

Introduction

Manual Linear UniSlide® Assemblies



For Nearly Four Decades Velmex...

positioning equipment has been used to produce linear and rotational motion in scientific, research, machine, instrument and industrial applications. Hundreds of thousands of UniSlides and BiSlides are in use providing simple, rugged, reliable motion.

Velmex applications are limited only by your imagination. For example: measurement, alignment, inspection and QA/QC, optical focusing, antenna alignment, film and animation work, medical and biological analysis, for moving probes, sensors, components, and thousands of other uses. If you need precise, versatile movement in one, two or three dimensions, do it more efficiently and less expensively with a Velmex UniSlide®, BiSlide® or XSlide™.

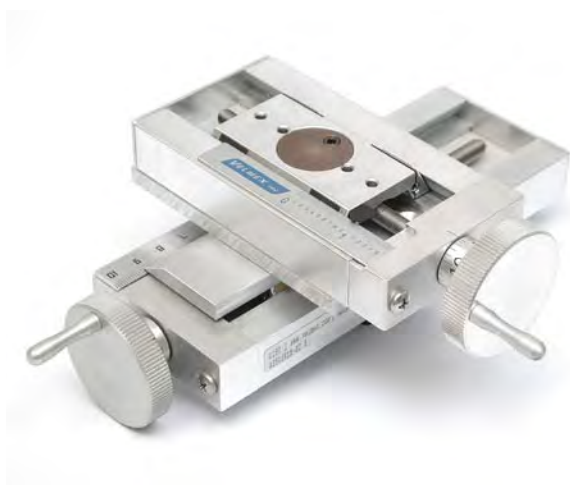
UniSlides are available in nearly 1000 standard models, including Free Sliding, Screw Drive, Graduated Knob and Scale with Vernier. Read position from 0.025" to 1 micron using mechanical or optical mechanisms. Finally, our Rapid Advance models save time.

That is an impressive array of products, but the real versatility of UniSlides is their amazing flexibility. Every UniSlide is built to order. Customers are not limited to off the shelf products — you can customize your UniSlide to meet your exact requirements. Rapid/fine motion, thumb screw locks, special finishes, way covers, revolution counters, position encoders or some other feature? We can do it.

BiSlide, XSlide and UniSlides Assemblies from Velmex, we've put quality into motion.

UniSlide Features

- Widths from 1.5" to 9"
- Lengths from 3" to 93"
- Weight capacities to 400 pounds
- Resolutions to 0.00005"
- Manual and motorized versions
- More compact than ball screw-driven stages
- Lighter weight-high strength aluminum alloys
- Low friction adjustable Rulon® sliding element eliminates lubrication, greatly decreases wear
- Resistant to impact loads
- Corrosion resistant
- Fewer parts
- Lower cost
- Completely nonferrous models possible



Scale and Vernier and Graduated Knob Series A25 Manual UniSlide Assemblies.

UniSlide Elevating Tables for applications requiring more strength and rigidity.

BiSlide Features

- Rugged I-beam design
- Integrated T-slot system for mounting and configuring XYZ systems
- Manual and motorized versions
- Corrosion resistant anodized finish
- In stock



Manual BiSlide Assembly with optional base.



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Manual UniSlide®

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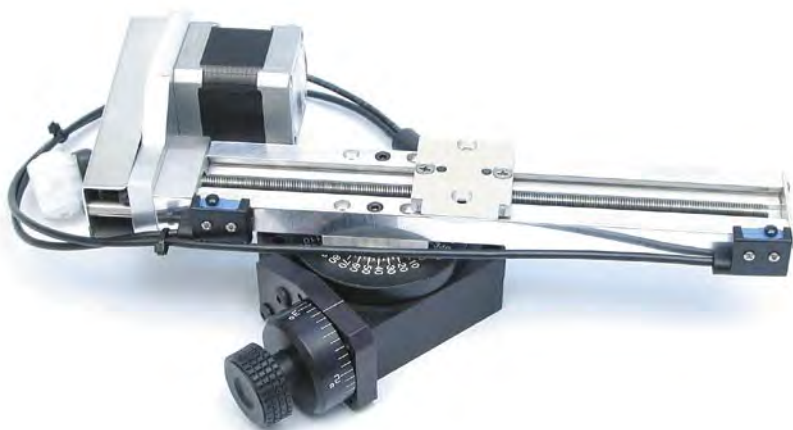
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Examples and Application Photos

Here are examples of UniSlide® stock and custom positioning equipment. Many more examples are shown on our website.

For help, please call our engineering staff, fill out the RFQ/RFA form on our website or the Fax-a-Quote form on page 1.58.



Example 1: A manual rotary table that rotates a small, motorized slide.

Example 2: A three axis system including an elevating table, all with a black anodized finish.



Example 3: A four axis system to measure travel distance for medium-sized payloads.



Example 4: Choose screw controlled positioning with or without travel measurement.



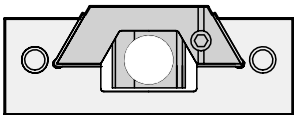
Example 5: Choose your assemblies width: 1.5", 2.5", 4", 6" or 9".



Example 6: Choose linear encoders with 1 or 5 μm resolution.

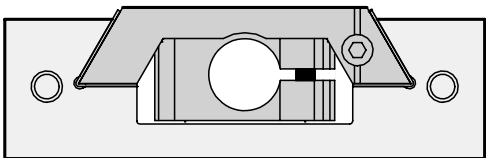
Choose a Size or Series

Actual size cross sections of the 5 different UniSlide Assembly Series. Drive nut diameter will vary.



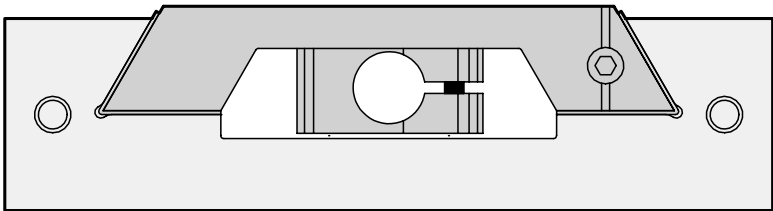
A15 Series

See page 1.9 for details.



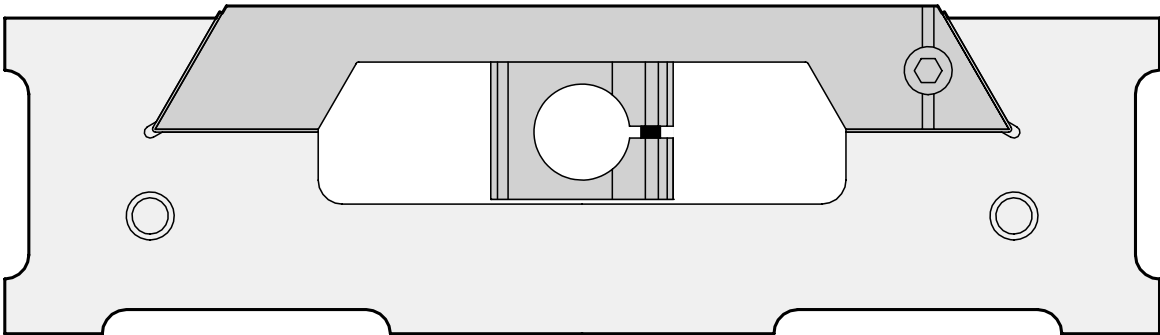
A25 Series

See page 1.15 for details.



A40 Series

See page 1.21 for details.



A60 Series

See page 1.27 for details.

Travel Distances and Load Capacities of Manual UniSlides

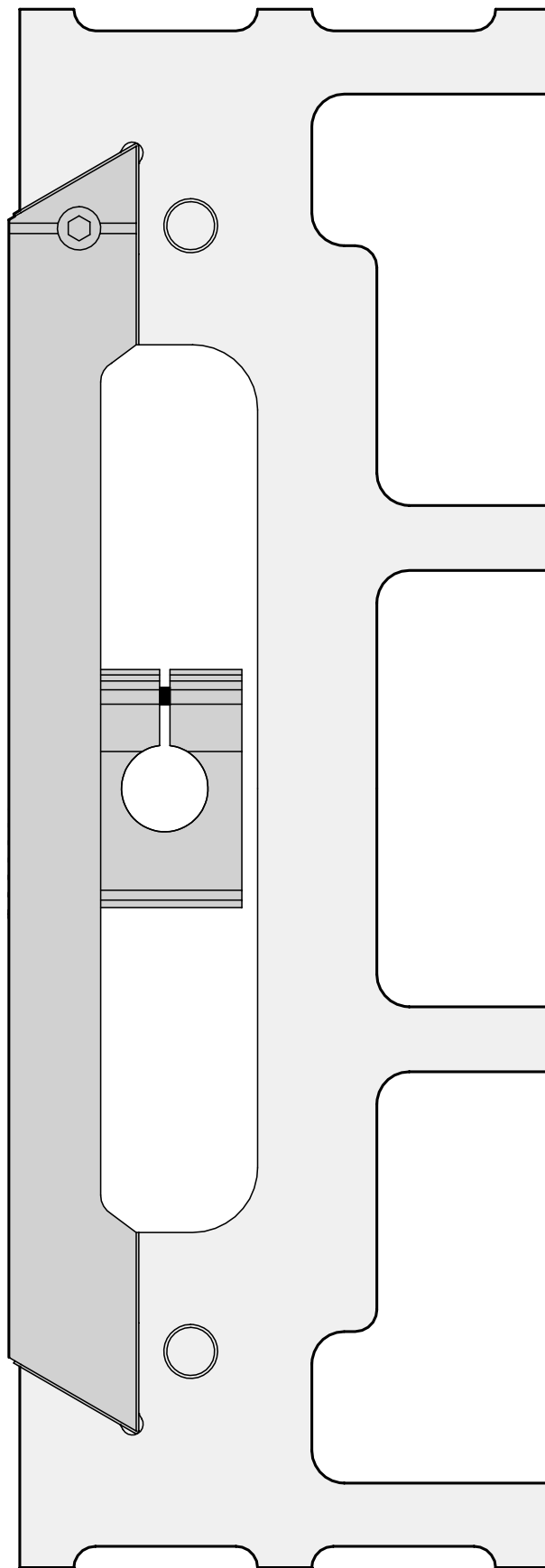
Width	Series	Travel Range	Horizontal Central	Cantilevered Load	Vertical Central
1.5"	A15	0-25.5"	15 lbs. or 6.8 kgs.	20 lbs.-in. or 23 kgs.-cm.	10 lbs. or 4.5 kgs.
2.5"	A25	0-24.5"	30 lbs. or 13.6 kgs.	40 lbs.-in. or 46 kgs.-cm.	10* lbs. or 4.5* kgs.
4"	A40	0-60"	100 lbs. or 45.5 kgs.	130 lbs.-in. or 150kgs.-cm.	50 lbs. or 22.7 kgs.
6"	A60	0-87"	240 lbs. or kgs.	320 lbs.-in. or 369 kgs.-cm.	100 lbs. or 45 kgs.
9"	B90	0-84"	400 lbs. or 182 kgs.	480 lbs.-in. or 550 kgs.-cm.	100 lbs. or 45 kgs.

* A25 Vertical Central Load Capacity with a 10 pitch (W1 and P10) screw is 30 lbs./15.5 kg. to due to a stronger thrust bearing design.

Also, for greater base stiffness, Series A25, A40 and A60 are available in deeper cross sections. See the B Series Bases on page 1.54 for more information.

B90 Series

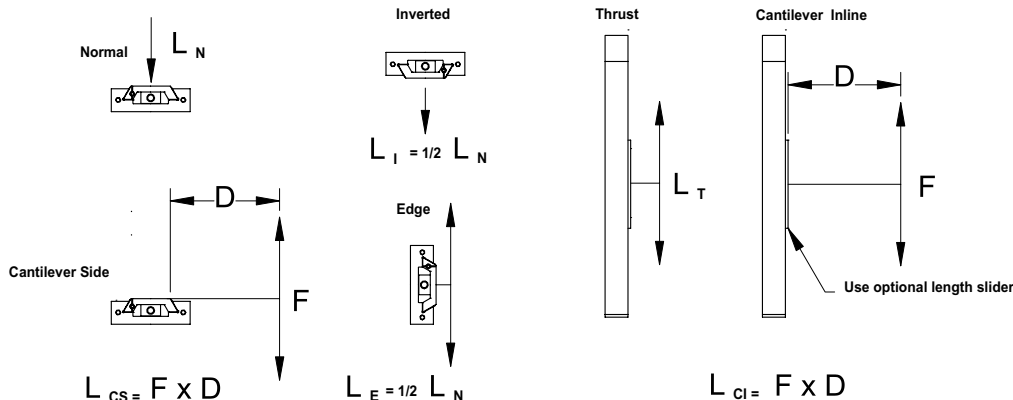
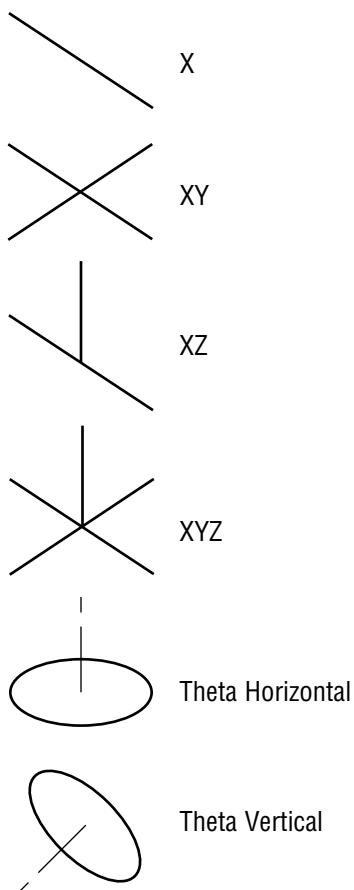
See page 1.31 for details.



Selecting the Right Size UniSlide

Load and slide size are major variables to consider when choosing your UniSlide. This page gives general guidelines on load handling for horizontal, vertical and cantilevered loads. Detailed dimensional information for each series is provided on the following pages.

Load Configurations



Nominal Load Capacity for Single (X) and (Y) Axis

Series	Load Normal (L_N)*		Load Thrust (L_T)*	
A15	0-5 lbs.	0-2.7 kgs.	0-1 lbs.	0-4.5 kgs.
A25	0-10 lbs.	0-4.54 kgs.	0-3 lbs.	0-1.36 kgs.
A40	0-40 lbs.	0-18.14 kgs.	0-20 lbs.#	0-9.07 kgs.
A60	0-80 lbs.	0-36.29 kgs.	0-40 lbs.#	0-18.14 kgs.
B90	0-140 lbs.	0-63.5 kgs.	0-70 lbs.	0-31.75 kgs.*

Values are less than minimum; refer to the engineering specifications on page 1.36 for operational limits.

5 lbs. max for Rapid Advance models.

Load Capacity for Low Deflection on the X Axis of XY and XYZ or Other Cantilever Loads

Series	Cantilever Side (L_{CS})*	Cantilever Inline (L_{CI})*
A15	0-5 lbs.-in.	0-10 lbs.-in.
A25	0-10 lbs.-in.	0-20 lbs.-in.
A40	0-32 lbs.-in.	0-64 lbs.-in.
A60	0-80 lbs.-in.	0-160 lbs.-in.
B90	0-120 lbs.-in.	0-204 lbs.-in.

* Values are less than minimum; refer to the engineering specifications on page 1.36 for operational limits.

Working With Cantilever Loads in XY and XYZ

The X axis carries the weight of the Y axis, the Z axis and the attached load. For good stability, the X axis should be one model larger when the Y axis length (L) is longer than three times (3x) the width of the X.

Example 1: Two A4012B-S4

UniSlides would be suitable in an

X and Y configuration. These A40 models are 4" wide and 12" long.

Example 2: If considering two A4015B-S4 UniSlides for an X and Y configuration, choose an A6018B-S6 for the X axis instead. This will be more stable, since the A60 model is 6" wide. The A4015B-S4 is only 15" long – not enough to meet the 3x criteria spelled out above.



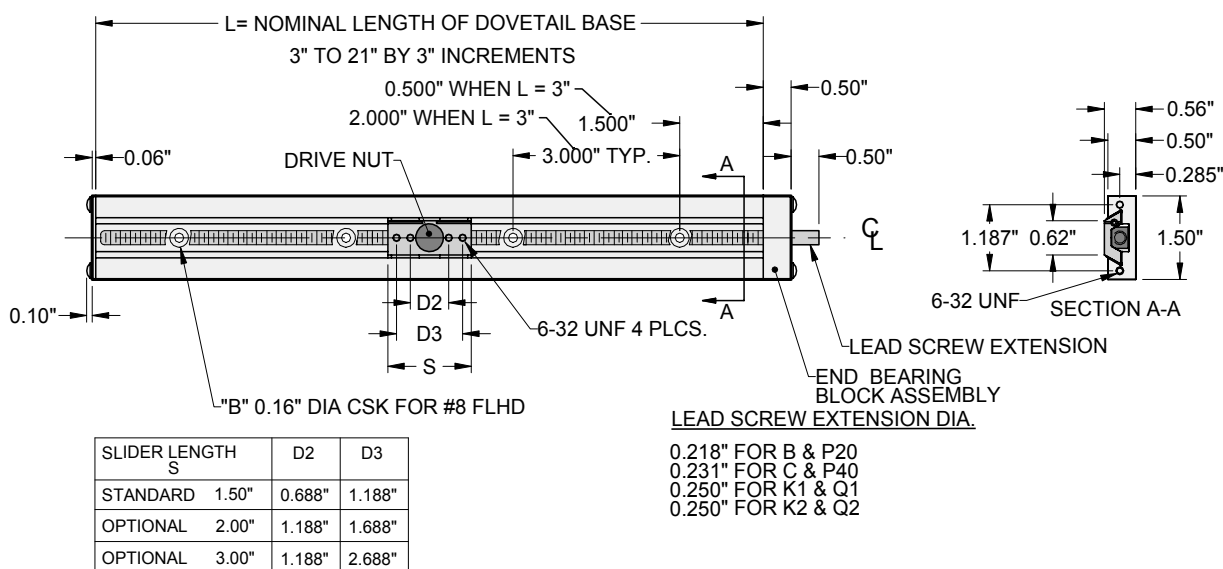
Screw driven and graduated knob UniSlides

Introduction

All Series A15 UniSlides are 1.5" wide. Lengths vary by Type. There are 9 types. Each Type offers you specific features and benefits to satisfy your requirements. The UniSlide Model Number specifies the Type and other characteristics.

Series A15

Series A15 Common Dimensions and Load Capacity



S is the slider length. The standard length is 1 1/2". Optional longer 2" and 3" length sliders are available to increase stability for large or cantilevered load.

L is the dovetail base length. Bases begin at 3" and increase in 3" increments. Your choice for base length is incorporated as the third and fourth digits of the Model Number. For example, Model A1506 has a 6" base length.

Travel = L - S. For an A1506B-S1.5, travel is 6" - 1.5" or 4.5". See Price List for Model Numbers and travel with standard length sliders.

Mounting holes "B" in the UniSlide Base – The first B mounting hole is 1 1/2" from the bearing block end of

Load Capacity

Dynamic Central Horizontal = 15 lbs. or 6.8 kg.

Dynamic Central Vertical = 10 lbs. or 4.5 kg.

Cantilevered = 20 lbs. -in. or 23 kg. -cm.

the dovetail base. All subsequent holes are 3" apart length-wise along the base, e.g., A1512 has 4 mounting holes. Exception: any model with a base length of less than 6" has two base mounting holes 1/2" from each end.

When Combining 2 or 3 units using XY and XZ Adapters (pages 1.44), see load considerations on Selecting the Right Size UniSlide on page 1.8.



Free Sliding UniSlide Assembly

The simplest assembly, a linear dovetail bearing. To specify, add “**A**” after the base length in the Model Number, e.g., A1503A-S1.5.

Feature: Linear Dovetail Bearing

Benefit: Linear motion

Length (Travel): Models from 0-25.5 inches

Some Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- 2” or 3” sliders
- Traveling slider lock



Screw Drive UniSlide Assembly

A Lead Screw controlled positioning slide. For 0.01” or 0.1 mm DRO position indication using a revolution counter and K1 lead screws, see page 1.35.

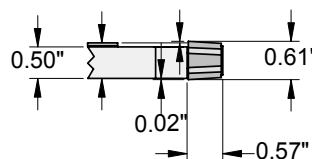
Feature: Free sliding plus lead screw drive

Benefit: Screw controlled positioning

Length (Travel): Models from 0-16.5 inches

Available Options (see pages 1.34)

- Lead screw lock — slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- 2” or 3” sliders
- 1 3/4” diameter aluminum knob and crank

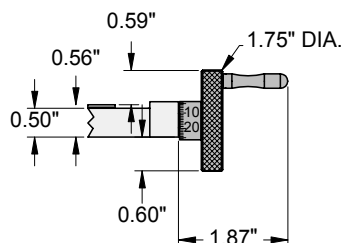




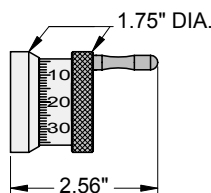
Graduated Knob UniSlide Assemblies

Measures position to 0.001" or 0.01 mm.

Your position is measured from the combined readings of the linear scale and engraved knob or drum dial. Each increment on the drum dials or knobs represents 0.001" or 0.01 mm. Scales have 0.025" or 1 mm increments. P20 or P40 lead screw models have a knob as in the drawing below. Q1 or Q2 lead screw models have a drum dial as shown below.



50 division P20 or 25 division P40 model knobs



100 division Q1 or 200 division Q2 model knobs

Graduated Knob type Models have a high precision lead screw (accuracy 0.0015"/10". or 0.033 mm/20 cm or better).

Feature: Screw drive plus accurate lead screw, engraved knob and printed scale

Benefit: Measures position to 0.001" or 0.01 mm

Length (Travel): Models from 0-16.5 inches



Scale and Vernier Screw Drive UniSlide Assembly

Measures position to 0.001" or 0.05 mm.

This type adds a precision engraved English or Metric scale and vernier to the Screw Drive UniSlide. Vernier position on the slider is offset to allow placement of a "Y" cross slide without blocking view of lower unit. Travel, as listed in the Price List, is reduced by 0.3" when the vernier cover plate comes into contact with the Rogan knob. See also the Rapid Advance with Scale and Vernier Style on the next page.

Feature: Engraved scale and vernier

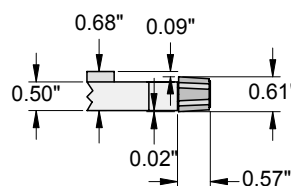
Benefit: Measures position to 0.001" or 0.05 mm

Length (Travel): Models from 0-10.5 inches

Available Options

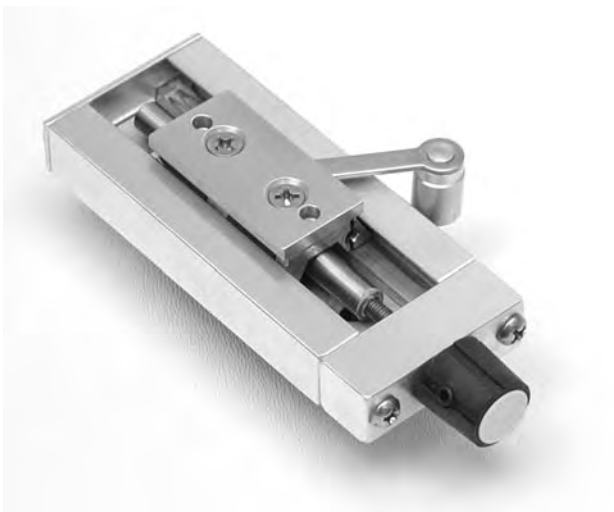
(for both models on this page, see pages 1.34)

- Lead screw lock — slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- 2" or 3" long sliders



All Rapid Advance Models

If you will be moving the slider frequently or your base length is long, consider one of these models. They **save time** by allowing you to quickly reposition the slider. This is accomplished by uncoupling from the drive system. There are two different Model groups, D, and G. They both use a clamping type drive and have different lengths of fine-adjust control. Mounting in a vertical position is not recommended.



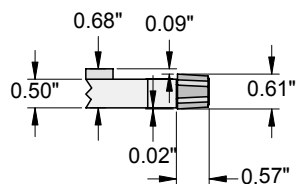
Rapid Advance with Limited Fine Adjust (Model D)

D Models have a 1/2" length of fine pitch adjust control. Moving the control lever clamps the slider to a central mandrel. Turning the Rogan knob rotates a short, 40 thread/inch screw into a threaded insert in the end of the mandrel. All metal parts are stainless and aluminum. Rogan knob is 0.61" diameter. If measured movement is required, see Models DE and GE.

Feature: Quick gross position

Benefit: Save time. Fine pitch adjustment

Length (Travel): Models from 0-16.5 inches



To operate, rotate the control lever on the slider to the "Release" station. Next, manually push the slider to the approximate desired location. Finally, rotate the control lever to the "Engage" station and fine-adjust the slider position with the knob. All Scale and Vernier units have a 1/8" top plate making the height to the top of slider 11/16".



Rapid Advance with Scale and Vernier (Models DE and DM)

DE and DM Models add an engraved scale and vernier to the Model D which provides measured movement and fixed zero reference point. Model DE has an English scale; Model DM has a Metric scale.

Feature: Quick gross position with vernier

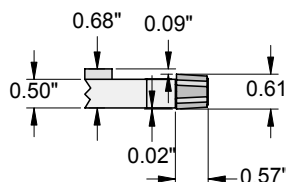
Benefit: Save time and measure position to 0.001" or 0.05 mm

Length (Travel): Models from 0-16.5 inches

Available Options

(for both models on this page, see pages 1.34)

- Slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 3" length slider





Rapid Advance with Micrometer Head (Models GE and GM*)

GE and GM Models have measured movement (1" or 25 mm) anywhere along the base and a movable zero reference point. Fine adjustment is made with a micrometer calibrated to 0.001" (Model GE) or 0.01 mm (Model GM). The mandrel clamping mechanism is the same as Model D. The end bearing block is 1 1/4" long.

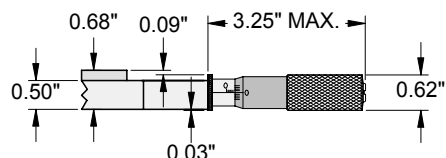
Feature: Quick gross position; micrometer head

Benefit: Save time and measure position. Moveable zero reference point.

Length (Travel): Models from 0-10.5 inches

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 3" length slider



*GM metric version is a special order. Contact Velmex.



Left-Hand Right-Hand Screw Drive

These unique UniSlides incorporate two sliders driven by a single right and left-hand threaded standard accuracy lead screw. When the knob is turned the sliders simultaneously move toward or away from each other. These slides are very useful for applications where two objects must share a common axis of movement. Typical uses for Left-Right UniSlides include centering or mating operations in manufacturing, testing and research environments. For example, guide forks can be mounted on the sliders to insure that roll goods of different widths are precisely centered.

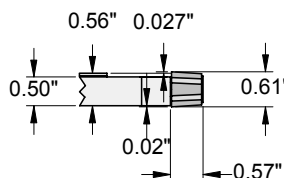
Feature: Left and right-hand thread on a common shaft

Benefit: Simultaneous together or apart motion

Length (Travel): Models from 0-15 inch separation

Available Options (see pages 1.34)

- Lead screw lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- 2" or 3" length sliders
- Independent (separate) lead screws
- 1 3/4" diameter aluminum knob and crank





Rack and Pinion Drive

These models delivers precision motion without backlash. Choose from 3 travel distances (models): 1.375", 2.875" or 5.875".

