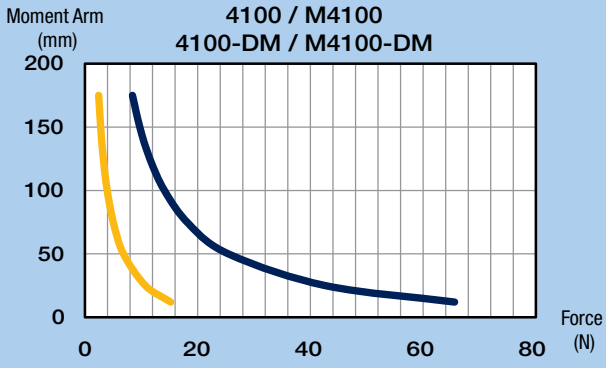


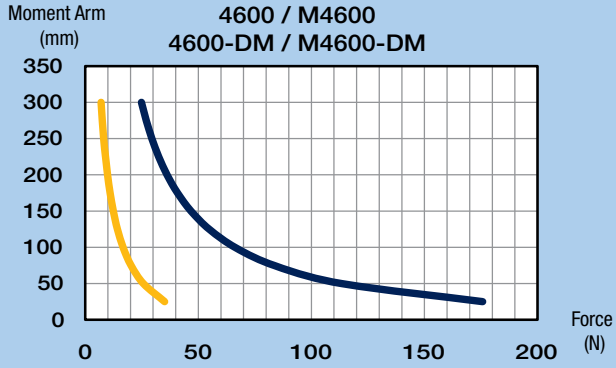
Yaw, Pitch, Roll

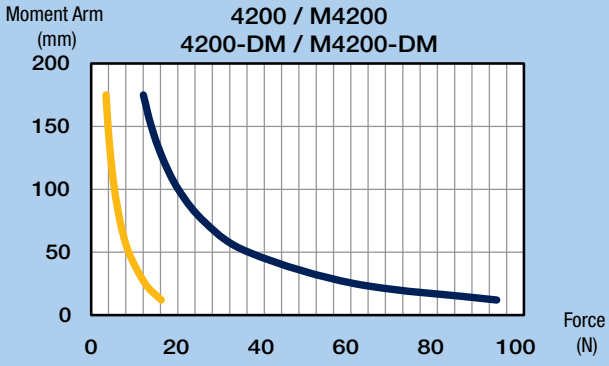
Yaw & Pitch | Roll

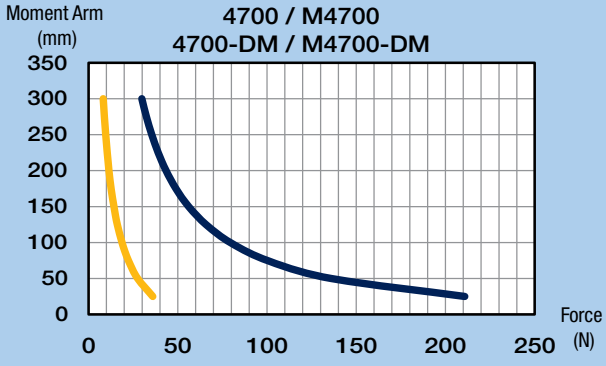


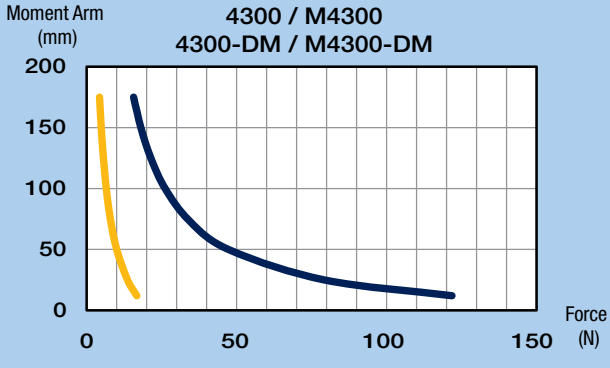


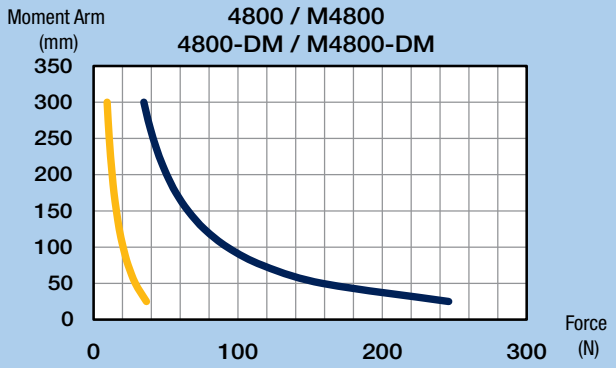










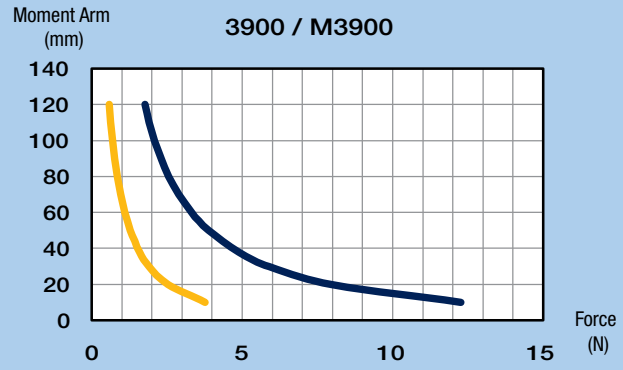


Ball Bearing Positioner Performance

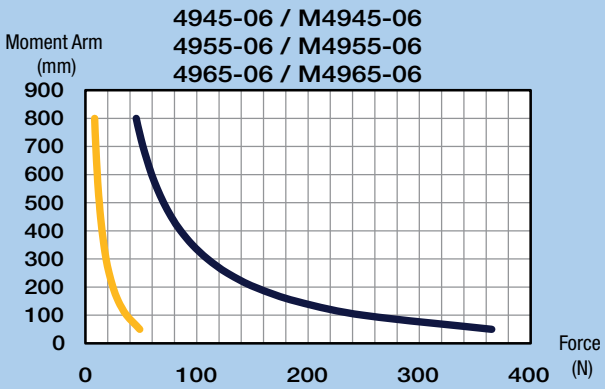
Yaw, Pitch, Roll

Yaw & Pitch Roll

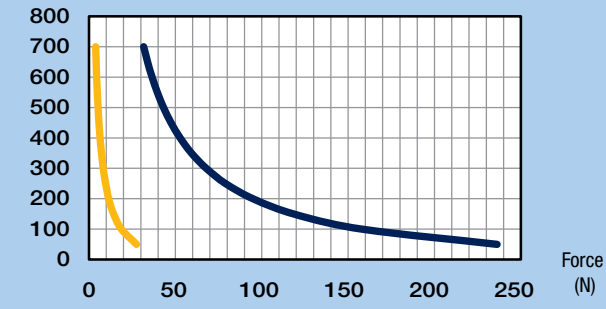
3900 / M3900



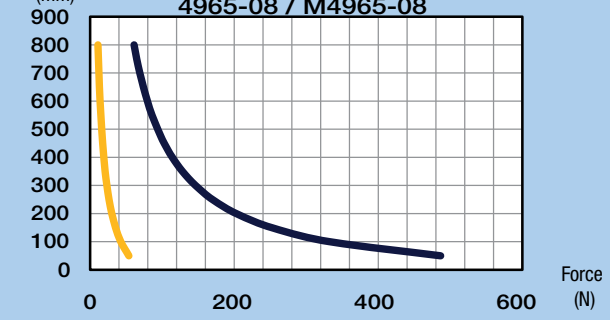
4945-06 / M4945-06
4955-06 / M4955-06
4965-06 / M4965-06



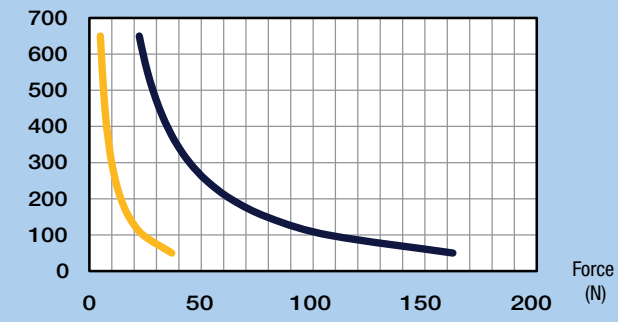
4400 / M4400
4400-DM / M4400-DM



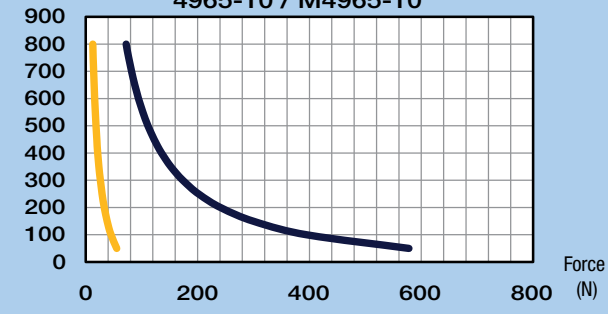
4945-08 / M4945-08
4955-08 / M4955-08
4965-08 / M4965-08



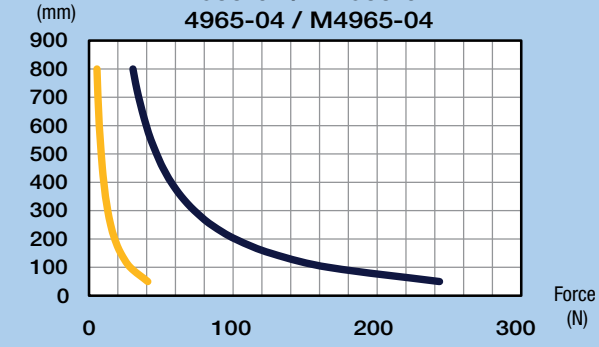
4910-4917 / M4910-M4917
4911-DM / M4911-DM



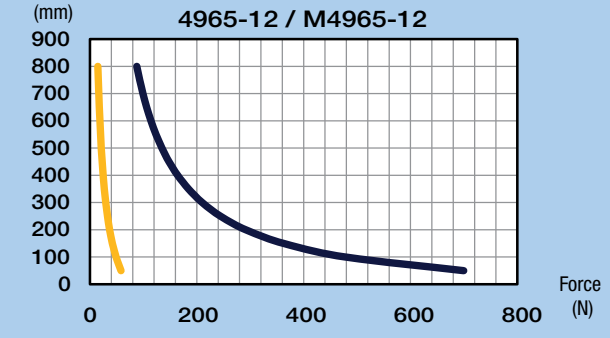
4945-10 / M4945-10
4955-10 / M4955-10
4965-10 / M4965-10

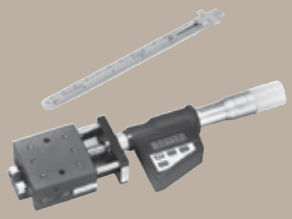


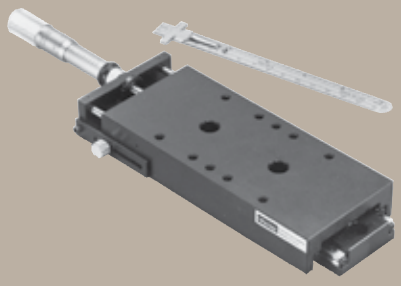
4945-04 / M4945-04
4955-04 / M4955-04
4965-04 / M4965-04



4945-12 / M4945-12
4955-12 / M4955-12
4965-12 / M4965-12







Crossed Roller Bearing Positioners

Parker Daedal precision crossed roller stages provide controlled, precise point-to-point positioning along a linear axis. Stages are comprised of two basic components: a precision linear crossed roller slide which serves as a linear bearing and guide, and a drive mechanism which accurately moves and positions the slide top along the linear axis. Crossed roller positioning stages offer exceptional load carrying capability, approximately 2 to 2 1/2 times that of comparably sized ball bearing stages. Additionally, crossed roller stages provide up to five times the life expectancy of the ball bearing stages without degradation of performance. Parker Daedal crossed roller stages are rated for over 100 million inches of travel at specified load.

Contents

Crossed Roller Bearing Positioners

- Precision Quality
- Budget Friendly
- Largest Selection
- Easy multi-axis configuration
- No maintenance
- Vacuum preparation and custom options

Crossed Roller Positioner Design Principles

Crossed roller positioning stages offer exceptional load carrying capability, approximately 2 to 2 1/2 times that of comparably sized ball bearing stages. Additionally, crossed roller stages provide up to five times the life expectancy of the ball bearing stages without degradation of performance. Parker Daedal crossed roller stages are rated for over 100 million inches of travel at specified load. Three types of drive mechanisms are available: a fine screw, a micrometer, and a differential screw. The fine screw is used for fine resolution positioning. The micrometer is used whenever a position readout is required. The differential screw is used for applications requiring extremely fine resolution positioning. Crossed roller positioning stages are available in a straight stage/drive configuration as well as a side-drive configuration.

The linear positioner operates in a simple manner: a bracket which supports the drive screw is attached to the slide base. The end of the drive screw rests against the end of the moveable top. There are two extended springs “pulling” the slide top toward the screw so that the top will always be held firmly against the screw end. When the screw is turned clockwise, it advances and pushes the slide top along the linear axis. When turned counter clockwise, the screw retracts and the slide top follows because of the spring pressure holding the top against the screw end. The result is a very smooth linear motion, accurately controlled by rotation of the drive mechanism.

Standard Features

Exacting manufacturing techniques, combined with demanding quality control standards, permit Parker Daedal to offer precision stages of unsurpassed quality. Selection can be made easily, based on required travel, load, and mounting surface requirements. Stages are available in single or multi-axis configurations (XY, XZ, and XYZ), and all have built-in quality features including:

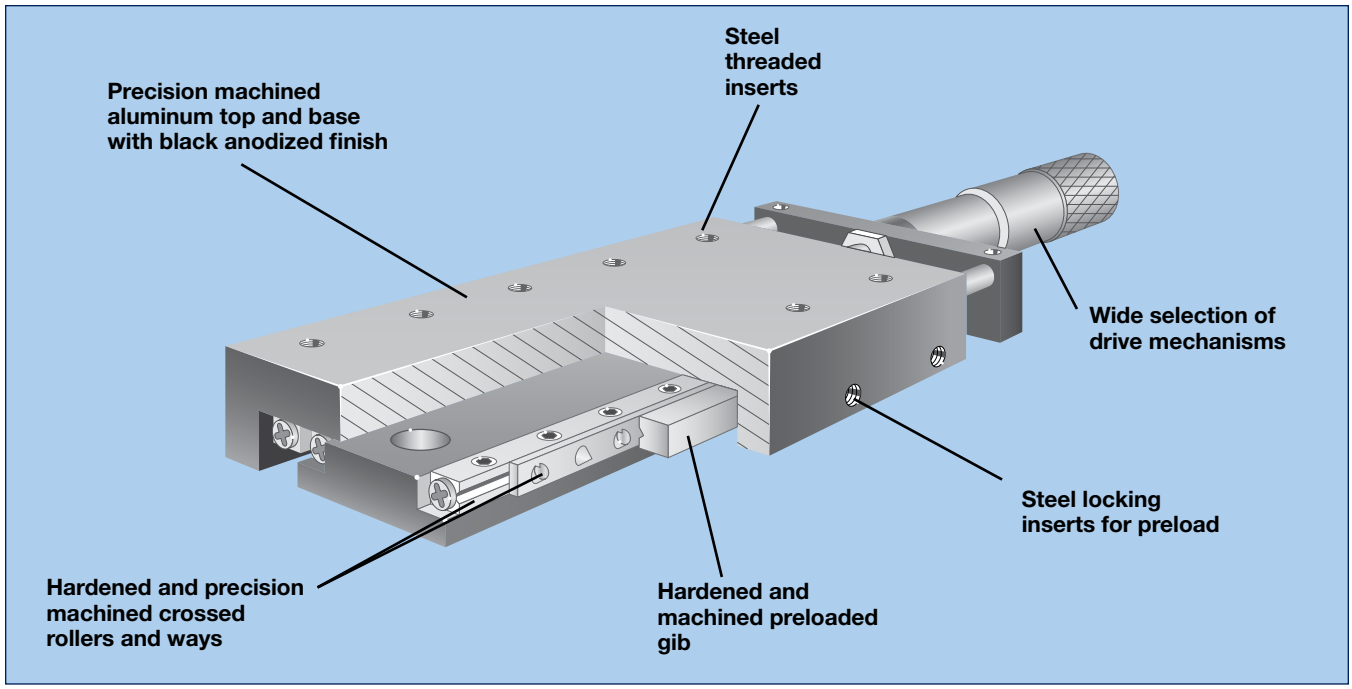
- Aluminum/steel construction
- Low friction linear adjustment with no backlash or side play
- Factory preloaded to provide dynamic stability and minimum runout
- Both top and bottom mounting surfaces are precision machined to provide micro-flat mounting surfaces
- Locking screw to positively lock stage without affecting position
- Straight line accuracy of 0.00008 in/in of travel
- Selectable drive mechanisms: Micrometer (Imperial or metric), Fine screw (64 pitch), Differential screw, Digital micrometers (Imperial and Metric)

Digital Micrometers

The 1.0” (25 mm) travel micrometer provides an LCD readout to 0.00005 in (0,001 mm) resolution and features incremental and/or absolute positioning modes and automatic shutdown to conserve the integral battery. The battery will power the unit for 500 hours of use. The 2.0” (51 mm) micrometer is accurate to ±0.0001 in (±2 microns) with a resolution and LCD reading to 0.00005 in (1 micron). The batteries will power the unit up to 5,000 hours.

How to Order

Use the overview chart on the following page to select the appropriate crossed roller positioner. Refer to the individual specifications page for complete performance and mechanical specifications. To order crossed roller bearing positioners, use the model number corresponding to the specific size and travel length selected. A variety of modifications to standard models are available to meet custom requirements. Contact our application engineering department with your design specifications.



Series	Width in (mm)	Travel		Normal Load		Drive Orientation		Mounting		Page
		in	(mm)	lbs	(kg)	Center	Side	Imperial	Metric	
CR4000	1.75 (44,5)	1.00	(25,4)	81	(37)	•	•	•		92-94
CR4100				81	(37)	•		•		95-96
CR4200				121	(55)	•		•		95-96
CR4300				131	(59)	•		•		95-96
SC050	1.97 (50,0)	0.98	(25)	175	(80)	•			•	97
SK050		1.97	(50)	263	(119)	•			•	
		2.95	(75)	351	(159)	•			•	
CR4500	2.62 (66,5)	1.00	(25,4)	111	(50)	•	•	•		98-99, 101
CR4600				151	(69)	•		•		100-101
CR4700				201	(91)	•		•		100-101
CR4800				251	(114)	•		•		100-101
SC075	2.95 (75,0)	0.98	(25)	351	(159)	•			•	102
SK075		1.97	(50)	439	(199)	•			•	
		2.95	(75)	527	(239)	•			•	
SC100	3.94 (100.0)	0.98	(25)	439	(199)	•			•	103
SK100		1.97	(50)	527	(239)	•			•	
		2.95	(75)	614	(278)	•			•	
		3.94	(100)	702	(318)	•			•	
CR4400	5.0 (127,0)	1.00	(25,4)	201	(91)	•	•	•		104-107
		2.00	(50,8)	201	(91)	•	•	•		104-107
CR4900	6.0 (152,4)	1.00	(50,8)	423	(192)	•		•		108-109
		2.00	(50,8)	423	(192)	•		•		108-109
		4.00	(100,0)	423	(192)	•		•		110
		6.00	(150,0)	719	(326)	•		•		110
		8.00	(200,0)	1052	(477)	•		•		110
		10.00	(250,0)	1395	(633)	•		•		110
		12.00	(300,0)	1735	(786)	•		•		110

CR4000 Series

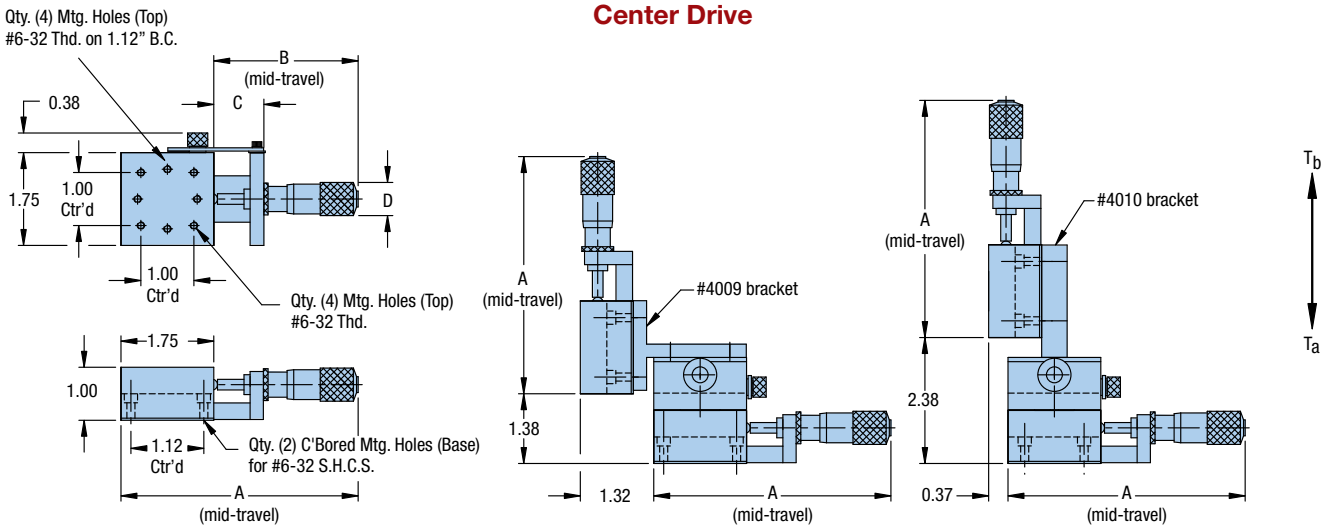
Specifications	
Travel:	0.5 in
Size:	
Width	1.75 in
Length (mid-travel)	2.95 – 4.47 in
Height	1.00 in
Load:	
Normal	81 lbs
Thrust – T_a	10 lbs
Thrust – T_b	5 lbs
Moment – Yaw, Pitch, Roll	See page 111
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.001 in or 0,01 mm
Differential screw:	
Coarse Adjustment	48 pitch
Fine Adjustment	336 pitch
Weight:	0.5 lbs/axis
Z-Axis bracket options: (See page 124-127)	
Center drive low profile	4009
Center drive standard	4010
Side drive low profile	4059
Side drive standard	4060
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Drive Mechanism	Travel	Center Drive Models				Side Drive Models			
		Single Axis	Two Axis	X-Y-Z Low Profile	X-Y-Z Standard	Single Axis	Two Axis	X-Y-Z Low Profile	X-Y-Z Standard
Imperial Micrometer	0.50 in	CR4002	CR4022	CR4032	CR4042	CR4052	CR4072	CR4082	CR4092
Metric Micrometer	13 mm	CR4002M	CR4022M	CR4032M	CR4042M	CR4052M	CR4072M	CR4082M	CR4092M
Differential Screw	2/8 mm	CR4002D	CR4022D	CR4032D	CR4042D	CR4052D	CR4072D	CR4082D	CR4092D

Dimensions Inches

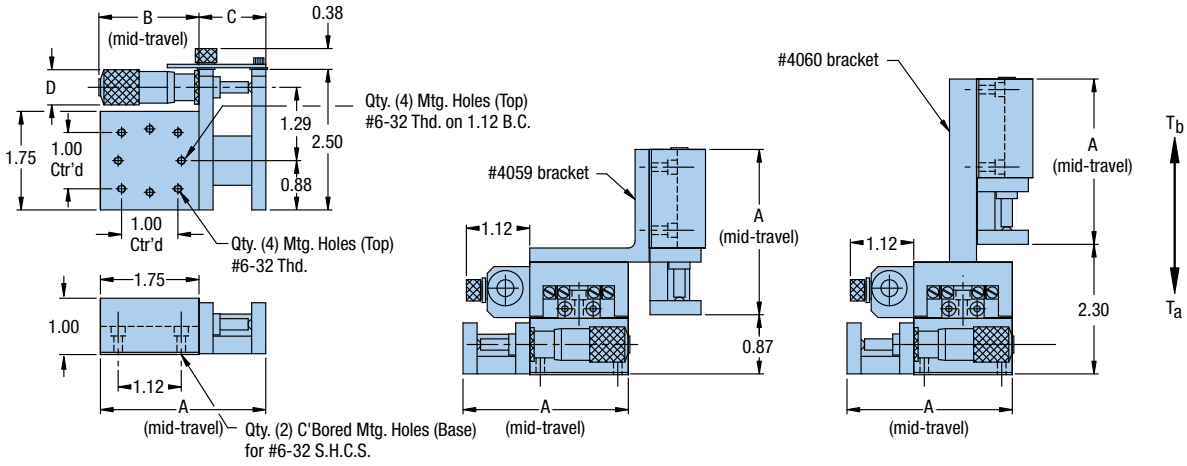
For additional end view dimensions, refer to the CR4000 crossed roller slide drawing, page 40. Consult factory for critical dimension concerns.

