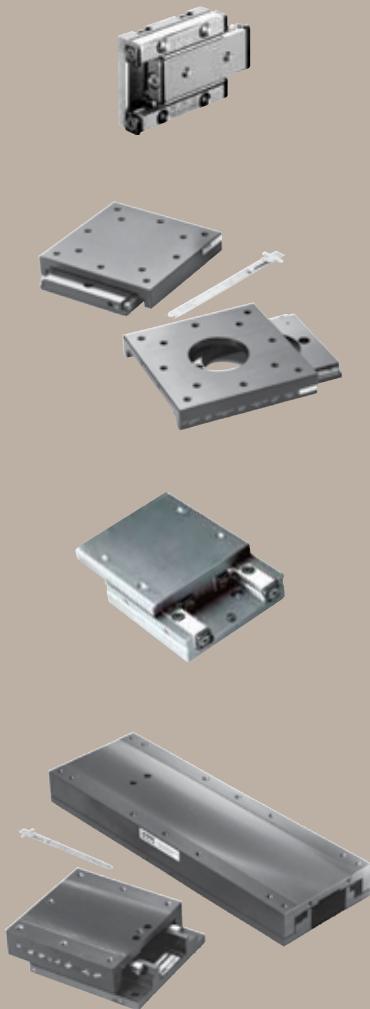


Crossed Roller Slides

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

36-38	Overview
39	1.496" (38,0 mm) Wide
40-41	1.75" (44,5 mm) Wide
42-43	1.97" (50,0 mm) Wide
44-45	2.62" (66,5 mm) Wide
46-47	2.95" (75,0 mm) Wide
48-49	3.94" (100,0 mm) Wide
50	5.00" (127,0 mm) Wide
51	6.00" (152,4 mm) Wide
52-60	Performance Curves

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.

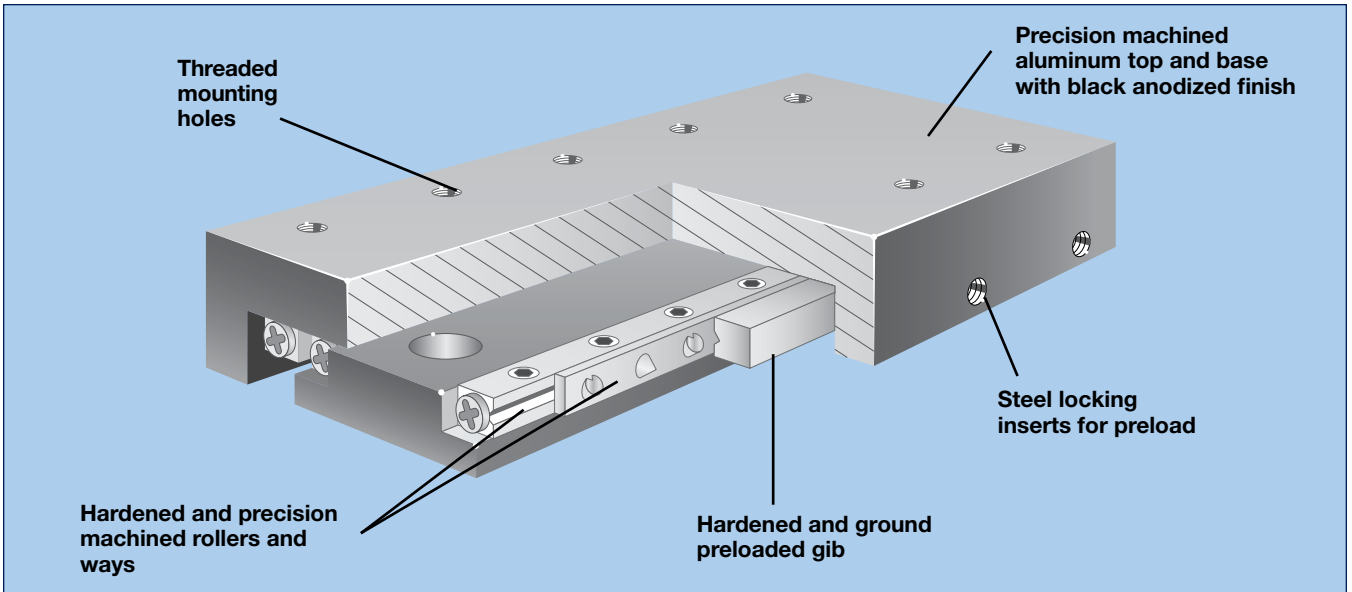
Standard Features

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



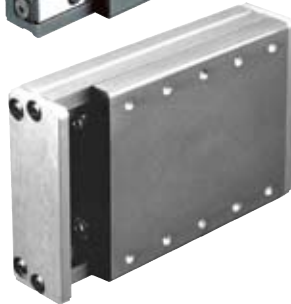
CR and SE Series

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



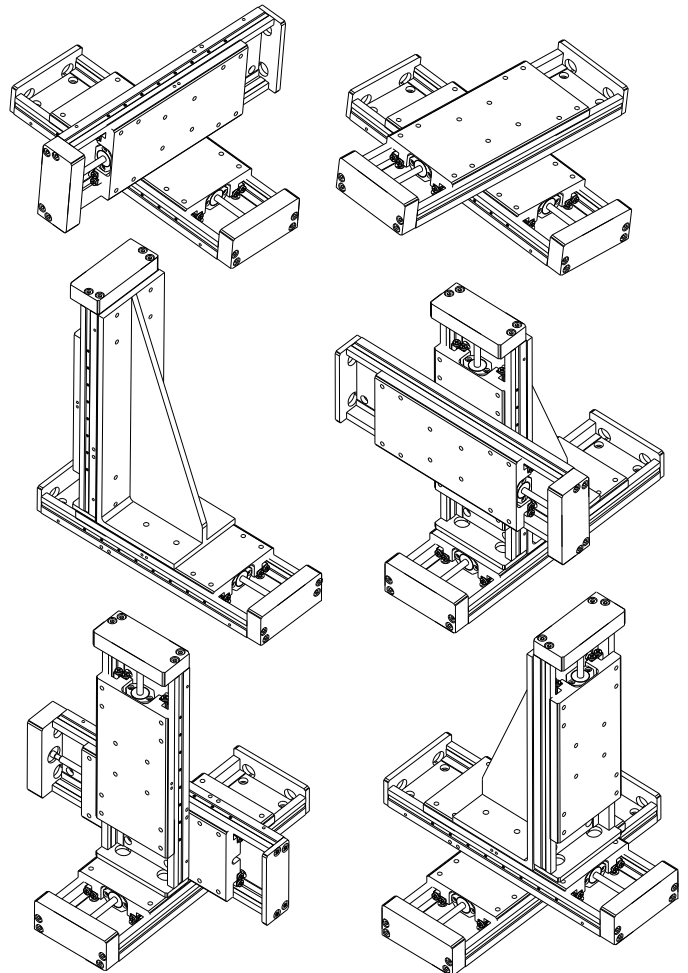
SP Series

Limited Travel Slides
Metric Mounting Only



Mounting Orientations

(see Accessory section for details for Z-brackets)