Operation: A side knob rotates a pinion engaging a helical rack attached to slider; advance per turn is 0.737"

Feature: Helical rack and pinion drive

Benefit: Compact, side access, minimal backlash, rapid, smooth motion

Length (Travel): 1.375, 2.875 or 5.875

Length (Slider): Varies with travel (See chart below).

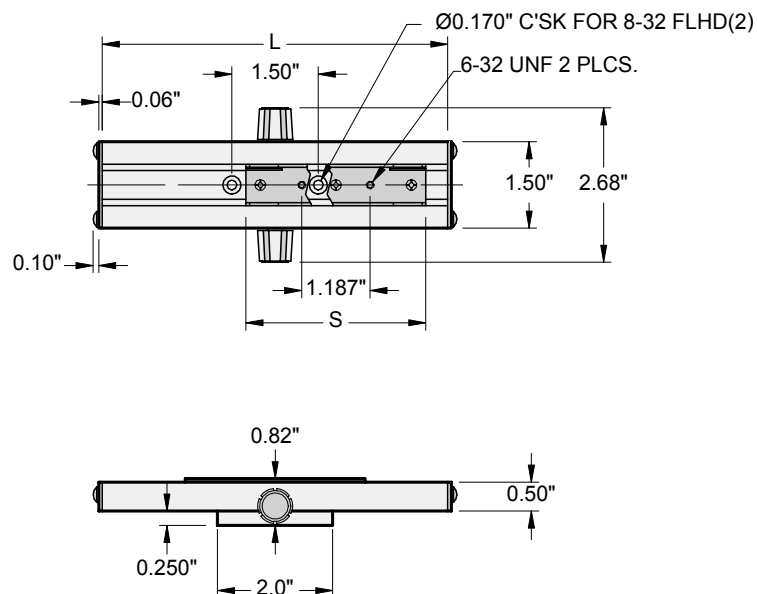
Depth from the bottom of the 1/4" base plate to the pinion center line is 11/32" and to the top of the slider is 13/16". Slider holes are tapped for 6-32 thread and are 1 3/16" apart. A pair of base mounting holes for 8-32 flat head mounting screws are centered 1 1/4" apart. The Model A1512R includes two extra mounting holes 31/32" from each end of the slider.

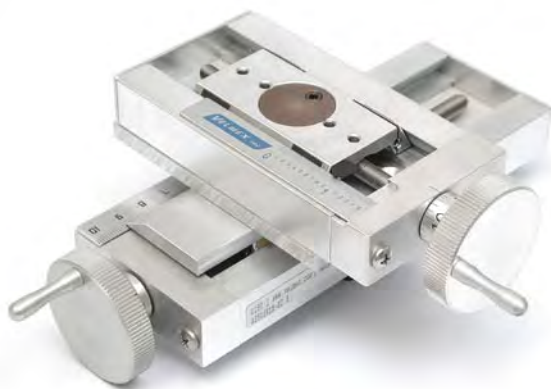
Available Options

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Lock: A second knob locks the pinion. To order, add "L" to the end of the model number.

For a side drive in other Series, see also Right Angle Gear Drive on page 1.35.

Model No.	Travel	Length L	Slider Length S	Weight
A1503R	1 3/8"	3"	1 5/8"	6 oz.
A1506R	2 7/8"	6"	3 1/8"	9 oz.
A1512R	5 7/8"	12"	6 1/8"	15 oz



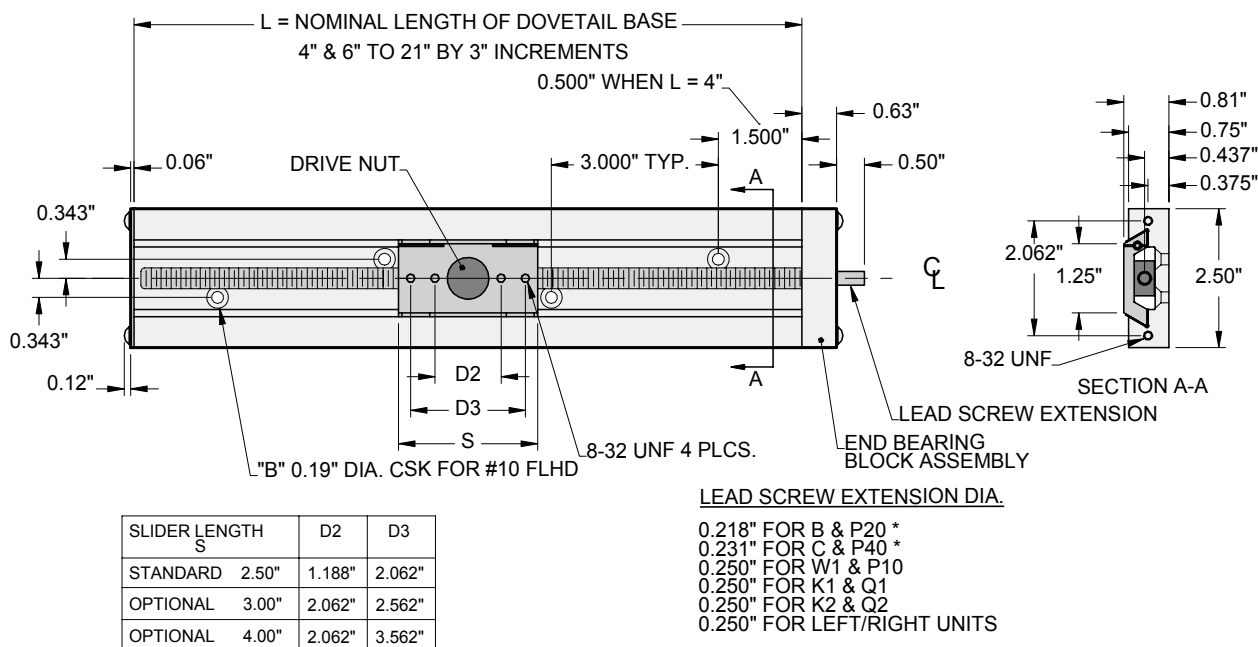


Introduction

All Series A25 UniSlides are 2.5" wide. Lengths vary by Type. There are 8 Types. Each Type offers you specific features and benefits to satisfy your requirements. The UniSlide Model Number specifies the Type and other characteristics.

Series A25

Series A25 Common Dimensions and Load Capacity



S is the slider length. The standard length is 2 1/2."

Optional 3" and 4" sliders are available to increase stability for large or cantilevered load.

L is the dovetail base length. Bases begin at 4" and after 6", increase in 3" increments. Your choice for base length is incorporated as the third and fourth digits of the Model Number. For example, Model A2506 has a 6" base length.

Travel = L - S. For an A2506B-S2.5, travel is 6" - 2.5" or 3.5". See Price List for Model Numbers and travel with standard length sliders.

Mounting holes "B" in the UniSlide Base – The first B mounting hole is 1 1/2" from the bearing block end of the

Load Capacity

Dynamic Central Horizontal = 25 lbs. or 6.8 kgs.

Dynamic Central Vertical = 10 lbs. or 4.5 kgs. *

Cantilevered = 40 lbs. -in. or 46 kgs. -cm.

*Exception: W1 and P10 lead screw = 30 lbs.

See Options (pg. 1.34) for way covers, optional finishes, etc.
See Combining UniSlides (pg. 1.57) to combine 2 or 3 units.

dovetail base. All subsequent holes are 3" apart lengthwise along the base, e.g., A2512 has 4 mounting holes. Also note, mounting holes in Model A2504 are 1/2" inward from each end of the dovetail base or 3" apart.



Free Sliding UniSlide Assembly

The simplest assembly. A Linear Dovetail Bearing. To specify, add "A" after the base length in the Model Number, e.g., A2506A-S2.5.

Feature: Linear Dovetail Bearing

Benefit: Linear motion

Length (Travel): Models from 0-24.5 inches

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional length sliders
- Traveling slider lock



Screw Drive UniSlide Assembly

A Lead Screw controlled positioning slide. For 0.01 or 0.1 mm DR0 position indication using a revolution counter and the W1 and K1 lead screws, see page 1.35.

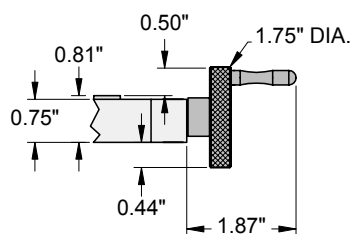
Feature: Free sliding plus lead screw drive

Benefit: Screw controlled positioning

Length (Travel): Models from 0-24.5 inches

Available Options (see pages 1.34)

- Lead screw and slider locks
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 3" or 4" long sliders

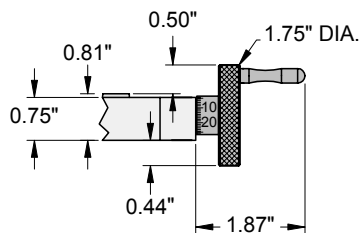




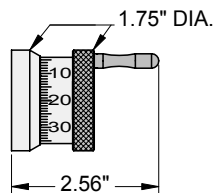
Graduated Knob UniSlide Assemblies

Measures position to 0.001" or 0.01 mm.

Your position is measured from the combined readings of the linear scale and engraved knob or drum dial. Each increment on the drum dials or knobs represents 0.001" or 0.01 mm. Scales have 0.025" or 1 mm increments. P20 or P40 lead screw models have a knob as in the drawing below. P10, Q1 or Q2 lead screw models have a drum dial as shown below.



50 division P20 or 25 division P40 model knobs



100 division P10, Q1 or 200 division Q2 model knobs

Graduated Knob type Models have a high precision lead screw (accuracy 0.0015"/10". or 0.033 mm/20 cm or better).

Feature: Screw drive more accurate lead screw, engraved knob and printed scale

Benefit: Measures position to 0.001" or 0.01 mm

Length (Travel): Models from 0-15.5 inches



Scale and Vernier Screw Drive UniSlide Assembly

Measures position to 0.001" or 0.05 mm.

This type adds a precision engraved English or Metric scale and vernier to the Screw Drive UniSlide. Vernier position on the slider is offset to allow placement of a "Y" cross slide without blocking view of lower unit. See also the Rapid Advance with Scale and Vernier Style on the next page.

Feature: Engraved scale and vernier

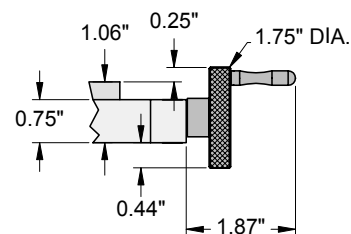
Benefit: Measures position to 0.001" or 0.05 mm

Length (Travel): Models from 0-16.5 inches

Available Options

(for both models on this page, see Options page 1..34)

- Lead screw lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional length sliders



All Rapid Advance Models

If you will be moving the slider frequently or your base length is long, consider one of these models. They **save time** by allowing you to quickly reposition the slider. This is accomplished by uncoupling from the drive system. There are three different Model groups, D, G, and H. The D and G Models use a clamping type drive. The H Model uses a lead screw and pinion design. They have different lengths of fine-adjust control. Mounting in a vertical position is not generally recommended.



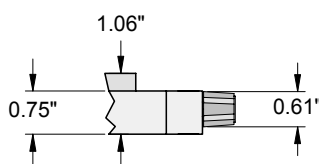
Rapid Advance with Limited Fine Adjust (Model D)

D Models have a 1/2" length of fine pitch adjust control. Moving the control lever clamps the slider to a central mandrel. Turning the Rogan knob rotates a short, 40 thread/inch screw into a threaded insert in the end of the mandrel. All metal parts are stainless and aluminum. Rogan knob is 0.61" diameter. If measured movement is required, see Models DE and GE.

Feature: Quick gross position

Benefit: Save time. Fine pitch adjustment

Length (Travel): Models from 0-15.5 inches



To operate, rotate the control lever on the slider to the "Release" station. Next, manually push the slider to the approximate desired location. Finally, rotate the control lever to the "Engage" station and fine-adjust the slider position with the knob. All Scale and Vernier units have a 1/4" top plate making the height to the top of slider 1 1/16".



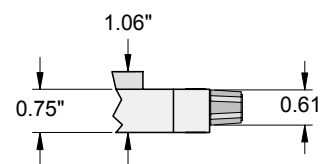
Rapid Advance with Scale and Vernier (Models DE and DM)

DE and DM Models add an engraved scale and vernier to the Model D and provides measured movement and fixed zero reference point. Model DE has an English scale; Model DM has a Metric scale.

Feature: Quick gross position with vernier

Benefit: Save time and measures position to 0.001" or 0.05 mm

Length (Travel): Models from 0-16.5 inches





Rapid Advance with Full Travel Fine Adjust (Model H1 and H20)

Model H units provide fine adjust control over the full travel length, using a standard lead screw. Fine motion is accomplished using a unique system that applies a brake on two threaded brass pinions secured in a Delrin® carrier and delivers a smooth, quiet linear motion. Model H20 uses a 1/4"-20 thread/inch lead screw; Model H1 has a 7 x 1 mm pitch lead screw. These units are not recommended for vertically mounted applications. Load capacity is limited to 15 pounds horizontal or 2 pounds vertical.

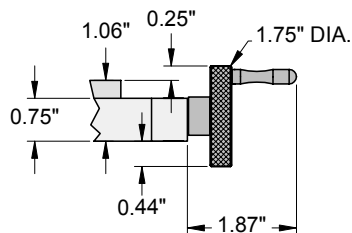
Feature: Rapid Advance mechanism

Benefit: Save time. Full length screw control

Length (Travel): Models from 0-14 inches

Available Options (see pages 1.34)

- Slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces



Rapid Advance with Full Travel Fine Adjust with Scale and Vernier (Models HE and HM)

HE and HM versions add an engraved scale and vernier, (0.001" or 0.05 mm resolution) to the H-model, and feature measured movement and a fixed zero reference point.

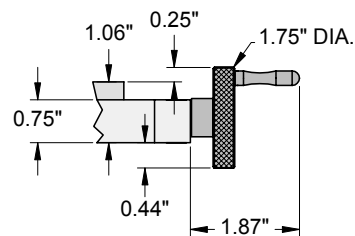
Feature: Rapid Advance mechanism, scale and vernier

Benefit: Saves time; measures movement

Length (Travel): Models from 0-17 inches

Available Options (see pages 1.34)

- Slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces





Rapid Advance with Micrometer Head (Models GE and GM*)

GE and GM Models have measured movement (1" or 25 mm) anywhere along the base and a movable zero reference point. Fine adjustment is made with a micrometer calibrated to 0.001" (Model GE) or 0.01 mm (Model GM). The mandrel clamping mechanism is the same as Model D. The end bearing block is 5/8" long.

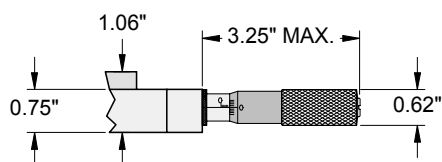
Feature: Quick gross position; micrometer head

Benefit: Save time and measure position. Moveable zero reference point.

Length (Travel): Models from 0-12.5 inches

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces



*GM metric version is a special order. Contact Velmex.



Left-Hand Right-Hand Screw Drive

These unique UniSlides incorporate two sliders driven by a single right and left-hand threaded standard accuracy lead screw. When the crank is turned the sliders simultaneously move toward or away from each other. These slides are very useful for applications where two objects must share a common axis of movement. Typical uses for Left-Right UniSlides include centering or mating operations in manufacturing, testing and research environments. For example, guide forks can be mounted on the sliders to insure that roll goods of different widths are precisely centered.

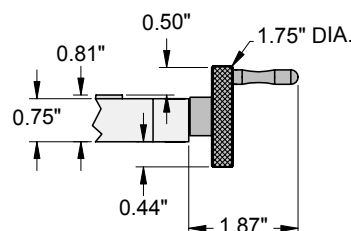
Feature: Left and right-hand thread on a common shaft

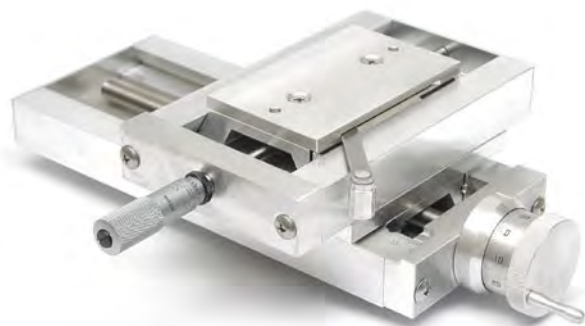
Benefit: Simultaneous together or apart motion

Length (Travel): Models from 0-16 inch separation

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional length sliders
- Lead screw lock
- Independent or separate lead screws



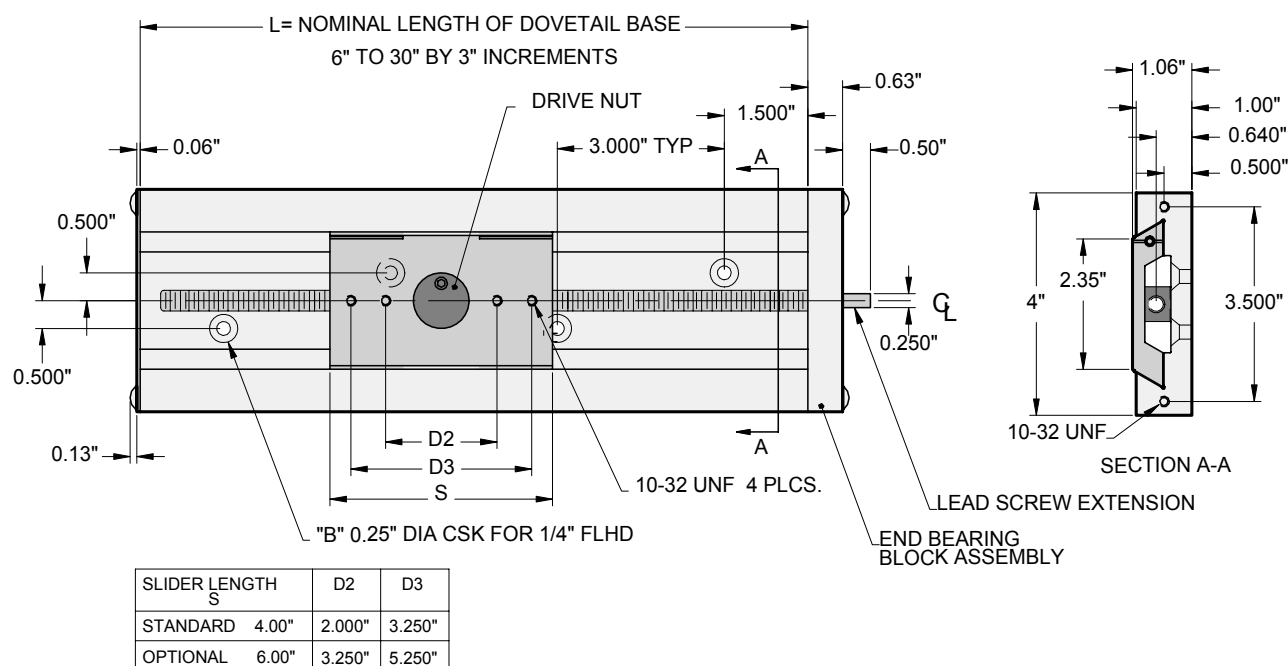


Introduction

All Series A40 UniSlides are 4" wide. Lengths vary by Type. There are 8 Types. Each Type offers you specific features or benefits to satisfy your requirements. The UniSlide Model Number specifies the Type and other characteristics. **P**

Series A40

Series A40 Common Dimensions and Load Capacity



S is the slider length. The standard length is 4." Optional 6" long slider is available to increase stability for large or cantilevered load.

L is the dovetail base length. Bases begin at 6" and increase in 3" increments. Your choice for base length is incorporated as the third and fourth digits of the Model Number. For example, Model A4006 has a 6" base length.

Travel = L - S. For an A4015B-S4, travel is 15" - 4" or 11". See Price List for Model Numbers and travel with standard length sliders.

Load Capacity

Dynamic Central Horizontal = 100 lbs. or 45 kgs.

Dynamic Central Vertical = 50 lbs. or 22 kgs.

Cantilevered = 130 lbs. -in. or 150 kgs. -cm.

See *Options* (pg. 1.34) for way covers, optional finishes, etc.

See *Combining UniSlides* (pg. 1.57) to combine 2 or 3 units.

Mounting holes "B" in the UniSlide Base – The first B mounting hole is 1 1/2" from the bearing block end of the dovetail base. All subsequent holes are 3" apart lengthwise along the base, e.g., A4015 has 5 mounting holes.



Free Sliding UniSlide Assembly

The simplest assembly, a Linear Dovetail Bearing. To specify, add "A" after the base length in the Model Number, e.g., A4009A-S4.

Feature: Linear Dovetail Bearing

Benefit: Linear motion

Length (Travel): Models from 0-56 inches

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 6" long slider
- Traveling Slider Lock



Screw Drive UniSlide Assembly

A lead screw controlled positioning slide. For 0.01" or 0.1 mm DRO position indication using a revolution counter and the W1 and K1 lead screws, see page 1.35.

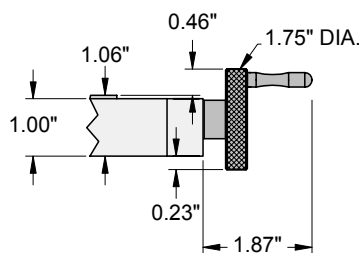
Feature: Free sliding plus lead screw drive

Benefit: Screw controlled positioning

Length (Travel): Models from 0-56 inches

Available Options (see pages 1.34)

- Lead screw and slider locks
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 6" long slider

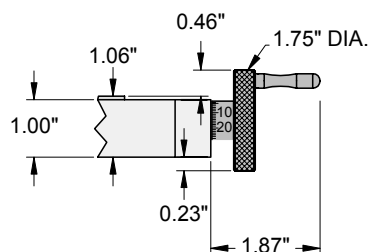




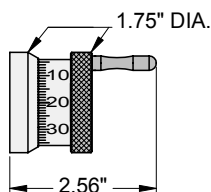
Graduated Knob UniSlide Assemblies

Measures position to 0.001" or 0.01 mm.

Your position is measured from the combined readings of the linear scale and engraved knob or drum dial. Each increment on the drum dials or knobs represents 0.001" or 0.01 mm. Scales have 0.025" or 1 mm increments. P20 or P40 lead screw models have a knob as in the drawing below. P5, P10, Q1 or Q2 lead screw models have a drum dial and collar as shown below.



50 division P20 or 25 division P40 model knobs



100 division P10 and Q1 or
200 division P5 or Q2 model knobs

Graduated Knob type Models have a high precision lead screw (accuracy 0.0015"/10". or 0.033 mm/20 cm or better).

Feature: Accurate lead screw, engraved knob and printed scale

Benefit: Measures position to 0.001" or 0.01 mm

Length (Travel): Models from 0-35 inches



Scale and Vernier Screw Drive UniSlide Assembly

Measures position to 0.001" or 0.05 mm.

This type adds a precision engraved scale and vernier to the Screw Drive UniSlide. To formulate your Model Number, choose one of the lead screw code letters from Code Letter for Model Number above. Add the letter "E" for English scale or "M" for Metric scale. Vernier position on the slider is offset to allow placement of a "Y" cross slide without blocking view of lower unit. See also the Rapid Advance with Scale and Vernier Style on the next page.

Feature: Engraved scale and vernier

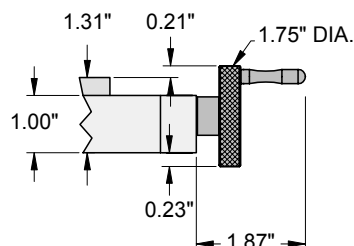
Benefit: Measures position to 0.001" or 0.05 mm

Length (Travel): Models from 0-17 inches

Available Options

(for both models on this page, see Options pages 1.34)

- Lead screw lock — slider lock
- Optional 6" long slider
- Special finishes or plating
- Encoders and revolution counters



All Rapid Advance Models

If you will be moving the slider frequently or your base length is long, consider one of these models. They **save time** by allowing you to quickly reposition the slider. This is accomplished by uncoupling from the drive system. There are three different Model groups, D, G, and H. The D and G Models use a clamping type drive. The H Model uses a lead screw and pinion design. They have different lengths of fine-adjust control. Mounting in a vertical position is not recommended.



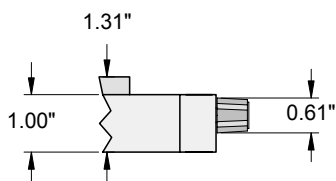
Rapid Advance with Limited Fine Adjust (Model D)

D Models have a 1/2" length of fine pitch adjust control. Moving the control lever clamps the slider to a central mandrel. Turning the Rogan knob rotates a short, 40 thread/inch screw into a threaded insert in the end of the mandrel. Most metal parts are stainless or aluminum. Rogan knob is 0.61" diameter. If measured movement is required, see Models DE and GE.

Feature: Quick gross position

Benefit: Save time. Fine pitch adjustment

Length (Travel): Models from 0-17 inches



To operate, rotate the control lever on the slider to the "Release" station. Next, manually push the slider to the approximate desired location. Finally, rotate the control lever to the "Engage" station and fine-adjust the slider position with the knob. All Scale and Vernier units have a 1/4" top plate making the height to the top of slider 1 5/16".



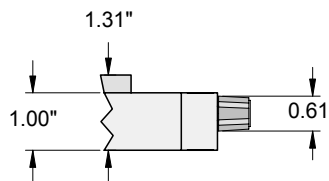
Rapid Advance with Scale and Vernier (Models DE and DM)

DE and DM Models add an engraved scale and vernier to Model D and provides measured movement and fixed zero reference point. Model DE has an English scale; Model DM has a Metric scale.

Feature: Quick gross position with vernier

Benefit: Save time and measures position to 0.001" or 0.05 mm

Length (Travel): Models from 0-14 inches





Rapid Advance with Full Travel Fine Adjust (Model H1 and H20)

Model H units provide fine adjust control over the full travel length, using a standard lead screw. Fine motion is accomplished using a unique system that applies a brake on two threaded brass pinions secured in a Delrin® carrier and delivers a smooth, quiet linear motion. Model H20 uses a 3/8"-20 thread/inch lead screw; Model H1 has a 10 x 1 mm pitch lead screw. These units are not recommended for vertically mounted applications. Load capacity is limited to 50 pounds horizontal or 2 pounds vertical.

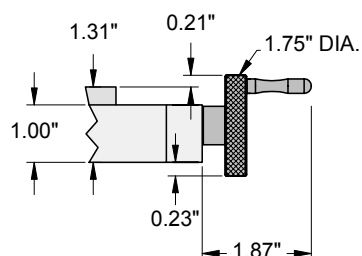
Feature: Rapid Advance mechanism

Benefit: Saves time. Full length screw control

Length (Travel): Models from 0-14 inches

Available Options (see pages 1.34)

- Slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces



Rapid Advance with Full Travel Fine Adjust with Scale and Vernier (Models HE and HM)

HE and HM versions add an engraved scale and vernier, (0.001" or 0.05 mm resolution) to the H-model, and features measured movement and a fixed zero reference point. Fine motion is accomplished using a unique system that applies a brake on two threaded brass pinions secured in a Delrin® carrier and delivers a smooth, quiet linear motion. Model HM uses a 3/8"-20 thread/inch lead screw; Model HE has a 10 x 1 mm pitch lead screw. These units are NOT recommended for vertically mounted applications. Load capacity is limited to 50 pounds horizontal or 2 pounds vertical.