Center Drive



Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

Side Drive



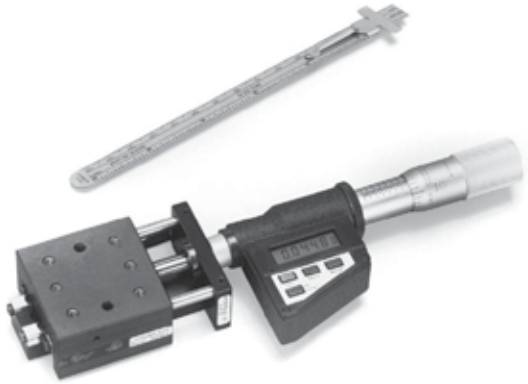
Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

Drive Mechanism	Travel	Center Drive Dimensions – in A	B	C	D	Side Drive Dimensions – in A	B	C	D
Imperial Micrometer	0.50 in	4.47	2.72	0.95	0.54	2.95	1.77	1.20	0.54
Metric Micrometer	13 mm	4.37	2.68	0.95	0.54	2.95	1.78	1.19	0.54
Differential Screw	2/8 mm	4.13	2.38	0.95	0.62	2.95	1.44	1.20	0.62

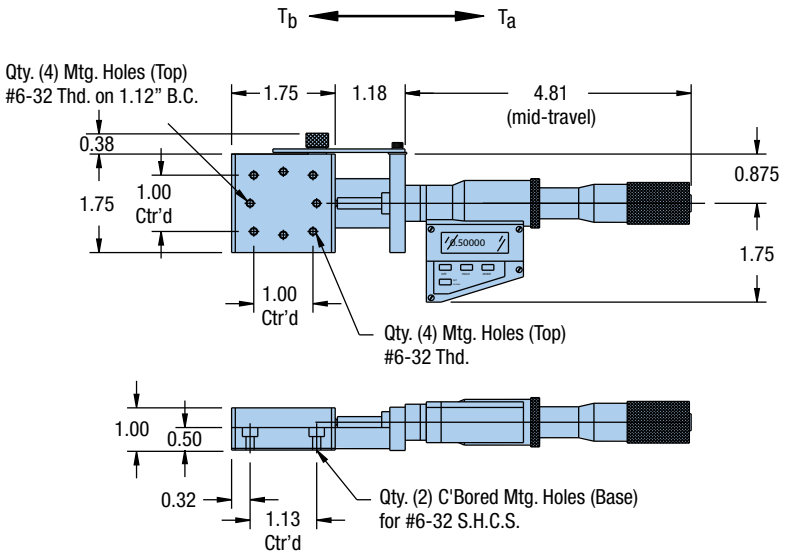
CR4000-DM Series

Specifications	
Travel:	1.0 in
Size:	
Width	1.75 in
Length (mid-travel)	7.75 in
Height	1.00 in
Load:	
Normal	81 lbs
Thrust – T_a	10 lbs
Thrust – T_b	3 lbs
Moment – Yaw, Pitch, Roll	See page 111
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.00005 in
Weight:	0.8 lbs
Construction:	Aluminum top and base/ 440C stainless steel bearings
Mounting surface:	Precision machined
Finish:	Black anodize

For additional end view dimensions, refer to the CR4000 crossed roller slide drawing, page 40. Consult factory for critical dimension concerns.



Dimensions Inches



	Model
Imperial Mounting	CR4002-DM

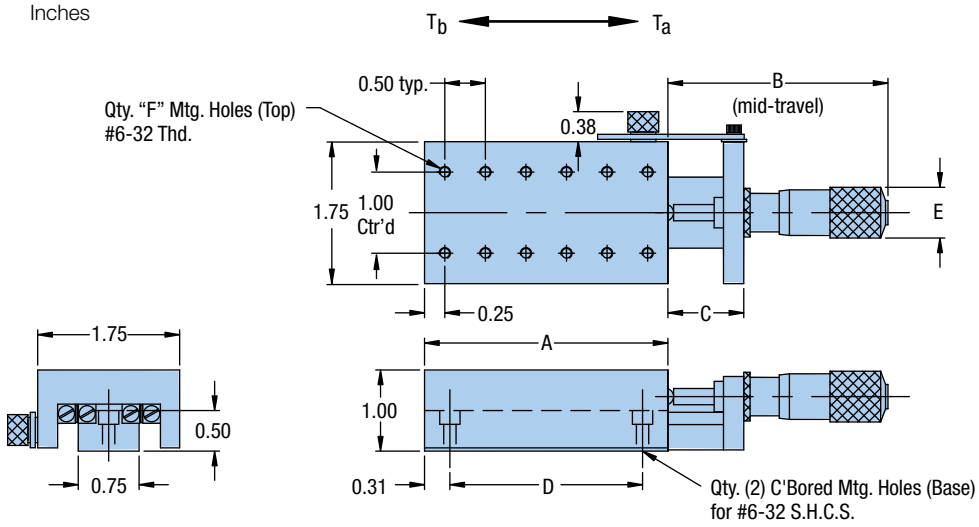
CR4100, CR4200, CR4300 Series

Specifications	
Travel:	0.5 – 1.0 in
Size:	
Width	1.75 in
Length (mid-travel)	4.6 – 8.28 in
Height	0.75 in
Load:	
Normal	81 - 131 lbs
Thrust – T_a	10 lbs
Thrust – T_b	3 lbs
Moment – Yaw, Pitch, Roll	See page 111
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.001 in or 0,01 mm
Fine screw:	64 pitch
Weight:	0.8 – 1.3 lbs/axis
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Consult factory for critical dimension concerns.

Dimensions

Inches



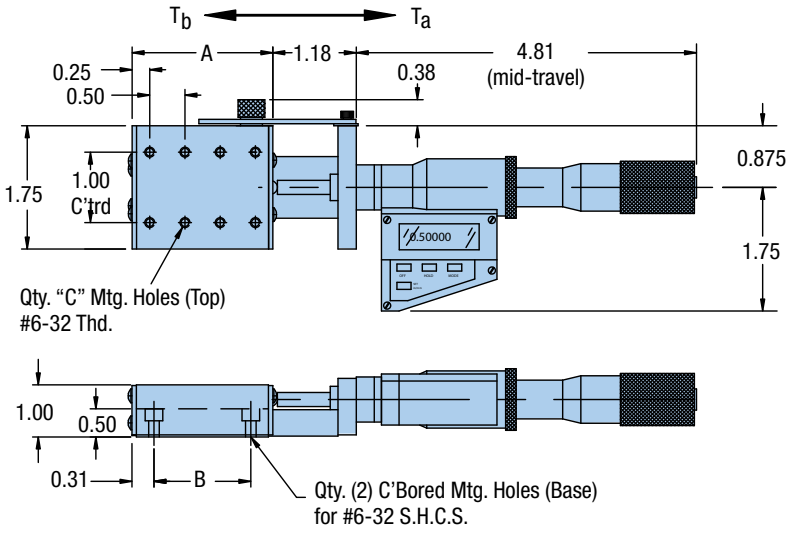
Drive Mechanism	Travel	Model	Load	Weight	Dimensions - in A	B	C	D	E	Qty F
Imperial Micrometer	0.50 in	**CR4102**				2.72	0.94		0.55	
	1.0 in	**CR4104**				4.28	1.18		0.71	
Metric Micrometer	13 mm	**CR4102M**	81 lbs	0.5 lbs	2.00	2.72	0.94	1.38	0.55	8
	25 mm	**CR4104M**				4.28	1.18		0.71	
Fine Screw	0.75 in	**CR4103**				2.50	0.94		0.58	
Imperial Micrometer	0.50 in	**CR4202**				2.72	0.94		0.55	
	1.0 in	**CR4204**				4.28	1.18		0.71	
Metric Micrometer	13 mm	**CR4202M**	121 lbs	0.8 lbs	3.00	2.72	0.94	2.38	0.55	12
	25 mm	**CR4204M**				4.28	1.18		0.71	
Fine Screw	0.75 in	**CR4203**				2.50	0.94		0.58	
Imperial Micrometer	0.50 in	**CR4302**				2.72	0.94		0.55	
	1.0 in	**CR4304**				4.28	1.18		0.71	
Metric Micrometer	13 mm	**CR4302M**	131 lbs	1.0 lbs	4.00	2.72	0.94	3.38	0.55	16
	25 mm	**CR4304M**				4.28	1.18		0.71	
Fine Screw	0.75 in	**CR4303**				2.50	0.94		0.58	

CR4100-DM, CR4200-DM, CR4300-DM Series

Specifications	
Travel:	1.0 in
Size:	
Width	1.75 in
Length (mid-travel)	7.99 – 9.99 in
Height	1.00 in
Load:	
Normal	81 – 131 lbs
Thrust – T_a	10 lbs
Thrust – T_b	3 lbs
Moment – Yaw, Pitch, Roll	See page 111
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.00005 in
Weight:	0.9 – 1.3 lbs/axis
Construction:	Aluminum top and base/ 440C stainless steel bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Consult factory for critical dimension concerns.

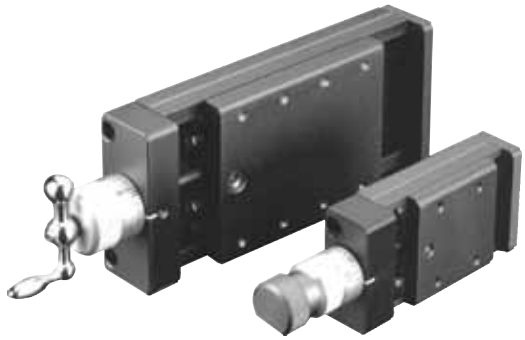
Dimensions Inches



Model	Normal Load	Weight	Dimensions – in A	B	C
CR4104-DM	81 lbs	1.0 lbs	2.00	1.38	8
CR4204-DM	121 lbs	1.1 lbs	3.00	2.38	12
CR4304-DM	131 lbs	1.3 lbs	4.00	3.38	16

SC050/SK050 Series

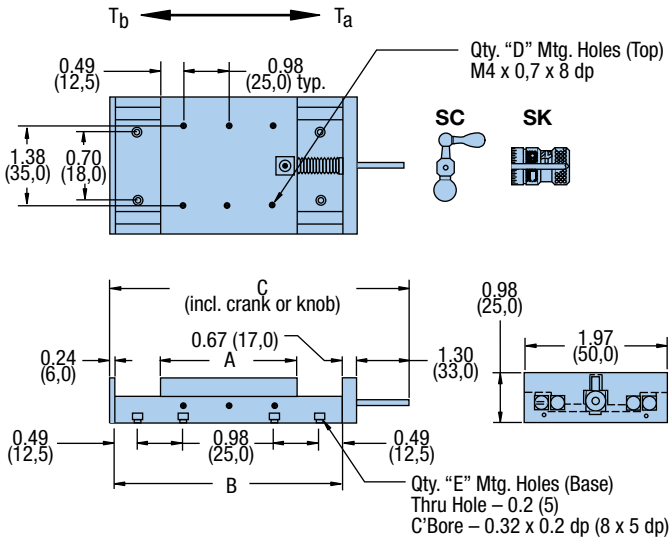
Specifications	
Travel:	0.98 – 2.95 in (25 – 75 mm)
Size:	
Width	1.97 in (50,0 mm)
Length	5.55 – 10.04 in (141.0,0 – 255,0 mm)
Height	0.98 in (25,0 mm)
Load:	
Normal	175 – 351 lbs (80 – 159 kg)
Moment: Yaw, Pitch, Roll	See page 112
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	0.9 – 2.0 lbs (0,4 – 0,9 kg)
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize



SC Crank Lead Screw (left); SK Knob Lead Screw (right)

Consult factory for critical dimension concerns.

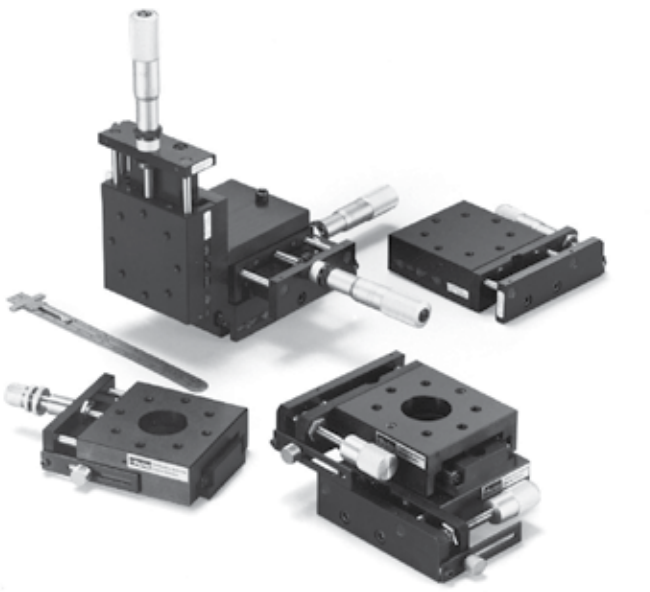
Dimensions in (mm)



Model	Travel in (mm)		Normal Load lbs (kg)		Weight lbs (kg)		Dimension – in (mm A		B		C		Qty D	Qty E
SC050A-075 **SK050A-075**	0.98	(25)	175	(80)	0.9	(0,4)	1.97	(50,0)	2.95	(75,0)	6.10 5.55	(155,0) (141,0)	4	6
SC050A-125 **SK050A-125**	1.97	(50)	263	(119)	1.4	(0,7)	2.95	(75,0)	4.92	(125,0)	8.07 7.52	(205,0) (191,0)	6	8
SC050A-175 **SK050A-175**	2.95	(75)	351	(159)	2.0	(0,9)	3.94	(100,0)	6.89	(175,0)	10.04 9.49	(255,0) (241,0)	8	8

CR4500 Series

Specifications	
Travel:	0.5 – 1.0 in
Size:	
Width	2.62 in
Length (mid-travel)	5.01 – 6.93 in
Height	1.00 in
Load:	
Normal	111 lbs
Thrust – T_a	10 lbs
Thrust – T_b	2 lbs
Moment – Yaw, Pitch, Roll	See page 111
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.001 in or 0,01 mm
Differential screw:	
Coarse Adjustment	48 pitch
Fine Adjustment	336 pitch
Fine screw:	64 pitch
Weight:	
Center drive	0.9 lbs/axis
Side drive	1.0 lbs/axis
Z-Axis bracket options: (See page 124-127)	
Center drive low profile	4509
Center drive standard	4510
Side drive low profile	4559
Side drive standard	4560
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

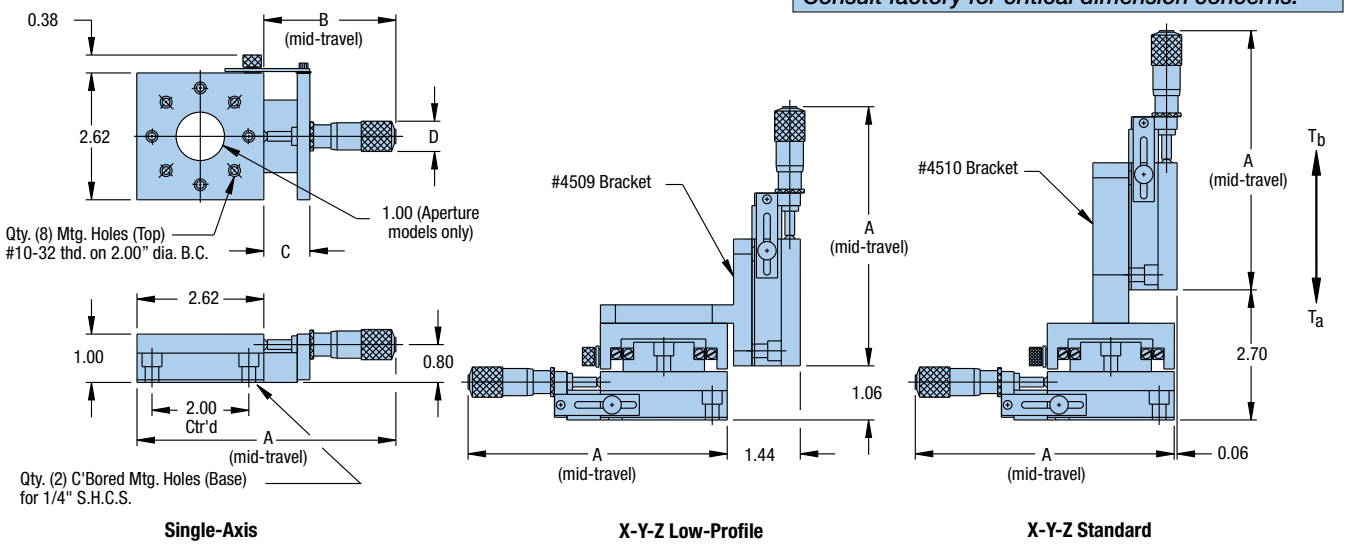


			Center Drive Models				Side Drive Models			
Style	**Drive Mechanism**	**Travel**	**Single Axis**	**Two Axis**	**X-Y-Z Low Profile**	**X-Y-Z Standard**	**Single Axis**	**Two Axis**	**X-Y-Z Low Profile**	**X-Y-Z Standard**
Solid Top	Imperial Micrometer Metric Micrometer Differential Screw Fine Screw	0.50 in	CR4502	CR4522	CR4532	CR4542	CR4552	CR4572	CR4582	CR4592
		1.0 in	CR4504	CR4524	CR4534	CR4544	CR4554	CR4574	CR4584	CR4594
		13 mm	CR4502M	CR4522M	CR4532M	CR4542M	CR4552M	CR4572M	CR4582M	CR4592M
		25 mm	CR4504M	CR4524M	CR4534M	CR4544M	CR4554M	CR4574M	CR4584M	CR4594M
		0.08/0.3 in	CR4502D	CR4522D	CR4532D	CR4542D	CR4552D	CR4572D	CR4582D	CR4592D
		0.75 in	CR4503	CR4523	CR4533	CR4543	CR4553	CR4573	CR4583	CR4593
Aperture (1.0 in)	Imperial Micrometer Metric Micrometer Differential Screw Fine Screw	0.50 in	CR4506	CR4526	CR4536	CR4546	CR4556	CR4576	CR4586	CR4596
		13 mm	CR4506M	CR4526M	CR4536M	CR4546M	CR4556M	CR4576M	CR4586M	CR4596M
		0.08/0.3 in	CR4506D	CR4526D	CR4536D	CR4546D	CR4556D	CR4576D	CR4586D	CR4596D
		0.75 in	CR4507	CR4527	CR4537	CR4547	CR4557	CR4577	CR4587	CR4597

Dimensions Inches

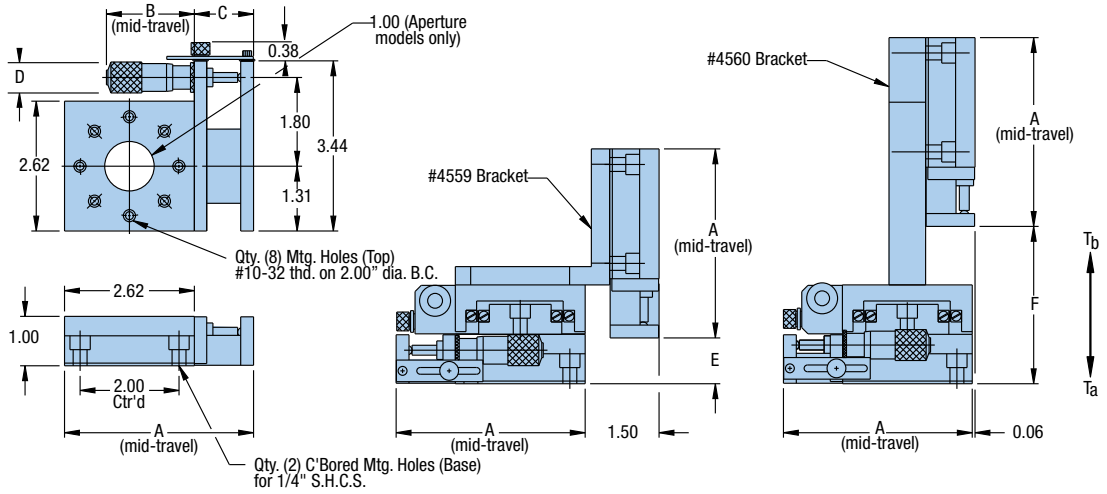
For additional end view dimensions, refer to the CR4500 crossed roller slide drawing, page 44. Consult factory for critical dimension concerns.

