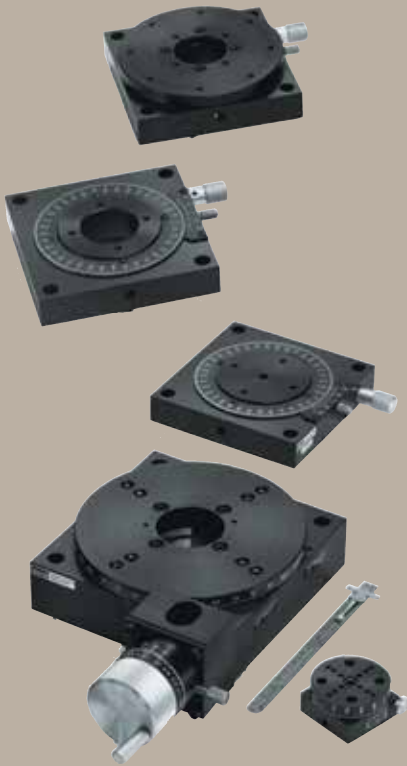


# Rotary Positioners

## Tangent Arm and Worm Gear Drive



Parker 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

<b>116</b>	Overview
<b>117</b>	1.88 – 2.62" (47,8 – 66,5 mm) Diameter Tables
<b>118</b>	2.38" (60,5 mm) Diameter Tables
<b>119</b>	2.75 – 4.75" Diameter Tables
<b>120-121</b>	5.0 – 12.0" Diameter Tables
<b>122</b>	Performance Curves

## Rotary Positioning Stages



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

### Rotary Positioner Principles

Parker 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 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 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	
<b>2500</b> <b>M2500</b>	1.88 – 2.62 in 47,7 – 66,5 mm	Tangent Arm	10 lb 4,5 kg	•	•	117
<b>4575*</b> <b>M4575*</b>	2.38 in 60,5 mm	Tangent Arm	5 lbs 2,25 kg	•	•	118
<b>10000-20000</b> <b>M10000-M20000</b>	2.75 – 4.75 in 69,8 – 120,6 mm	Worm Gear	50 lbs 22,0 kg	•	•	119
<b>30000</b> <b>M30000</b>	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.

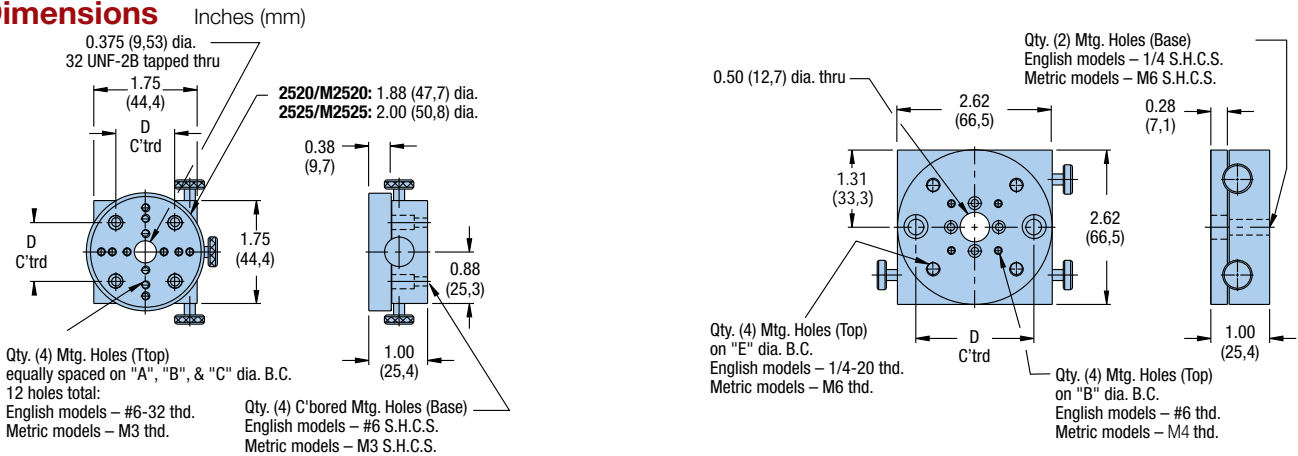
Models 2525/M2525 and 2535/M2535 include a dial and vernier for direct position readout (readable to six arc-minutes). These stages can be mounted in a horizontal or vertical position, and can be combined with compatible linear stages for linear-rotary applications.