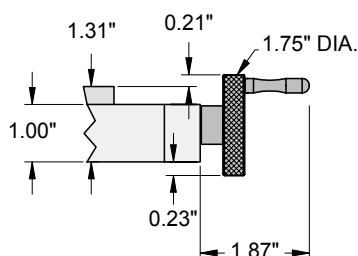
Feature: Rapid Advance mechanism, scale and vernier

Benefit: Saves time; measures movement

Length (Travel): Models from 0-17 inches

Available Options (see pages 1.34)

- Slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces





Rapid Advance with Micrometer Head (Models GE and GM*)

GE and GM Models have measured movement (1" or 25 mm) anywhere along the base and a movable zero reference point. Fine adjustment is made with a micrometer calibrated to 0.001" (Model GE) or 0.01 mm (Model GM). The mandrel clamping mechanism is the same as Model D. The end bearing block is 5/8" long.

Feature: Quick gross position; micrometer head

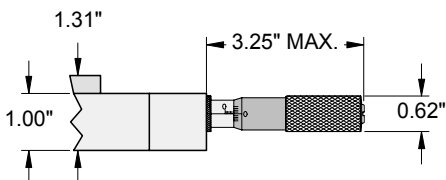
Benefit: Save time and measure position. Moveable zero reference point.

Length (Travel): Models from 0-14 inches

Available Options

(for Rapid Advance Models, see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 6" long slider



*GM metric version is a special order. Contact Velmex.



Left-Hand Right-Hand Screw Drive

These unique UniSlides incorporate two sliders driven by a single right and left-hand threaded standard accuracy lead screw. When the crank is turned the sliders simultaneously move toward or away from each other. These slides are very useful for applications where two objects must share a common axis of movement. Typical uses for Left-Right UniSlides include centering or mating operations in manufacturing, testing and research environments. For example, guide forks can be mounted on the sliders to insure that roll goods of different widths are precisely centered.

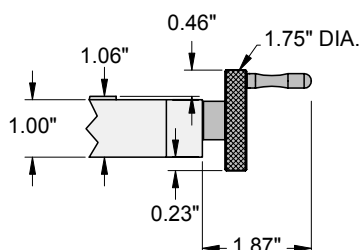
Feature: Left and right-hand thread on a common

shaft **Benefit:** Simultaneous together or apart motion

Length (Travel): Models from 0-16 inch separation

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional length sliders
- Lead screw lock
- Independent or separate lead screws



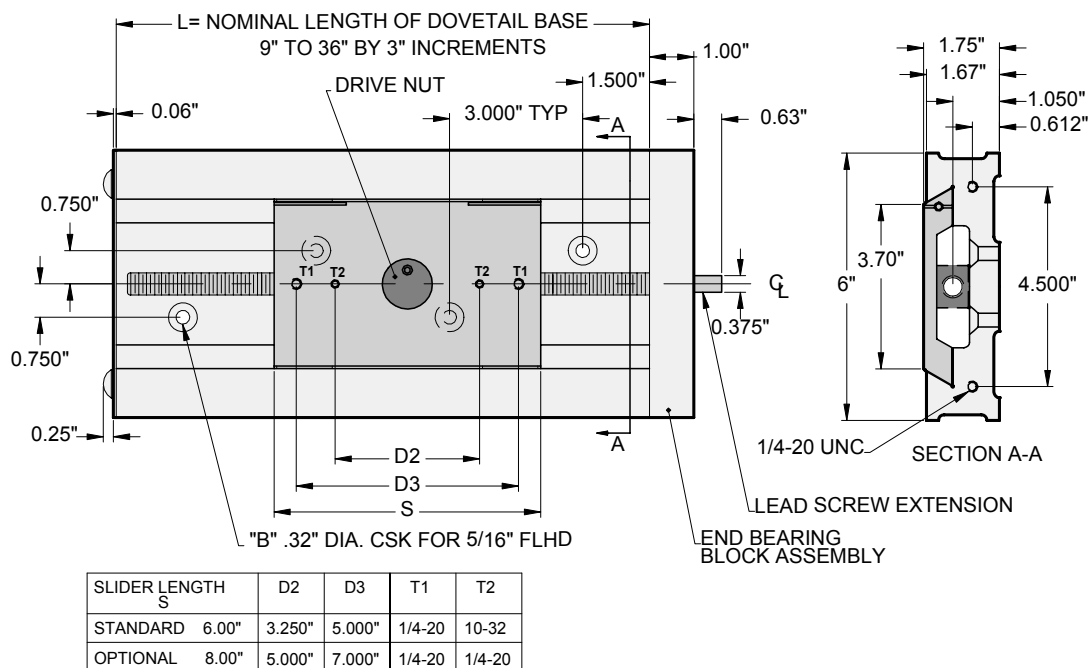


Introduction

All Series A60 UniSlides are 6" wide. Lengths vary by Type. There are 6 Types. Each Type offers you specific features or benefits to satisfy your requirements. The UniSlide Model Number specifies the Type and other characteristics.

Series A60

Series A60 Common Dimensions and Load Capacity



S is the slider length. The standard length is 6." Optional 8" long slider is available to increase stability for large or cantilevered load.

L is the dovetail base length. Bases begin at 9" and increase in 3" increments. Your choice for base length is incorporated as the third and fourth digits of the Model Number. For example, Model A6015 has a 15" base length.

Travel = L - S. For an A6015B-S6, travel is 15" - 6" or 9". See Price List for Model Numbers and travel with standard length sliders.

Load Capacity

Dynamic Central Horizontal = 240 lbs. or 109 kgs.

Dynamic Central Vertical = 100 lbs. or 45 kgs.

Cantilevered = 320 lbs. -in. or 369 kgs. -cm.

See *Options* (pg. 1.34) for way covers, optional finishes, etc. See *Combining UniSlides* (pg. 1.57) to combine 2 or 3 units.

Mounting holes "B" in the UniSlide Base — The first B mounting hole is 1 1/2" from the bearing block end of the dovetail base. All subsequent holes are 3" apart lengthwise along the base, e.g., A6015 has 5 mounting holes.



Free Sliding UniSlide Assembly

The simplest assembly, a Linear Dovetail Bearing. To specify, add "A" after the base length in the Model Number, e.g., A6009A-S6.

Feature: Linear Dovetail Bearing

Benefit: Linear motion

Length (Travel): Models from 0-66 inches

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 8" long slider
- Traveling Slider Lock



Screw Drive UniSlide Assembly

A lead screw controlled positioning slide. For 0.01" or 0.1 mm DRO position indication using a revolution counter and the W1 and K1 lead screws, see page 1.35.

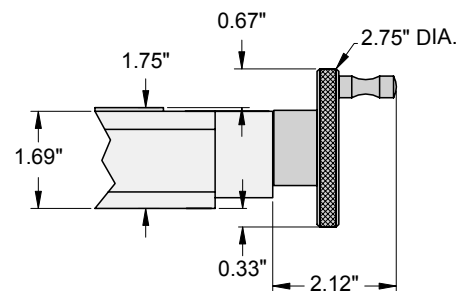
Feature: Free sliding plus lead screw drive

Benefit: Screw controlled positioning

Length (Travel): Models from 0-66 inches

Available Options (see pages 1.34)

- Lead screw and slider locks
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 8" long slider

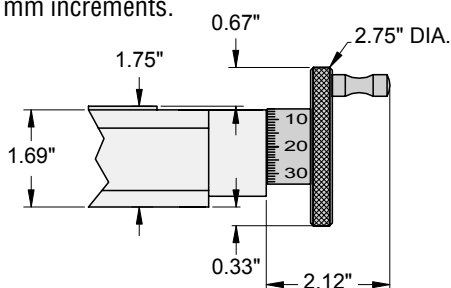




Graduated Knob UniSlide Assemblies

Measures position to 0.001" or 0.01 mm.

Your position is measured from the combined readings of the linear scale and engraved knob. Each increment on the knob represents 0.001" or 0.01 mm. Scales have 0.025" or 1 mm increments.



Graduated Knob type Models have a high precision lead screw (accuracy 0.0015"/10". or 0.033 mm/20 cm or better)

Feature: Accurate lead screw, engraved knob and printed scale

Benefit: Measures position to 0.001" or 0.01 mm

Length (Travel): Scale version models from 0-36 inches, pictured above. Counter version models from 0-66 inches



Scale and Vernier Screw Drive UniSlide Assembly

Measures position to 0.001" or 0.05 mm.

This type adds a precision engraved scale and vernier to the Screw Drive UniSlide. To formulate your Model Number, choose one of the lead screw code letters from Code Letter for Model Number above. Add the letter "E" for English scale or "M" for Metric scale, e.g., A6015BE-S6.

Vernier position on the slider is offset to allow placement of a "Y" cross slide without blocking view of lower unit. Travel is listed in the Price List. See also the Rapid Advance with Scale and Vernier Style on the next page.

Feature: Screw drive, plus engraved scale and vernier

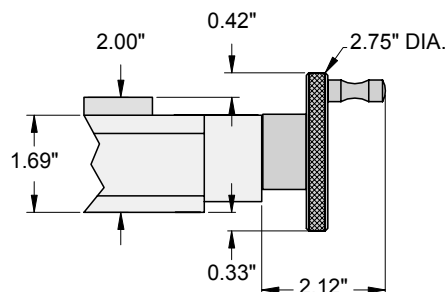
Benefit: Measures position to 0.001" or 0.05 mm

Length (Travel): Models from 0-15 inches

Available Options

(for both models on this page, see Options pages 1.34)

- Lead screw and slider locks
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 8" long slider



All Rapid Advance Models

If you will be moving the slider frequently or your base length is long, consider one of these models. They **save time** by allowing you to quickly reposition the slider. This is accomplished by uncoupling from the drive system. Model H uses a 3/8" or 10 mm lead screw and pinion design with full length fine-adjust control. Mounting in a vertical position is not recommended.



Rapid Advance with Full Travel Fine Adjust (Model H1 and H20)

Model H units provide fine adjust control over the full travel length, using a standard lead screw. Fine motion is accomplished using a unique system that applies a brake on two threaded brass pinions secured in a Delrin® carrier and delivers a smooth, quiet linear motion. Model H20 uses a 3/8"-20 thread/inch lead screw; Model H1 has a 10 x 1 mm pitch lead screw. These units are not generally recommended for vertically mounted applications. Load capacity is limited to 50 pounds horizontal or 2 pounds vertical.

Feature: Rapid Advance mechanism

Benefit: Saves time. Full length screw control

Length (Travel): Models from 0-30 inches

Available Options (see pages 1.34)

- Slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 8" length slider

To operate, rotate the control lever on the slider to the "Release" station. Next, you manually push the slider to the approximate desired location. Finally, you rotate the control lever to the "Engage" station and fine-adjust the slider position with the knob. All Scale and Vernier units have a 1/2" top plate making the height to the top of slider 2.25". Caution: When used vertically, load may drop suddenly when slider is released.



Rapid Advance with Full Travel Fine Adjust with Scale and Vernier (Models HE and HM)

HE and HM versions add an engraved scale and vernier, (0.001" or 0.05 mm resolution) to the H-model, and features measured movement and a fixed zero reference point.

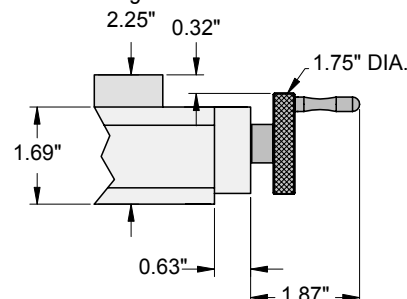
Feature: Rapid Advance mechanism, scale and vernier

Benefit: Saves time; measures movement

Length (Travel): Models from 0-12 inches

Available Options (see pages 1.34)

- Slider lock
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 8" length slider



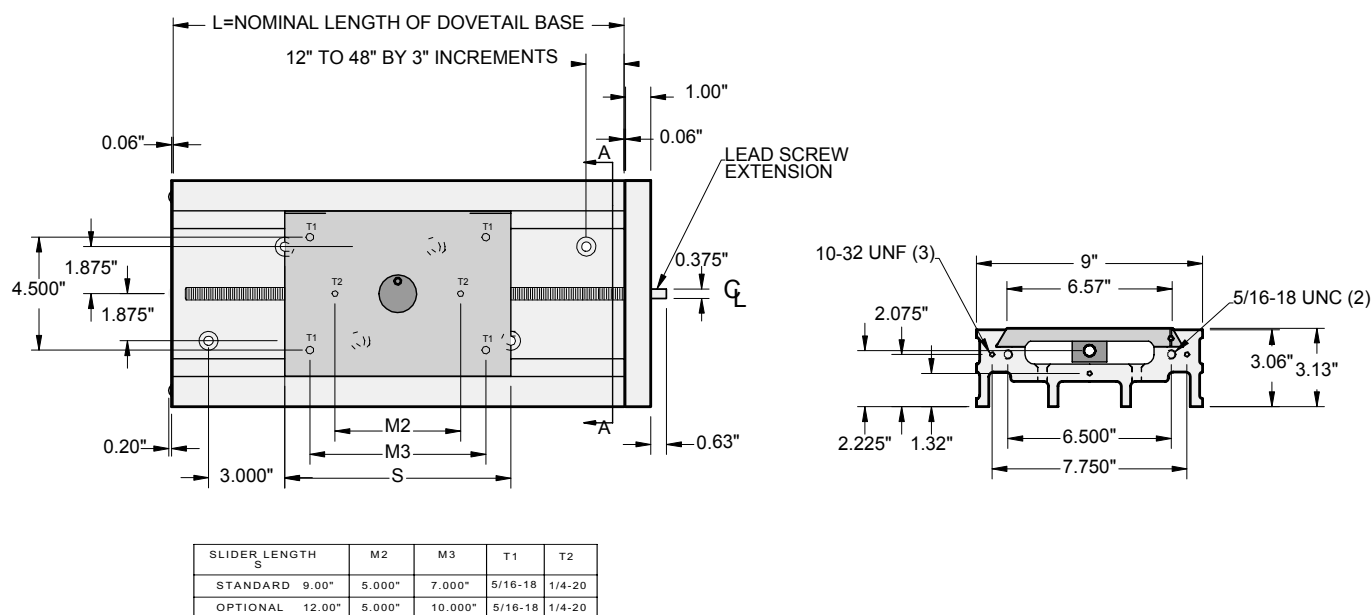


Introduction

All Series B90 UniSlides are 9" wide. Lengths vary by Type. There are 3 Types. Each Type offers you specific features or benefits to satisfy your requirements. The UniSlide Model Number specifies the Type and other characteristics.

Series B90

Series B90 Common Dimensions and Load Capacity



S is the slider length. The standard length is 9." Optional 12" long slider is available to increase stability for large or cantilevered load.

L is the dovetail base length. Bases begin at 9" and increase in 3" increments. Your choice for base length is incorporated as the third and fourth digits of the Model Number. For example, Model B9012 has a 12" base length.

Travel = L - S. For an B9015B-S9, travel is 15"- 6" or 6". See Price List for Model Numbers and travel with standard length sliders.

Load Capacity

Dynamic Central Horizontal = 400 lbs. or 182 kgs.

Dynamic Central Vertical = 100 lbs. or 45 kgs.

Cantilevered = 320 lbs. -in. or 369 kgs. -cm.

See *Options* (pg. 1.34) for way covers, optional finishes, etc.
See *Combining UniSlides* (pg. 1.57) to combine 2 or 3 units.

Mounting holes "B" in the UniSlide Base – The first B mounting hole is 1 1/2" from the end of the dovetail base. All subsequent holes are 3" apart lengthwise along the base, e.g., B9015 has 5 mounting holes.



Free Sliding UniSlide Assembly

The simplest assembly, a Linear Dovetail Bearing. To specify, add "A" after the base length in the Model Number, e.g., B9012A-S9.

Feature: Linear Dovetail Bearing

Benefit: Linear motion

Length (Travel): Models from 0-75 inches

Available Options (see pages 1.34)

- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 12" long slider
- Locks per page 1.34



Screw Drive UniSlide Assembly

A large lead screw controlled positioning slide. For 0.01" or 0.1 mm DRO position indication using a revolution counter and the W1 and K1 lead screws, see page 1.35.

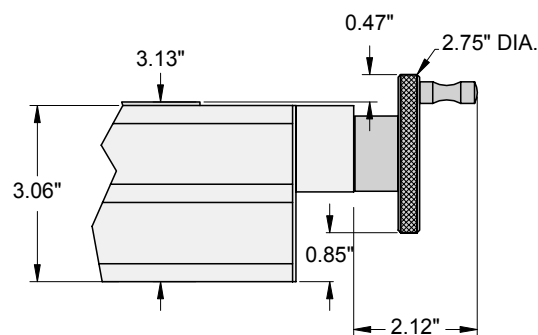
Feature: Free sliding plus lead screw drive

Benefit: Screw controlled positioning

Length (Travel): Models from 0-75 inches

Available Options (see pages 1.34)

- Lead screw and slider locks
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 12" long slider





Graduated Knob UniSlide Assemblies

Measures position to 0.001" or 0.01 mm.

Your position is measured from the combined readings of the linear scale and engraved knob. Each increment on the knob represents 0.001" or 0.01 mm. Scales have 0.025" or 1 mm increments. These Models have a high precision lead screw (accuracy 0.0015"/10". or 0.033 mm/20 cm or better).

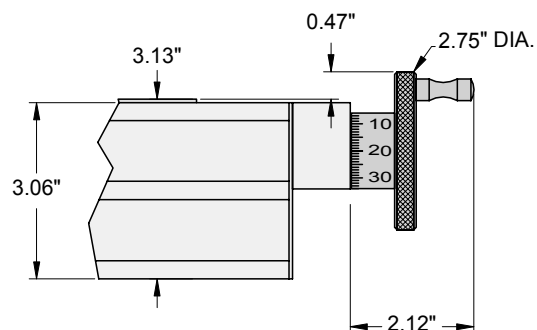
Feature: Accurate lead screw, engraved knob and printed scale

Benefit: Measures position to 0.001" or 0.01 mm

Length: Travel is 0-36 inches with scale. For units with travel from 36-75", a revolution counter is required.
See page 1.35

Available Options (see pages 1.34)

- Lead screw and slider locks
- Hard anodized or electroless nickel base
- Black anodizing on all surfaces
- Optional 12" long slider



UniSlide Options

Velmex offers the most versatile slide of any manufacturer in North America. One of the reasons for that amazing versatility is the range of options and accessories that can be added to your UniSlide, allowing you to customize it to your exact application. Here are some of the options available:



Lead Screw Lock

Thumbscrew-on-Lead-Screw Lock (-TL)

This is the most common lock, and is an easy method for fixing the position of the slider. It uses a simple thumb screw to secure the lead screw near the end bearing block. Note that the overall length of the UniSlide is slightly increased. Series A15 end block (W) is 0.78"; Series A25 and A40 end block is 1.00". Series A60 and B90 have a 1 3/8" thick end block. This lock type is not appropriate for Rapid Advance Style UniSlides. To order a UniSlide with Lead Screw Lock, add "-TL" to the end of the model number.



Traveling Slider Lock

Traveling Slider Lock (-TSL)

This lock attaches to the slider; the thumb screw presses against the outside edge of the base. It can be mounted for use on right or left side of the base. The lock is available in all Series but limited to Free Sliding, Screw Motion, Graduated Knob. Slider height is increased by 3/16" Series A15, 1/4", Series A25, and 3/8" Series A40, A60 and B90.



Slider Lock

Slider Lock (-SLR or -SLL)

Typically for short units, if slider length S is greater than 1/2 the base length L, a Slider Lock is available. This is a thumbscrew located at the midpoint of the base length. The screw tightens against a 90° step milled into the side of the slider, preventing movement of the slider. To order lock on the right side, append "-SLR" to the model number. For a lock on the left side, add "-SLL". See page 1.36, Engineering Data, to identify right and left sides.



Black Anodized Finish

Optional Finishes (-BK, Z, N)

Standard UniSlide components have a brushed aluminum finish; aluminum knobs have a clear anodized finish. Please see our web site (keyword: options) for complete details of the many optional finishes available to meet your requirements.

UniSlides can be cosmetically anodized in different colors, hard coat anodized to increase surface hardness and abrasion resistance, or coated with electroless nickel to provide a slick, even and corrosion resistant surface.

Finally, we offer AnoLube III-15K which provides a ceramic-hard, lubricous, protective coating for very harsh environments such as food processing, medical and offshore oil platforms.



Nickel Plated Finish

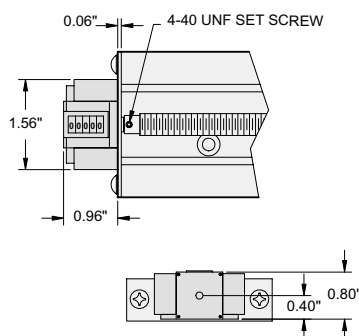


Revolution counter (-RC)

This modestly priced mechanical rev counter provides a convenient digital readout of either 0.01" or 0.1 mm. It increments every 1/10 revolution, and counts correctly with 0.100" or 1 mm (W1, P10, K1 or Q1) lead screws. Other screws require multiplying or dividing. Zero position is at the counter end of the unit and is not resetable.

Counters can replace the linear scale on Graduated Knob Drive models when the linear scale is obscured by the payload or way covers.

To order the Revolution Counter, add "-RC" to the end of the model number.



Way Covers (-WC)

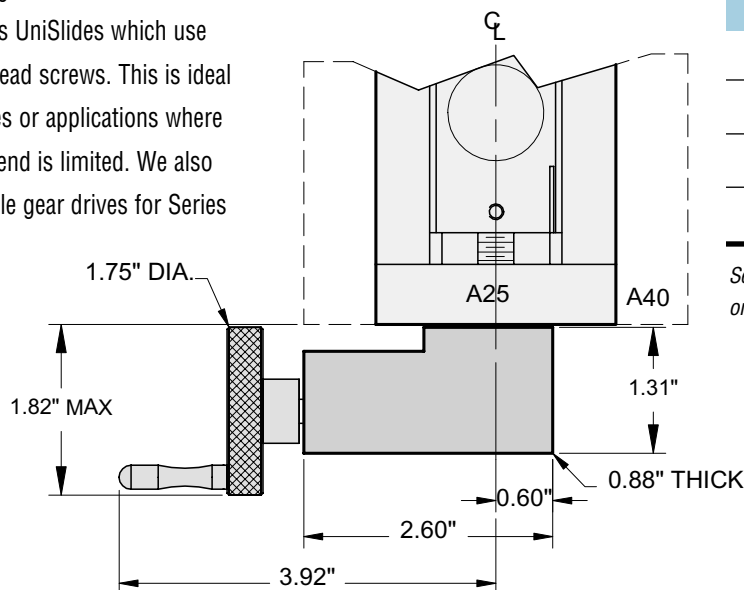
Way covers are a convenient method to protect the slider and dovetail from dust, dirt and grit that may be in the working environment. These consist of Estane bellows and attaching plates, and are available for Free Sliding, Screw Drive and Graduated Knob (requires P10 or Q1 screw and Revolution Counter) UniSlides. Way covers are not available for A15 Series.

Adding way covers will increase slider height and reduce the travel of a standard UniSlide. See our web site for complete details including a travel distance graph, drawings and more.

Gearbox (Part No. 5005B-A3-L Shown)

This 1:1 ratio gearbox fits on A25 and A40 Series UniSlides which use 3/8" diameter lead screws. This is ideal for tight spaces or applications where access to the end is limited. We also have right angle gear drives for Series

A60 and B90 models. See web site or call for details.



Gear Box Ordering Information

Knob Orientation	Model Number
Down	5005B-A3-D
Up	5005B-A3-U
Left	5005B-A3-L
Right	5005B-A3-R

See Engineering Data, Up, Down, Left Right, on page 1.36 for orientation.

Engineering Data

Design Advantages of Linear UniSlide Assemblies

- Compact design yields long travel in a short work space
- A simple, reliable design easily adaptable
- Modular components facilitate multiple axis system
- A broad variety of lengths, sizes and feature
- Customizing to accommodate special circumstances or uses

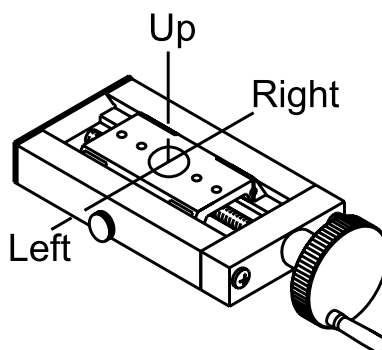
Load Capacity

The size of the slide selected for a given application will depend on user requirements. The chart below provides maximum dynamic load capacities for each model for three different load positions.

**A25 Series with W1 or P10 lead screws: LT = 30 lbs./13.5 kg. Static loads are twice the dynamic load values given above.*

Orientation: Up, Down, Left and Right

The reference position for linear UniSlide Assemblies is with the base down, the slider up, and the knob, if any, facing the user.



Construction

We begin as an extrusion of aluminum alloy with a straightness tolerance of half the normal commercial tolerance. Subsequent machining and lapping operations produce a very high degree of straightness and parallelism in the dovetail ways.

Base Stiffness

For increased base stiffness, three of our A-series bases — A25, A40 and A60 — are also available in the deeper B Series style. This extra stiffness is useful when the full length of the base cannot be adequately supported. Typical stiffness of the B Series base is two to four times greater than the A-series. See B Series bases on page 1.54.

Deviations from Straightness

There are three types of deviations from straightness than can occur: X, Y and Z. Picture a UniSlide Assembly resting base down on a flat surface, with its linear motion in the X or longitudinal direction. A departure from straightness in the upward direction — the Z axis — is designated as the bow error. A deviation in the horizontal direction — the Y axis — is horizontal run out, often referred to simply as run out. And a twist in the direction of the slide — the X axis — is called twist. The upper limits for these deviations from straightness, as determined by our manufacturing processes, are:

- Bow* 0.002" per foot
- Run Out 0.001" per foot
- Twist 1 milliradian per foot

** As installed, bow can be affected by the degree of flatness of the supporting surface and the relative tension of the mounting screws.*

Load Capacities

Series	Horizontal Central	Cantilevered Load	Vertical Central
A15	15 lbs. or 6.8 kgs.	20 lbs.-in. or 23 kgs.-cm.	10 lbs. or 4.5 kgs.
A25	30 lbs. or 13.6 kgs.	40 lbs.-in. or 46 kgs.-cm.	10* lbs. or 4.5* kgs.
A40	100 lbs. or 45.5 kgs.	130 lbs.-in. or 150kgs.-cm.	50 lbs. or 22.7 kgs.
A60	240 lbs. or kgs.	320 lbs.-in. or 369 kgs.-cm.	100 lbs. or 45 kgs.
B90	400 lbs. or 182 kgs.	480 lbs.-in. or 550 kgs.-cm.	100 lbs. or 45 kgs.

** A25 Vertical Central Load Capacity with a 10 pitch (W1 and P10) screw is 30 lbs./15.5 kg. to due to a stronger thrust bearing design.*

Also, for greater base stiffness, Series A25, A40 and A60 are available in deeper cross sections. See the B Series Bases on page 1.54 for more information.