Center Drive



Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

Side Drive



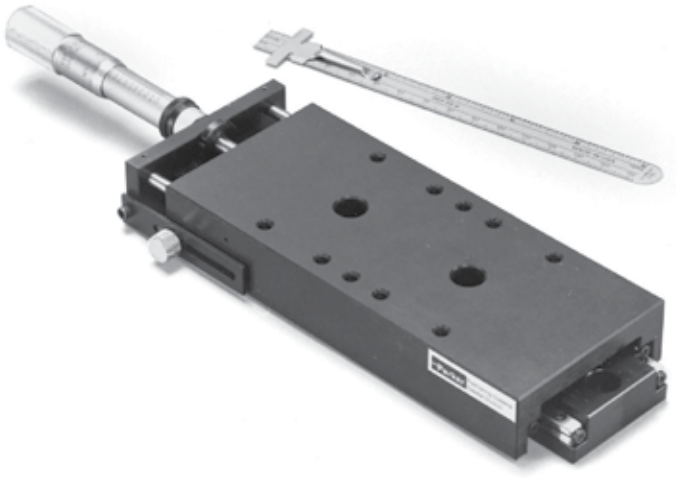
Single-Axis **X-Y-Z Low-Profile** **X-Y-Z Standard**

Style	Drive Mechanism		Center Drive Dimensions – in				Side Drive Dimensions – in					
			A	B	C	D	A	B	C	D	E	F
Solid Top	Imperial Micrometer	0.50 in	5.35	2.73	0.95	0.54	3.82	1.78	1.20	0.54	0.93	3.18
		1.0 in	6.93	4.31	1.22	0.71	4.07	3.10	1.45	0.71	0.68	2.93
	Metric Micrometer	13 mm	5.35	2.73	0.95	0.54	3.82	1.78	1.20	0.54	0.93	3.18
		25 mm	6.93	4.31	1.22	0.71	4.07	3.10	1.45	0.71	0.68	2.93
	Differential Screw	0.08/0.3 in	5.01	2.39	0.95	0.62	3.82	1.44	1.20	0.62	0.93	3.18
	Fine Screw	0.75 in	5.24	2.62	0.95	0.58	3.82	1.72	1.20	0.58	0.93	3.18
Aperture (1.0 in)	Imperial Micrometer	0.50 in	5.35	2.73	0.95	0.54	3.82	1.78	1.20	0.54	0.93	3.18
	Metric Micrometer	13 mm	5.35	2.73	0.95	0.54	3.82	1.78	1.20	0.54	0.93	3.18
	Differential Screw	0.08/0.3 in	5.01	2.39	0.95	0.62	3.82	1.44	1.20	0.62	0.93	3.18
	Fine Screw	0.75 in	5.24	2.62	0.95	0.58	3.82	1.72	1.20	0.58	0.93	3.18

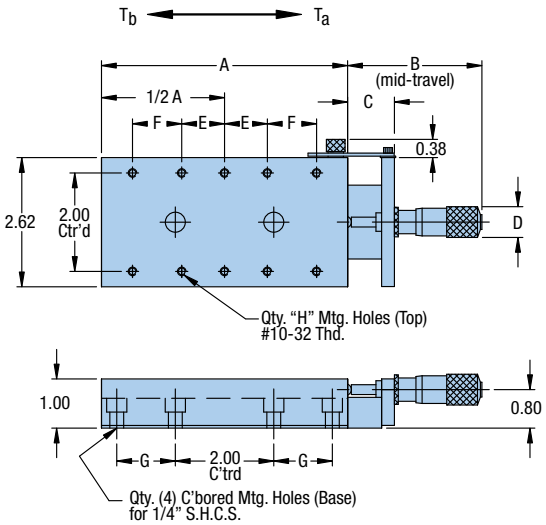
CR4600, CR4700, CR4800 Series

Specifications	
Travel:	0.5 – 1.0 in
Size:	
Width	2.62 in
Length (mid-travel)	6.62 – 10.31 in
Height	1.00 in
Load:	
Normal	151 – 252 lbs
Thrust – T_a	30 lbs
Thrust – T_b	2 lbs
Moment – Yaw, Pitch, Roll	See page 111
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.001 in or 0,01 mm
Fine screw:	64 pitch
Weight:	1.1 – 1.5 lbs/axis
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

For additional end view dimensions, refer to the CR4600-4800 crossed roller slide drawing, page 45. Consult factory for critical dimension concerns.



Dimensions Inches



Drive Mechanism	Travel	Model	Load	Weight	Dimensions - in A	B	C	D	E	F	G	Qty H
Imperial Micrometer	0.50 in	**CR4602**				2.73	0.95	0.54				
	1.0 in	**CR4604**				4.31	1.22	0.71				
Metric Micrometer	13 mm	**CR4602M**	151 lbs	1.1 lbs	4.00	2.73	0.95	0.54	0.50	—	0.69	6
	25 mm	**CR4604M**				4.31	1.22	0.71				
Fine Screw	0.75 in	**CR4603**				2.62	0.95	0.58				
Imperial Micrometer	0.50 in	**CR4702**				2.73	0.95	0.54				
	1.0 in	**CR4704**				4.31	1.22	0.71				
Metric Micrometer	13 mm	**CR4702M**	201 lbs	1.3 lbs	5.00	2.73	0.95	0.54	1.00	—	1.19	6
	25 mm	**CR4704M**				4.31	1.22	0.71				
Fine Screw	0.75 in	**CR4703**				2.62	0.95	0.58				
Imperial Micrometer	0.50 in	**CR4802**				2.73	0.95	0.54				
	1.0 in	**CR4804**				4.31	1.22	0.71				
Metric Micrometer	13 mm	**CR4802M**	252 lbs	1.5 lbs	6.00	2.73	0.95	0.54	0.50	1.00	1.69	10
	25 mm	**CR4804M**				4.31	1.22	0.71				
Fine Screw	0.75 in	**CR4803**				2.62	0.95	0.58				

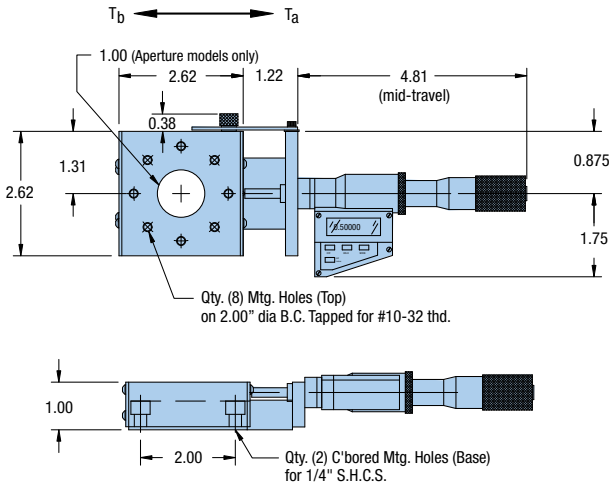
CR4500-DM Series
CR4600-DM, CR4700-DM, CR4800-DM Series

Specifications	
Travel:	1.0 in
Size:	
Width	2.62 in
Length (mid-travel)	8.65 – 12.03 in
Height	1.00 in
Load:	
Normal	111 – 252 lbs
Thrust – T_a	10 lbs
Thrust – T_b	2 lbs
Moment – Yaw, Pitch, Roll	See page 111
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.00005 in or 0,001 mm
Weight:	1.5 – 2.1 lbs/axis
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

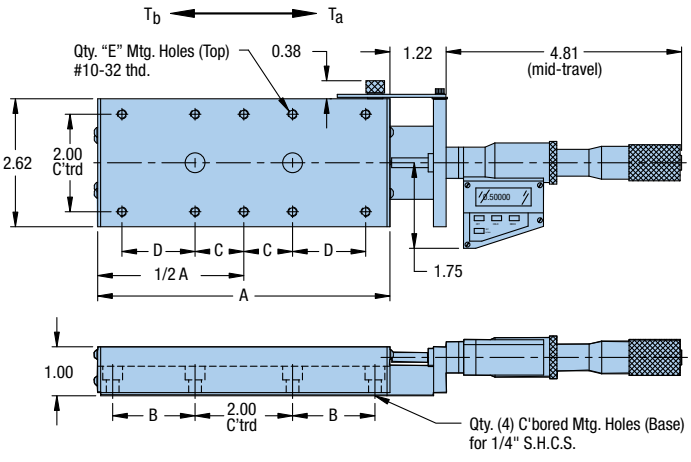
For additional end view dimensions, refer to the CR4500 and CR4600-4800 crossed roller slide drawing, page 44-45.
Consult factory for critical dimension concerns.

Dimensions Inches

CR4500-DM



CR4600-DM – CR4800-DM



Model	Load	Weight	Dimensions - in A	B	C	D	Qty E
CR4504-DM	111 lbs	1.5 lbs	—	—	—	—	—
CR4604-DM	151 lbs	1.7 lbs	4.00	0.69	0.50	—	6
CR4704-DM	201 lbs	1.9 lbs	5.00	1.19	1.00	—	6
CR4804-DM	252 lbs	2.1 lbs	6.00	1.69	0.50	1.00	10

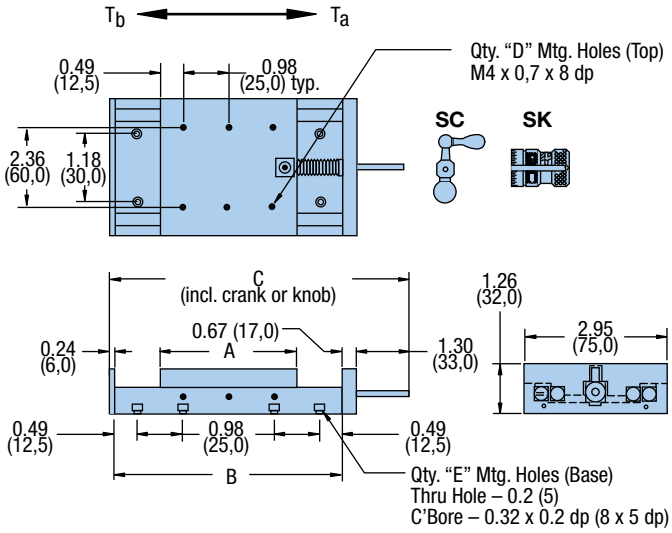
SC075/SK075 Series

Specifications	
Travel:	0.98 – 2.95 in (25 – 75 mm)
Size:	
Width	2.95 in (75,0 mm)
Length	3.94 – 7.87 in (175,0 – 283,0 mm)
Height	1.26 in (32,0 mm)
Load:	
Normal	351 – 527 lbs (159 – 239 kg)
Moment: Yaw, Pitch, Roll	See page 112
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	1.7 – 3.5 lbs (0,8 – 1,6 kg)
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

SC Crank Lead Screw (left); SK Knob Lead Screw (right)

Consult factory for critical dimension concerns.

Dimensions in (mm)



Model	Travel in (mm)		Normal Load lbs (kg)		Weight lbs (kg)		Dimension – in (mm) A		B		C		Qty D	Qty E
SC075A-100 **SK075A-100**	0.98	(25)	351	(159)	1.7	(0,8)	2.95	(75,0)	3.94	(100,0)	7.20 6.89	(183) (175)	6	8
SC075A-150 **SK075A-150**	1.97	(50)	439	(199)	2.6	(1,2)	3.94	(100,0)	5.90	(150,0)	9.17 8.86	(233) (225)	8	8
SC075A-200 **SK075A-200**	2.95	(75)	527	(239)	3.5	(1,6)	4.92	(125.0)	7.87	(200,0)	11.14 10.83	(283) (275)	10	8

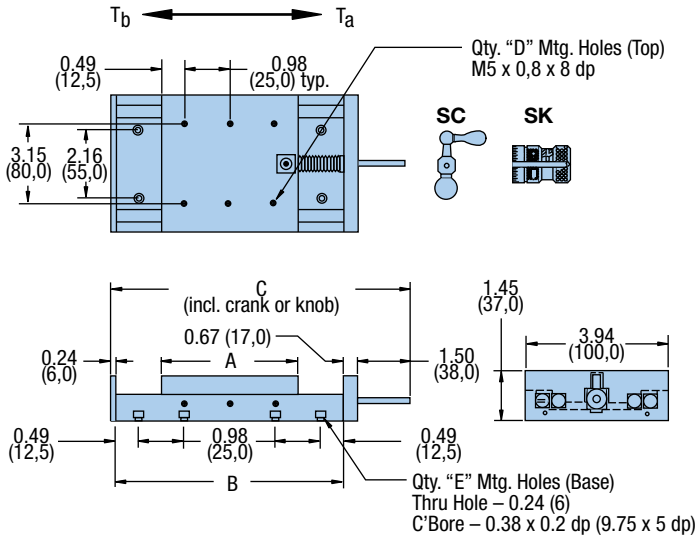
SC100/SK100 Series

Specifications	
Travel:	0.98 – 3.94 in (25 – 100 mm)
Size:	
Width	3.94 in (100,0 mm)
Length	8.86 – 15.08 in (225,0 – 383,0 mm)
Height	1.45 in (37,0 mm)
Load:	
Normal	439 – 702 lbs (199 – 318 kg)
Moment: Yaw, Pitch, Roll	See page 113
Straight line accuracy:	0.00008 in/in of travel 2 µm/25 mm of travel
Weight:	3.7 – 7.3 lbs (1,7 – 3,4 kg)
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

SC Crank Lead Screw (left); SK Knob Lead Screw (right)

Consult factory for critical dimension concerns.

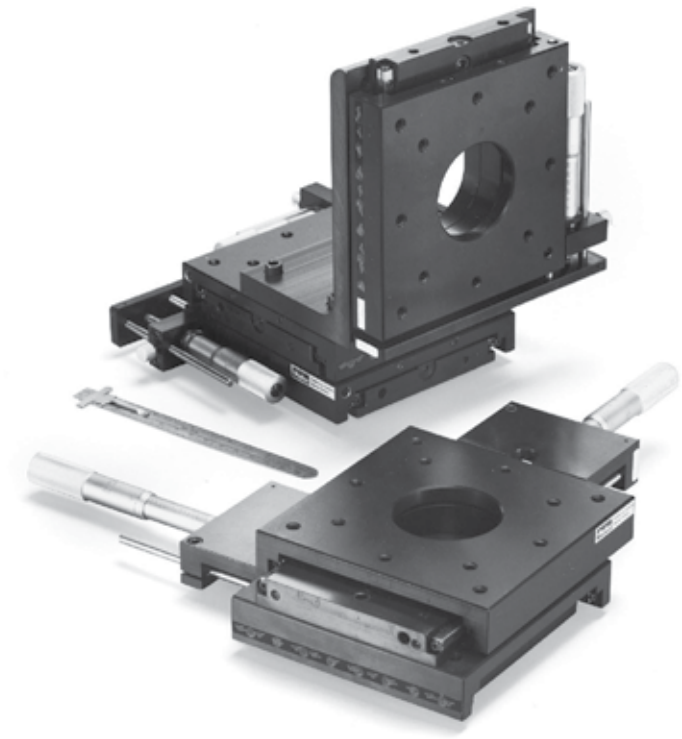
Dimensions in (mm)



Model	Travel in (mm)		Normal Load lbs (kg)		Weight lbs (kg)		Dimension – in (mm) A		B		C		Qty D	Qty E
SC100A-150 **SK100A-150**	0.98	(25)	439	(199)	3.7	(1,7)	4.92	(125,0)	5.90	(150,0)	9.17 8.86	(233) (225)	10	8
SC100A-200 **SK100A-200**	1.97	(50)	527	(239)	4.9	(2,2)	5.90	(150,0)	7.87	(200,0)	11.14 10.83	(283) (275)	12	8
SC100A-250 **SK100A-250**	2.95	(75)	614	(278)	6.1	(2,8)	6.89	(175,0)	9.84	(250,0)	13.11 12.80	(333) 325)	14	8
SC100A-300 **SK100A-300**	3.94	(100)	702	(318)	7.3	(3,4)	7.87	(200,0)	11.81	(300,0)	15.08 14.76	383) (375)	16	8

CR4400 Series

Specifications	
Travel:	1.0 – 2.0 in
Size:	
Width	5.00 in
Length (mid-travel)	6.0 – 11.34 in
Height	1.00 in
Load:	
Normal	201 lbs
Thrust – T_a	30 lbs
Thrust – T_b	3 lbs
Moment – Yaw, Pitch, Roll	See page 114
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.001 in or 0,01 mm
Weight:	2.6 lbs/axis
Z-Axis bracket options: (See page 124-127)	4499
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

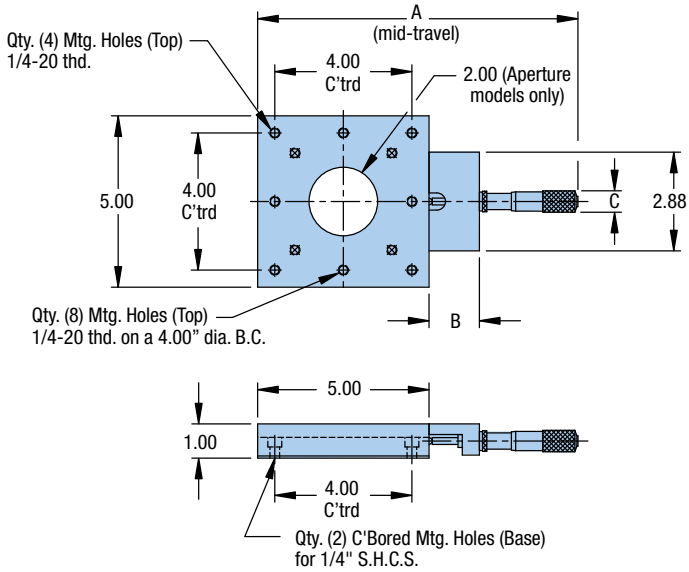


Style	Drive Mechanism	Travel	Center Drive Models			Side Drive Models		
			Single Axis	Two Axis	Three Axis	Single Axis	Two Axis	Three Axis
Solid Top	Imperial Micrometer	1.0 in	CR4411	CR4421	CR4431	CR4416	CR4426	CR4436
		2.0 in	CR4412	CR4422	CR4432	CR4417	CR4427	CR4437
	Metric Micrometer	25 mm	CR4413	CR4423	CR4433	CR4418	CR4428	CR4438
		50 mm	CR4414	CR4424	CR4434	CR4419	CR4429	CR4439
Aperture (2.0 in)	Imperial Micrometer	1.0 in	CR4451	CR4461	CR4471	CR4456	CR4466	CR4476
		2.0 in	CR4452	CR4462	CR4472	CR4457	CR4467	CR4477
	Metric Micrometer	25 mm	CR4453	CR4463	CR4473	CR4458	CR4468	CR4478
		50 mm	CR4454	CR4464	CR4474	CR4459	CR4469	CR4479

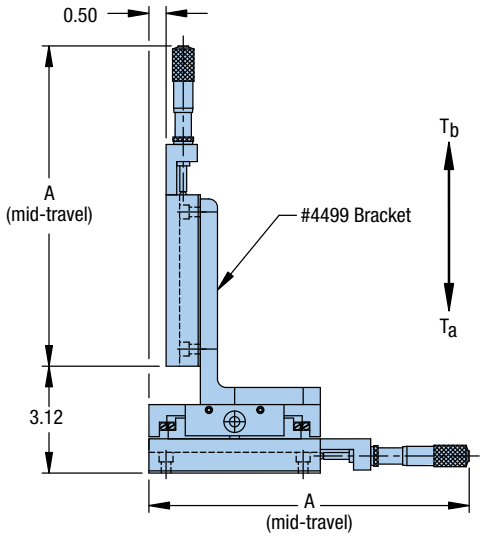
Dimensions Inches

For additional end view dimensions, refer to the CR4400 crossed roller slide drawing, page 50. Consult factory for critical dimension concerns.

Center Drive

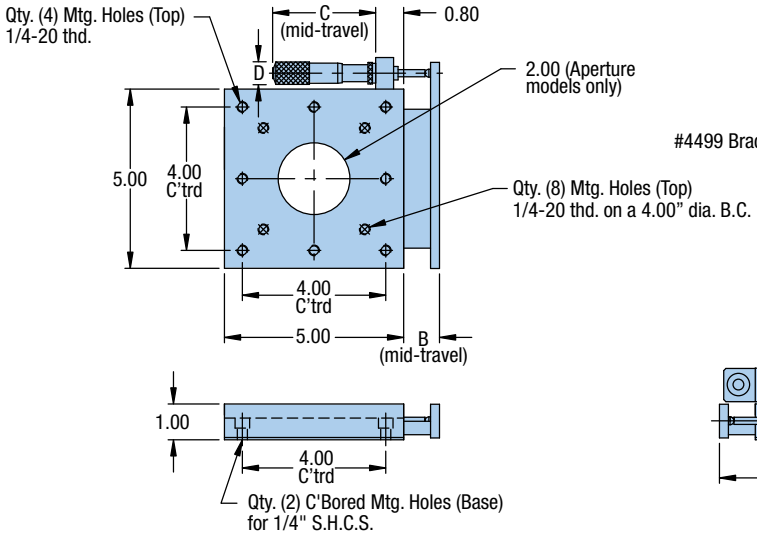


Single-Axis

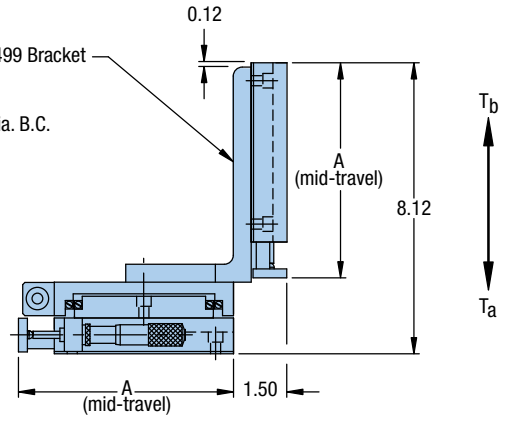


X-Y-Z Standard

Side Drive



Single-Axis



X-Y-Z Standard

Style	Drive Mechanism	Travel	Center Drive Dimensions – in A	B	C	Side Drive Dimensions – in A	B	C	D
Solid Top	Imperial Micrometer	1.0 in	9.31	1.47	0.71	6.0	1.00	2.84	0.71
		2.0 in	11.34	1.98	0.73	6.5	1.50	4.36	0.73
	Metric Micrometer	25 mm	9.31	1.47	0.71	6.0	1.00	2.84	0.71
		50 mm	11.34	1.98	0.73	6.5	1.50	4.36	0.73
Aperture	Imperial Micrometer	1.0 in	9.31	1.47	0.71	6.0	1.00	2.84	0.71
		2.0 in	11.34	1.98	0.73	6.5	1.50	4.36	0.73
	Metric Micrometer	25 mm	9.31	1.47	0.71	6.0	1.00	2.84	0.71
		50 mm	11.34	1.98	0.73	6.5	1.50	4.36	0.73

CR4400-DM Series

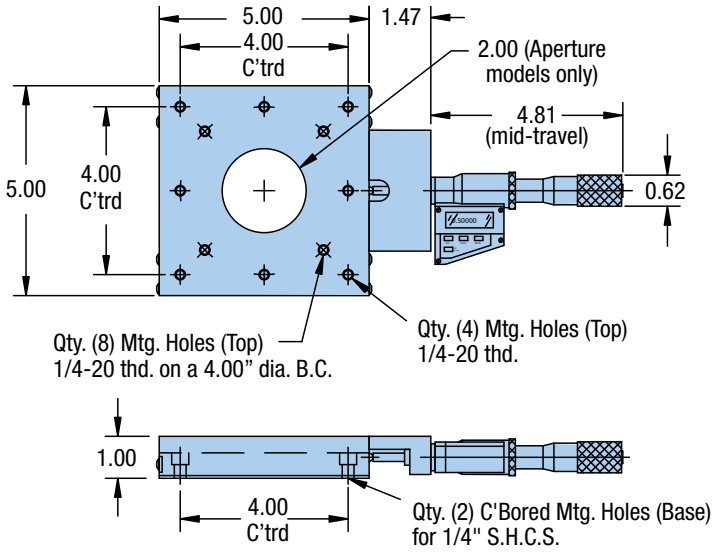
Specifications	
Travel:	1.0 – 2.0 in
Size:	
Width	5.00 in
Length (mid-travel)	11.28 – 14.16 in
Height	1.00 in
Load:	
Normal	201 lbs
Thrust – T_a	30 lbs
Thrust – T_b	2.0 lbs
Moment – Yaw, Pitch, Roll	See page 114
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	0.00005 in or 0,001 mm
Weight:	3.1 lbs/axis
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Series	Model	Travel
Solid Top	CR4411-DM	1.0 in
	CR4412-DM	2.0 in
Aperture (2.0 in)	CR4451-DM	1.0 in
	CR4452-DM	2.0 in

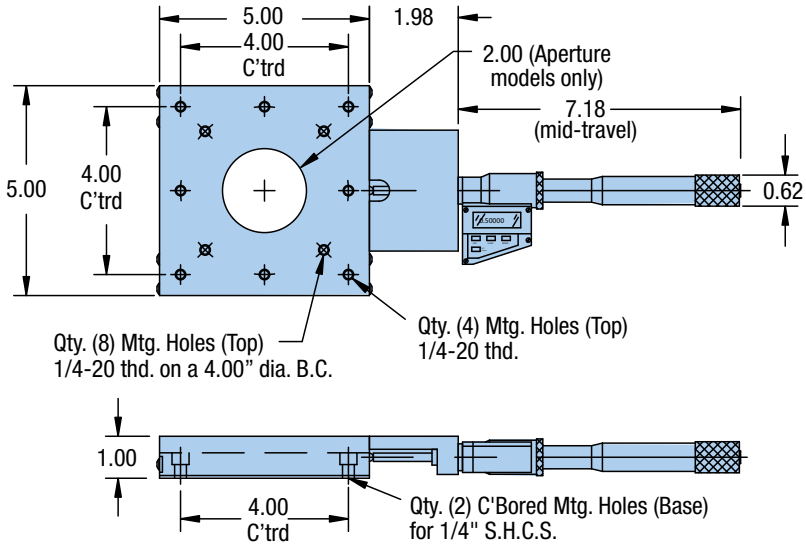
Dimensions Inches

For additional end view dimensions, refer to the CR4400 crossed roller slide drawing, page 50. Consult factory for critical dimension concerns.