## 2500/M2500 Series

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

## Dimensions



**2520/M2520**  
**2525/M2525**

**2530/M2530**  
**2535/M2535**

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

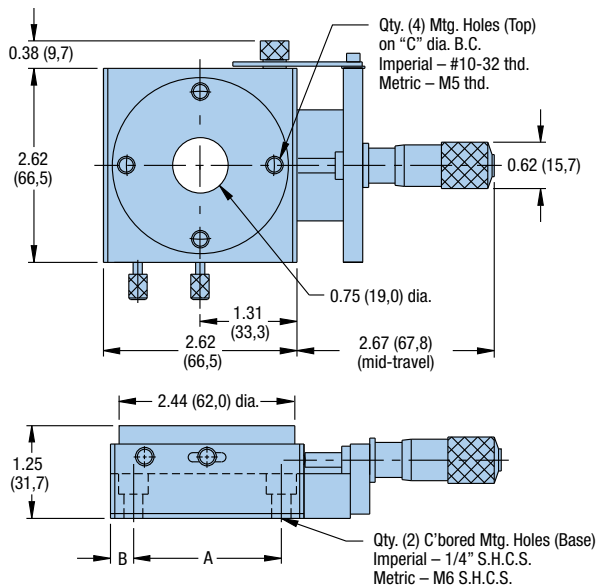


**4575/M4575 Series**

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



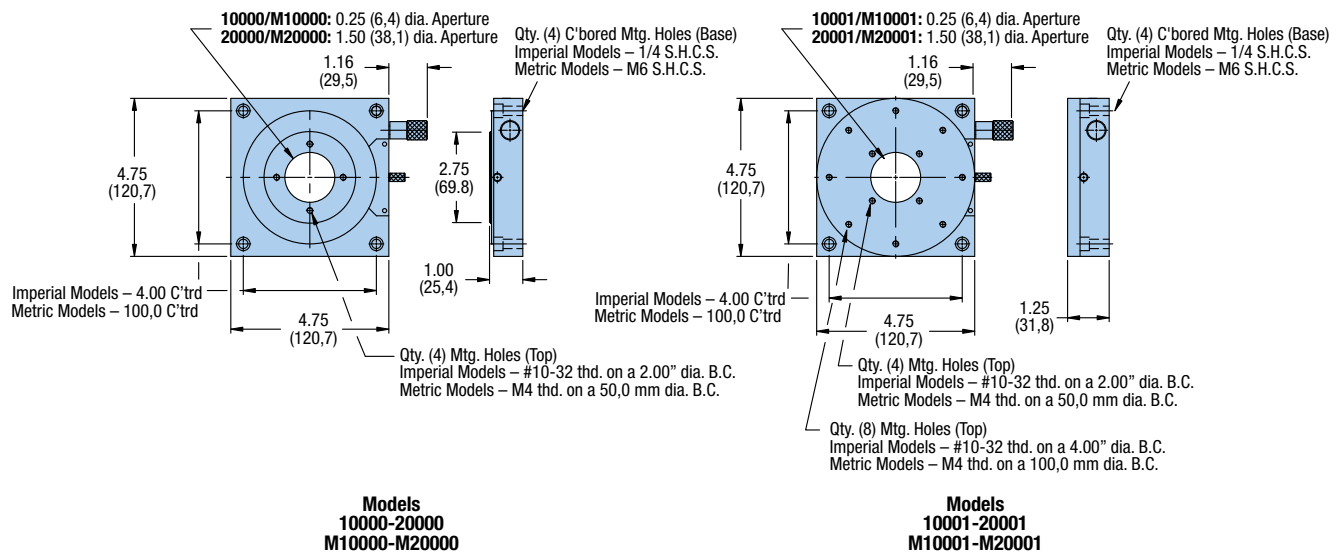
The 10000-20000 and M10000-M20000 Series rotary positioning stages provide smooth, continuous adjustment over a full 360° travel range. The drive mechanism features a worm gear drive. A position locking knob allows the stage to be positively locked in place. The 10000 and 20000 models offer a 2.75 inch (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
<b>Table Diameter:</b>	2.75 in	4.75 in	2.75 in	4.75 in	69,8 mm	120,7 mm	69,8 mm	120,7 mm
<b>Vernier Resolution:</b>	6 arc-min	–	6 arc-min	–	6 arc-min	–	6 arc-min	–
<b>Aperture:</b>	0.25	0.25	1.50	1.50	(6,3)	(6,3)	(38,1)	(38,1)
<b>Weight:</b>	2.0 lbs	2.4 lbs	2.0 lbs	2.4 lbs	0,9 kg	1,9 kg	0,9 kg	1,9 kg
<b>Load:</b>								
<b>Normal</b>	25 lbs				11,3 kg			
<b>Moment</b>	Not recommended for moment loads				Not recommended for moment loads			
<b>Range:</b>	360° (continuous)				360° (continuous)			
<b>Drive Ratio:</b>	120:1				120:1			
<b>Construction:</b>	Aluminum top and base; steel/bronze worm gear drive				Aluminum top and base; steel/bronze worm gear drive			
<b>Mounting surface:</b>	Precision machined				Precision machined			
<b>Finish:</b>	Black anodize				Black anodize			

## Dimensions Inches (mm)



Parker 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 linear tables.



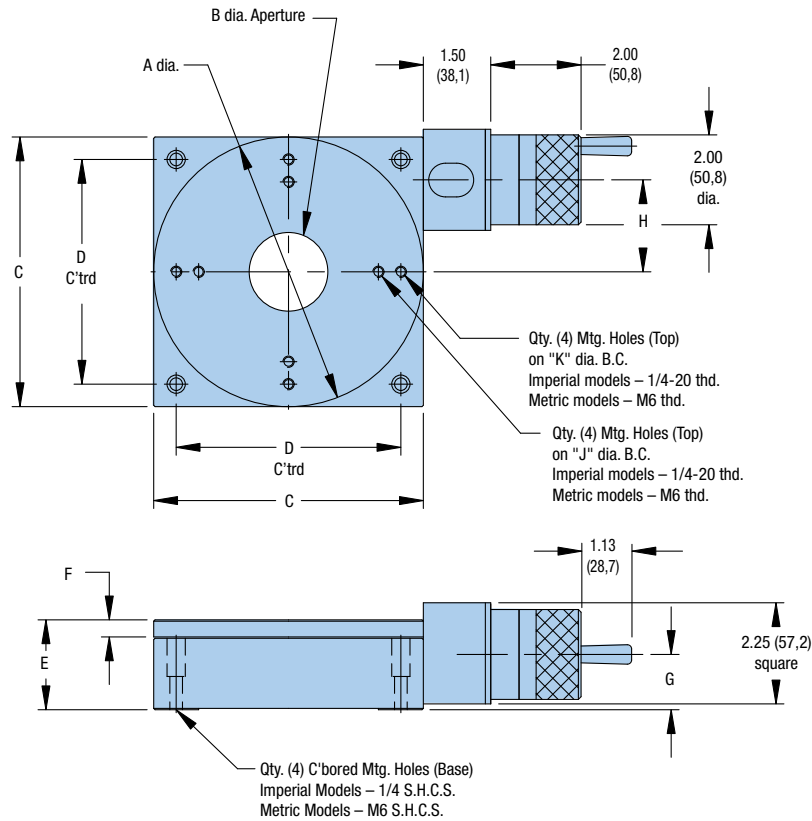
**30000/M30000 Series**

Specifications	Imperial Models	Metric Models
<b>Load:</b>		
Normal Moment	25 – 200 lbs See page 122	11,5 – 90 kg See page 122
<b>Concentricity:</b>		
Standard	0.005 in	127,0 µm
Precision	0.001 in	25,4 µm
<b>Runout:</b>		
Standard	0.003 in	75 µm
Precision	0.001 in	25 µm
<b>Range:</b>	360° (continuous)	360° (continuous)
<b>Weight:</b>	6.0 – 31.0 lbs	2,7– 14,1 kg
<b>Vernier Resolution:</b>	0.12 arc-min	0.12 arc-min
<b>Construction:</b>	Aluminum top and base; steel/bronze worm gear drive	Aluminum top and base; steel/bronze worm gear drive
<b>Mounting surface:</b>	Precision machined	Precision machined
<b>Finish:</b>	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	150	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)