Selection

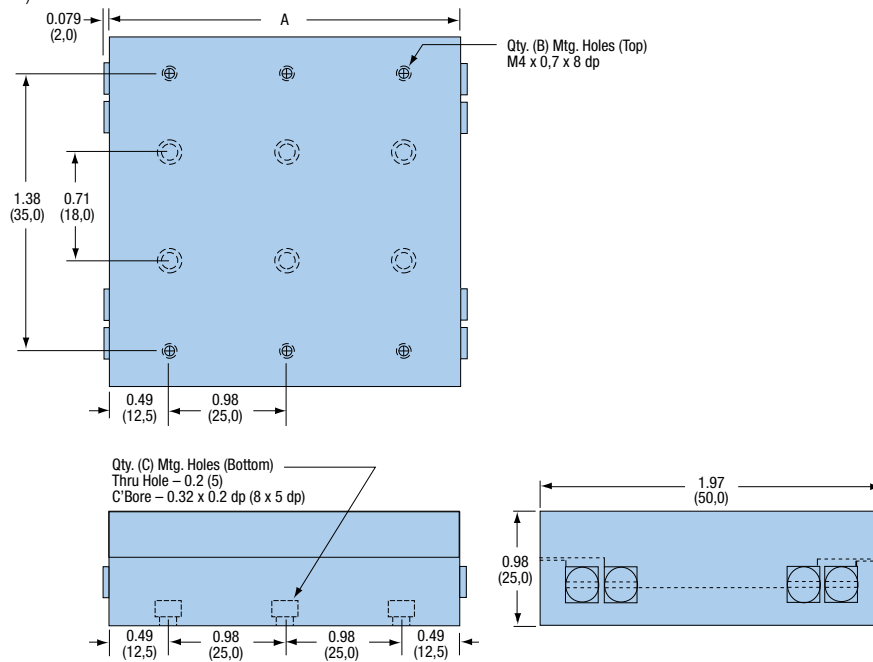
Series	Width in (mm)	Travel		Normal Load		Mounting		Page
		in	(mm)	lbs	(kg)	Imperial	Metric	
SW038	1.496 (38,0)	0.98	(25)	213	(97)		•	39
		1.97	(50)	263	(119)		•	39
		2.95	(75)	351	(159)		•	39
		3.94	(100)	439	(199)		•	39
		4.92	(125)	527	(239)		•	39
		5.91	(150)	614	(278)		•	39
		7.87	(200)	789	(358)		•	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	(119)		•	46
				348	(158)		•	47
		2.95	(75)	351	(159)		•	46
				439	(199)		•	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	(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
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

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		Normal Load		Weight		Dimension A		Qty B	Qty C
	in	(mm)	lbs	(kg)	lbs	(kg)	in	(mm)		
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

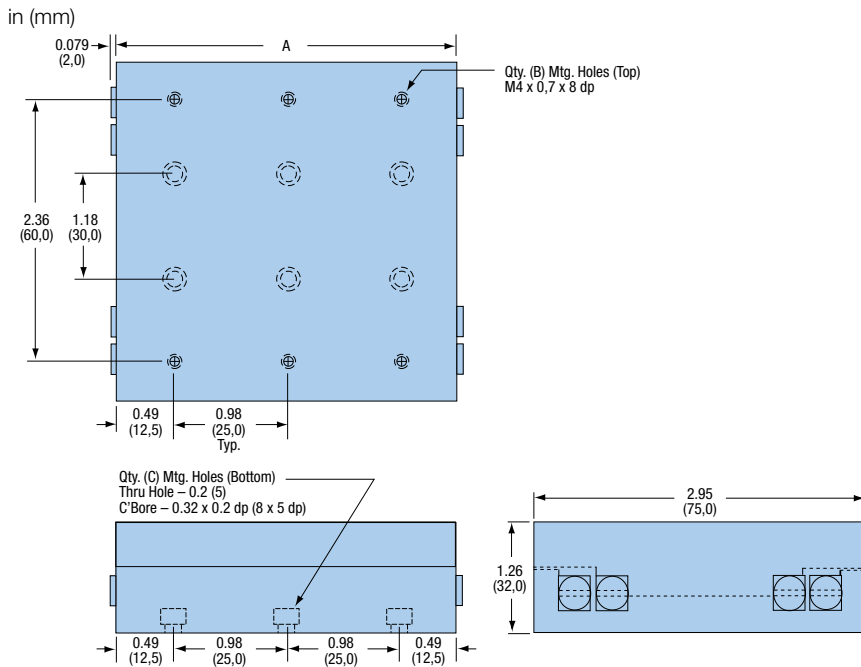


SE075 Series

Specifications	
Travel:	1.97 – 7.87 in (50 – 200 mm)
Size:	
Width	2.95 in (75,0 mm)
Length	3.11 – 9.02 in (79,0 – 229,1 mm)
Height	1.26 in (32,0 mm)
Load:	
Normal	263 – 789 lbs (119 – 358 kg)
Moment: Yaw, Pitch, Roll	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



Model	Travel		Normal Load		Weight		Dimension A		Qty B	Qty C
	in	(mm)	lbs	(kg)	lbs	(kg)	in	(mm)		
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

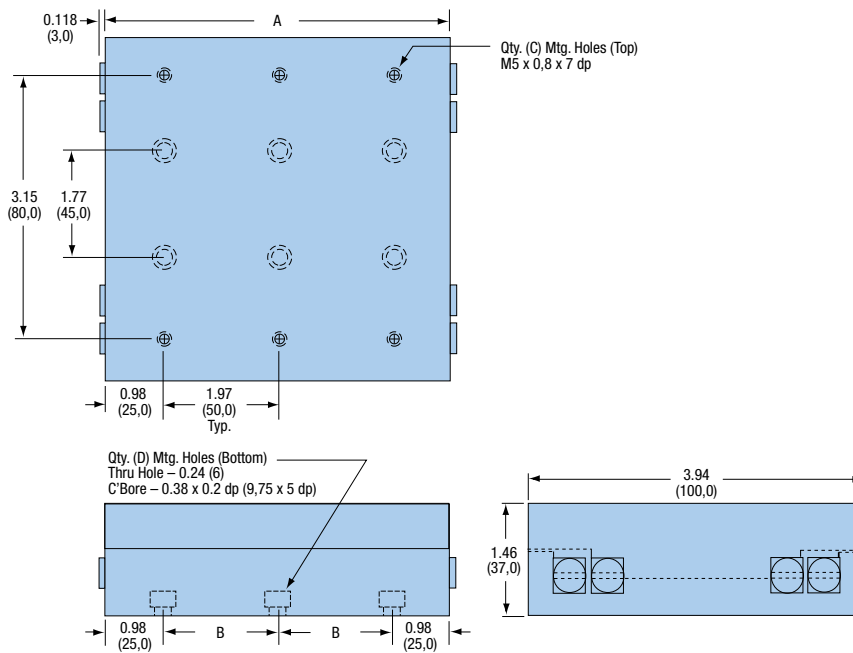
SE100 Series

Specifications

Travel:	2.95 – 11.81 in (75 – 300 mm)
Size:	
Width	3.94 in (100,0 mm)
Length	4.10 – 13.94 in (104,1 – 354,1 mm)
Height	1.46 in (37,0 mm)
Load:	
Normal	795 – 2758 lbs (631 – 1242 kg)
Moment: Yaw, Pitch, Roll	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



