

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.

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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

Exact 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:

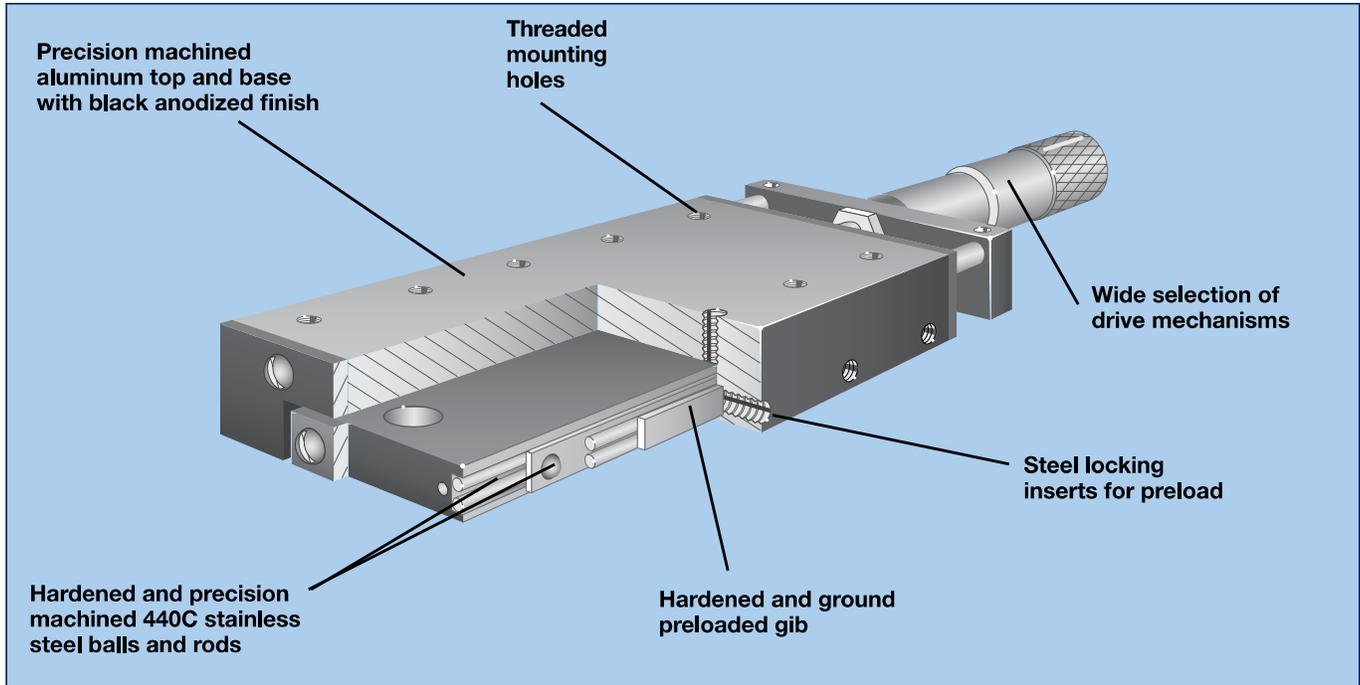
- Aluminum top and base and stainless steel bearings
- Low friction linear adjustment with no backlash or side play
- Factory preloaded to provide dynamic stability and minimum runout
- Both top and bottom mounting surfaces are precision machined to provide flat mounting surfaces
- Locking screw to positively 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.



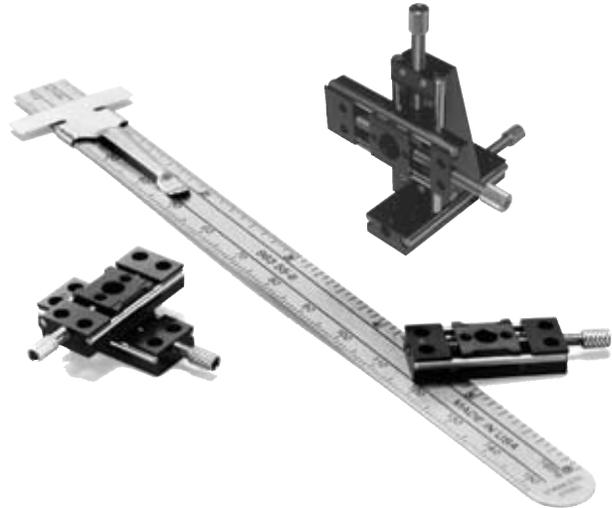
Ball Bearing Positioners

Selection

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

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 | |



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

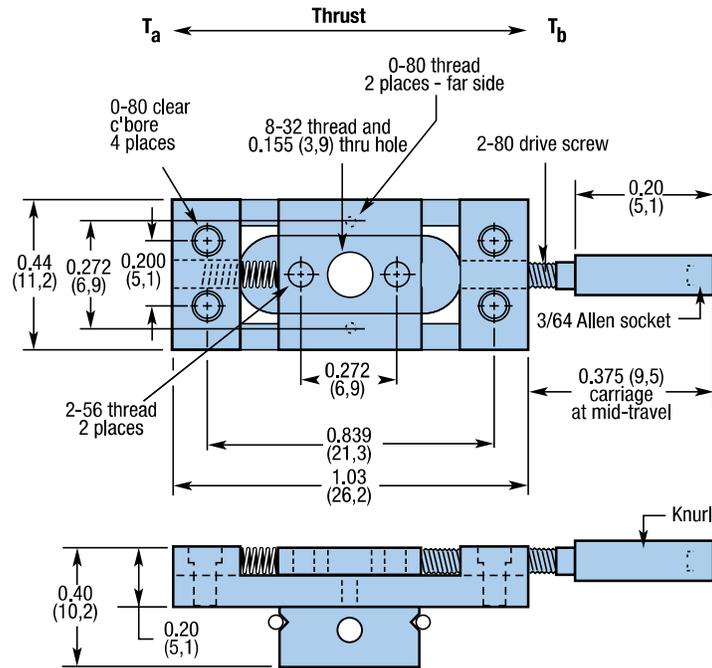
- Black anodized aluminum body with stainless steel rails
- Precise, smooth motion
- Aperture accommodates pinhole adapters
- No backlash; positive spring-loaded carriage
- Fine 80 TPI screw adjustment with Allen socket
- Sturdy one-piece base, three-piece construction
- Includes ball driver
- Compact 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

| Series | Model | Configurariion |
|--------|------------|----------------|
| | 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 |

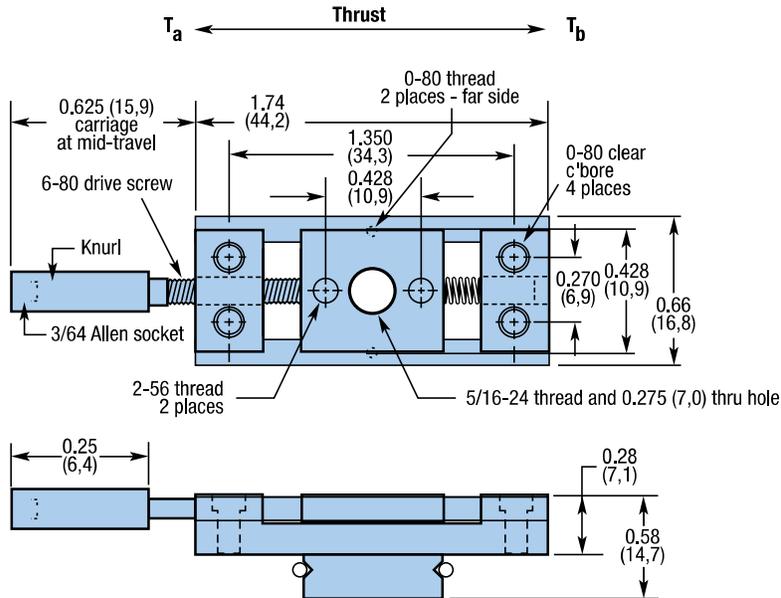


Dimensions in (mm)