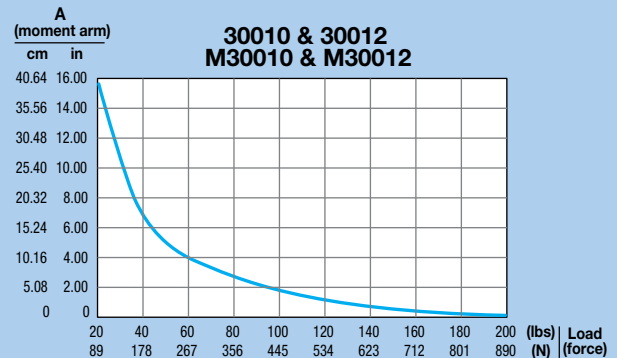
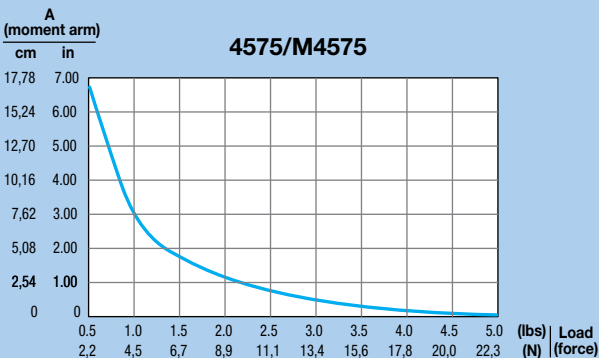
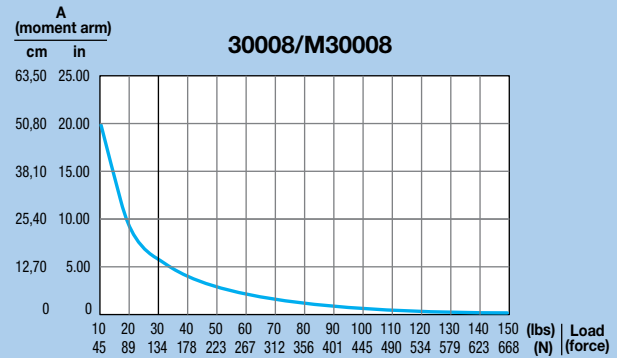
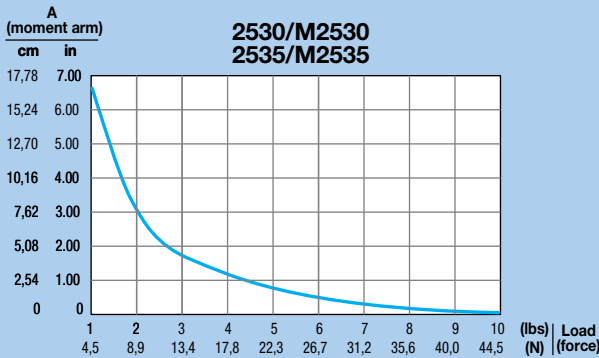
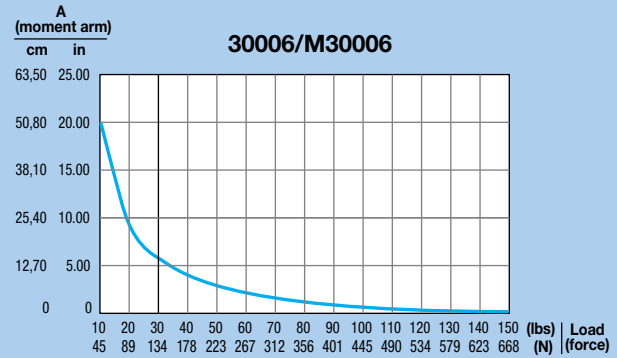
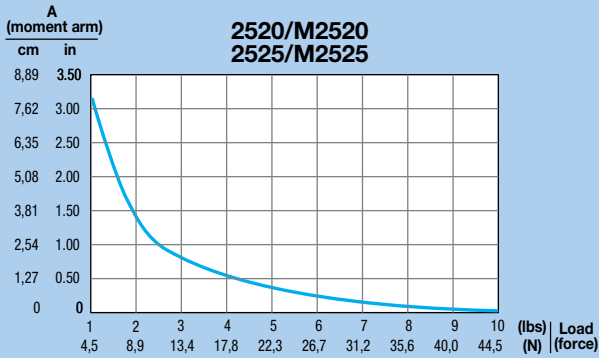
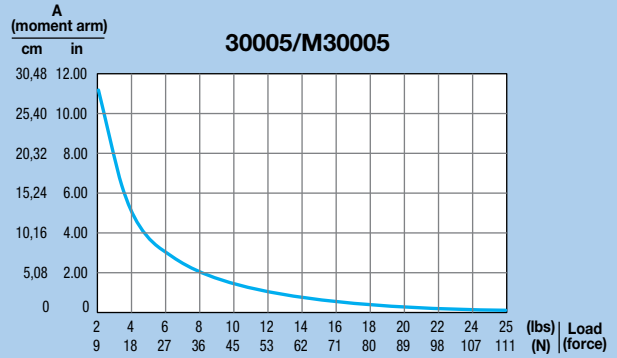
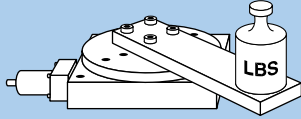


## Dimensions Inches (mm)



		Dimensions – in (mm)									
	Model	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**





# Accessories for Linear and Rotary Positioners

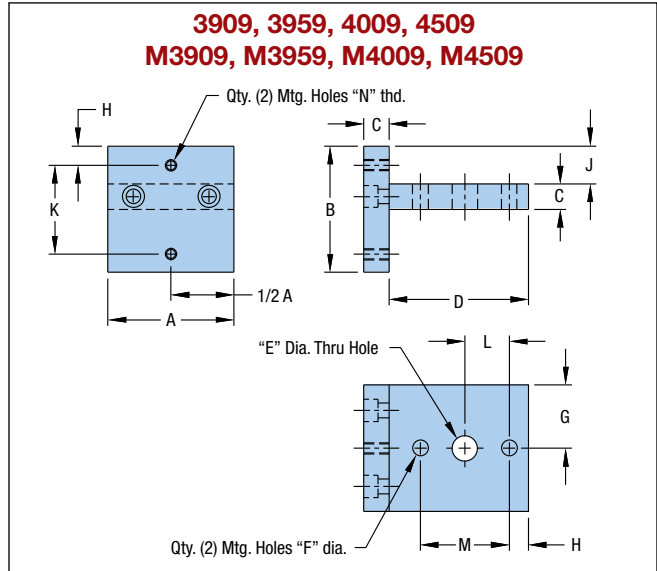


Parker offers a complete line of Z-axis brackets to combine ball bearing and cross roller stages into three axis positioning systems. We also offer drive mechanisms in an assortment of standard and digital micrometer heads, fine adjustment screws, and differential screws. Optical components including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

## Contents

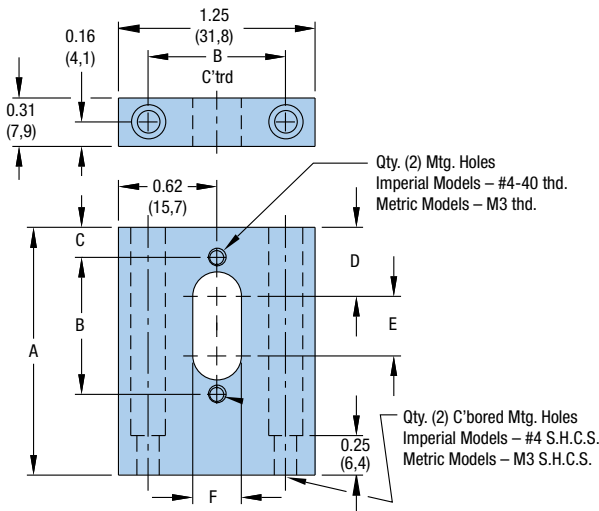
<b>124-127</b>	Z-Axis Brackets
<b>128-129</b>	Micrometer Heads
<b>130-132</b>	Optical Mounts

# Z-Axis Brackets



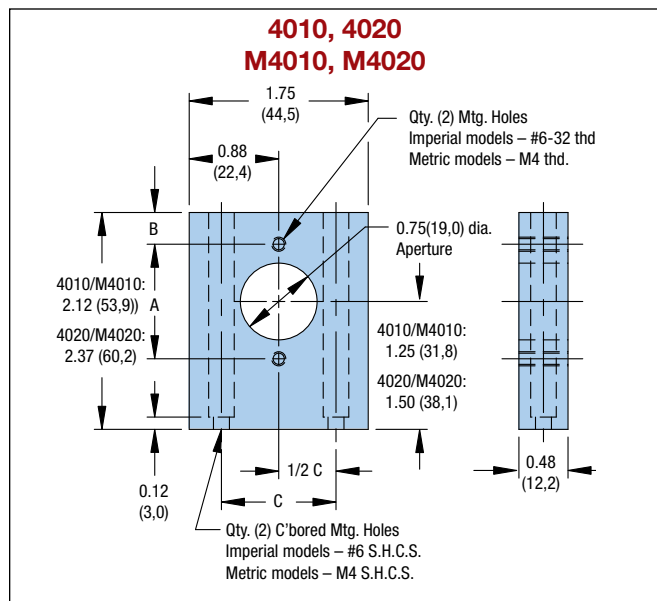
		Dimensions – in (mm)											Thd. N	
	Model	A	B	C	D	E	F	G	H	J	K	L	M	
Imperial	3909	1.25	1.25	0.25	1.38	0.25	0.156	0.62	0.19	0.38	0.88	0.44	0.88	#4-40
	3959	1.25	1.25	0.25	1.38	0.25	0.156	0.62	0.19	0.04	0.88	0.44	0.88	#4-40
	4009	1.75	1.69	0.25	1.88	—	0.156	0.88	0.31	0.63	1.12	—	1.12	#6-32
	4509	2.44	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**