1.0 in (25 mm) Travel Models



2.0 in (50 mm) Travel Models



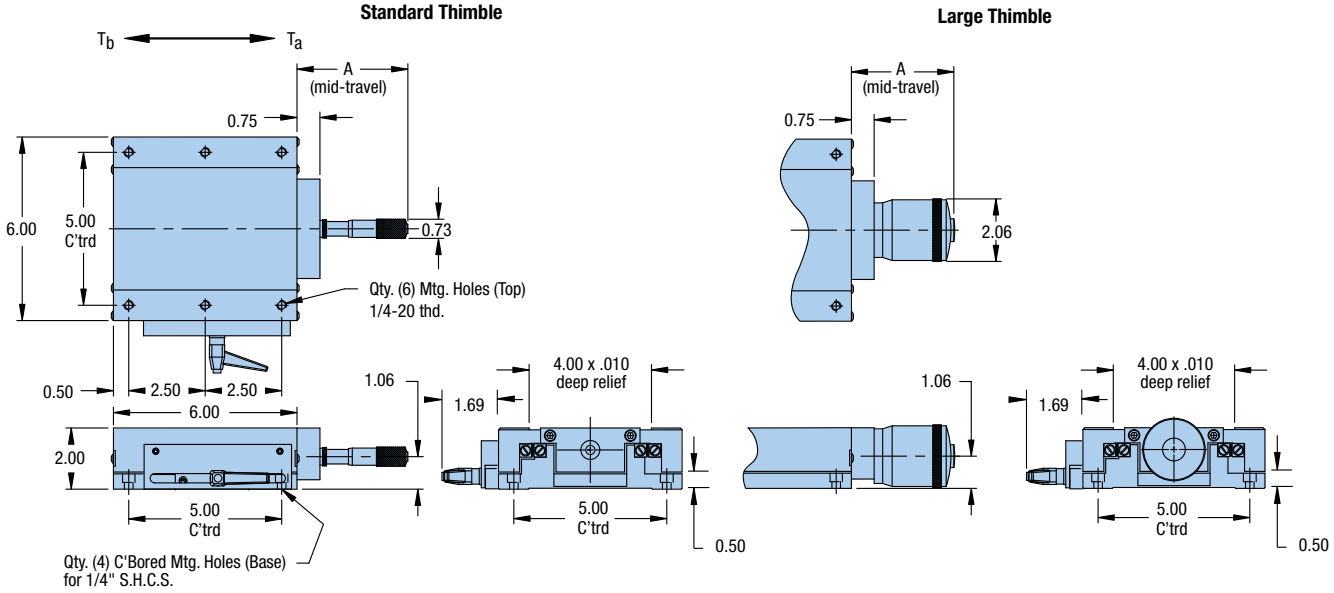
CR4900 Series

Specifications	
Travel:	1.0 – 2.0 in
Size:	
Width	6.00 in
Length (mid-travel)	9.59 – 11.94 in
Height	2.00 in
Load:	
Normal	423 lbs
Thrust T_a (Std. thimble)	30 lbs
Thrust – T_b (Std. thimble)	5 lbs
Thrust T_a (Std. thimble)	50 lbs
Thrust – T_b (Std. thimble)	5 lbs
Moment – Yaw, Pitch, Roll	See page 114
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	
Standard thimble	0.001 in or 0,01 mm
Large thimble	0.0001 in or 0,002 mm
Weight:	7 lbs/axis
Z-Axis bracket options: (See page 124-127)	4990-04
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Standard thimble with optional position lock (left), and large thimble (right). To order the optional lock, add -L to the model number selected from the chart below.

Consult factory for critical dimension concerns.

Dimensions Inches



Drive Mechanism	Travel	Standard Thimble Size Model	Graduations	A – in	Large Thimble Size Model	Graduations	A – in
Imperial Micrometer	1.0 in	CR4914	0.001 in	3.59	CR4910	0.0001 in	4.44
	2.0 in	CR4915	0.001 in	5.11	CR4911	0.0001 in	5.94
Metric Micrometer	25 mm	CR4916	0.01 mm	3.59	CR4912	0.002 mm	4.44
	50 mm	CR4917	0.01 mm	5.11	CR4913	0.002 mm	5.94

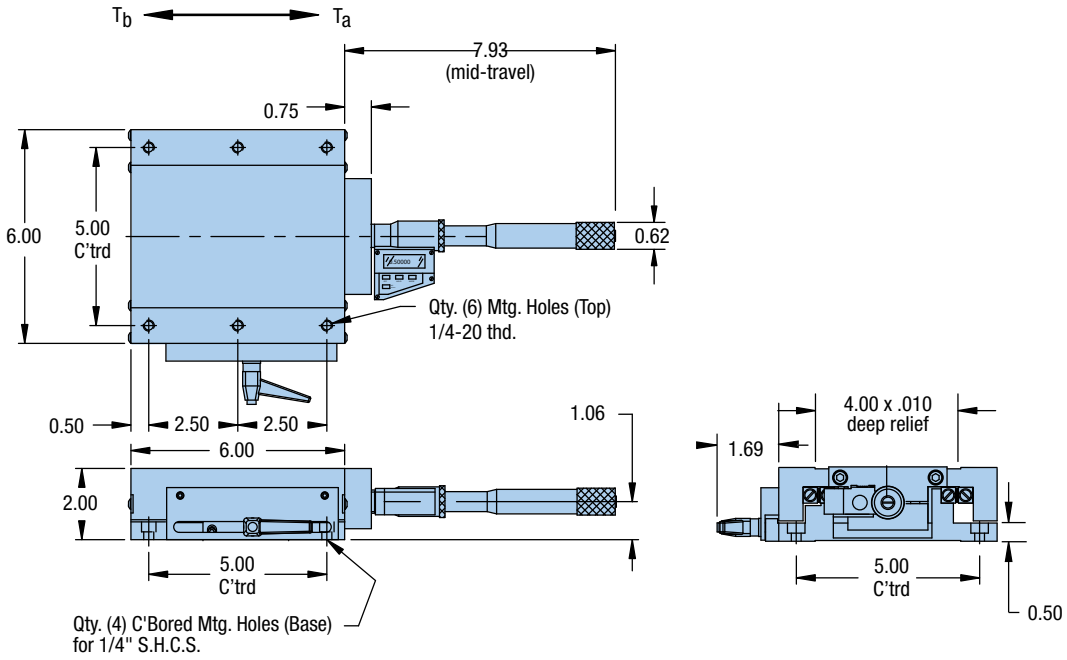
CR4900-DM Series

Specifications	
Travel:	2.0 in
Size:	
Width	6.00 in
Length (mid-travel)	13.93 in
Height	2.00 in
Load:	
Normal	423 lbs
Thrust T_a	50 lbs
Thrust – T_b	5 lbs
Moment – Yaw, Pitch, Roll	See page 114
Straight line accuracy:	0.00008 in/in of travel
Micrometer graduations:	
Large thimble	0.00005 in or 0,001 mm
Weight:	8 lbs/axis
Z-Axis bracket options: (See page 124-127)	4990-04
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

Digital micrometer positioner shown with optional position lock. To order the optional lock, add -L to the model number selected from the chart below.

Consult factory for critical dimension concerns.

Dimensions Inches



	Model
Imperial Mounting	CR4911-DM

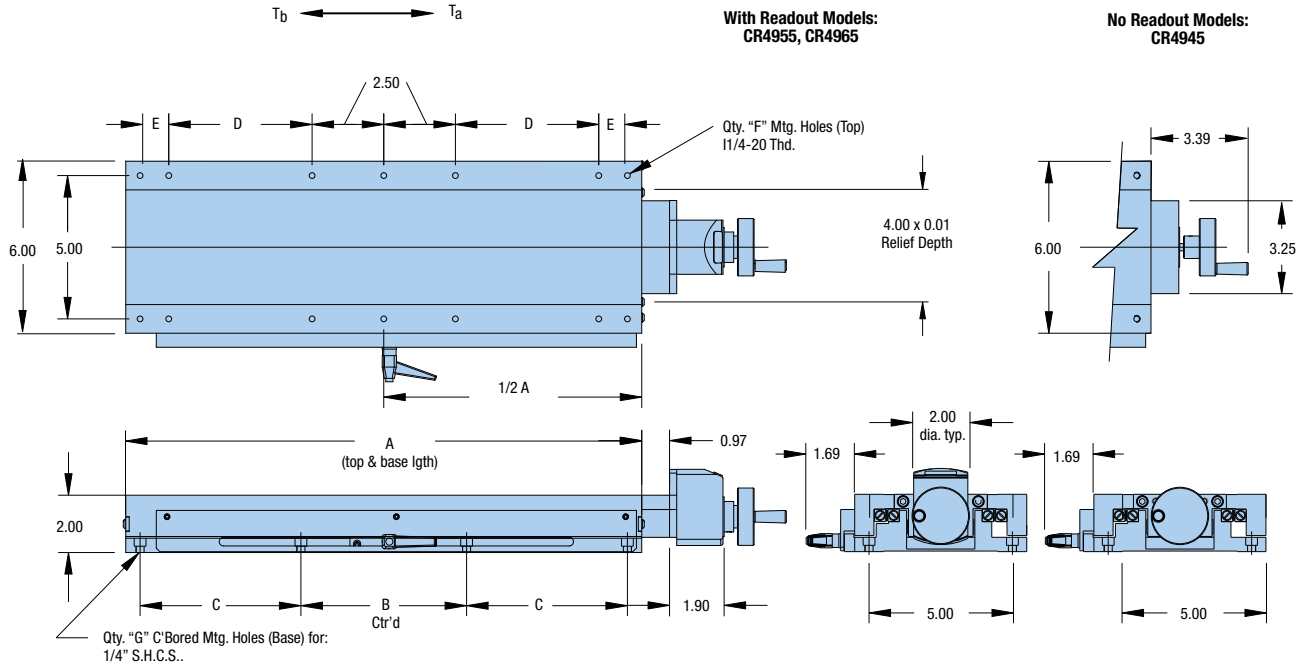
CR4900 Series (Leadscrew Drive)

Specifications	
Travel:	4.0 – 12.0 in
Size:	
Width	6.00 in
Length (mid-travel)	10.04 – 23.04 in
Height	2.00 in
Load:	
Normal	423 – 1733 lbs
Thrust T_a	30 lbs
Thrust – T_b	30 lbs
Moment – Yaw, Pitch, Roll	See page 114
Straight line accuracy:	0.00008 in/in of travel
Readout graduations:	0.001 in or 0,01 mm
Weight:	4 – 12 lbs/axis
Z-Axis bracket options: (See page 124-127)	4990-04/-12
Construction:	Aluminum top and base/ steel crossed roller bearings
Mounting surface:	Precision machined
Finish:	Black anodize

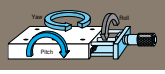
Leadscrew drive positioner with readout (left); positioner with no readout and optional position lock (right). To order the optional lock, add -L to the model number selected from the chart below.

Consult factory for critical dimension concerns.

Dimensions Inches



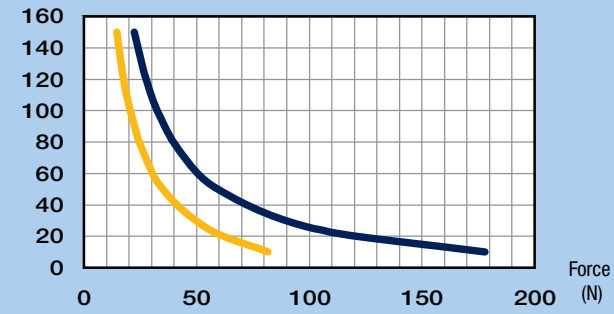
No Readout Model	Imperial Readout Model	Metric Readout Model	Travel	Load	Weight	Dimensions – In (mm) A	B	C	D	E	Qty F	Qty G
CR4945-04	CR4955-04	CR4965-04	4.0 in	423 lbs	4.0 lbs	6.00	5.00	—	—	—	6	4
CR4945-06	CR4955-06	CR4965-06	6.0 in	719 lbs	6.0 lbs	9.00	5.00	1.50	1.50	—	10	8
CR4945-08	CR4955-08	CR4965-08	8.0 in	1052 lbs	8.0 lbs	12.00	5.00	3.00	2.50	—	10	8
CR4945-10	CR4955-10	CR4965-10	10.0 in	1395 lbs	10.0 lbs	15.00	6.00	4.00	2.50	2.00	14	8
CR4945-12	CR4955-12	CR4965-12	12.0 in	1735 lbs	12.0 lbs	18.00	7.00	5.00	5.00	1.00	14	8