MM-1



MM-3



Ball Bearing Positioners

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 | |



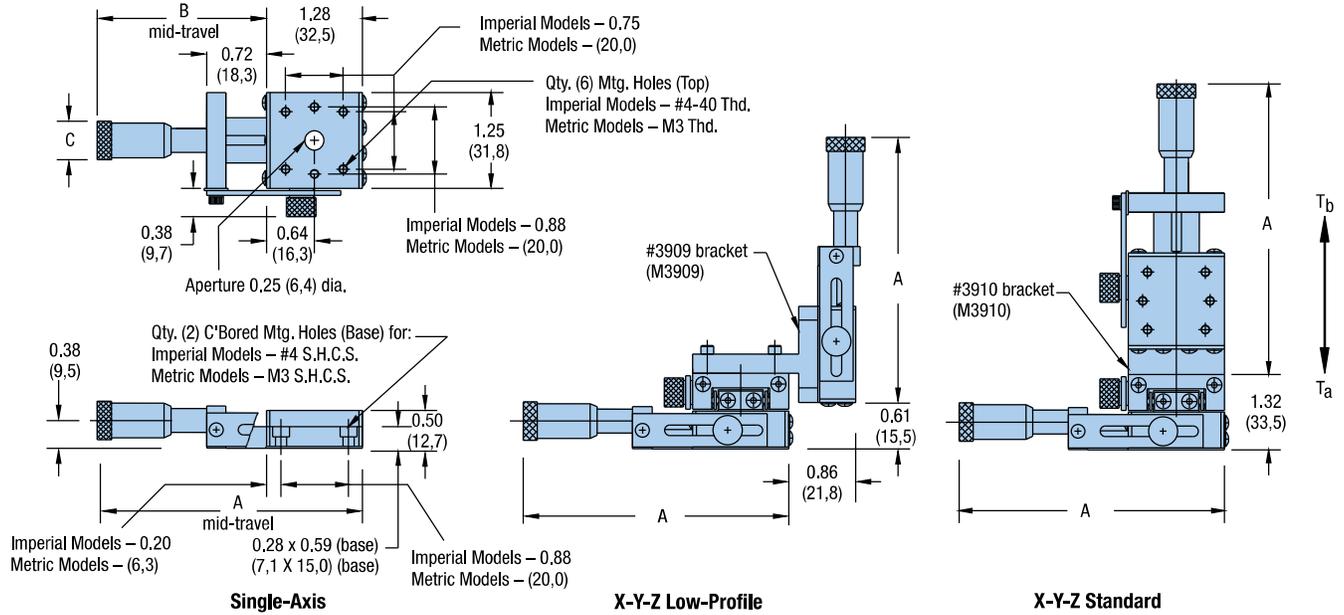
| | Style | Drive Mechanism | Travel | Center Drive Models | | | | Side Drive Models | | | |
|----------|--------------------|---------------------|---------|---------------------|----------|-------------------|----------------|-------------------|----------|-------------------|----------------|
| | | | | Single Axis | Two Axis | Y-Y-Z Low Profile | Y-Y-Z Standard | Single Axis | Two Axis | Y-Y-Z Low Profile | Y-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.

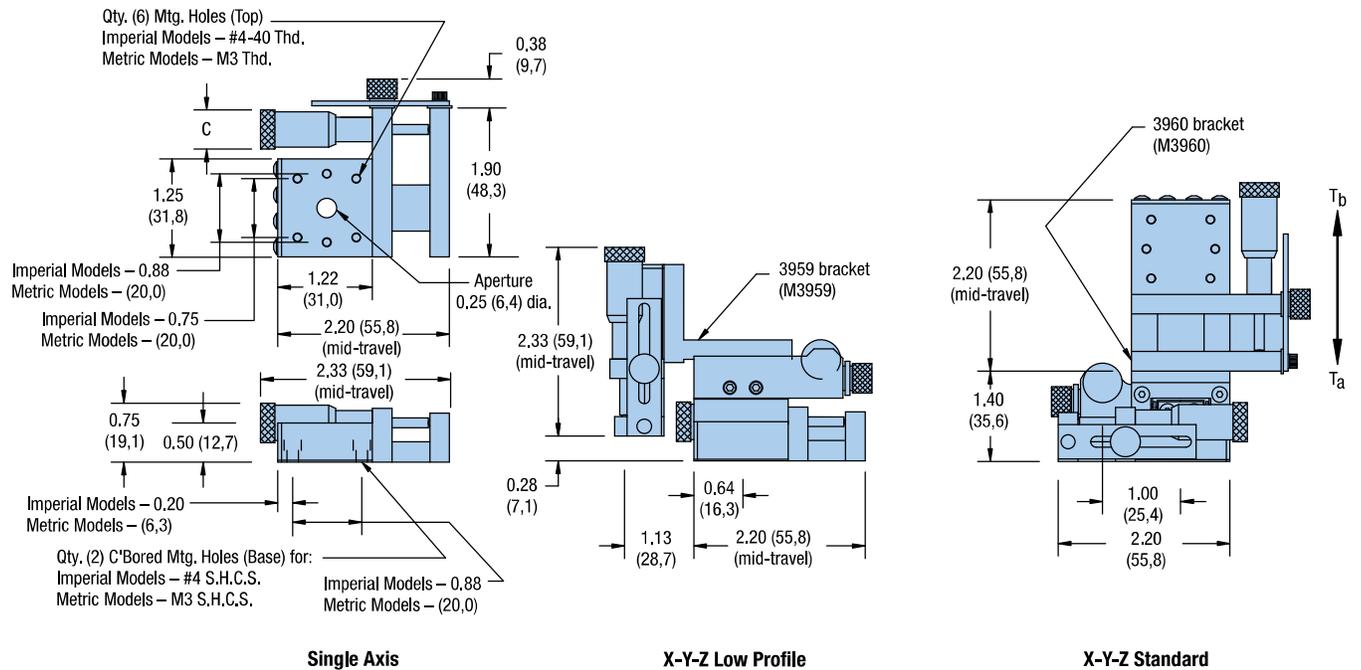
Center Drive



Ball Bearing Positioners

| Style | Drive Mechanism | Travel | Imperial Model Dimensions — in | | | Metric Model Dimensions — mm | | |
|-----------|---------------------|---------|--------------------------------|------|------|------------------------------|------|------|
| | | | A | B | C | 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



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 | |

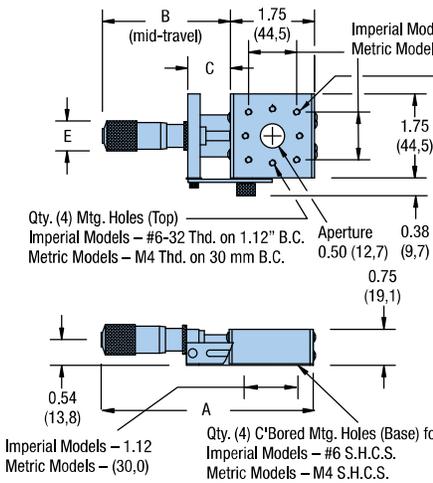


| | Style | Drive Mechanism | Travel | Center Drive Models | | | | Side Drive Models | | | |
|-------------------|--------------------|---------------------|---------------------|---------------------|----------|-------------------|----------------|-------------------|----------|-------------------|----------------|
| | | | | Single Axis | Two Axis | Y-Y-Z Low Profile | Y-Y-Z Standard | Single Axis | Two Axis | Y-Y-Z Low Profile | Y-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 |
| | Aperture (0,5 in) | 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 |
| | | 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 | |
| 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 |
| | | Differential Screw | 2/8 mm | M4006D | M4026D | M4036D | M4046D | M4056D | M4076D | M4086D | M4096D |
| | | | Fine Screw | 19 mm | M4007 | M4027 | M4037 | M4047 | M4057 | M4077 | M4087 |



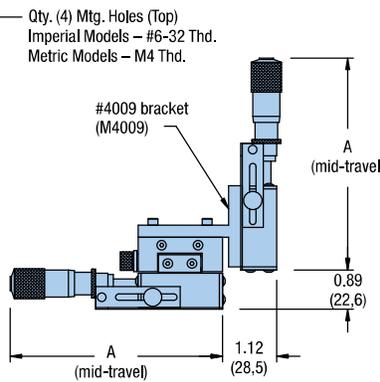
Dimensions in (mm)