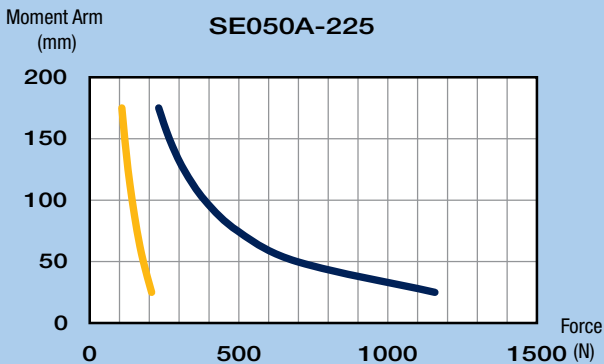
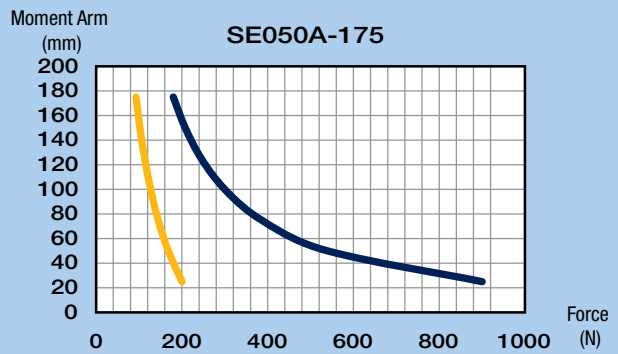
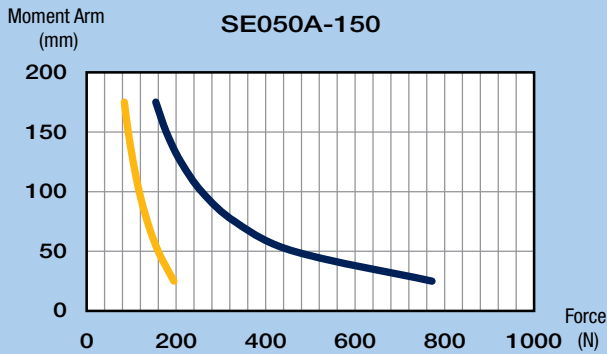
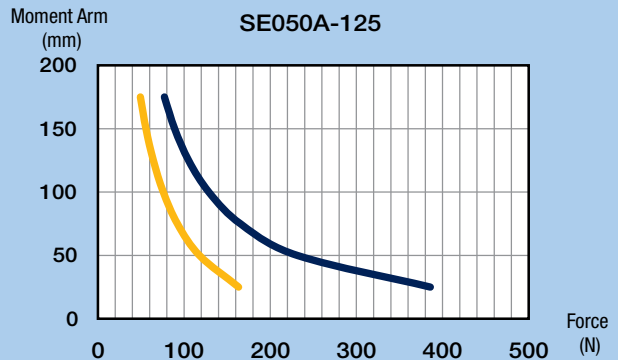
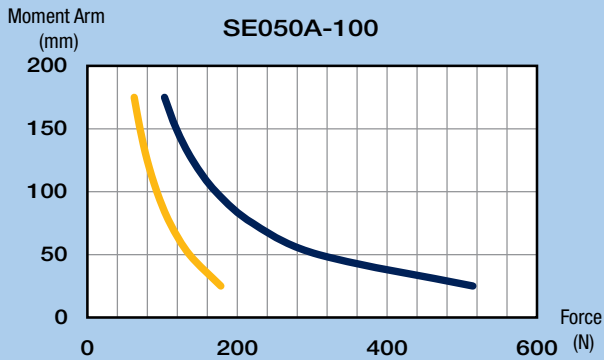
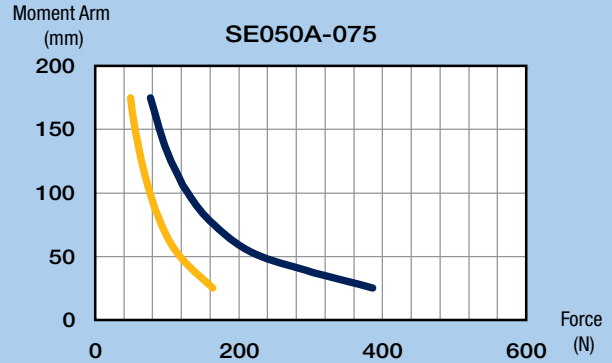
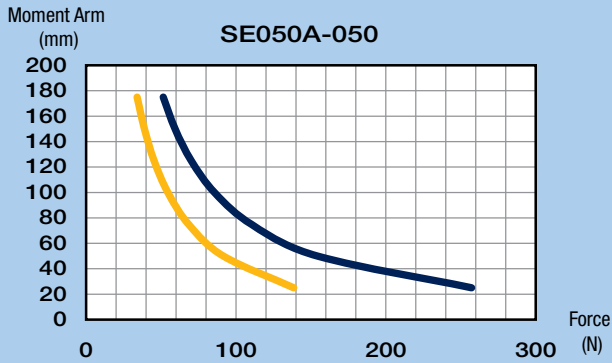
Dimensions in (mm)



Model	Travel		Normal Load		Weight		Dimension A		Dimension B		Qty C	Qty D
	in	(mm)	lbs	(kg)	lbs	(kg)	in	(mm)	in	(mm)		
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

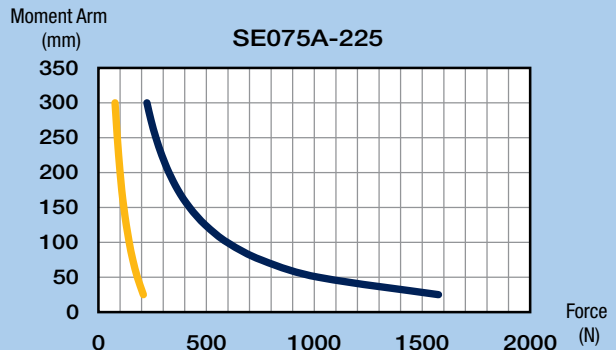
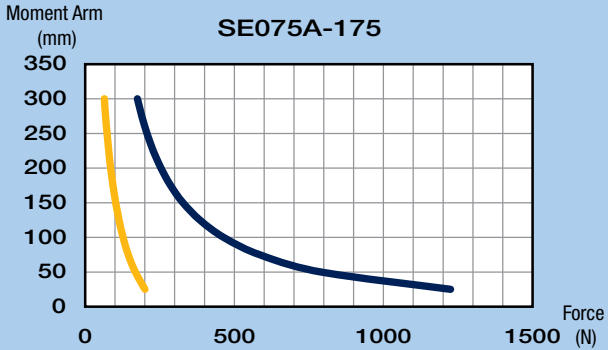
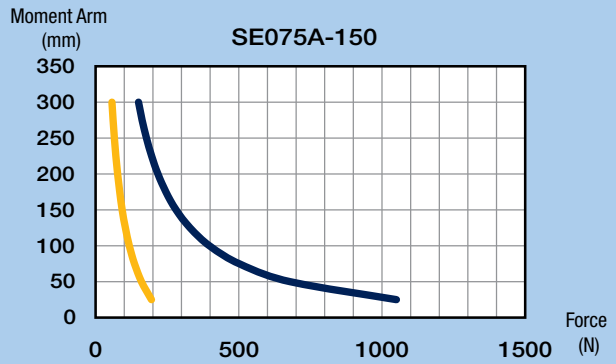
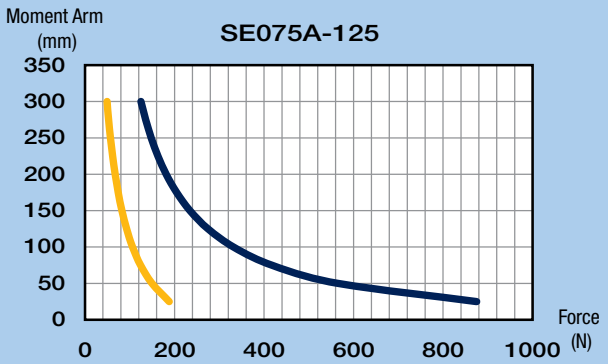
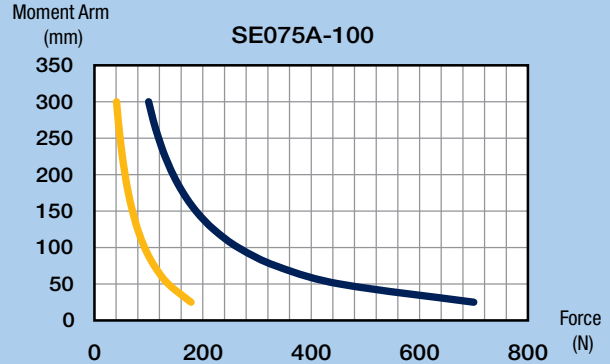
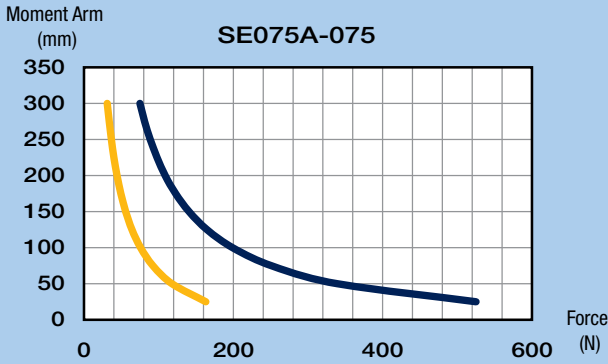
Yaw, Pitch, Roll