Enhanced Straightness

Tolerances

If your application requires improved straightness tolerances, we can supply Models with straightness tolerances approximately one-half of the nominal values given previously. We individually select, measure and certify UniSlide Assemblies.

Wear Resistance

The standard aluminum alloy dovetail base and low friction polymer pads of the slider provide excellent performance as a bearing material combination. Unlike ball screw slide mechanisms, no lubrication is required. Under light to moderate loads, sideways play caused by wear during the first 30,000 cycles of operation will be approximately 0.00015 inches. Wear after that is reduced, to approximately 0.00005 inches over the next 50,000 cycles. Sliders are equipped with adjustment screws to compensate for wear, if necessary. For harsh environments and/or a higher number of cycles, UniSlide Assemblies with hard coat anodized ways are available. For clean room environments we recommend electroless nickel plating.

Magnetic Properties

We can make linear positioners with very low or no ferric (iron) content. UniSlide base and slider assemblies are made from aluminum alloy. Most lead screws are 303 stainless steel. The exceptions are the double and quad lead screws which are electroless nickel-plated cold rolled steel. We can also substitute brass lead screws for some models. Brass lead screws are only offered in standard

grade accuracy. In a few models with small steel parts, no nonmagnetic replacements are available. For further information please contact the factory.

Base and Slider Lengths

Standard and maximum base lengths for all models are listed in the specifications for each model. Custom base lengths are available on special order. Slider lengths available are only those listed in the model specifications.

Vacuum Applications

UniSlide Assembly's patented dovetail bearings give it certain advantages over other designs. They have been used in a myriad number of environments from outer space to vacuum chambers. The necessity for modification depends upon the so-called hardness of the vacuum and other specific requirements. Velmex can supply assemblies that are free of grease and oils. However, for critical applications the assemblies should be cycled in an outgassing chamber to remove residual contamination.

Back driving the Lead Screw

Models with 5 or 2.5 pitch lead screws (codes W2, W4, P5 or P2.5) can be back driven by the payload. See Lead Screws for additional details.

Scale and Control Lever

Position

The control lever for Rapid Advance units is on the right hand side. Printed and engraved scales are on the left side as shown in the drawings and photos in this catalog. Scale numbering

always progresses toward the knob end of the unit — i.e., the largest numbers on the scale are closest to the knob. Control levers, top plates, thumbscrew locks and verniers can be mounted on the alternate side on special request. If requested, the scale can be mounted on the right side of the unit, with the largest numbers going away from the operator. For models with the base mounting holes located off the center line, holes begin at the bearing block end with the first hole to the right of the lead screw. See Dimensional Drawing for series of choice for details.

Material Substitutions

Material substitutions for drive nuts, lead screws and thrust bearing are possible. Drive nuts are available in brass, oil-impregnated bronze, and, for high temperature or radiation applications, in Vespel. Thrust bushings can be manufactured from Vespel. Alternatively, thrust bearings made with polymer raceways and cages, and stainless steel or ceramic balls are also available. Brass lead screws are available in a limited pitch selection.

Lead Screws

A Few Words About Lead Screws

The lead screws in our UniSlide Assemblies are formed by rolling through precision dies, rather than cut on a screw machine. This results in higher quality and accuracy. Our lead screws are 303 stainless steel except W2, W4 and P5 lead screws which are electroless nickel plated cold rolled steel. Nonmagnetic brass lead screws are available—please refer to the Engineering Data on page 1.36.

Lead Screw Diameters

Series	Type Code	Diameter
A15 & A25	C, B, P40, P20	1/4 "
A15 & A25	K1, K2, Q1, Q2	7 mm
A25	W1, P10, W2, W4, P5	3/8"
A40	C, B, W1, W2, W4, P40, P20, P10, P5	3/8"
A40	K1, K2, Q1, Q2	10 mm
A60 & B90	C, B, W1, W2, W4, P40, P20, P10, P5	1/2"
A60 & B90	K1, K2, Q1, Q2	14 mm

Lead Screw Code Letters for Series Numbers

Use these code letters when constructing model numbers. Lead screw code letter(s) follow base length value.

Series English Thread	Turns per Inch English Tread	Advance per Revolution	Screw Motion Type Code Letter for Standard Accuracy	Scale and Vernier Type Code Letter	Graduated Knob Code Letter for Precision Accuracy	Divisions on Graduated Knob
A15, A25, A40, A60, B90	40	0.025"	C	CE*	P40	25
A15, A25, A40, A60, B90	20	0.050"	B	BE*	P20	50
A25, A40, A60, B90	10	0.100"	W1	W1E*	P10	100
A25, A40, A60, B90	5	0.200"	W2	W2E*	P5	200
A25, A40, A60, B90	2.5	0.400"	W4	—	—	—
Series Metric Thread	Turns per cm Metric Thread					
A15, A25, A40, A60, B90	10	1 mm	K1	K1M*	Q1	100
A15, A25, A40, A60, B90	5	2 mm	K2	K2M*	Q2	200

* Not available in B90. Delrin® is a trademark of E. I. duPont Co.

Accuracy

The accuracy of standard lead screws is 0.007"/10" or better. The accuracy of Graduated Knob Model screws is 0.0015"/10" or 0.033 mm/20 cm or better, and is checked to not exceed this value.

Thrust Bearings Design

A15 and A25 lead screws use pre-loaded Delrin® thrust bearings except A25 W1, and P10, which have pre-loaded ball bearings. A40, A60 and B90 lead screws have pre-loaded ball bearings.

Backdriving

Because of the steep helix angle of the threads in W2, W4 and P5 lead screws, they may backdrive (coast back down) when supporting a vertical load or, if horizontal and a linear thrust load is applied, the slider will move away until the thrust has been equalized. If you want the slide to stay where you put it, be aware of this characteristic and design accordingly.

Assembled UniSlide XY Tables

AXY40 and AXY60 Series

Although any two UniSlide Assemblies in combination offer a very wide variety of XY possibilities, we also have these assembled XY tables to meet common applications. These tables feature a large top work surface

combined with a stable base, and can provide load handling from 25 to 100 pounds. Tables are designed with crossed and inverted (slider down) A40 or A60 UniSlides and XY plates. Overall height is 3 3/4" on the AXY40, and 5 1/2" on the AXY60. The standard lead screw is the W1 with a lead of 0.100" /revolution.

Available Options

B (0.050"/rev), C (0.025"/rev) or K1 (1 mm/rev) lead screws can be substituted for the standard W1. A Graduated Knob 0.001" resolution and/or revolution counter providing 0.01" resolution are also available. Refer to the Options pages for additional information on rev counters.



Model AXY4009W1 — 5" x 5" travel. A 2" x 2" travel model is also available.

Model Number	Travel
AXY4006W1	2" x 2"
AXY4009W1	5" x 5"

Model Number	Travel
AXY6009W1	3" x 3"
AXY6012W1	6" x 6"
AXY6015W1	9" x 9"



Model AXY6012W1 — 6" x 6" travel with optional revolution counters. Models with 3" and 9" travels are also available.

AXY25 Series

These low profile tables feature a height of just 2 3/8" and provide exceptional rigidity and a large work surface area. They are designed around four A25

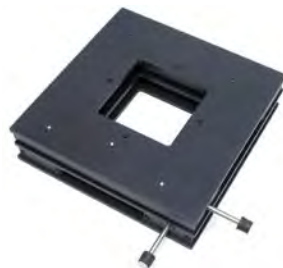
Series UniSlide Assemblies. The standard lead screw is the W1 or 0.100" per revolution. All models have a 25 pound load capacity.

Available Options

B (0.050"/rev), C (0.025"/rev) and K1 lead screws can be substituted for the standard W1. Black Anodizing (-BK).



Models AXY2506W1 and AXY2509W1



Model AXY25 with optional window

Model Number	Travel
AXY2506W1	2" x 2"
AXY2509W1	3" x 3"
AXY2512W1	4" x 4"

Model Number	Travel	Height (H)	Load	Work Envelope
AXY2506W1	2" X 2"	2.40"	25 lbs.	13" x 13"
AXY2509W1	3" X 3"	2.40"	25 lbs.	18" x 18"
AXY2512W1	4" X 4"	2.40"	25 lbs.	23.38" x 23.38"
AXY4006W1	2" X 2"	3.75"	60 lbs.	12.53" x 12.53"
AXY4009W1	5" X 5"	3.75"	25 lbs.	18.53" x 18.53"
AXY6009W1	3" X 3"	5.50"	100 lbs.	17.03" x 17.03"
AXY6012W1	6" X 6"	5.50"	60 lbs.	23.03" x 23.03"
AXY6015W1	9" X 9"	5.50"	30 lbs.	29.03" x 29.03"

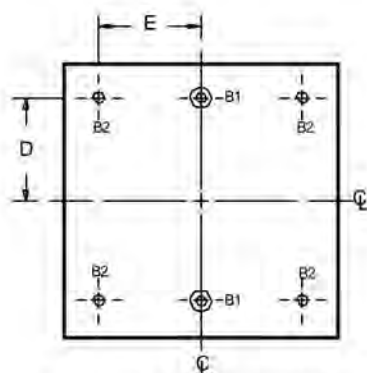
AXY Table Plates

T1- 8-32 ON A 2.062 DIA BOLT CIRCLE
ACCEPTS A25 ADAPTERS & A2505TS TURNTABLES

T2- 10-32 ON A 3.250 DIA BOLT CIRCLE
ACCEPTS A40 ADAPTERS, A4007TS, AND *A4800 ROTARY TABLES

T3- 1/4-20 ON A 5.000 DIA BOLT CIRCLE
ACCEPTS A60 ADAPTERS AND * A4800 ROTARY TABLE

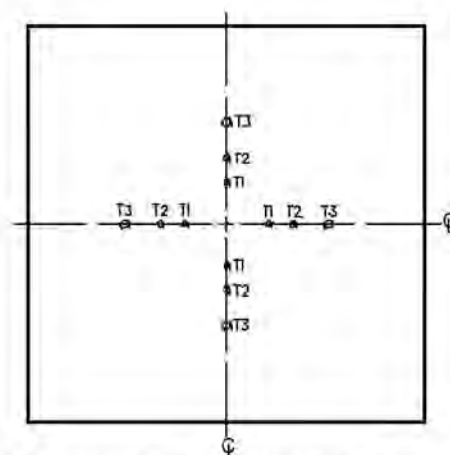
*A6000TX ADAPTER PLATE USED TO MOUNT
A4800 ROTARY TABLE



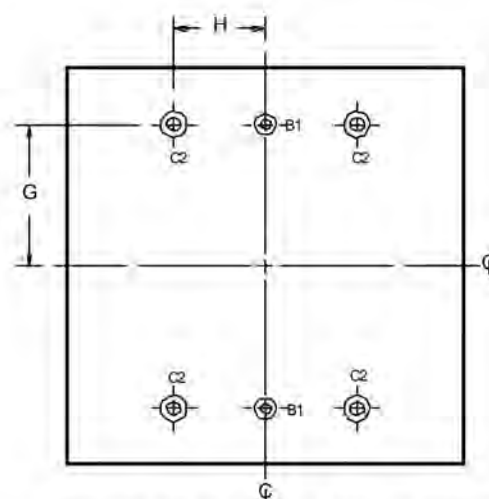
BOTTOM PLATE FOR AXY2506, AXY4006 & AXY4009 SERIES TABLES

B1- CLEARANCE (AND CSK IN AXY2506) FOR 1/4 FLHD MACHINE SCREWS FOR MOUNTING ON A60 SERIES SLIDER OR OTHER SURFACE

B2- CLEARANCE FOR 1/4 DIA CPHD AND FOR MOUNTING ON ANY CUSTOMER SURFACE



TOP PLATE FOR ALL AXY SERIES TABLES



BOTTOM PLATE FOR AXY2509, AXY2512, AXY6009, AXY6012 & AXY6015 SERIES TABLES

B1- CLEARANCE AND CSK FOR 1/4 FLHD MACHINE SCREWS FOR MOUNTING ON A60 SERIES SLIDER OR OTHER SURFACE

C2- CLEARANCE AND CSK FOR 5/16 FLHD MACHINE SCREW FOR MOUNTING ON B60 SERIES SLIDER OR OTHER SURFACE

Model Number Top & Bottom	Plate Size Mtg. Holes	Top Plate Mtg. Holes	Bottom Plate	D	E	G	H
AXY2506W1	1/4" X 6.75" X 6.75"	T1 & T2	B1	2.500" On Ctr. Line			
AXY2509W1	1/4" X 9.75" X 9.75"	T2 & T3	C2			3.500"	2.250"
AXY2512W1	1/4" X 12.75" X 12.75"	T2 & T3	C2			3.500"	2.250"
AXY4006W1	3/8" X 6" X 6"	T1 & T2	B1 & B2	2.500"	2.500"		
AXY4009W1	3/8" X 9" X 9"	T1 & T2	B1 & B2	2.500"	2.500"		
AXY6009W1	3/8" X 9" X 9"	T2 & T3	Ctr. Line			3.500"	2.250"
AXY6012W1	3/8" X 12" X 12"	T2 & T3	C2			5.000"	2.250"
AXY6015W1	3/8" X 12" X 12"	T2 & T3	C2			5.000"	2.250"

Elevating Tables

UniSlide Series B29, B49, and B69

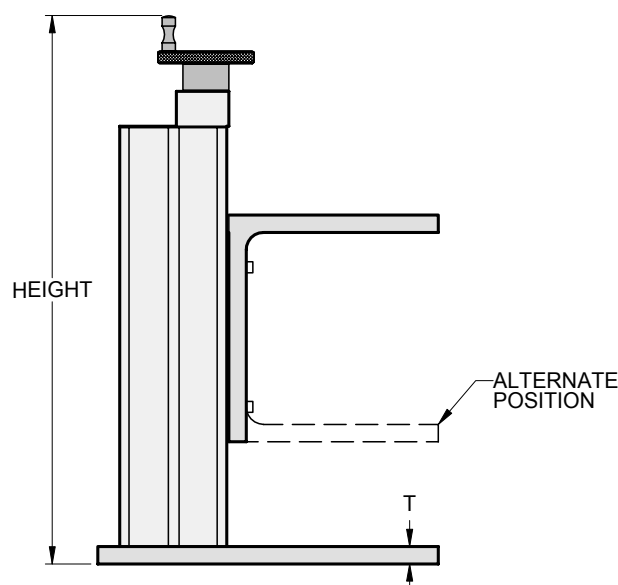
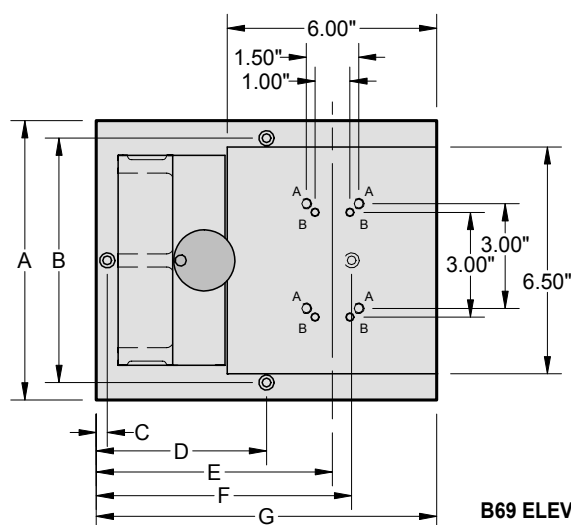
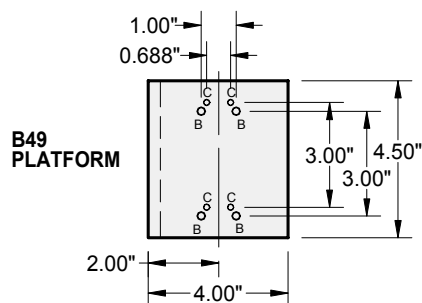
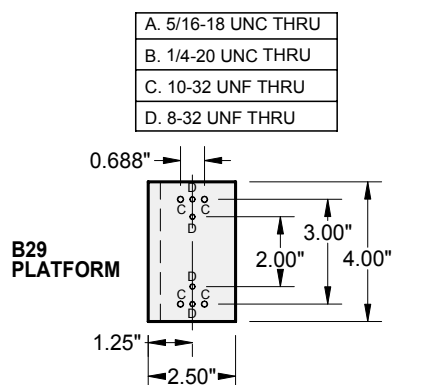
Although most UniSlide Assemblies can be used in a vertical position, some applications require greater strength and rigidity, and more overall versatility. UniSlide Elevating Tables are designed for these applications.

Because the dovetail base is freestanding, B29, B49 and B69 Series Elevating Tables use the deeper "B"-type cross sections for greater rigidity. See page 1.54. The standard lead screw is the W1, with 0.100" revo-

lution. Each Elevating Table features a convenient top-mounted knob for easy table height adjustment, and has a large, stable base plate and a right angle platform secured to the slider. This right angle platform may be removed and remounted in an inverted position. This platform can also be purchased separately.

Available Options

Elevating Tables are available in plain or Black Anodized finishes, with finer pitch lead screws, with Graduated Knob position readout, and with longer travel distances.



Elevating Table Models and Specifications (see drawing on previous page). All dimensions are in inches.

Model No.	B29 Series			B49 Series			B69 Series		
	B2904W1	B2906W1	B2909W1	B4906W1	B4909W1	B4912W1	B6909W1	B6912W1	B6915W1
Travel Distance	1 1/2	3 1/2	6 1/2	2	5	8	3	6	9
Height	6 7/8	8 3/4	11 7/8	8 7/8	11 7/8	14 7/8	12 3/4	15 3/4	18 3/4

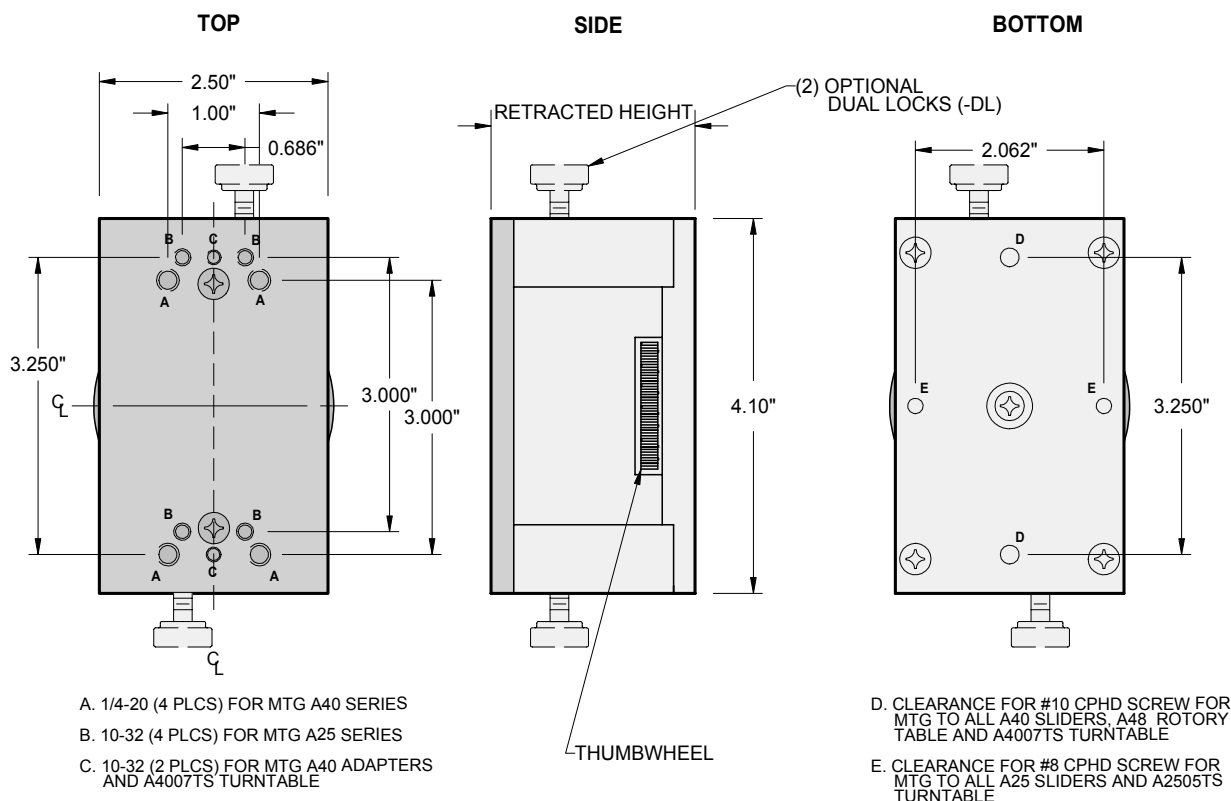
Series	Load Capacity	Min. Platform Height	Base Clearance Holes	A	B	C	D	E	F	G	T
B29	30 lbs	3.375	0.196	4	3 1/4	3/8	2	3 9/16	3 5/8	4	3/8
B49	50 lbs	4.5	0.25	6	5	5/16	3 21/32	5 7/32	5 5/16	7 5/16	1/2
B69	100 lbs	6.5	0.25	8	7	5/16	4 7/8	6 7/8	7 5/16	9 3/4	1/2

UniSlide A39 Series Elevating Tables

With these tables, the space above and around the table top is unobstructed. Our design provides a stable platform with a large thumb wheel for moving small loads. Central load capacity is 25

lbs. The standard lead screw is 3/8-20 double lead Acme, with a lead of 0.100". Other lead screws are available, please consult factory. Options include dual locking screw and black anodized finish.

Model Number	Retracted Height	Vertical Travel
A3901W1	2.25"	1.00"
A3903W1	4.50"	3.25"



Note: This drawing shows table with optional locking screws.

NOTE: TOP PLATE MUST BE REMOVED FOR ACCESS TO MTG HOLES IN BASE

XY Adapter Plates

These aluminum XY Plates allow you to configure an XY motion system using two UniSlides. Each plate has a hole pattern that mates the slider of the lower (X) UniSlide, and at right angles to that, a pattern matching the base of the top (Y) UniSlide.

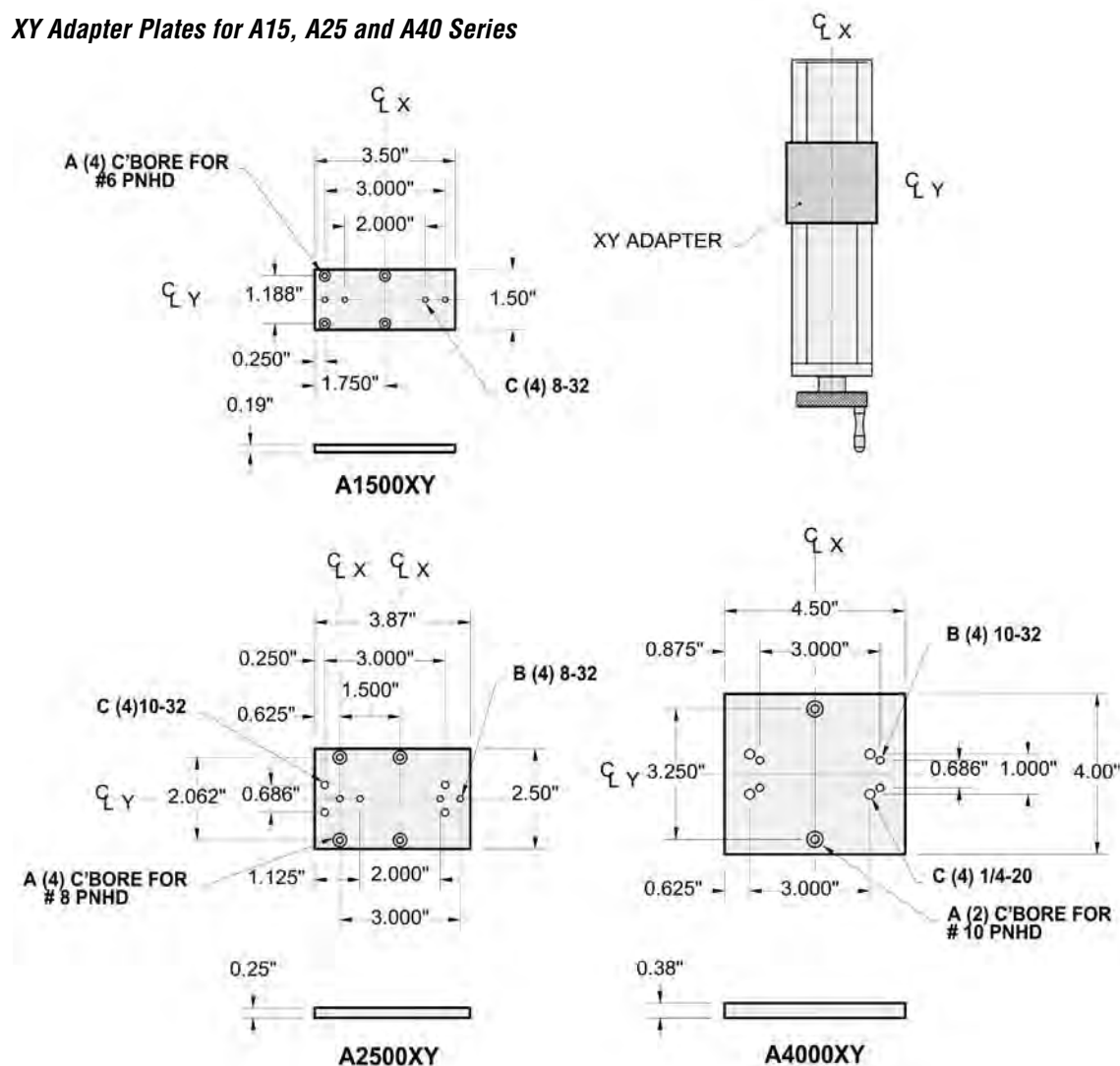
Select the adapter plate to match the lower UniSlide Series you will be using. For example, use the A4000XY Adapter Plate with A40 Series UniSlides. Typical examples are illustrated on page 1.57.