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

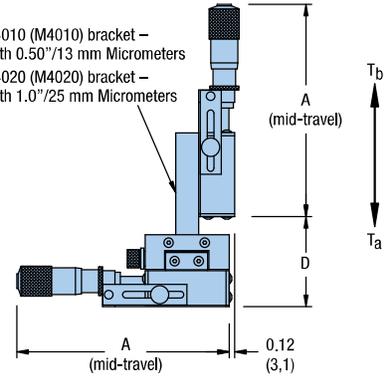


Single-Axis

Center Drive

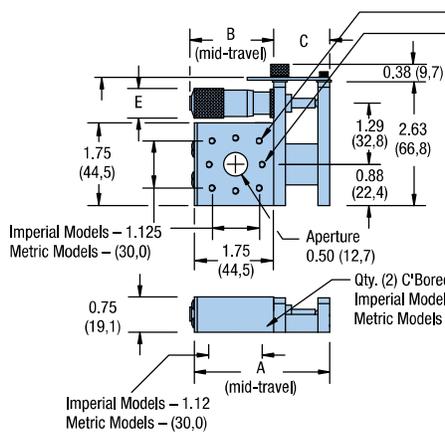


X-Y-Z Low-Profile

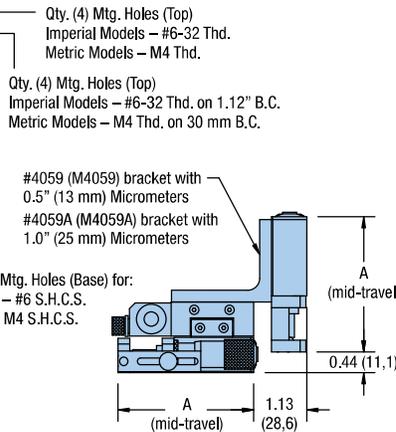


X-Y-Z Standard

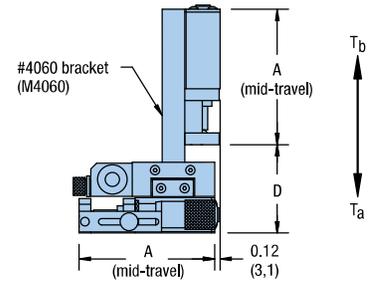
Side Drive



Single-Axis



X-Y-Z Low-Profile



X-Y-Z Standard

| Style | Drive Mechanism | Travel | Center Drive Dimensions — in (mm) | | | | | Side Drive Dimensions — in (mm) | | | | | | |
|----------|-----------------|---------------------|-----------------------------------|---------|-------|------|--------|---------------------------------|--------|--------|--------|--------|--------|--------|
| | | | A | B | C | D | E | 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 | |
| | | 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 | |
| | 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 | |
| | Metric | Solid Top | Metric Micrometer | 13 mm | (112) | (68) | (23) | (47,8) | (13,6) | (75,5) | (45,2) | (30,2) | (47,8) | (13,6) |
| | | | Imperial Micrometer | 0.50 in | (112) | (68) | (23) | (47,8) | (13,6) | (75,5) | (45,2) | (30,2) | (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) |
| 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) | |

Ball Bearing Positioners



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

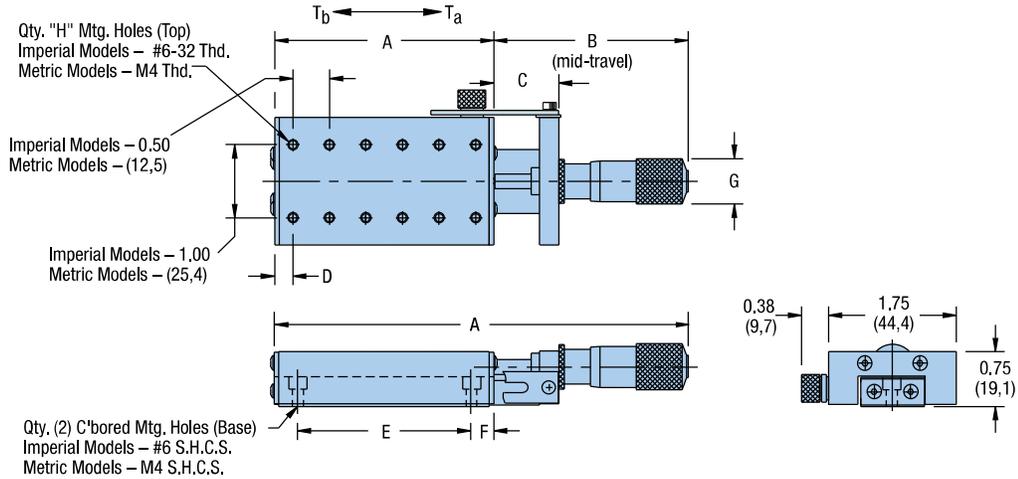
| Specifications | Imperial | Metric |
|--------------------------------|---|-------------------------|
| Travel: | 0.5 – 1.0 in | 13 – 25 mm |
| Size: | | |
| Width | 1.75 in | 44,4 mm |
| Length (mid-travel) | 4,60 – 8,28 in | 114,3 – 210,3 mm |
| Height | 0,75 in | 19,0 mm |
| Load: | | |
| Normal | 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.



| | | Dimensions — in (mm) | | | | | | | | | | | Qty |
|---------------------|---------------------|----------------------|---------------|---------|---------|---------|---------|--------|--------|--------|--------|--------|-----|
| | Drive Mechanism | Travel | Model | Load | Weight | A | B | C | D | E | F | G | H |
| Imperial | Imperial Micrometer | 0.50 in | 4102 | | | | 2.68 | 0.89 | | | | 0.54 | 8 |
| | | 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 | |
| | | 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 | |
| | | 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 | | |
| | 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) | 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) | |
| | | 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) | |
| | | 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) | | |
| | 1.0 in | M4304 | | | | (108,7) | (30,0) | | | | (17,9) | | |
| Fine Screw | 0.75 in | M4303 | | | | (63,5) | (22,6) | | | | (14,7) | | |

Ball Bearing Positioners

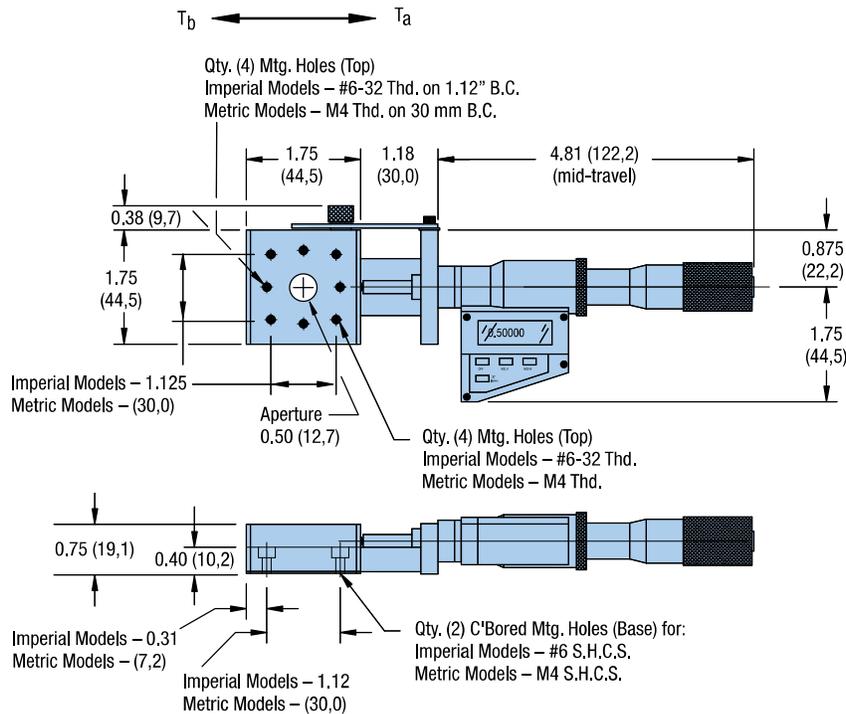
4000-DM/M4000-DM Series

| 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

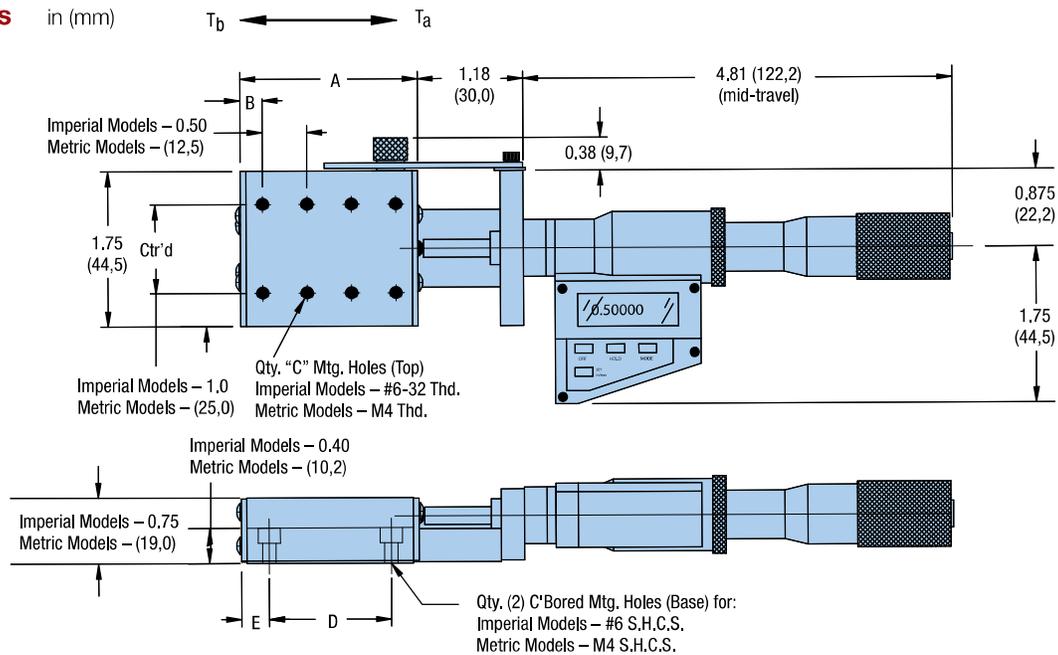
For additional end view dimensions, refer to the 4100-4300/M4100-4300 ball slide drawing, page 22. Consult factory for critical dimension concerns.