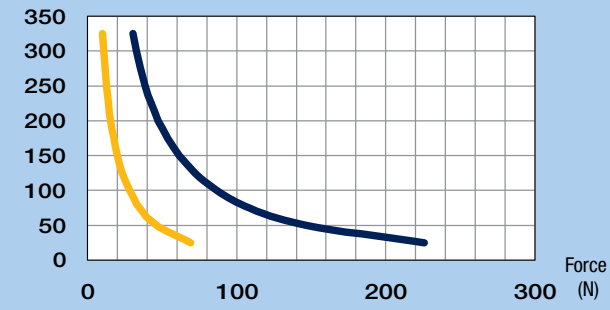
Yaw, Pitch, Roll

Yaw & Pitch | Roll

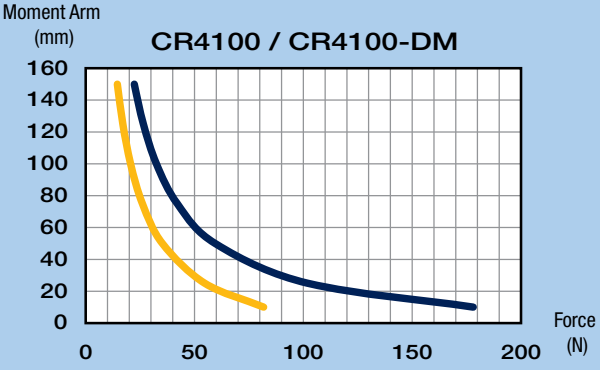
CR4000 / CR4000-DM



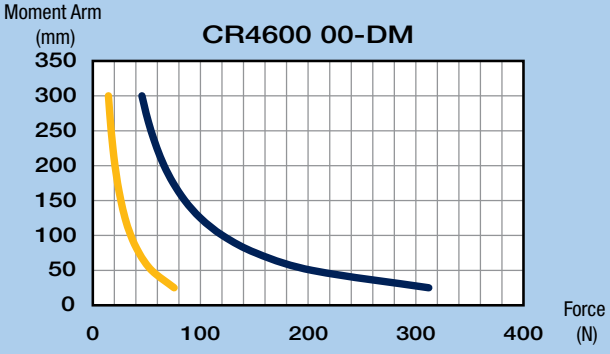
CR4500 / CR4500-DM



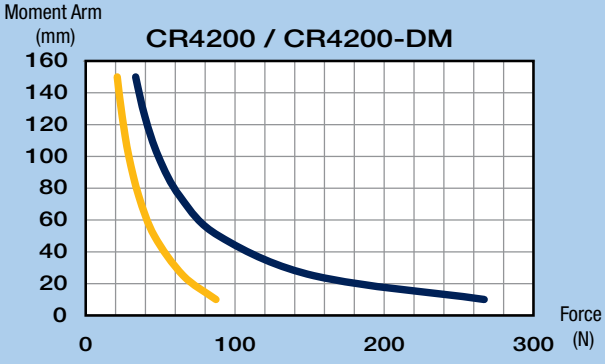
CR4100 / CR4100-DM



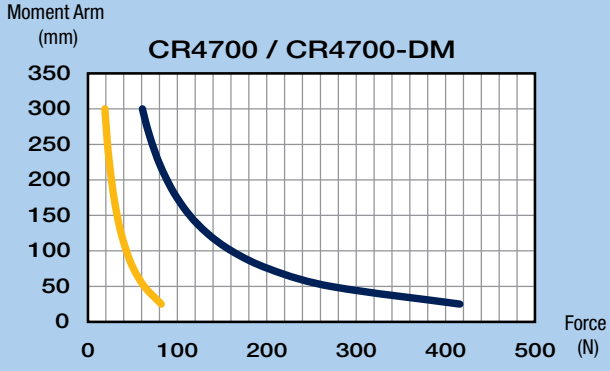
CR4600 00-DM



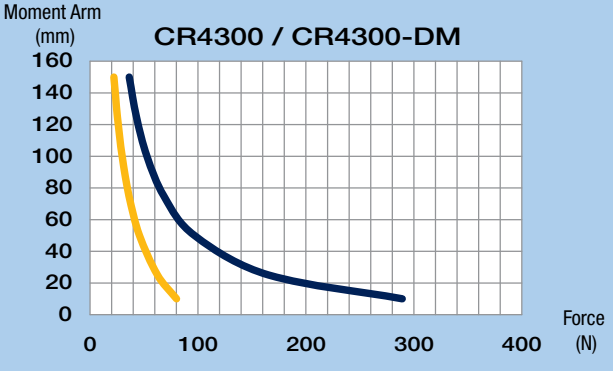
CR4200 / CR4200-DM



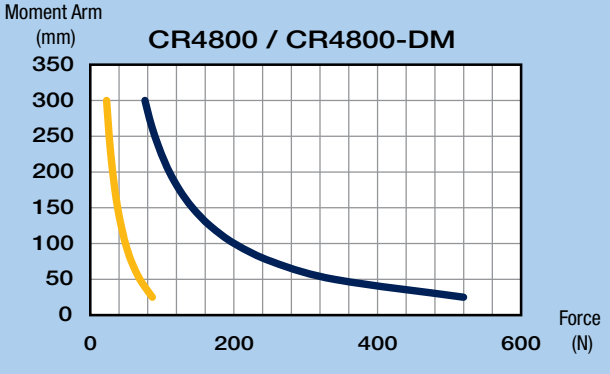
CR4700 / CR4700-DM



CR4300 / CR4300-DM

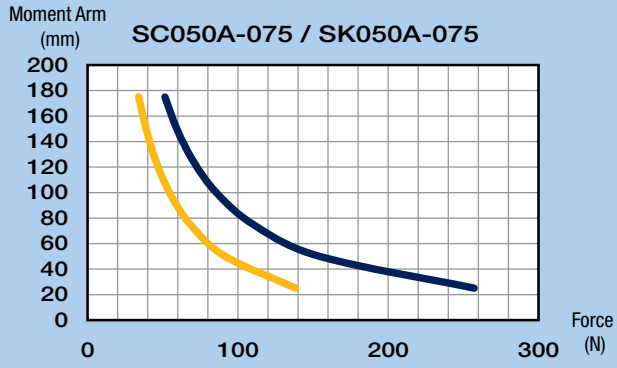


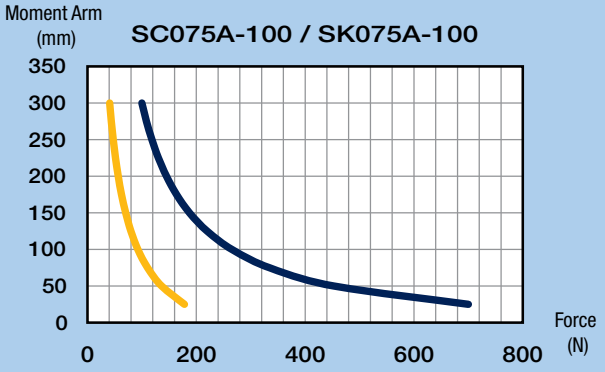
CR4800 / CR4800-DM

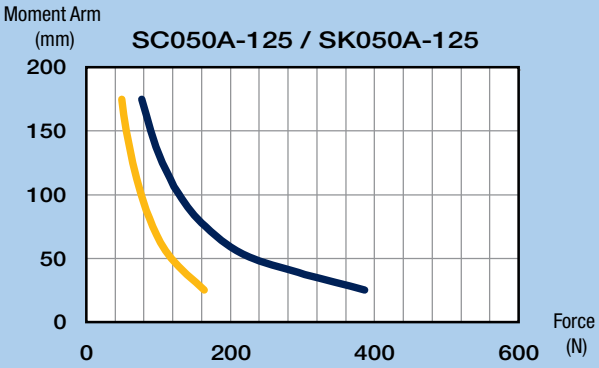


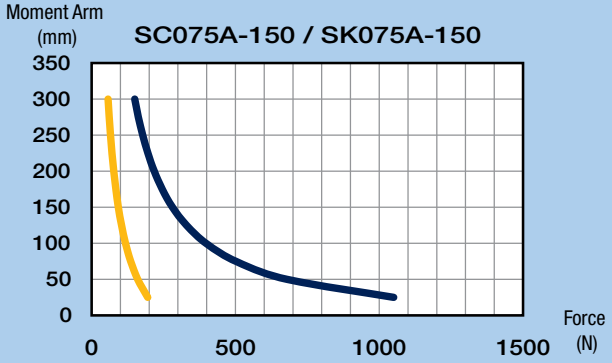
Yaw, Pitch, Roll

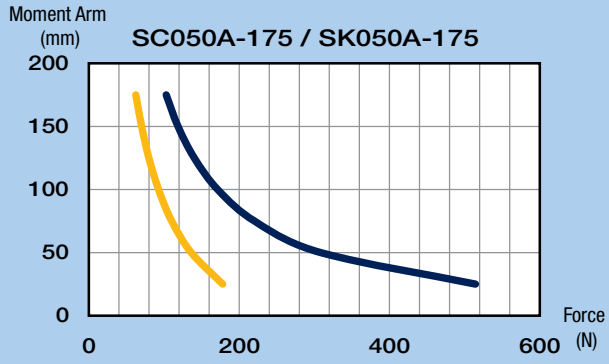
Yaw & Pitch Roll

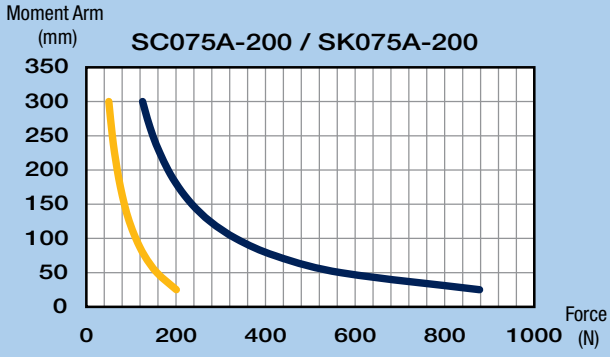






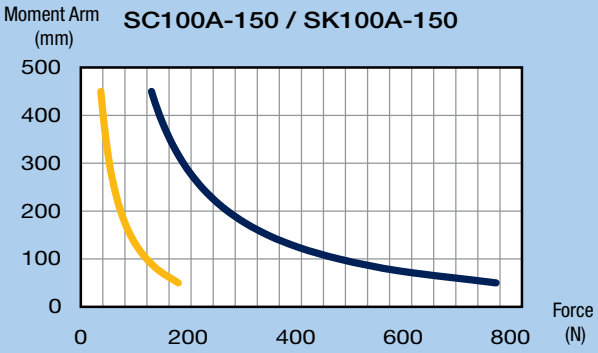


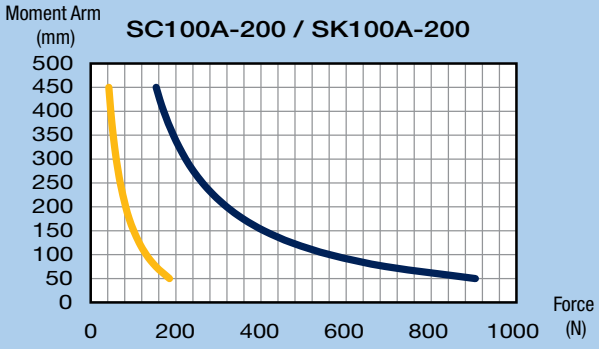


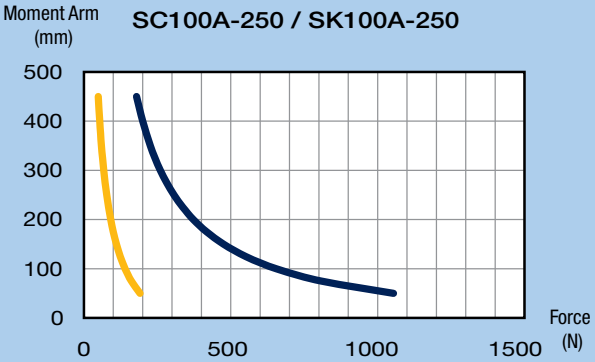


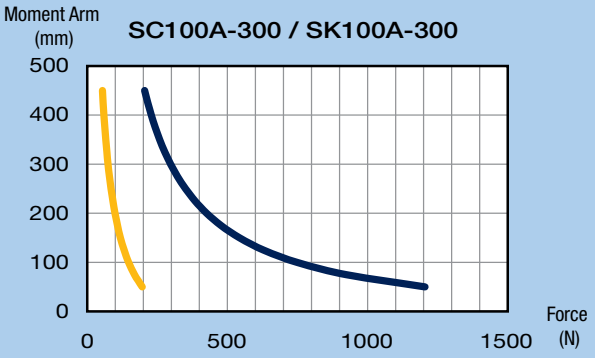
Yaw, Pitch, Roll

Yaw & Pitch Roll







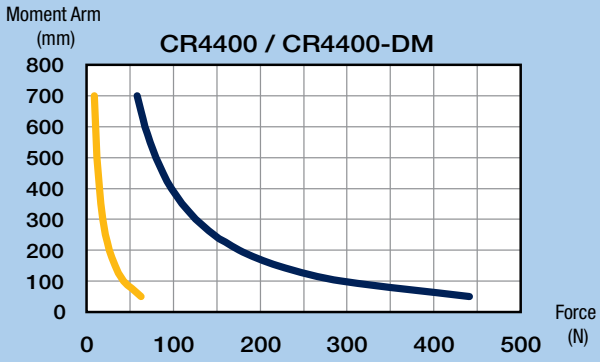


Crossed Roller Positioner Performance

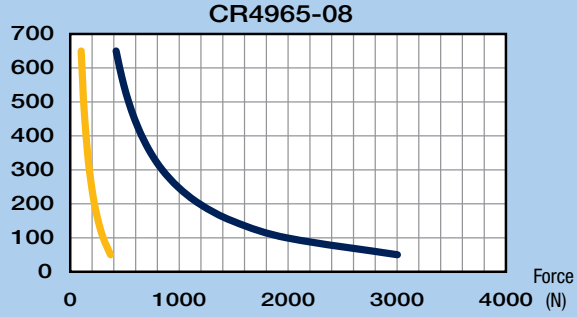
Yaw, Pitch, Roll

Yaw & Pitch Roll

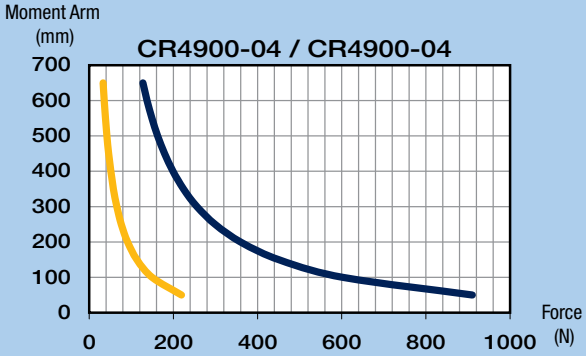
CR4400 / CR4400-DM



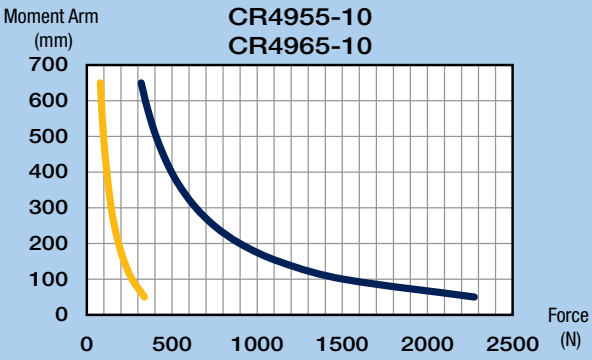
CR4945-08
CR4955-08
CR4965-08



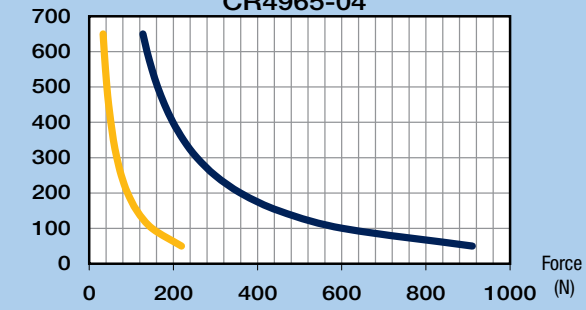
CR4900-04 / CR4900-04



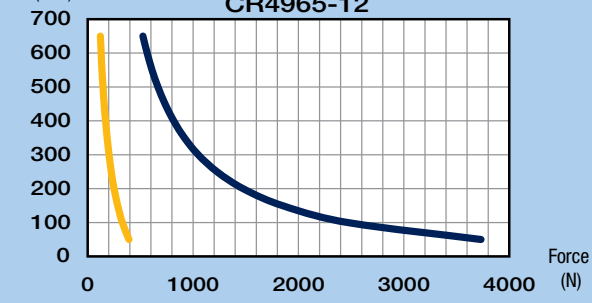
CR4945-10
CR4955-10
CR4965-10



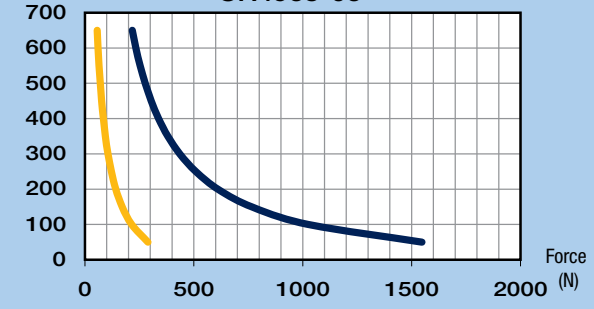
CR4945-04
CR4955-04
CR4965-04



CR4945-12
CR4955-12
CR4965-12



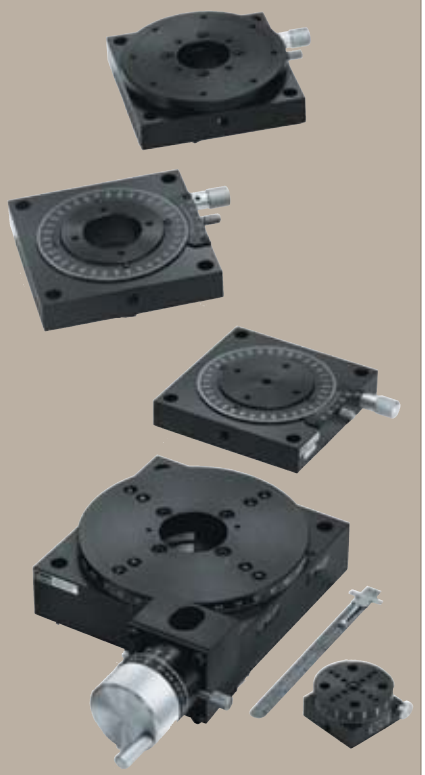
CR4945-06
CR4955-06
CR4965-06



CR4900-10

Moment Arm (mm)

Rotary Positioners
tangent arm and worm gear drive



Parker Daedal rotary stages are designed to produce precision rotary motion. The basic components in these stages are a base, main bearing, drive mechanism and top (load platform). The base houses the main bearing and drive mechanism and is design to be mounted to a stationary surface. The main bearings provide low friction contact between the base and top. The drive mechanisms used are either tangent arms or worm gears. The table top provides a mounting surface for mounting payloads.

Contents

Rotary Positioning Stages

- Precision quality
- Budget friendly
- Largest selection
- Rotary-linear configurations
- No maintenance
- Vacuum preparation and custom options

Rotary Positioner Principles

Parker Daedal rotary stages and tables produce controlled rotation and angular positioning.

Tangent Arm Drive

With some stages (models 2520, 2525, 4575), the drive mechanism is a tangent arm drive. Angular rotation, with this system, is controlled by three control knobs. The release knob disengages the shaft from the drive, freeing the table to be rotated by hand to a desired location. The release knob is then tightened to re-engage the drive mechanism and transfer control to the adjustment knob which, when rotated, produces precise angular positioning of the shaft and table top. The locking knob can then be used to positively lock the table at the desired setting.

Precision Worm Gear Drive

A precision worm gear drive is employed as the drive mechanism for the other Parker Daedal stages. A worm wheel (gear), which is attached to the table shaft, meshes with the worm drive, whose shaft extends out of the housing. Controlled rotation of the worm shaft creates precise angular rotation of the worm wheel and table shaft. The worm gear and shaft are matched sets and are preloaded to remove backlash. This type of drive provides high resolution (180:1) and continuous angular positioning over a full 360° range.

Standard Features

Parker Daedal has engineered all of its rotary positioners with emphasis on construction and detail. The resulting stages exhibit outstanding quality and proven, reliable performance. All models are manufactured on the very best automated equipment, skillfully assembled, and thoroughly inspected and tested. This enables units manufactured in production quantities to satisfy critical performance specifications. All Parker Daedal rotary positioning devices feature:

- Aluminum/steel construction
- Protective black anodize finish
- Low-friction rotary adjustment
- Precise/accurate movement
- Trouble-free operation

How to Order

Use the Selection Chart below to determine the appropriate model series. Refer to individual series pages for complete performance and mechanical specifications. To order, use the model number specific to the selected table.

Model Series	Table Diameter	Drive Mechanism	Normal Load	Mounting		Page
				Imperial	Metric	
2500 **M2500**	1.88 –2.62 in 47,7 – 66,5 mm	Tangent Arm	10 lb 4,5 kg	•	•	117
4575* **M4575***	2.38 in 60,5 mm	Tangent Arm	5 lbs 2,25 kg	•	•	118
10000-20000 **M10000-M20000**	2.75 – 4.75 in 69,8 – 120,6 mm	Worm Gear	50 lbs 22,0 kg	•	•	119
30000 **M30000**	5.00 – 12.00 in 127,0 – 305,0 mm	Worm Gear	25 – 200 lbs 11,5 – 90,0 kg	•	•	120-121

* Models 4575/M4575 are combination rotary and linear stages which also provide 0.50 in (12,7 mm) of linear travel.

Series 2500 rotary positioners offer low-friction rotary positioning, quick manual table top rotation, precise angular adjustment at any selected position, and positive locking. These miniature units have a preloaded angular contact ball bearing system which provides smooth, continuous rotary movement.

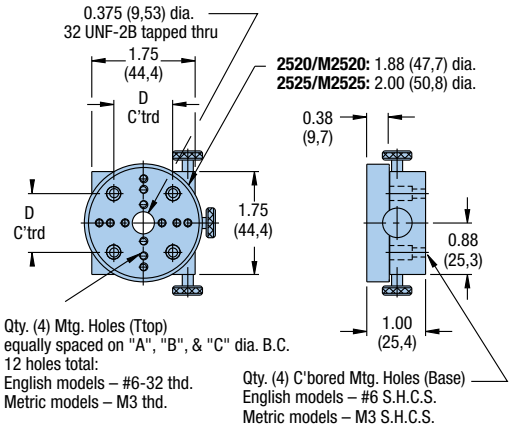
Models 2525/M2525 and 2535/M2535 include a dial and vernier for direct position readout (readable to six arc-minutes). These stages can be mounted in a horizontal or vertical position, and can be combined with compatible linear stages for linear-rotary applications.

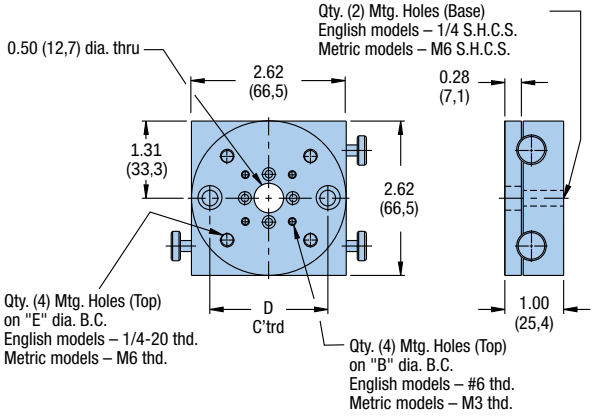
2500/M2500 Series

Specifications	Imperial Models	Metric Models
Load:		
Normal	10 lbs	4,5 kg
Moment	See page 122	See page 122
Range:	360° (free rotation) 10° (fine positioning)	360° (free rotation) 10° (fine positioning)
Weight:	1.0 – 1.8 lbs	0,5 – 0,8 kg
Vernier Resolution:	12 arc-min	12 arc-min
Construction:	Aluminum top and base; steel tangent arm drive	Aluminum top and base; steel tangent arm drive
Mounting surface:	Precision machined	Precision machined
Finish:	Black anodize	Black anodize

Dimensions

Inches (mm)





Model		2520/M2520 2525/M2525 Diameter in (mm)	Vernier Readout	Aperture Diameter in (mm)	Weight lbs (kg)	2530/M2530 2535/M2535 Dimensions – in (mm) A	B	C	D	E
Imperial	2520	1.88	No	0.25	1.0	0.625	1.125	1.50	1.00	–
	2525	2.00	Yes	0.25	1.0	0.625	1.125	1.50	1.00	–
	2530	2.62	No	0.50	1.8	–	1.125	–	2.00	2.00
	2535	2.62	Yes	0.50	1.8	–	1.125	–	2.00	2.00
Metric	M2520	(47,7)	No	(6,3)	(0,5)	(15,0)	(25,0)	(35,0)	(25,0)	–
	M2525	(50,8)	Yes	(6,3)	(0,5)	(15,0)	(25,0)	(35,0)	(25,0)	–
	M2530	(66,5)	No	(12,7)	(0,8)	–	(25,0)	–	(50,0)	(50,0)
	M2535	(66,5)	Yes	(12,7)	(0,8)	–	(25,0)	–	(50,0)	(50,0)

Combination Linear/Rotary Positioner

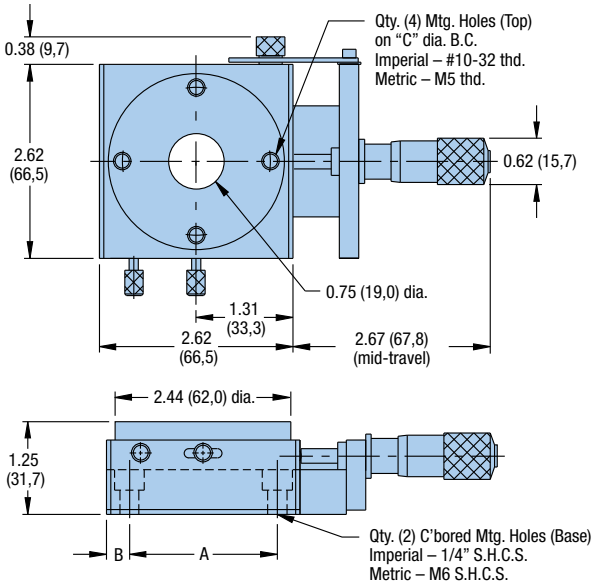
The model 4575 combines both linear and rotary motion into one compact unit. It is designed for applications where space restrictions do not allow stacking a linear stage and a rotary stage. The mounting surface is 2.38" diameter with a 0.75" diameter thru hole, with (4) #10-32 threaded mounting holes on 2.00" centers. Linear travel is provided by a fine resolution micrometer. Rotary travel is provided with both a coarse and a fine adjustment. This feature allows quick rotation over a continuous 360° range, plus precise angular adjustment at any selected position.

4575/M4575 Series

Specifications	Imperial Models	Metric Models
Load:		
Normal	15 lbs	2,25 kg
Moment	See page 122	See page 122
Range:		
Rotary	360° (free rotation) 10° (fine positioning)	360° (free rotation) 10° (fine positioning)
Linear	0.50 in	12,7 mm
Straight line accuracy:	0.0001 in	2,5 µm
Micrometer graduations:	0.001 in	0,01 mm
Weight:	1.0 lb	0,5 kg
Construction:	Aluminum top and base; steel tangent arm drive	Aluminum top and base; steel tangent arm drive
Mounting surface:	Precision machined	Precision machined
Finish:	Black anodize	Black anodize

Dimensions

Inches (mm)



Model		Diameter in (mm)	Aperture Diameter in (mm)	Dimensions – in (mm) A	B	C
Imperial	**4575**	2.62	0.75	2.00	0.31	2.00
Metric	**M4575**	(66,5)	(19,0)	(50,0)	(8,3)	(50,0)

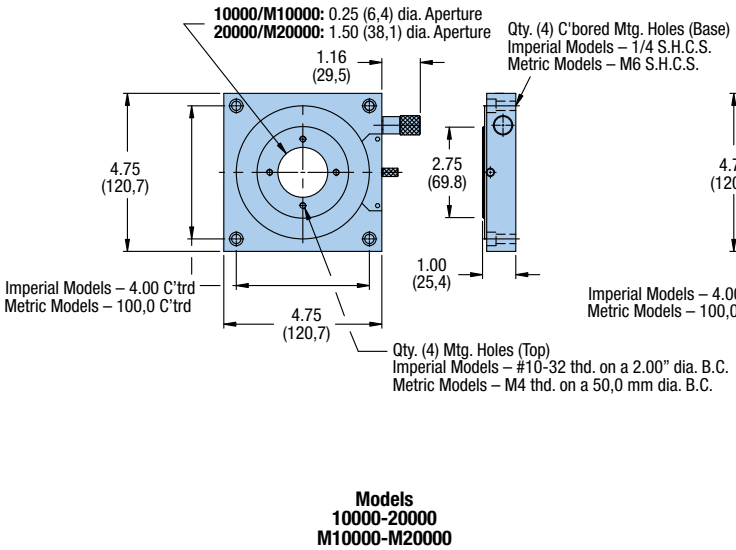
The 10000-20000 and M10000-M20000 Series rotary positioning stages provide smooth, continuous adjustment over a full 360° travel range. The drive mechanism features a worm gear drive. A position locking knob allows the stage to be positively locked in place. The 10000 and 20000 models offer a 2.75 inch (69,8 mm) diameter stage with a calibrated dial and vernier, readable to 6.00 arc minutes. The 10001 and 20001 models, which do not include the vernier readout, offer a larger 4.75 inch (120,6 mm) diameter mounting surface. These versatile low cost units can be combined with linear positioning stages having 4.00 inch (Imperial) or 100,0 mm (Metric) mounting hole centers for multi-axis polar set-ups.

10000-20000/M10000-M20000 Series

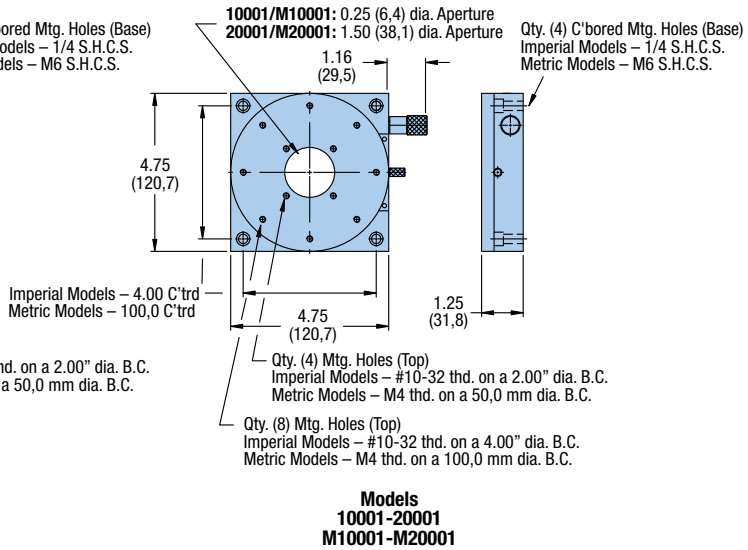
Specifications	Imperial Models				Metric Models			
	10000	10001	20000	20001	M10000	M10001	M20000	M20001
Table Diameter:	2.75 in	4.75 in	2.75 in	4.75 in	69,8 mm	120,7 mm	69,8 mm	120,7 mm
Vernier Resolution:	6 arc-min	–	6 arc-min	–	6 arc-min	–	6 arc-min	–
Aperture:	0.25	0.25	1.50	1.50	(6,3)	(6,3)	(38,1)	(38,1)
Weight:	2.0 lbs	2.4 lbs	2.0 lbs	2.4 lbs	0,9 kg	1,9 kg	0,9 kg	1,9 kg
Load:								
Normal	25 lbs				11,3 kg			
Moment	Not recommended for moment loads				Not recommended for moment loads			
Range:	360° (continuous)				360° (continuous)			
Drive Ratio:	120:1				120:1			
Construction:	Aluminum top and base; steel/bronze worm gear drive				Aluminum top and base; steel/bronze worm gear drive			
Mounting surface:	Precision machined				Precision machined			
Finish:	Black anodize				Black anodize			

Dimensions

Inches (mm)



Models
10000-20000
M10000-M20000



Models
10001-20001
M10001-M20001

30000/M30000 Series Specifications

Parker Daedal rotary indexing tables provide accurate rotational positioning with a heavy load-carrying capability. Tables feature a crossed roller bearing system which is stiffly pre-loaded to produce precise rotation of the table top. The drive mechanism is a precision worm gear drive which provides precise rotational positioning.

An angular readout—graduated in degrees—is provided around the circumference of the table top, while a finer position readout dial, found on the control knob, reads directly in 0.01° increments, with the vernier providing even higher (0.002°) resolution. A thumbscrew lock is included to lock the table at the desired setting.

For customer convenience, threaded mounting holes with locking threaded inserts are provided as well as a clearance hole through the center of the table to allow easy access from below.