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

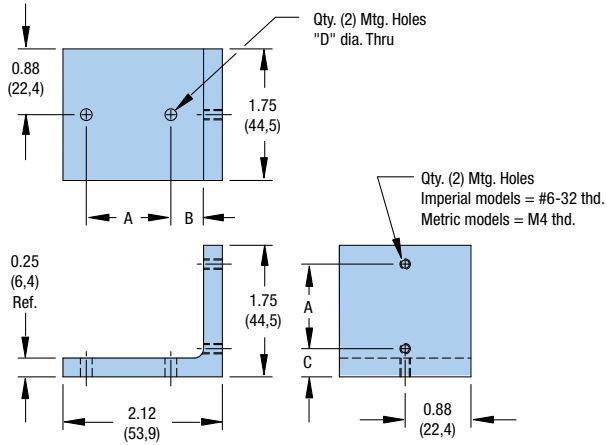
**4010, 4020  
M4010, M4020**



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

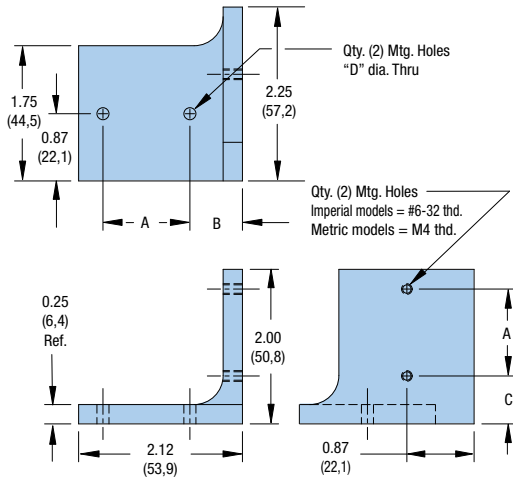


## 4059 M4059



## 4059A M4059A

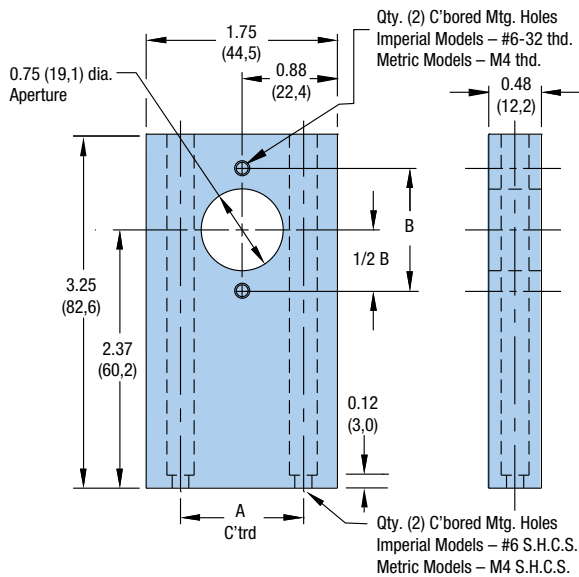
For 1.00 inch (25,0 mm) Travel Micrometer Option



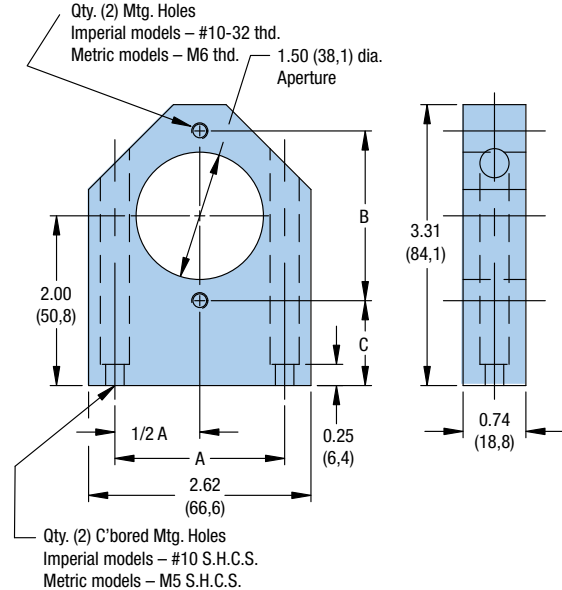
Dimensions - in (mm)					
	Model	A	B	C	D
Imperial	4059	1.12	0.68	0.38	0.16
Metric	M4059	(30,0)	(16,8)	(8,8)	(4,8)

Dimensions - in (mm)					
	Model	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