| 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 | |



Ball Bearing Positioners

Dimensions



| | | Normal Load | Weight | Dimensions – in (mm) | | | | |
|----------|----------|-------------|---------|----------------------|--------|----|--------|-------|
| | Model | | | 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 | |



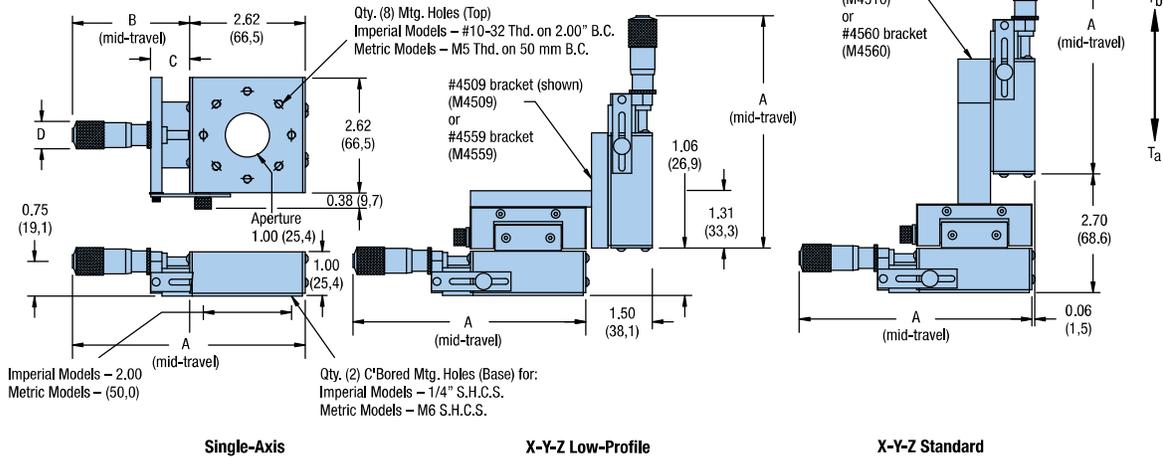
| | Style | Drive Mechanism | Travel | Center Drive Models | | | | Side Drive Models | | | |
|--------------------|--------------------|---------------------|-------------|---------------------|----------|-------------------|----------------|-------------------|----------|-------------------|----------------|
| | | | | Single Axis | Two Axis | Y-Y-Z Low Profile | Y-Y-Z Standard | Single Axis | Two Axis | Y-Y-Z Low Profile | Y-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 |
| | Aperture (1.0 in) | Differential Screw | 0.08/0.3 in | 4502D | 4522D | 4532D | 4542D | 4552D | 4572D | 4582D | 4592D |
| | | | 0.75 in | 4503 | 4523 | 4533 | 4543 | 4553 | 4573 | 4583 | 4593 |
| | | Fine Screw | 0.50 in | 4506 | 4526 | 4536 | 4546 | 4556 | 4576 | 4586 | 4596 |
| | | | 13 mm | 4506M | 4526M | 4536M | 4546M | 4556M | 4576M | 4586M | 4596M |
| 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 |
| | Aperture (25,4 mm) | Differential Screw | 2/8 mm | M4502D | M4522D | M4532D | M4542D | M4552D | M4572D | M4582D | M4592D |
| | | | 19 mm | M4503 | M4523 | M4533 | M4543 | M4553 | M4573 | M4583 | M4593 |
| | | Fine Screw | 13 mm | M4506M | M4526M | M4536M | M4546M | M4556M | M4576M | M4586M | M4596M |
| | | | 0.50 in | M4506 | M4526 | M4536 | M4546 | M4556 | M4576 | M4586 | M4596 |
| Differential Screw | 2/8 mm | M4506D | M4526D | M4536D | M4546D | M4556D | M4576D | M4586D | M4596D | | |
| | 19 mm | M4507 | M4527 | M4537 | M4547 | M4557 | M4577 | M4587 | M4597 | | |



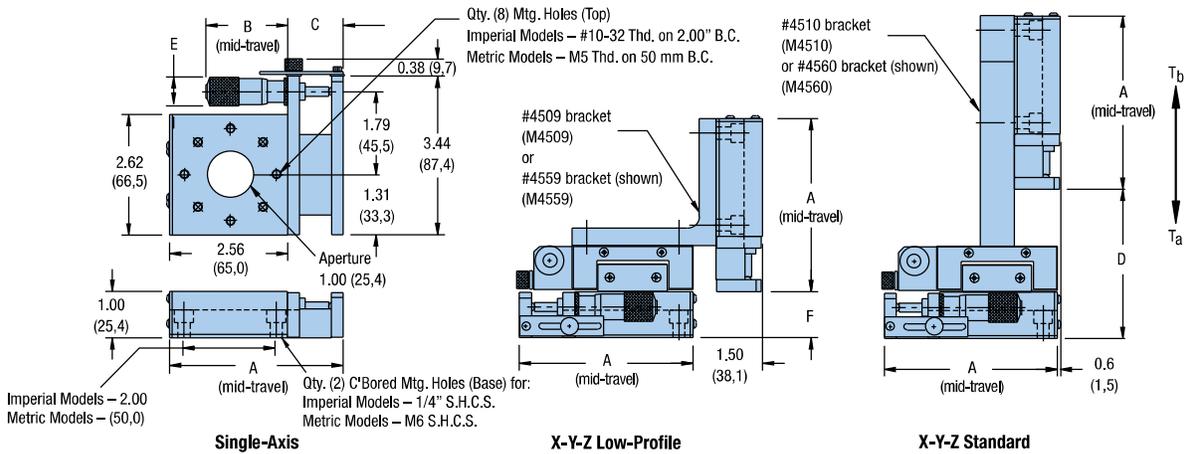
Dimensions in (mm)

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

Center Drive



Side Drive



| Style | Drive Mechanism | Travel | Center Drive Dimensions in (mm) | | | | Side Drive Dimensions in (mm) | | | | | | |
|----------|--------------------|---------------------|---------------------------------|---------|---------|--------|-------------------------------|---------|--------|--------|--------|--------|--------|
| | | | A | B | C | D | 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 |
| | | 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 |
| | 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) |
| | | Metric Micrometer | 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) |
| | | Imperial Micrometer | 1.0 in | (174,4) | (107,8) | (29,3) | (17,9) | (102,0) | (79,0) | (37,0) | (76,3) | (15,7) | (19,1) |
| | Aperture | 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) |
| | | 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) |
| Aperture | 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

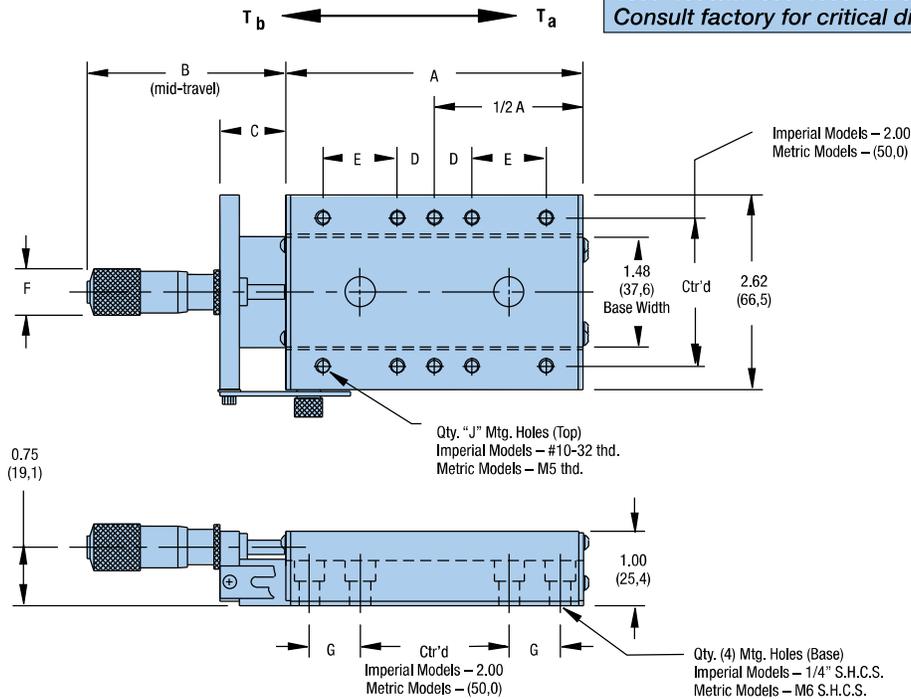
| Specifications | Imperial | Metric |
|--------------------------------|---|-------------------|
| Travel: | 0.5 – 1.0 in | 13 – 25 mm |
| Size: | | |
| Width | 2.62 in | 66,5 mm |
| Length (mid-travel) | 6.50 – 10.28 in | 164,1 – 261,1 mm |
| Height | 1.00 in | 25,4 mm |
| Load: | | |
| Normal | 88 – 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 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.