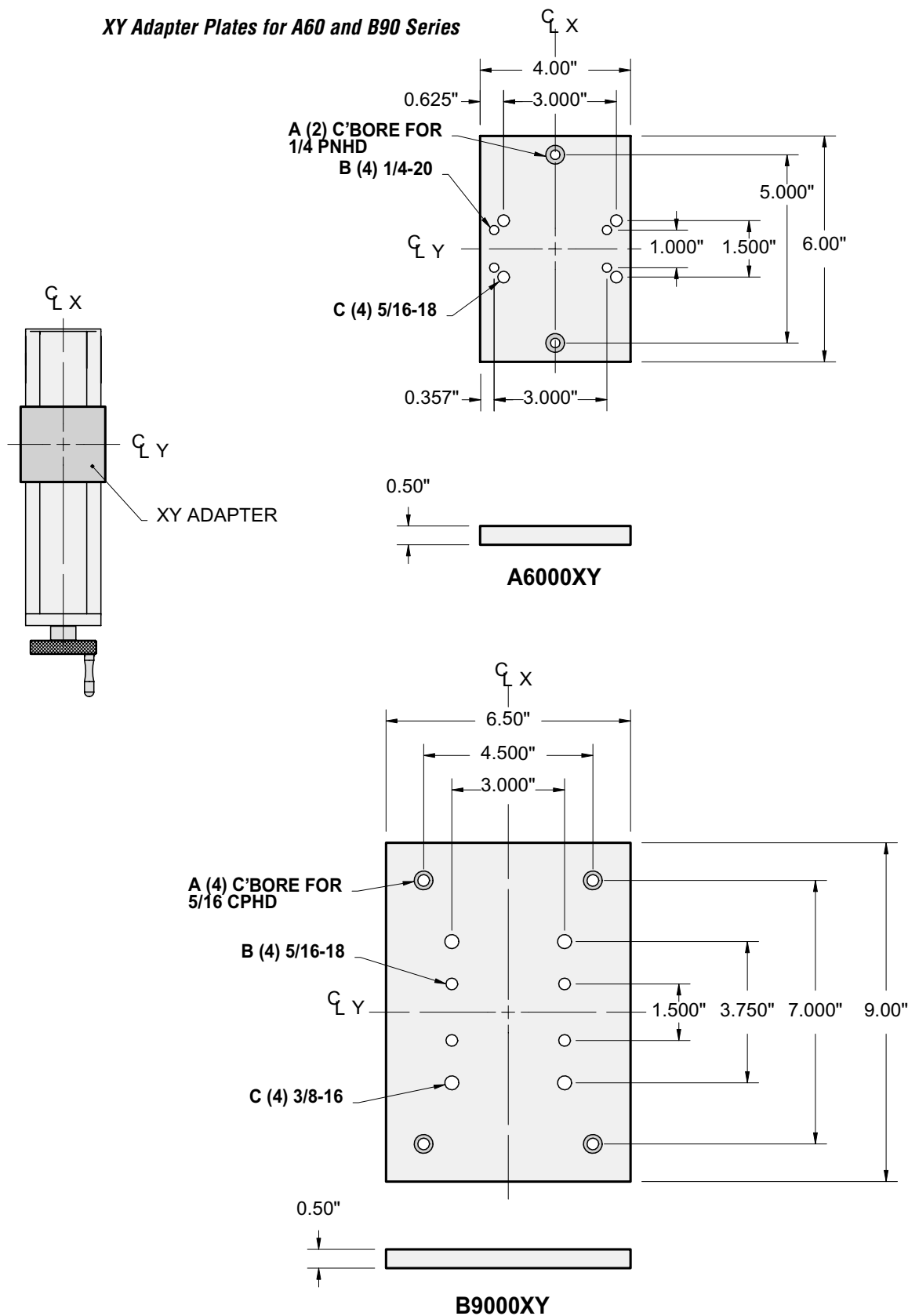
If the moment on the supporting (X axis) unit is significant, you will want to combine two different Series, using the larger Series for the supporting unit. To accommodate this, all adapter plates include a hole pattern for the base of the next smaller UniSlide Series. Therefore, the A2500XY Adapter Plate will also accept A15 Series using the base hole pattern. Similarly, the A4000XY Plate accepts both A40 and A25 Series UniSlides, the A6000XY Plate accepts both A60 and A40 UniSlides. and the B9000XY Plate

accepts both B90 and A60 UniSlides. The A1500XY Plate accepts only A15 Series UniSlides.

There are other uses for these plates too. They can be used as auxiliary payload mounting plates or as intermediate plates between the load and the slider. This provides more mounting surface area, and is also a quick way to change loads while maintaining their alignment to the UniSlide. And they provide an easy way to mount a UniSlide upside (slider) down.

XY Adapter Plates for A15, A25 and A40 Series



XY Adapter Plates for A60 and B90 Series

A = FOR MOUNTING TO LOWER "X" UNISLIDE

B = FOR MOUNTING TO UPPER "Y" UNISLIDE OF NEXT SMALLER SERIES

C = FOR MOUNTING TO UPPER "Y" UNISLIDE OF THE SAME SERIES

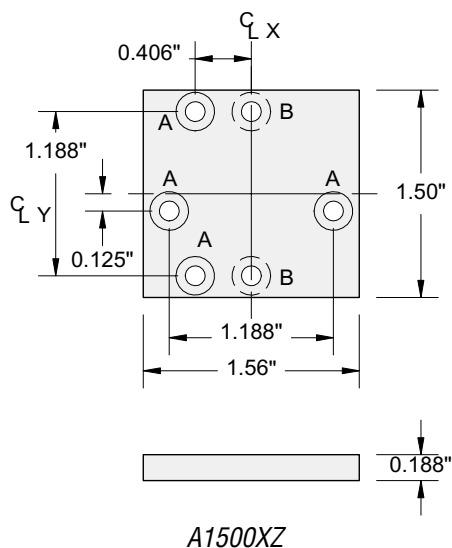
XZ Adapter Plates

XZ Adapter Plates and Brackets allow UniSlide Assemblies to be positioned vertically or end mounted, facing any one of four directions, all of which are

perpendicular to the X or Y planes. Look at Combining UniSlides, page 1.57, now for examples. The XZ Plate Adapter end-mounts the UniSlide using the two holes in the nameplate end of the base. It is for light loads and short slides, while the

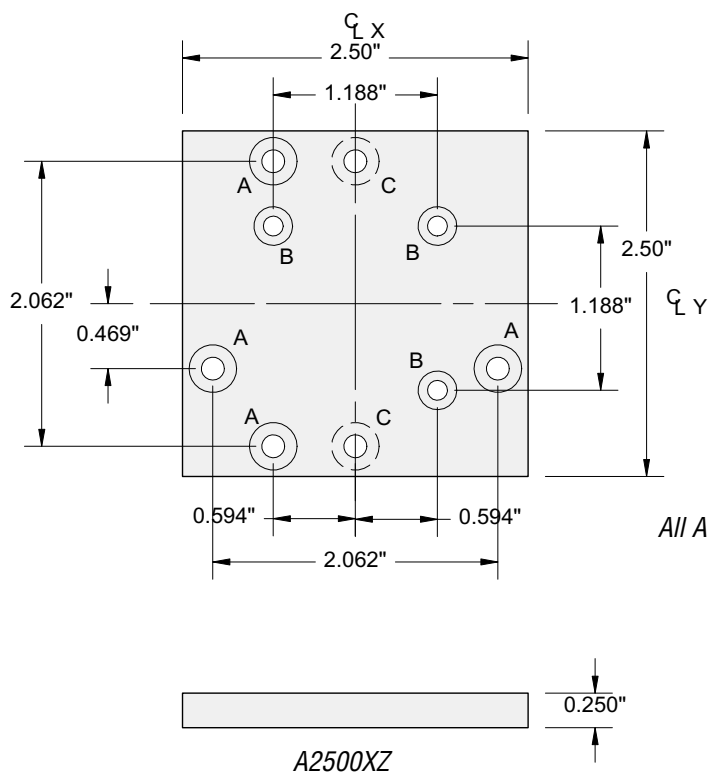
bracket designs (page 1.49) are more rigid to handle heavier loads.

At the end of this section is the A6000TX adapter for A4800 Rotary tables.



A= (4) C'BORE FOR 6-32 PNHD SCREW. FOR MOUNTING A15 SERIES UNISLIDE VERTICALLY

B= (2) C'BORE FOR 6-32 PNHD SCREW. FOR MOUNTING PLATE TO A15 SERIES UNISLIDE (OPPOSITE SIDE)

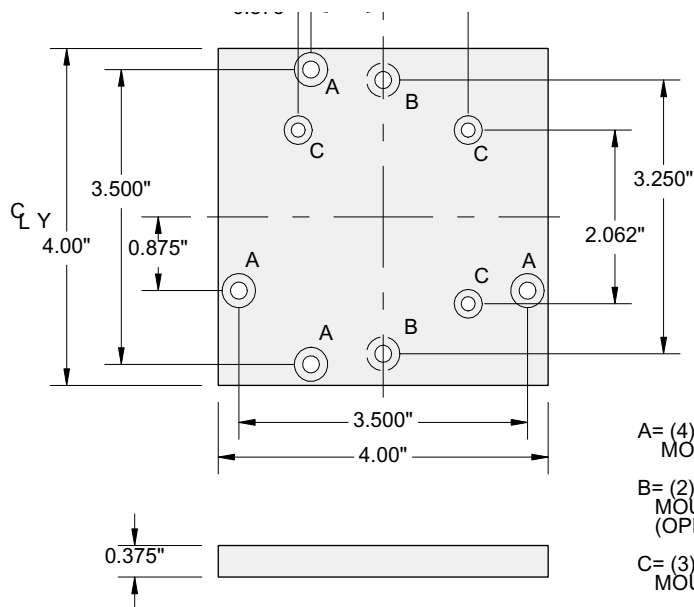


A= (4) C'BORE FOR 8-32 PNHD SCREW. FOR MOUNTING A25 SERIES UNISLIDE VERTICALLY

B= (3) C'BORE FOR 6-32 PANHEAD. FOR MOUNTING A15 SERIES UNISLIDE VERTICALLY

C= (2) C'BORE FOR 8-32 PNHD SCREW. FOR MOUNTING PLATE TO 25 SERIES UNISLIDE (OPPOSITE SIDE)

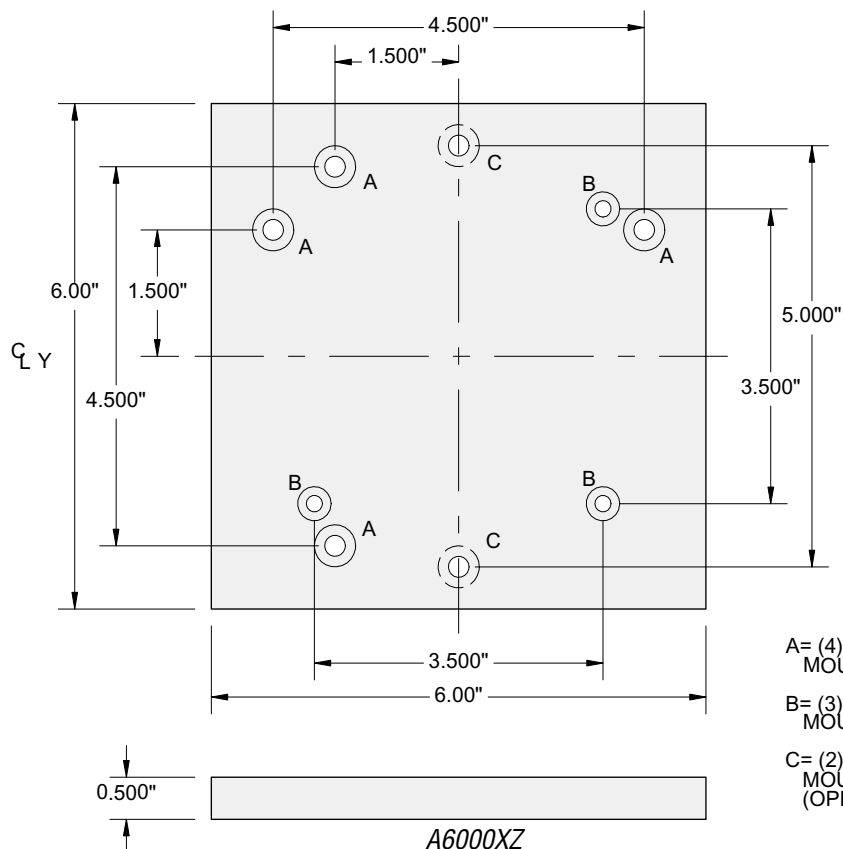
All A and C holes will mount to A25 end or slider holes.

XZ Adapter Plates for A40 and A60 Series

A= (4) C'BORE FOR 10-32 PNHD SCREW. FOR MOUNTING A40 SERIES UNISLIDE VERTICALLY

B= (2) C'BORE FOR 10-32 PNHD SCREW. FOR MOUNTING PLATE TO 40 SERIES UNISLIDE (OPPOSITE SIDE)

C= (3) C'BORE FOR 8-32 PNHD SCREW. FOR MOUNTING A25 SERIES UNISLIDE VERTICALLY

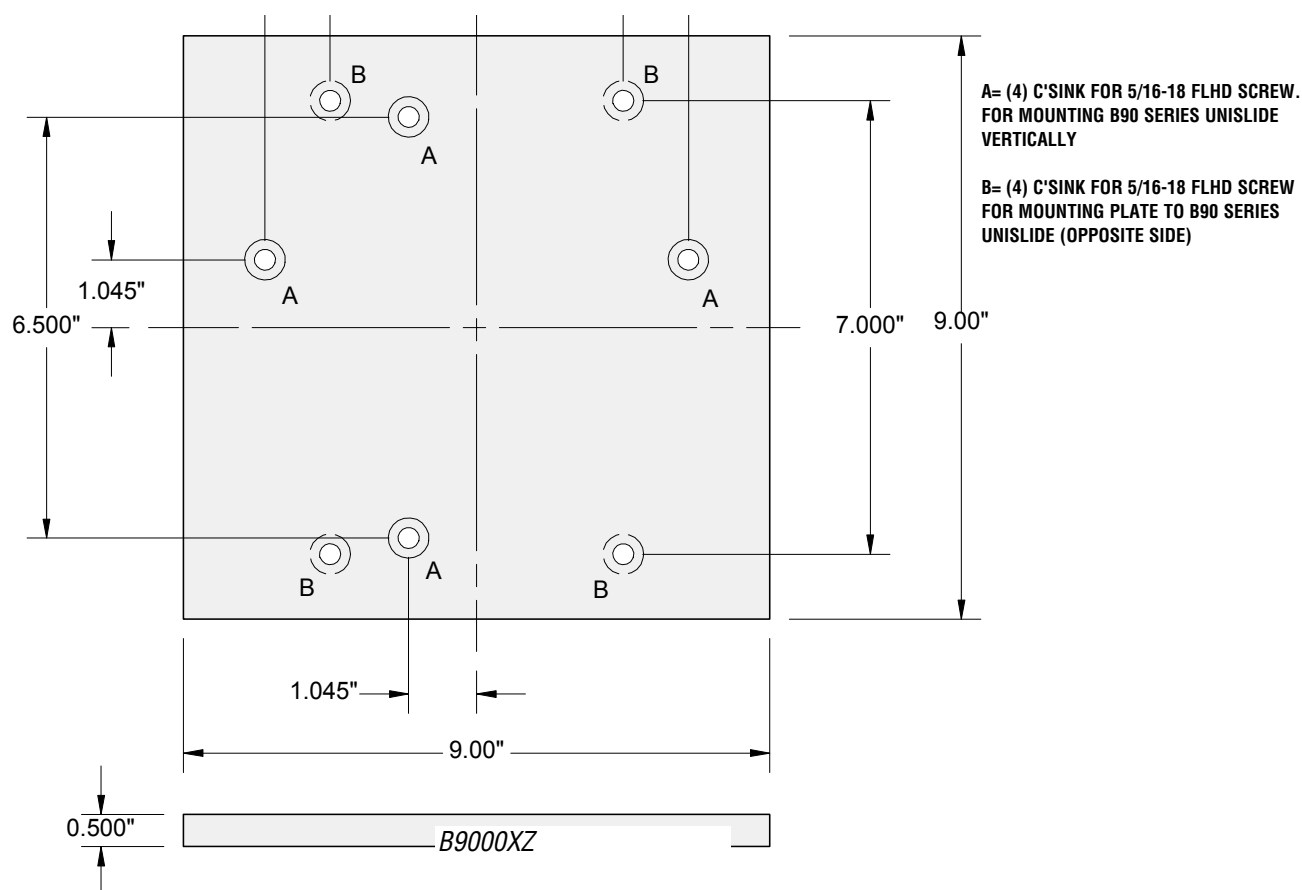
A4000XZ

A= (4) C'BORE FOR 1/4-20 PNHD SCREW. FOR MOUNTING A60 SERIES UNISLIDE VERTICALLY

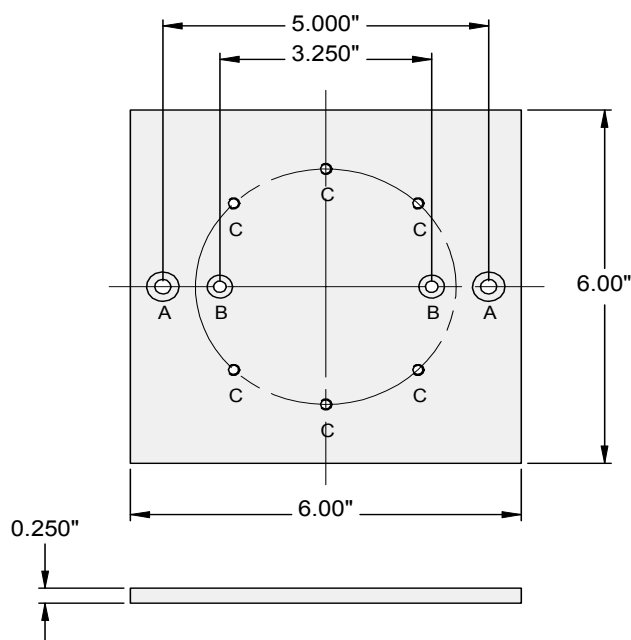
B= (3) C'BORE FOR 10-32 PANHEAD. FOR MOUNTING A40 SERIES UNISLIDE VERTICALLY

C= (2) C'BORE FOR 1/4-20 PNHD SCREW. FOR MOUNTING PLATE TO 60 SERIES UNISLIDE (OPPOSITE SIDE)

A6000XZ

XZ Adapter Plate for B90 Series**Adapter Plate A6000TX for A4800 Series Rotary Table**

- A: (2) C'SINK FOR 1/4" FLHD SCREW. FOR MOUNTING A60 SERIES UNISLIDE
- B: (2) C'SINK FOR #10 FLHD SCREW. FOR MOUNTING TO A40 SERIES UNISLIDE
- C: (6) TAP 10-32 ON A 4" BOLT CIRCLE. FOR MOUNTING 4800 SERIES ROTARY TABLE



XZ Adapter Brackets

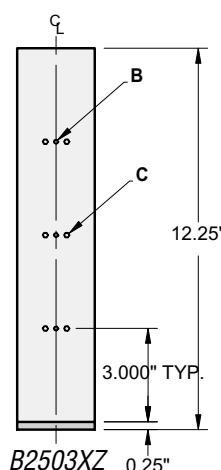
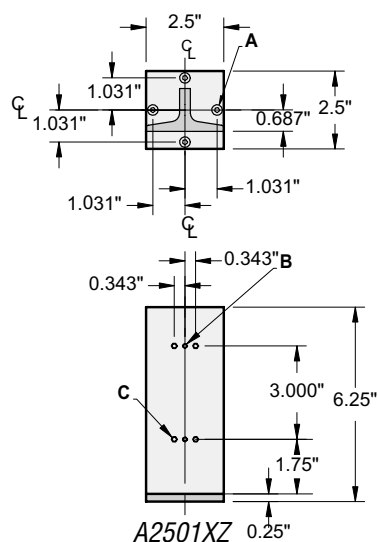
XZ Adapter Brackets and Plates allow UniSlide Assemblies to be positioned vertically, facing any one of four directions, all of which are perpendicular to the X or Y planes. Look at Combining UniSlides, page 1.57, now for examples. The XZ plates (page 1.46) are for light loads and

short slides, while brackets support the dovetail base, provide more rigidity and handle heavier loads.

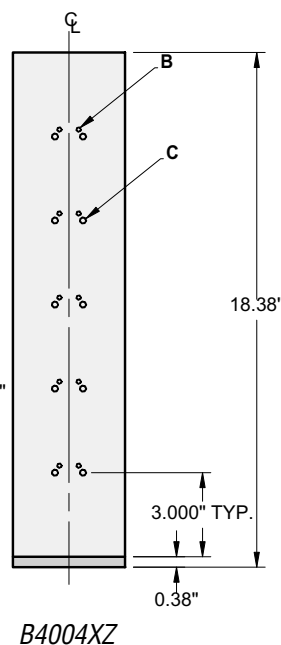
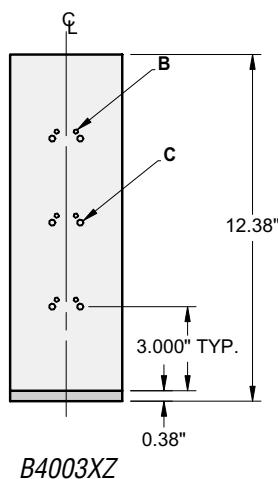
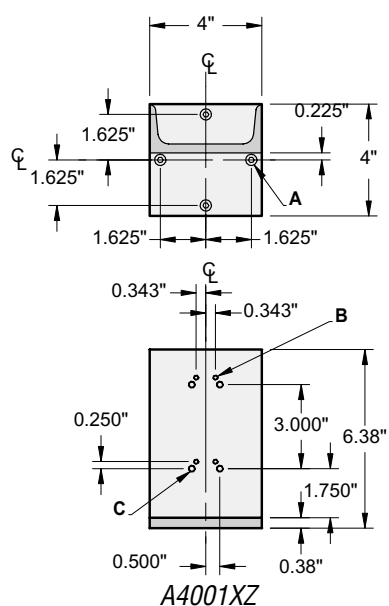
Similar to the XY adapter plan, a bracket for a given Series will accept the base of that Series and the next smaller Series. Those brackets with the "B" prefix, such as B4004XZ, are designed

for dual use: they accept both manual "A" UniSlides or motor drive "B" bases. Optional longer length sliders for X axis UniSlides are recommended to increase stability when using medium or long XZ brackets.

XZ Adapter Brackets for A15, A25 and A40 Series

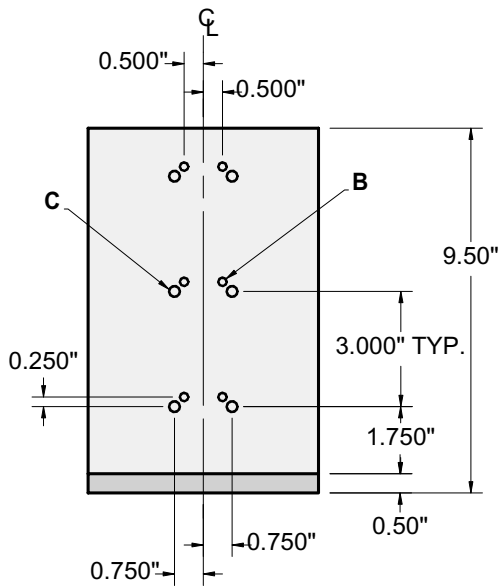
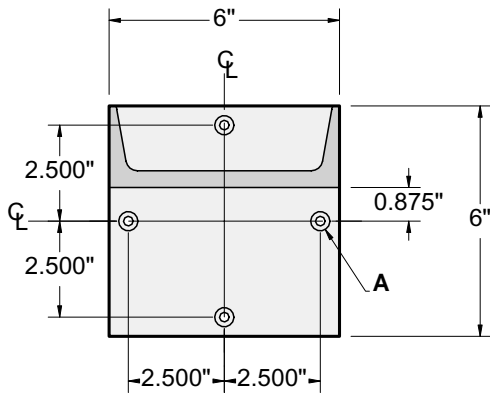
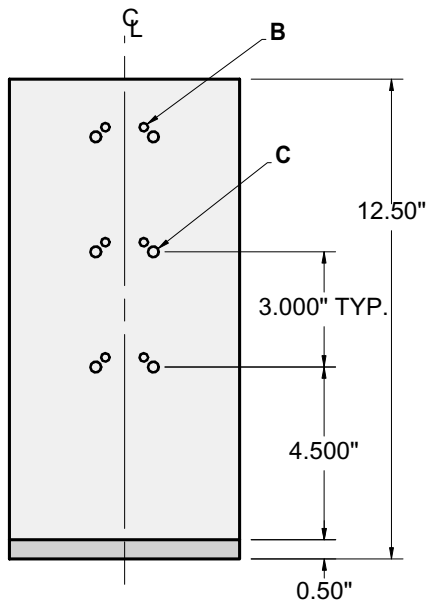
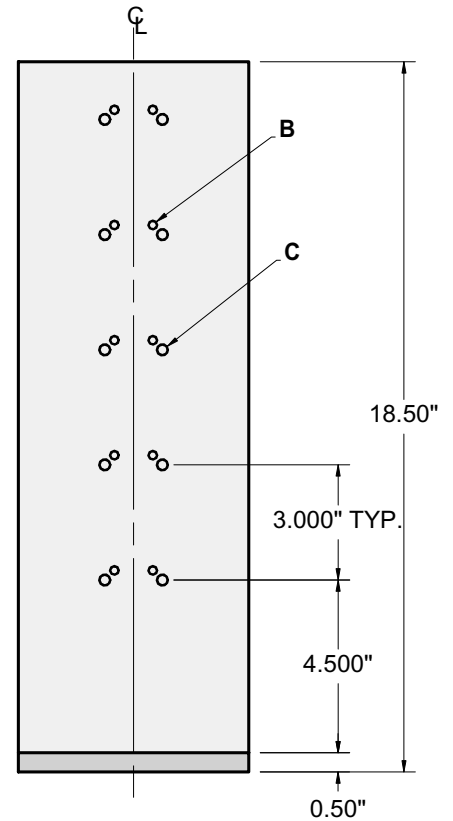


A=(4) COUNTER BORE FOR #8 PANHEAD.
FOR MOUNTING TO 25 SERIES SLIDER,
A2505TS, A4007TS, AND AX40
B= 8-32 THREAD FOR MOUNTING 15
SERIES UNISLIDE
C= 10-32 THREAD FOR MOUNTING
25 SERIES UNISLIDE



A=(4) COUNTER BORE FOR #10 PANHEAD.
FOR MOUNTING TO 40 SERIES SLIDER,
60 SERIES SLIDERS, A4007TS,
A4800 ROTARY TABLE, AXY40 AND AXY60

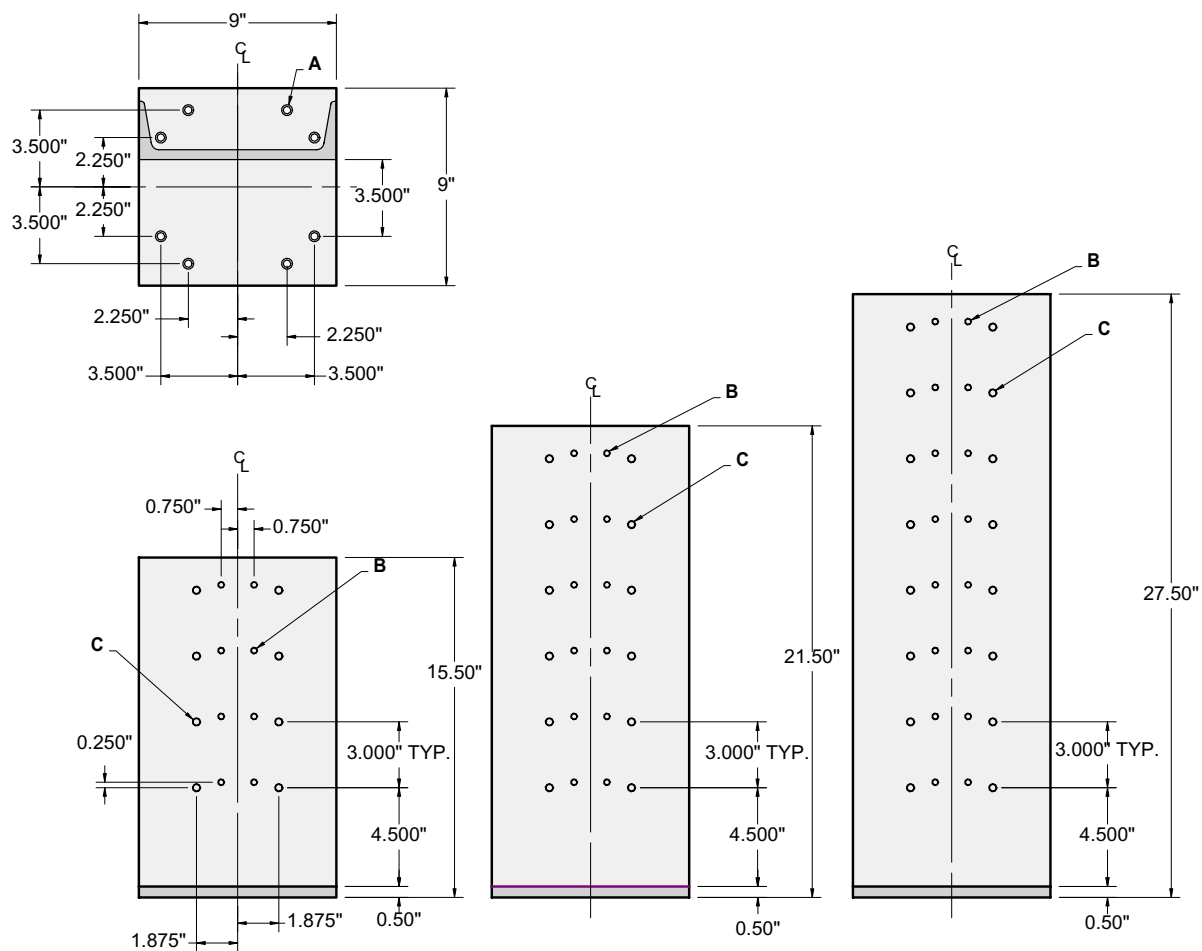
B=10-32 THREAD FOR MOUNTING 25
SERIES UNISLIDE
C= 1/4-20 THREAD FOR MOUNTING
40 SERIES UNISLIDE