Yaw & Pitch Roll



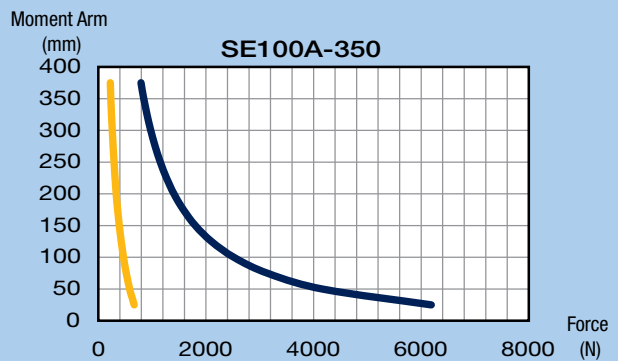
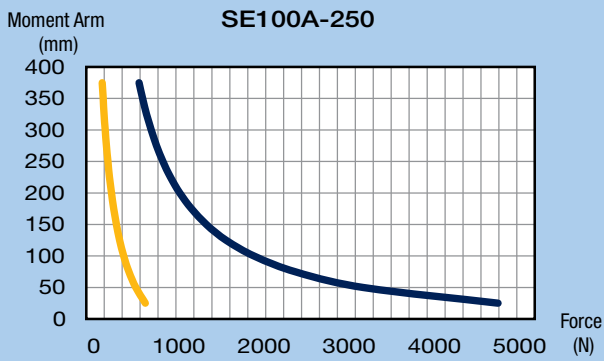
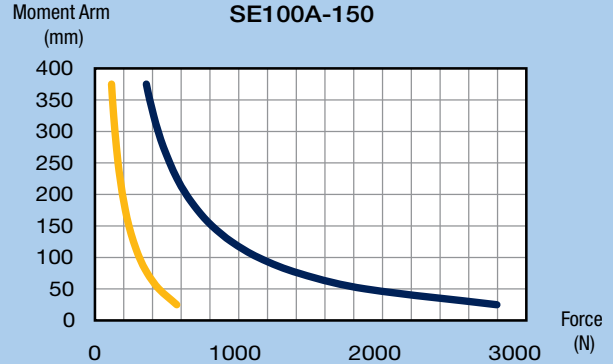
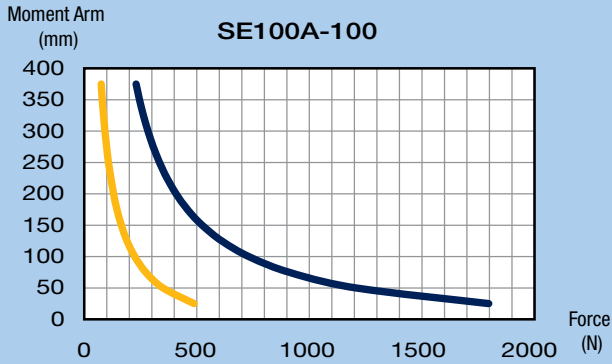
Yaw, Pitch, Roll

Yaw & Pitch Roll



Yaw, Pitch, Roll

Yaw & Pitch Roll





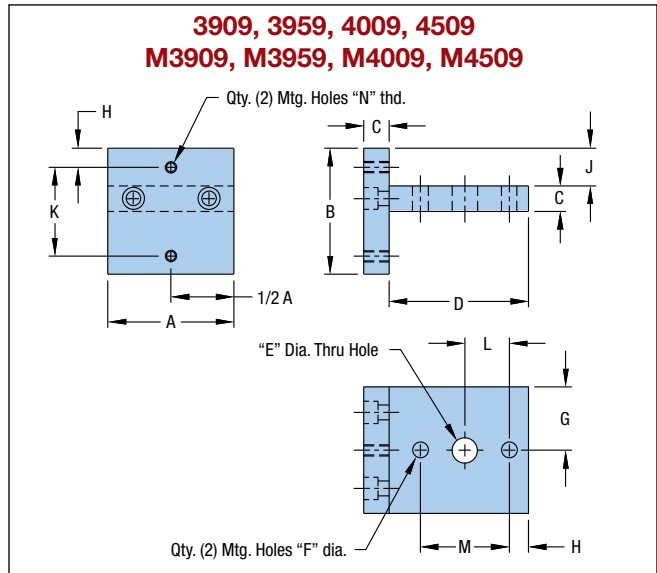
Accessories for linear and rotary positioners

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

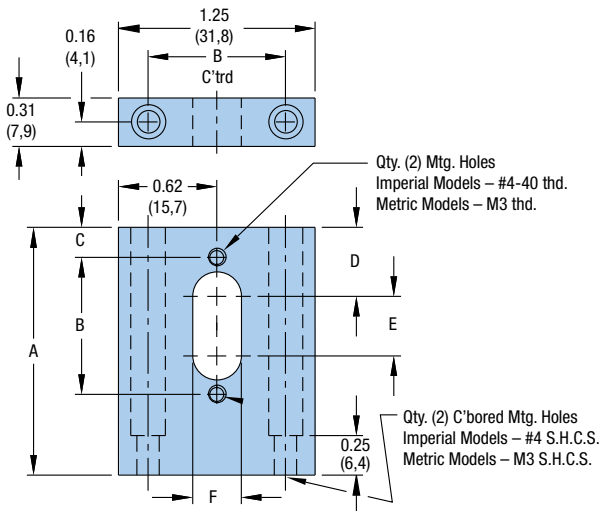
124-127	Z-Axis Brackets
128-129	Micrometer Heads
130-132	Optical Mounts

Z-Axis Brackets



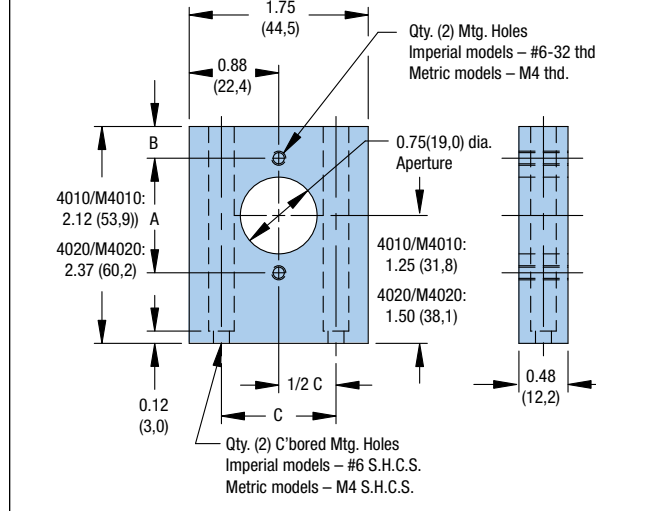
		Dimensions – in (mm)											Thd. N	
	Model	A	B	C	D	E	F	G	H	J	K	L	M	
Imperial	3909	1.25	1.25	0.25	1.38	0.25	0.156	0.62	0.19	0.38	0.88	0.44	0.88	#4-40
	3959	1.25	1.25	0.25	1.38	0.25	0.156	0.62	0.19	0.04	0.88	0.44	0.88	#4-40
	4009	1.75	1.69	0.25	1.88	—	0.156	0.88	0.31	0.63	1.12	—	1.12	#6-32
	4509	2.44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