Ball Bearing Positioners

| | | | Load | | Weight | | Dimensions — in (mm) | | | | | | Qty | |
|---------------------|---------------------|---------------------|---------|---------|--------|---------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| Drive Mechanism | Travel | Model | lb (kg) | lb (kg) | A | B | C | D | E | F | G | J | | |
| Imperial | Imperial Micrometer | 0.50 in | 4602 | | | | 2.68 | 0.89 | | 0.55 | | | | |
| | | 1.0 in | | | | | | | | | | | 4604 | |
| | Metric Micrometer | 13 mm | 4602M | 88 | 1.1 | 4.00 | 2.68 | 0.89 | 0.50 | — | 0.55 | 0.69 | 6 | |
| | | 25 mm | 4604M | | | | | | | | | | | |
| | Fine Screw | 0.75 in | 4603 | | | | 2.50 | 0.88 | | | 0.59 | | | |
| | Imperial | Imperial Micrometer | 0.50 in | 4702 | | | 2.68 | 0.89 | | | 0.55 | | | |
| | | | 1.0 in | | | | | | | | | | | 4704 |
| | | Metric Micrometer | 13 mm | 4702M | 106 | 1.2 | 5.00 | 2.68 | 0.89 | 1.00 | — | 0.55 | 1.19 | 6 |
| | | | 25 mm | 4704M | | | | | | | | | | |
| | Fine Screw | 0.75 in | 4703 | | | | 2.50 | 0.88 | | | 0.59 | | | |
| | Imperial | Imperial Micrometer | 0.50 in | 4802 | | | 2.68 | 0.89 | | | 0.55 | | | |
| | | | 1.0 in | | | | | | | | | | | 4804 |
| 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 | | | | | | | | | | | |
| 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 | |
| | 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 | | | | | | | | | | | |
| | Fine Screw | 0.75 in | M4603 | | | | (63,5) | (22,3) | | | (15,0) | | | |
| | Metric | Metric Micrometer | 13 mm | M4702M | | | (67,7) | (22,6) | | | (14,0) | | | |
| | | | 25 mm | | | | | | | | | | | M4704M |
| | | 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 | | | | | | | | | | |
| | Fine Screw | 0.75 in | M4703 | | | | (63,5) | (22,3) | | | (15,0) | | | |
| | Metric | Metric Micrometer | 13 mm | M4802M | | | (67,7) | (22,6) | | | (14,0) | | | |
| | | | 25 mm | | | | | | | | | | | M4804M |
| 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 | | | | | | | | | | | |
| Fine Screw | 0.75 in | M4803 | | | | (63,5) | (22,3) | | | (15,0) | | | | |

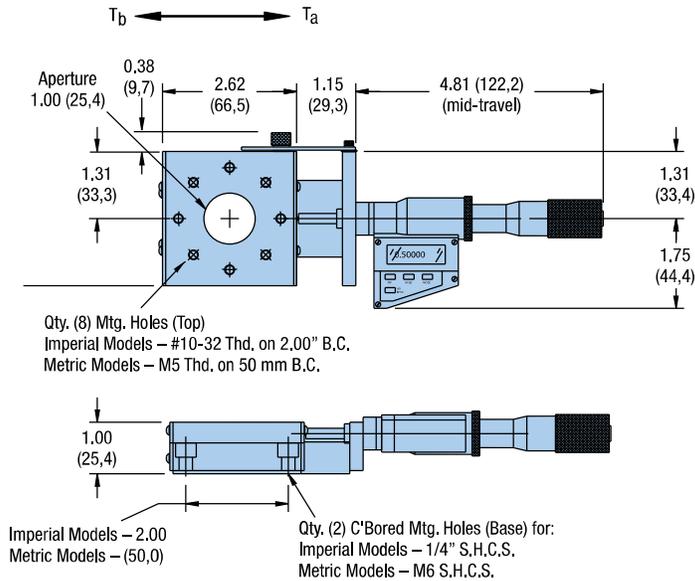
4500-DM/M4500-DM Series

| 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)



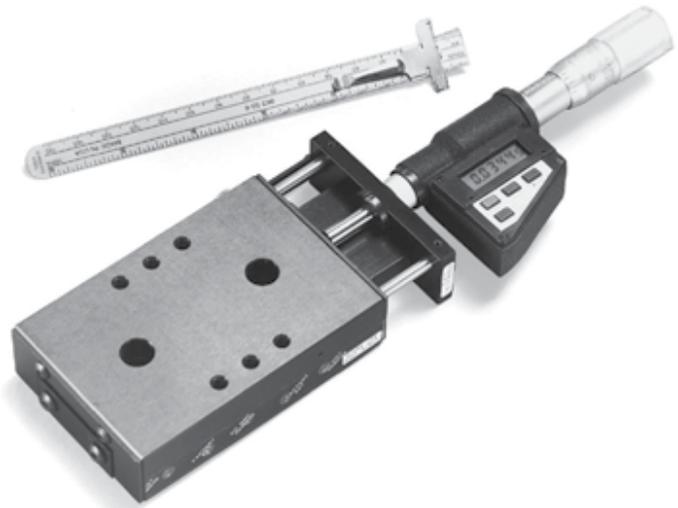
| | Style | Model |
|----------|--------------------|----------|
| Imperial | Solid Top | 4504-DM |
| | Aperture (1.0 in) | 4508-DM |
| Metric | Solid Top | M4504-DM |
| | Aperture (25,4 mm) | M4508-DM |



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

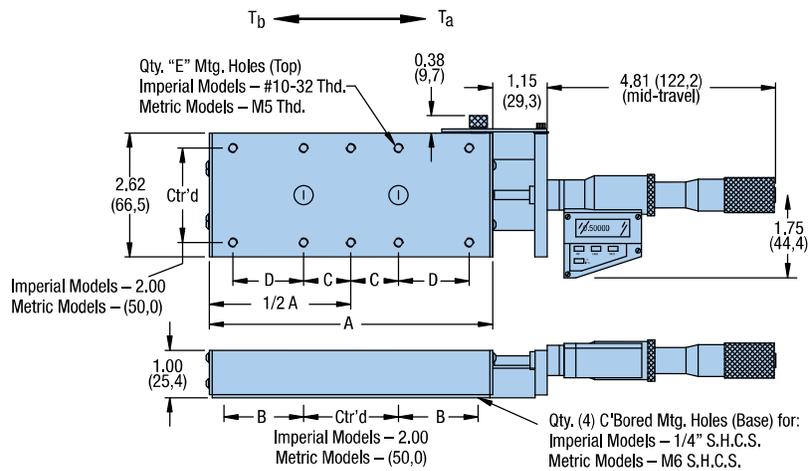
For additional end view dimensions, refer to the 4600-4800/M4600-4800 ball slide drawing, page 24. Consult factory for critical dimension concerns.

| 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 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 | |



Ball Bearing Positioners

Dimensions in (mm)



| | Model | Load | Weight | Dimensions — in (mm) | | | | Qty E |
|----------|----------|---------|---------|----------------------|--------|--------|--------|-------|
| | | | | A | B | C | D | |
| 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 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 | |

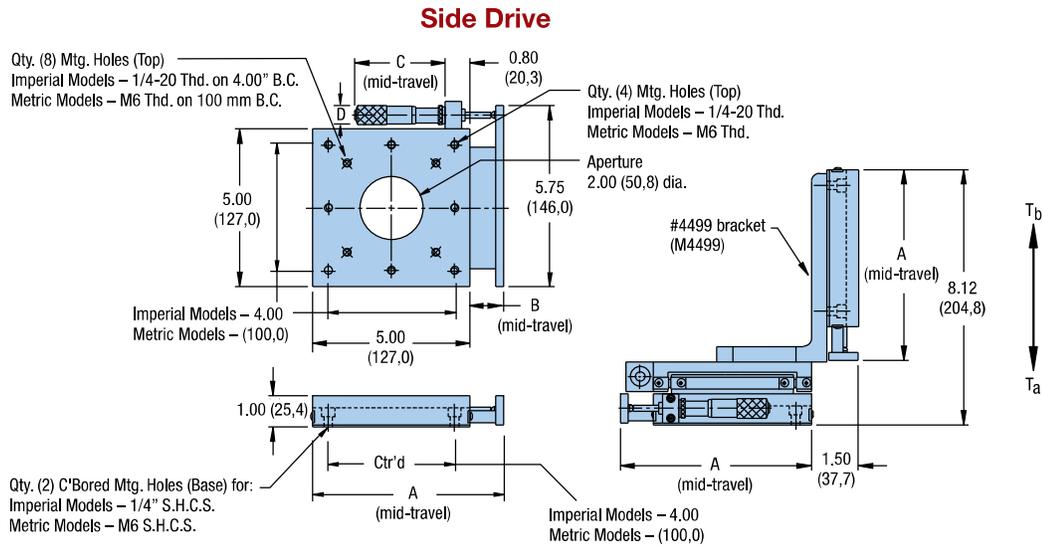
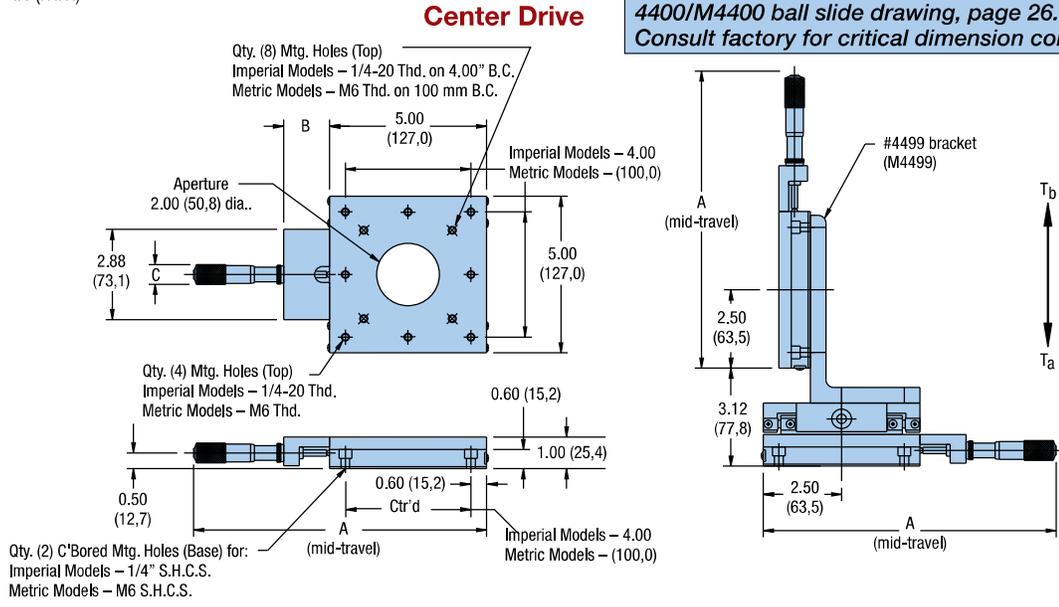