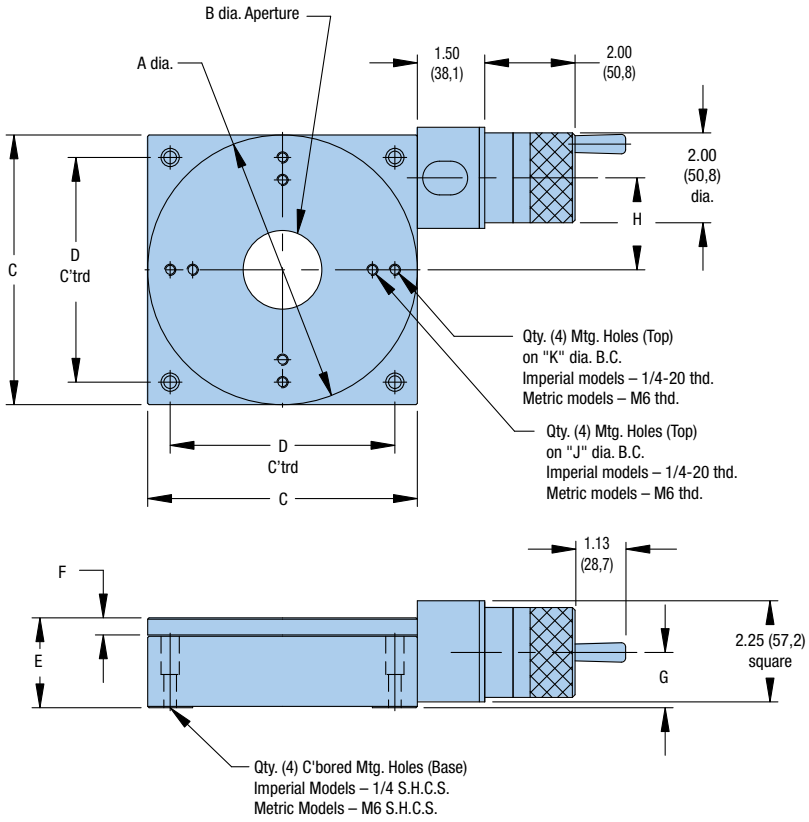
If desired, the table top can easily be removed to permit custom modification. These units can be mounted in any orientation and are compatible with Parker Daedal linear tables.

30000/M30000 Series

Specifications	Imperial Models	Metric Models
Load:		
Normal	25 – 200 lbs	11,5 – 90 kg
Moment	See page 122	See page 122
Concentricity:		
Standard	0.005 in	127,0 µm
Precision	0.001 in	25,4 µm
Runout:		
Standard	0.003 in	75 µm
Precision	0.001 in	25 µm
Range:	360° (continuous)	360° (continuous)
Weight:	6.0 – 31.0 lbs	2,7– 14,1 kg
Vernier Resolution:	0.12 arc-min	0.12 arc-min
Construction:	Aluminum top and base; steel/bronze worm gear drive	Aluminum top and base; steel/bronze worm gear drive
Mounting surface:	Precision machined	Precision machined
Finish:	Black anodize	Black anodize

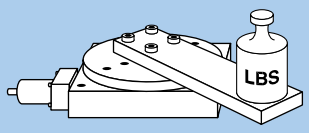
	Model		Table Diameter in (mm)	Normal Load lbs (kg)	Output Torque in-lb (Nm)	Weight lbs (kg)
	Standard	**Precision**				
Imperial	**30005-S**	**30005-P**	5.00	25	25	6.0
	30006-S	**30006-P**	6.00	150	40	8.0
	30008-S	**30008-P**	8.00	75	40	15.0
	30010-S	**30010-P**	10.00	200	190	27.0
	30012-S	**30012-P**	12.00	200	190	31.0
Metric	**M30005-S**	**M30005-P**	(127,0)	(11,5)	(2,8)	(2,7)
	M30006-S	**M30006-P**	(152,4)	(68,0)	(4,5)	(3,6)
	M30008-S	**M30008-P**	(203,2)	(34,0)	(4,5)	(6,8)
	M30010-S	**M30010-P**	(254,0)	(90,0)	(21,5)	(12,2)
	M30012-S	**M30012-P**	(304,8)	(90,0)	(21,5)	(14,1)

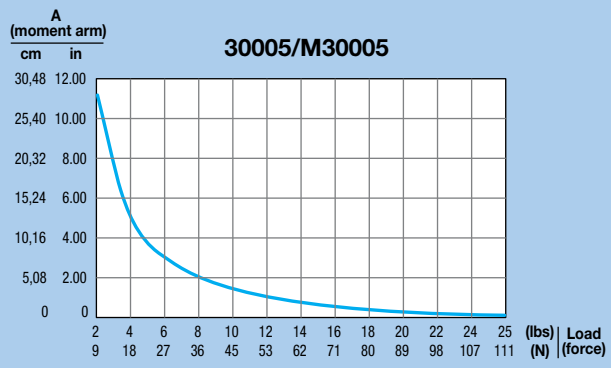
Dimensions Inches (mm)

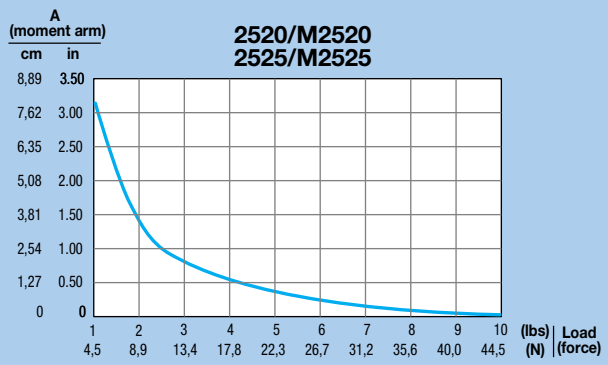


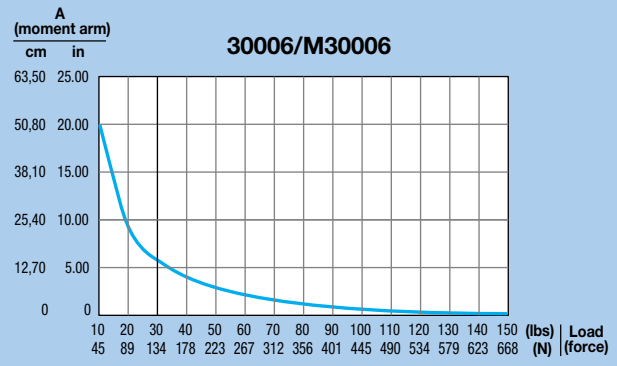
	Model	Dimensions – in (mm)									
		A	B	C	D	E	F	G	H	J	K
Imperial	30005-S/P	5.00	1.00	5.00	4.00	1.82	0.38	1.13	1.67	3.00	4.00
	30006-S/P	6.00	1.75	6.00	5.00	2.00	0.38	1.23	2.04	4.00	5.00
	30008-S/P	8.00	1.75	8.00	6.00	2.50	0.50	1.57	2.04	4.00	6.00
	30010-S/P	10.00	2.00	10.00	9.00	3.00	0.75	1.81	3.03	6.00	8.00
	30012-S/P	12.00	2.00	10.00	9.00	3.00	0.75	1.81	3.03	8.00	10.00
Metric	M30005-S/P	(127,0)	(25,4)	(127,0)	(100,0)	(46,2)	(9,7)	(28,7)	(42,4)	(75,0)	(100,0)
	M30006-S/P	(152,4)	(44,5)	(152,4)	(125,0)	(50,8)	(9,7)	(31,2)	(51,8)	(100,0)	(125,0)
	M30008-S/P	(203,2)	(44,5)	(203,2)	(175,0)	(63,5)	(12,7)	(39,9)	(51,8)	(100,0)	(175,0)
	M30010-S/P	(254,0)	(50,8)	(254,0)	(225,0)	(76,2)	(19,1)	(46,0)	(77,0)	(150,0)	(200,0)
	M30012-S/P	(304,8)	(50,8)	(254,0)	(225,0)	(76,2)	(19,1)	(46,0)	(77,0)	(200,0)	(250,0)

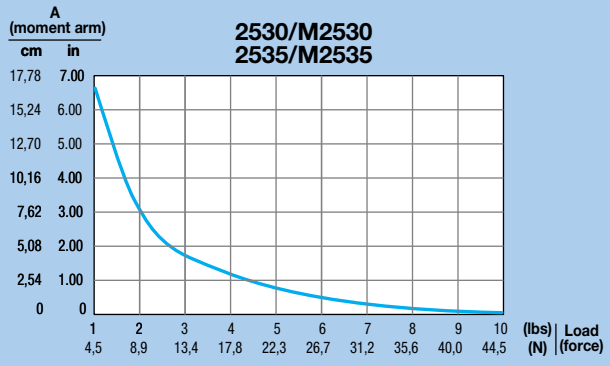
Moment Load

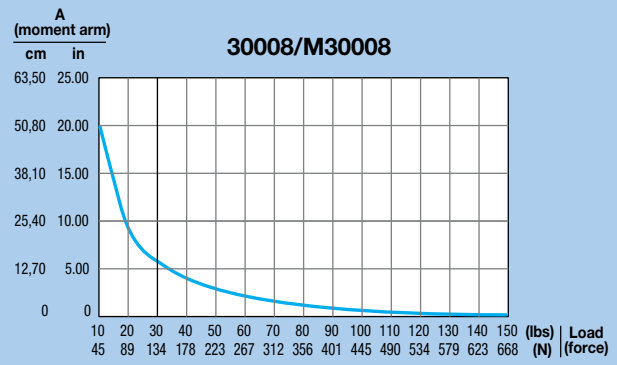

LBS

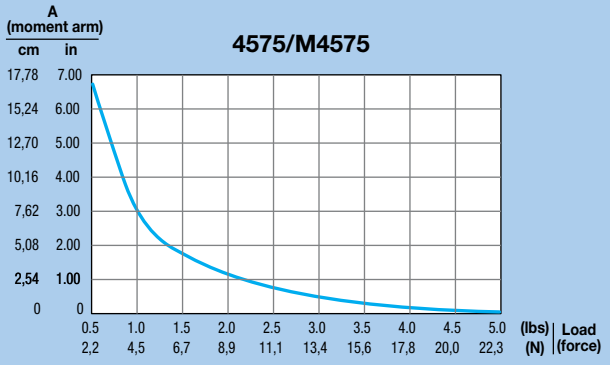

A (moment arm)
cm in
30005/M30005
30,48 12.00
25,40 10.00
20,32 8.00
15,24 6.00
10,16 4.00
5,08 2.00
0 0
2 4 6 8 10 12 14 16 18 20 22 24 25 (lbs)
9 18 27 36 45 53 62 71 80 89 98 107 111 (N)
Load (force)

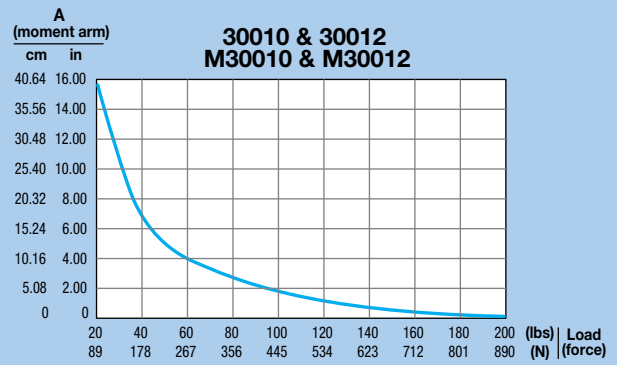

A (moment arm)
cm in
2520/M2520
2525/M2525
8,89 3.50
7,62 3.00
6,35 2.50
5,08 2.00
3,81 1.50
2,54 1.00
1,27 0.50
0 0
1 2 3 4 5 6 7 8 9 10 (lbs)
4,5 8,9 13,4 17,8 22,3 26,7 31,2 35,6 40,0 44,5 (N)
Load (force)


A (moment arm)
cm in
30006/M30006
63,50 25.00
50,80 20.00
38,10 15.00
25,40 10.00
12,70 5.00
0 0
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 (lbs)
45 89 134 178 223 267 312 356 401 445 490 534 579 623 668 (N)
Load (force)


A (moment arm)
cm in
2530/M2530
2535/M2535
17,78 7.00
15,24 6.00
12,70 5.00
10,16 4.00
7,62 3.00
5,08 2.00
2,54 1.00
0 0
1 2 3 4 5 6 7 8 9 10 (lbs)
4,5 8,9 13,4 17,8 22,3 26,7 31,2 35,6 40,0 44,5 (N)
Load (force)


A (moment arm)
cm in
30008/M30008
63,50 25.00
50,80 20.00
38,10 15.00
25,40 10.00
12,70 5.00
0 0
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 (lbs)
45 89 134 178 223 267 312 356 401 445 490 534 579 623 668 (N)
Load (force)


A (moment arm)
cm in
4575/M4575
17,78 7.00
15,24 6.00
12,70 5.00
10,16 4.00
7,62 3.00
5,08 2.00
2,54 1.00
0 0
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 (lbs)
2,2 4,5 6,7 8,9 11,1 13,4 15,6 17,8 20,0 22,3 (N)
Load (force)


A (moment arm)
cm in
30010 & 30012
M30010 & M30012
40.64 16.00
35.56 14.00
30.48 12.00
25.40 10.00
20.32 8.00
15.24 6.00
10.16 4.00
5.08 2.00
0 0
20 40 60 80 100 120 140 160 180 200 (lbs)
89 178 267 356 445 534 623 712 801 890 (N)
Load (force)

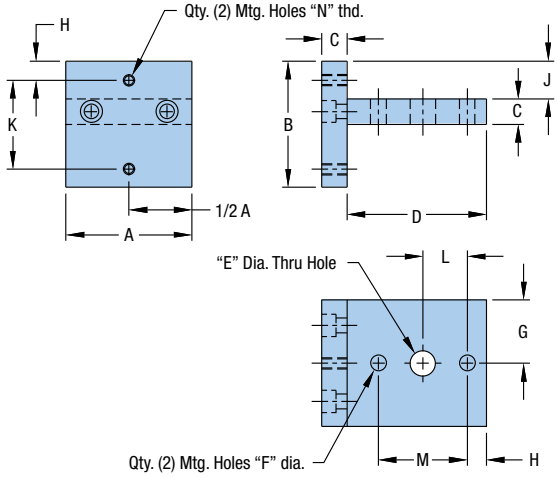
Accessories
for linear and rotary positioners

Parker Daedal offers a complete line of Z-axis brackets to combine ball bearing and cross roller stages into three axis positioning systems. We also offer drive mechanisms in an assortment of standard and digital micrometer heads, fine adjustment screws, and differential screws. Optical components including beam directors, optical mounts, mirror mounts and optical cells are also available.

Contents

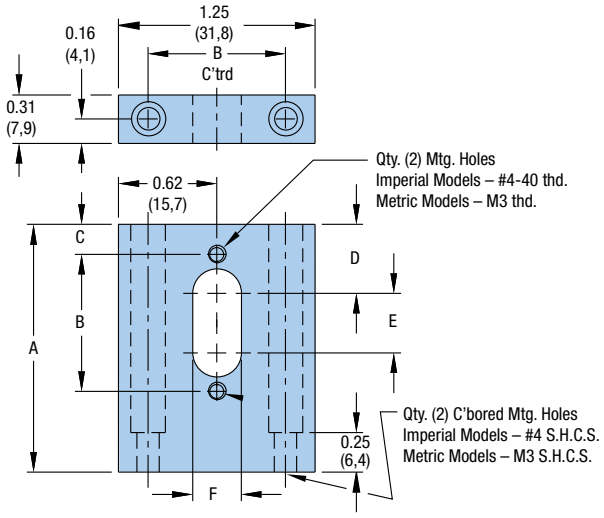
Z-Axis Brackets

3909, 3959, 4009, 4509
M3909, M3959, M4009, M4509



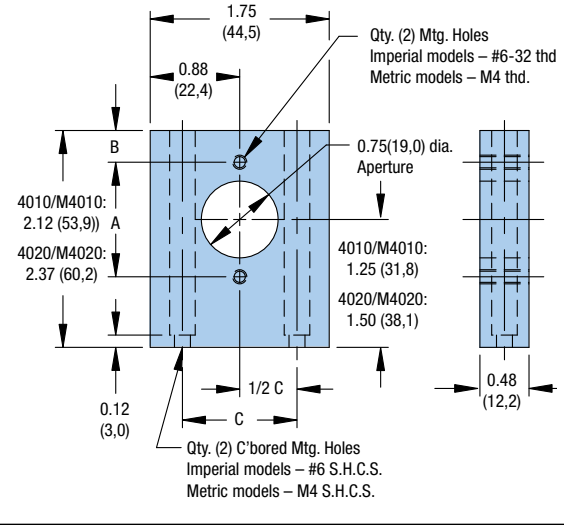
	Model	Dimensions – in (mm) A	B	C	D	E	F	G	H	J	K	L	M	Thd. N
Imperial	3909	1.25	1.25	0.25	1.38	0.25	0.156	0.62	0.19	0.38	0.88	0.44	0.88	#4-40
	3959	1.25	1.25	0.25	1.38	0.25	0.156	0.62	0.19	0.04	0.88	0.44	0.88	#4-40
	4009	1.75	1.69	0.25	1.88	—	0.156	0.88	0.31	0.63	1.12	—	1.12	#6-32
	4509	2.44	2.62	0.38	2.75	—	0.218	1.22	0.31	0.93	2.00	—	2.00	#10-32
Metric	M3909	(31,8)	(31,8)	(6,4)	(35,1)	(6,4)	(4,0)	(15,7)	(5,9)	(9,7)	(20,0)	(10,0)	(20,0)	M3
	M3959	(31,8)	(31,8)	(6,4)	(35,1)	(6,4)	(4,0)	(15,7)	(5,9)	(1,0)	(20,0)	(10,0)	(20,0)	M3
	M4009	(44,5)	(42,9)	(6,4)	(47,8)	—	(4,8)	(22,4)	(7,3)	(16,0)	(30,0)	—	(30,0)	M4
	M4509	(62,0)	(66,5)	(9,7)	(69,9)	—	(7,3)	(31,0)	(8,4)	(23,6)	(50,0)	—	(50,0)	M6

3910, 3960
M3910, M3960



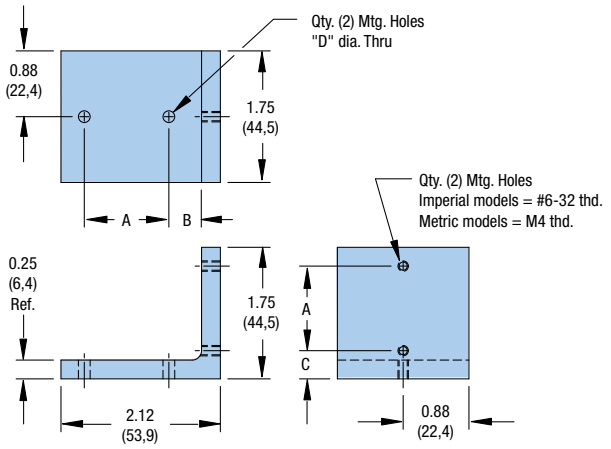
	Model	Dimensions – in (mm) A	B	C	D	E	F
Imperial	3910	1.58	0.88	0.19	0.44	0.38	0.31
	3960	2.33					
Metric	M3910	(40,1)	(20,0)	(5,9)	(12,3)	(7,1)	(6,4)
	M3960	(59,2)					

4010, 4020
M4010, M4020



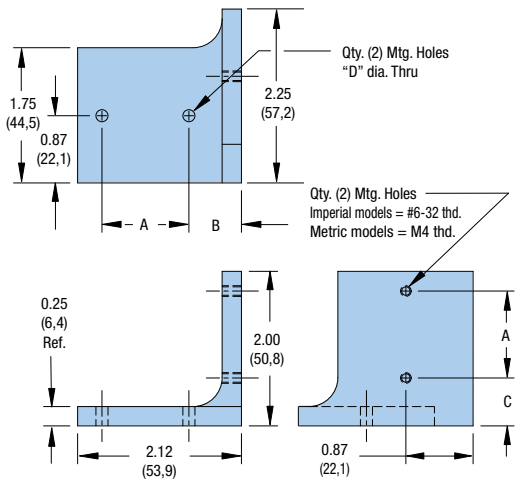
	Model	Dimensions – in (mm) A	B	C
Imperial	4010	1.12	0.31	1.12
Metric	M4010	(30,0)	(7,1)	(30,0)

4059
M4059



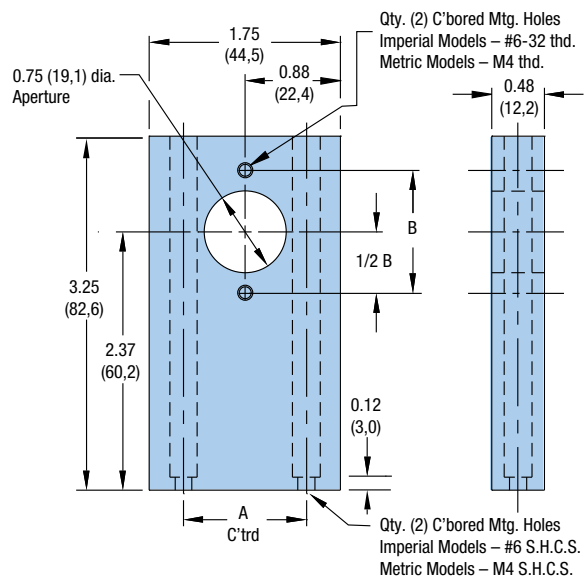
	Model	Dimensions – in (mm) A	B	C	D
Imperial	**4059**	1.12	0.68	0.38	0.16
Metric	**M4059**	(30,0)	(16,8)	(8,8)	(4,8)

4059A
M4059A
For 1.00 inch (25,0 mm) Travel Micrometer Option



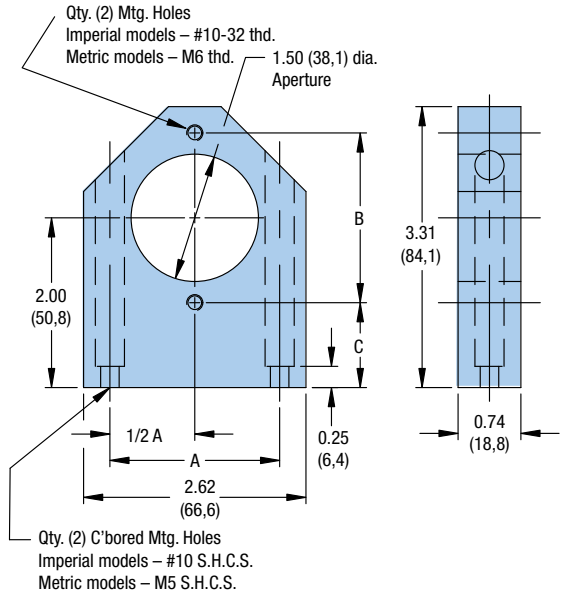
	Model	Dimensions – in (mm) A	B	C	D
Imperial	**4059A**	1.12	0.68	0.62	0.16
Metric	**M4059A**	(30,0)	(16,8)	(15,2)	(4,8)

4060
M4060



	Model	Dimensions – in (mm) A	B
Imperial	**4060**	1.13	1.13
Metric	**M4060**	(30,0)	(30,0)