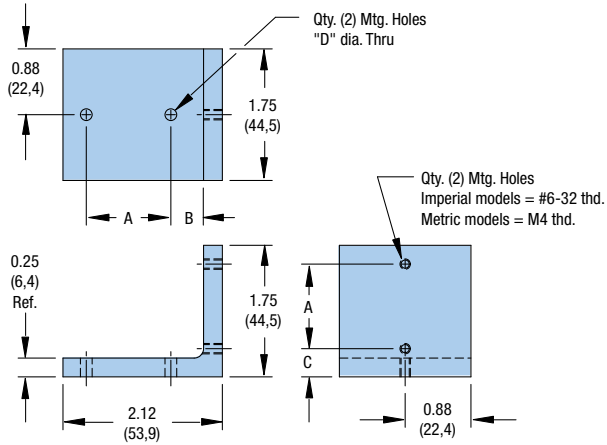
**4010, 4020
M4010, M4020**



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

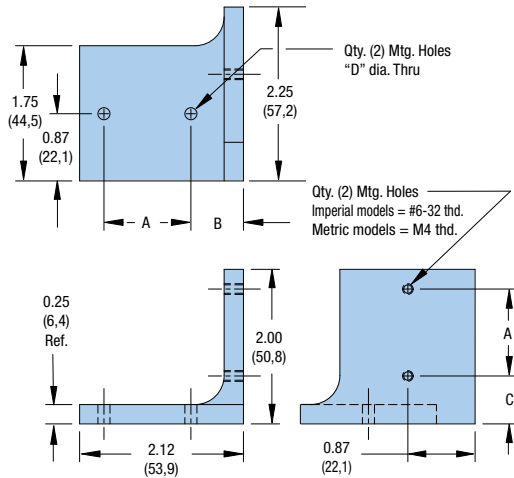


4059 M4059



4059A M4059A

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



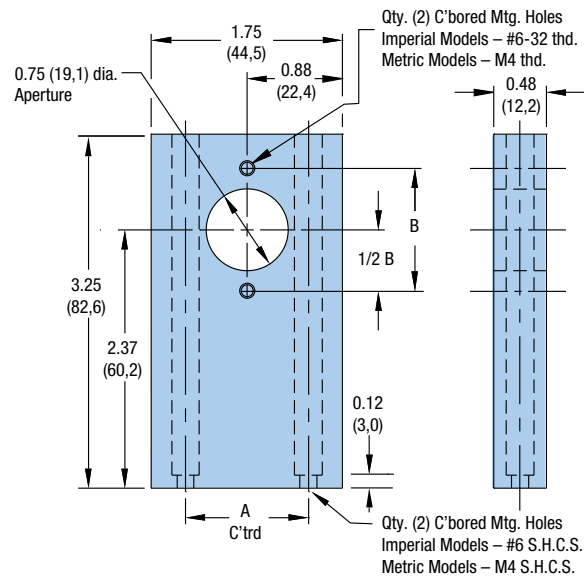
Dimensions - in (mm)

	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)

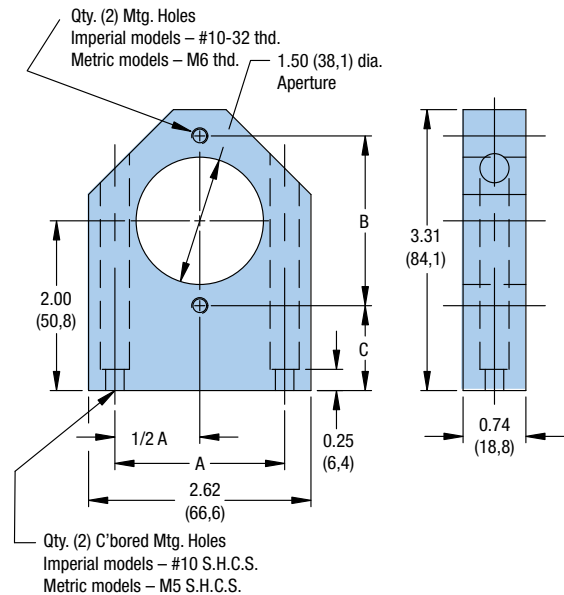
4060 M4060



Dimensions - in (mm)

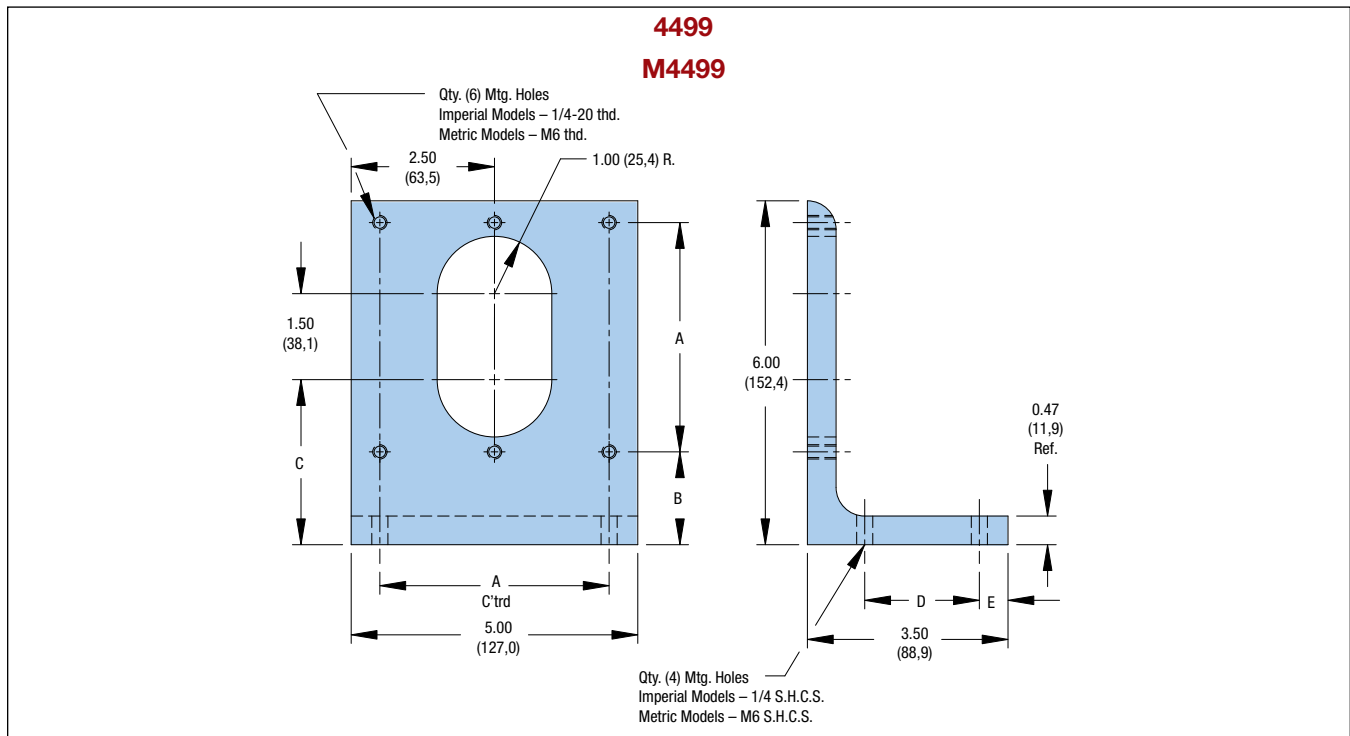
	Model	A	B
Imperial	4060	1.13	1.13
Metric	M4060	(30,0)	(30,0)

4510 M4510

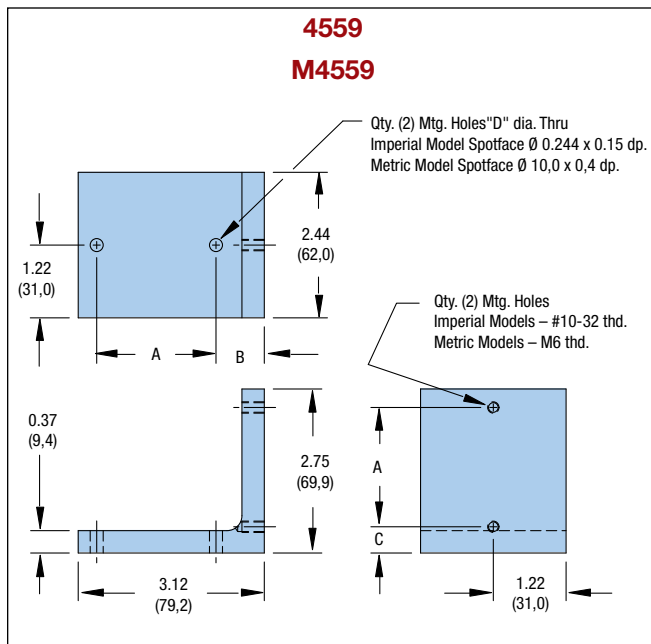


Dimensions - in (mm)