| | | | Center Drive Models | | | Side Drive Models | | | |
|-------------------|--------------------|---------------------|---------------------|-------------|----------|-------------------|-------------|----------|------------|
| | Style | Drive Mechanism | Travel | Single Axis | Two Axis | Three Axis | Single Axis | Two Axis | 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.



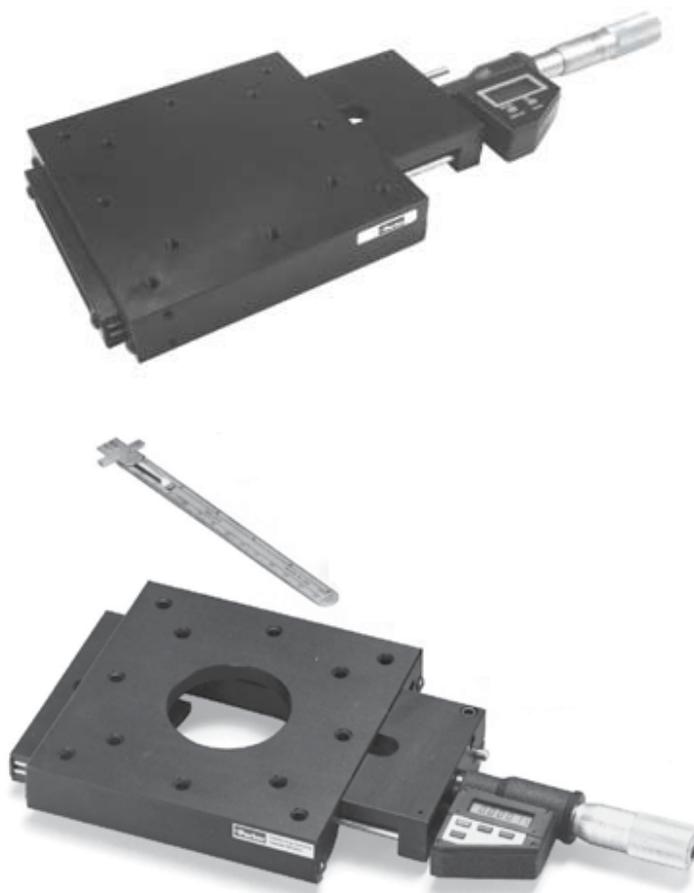
Ball Bearing Positioners

| Style | Drive Mechanism | Travel | Center Drive Dimensions – in (mm) | | | Side Drive Dimensions – in (mm) | | | | |
|----------|-----------------|---------------------|-----------------------------------|---------|--------|---------------------------------|---------|--------|---------|--------|
| | | | A | B | C | 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 |
| | | Metric Micrometer | 25 mm | 11.26 | 1.98 | 0.63 | 6.5 | 1.53 | 4.36 | 0.63 |
| | Aperture | Imperial Micrometer | 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 |
| Metric | Solid Top | Metric Micrometer | 25 mm | (236,0) | (37,4) | (18,5) | (152,4) | (25,4) | (72,0) | (18,5) |
| | | Metric Micrometer | 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) |
| | | Imperial Micrometer | 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) |
| | | Metric Micrometer | 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) |
| | | Imperial Micrometer | 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 | |



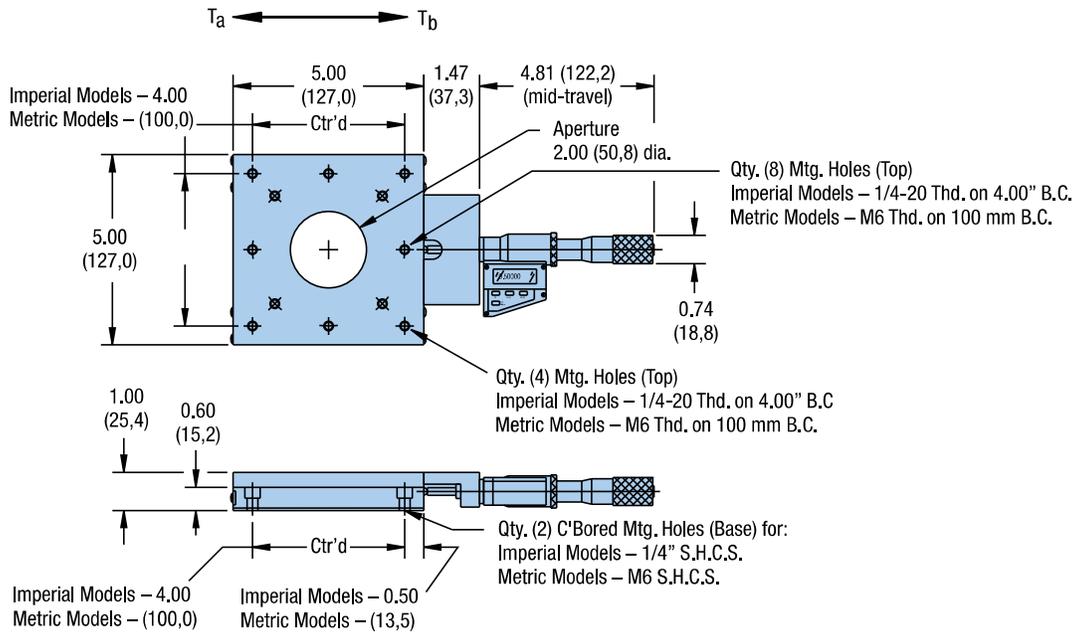
| | Style | Model | Travel |
|----------|--------------------|----------|--------|
| Imperial | Solid Top | 4410-DM | 1.0 in |
| | | 4412-DM | 2.0 in |
| | Aperture (1.0 in) | 4450-DM | 1.0 in |
| | | 4452-DM | 2.0 in |
| Metric | Solid Top | M4410-DM | 25 mm |
| | | M4412-DM | 50 mm |
| | Aperture (25,4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