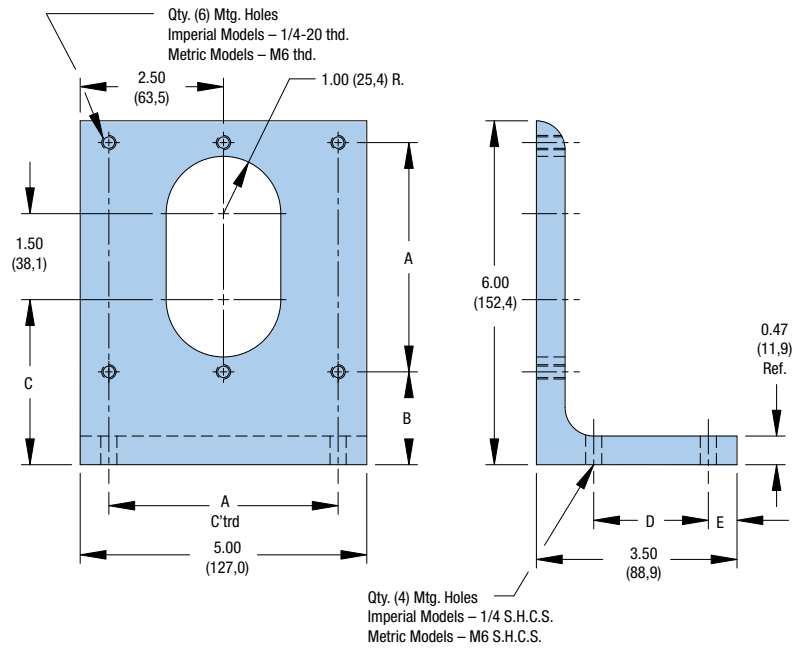
4510
M4510



	Model	Dimensions – in (mm) A	B	C
Imperial	**4510**	2.00	2.00	1.00
Metric	**M4510**	(50,0)	(50,0)	(25,8)

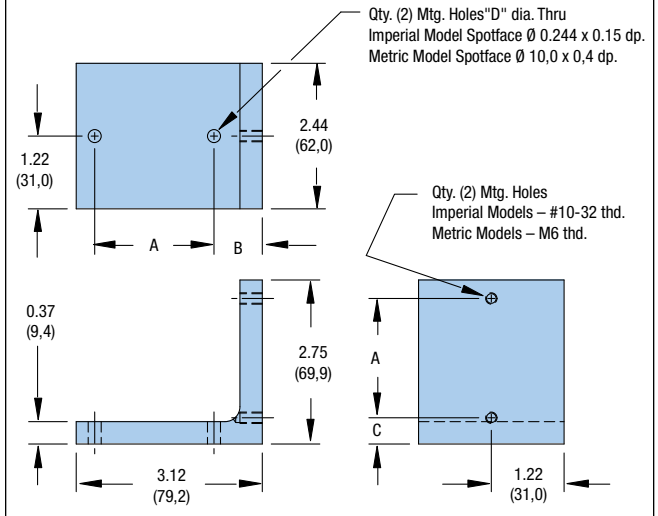
Z-Axis Brackets

4499
M4499



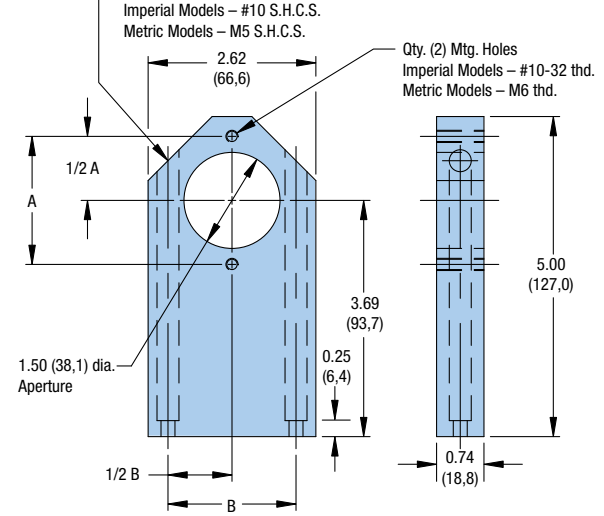
		Dimensions – in (mm)				
	Model	A	B	C	D	E
Imperial	4499	4.00	1.62	2.88	2.00	0.50
Metric	M4499	(100,0)	(40,5)	(71,4)	(50,0)	(13,1)

4559
M4559



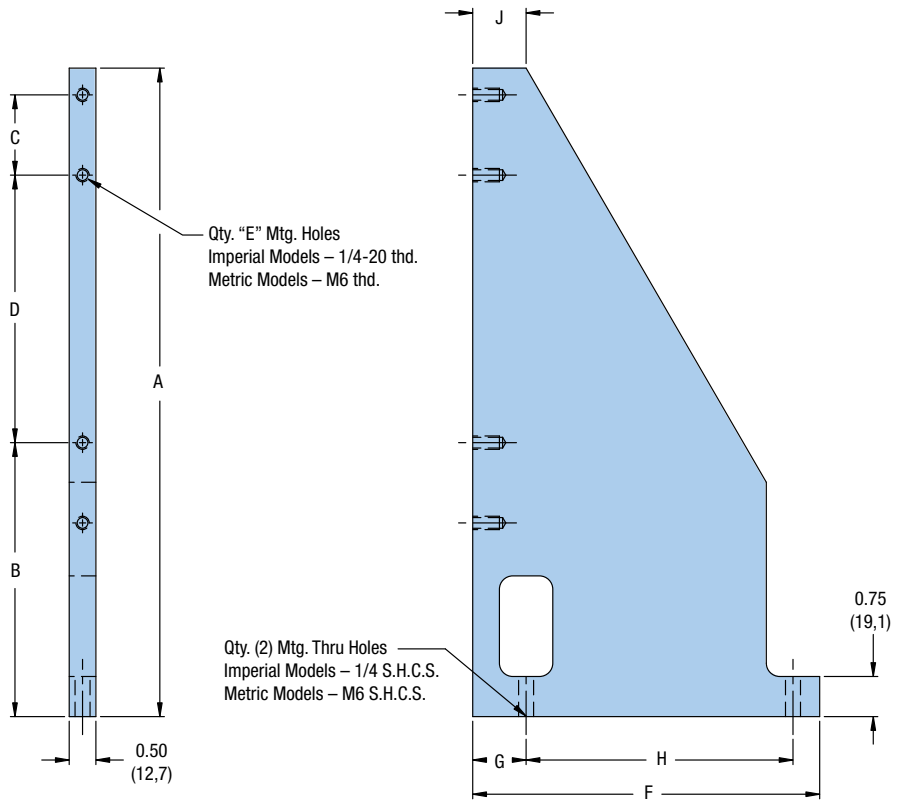
		Dimensions – in (mm)			
	Model	A	B	C	D
Imperial	4559	2.00	0.81	0.44	0.22
Metric	M4559	(50,0)	(20,9)	(11,5)	(5,5)

4560
M4560



		Dimensions – in (mm)	
	Model	A	B
Imperial	4560	2.00	2.00
Metric	M4560	(50,0)	(50,0)

4990-02 – 4990-12
M4990-02 – M4990-12



	Dimensions – in (mm)								
	Model	A	B	C	D	E	F	G	H	J
Imperial	**4990-02**	6.00	1.50	–	4.00	2	5.50	1.00	4.00	1.00
	4990-04	8.12	2.62	–	5.00	2	6.50	1.00	5.00	1.00
	4990-06	12.12	5.12	1.5	5.00	4	6.50	1.00	5.00	1.00
	4990-08	17.12	8.62	3.0	5.00	4	6.75	1.25	5.00	1.50
	4990-10	20.50	10.00	4.0	6.00	4	6.75	1.25	5.00	1.50
	4990-12	24.12	11.62	5.0	7.00	4	6.50	1.00	5.00	1.00
Metric	**M4990-02**	(152,4)	(38,9)	–	(100,0)	2	(139,7)	(26,2)	(100,0)	(25,4)
	M4990-04	(206,2)	(67,6)	–	(125,0)	2	(165,1)	(26,4)	(125,0)	(25,4)
	M4990-06	(307,8)	(131,2)	(37,5)	(125,0)	4	(165,1)	(26,4)	(125,0)	(25,4)
	M4990-08	(434,8)	(220,0)	(75,0)	(125,0)	4	(171,5)	(32,8)	(125,0)	(38,1)
	M4990-10	(520,7)	(255,2)	(100,0)	(150,0)	4	(171,5)	(32,8)	(125,0)	(38,1)
	M4990-12	(612,6)	(296,6)	(125,0)	(175,0)	4	(171,5)	(32,8)	(125,0)	(38,1)

9510-9530 Series Micrometer Heads

Parker Daedal micrometer heads are recommended for any application requiring micrometer accuracy in settings and adjustment. These units feature a hardened and ground spindle, easy-to-read graduations, and an attractive non-glare satin chrome finish.

9511E
9511M

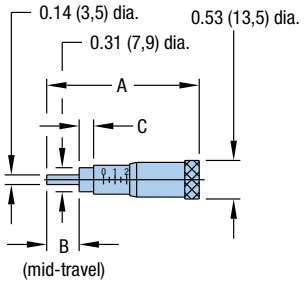


Figure A
Mini Thimble MIcrometer Head

9512E, 9524E, 9526E
9512M, 9524M, 9526M

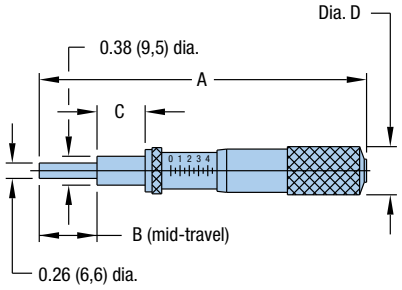


Figure B
Standard Thimble MIcrometer Head

9531E, 9532E
9531M, 9532M

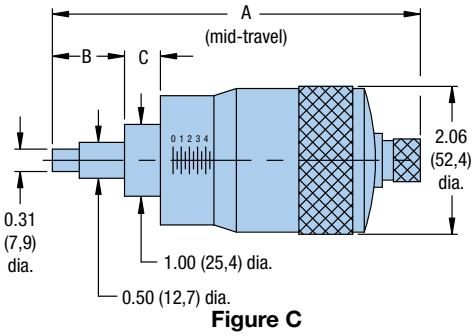


Figure C
Large Thimble MIcrometer Head

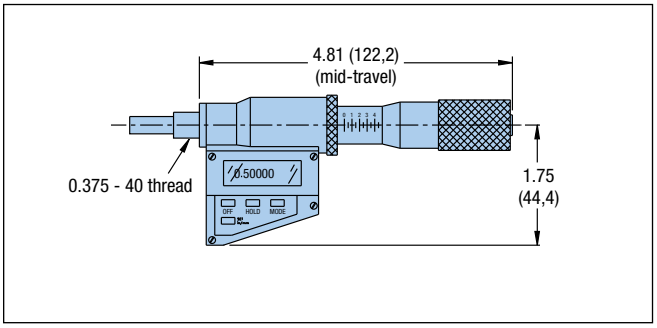
	Model Number	Figure	Travel in (mm)	Graduations in (mm)	Dimensions – in (mm) A	B	C	D
Imperial	9511E	A	0.50	0.001	2.03	0.50	0.187	—
	9512E	B	0.50	0.001	2.63	0.50	0.375	0.54
	9524E	B	1.00	0.001	4,23	0.75	0.625	0.73
	9526E	B	2.00	0.001	6.16	1.25	0.625	0.73
	9531E	C	1.00	0.0001	5.18	0.94	0.56	—
	9532E	C	2.00	0.0001	7.18	1.44	0.56	—
Metric	9511M	A	(13)	(0,01)	(51,6)	(13,0)	(4,7)	—
	9512M	B	(13)	(0,01)	(66,8)	(13,0)	(9,5)	(13,7)
	9524M	B	(25)	(0,01)	(107,4)	(19,0)	(15,9)	(18,5)
	9526M	B	(50)	(0,01)	(156,5)	(32,0)	(15,9)	(18,5)
	9531M	C	(25)	(0,002)	(131,6)	(23,9)	(14,2)	—
	9532M	C	(50)	(0,002)	(182,4)	(36,6)	(14,2)	—

9550 Series Digital Micrometer Heads

Model 9551

The 9551 precision electronic digital micrometer head provides an LCD readout to 0.00005 inch resolution. The micrometer features:

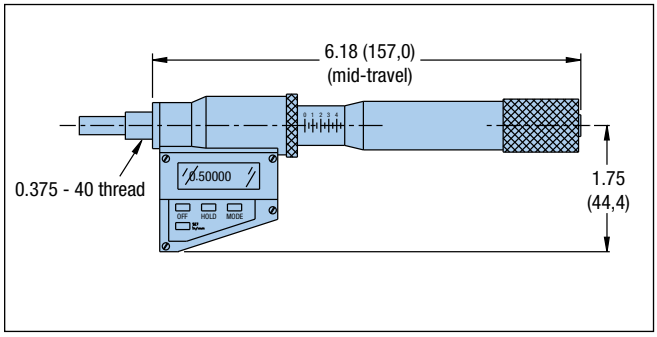
- Incremental and/or absolute positioning modes
- Zero set at any position, inch and millimeter readout (0.001 mm resolution), display hold, and automatic shutdown after two hours to conserve the integral battery
- 1.00 inch micrometer travel
- Battery powered for 500 hours of use



Model 9552

The 9552 precision electronic digital micrometer offers a 0 – 2 inch travel range with a 0.00005 inch resolution. Features include:

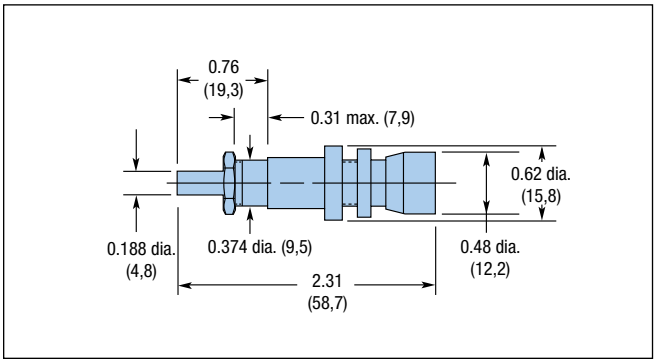
- 2 inch spindle
- Display face swivels for easy reading at various angles
- Non-rotating spindle
- Pre-set, zero, and inch/mm
- Carbide tipped measuring face
- Battery powered for 5,000 hours of use



9560 Series Differential Screws

Model 9560: 0.75 in Range

The 9560 differential screw offers two linear adjustment ranges in one unit: a coarse adjustment range of 0.31 in (8 mm) with a 48-pitch thread and a fine adjustment range of 0.078 in (2 mm) with a pitch equal to 336 threads per inch. The 9560 is interchangeable with 9511 – 9532 series micrometer heads.

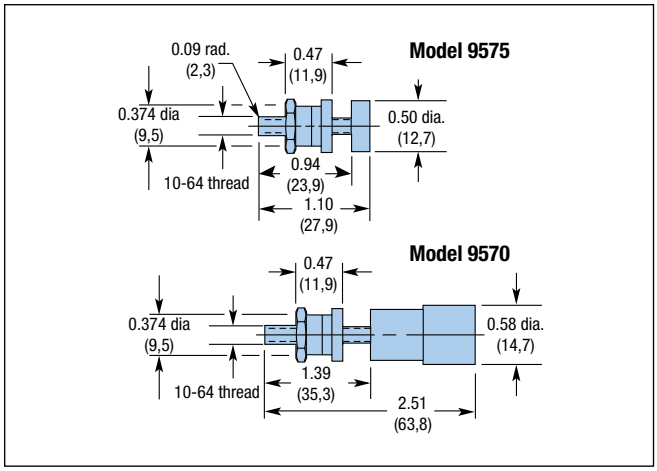


9570 Series Fine Adjsutment Screws

Model 9570: 0.75 in Range

Model 9575: 0.50 in Range

These steel adjustment screws feature a 64-pitch thread, making them ideal for applications where finer resolution is required, but positional readout is not. These screws are easily interchanged with the 9511 – 9532 series micrometer heads.



Optical Cell Mounts

Model 2350: 6.0” Diameter

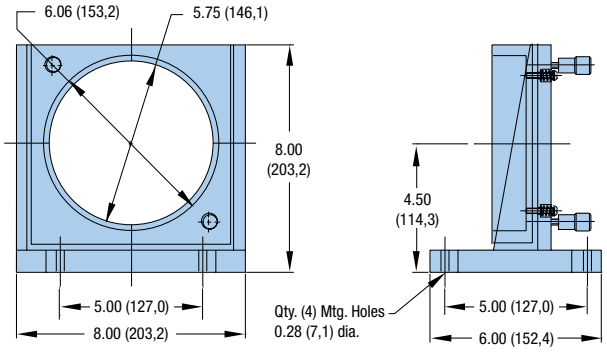
Model 2355: 7.0” Diameter

Model 2360: 8.0” Diameter

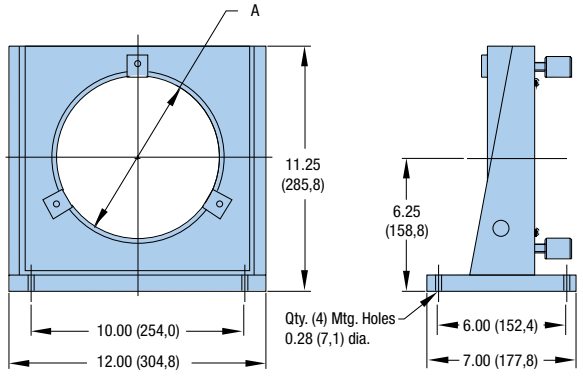
Model 2365: 9.0” Diameter

Parker Daedal optical mounts are highly stable, adjustable mounts for optics up to 9” in diameter and 1.25” thick. These mounts feature precise kinematic ball pivot adjustment on two axes, with orthogonal three-point suspension.

Model 2350



Models 2355, 2360, 2365



Specifications	2350	2355	2360	2365
Optic Size Opening – in (mm)				
Dimension “A” Dia. max.:	6.03 (153,1)	7.06 (179,3)	8.06 (204,7)	9.06 (230,1)
Thickness:	1.00 (25,4)	1.25 (31,75)	1.25 (31,7)	1.25 (31,7)
Optic Retention:	Threaded retainer	3 mounting clips	3 mounting clips	3 mounting clips
Range:	5°	5°	5°	5°
Resolution:	0.5 arc-sec	0.5 arc-sec	0.5 arc-sec	0.5 arc-sec
Adjustment:	2 – 64-pitch screws	3 – 32-pitch screws	3 – 32-pitch screws	3 – 32-pitch screws
Weight:	7.5 lb (16,5 kg)	20 lb (44 kg)	20 lb (44 kg)	20 lb (44 kg)
Construction:	Aluminum/stainless steel			
Finish:	Black anodize			

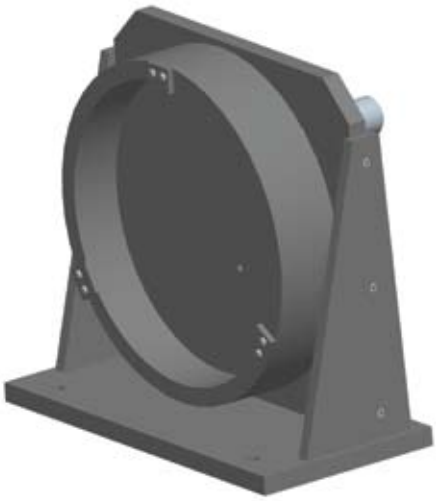
Optical Cell Mounts

Model 2370/2371: 10.0” Diameter

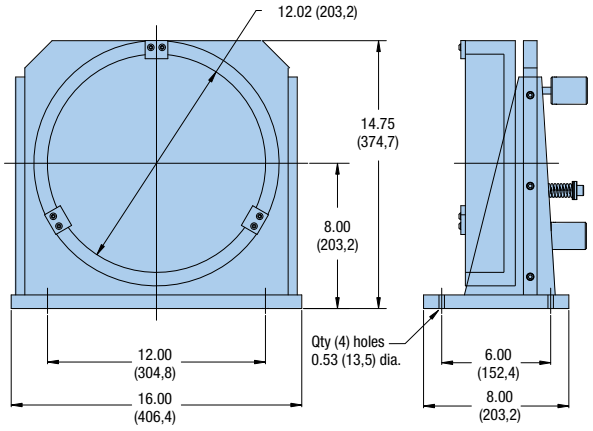
Model 2375/2376: 11.0” Diameter

Model 2380/2381: 12.0” Diameter

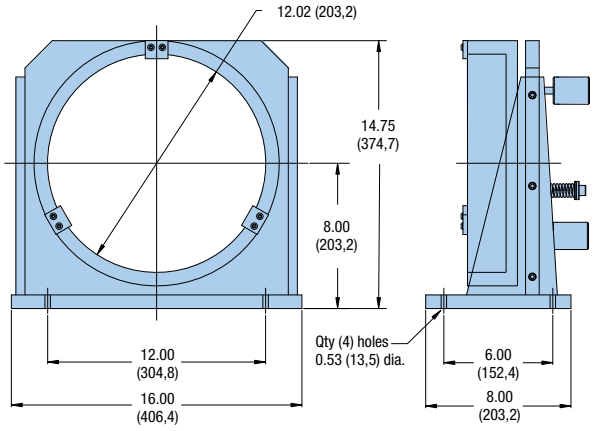
Parker Daedal optical mounts are highly stable, adjustable mounts for optics up to 12” in diameter and 2.0” thick. These mounts feature precise kinematic ball pivot adjustment on two axes, with orthogonal three-point suspension. Solid back models are designed to support reflective optics.



Models 2370, 2375, 2380



Models 2371, 2376, 2381



Specifications	Solid Back Models 2370	2375	2380	Aperture Models 2371	2376	2381
Optic Size Opening – in (mm) Dimension “A” Dia. max.:	10.02 (254,5)	11.02 (379,9)	12.02 (305,3)	10.06 (255,5)	11.06 (280,9)	12.06 (306,3)
Thickness:	2.00 (50,8)	2.00 (50,8)	2.00 (50,8)	2.00 (50,8	2.00 (50,8	2.00 (50,8
Optic Retention:	3 mounting clips			3 mounting clips		
Range:	7°			7°		
Resolution:	0.5 arc-sec			0.5 arc-sec		
Adjustment:	3 – 32-pitch screws			3 – 32-pitch screws		
Weight:	45 lb (99 kg)			41 lb (90 kg)		
Construction:	Aluminum/stainless steel			Aluminum/stainless steel		
Finish:	Black anodize			Black anodize		

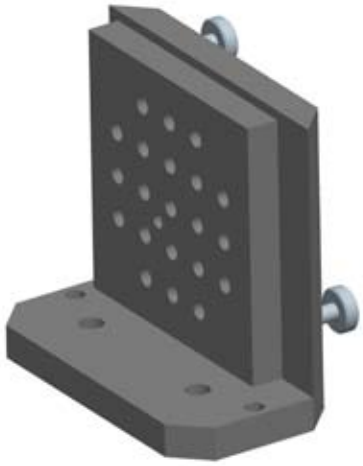
Mirror Mounts

Model 5000/5100: 3.0” Square Mounting Surface

Model 5300/5700: 4.5” Square Mounting Surface

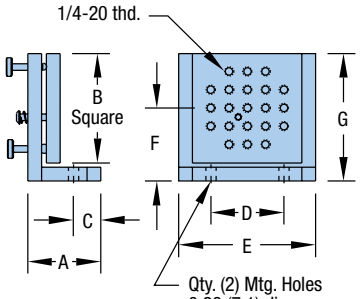
Model 5800/5900: 6.0” Square Mounting Surface

Parker Daedal mirror mounts are patterned with 1/4-20 holes on 0.5” or 1.0” centers to mount mirrors and other hardware. All models except the 5800 have two fine resolution 64-pitch adjustment screws to provide precise tilting of the mounting surface in two axes. The 5800 is equipped with three adjustment screws to provide precise tilting in two axes.