**A6001XZ****B6003XZ****B6004XZ**

A =(4) COUNTERBORE FOR 1/4" PANHEAD, FOR MOUNTING TO 60 SERIES SLIDERS,
B90 SERIES SLIDERS AND AXY60

B = 1/4-20 THREAD FOR MOUNTING 40 SERIES UNISLIDE

C = 5/16-18 THREAD FOR MOUNTING 60 SERIES UNISLIDE

XZ Adapter Brackets for B90 Series**B9001XZ****B9002XZ****B9003XZ**

A =(8) COUNTERBORE FOR 5/16 CPD , FOR MOUNTING TO B90 SERIES SLIDERS

B = 5/16-18 THREAD FOR MOUNTING 60 SERIES UNISLIDE

C = 3/8-16 THREAD FOR MOUNTING B90 SERIES UNISLIDE

TA Rapid Advance UniSlide with Linear Encoder

Several years ago a customer came to us with an unusual request. He needed a very high accuracy system to observe and measure tree rings. The requirements were high resolution readout,

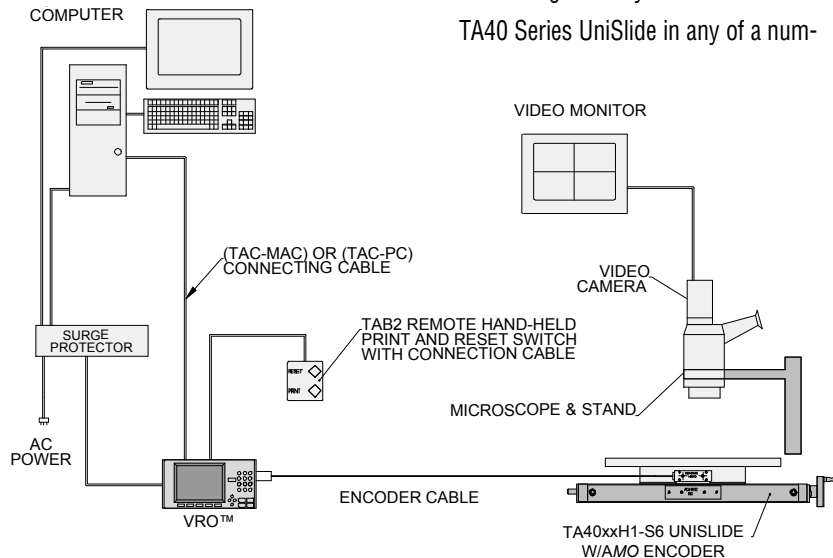
computer interface for data acquisition, fine motion control with rapid release for quick repositioning, a selection of travels, and modest cost. Working with him, we developed the TA4000 measurement system. Thus far, we have sold hundreds of systems.

This single axis system consists of a TA40 Series UniSlide in any of a num-

ber of travel distances, an AMO Linear Encoder in one of three resolutions, a VRO™ digital readout with resolution down to 0.000004"/0.0001 mm, and a Tab2 remote zero reset/ print control. The user supplies the computer (PC or Mac), microscope, video system, and miscellaneous electrical and mechanical hardware, as shown in the drawing.

The TA system uses a 10 x 1 mm lead screw with a unique rapid advance system that allows the user to disengage the lead screw, move rapidly to another area of the specimen to be studied, engage the lead screw and begin to take accurate measurements.

In addition to being used for a tree ring measurement, this system can be used in a variety of other applications such as QC/QA, manufacturing and research. If you need to make precise position measurements of a camera, sensor or other device, please give us a call. We can help you design an accurate, versatile system.



The above schematic illustrates the components of a complete "TA" System. They are: "TA" Rapid Advance UniSlide Assembly with Linear Encoder; VRO™ Digital Readout, TAB2 Two-Button Remote (print or reset of VRO; 10' connecting cable from VRO to PC computer or TAC-MAC 10"; connecting cable from VRO to MAC computer.

High Resolution Position Readout

Linear Encoders

For high resolution position readout, we can mount AMO encoders to most linear UniSlide Assemblies except Series A15 and A25. Mounting an encoder directly to the slider gives a true and accurate reading eliminating lead screw and backlash errors. Typically, encoders are mounted to Screw Drive or Rapid Advance type UniSlide Assemblies. See the table on TA page 1.52 for ACU-RITE encoder numbers. Please call us for help in selecting the proper encoder.

Encoder Specifications

Resolutions:

0.0002"/0.005 mm;

0.00005"/0.001 mm

Repeatability: Within one resolution count

Scale Medium: Chrome-coated glass

Output: Two line TTL quadrature signal Cable Length: 10 ft.

UniSlide Specifications when equipped with Linear Encoder:

B25 Series (see page 1.54): 4" slider required. Height increased by 3/4". Max length of 36" with travel of 32".

A or B40 Series: 6" slider required. Height increased by 1". Max length of 30" with travel of 24".

A or B60 Series: Uses standard 6" slider. Height increased by 3/4". Max length of 66" with travel of 60".

(VRO) Digital Readout and Encoder

The Velmex VROs™ are compatible with a wide variety of input signals, including those from optical comparators, microscopes, multi-axis measurement systems and, of course, AMO linear encoders.

Readout systems

One Axis: VRO-1

Two Axis: VRO-2

Options and Accessories

- Assorted Adapter Cables - with international adapters

- VRO-Tab 2 - Hand-held, two button remote for reset and printing

VRO features:

- Selectable encoder resolution down to 0.000004"/0.0001 mm
- LED status indicator
- Selectable angular or linear readout
- Incremental offset
- Reversible axis count direction
- Absolute and incremental units
- Instant inches to mm conversion
- High-speed interface
- TTL square wave input for compatibility with most linear encoders
- RS-232 port allows printing out data or sending it to your PC
- Tracks position even when in Sleep mode



Optical Rotary Encoder

This encoder has quadrature output using 5 V logic and delivers 0.001" or 0.01 mm resolution. The encoder is attaches to a lead screw shaft extension at the nameplate end. It can be used with the A40, A60 and B90 Series, and is available with or without a remote LCD

for readout. To order the Rotary Encoder with LCD readout, specify part number 3-919. To order the Encoder only, with no readout, specify part number 3-919E.



Rotary Encoder mounted to A40 Series

B Series Dovetail Base

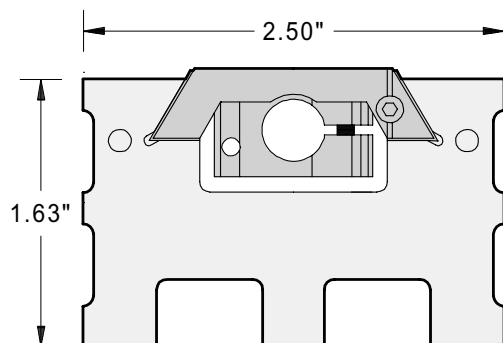
The A25, A40 and A60 Series dovetail base shown on pages 1.6 -1.8 are also available in the B25, B40 and B60 Series cross sections illustrated here. This design has the same width but greater depth providing more rigidity and strength, will

defect less when the base is only partially supported.

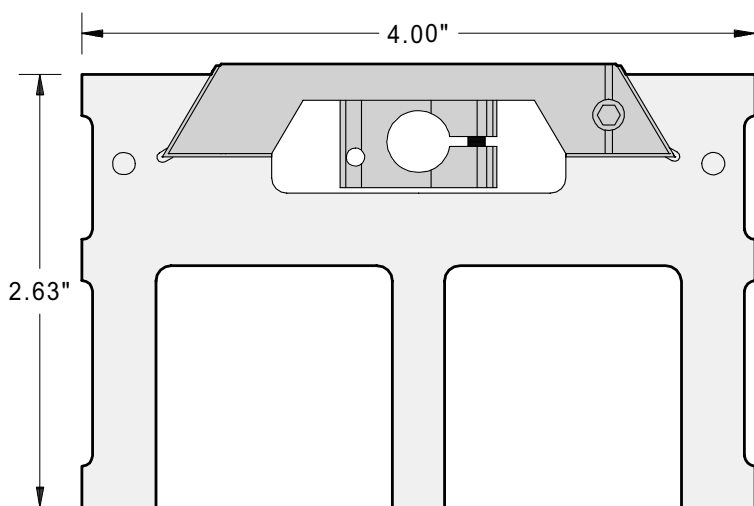
This is also a great way to provide clearance for easy access to the hand wheel knob if it extends below the dovetail base.

Please see the price list for the added cost/inch to substitute the B style base for your A style UniSlide Assembly.

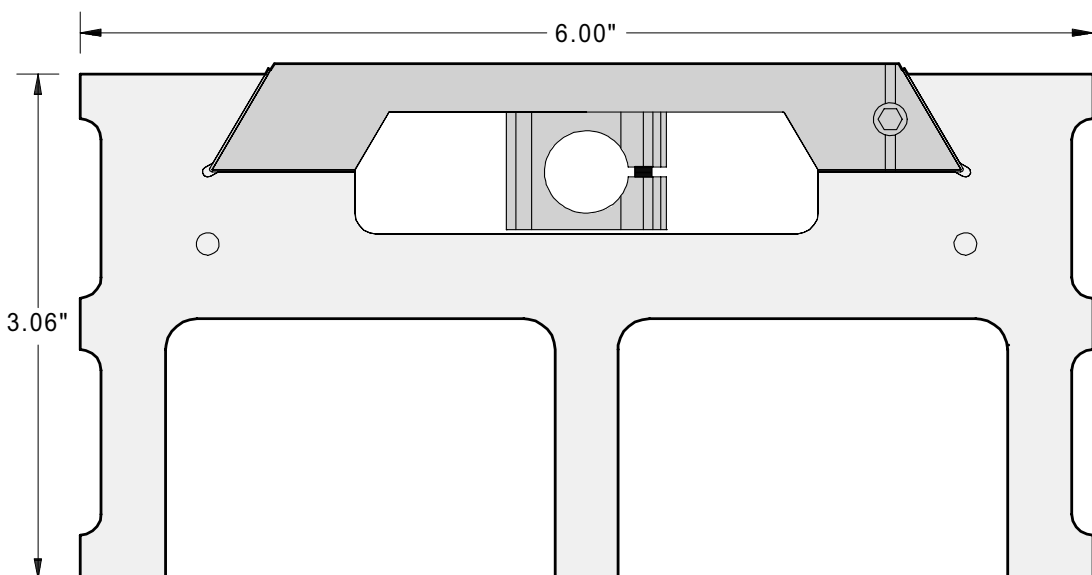
B25 Series



B40 Series



B60 Series



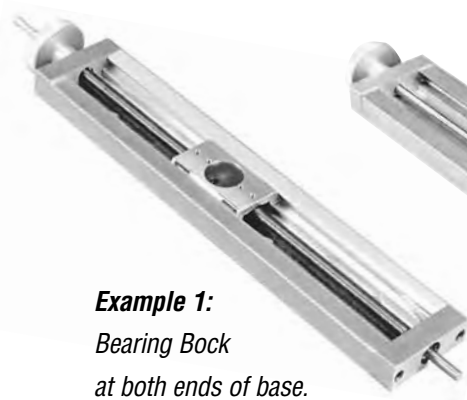
UniSlide Modifications

Nearly 1000 standard UniSlide models are available. But sometimes, the standard versions just won't suit your application.

We understand. That's why we offer a wide range of custom modification capabilities, including these:

- Additional holes in base, slider or plates
- Additional sliders or multiple sliders
- Different knobs
- Special length dovetail bases
- Deeper bases, using the "B" base cross-sections — see page 1.54
- Lead screw shaft extensions
- Vacuum preparation
- Milled slots
- Optional finishes
- Choice of lead screw materials, including brass
- Choice of drive nut materials, including brass, oil-impregnated bronze and Vespel
- Gearbox
- Right and left-hand threads on the same lead screw, allowing a pair of sliders to move together or apart

Still don't see what you want? Give us a call. If it can be done with UniSlides, we can do it.



Example 1:
Bearing Bock
at both ends of base.



Example 2: Extra holes
in slider and end
of base.



Example 3: Shorter than standard
dovetail base.

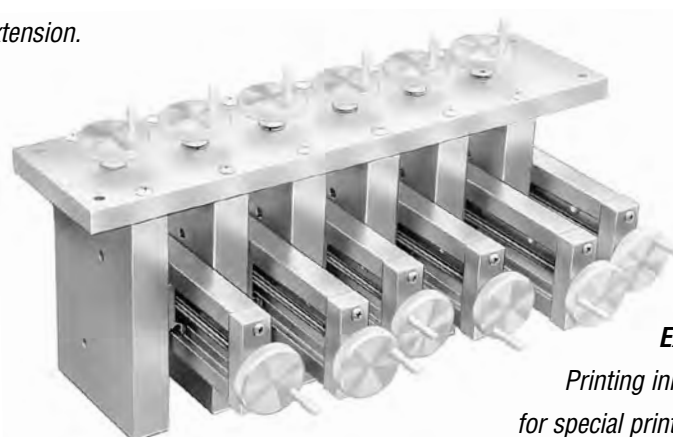


Example 4: Five Rapid Advance sliders on a stationary central rod



Example 6: Special B29 Elevating Table
and right angle gearbox on cross-side.
This fixture operates inside an enclosure.

Example 5: Left-right
lead screw on B25
Series (page 1.34)
dovetail base with
lead screw shaft
extension.



Example 7:
Printing ink manifold
for special printing press.

Warranty and Policies

Warranty

Velmex Inc. warrants all manual UniSlide Assemblies supplied by Velmex Inc. to be free from defects in materials and workmanship for one year from date of invoice. Velmex's sole obligation under this warranty is limited to furnishing, without additional charge, a replacement for, or at its option, repairing or issuing credit for, any product which is returned freight prepaid. This warranty shall not apply to any unit which has been subjected to misuse, improper operating conditions, or any alterations. The seller makes no claim that its products are intended for every use or purpose to which they may be put by the buyer. *IN NO EVENT SHALL VELMEX INC. BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.*

Notice

Failure, improper selection or improper use of the products described herein or related items can cause personal injury and property damage. This catalog from Velmex Inc. provides product options for further investigation by users having technical expertise. It is important that you thoroughly analyze all aspects of your application and review the information in this catalog. Due to the variety of operating conditions and applications for these products, the user, through his own analysis and testing, is solely responsible for making the final selection of products and determining that all performance, safety and warning requirements of the application are met. The products, including, without limitation, product features, specifications, designs, availability and pricing, are subject to change by Velmex Inc. at any time without notice.

Cancellation Policy

Cancellation of orders consisting of standard products, for any reason, is subject to a 15% cancellation charge. Cancellation of orders for special products and nonstandard UniSlide Assemblies are subject to a cancellation charge to be determined by Velmex Inc.

Repair Return Policy

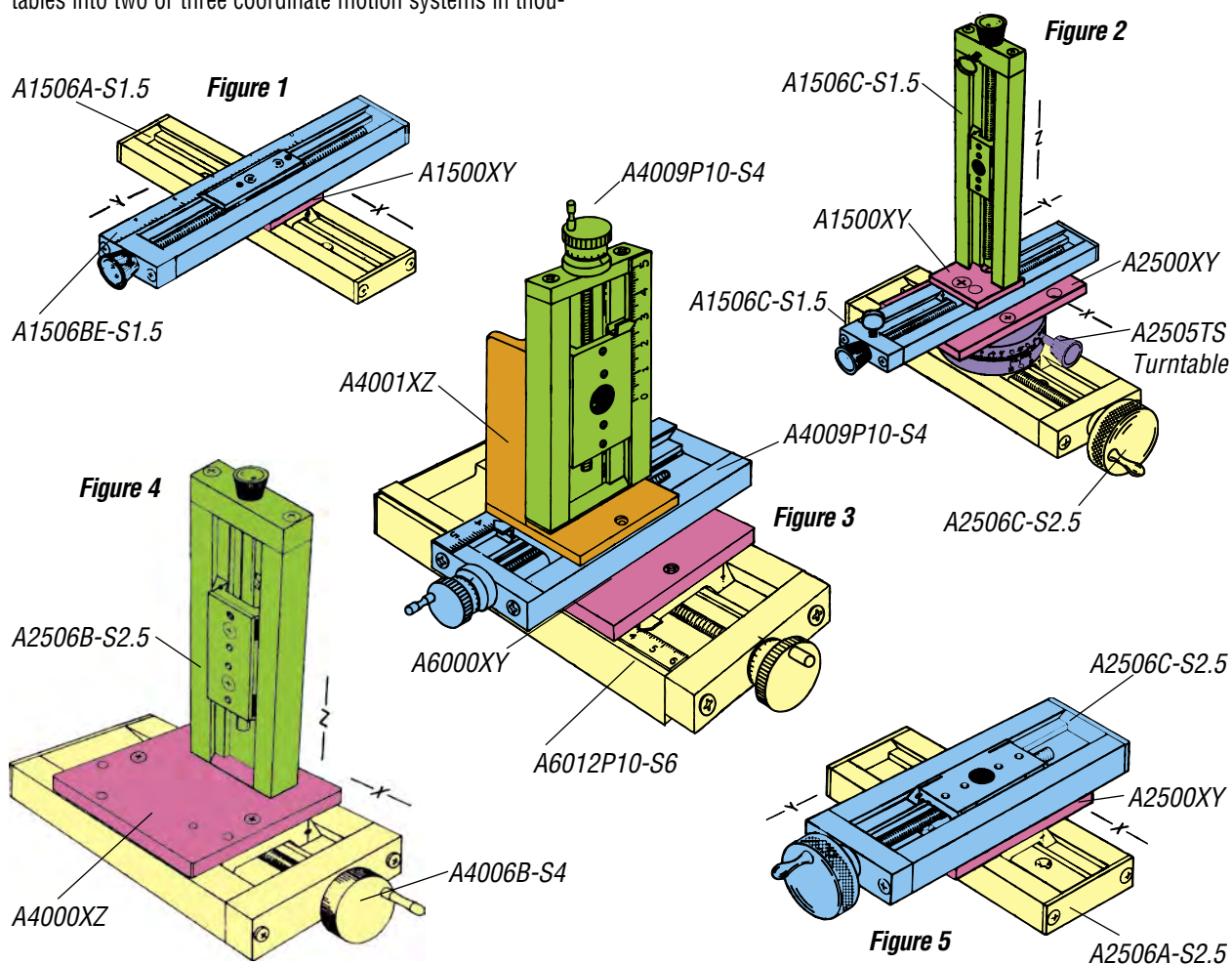
If you need to return a product to us for repair, please contact us for an RMA number before returning the product. Include a written explanation of the problem. We will inspect the unit and notify you of the cost, if any, before any work is performed or if we determine it is not cost-effective to repair the unit. The charge for non-warranty work will be billed at the current hourly rate.

Combining UniSlides/UniSlide Components

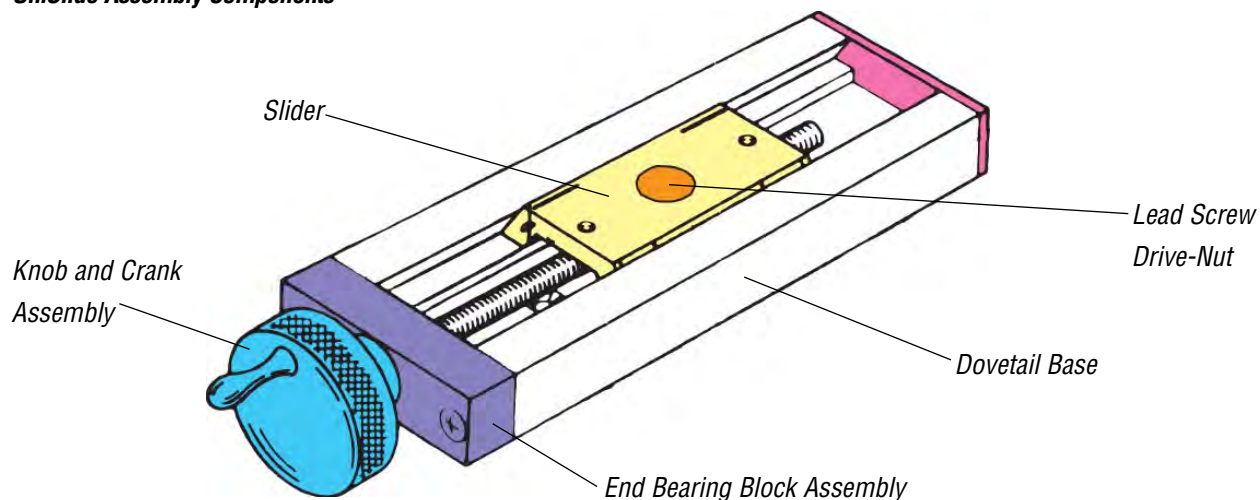
Combinations of UniSlide Assemblies with Adapter Plates

UniSlide Assemblies may be assembled into a limitless variety of shapes, sizes and functions when used with adapter plates. It's easy to combine linear slides, elevating tables and rotary tables into two or three coordinate motion systems in thou-

sands of combinations. Using the versatile XZ adapters, the vertical UniSlide can be located in any of four positions, all perpendicular to the X or Y planes Figures 3 and 4 illustrate two possibilities.



UniSlide Assembly Components



Fax form to us at 585-657-6153

Request for Assistance or Quotation

Please fill out this form for help in selecting a manual UniSlide or BiSlide Assembly.

Name _____ Phone _____

Company _____ Fax _____

Address _____ E-mail _____

City _____ State _____ Zip _____

Application Objective _____

Have you used Velmex Assemblies before? Yes No

Operating environment is _____

Do you need options? _____

☐ I need nonmagnetic slides

A sketch or drawing of your application is helpful.

<i>Axis*</i>	<i>Travel Distance</i>	<i>Payload Weight</i>	<i>Measure Travel or Position?</i>		<i>Position Readout Resolution</i>	<i>Other Requirements</i>
X			Yes	No		
Y			Yes	No		
Z			Yes	No		
Rotary			Yes	No		

* See page 1.57 for orientation of XYZ axes.

Manual

Manual BiSlide and XSlide

New XSlide assemblies— See Motorized BiSlide and XSlide for information on the new motor driven, knob/crank, and free motion XSlide versions.



BiSlide with counter. Resolution is 0.001"



BiSlide without counter



BiSlide without lead screw



Vertical BiSlide with platform base



BiSlide with right angle gear drive

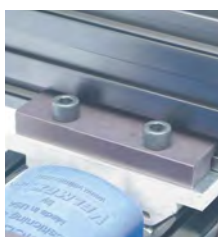
Manual BiSlides Assemblies are Modular, Compact, and Durable

- 45 degree opposing way guides carry high loads in all directions
- Long life anodized ways standard
- Biggest lead screw drive for higher thrust capacity
- Improved modular design eliminates adapter plates and brackets

The Velmex BiSlide is a modular system of positioning stages and hardware that allows you to quickly and easily create a complete one, two and three axis system by simply bolting together modular components. These components can be configured and assembled to form a work cell dedicated to a specific task. Because BiSlide components are all standard and interchangeable, if this task changes or ends, you can readily disassemble the components and put them to work elsewhere.

Manual BiSlides are easily upgraded to a motor driven system by replacing the hand wheel with a motor and limit switches. It's fast, simple, inexpensive, and requires no machining or other modifications.

If you're a manufacturer, you'll find the BiSlide system delivers ease of service and upgradeability to keep up with your rapidly changing marketplace. If you're a researcher, you'll like BiSlide's easy reconfigurability and expandability for different projects. Everyone appreciates BiSlide's durable construction and low cost.



Cleats make mounting multiple units easy



3 axis system



BiSlide with 80 inch travel length

Features and Benefits of BiSlides

- Lighter weight
- Fewer parts
- Lower cost
- Higher strength to weight ratio – uses hard aluminum alloys and a rigid I-beam cross section
- More compact than most ball screw driven stages
- Self-holding – unlike ball screws, the 10 pitch or 2 mm lead screw will not creep or backdrive
- Resistant to impact loads
- Natural wiping action expels debris
- Gradual wear not sudden failure of rolling element type screws and guide-ways
- Corrosion resistant anodized finish
- Operate without lubrication
- Spare set of guide-ways built-in on the flip side just in case the primary ones get damaged

Options

- Knob/Crank
- Knob/Crank/Counter
- Right Angle Drive
- Side Knob Drive
- Right/Left-hand Drives
- Rotary, Linear Encoders, and Digital Readouts
- Extra Carriages
- Short Carriages
- Carriage Lock
- Custom Lengths
- Special Holes

For More Information:

- Call Velmex at 1-800-642-6446 from 8 am to 5:30 pm EST.
- See specifications at Motor Driven BiSlide Assemblies on page 2.37.
- Visit www.Velmex.com to input your specifications, lookup prices, see photographs and download drawings of specific BiSlide models.
- Visit www.BiSlide.com for more examples of BiSlide's extraordinary versatility.

Table of Contents

Manual



Manual Rotary Tables & Turntables

Rotary Tables	1.62
Turntables	1.64



Rotary Tables

Rotary Tables use a rugged worm and gear drive design with a central rotating ball bearing. We offer two sizes: A4800, a series of three Models with gear ratios of 18:1, 36:1 and 72:1. Also, we have the smaller Model A5990TS with a 90:1 gear ratio. See Model Details table on the following page.

All Series A4800 features include a hollow spindle or clear aperture in the center, 360° scale, graduated knob, and a readily accessible adjustment to minimize gear backlash. They can also be motorized by simply removing the knob and shaft and attaching a size NEMA 23 motor. See page 3.9.

Model A5990TS features include a hollow spindle or clear aperture in the center, 360° scale, graduated knob, standard black anodized finish. They can also be motorized by simply removing the knob and shaft and attaching a NEMA 17 motor. See page 2.52.