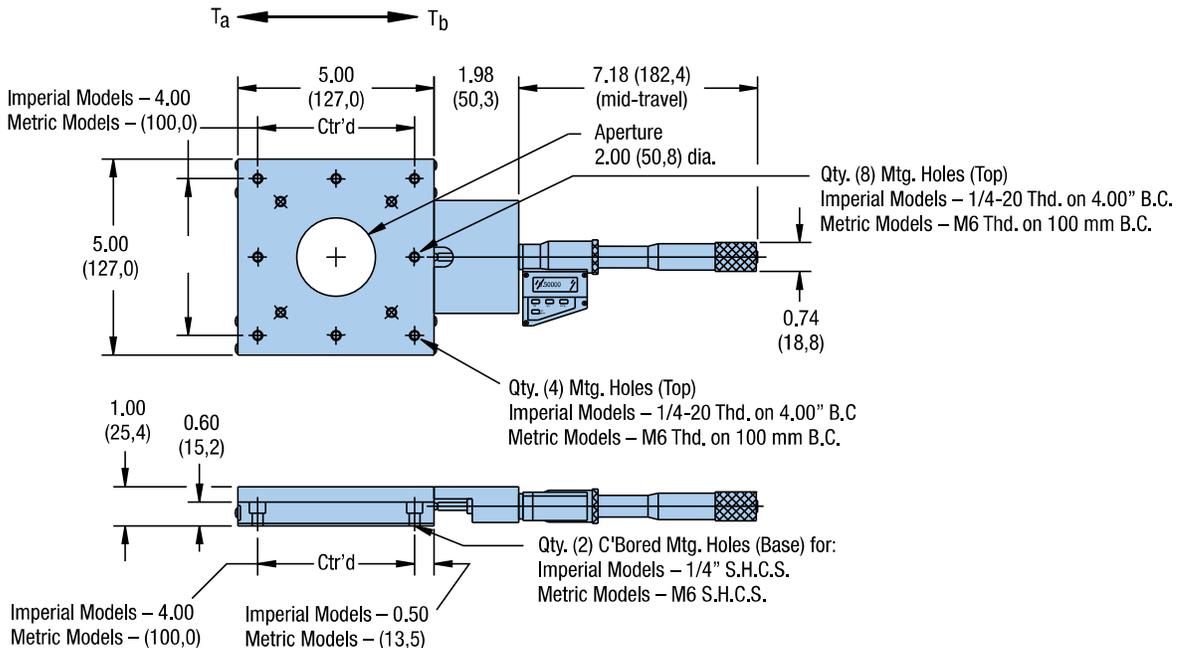
Dimensions in (mm)

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



Ball Bearing Positioners

4900/M4900 Series

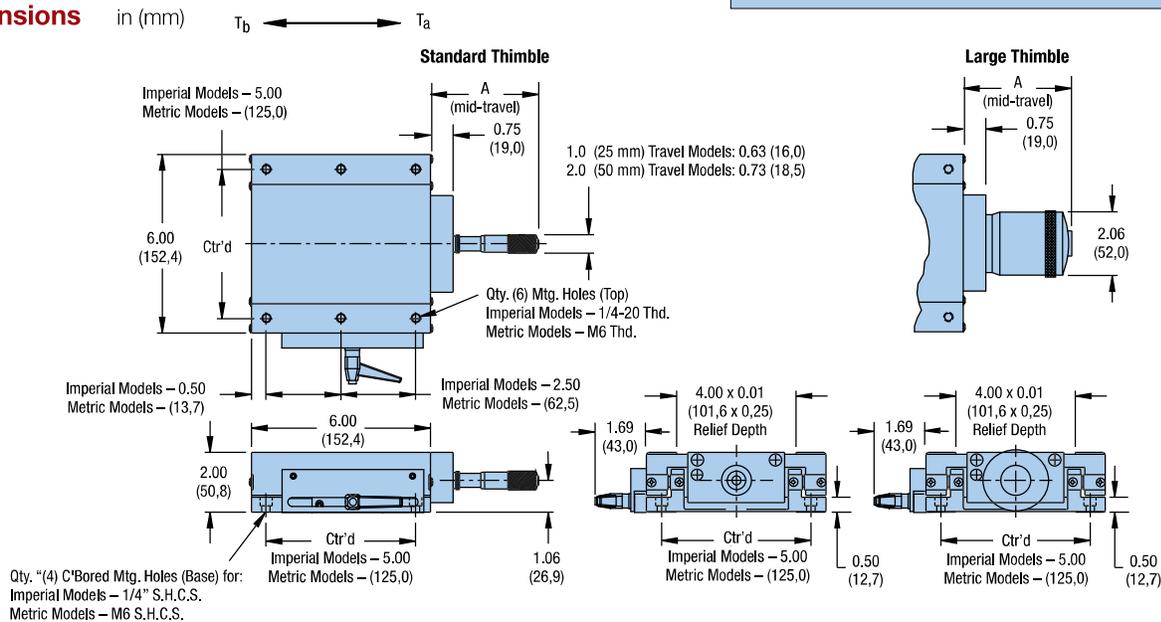
| Specifications | Imperial | Metric |
|--------------------------------|---|---------------------------|
| Travel: | 1.0 – 2.0 in | 25 – 50 mm |
| Size: | | |
| Width | 6.00 in | 152,4 mm |
| Length (mid-travel) | 9.59 – 11.11 in | 243,6 – 282,2 mm |
| Height | 2.00 in | 50,8 mm |
| Load: | | |
| Normal | 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 (Large thimble) | 50 lbs | 23,0 kg |
| Thrust T_b (Large 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 μ m/25 mm of travel |
| Micrometer graduations: | | |
| Standard thimble | 0.001 in | 0,01 mm |
| Large thimble | 0.0001 in | 0,001 mm |
| 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



| | Drive Mechanism | Travel | Standard Thimble | | Large Thimble | |
|----------|---------------------|--------|------------------|-----------------------|---------------|-----------------------|
| | | | Model* | Dimension A – in (mm) | Model* | 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 μ m/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 | |

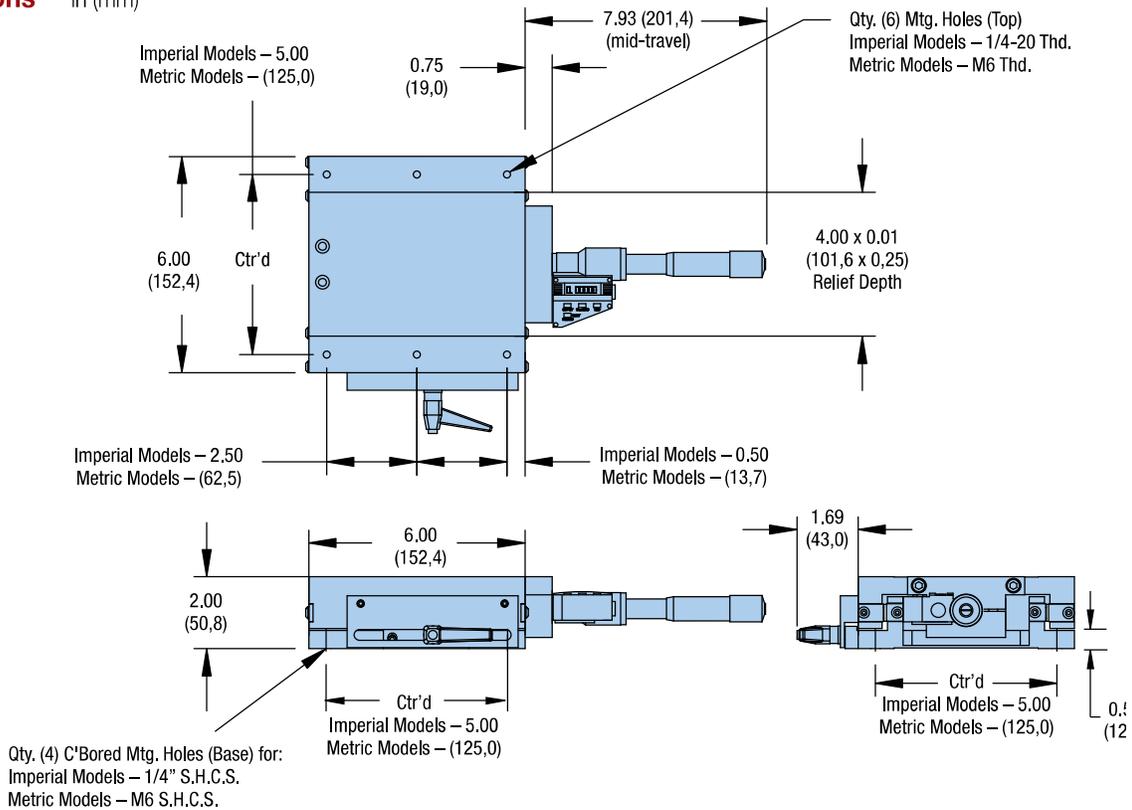


Digital micrometer positioner shown with optional position lock. To order the optional lock, add -L to the model number selected from the chart below.

Consult factory for critical dimension concerns.