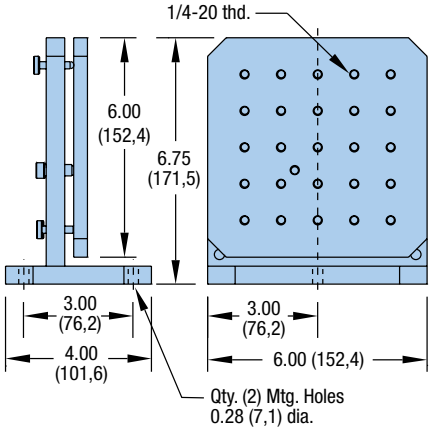


Specifications	Angled Base Models			Flat Base Models		
	5000	5300	5800	5100	5700	5900
Mounting Surface Size (Square) – in (mm) Holes – (Qty. x Center)	3.0 (76,2) 21 x 0.50”	4.5 (114,3) 49 x 0.50”	6.0 (152,4) 25 x 1.0”	3.0 (76,2) 21 x 0.50”	4.5 (114,3) 49 x 0.50”	6.0 (152,4) 25 x 1.0”
Range:	12°	8°	4°	12°	8°	4°
Resolution:	1.0 arc-sec	0.75 arc-sec	0.5 arc-sec	1.0 arc-sec	0.75 arc-sec	0.5 arc-sec
Weight – lb (kg)	1 (2,2)	2 (4,4)	4.1 (9)	0.7 (1,5)	1.6 (3,5)	3 (6,6)
Adjustment:	2 – 64-pitch screws (3 screws on 5800)			2 – 64-pitch screws		
Construction:	Aluminum/stainless steel			Aluminum/stainless steel		
Finish:	Black anodize			Black anodize		

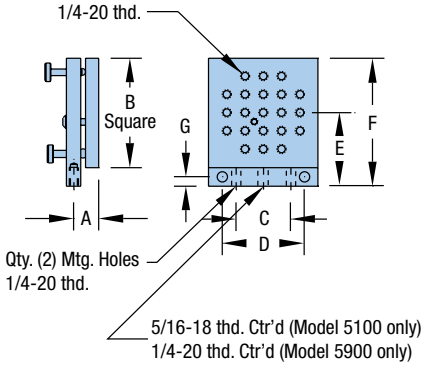
Models 5000, 5300



Models 5800



Models 5100, 5700, 5900



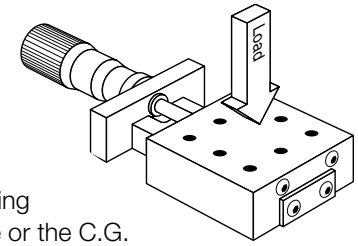
Model	Dimensions – in (mm) A	B	D	D	E	F	G
5000	2.00 (50,8)	3.00 (76,2)	0.75 (19,1)	2.00 (50,8)	3.75 (95,3)	2.00 (50,8)	3.50 (88,9)
5300	3.00 (76,2)	4.50 (114,3)	1.25 (31,8)	4.00 (101,6)	4.50 (114,3)	2.88 (73,2)	5.12 (130,1)
5100	0.69 (17,5)	3.00 (76,2)	1.50 (38,1)	2.25 (57,2)	2.00 (50,8)	3.50 (88,9)	0.25 (6,4)
5700	0.69 (17,5)	4.50 (114,3)	3.00 (76,2)	3.75 (95,3)	2.88 (73,2)	5.12 (130,1)	0.25 (6,4)
5900	0.88 (2,4)	6.00 (152,4)	4.00 (101,6)	5.38 (136,7)	3.25 (82,6)	6.25 (158,8)	0.31 (7,9)

Travel

The travel listed is the total travel of the positioner from hard stop to hard stop.

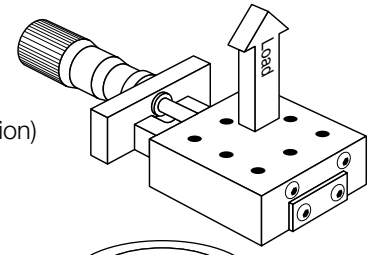
Bearing Load Capacity

Normal Load



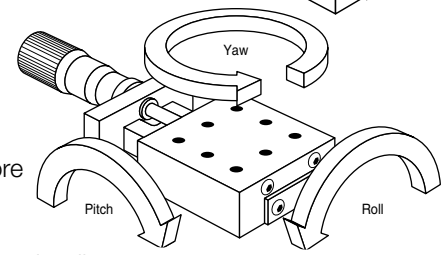
This is the maximum downward (compression) load or force which can be applied to the positioner perpendicular to the mounting surface. The center of force or the C.G. of the load must be located in the center of the mounting surface. For loads which are offset from this position, refer to moment loads.

Inverted Load



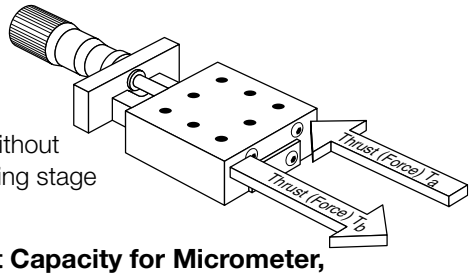
Same as a normal load except in an upward (tension) direction.

Moment Load



This refers to forces which are offset (cantilevered) from the bearing centers and therefore producing uneven loading on the bearings. This uneven loading means that some bearings are supporting more of the load than others. For this reason it is very important to determine if the moment loading for a given positioner is within acceptable limits. These moment forces are categorized by the direction they act in Pitch, Roll or Yaw; see diagram at left. When loading results in moments acting in only one of the moment directions (pitch, roll or yaw) it is called a single direction moment. Examples of this type of loading are shown below. How to calculate the maximum allowable moment load is discussed on the following page.

Thrust Capacity



Thrust capacity is the maximum force or load which can be applied in the direction of travel without damage to positioning stage components.

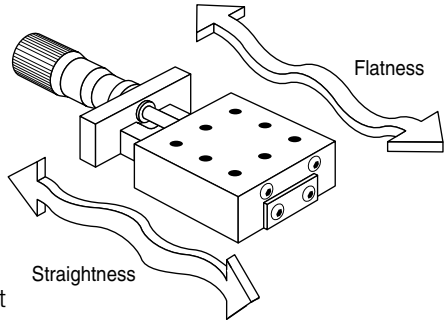
T_a and T_b Thrust Capacity for Micrometer, Fine Screw and Differential Screw Drives

With these types of drives the mounting surface or stage carriage is pressed against the drive mechanism by means of a spring. Because of this the maximum thrust which the stage assembly can maintain is different when pressing toward the spring or away from it. When pressing toward the spring, the force is taken up by the drive mechanism (i.e. micrometer). While pulling away, the force is being held in place by the spring. Stages with this type of mechanism have two thrust capacity specifications (T_a and T_b). Ta refers to the load capacity against the micrometer and Tb is the spring load capacity. Refer to specific product drawings for load direction.

Screw Drive Thrust Capacity

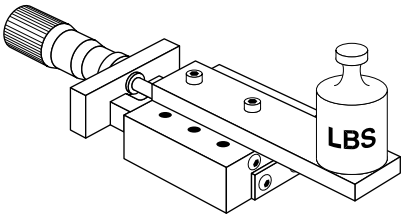
Stages which use screw drive assemblies will only have one thrust capacity rating. This rating is for either direction of travel.

Straight Line and Flatness Accuracy

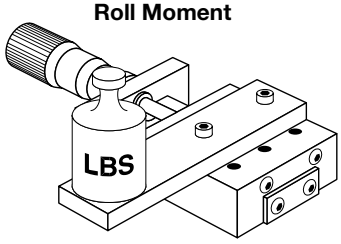


This is the amount of error a linear positioner deviates from an ideal straight line. The straight line accuracy is the error in the horizontal plane while flatness is the error in the vertical plane. Both the straight line and the flatness accuracy are measured at the moving carriage surface center.

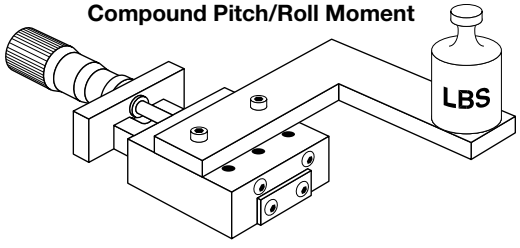
Pitch Moment



Roll Moment



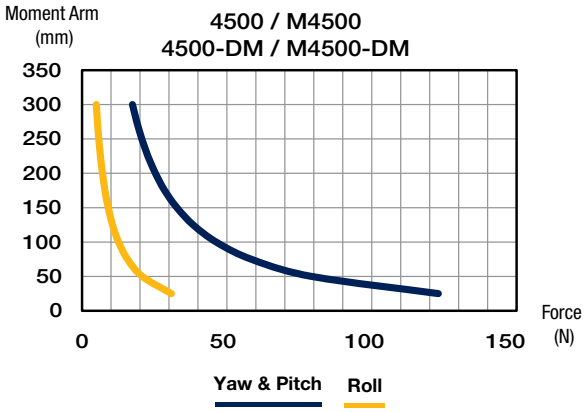
Compound Pitch/Roll Moment



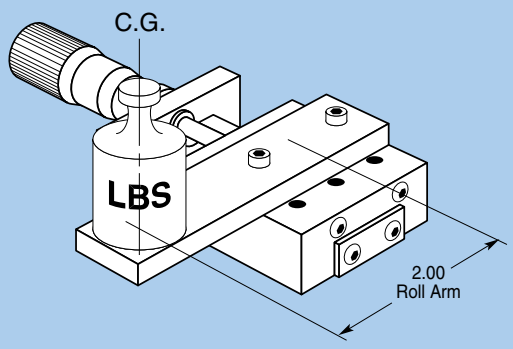
Calculating Maximum Allowable Moment Loads on Linear Slides and Stages

To determine if a load or force is within acceptable moment load ranges follow the steps below:

1. Calculate maximum load and or force which will be applied to the positioner. Include brackets and other axes which are mounted to the positioner.
2. Locate the center of gravity of the load.
3. Determine if there is a single or compound moment.
4. Measure the distance from the center of force or C.G. to the center of the linear stage carriage. This is the moment arm length and is designated A_S for single direction moments and A_C for compound moments.
5. Locate the moment load graph for the positioner you are interested in (located in back of individual product section, esee example below). The X axis of the graph is the Force, the Y axis is the allowable moment arm A_S for single direction moments.
6. Locate the moment curve(s) which your load is acting in (pitch, roll or yaw).
7. Locate your load force on the X axis of the graph.
8. Draw a vertical line from the Force location on the X axis parallel with the Y axis.
9. Find the moment arm distance on the Y axis. Draw a horizontal line from this point parallel with the X axis until the vertical and horizontal lines intersect.
10. If the intersection point is below the moment curve in question then the stage is within acceptable limits. If the intersection point is above the moment curve, a positioner with a larger normal load capacity should be selected and the above steps repeated.



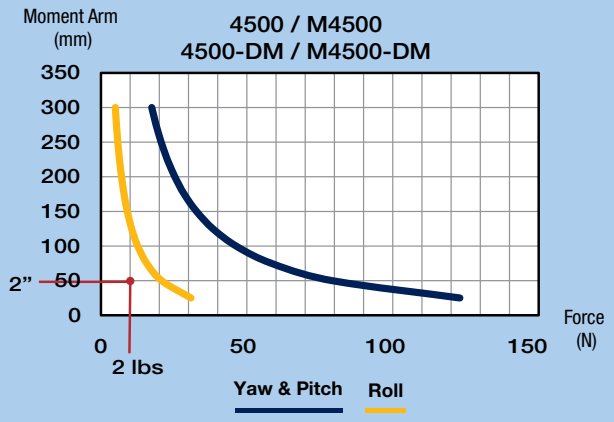
Example #1: Single Direction Moment Load



A 2 pound load is mounted to a single axis linear stage. The diagram shows the load's position in reference to the positioner carriage center. This shows that the load is offset 2 inches from the carriage center creating a roll moment.

The selected positioner is a 4502 ball stage. (The moment load curve for the 4502 is shown below.) First, find 2 pounds on the X axis and draw a vertical line. Next, draw a horizontal line starting at the 2 inches position on the A_S axis (single direction moment). Mark the intersection point.

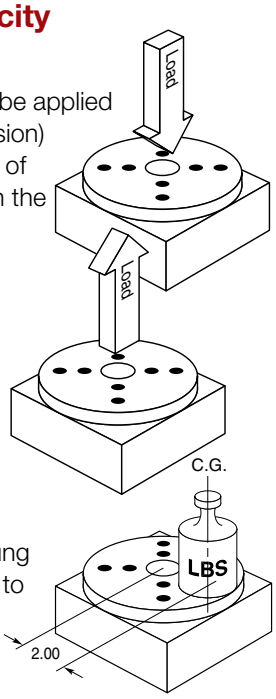
In this example the intersection point is below the roll moment curve, indicating that the stage is acceptable for this application.



Main Bearing Load Capacity

Normal Load

This is the load or force which can be applied in a downward direction (Compression) on the rotary stage top. The center of force or C.G. of the load must be in the center of the mounting surface. For loads which are offset from the center, refer to moment loads.



Inverted Load

Same as Normal load capacity except in an upward or tension direction.

Moment Load

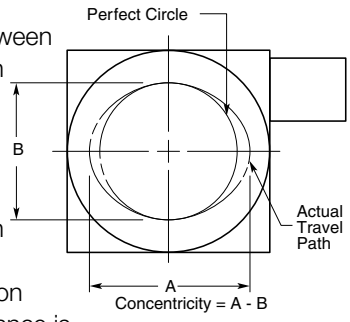
This specifies the maximum overhung load or force which can be applied to the rotary stage without damaging the mechanism. (See Calculating Moment Loads, below.)

Maximum Output Torque

The maximum torque which the rotary stage can produce at the carriage without damage or excess wear to the mechanisms.

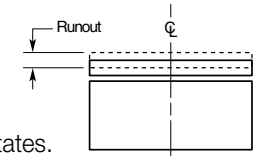
Concentricity

The maximum variance between a perfect circle and the path which the rotary stage follows. Concentricity is measured by placing a circular gauge disk on the table top and aligning it with the circular path of travel. An indicator is then placed on the gauge disk and the variance is measured as the concentricity error.



Axial Runout

Measured at the center of rotation, axial runout is the amount of vertical motion the rotary stage moves as it rotates.



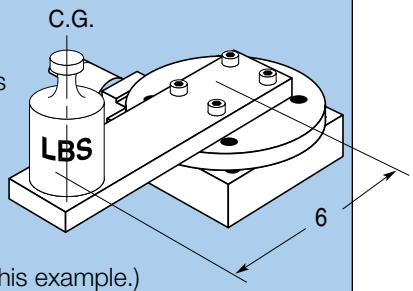
Calculating Maximum Allowable Moment Loads on Rotary Positioners

To determine if a load or force is within acceptable moment load ranges follow the steps below:

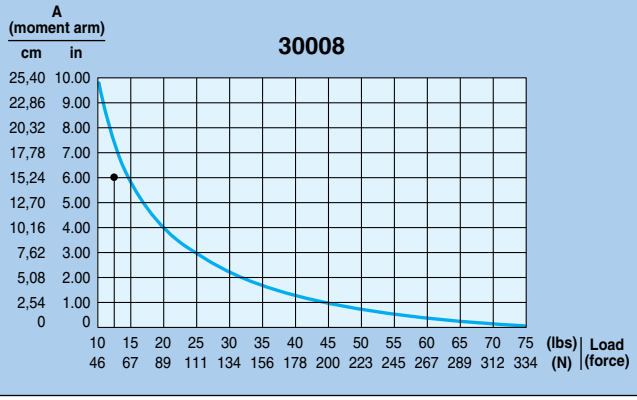
1. Calculate maximum load or force which will be applied to the Rotary stage. Include brackets, and other axes which are mounted to the rotary stage.
2. Locate the center of force or C.G. of the load.
3. Measure the distance from the center of force or C.G. to the center of the rotary stage. This is the moment arm and is designated A.
4. Locate the moment load graph for the rotary stage you are interested in (located in back of individual product section). The X axis of the graph is the Force, the Y axis is the allowable moment arm A.
5. Locate your load force on the X axis of the graph.
6. Draw a vertical line from the Force location on the X axis parallel with the Y axis.
7. Find the Moment Arm distance on the Y axis. Draw a horizontal line from this point parallel with the X axis until the vertical and horizontal lines intersect.
8. If the intersection point is below the moment curve then the stage is within acceptable limits. If the intersection point is above the moment curve a positioner with a larger normal load capacity should be selected and the above steps repeated.

Example: Rotary Stage Moment Load

A load of 12 pounds is mounted to a 30008 rotary table. The illustration shows the position of the load in reference to the center of rotation on the rotary table. The load is offset 6 inches from the rotation center. (The 30008 moment load curve is shown below for this example.)



First find 12 pounds on the X axis and draw a vertical line parallel to the Y axis, next locate the moment arm distance on the Y axis. Draw a horizontal line from this point until it intersects with the vertical line. The intersection point is below the moment curve, thus the 30008 table is acceptable for this application.



Model Number Index

Model Number Index

Model Number Index

Model Number Index

The items described in this document and other documents or descriptions provided by Parker Daedal, its subsidiaries and its authorized distributors are hereby offered for sale at prices to be established by Parker Daedal, its subsidiaries and its authorized distributors. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any such item, when communicated to Parker Daedal, its subsidiary or an authorized distributor ("Seller") verbally or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between, Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer. Acceptance of Seller's products shall in all events constitute such assent.

2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 12 months from date of shipment from Parker Daedal. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED. NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGNS OR SPECIFICATIONS.

5. Limitation of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FORM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. Changes, Reschedules and Cancellations: Buyers may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification of cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and not withstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings confidential information or equipment furnished by Buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it non infringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Right. If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder of this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the “Offer of Sale” found on the last page of this publication.

Extensive Automation Solutions

HMI and Controllers

Superior integration and support for machine control as well as HMI hardware and software.

www.parkermotion.com/em/hmicont

Electric Actuators

Screw, belt-driven, and linear motor actuators for the complete range of industrial applications, offering precise motion and flexibility.

www.parkermotion.com/em/linear

Motors and Drives

Parker's family of innovative servo/stepper motors and drives continues to expand to meet the challenges of new technologies.

www.parkermotion.com/em/motordrive

Linear Actuators

Aluminum and steel pneumatic cylinders, guided cylinders, rodless cylinders, and short stroke thrusters from the industry leader.

www.parkermotion.com/pneu/linear

Rotary Actuators

Industry leader in the design and manufacture of pneumatic rack and pinion, and vane-style rotary actuators.

www.parker.com/pneu/rotary

Vacuum Products and Sensors

Vacuum solutions include a broad range of generators (integrated/inline), cups, and pressure sensors.

www.parker.com/pneu/vacsen

Grippers

Parallel, angular, and three jaw grippers are available in over 1,000 configurations.

www.parker.com/pneu/gripper

Airline Accessories

Airline accessories include silencers, flow controls, and mufflers to round out Parker's pneumatic solution.

www.parker.com/pneu/access

Air Control Valves

Valve technology that meets the most demanding requirements in any industrial application.

www.parker.com/pneu/valve

Air Preparation

Parker, the industry leader in air preparation, offers a complete line of products to ensure clean, dry, oil-free air.

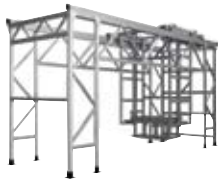
www.parker.com/pneu/airprep

Connectors and Tubing

The most complete line of fluid connectors worldwide will meet virtually any automation application.

www.parker.com/pneu/fc

Parker IPS Structural Automation



More than 150 metric and inch profiles, integral motion components, and accessories for unlimited and flexible configurations. Pre-machined kits or complete assemblies.

www.parker.com/ips

New Parker Daedal catalog. Call for your comprehensive guide today. 800-245-6903 Catalog 8092

Parker also has product ranges available for the Precision Automation, Industrial Automation and Pneumatic markets, each paired with an interactive CD. Call 800-CPARKER.

Bulletin AU01-5000/US

Bulletin AU01-7500/US

Bulletin AU01-1000/US

EM Sales Offices

Australia

Parker Hannifin (Australia) Pty Limited
9 Carrington Road
Castle Hill NSW 2154
Australia
Tel: +61 (0) 2 9634-7777
Fax: +61 (0) 2 9634 3749

Brazil

Parker Hannifin Ind. Com Ltda.
Av. Lucas Nogueira Garcez 2181
Esperança
12325-900 Jacareí, SP
Tel: 12 3954 5100
Fax: 12 3954 5262
Email: automation.brazil@parker.com

Canada

Parker Hannifin (Canada) Inc.
160 Chisholm Dr
Milton, Ontario L9T 3G9
Tel: 905-693-3000
Fax: 905-876-1958
Email: miltoncustservice@parker.com

China

Parker Hannifin Motion & Control (Shanghai) Co., Ltd
280 Yunqiao Rd. Jin Qiao Export Processing Zone
Shanghai 201206, China
Tel: (86-21) 50312525
Fax: (86-21) 64459717

France

Parker SSD Parvex
8 avenue du Lac
B.P. 249
F-21007 Dijon Cedex
Tel: +33 (0) 3 80 42 41 40
Fax: +33 (0) 3 80 42 41 23

Germany

Electromechanical Europe
Parker Hannifin GmbH & Co KG
Robert-Bosch-Strasse 22
D-77656 Offenburg
Germany
Tel: +49 (0) 781 509 0
Fax: +49 (0) 781 509 98176

India

Parker Hannifin India Pvt. Ltd
Automation Group-SSD Drives Division
133 & 151 Developed Plots Estate
Perungudi, Chennai 600 096
Tel: 044-4391-0799
Fax: 044-4391-0700

Italy

Parker Hannifin SpA
Via Gounod 1
20092 Cinsello Balsamo
Milano, Italy
Tel: +39 02 361081
Fax: +39 02 36108400

Korea

Parker Hannifin Korea
9th Floor KAMCO Yangjae Tower
949-3 Dogok 1-dong Gangnam-gu
Seoul 135-860, Korea
Tel: 82-2-559-0454
Fax: 82-2-556-8187

Mexico

Parker Hannifin de Mexico
Eje uno Norte No.100
Parque Industrial Toluca 2000
Toluca, CP 50100 México
Tel: 52-722-275-4200
Fax: 52-722-279-0316

Singapore

Parker Hannifin Singapore Pte Ltd
11, Fourth Chin Bee Road
Singapore 619702
Tel: (65) 6887 6300
Fax: (65) 6265 5125/6261 4929

Taiwan

Parker Hannifin Taiwan Co., Ltd
No. 40, Wuchiuan 3rd Road
Wuku Industrial Park
Taipei County, Taiwan 248
ROC
Tel: 886 2 2298 8987
Fax: 886 2 2298 8982

Thailand

Parker Hannifin (Thailand) Co., Ltd.
1023, 3rd Floor, TPS Building,
Pattanakarn Road,
Suanluang, Bangkok 10250
Thailand
Tel: (66) 02717 8140
Fax: (66) 02717 8148

UK

Parker Hannifin Ltd.
Tachbrook Park Drive
Tachbrook Park
Warwick CV34 6TU
Tel: +44 (0) 1926 317970
Fax: +44 (0) 1926 317980

USA

Parker Hannifin Electromechanical Automation Division Main Office/ Compumotor/CTC
5500 Business Park Drive
Rohnert Park, CA 94928 USA
Tel: 707-584-7558
800-358-9070
Fax: 707-584-8015
Email: emn_support@parker.com

Parker Hannifin Electromechanical Automation Division/Bayside
27 Seaview Boulevard
Port Washington, NY 11050
Tel: 707-584-7558
800-358-9070
Fax: 707-584-8015
Email: emn_support@parker.com

Parker Hannifin Electromechanical Automation Division/Daedal
1140 Sandy Hill Road
Irwin, PA 15642
Tel: 724-861-8200
800-245-6903
Fax: 724-861-3330
Email: ddlcat@parker.com

Catalog 8099-M 6/09
Printed in U.S.A

Parker Hannifin Corporation
Electromechanical Automation Div.
1140 Sandy Hill Road
Irwin, PA 15642
Tel: 800-245-6903
Email: emn_sales@parker.com
emn_support@parker.com