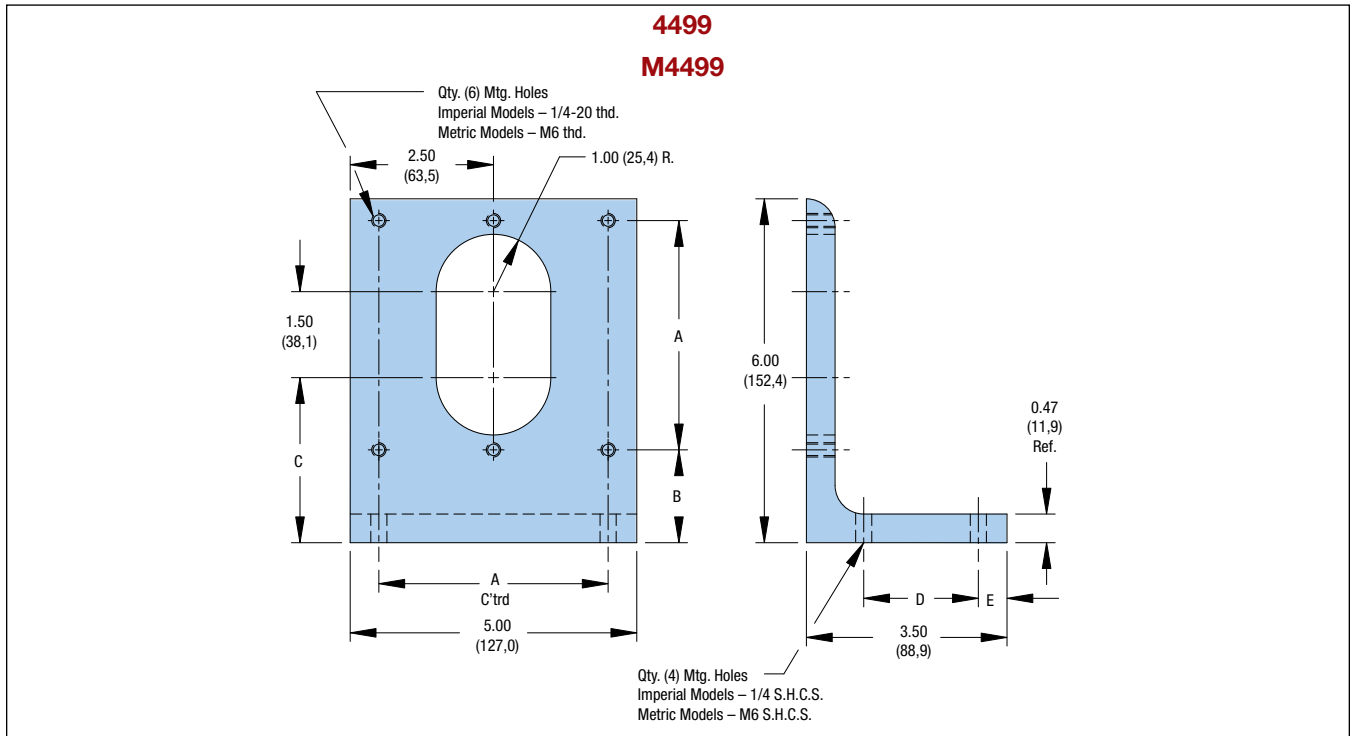


## 4510 M4510

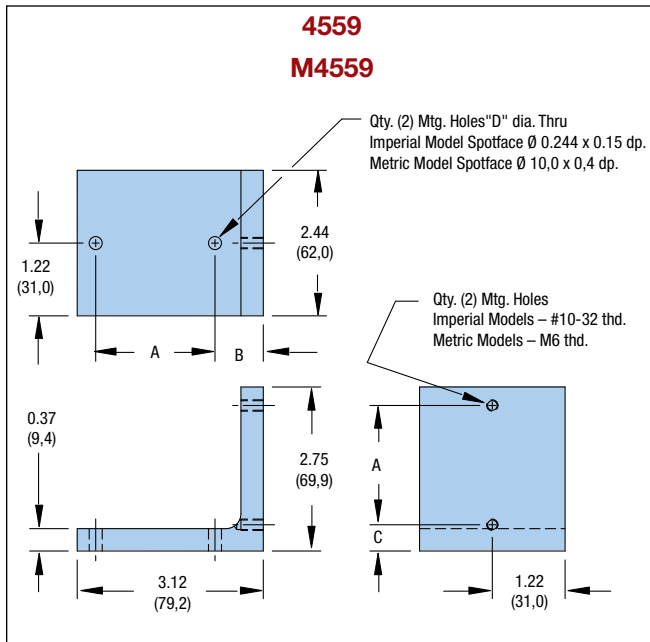


Dimensions - in (mm)			
	Model	A	B
Imperial	4060	1.13	1.13
Metric	M4060	(30,0)	(30,0)

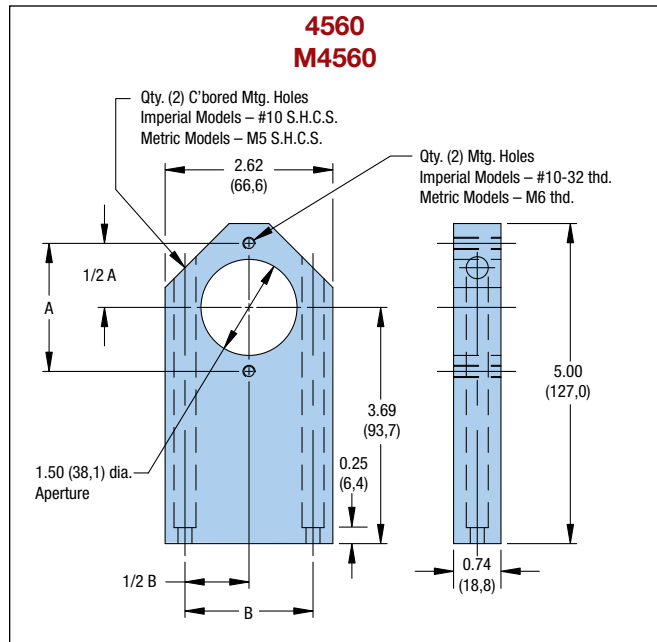
Dimensions - in (mm)				
	Model	A	B	C
Imperial	4510	2.00	2.00	1.00
Metric	M4510	(50,0)	(50,0)	(25,8)



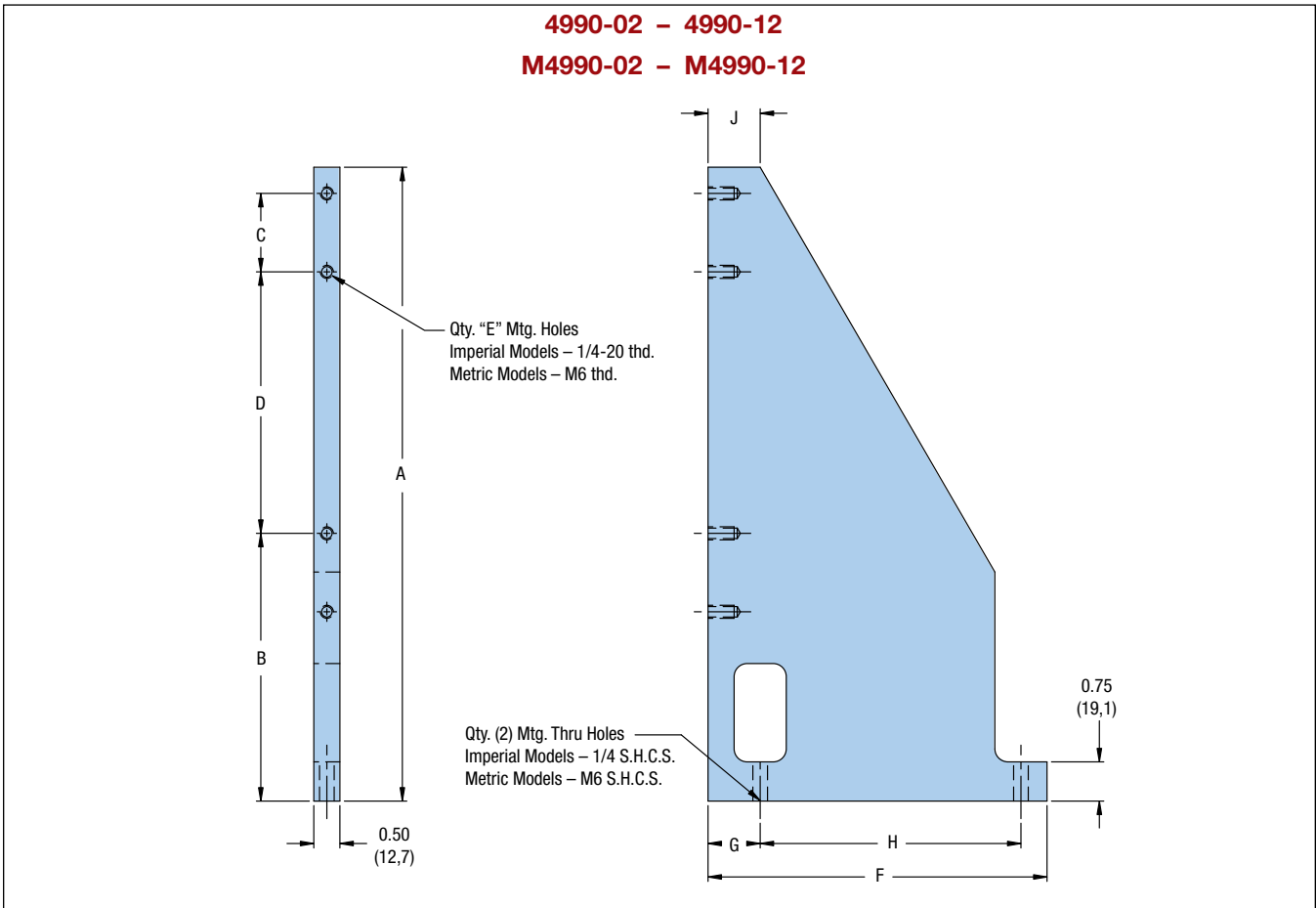
		Dimensions - in (mm)				
	Model	A	B	C	D	E
Imperial	4499	4.00	1.62	2.88	2.00	0.50
Metric	M4499	(100,0)	(40,5)	(71,4)	(50,0)	(13,1)