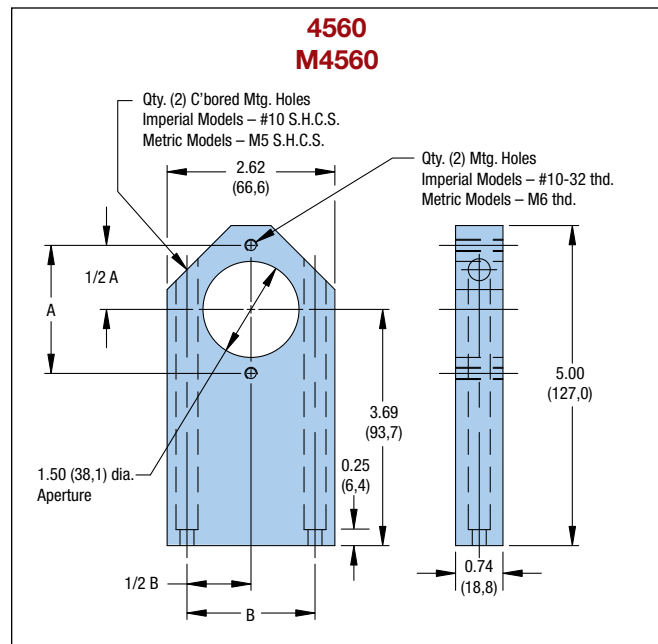
	Model	A	B	C
Imperial	4510	2.00	2.00	1.00
Metric	M4510	(50,0)	(50,0)	(25,8)



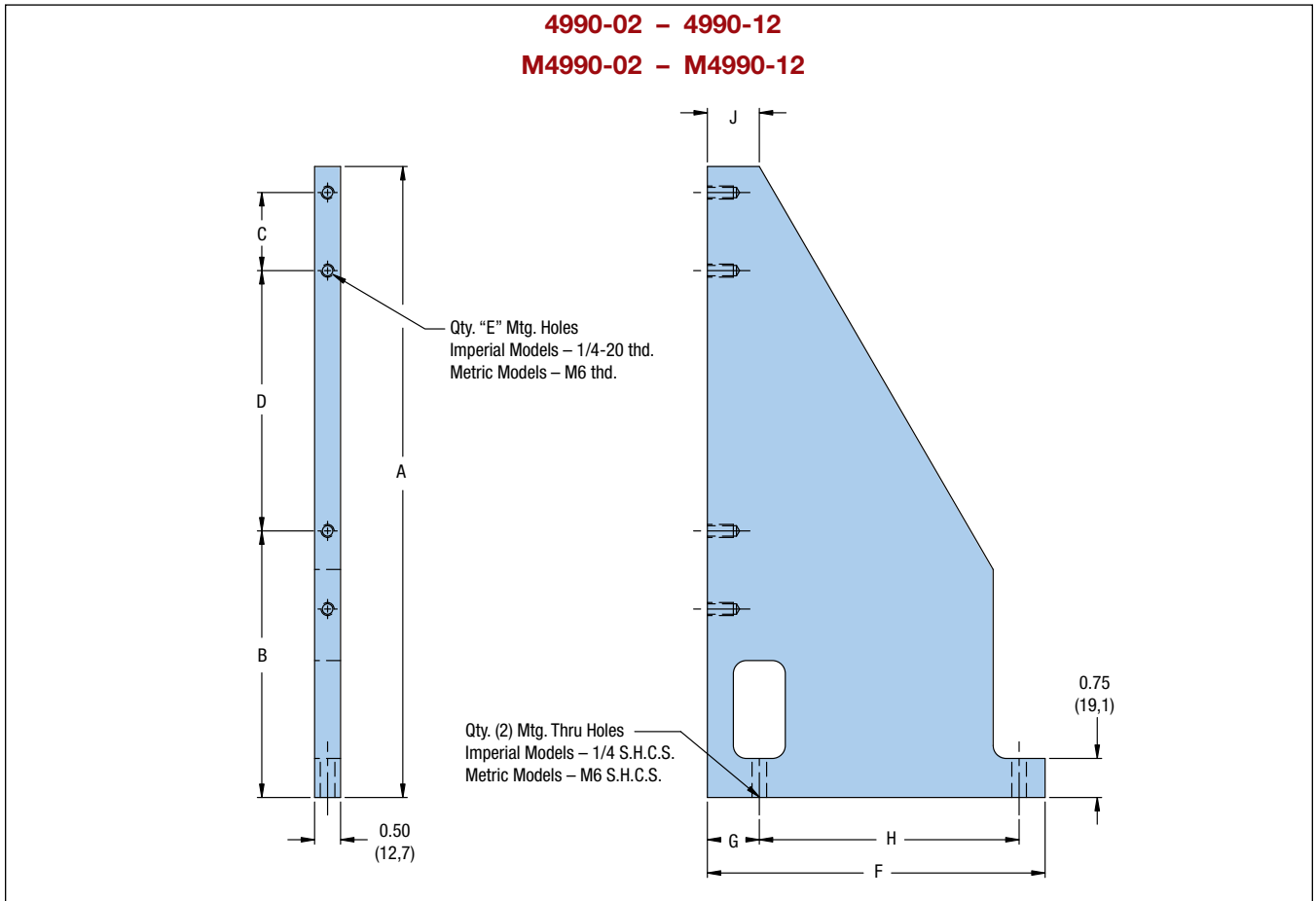
Dimensions – in (mm)					
	Model	A	B	C	E
Imperial	4499	4.00	1.62	2.88	0.50
Metric	M4499	(100,0)	(40,5)	(71,4)	(13,1)



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



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	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)	

Accessories

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.

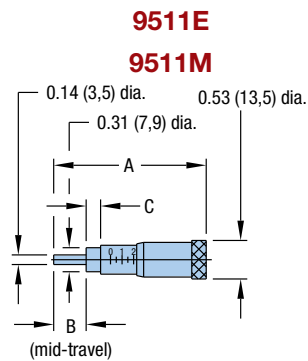


Figure A
Mini Thimble Micrometer Head

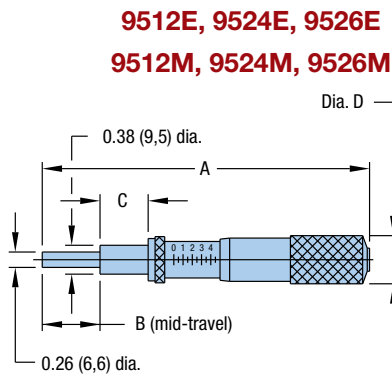


Figure B
Standard Thimble Micrometer Head

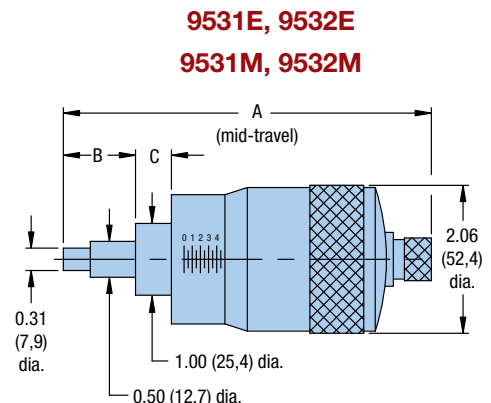


Figure C
Large Thimble Micrometer Head

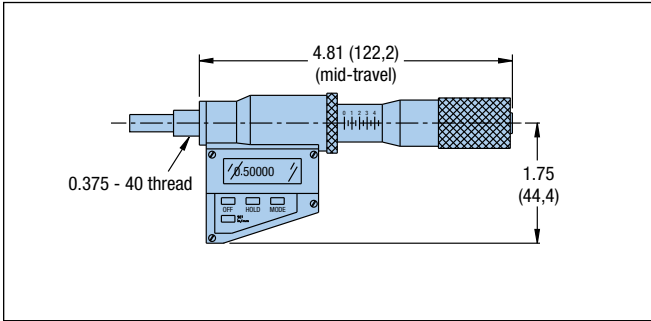
		Model Number	Figure	Travel in (mm)	Graduations in (mm)	Dimensions – in (mm)			
						A	B	C	D
Imperial		9511E	A	0.50	0.001	2.03	0.50	0.187	—
		9512E	B	0.50	0.001	2.63	0.50	0.375	0.54
		9524E	B	1.00	0.001	4,23	0.75	0.625	0.73
		9526E	B	2.00	0.001	6.16	1.25	0.625	0.73
		9531E	C	1.00	0.0001	5.18	0.94	0.56	—
		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:

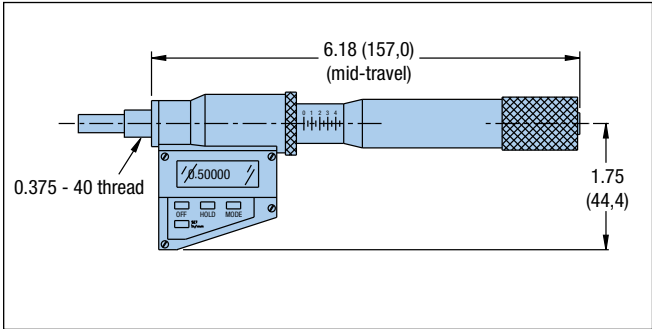
- Incremental and/or absolute positioning modes
- Zero set at any position, inch and millimeter readout (0.001 mm resolution), display hold, and automatic shutdown after two hours to conserve the integral battery
- 1.00 inch micrometer travel
- Battery powered for 500 hours of use



Model 9552

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

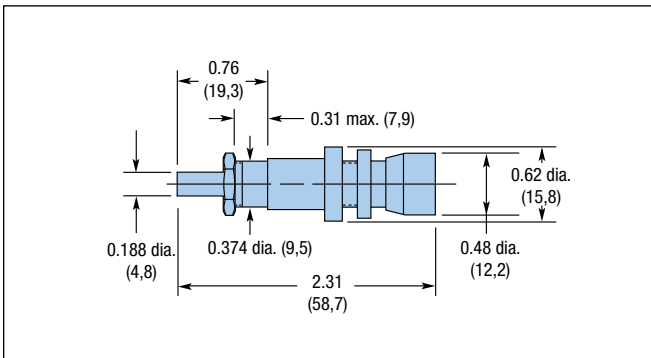
- 2 inch spindle
- Display face swivels for easy reading at various angles
- Non-rotating spindle
- Pre-set, zero, and inch/mm
- Carbide tipped measuring face
- Battery powered for 5,000 hours of use



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.

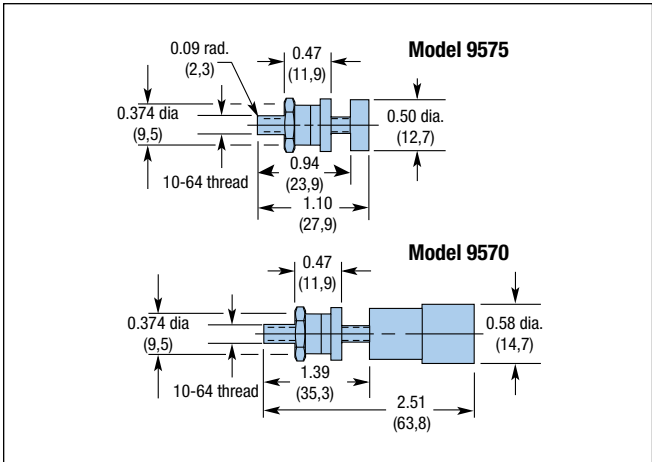


9570 Series Fine Adjustment Screws

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.



Accessories

Optical Cell Mounts

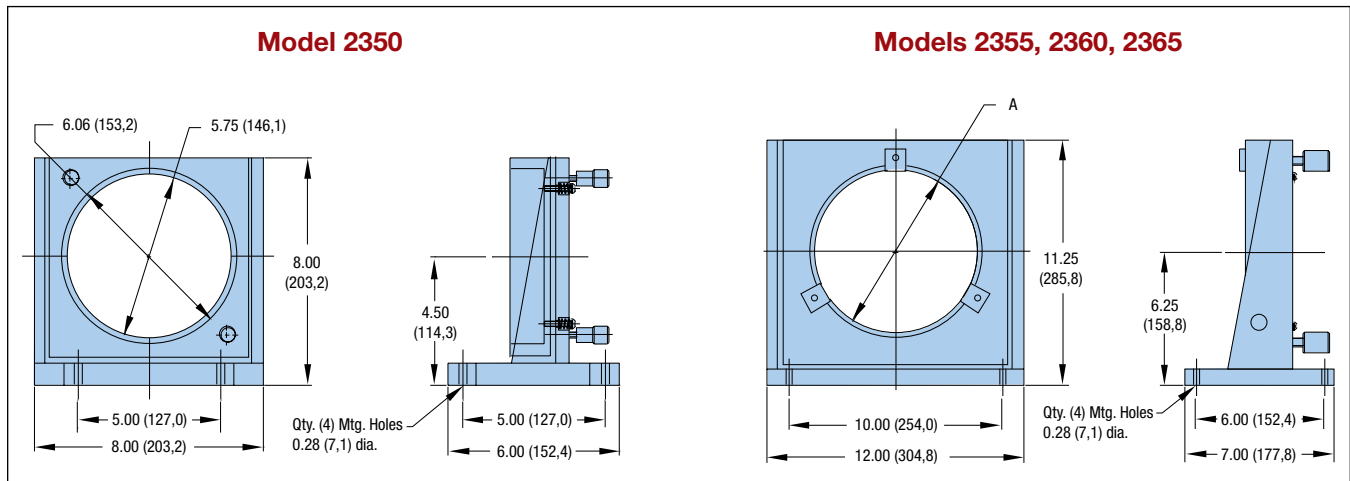
Model 2350: 6.0” Diameter

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			



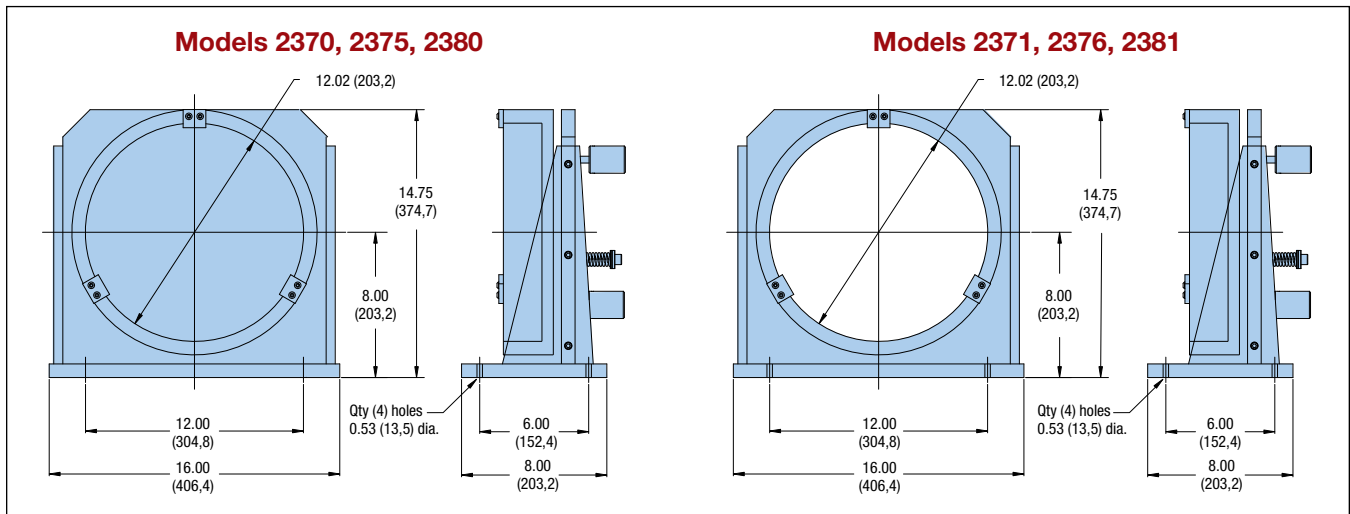
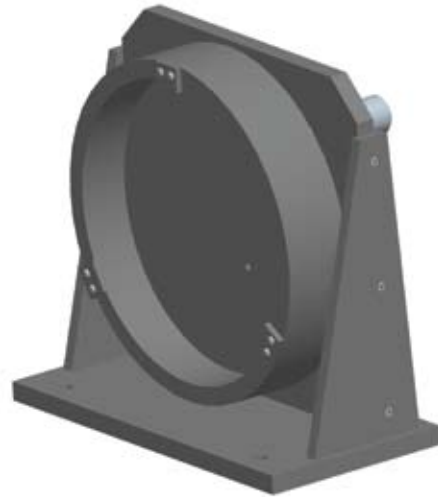
Optical Cell Mounts

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.