Note: Gear ratios 18:1, (Model A4818TS) and 36:1 (Model A4836TS) may backdrive if sufficient rotational torque is applied to the table top.

To attach any A48 table to the slider of an A40 or A60 Series UniSlide, use the A6000TX adapter plate. See page 1.48.

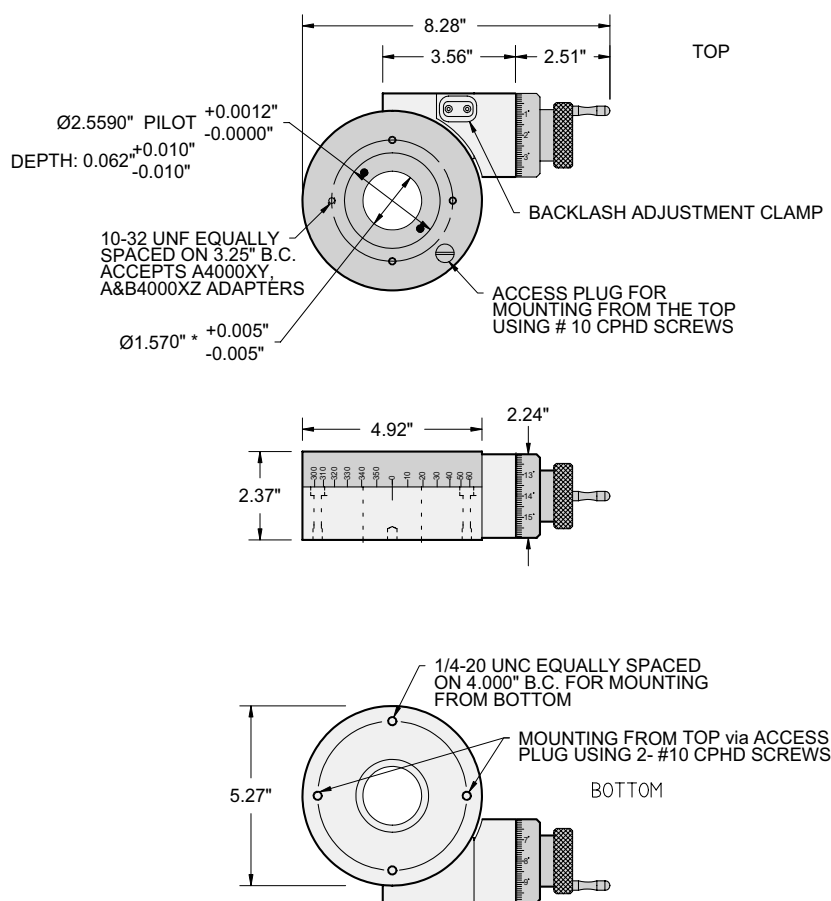
See also Turntables on page 1.64.



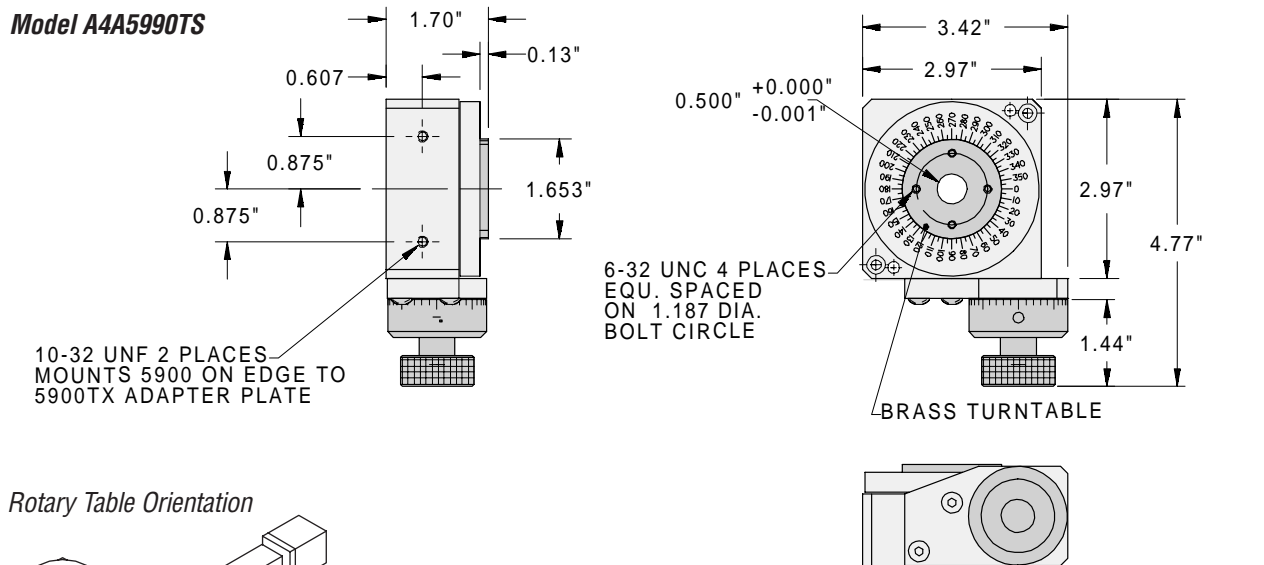
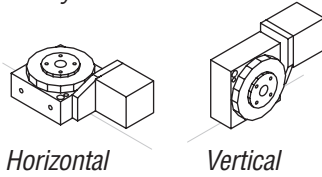
Series A4800

Model A5990TS

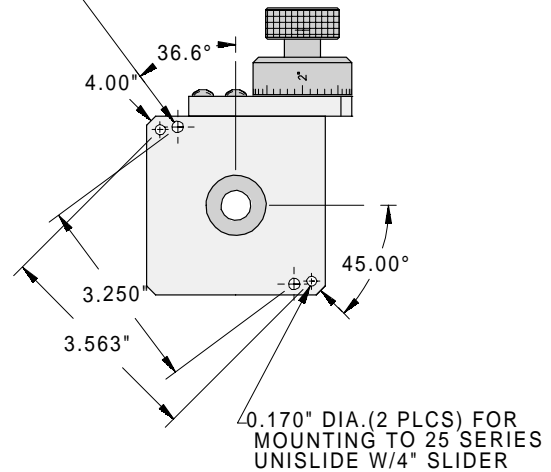
Model A48 Series Rotary Table



Locking knob option on Series A4800

Model A4A5990TS**Rotary Table Orientation****Specifications**

	A4818TS A4836TS, A4872TS	A5990TS
Central Horizontal Load Capacity	200 lbs/90.7 kg	50 lbs/22.6 kg
Central Vertical Load Capacity	25 lbs/11.3 kg	5 lbs/2.3 kg
Cantilever Load-Horizontal	500 in-lbs	20 in-lb
Table Top Axial Runout	0.00025" TIR	0.00011" TIR
Table Top Radial Runout	0.0005" TIR	0.00008" TIR
Accuracy	100 arc-second	100 arc-second
Table Weight	5.5 lbs/2.5 kg	2.7 lbs/1.23 k

**More Details**

Model Number	Gear Ratio	Table Top Rotation per Turn of Knob	Typical Backlash	Calibration on Drum Dial	Adapter Plate
A4818TS	18:1	20 degrees	600 arc-second	0.1°	A6000TX
A4836TS	36:1	10 degrees	400 arc-second	0.1°	A6000TX
A4872TS	72:1	5 degrees	200 arc-second	0.1°	A6000TX
A5990TS	90:1	4 degrees	200 arc-second	0.1°	B5990TX



Two A5990TS tables joined with A5990TXZ adapter plate.

Turntables

Turntables differ from Velmex Rotary Tables in that turntables can be spun freely by hand. They also feature a 12° range of fine position adjustment. Typical applications include mounting and rotation of test specimens, cameras, transducers, sensors, and mirrors.

Unlike the rotary tables on page 1.62, turntables do not use a worm and gear design. They use a spring-loaded tangent screw drive for fine adjustments. With the clamping knob released, the turntable can be freely rotated into position by hand.

Tightening the clamping knob engages a tangent screw driven against a spring-loaded yoke, allowing fine motion control. The spring will resist up to 14 oz-in of rotational torque.

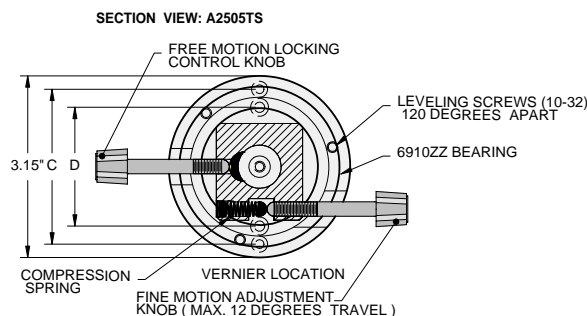
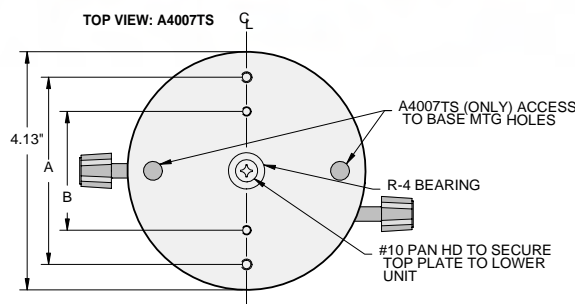
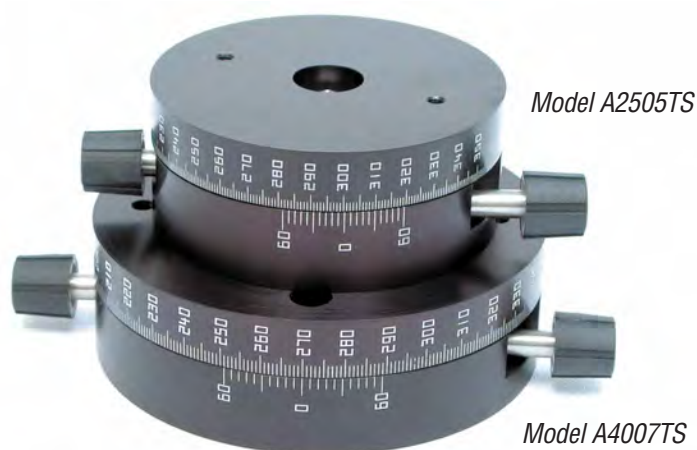
Table features include an easy to read engraved 360° scale, 6 minute (0.1 degree) resolution, maximum horizontal load capacity of 200 pounds, and rugged black finish. These tables cannot be motor-driven and are not recommended for tensile (pulling) loads or vertical loads greater than 1 lb.

Base Mounting

Model A2505TS: This table will mount on an A15 Series 3" slider using the C holes, and A25 or B25 2 1/2" sliders using the D holes. If the A25 Series unit has a 2.5" slider and thumbscrew lock, 0.650" travel will be relinquished.

Model A4007TS: This turntable will mount on all A40 or B40 sliders using the C holes and A/B 60 sliders.

Model	Diameter	Height
A2505TS	3.15"	1.3"
A4007TS	4.13"	1.3"



Model Number		Thread	Center to Center	Accepts
A2505TS	A	8-32	2.062"	All A2500 Adapters
	B	N/A	N/A	--
		Clearance	Center to Center	Mounts On
	C	#6 CPHD	2.688"	A1500 3" Slider
	D	#8 CPHD	2.062"	All A2500 Sliders
Model Number		Thread	Center to Center	
A4007TS	A	10-32	3.250"	All A4000 Adapters
	B	8-32	2.062	All A2500 Adapters
		Clearance	Center to Center	Mounts On
	C	#10 CPHD	3.250"	All A40/60 Sliders
	D	N/A	N/A	--

Introduction



Motor Driven



Velmex, Inc. manufactures practical, reliable UniSLIDE®, BiSLIDE® and XSLIDE™ Assemblies in a wide choice of cross sections for medium or high accuracy positioning and scanning. Applications include instrumentation and light machining. The UniSlide Assemblies System offers you the opportunity to specify the slide width, length, lead screw and motor to precisely satisfy your requirements. (The BiSlide and XSlide System has fewer variations but may be more design and cost effective. Please refer to the BiSlide section.) Although there are numerous versions of UniSlide Assemblies, they all share a common design. The key to specifying the proper assembly is understanding the UniSlide Assembly Part Numbering System which is explained on page 2.9.

To begin, we recommend you develop a list of requirements for your application as detailed on page 2.8. Then, look at the examples beginning on page 2.5 of this section (Motor Driven). You'll find even more examples on our website. You should also review the Engineering Information, Sizes, and Load Capacity Sections.



Request for Quotation

Please copy and fill out this form for help in selecting a motorized UniSlide or BiSlide Assembly.

Name _____ Phone _____

Company _____ Fax _____

Address _____ Email _____

City _____ State _____ Zip _____

Application Objective _____

☐ This is a positioning application (My work will be done when slides are stationary)

☐ This is a scanning application (My work will be done when slides are in motion)

☐ I need linear or circular interpolation

☐ I have my own motors — Manufacturer/Type/Model? X _____

☐ I have my own controller _____ Y _____

_____ Z _____

A sketch or drawing of your application is helpful. \ominus _____

Axis	Travel	Payload Weight	Payload Moment	Speed Range	Resolution	Accuracy of Position	Hours/Day Unit is in Use	Duty Cycle
X								
Y								
Z								
\ominus								

Fax form to us at 585-657-6153

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Motor Driven

Motorized UniSlide



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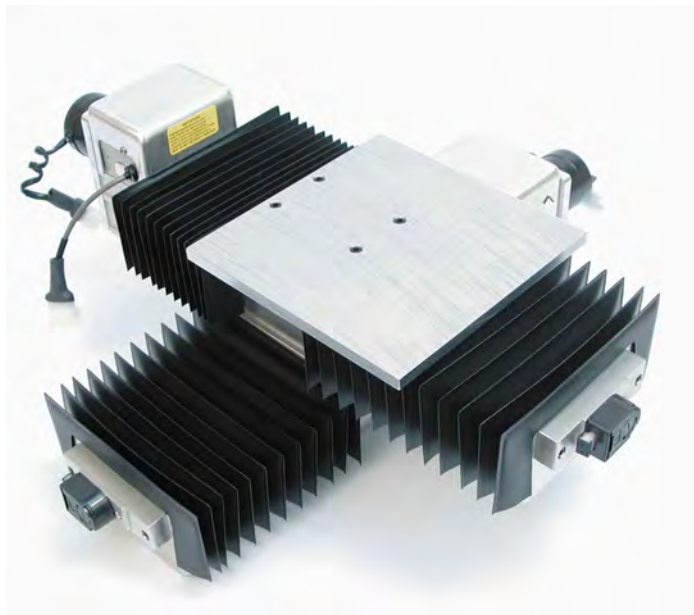
<i>Series MB/MA4000</i>	<i>2.21</i>
<i>Series MB/MA6000</i>	<i>2.24</i>
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Examples and Application Photos

Here are examples of UniSlide® stock and custom positioning equipment. Previous applications include pill crushers, hot wire anemometry, connector testers, tire

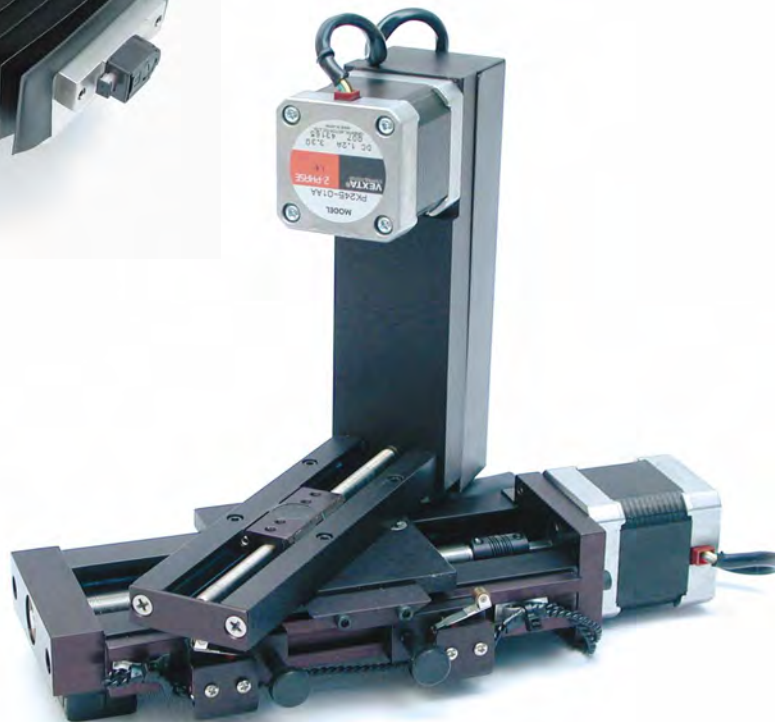
manufacturing, tensile test stand equipment and laser guides. For help call our engineering staff, fill out our website RFQ/RFA form or the Fax-a-Quote form on page 2.2.

Example 1: Medium travel UniSlide with adjustable internal limit switches and resonance damper on the extended motor shaft.



Example 3: Small, compact, low profile XY assembly with timing belt drive. Configurations also available with side or back mount motor.

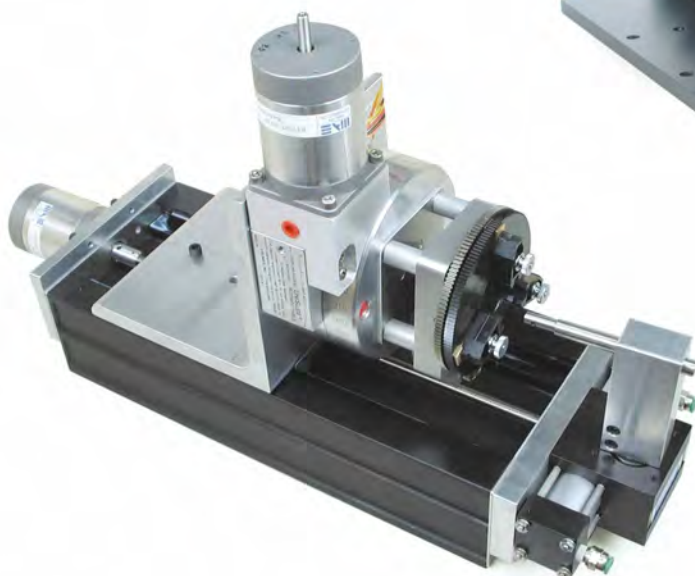
Example 2: An XY combination with way covers and rotary encoders mounted to lead screwshaft extensions.





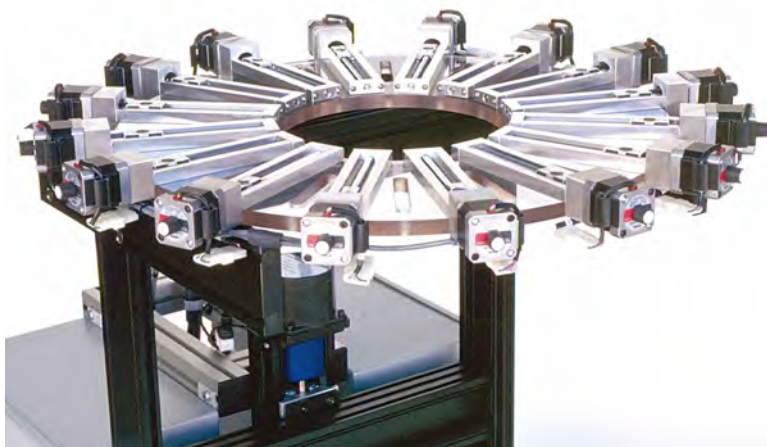
Example 4: UniSlide Assembly with two sliding carriages and a left and right hand threaded lead screw for simultaneous reciprocal motion. This design is useful for alignment and centering operations.

Example 5: Preassembled XY tables come in two Series and five travel distances. Optional linear encoders are available in 1 and 5 Micron resolutions.



Example 6: A ring engraving machine utilizing linear UniSlide Assembly and Velmex rotary table.

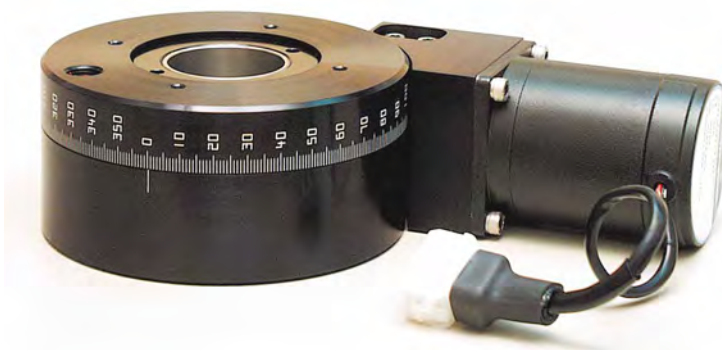
Example 7: A circular array of 16 Series M1500 UniSlides for moving diagnostic fiber optic lights. The platform is positioned vertically by a BiSlide Assembly.





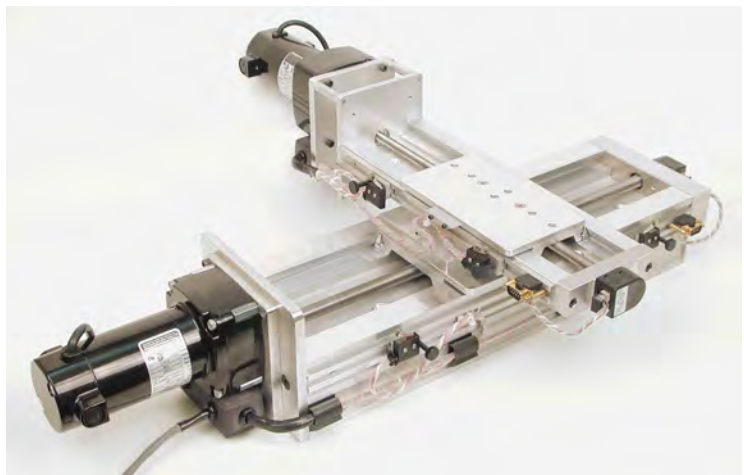
Example 8: A 9 inch wide UniSlide Assembly. UniSlides come in eight cross-sectional sizes and base lengths from 3 inch to 80 inch.

Example 9: Low voltage Speed Control, a small DC gear motor and MB2500 UniSlide produce smooth motion at slow speed.



Example 10: There are two sizes of rotary tables available in four gear ratios.

Example 11: Combining MB6000 and MA4000 Series will reduce total system height. Both units have optional encoders and outboard limit switches.



Linear UniSlide Assemblies Construction

Motor driven UniSlide Assemblies are constructed of 6000 series hard aluminum alloy dovetail base extrusion, or simply base. Straightness for the base are given on page 2.10. The lead screw engages the drive nut which is secured to the movable sliding carriage called a slider. The slider travels on low friction polymer bearing pads and has an adjustment for side play.

There are two styles of dovetail base cross section. The deeper "B" Style, with reinforcing ribs along the bottom, is designed specifically for most common motor driven applications. The standard "B" base incorporates a protective internal limit switch assembly to interface with the motor. This limit switch assembly is denoted by "J" in the part number. The "B" Style base also allows most motor units to be mounted directly on a flat surface.

In applications where reduced slide height is a concern, the "A" cross section extrusion can be used. Motors attached to the "A" cross section base will extend above and below the base. See pages 2.17-2.26 for more information.

Selection

To select a linear slide, you determine a part number based on the width (related to the load), length (related to travel) and lead screw pitch (a function of resolution and speed) for your requirements. Begin by selecting a UniSlide Series. A Series is a group of UniSlide stages with the same base width and height. For example, the Series MB4000 units are 4" W x 2 11/16" H and have a maximum horizontal load

capacity of 100 lbs. Next, specify the slide base length. The nominal length is the sum of the required travel plus the slider length. For the MB4012 (nominal base length = 12"), with the standard 4" long slider the net travel is 8" ($12" - 4" = 8"$). See page 2.12 for UniSlide Base Size and Lengths. Finally, the pitch of the lead screw is chosen. Our screws come in two accuracy grades: Standard and Precision. Please refer to Table II, page 2.12, for available lead screw choices. Motor and control selection is covered separate section in the catalog.

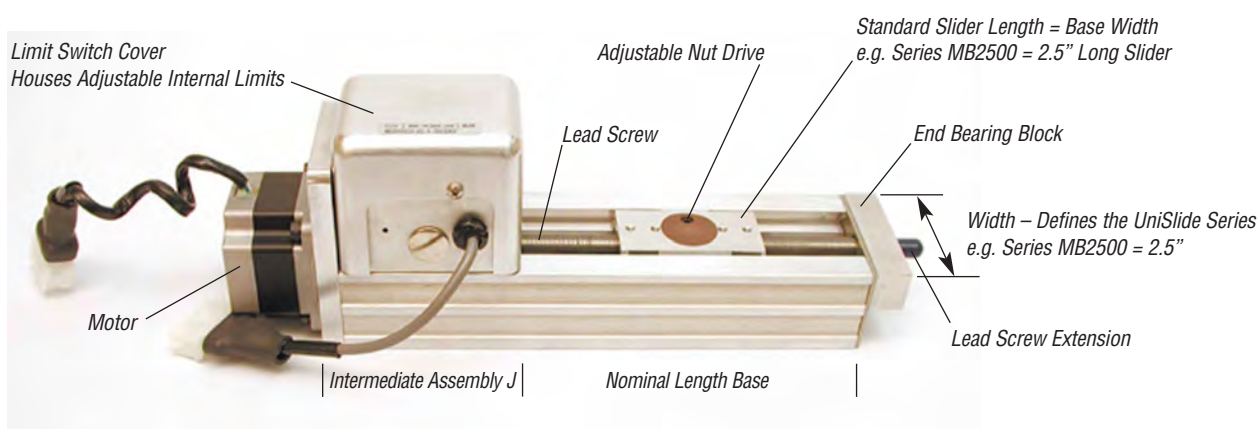
Application Requirements

Before beginning the reader should define his requirements thoroughly. Please determine the following:

1. Type of motion. See the Functional Classification discussion on page 3.4.
2. Human-to-Motor Control interface.
3. Motor control and motor type. See page 3.1.
4. Mechanical requirements of the system including:
 - Load (weight and movement on UniSlide Assembly)
 - Speed
 - Travel distance
 - Lead screw accuracy required (Standard or Precision Grade)
 - Resolution (smallest movement)
 - Life or number of duty cycles/day
 - Position indication system
 - Environmental conditions

After becoming familiar with the catalog, please call Velmex and our technical sales staff will assist you in the selection of equipment.

UniSlide Assembly Components



UniSlide Numbering System

For typical Model Number M B 25 12 C J - S2.5

M

Denotes a motor mounting plate and motor coupling is present.

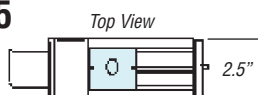
B



Specifies **cross section type**. **B** is the standard motor driven base.

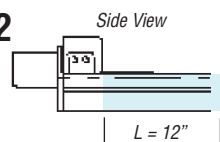
A is the low profile base design.

25



Specifies the UniSlide Assemblies **Series**. The Series is defined by the **base width** and is measured in tenths of inches. The example unit is Series MB2500. See Parameters by Series, page 2.12, for the available choices.