		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)



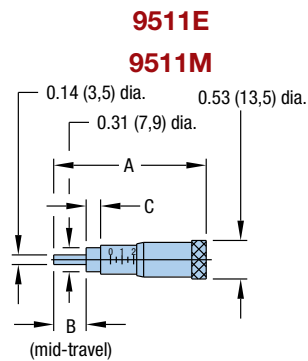
		Dimensions - in (mm)	
	Model	A	B
Imperial	4560	2.00	2.00
Metric	M4560	(50,0)	(50,0)



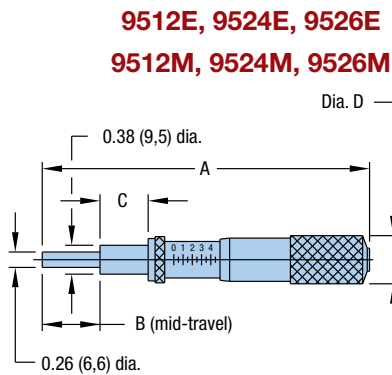
		Dimensions - in (mm)									
	Model	A	B	C	D	E	F	G	H	J	
Imperial	<b>4990-02</b>	6.00	1.50	-	4.00	2	5.50	1.00	4.00	1.00	
	<b>4990-04</b>	8.12	2.62	-	5.00	2	6.50	1.00	5.00	1.00	
	<b>4990-06</b>	12.12	5.12	1.5	5.00	4	6.50	1.00	5.00	1.00	
	<b>4990-08</b>	17.12	8.62	3.0	5.00	4	6.75	1.25	5.00	1.50	
	<b>4990-10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

**9510-9530 Series Micrometer Heads**

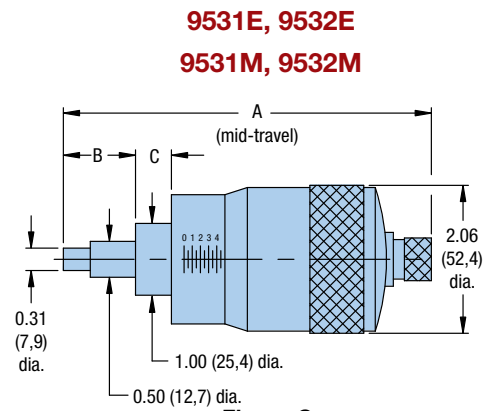
Parker Daedal micrometer heads are recommended for any application requiring micrometer accuracy in settings and adjustment. These units feature a hardened and ground spindle, easy-to-read graduations, and an attractive non-glare satin chrome finish.



**Figure A**  
Mini Thimble Micrometer Head



**Figure B**  
Standard Thimble Micrometer Head



**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)	—

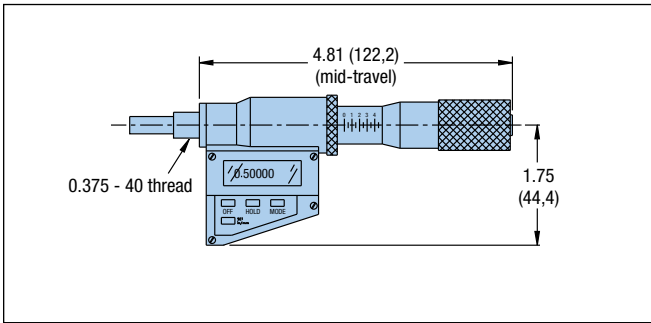


**9550 Series Digital Micrometer Heads**

**Model 9551**

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

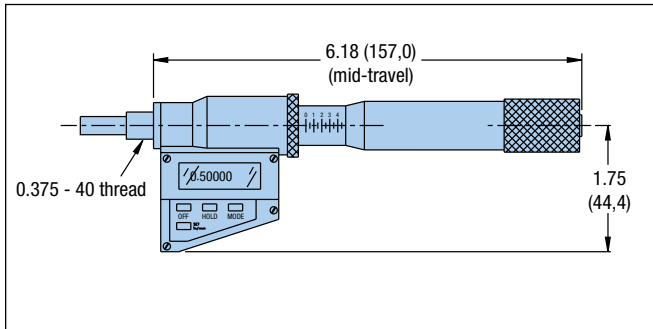
- Incremental and/or absolute positioning modes
- Zero set at any position, inch and millimeter readout (0.001 mm resolution), display hold, and automatic shutdown after two hours to conserve the integral battery
- 1.00 inch micrometer travel
- Battery powered for 500 hours of use



**Model 9552**

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

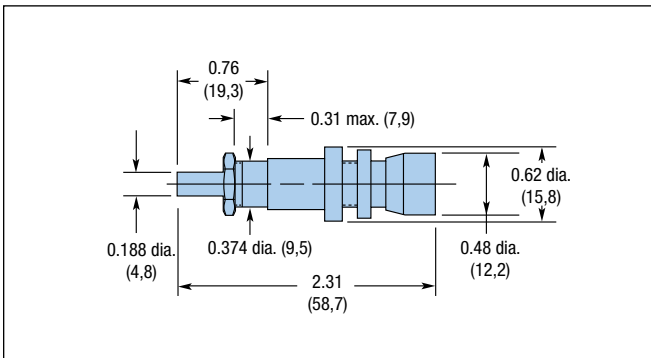
- 2 inch spindle
- Display face swivels for easy reading at various angles
- Non-rotating spindle
- Pre-set, zero, and inch/mm
- Carbide tipped measuring face
- Battery powered for 5,000 hours of use