Specifications	Solid Back Models			Aperture Models		
	2370	2375	2380	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		

Accessories

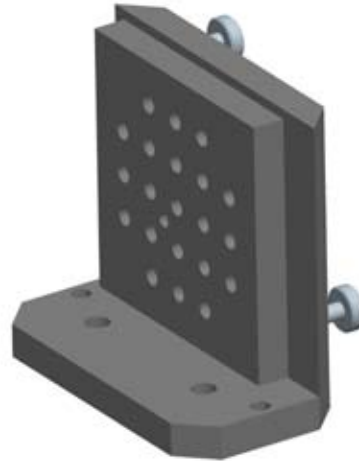
Mirror Mounts

Model 5000/5100: 3.0" Square Mounting Surface

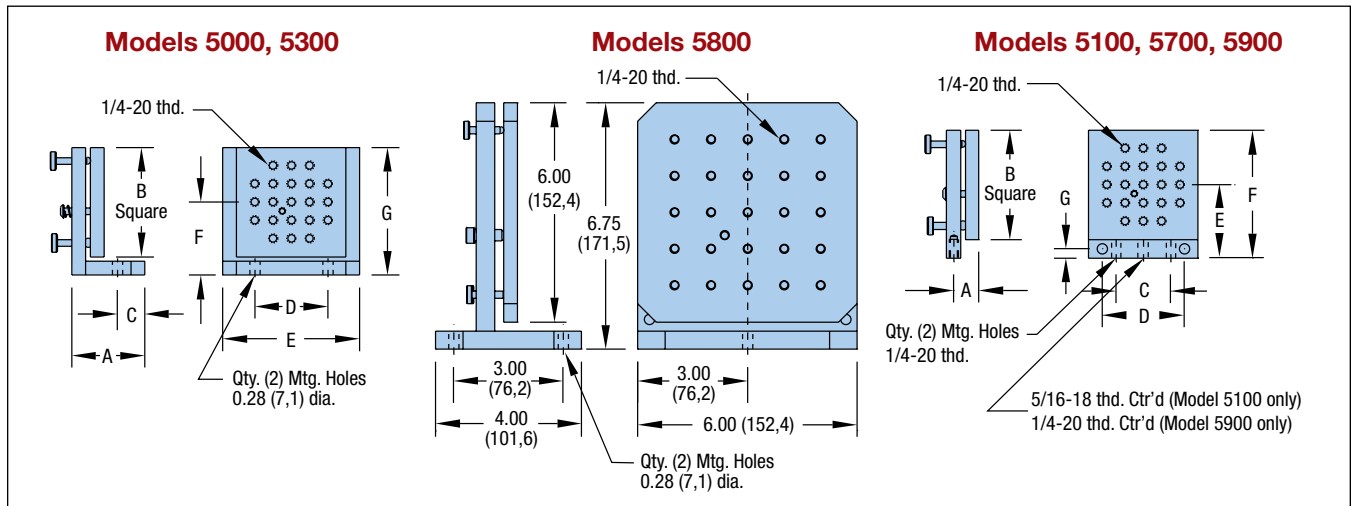
Model 5300/5700: 4.5" Square Mounting Surface

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)	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"
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		



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)

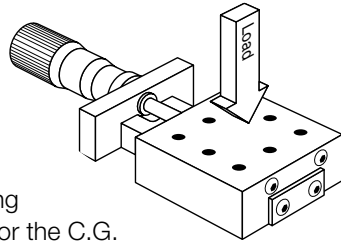
Travel

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

Bearing Load Capacity

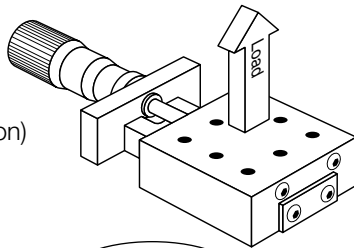
Normal Load

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.



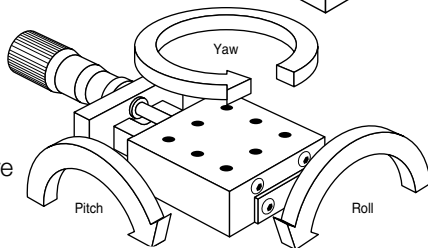
Inverted Load

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



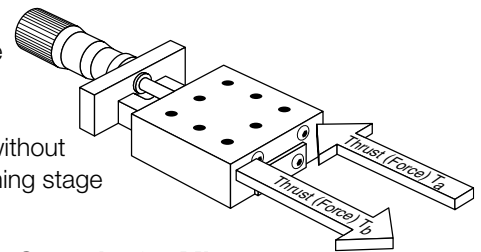
Moment Load

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

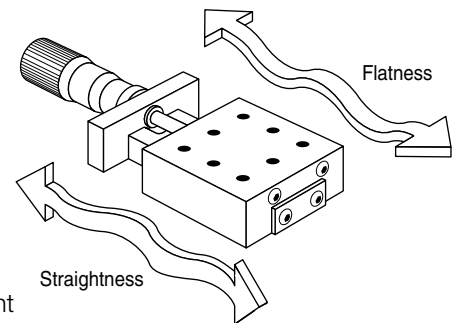
With these types of drives the mounting surface or stage carriage is pressed against the drive mechanism by means of a spring. Because of this the maximum thrust which the stage assembly can maintain is different when pressing toward the spring or away from it. When pressing toward the spring, the force 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). T_a refers to the load capacity against the micrometer and T_b is the spring load capacity. Refer to specific product drawings for load direction.

Screw Drive Thrust Capacity

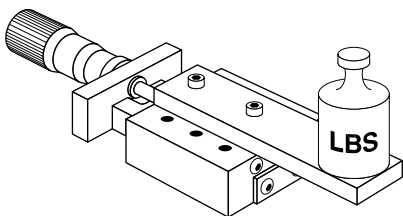
Stages which use screw drive assemblies will only have one thrust capacity rating. This rating is for either direction of travel.

Straight Line and Flatness Accuracy

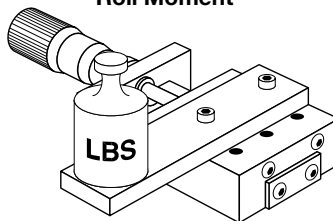
This is the amount of error a linear positioner deviates from an ideal straight line. The straight line accuracy is the error in the horizontal plane while flatness is the error in the vertical plane. Both the straight line and the flatness accuracy are measured at the moving carriage surface center.



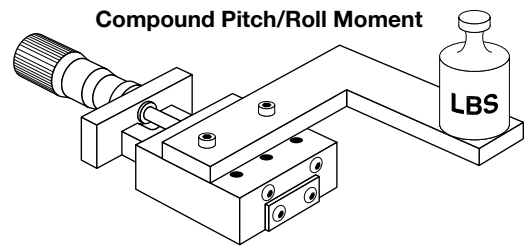
Pitch Moment



Roll Moment



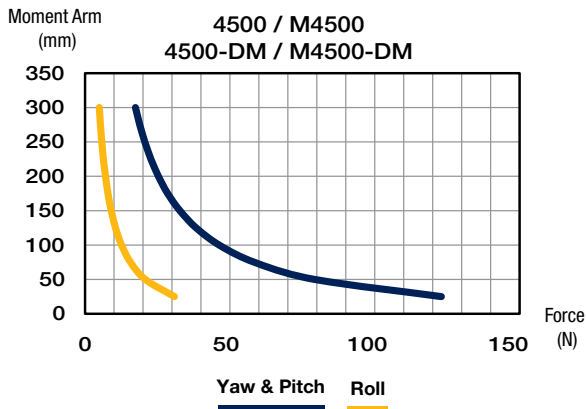
Compound Pitch/Roll Moment



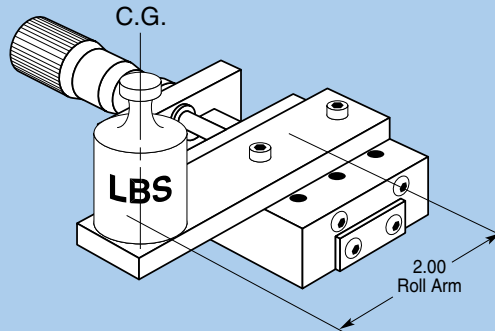
Calculating Maximum Allowable Moment Loads on Linear Slides and Stages

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, see 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.