Ball Bearing Positioners

Dimensions in (mm)



| Model* | |
|----------|----------|
| Imperial | 4911-DM |
| Metric | M4911-DM |

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



4900/M4900 Series

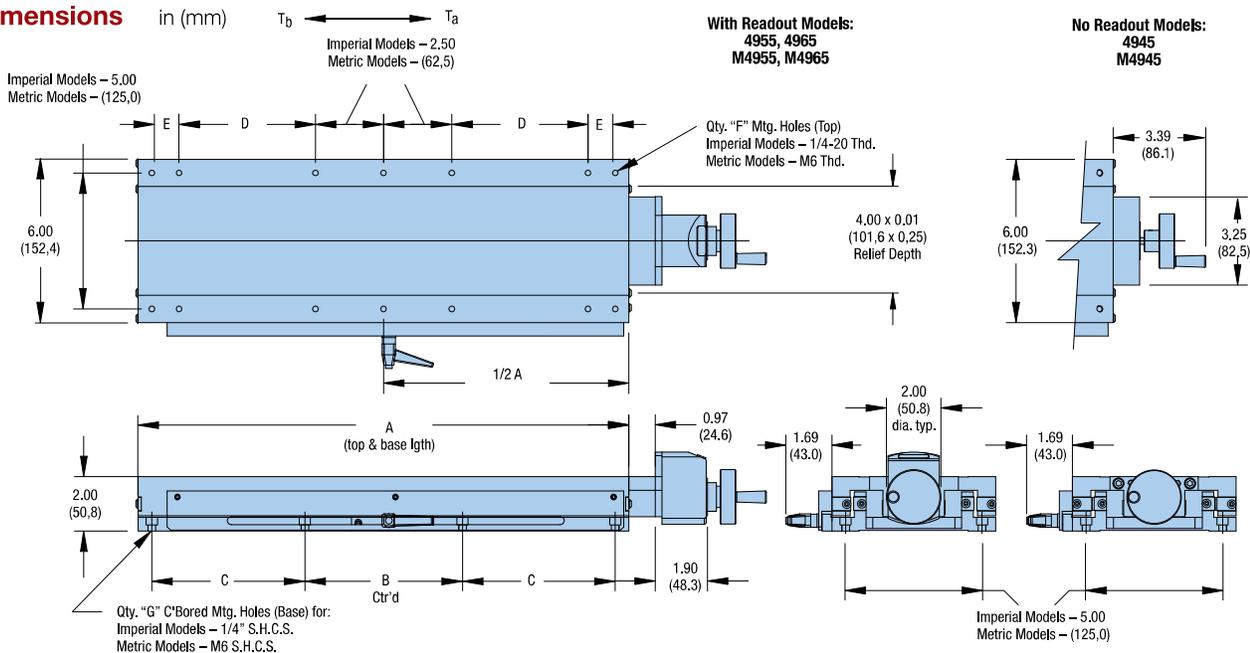
| Specifications | Imperial | Metric |
|--|---|---------------------------|
| Travel: | 4.0 – 12.0 in | 100,0 – 300,0 mm |
| Size: | | |
| Width | 6.00 in | 152,4 mm |
| Length | 9.39 – in | mm |
| Height | 2.00 in | 50,8 mm |
| Load: | | |
| Normal | 100 – 294 lbs | 45 – 133 kg |
| Thrust T_a | 30 lbs | 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 μ m/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.

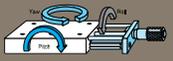
Consult factory for critical dimension concerns.

Dimensions



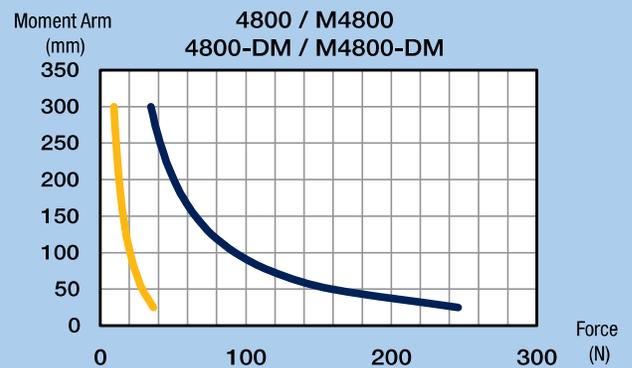
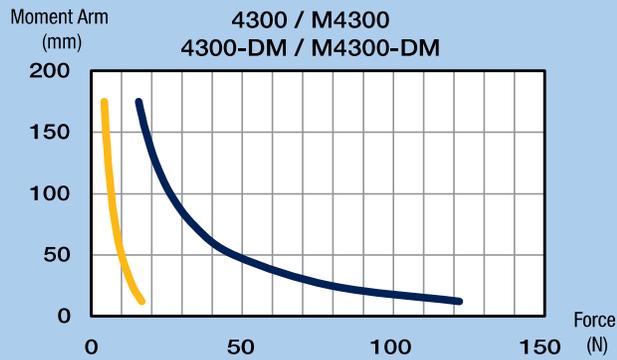
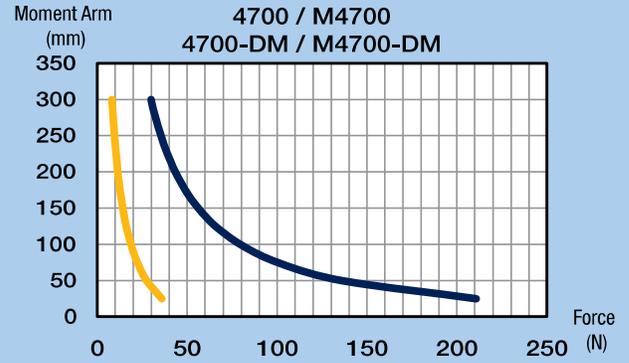
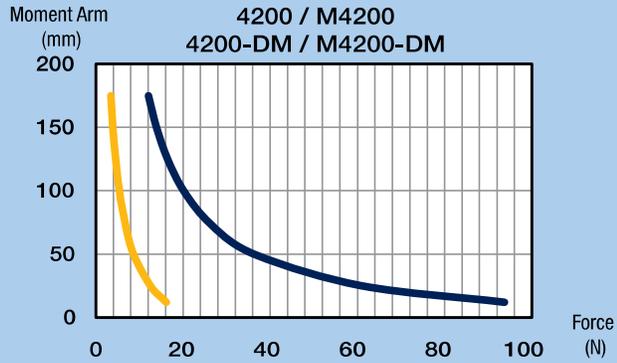
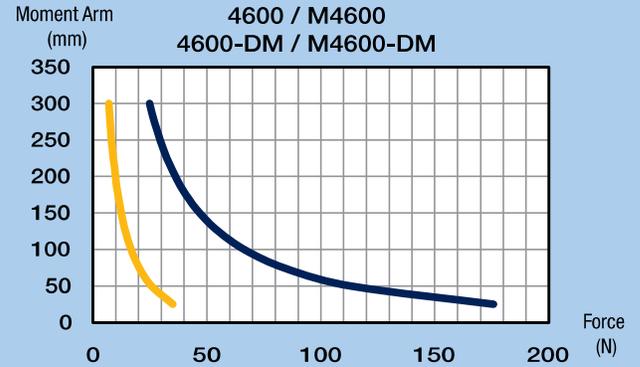
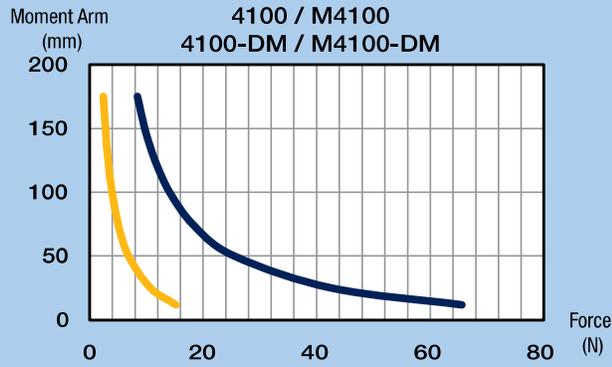
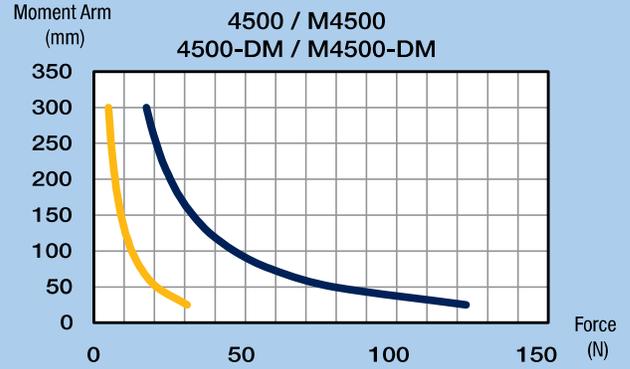
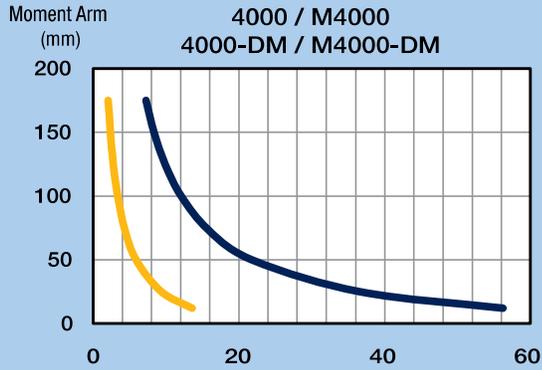
| | | | | Travel in (mm) | Load lbs (kg) | Weight lbs (kg) | Dimensions – in (mm) | | | | | Qty F | Qty G |
|----------|-------------------------|-------------------------------|-----------------------------|-------------------|------------------|--------------------|----------------------|---------|---------|---------|--------|----------|----------|
| | No Readout Model* | Imperial Readout Model* | Metric Readout Model* | | | | A | B | C | D | E | | |
| 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 Positioners

Yaw, Pitch, Roll

Yaw & Pitch **Roll**