**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.

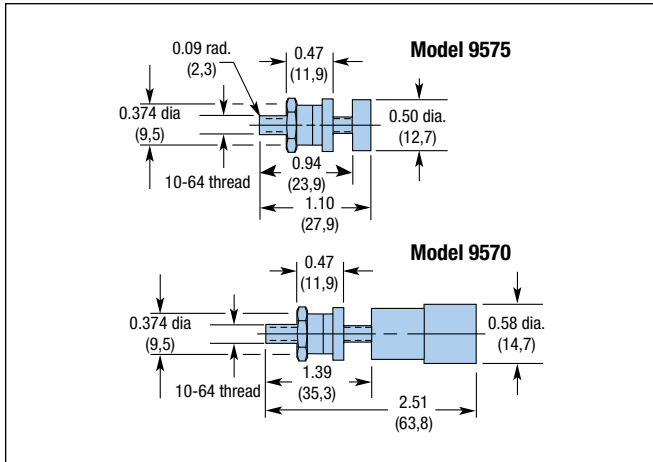


**9570 Series Fine Adjustment Screws**

**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**

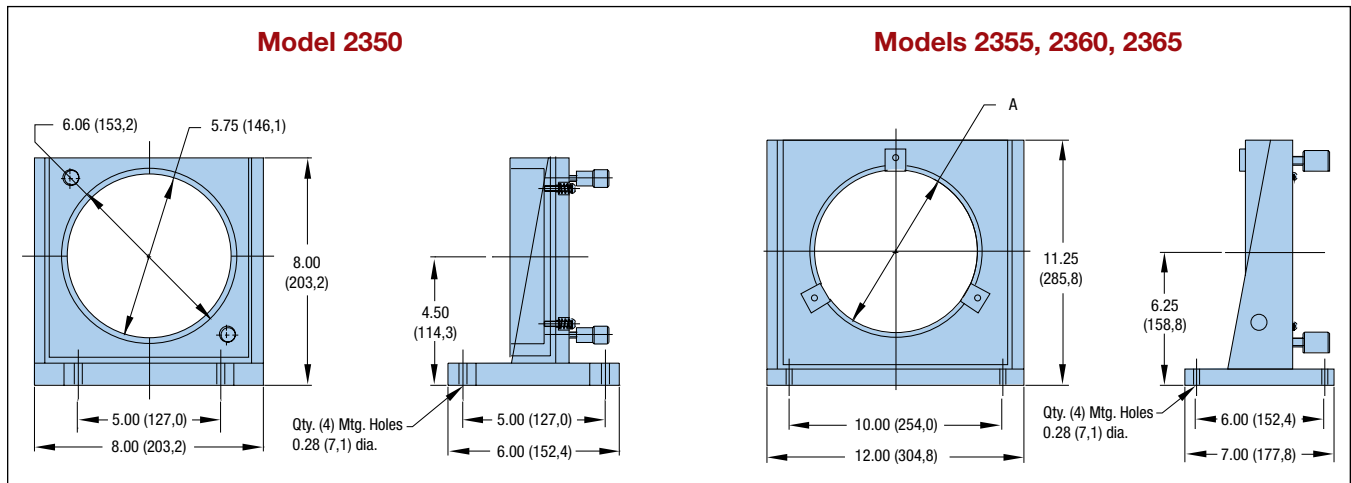
**Model 2350: 6.0" Diameter**

**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.



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			





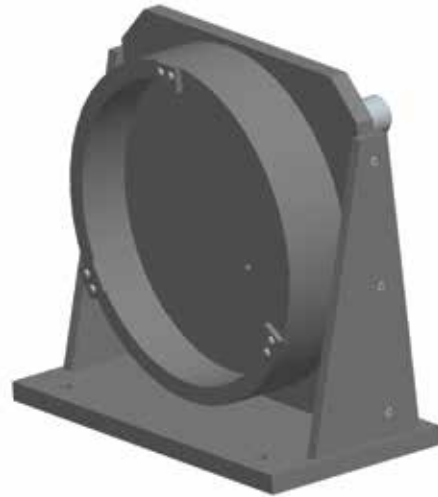
## Optical Cell Mounts

**Model 2370/2371: 10.0" Diameter**

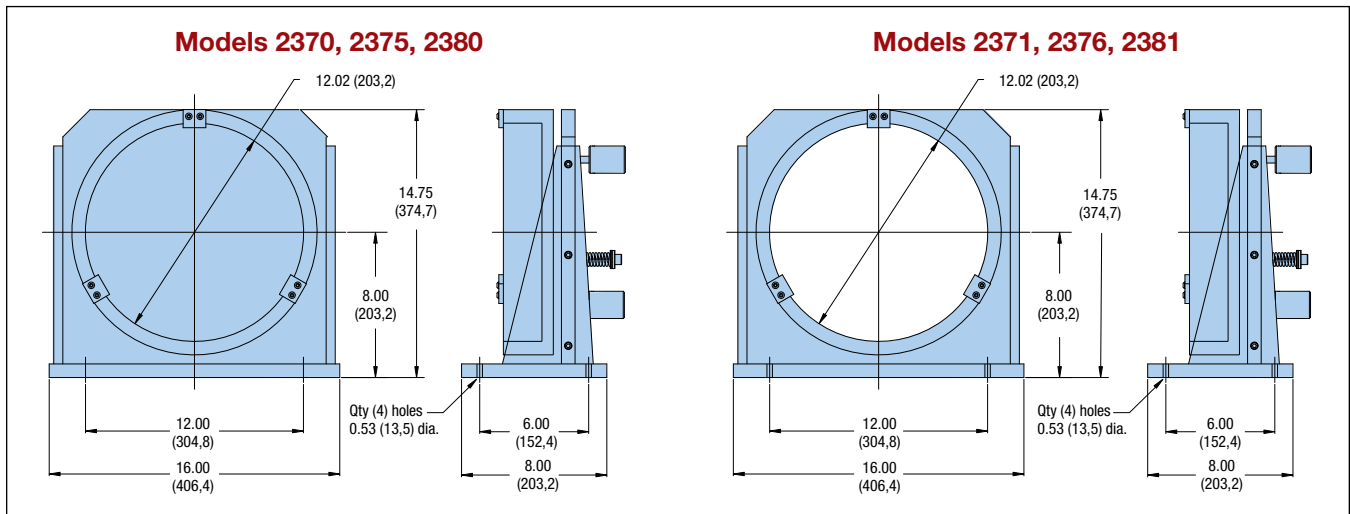
**Model 2375/2376: 11.0" Diameter**

**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.



Crossed Roller Slides



Specifications	Solid Back Models			Aperture Models		
	2370	2375	2380	2371	2376	2381
<b>Optic Size Opening – in (mm)</b>						
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)
<b>Optic Retention:</b>	3 mounting clips			3 mounting clips		
<b>Range:</b>	7°			7°		
<b>Resolution:</b>	0.5 arc-sec			0.5 arc-sec		
<b>Adjustment:</b>	3 – 32-pitch screws			3 – 32-pitch screws		
<b>Weight:</b>	45 lb (99 kg)			41 lb (90 kg)		
<b>Construction:</b>	Aluminum/stainless steel			Aluminum/stainless steel		
<b>Finish:</b>	Black anodize			Black anodize		

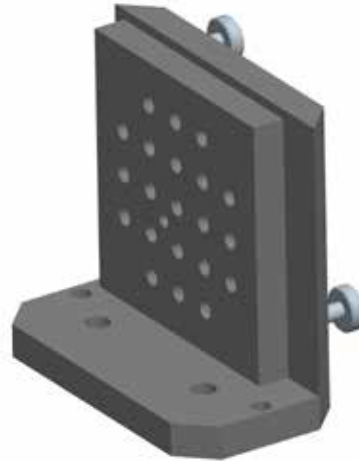
**Mirror Mounts**

**Model 5000/5100: 3.0" Square Mounting Surface**

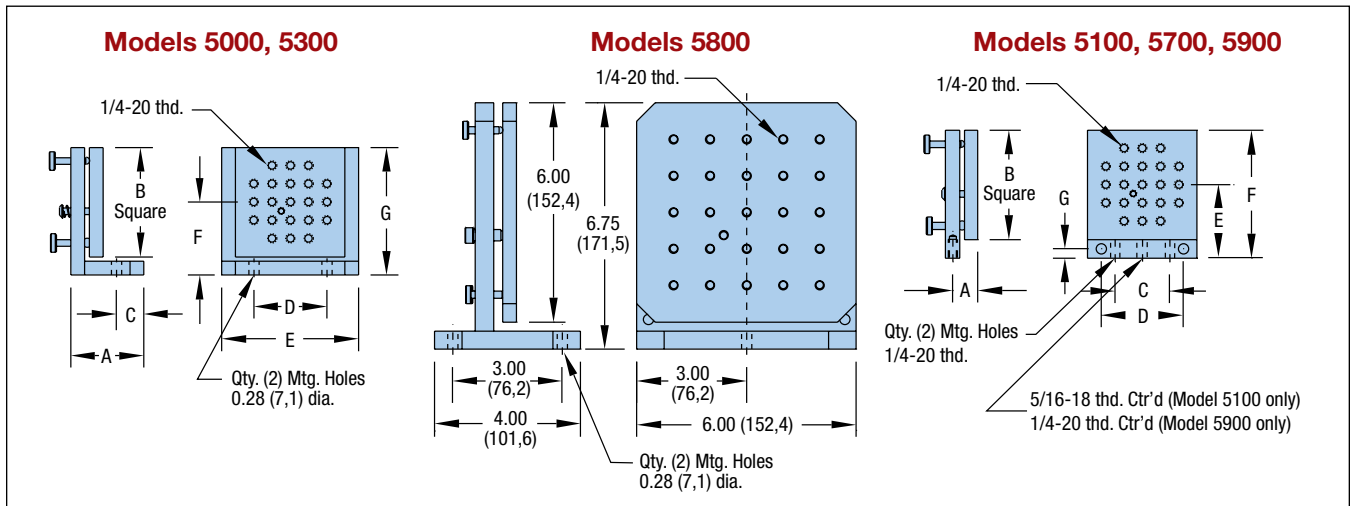
**Model 5300/5700: 4.5" Square Mounting Surface**

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



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)

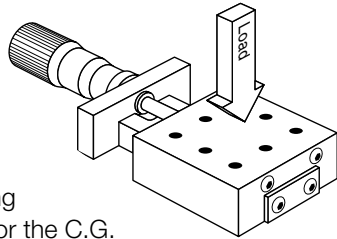
## Travel

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

## Bearing Load Capacity

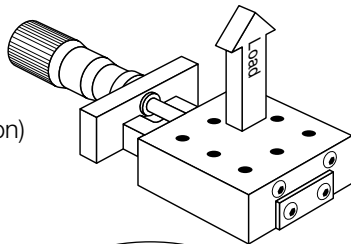
### Normal Load

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.



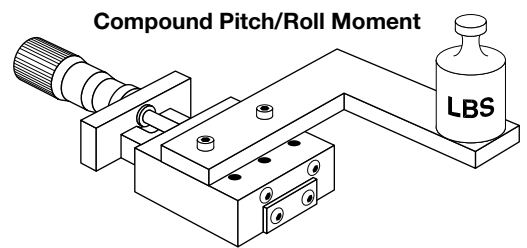
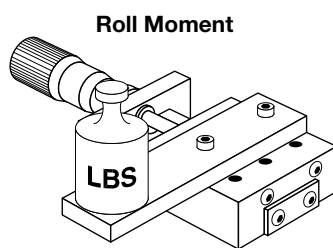
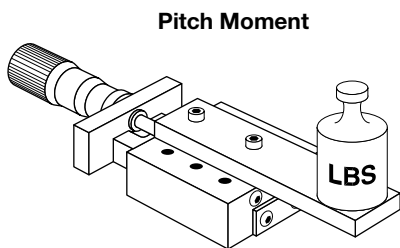
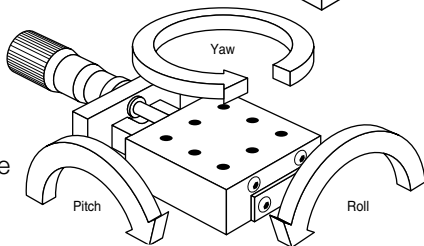
### Inverted Load

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



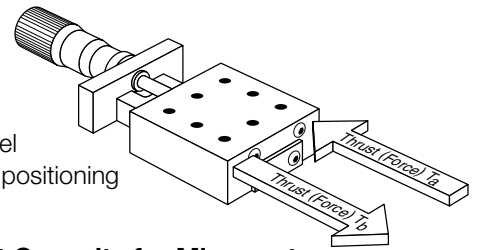
### Moment Load

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<sub>a</sub> and T<sub>b</sub> Thrust Capacity for Micrometer, Fine Screw and Differential Screw Drives

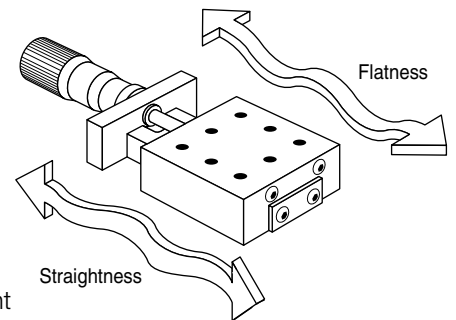
With these types of drives the mounting surface or stage carriage is pressed against the drive mechanism by means of a spring. Because of this the maximum thrust which the stage assembly can maintain is different when pressing toward the spring or away from it. When pressing toward the spring, the force 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<sub>a</sub> and T<sub>b</sub>). T<sub>a</sub> refers to the load capacity against the micrometer and T<sub>b</sub> 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

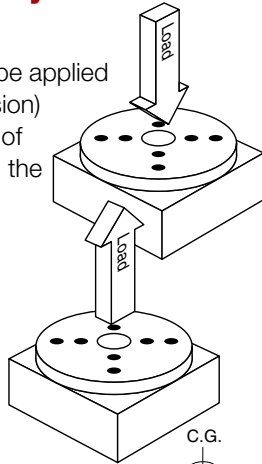
This is the amount of error a linear positioner deviates from an ideal straight line. The straight line accuracy is the error in the horizontal plane while flatness is the error in the vertical plane. Both the straight line and the flatness accuracy are measured at the moving carriage surface center.



## Main Bearing Load Capacity

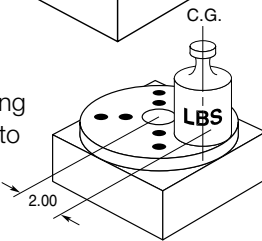
### Normal Load

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.



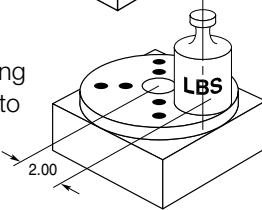
### Inverted Load

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.)

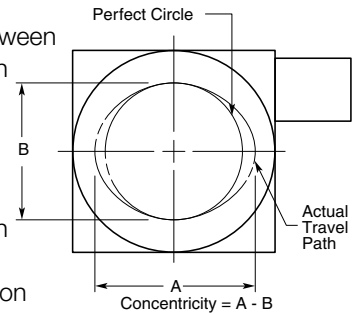


## Maximum Output Torque

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

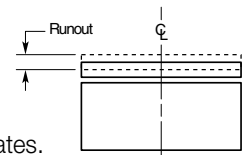
## Concentricity

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.



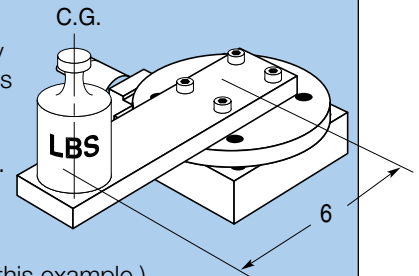
## Calculating Maximum Allowable Moment Loads on Rotary Positioners

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.