12



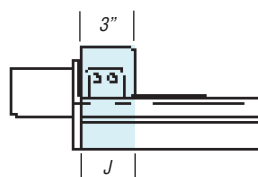
Specifies the **nominal length of the dovetail base (L)**. This is the base length available for slider travel and excludes the length that the internal limit switch assembly J occupies. Standard base lengths increase in 3" increments.

C



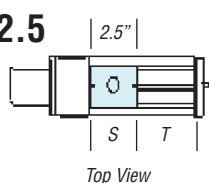
Designates the **lead screw**. See Table II, page 2.12 for available choices. In this example, C = 40 revolutions /in., in the Standard Grade.

J



Indicates Internal Limit Switch **J** is present. It consists of two adjustable limit switches, control rod with two collars and cover atop an additional 3" of dovetail base as shown. Outboard style limit switches may be ordered in place of, or in addition to, internal limit switches. See page 2.31.

S2.5



Defines the **slider length (S)**, for either standard sliders or one of the optional lengths. See Table I, page 2.12, for the available choices. Travel (T) + slider length (S) = required nominal length of dovetail base (L). For this example, S = 2.5" and L = 12" which yields a travel of 9.5". See the price list for the travel of UniSlide Assemblies with standard length sliders.

Other Letter Prefixes:

Z Indicates only dovetail base is hard coat anodized and dyed black. See page 2.32.

MAXY Designates an assembled XY table, See page 2.29.

SP Designates an assembly with a special modification.

N Indicates dovetail base has electroless nickel coating.

Suffixes:

Lead Screws: B, C, W1, W2, W4, P2.5, P5, P10, P20, P40, K1 or K2, and Q1 or Q2. These indicate the lead screw grade and pitch. See page 2.12, Table II.

WC Way Covers

PC xx Parallel coupled Assembly. xx represents the center-to-center separation distance.

BK Black anodized – all aluminum parts.

See accompanying Price List for specific Model Numbers. All other options or details of a UniSlide Assembly should be described verbally in the Description portion of the order. This includes the make and model number of the motor if it will be mounted separately.

Length Summary

1. The length of the standard slider is always equal to the base width. Longer lengths are optional.
2. Travel length is the nominal base length minus the slider length.
3. Total length is the sum of the nominal base length plus 3" occupied by the Limit Switch Assembly, J, if present, plus the motor length, plus the length of the end bearing block plus the length of the lead screw shaft extension.

Refer to pages 2.17-2.28 for detailed drawings.

Engineering Information

Design Advantages of Linear UniSlide Assemblies

- Compact design yields long travel in a short work space
- A simple, reliable design that is easily adaptable
- Modular components facilitate multiple axis system
- A broad variety of lengths, sizes and features

Straightness

Commencing with a aluminum alloy extrusion having a straightness tolerance of half the normal commercial tolerance, the subsequent machining and lapping operations are designed to secure a high degree of straightness and parallelism in the dovetail ways. There are essentially three types of deviation from straightness that can occur. Referring to a UniSlide Assembly resting base down on a flat surface with its linear motion or longitudinal direction, X, there can be a departure from straightness in the upward direction, Z, which is designated as the bow error. There can be a deviation from straightness in the horizontal direction, Y, designated as horizontal run-out, or simply run-out. There can also be a twist in the direction of the slide, X.

The upper limits for these three deviations from straightness as determined by our manufacturing processes are:

Bow* – 0.002" per foot

Run-Out – 0.001" per foot

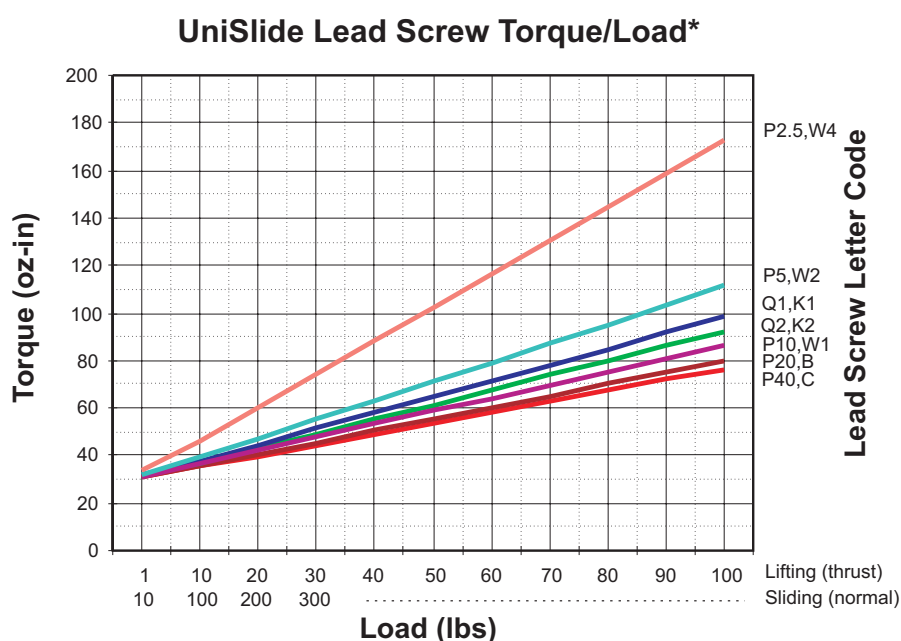
Twist – 1 milliradian per foot

**As installed, bow can be affected by the degree of flatness of the supporting surface and relative tension in the mounting screws.*

If reduced straightness tolerances are required in the order of one half of the nominal values above, Velmex will select, measure and certify UniSlide Assemblies for the customer at an extra charge of \$7/in.

Wear Resistance

The aluminum alloy dovetail base and low friction polymer pads of the slider give excellent performance as a bearing material combination. Under moderate and light loads, the sideways play developed by wear during the first 30,000 cycles of operation is approximately 0.00015 inches. Thereafter, the wear is further reduced, amounting to approximately 0.00005 inches during the next 50,000 cycles. The slider has adjustment screws to compensate for moderate wear. Replacement bearing pads can be laminated to the slider at a nominal cost to recondition the slide after long periods of use, if necessary. For harsh environments and/or a higher number of cycles, UniSlide assemblies are available with hard coat anodized ways. See page 2.31, Options.



* 1.5x torque for dynamic safety margin, 2x torque needed for startup

Protective Limit Switch Assembly

Velmex recommends limit switches be included whenever motor torque could damage the lead screw or drive nut at the end of slider travel and for operator safety. This includes most applications except those with small stepper motors. See our website for a complete selection of limits.

Vacuum Applications

UniSlide linear and rotary positioners can be used in a vacuum to 10⁻⁶ torr with modifications. Please see our web site for an in-depth discussion of vacuum applications.

Nonmagnetic properties

Lead screws are made of 303 stainless steel (except W2/P5 and W4/P2.5) and are slightly magnetic. Where an exceptionally high degree of nonmagnetic character is required, Velmex may supply plated brass fasteners and brass lead screws. Rotary tables have several essential steel ball bearings. Electric motors are inherently magnetic.

Lengths

Catalog lengths are those listed, but longer units are also available. In-between lengths are also available on special order. Slider lengths are only those listed.

Warranty, Cancellation and Repair Return Policies**Warranty**

Velmex Inc. warrants all mechanical UniSlide Assemblies supplied by Velmex Inc. to be free from defects in materials and workmanship for one year from date of invoice.

Velmex motor controls have a two year limited warranty. Velmex's sole obligation under this warranty is limited to furnishing, without additional charge, a replacement for, or at its option, repairing or issuing credit for any product which is returned freight prepaid. This warranty shall not apply to any unit which has been subjected to misuse, improper operating conditions, or any alterations. The seller makes no claim that it's products are intended for every use or purpose to which they may be put by the buyer. IN NO EVENT SHALL VELMEX INC. BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Material Substitutions

Drive nuts: brass, oil-impregnated bronze, Vespel®.

Lead screws: brass, in some sizes.

Notice

Failure, improper selection or improper use of the products described herein or related items may cause personal injury and property damage. This catalog from Velmex, Inc. provides product options for further investigation by users having technical expertise. It is important that you thoroughly analyze all aspects of your application and review the information in this catalog. Due to the variety of operating conditions and applications for these products, the user, through his own analysis and testing, is solely responsible for making the final selection of products and determining that all performance, safety and warning requirements of the application are met. The products, including, without limitation, product features, specifications, designs, availability and pricing are subject to change by Velmex, Inc. at any time without notice.

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Cancellation Policy

Cancellation of orders consisting of standard products, for any reason, is subject to a 15% cancellation charge. Cancellation of orders for special products and non standard UniSlide Assemblies are subject to a cancellation charge to be determined by Velmex Inc.

Repair Return Policy

Please contact Velmex for an RMA number. When returning a UniSlide Assembly, include a written explanation of the problem. Velmex will inspect the unit and notify you of the cost, if any, before any work is undertaken. If the unit is unrepairable it will be returned at the owner's expense. The charge for non-warranty work will be assessed at the current hourly rate.

Table I: UniSlide Base Size, Length, and Slider lengths by Series

UniSlide Assembly Series ¹	Width	Height	Nominal Base Length in Inches ²	Slider Lengths in Inches Standard ² Optional ²	
MA1500	1 1/2"	9/16"	3 to 12	1.5	2,3
MB2500	2 1/2"	1 11/16"	4 to 60	2.5	3,4
MA2500	2 1/2"	13/16"	4 to 24	2.5	3,4
MB4000	4"	2 11/16"	6 to 90	4	6
MA4000	4"	1 1/16"	6 to 36	4	6
MB6000	6"	3 1/8"	9 to 90	6	8
MA6000	6"	1 3/4"	9 to 48	6	8
MB9000	9"	3 1/8"	12 to 90	9	12

¹ Travel for specific model numbers are given in the accompanying price list.

² Nominal length is the length of the base used for slider travel.

Travel + Slider length = Nominal Base Length.

Optional longer slider length increases the stability of large or offset loads but reduces free travel.

Combining UniSlide Assemblies

Velmex offers XY plates and XZ brackets with threaded hole patterns to match the UniSlide Assembly bases. Thus, UniSlide Assemblies are easily combined for multiple coordinate systems. For dimensions and compatibility information see Adapter Plate and Brackets on page 1.44. See also preassembled Series MAXY X-Y Tables on page 2.29.

Lead Screw and Drive Nuts

A wide variety of lead screws are offered to allow you the greatest flexibility in designing the drive portion of your translation stage.

Lead screws are supplied in two quality grades and are priced accordingly. The Standard rolled screw may deviate in true pitch no more than 0.007"/10" (0.18mm/25.4cm). The Precision lead screw units, designated by the letter "P" if English or "Q" if Metric, have a lead error not to exceed 0.0015"/10" or 0.04mm/25.4cm. All screws are type 303 stainless steel except the W2/P5 and W4/P2.5 which are electroless nickel plated cold rolled steel. The standard drive nut is adjustable to minimize backlash and is made of Delrin or Delrin AF®.

Velmex can also supply lead screws alone. Special lead screws with right and left hand thread for together-apart motion with two sliders can be installed. Please contact us for pricing.

Detrimental lead screw resonance or whip can develop at high RPM. This resonance is a function of lead screw diameter and RPM. All "B" type UniSlide Assemblies over 36" in length will have a resonance damper included to minimize whip. Lead screw RPM should not exceed 1000 RPM for the following models: B2500 Series longer than 12", B4000 Series longer than 18" and B6000 or B9000 Series longer than 24".

Table II: Lead Screws

Standard Accuracy – 0.007"/10" or better
Letter Codes – C, B, W1, W2, W4, K1 and K2

Precision Accuracy – 0.0015"/10" or better
Letter Codes – P40, P20, P10, P5, P2.5, Q1 and Q2

Letter Code		Screw Thread	Turns per Inch	Advance/Rev. (Lead)	Lead Screw Diameter			Efficiency
Standard Accuracy	Precision Accuracy				MA1500	MA/MB2500 MA/MB4000	MA/MB6000 MB9000	
C	P40	40 UNS	40	0.025"	1/4"	3/8"	1/2"	0.14
B	P20	20 UNS/UNF	20	0.050"	1/4"	3/8"	1/2"	0.26
W1	P10	20 Acme Double Start	10	0.100"	NA	3/8"	1/2"	0.46
W2	P5	20 Acme Quad Start	5	0.200"	NA	3/8"	1/2"	0.64
W4	P2.5	10 Acme Quad Start	2.5	0.400"	NA	3/8"	1/2"	0.73
K1	Q1	1 mm	10/cm.	1.0 mm (0.0394")	7 mm	10 mm	14 mm	0.15
K2	Q2	1 mm ISO Double Start	5/cm.	2.0 mm (0.0787")	7 mm	10 mm	14 mm	0.33

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Torque requirements – The minimum dynamic torque required to drive an assembly running horizontally can be calculated as

$$\text{Torque (oz-in)}_{\text{Horiz.}} = \frac{[(W \times 0.15) + 1.5] \times L}{0.39 \times E} + 10 \text{ oz. in.}$$

For a vertical or lifting load:

$$\text{Torque (oz-in)}_{\text{Vert.}} = \frac{(W + 1.5 \text{ lbs.}) \times L}{0.39 \times E} + 10 \text{ oz.-in.}$$

Where W = Weight of the load in pounds

L = Lead of the screw in in./rev. See Table II, above.

E = Efficiency of the lead screw. See Table II, above.

10 = Minimum Torque required to move slider with no load

Note: The calculated torque is a minimum.

Add 50% for safety margin.

Permissible Loading

The size of the slide selected for a given application will depend upon your requirements. Load, speed, and duty cycle are major variables to consider. This page gives general guidelines on load handling for horizontal, vertical and cantilevered loads. **Recommended Range** is for continuous duty; **Maximum** is for intermittent duty.

Multi-axis systems require additional engineering. In calculating the moment created by a cross slide, determine the weight of the upper slide assembly and payload. Weights are listed in the Price List. Be cognizant of deflection of an unsupported UniSlide base. For long transport in two or more axes, parallel coupled slide assemblies are recommended. Please see Parallel Coupled BiSlide Assemblies, page 2.43.

Working With Cantilever Loads

The X axis carries the weight of the Y axis, the Z axis and the attached load. For good stability, the X axis should be one model larger than the Y axis when the Y axis length (L) is longer than three times (3x) the width of the X.

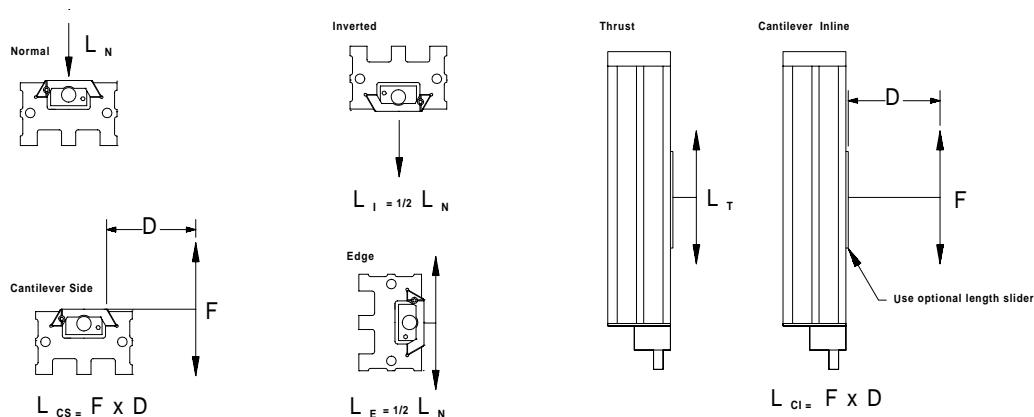
Example 1: Two Model MB4012BJ-S4 UniSlides would be suitable in an X and Y configuration. These models are 4" wide and 12" long.

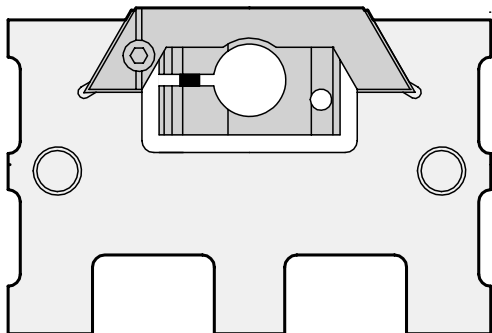
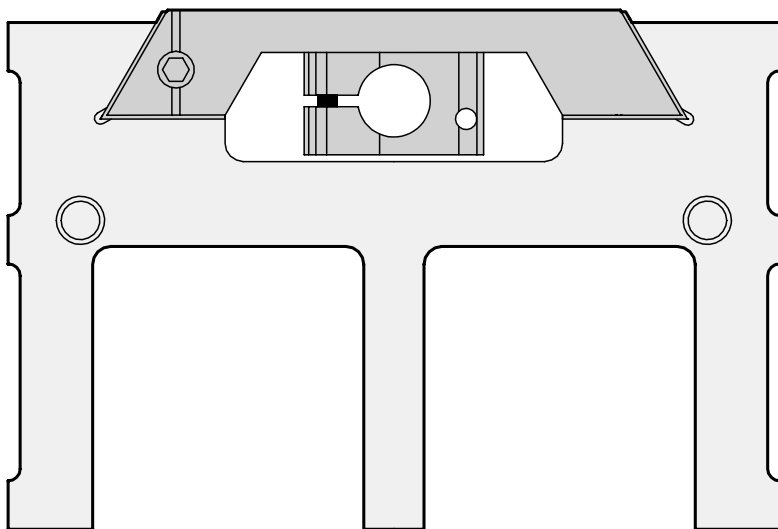
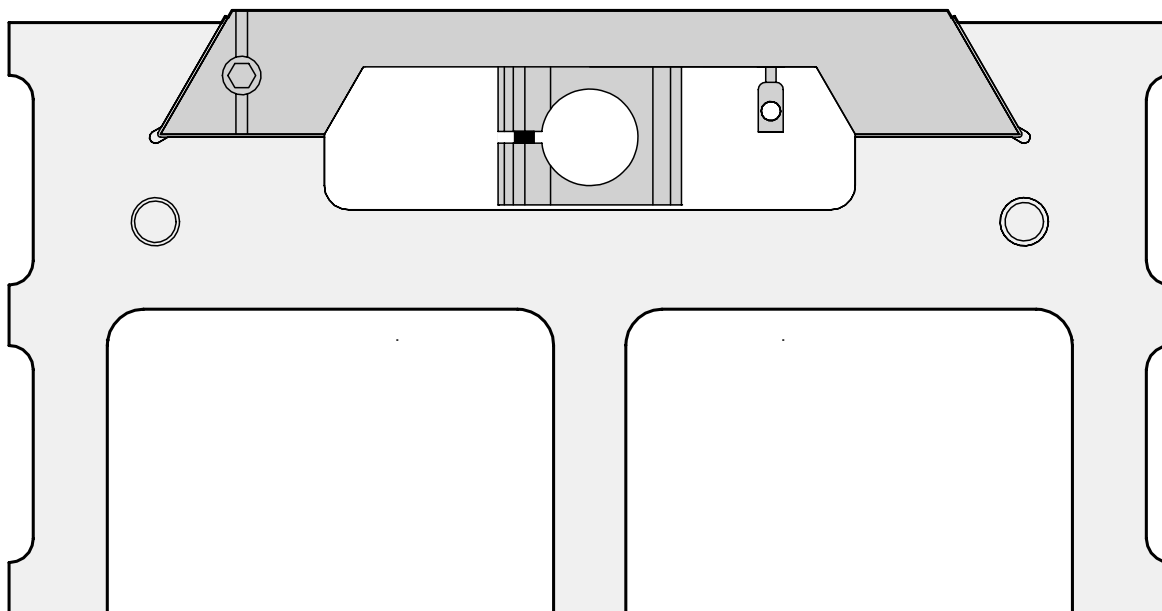
Example 2: If considering two MB4015BJ-S4 Unislides for an X and Y configuration, choose an MB6018BJ-S6 for the X axis instead. This will be more stable, since the MB6000 model is 6" wide. The MB4015BJ-S4 is only 15" long-not enough to meet the 3x criteria spelled out above.

UniSlide Capacity for Normal, Thrust and Cantilever Loads by Series

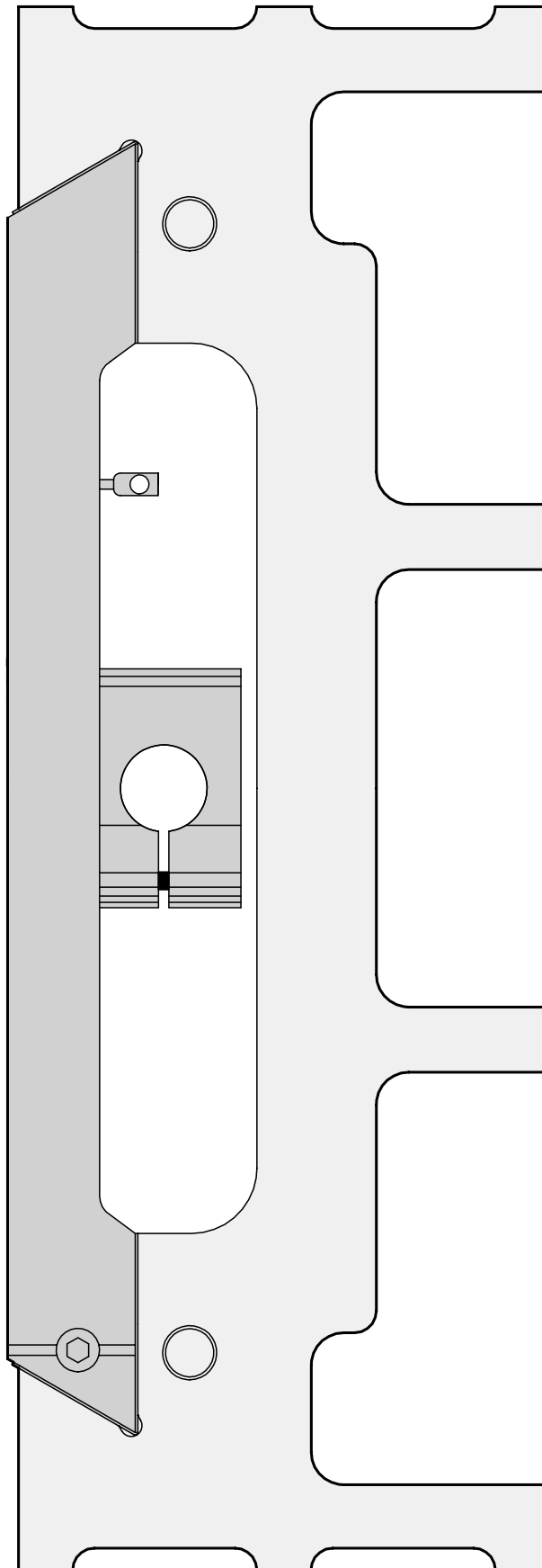
Normal Load (L_N)*		Maximum		Series	Thrust Load (L_T)*		Maximum	
Recommended Range		Lbs	Kg		Recommended Range		Lbs	Kg
Lbs	Kg				Lbs	Kg		
0 - 2	0 - 1	3	1	MA1500	0 - 1	0 - 0.5	1.5	1
0 - 20	0 - 9	30	14	MB2500	0 - 6	0 - 3	15	7
0 - 10	0 - 5	15	7	MA2500	0 - 3	0 - 1	7.5	3
0 - 40	0 - 18	100	45	MB/MA4000	0 - 20	0 - 9	50	23
0 - 80	0 - 36	200	91	MB/MA6000	0 - 40	0 - 18	100	45
0 - 140	0 - 63	400	182	MB9000	0 - 70	0 - 32	125	57

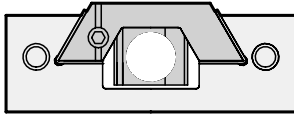
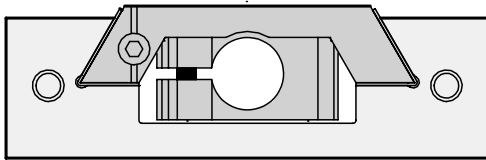
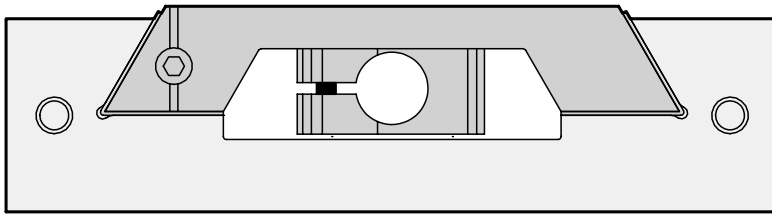
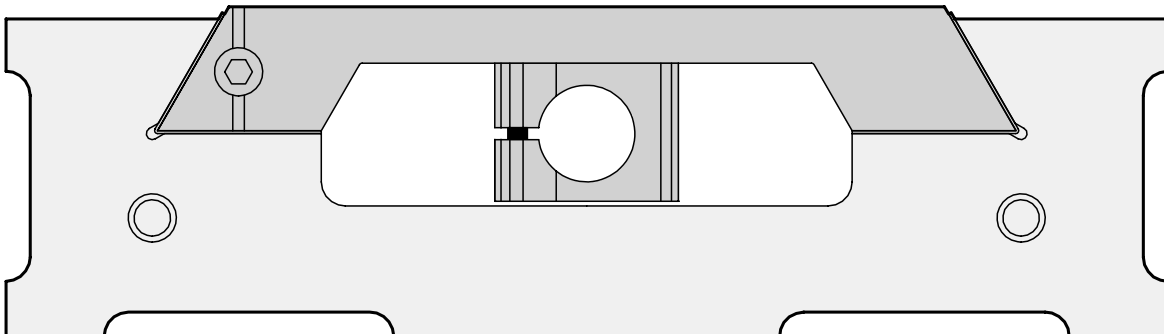
Cantilever Side Load (L_{CS})*		Maximum		Series	Cantilever in Line Load (L_{CI})*		Maximum	
Recommended Range		Lbs-Inches	Kg-Cm		Recommended Range		Lbs-Inches	Kg-Cm
Lbs-Inches	Kg-Cm				Lbs-Inches	Kg-Cm		
0 - 5	0 - 6	7	8	MA1500	0 - 5	0 - 6	7	8
0 - 15	0 - 17	40	46	MB2500	0 - 30	0 - 35	40	46
0 - 10	0 - 12	25	29	MA2500	0 - 20	0 - 23	25	29
0 - 32	0 - 37	130	150	MB/MA4000	0 - 64	0 - 74	130	150
0 - 80	0 - 92	320	369	MB/MA6000	0 - 160	0 - 185	320	369
0 - 120	0 - 139	480	554	MB9000	0 - 240	0 - 277	480	554



Actual Size Cross Sections of UniSlide Assemblies (Scale 1:1)***MB2500 Series******MB4000 Series******MB6000 Series***

MB9000 Series



Actual Size Cross Sections of UniSlide Assemblies (Scale 1:1)***MA1500 Series******MA2500 Series******MA4000 Series******MA6000 Series***

UniSlide Assemblies

A comparison of dovetail base style:



MB Style – the standard motorized UniSlide Assembly

- Includes protective internal limit switches, J.
- Base is stiffer than the MA style reducing the deflection of unsupported sections.
- Added height allows most units to lie flat on a flat mounting surface.



MA Style – the low-profile design UniSlide Assembly

- A more compact design with reduced slide height and weight. Base lengths available to 12".
- Compatible with steppers, AC synchronous motors and PM motors only. Motors extend below slide base.
- Outboard limit switches suggested unless used with NEMA 17 low torque motors.

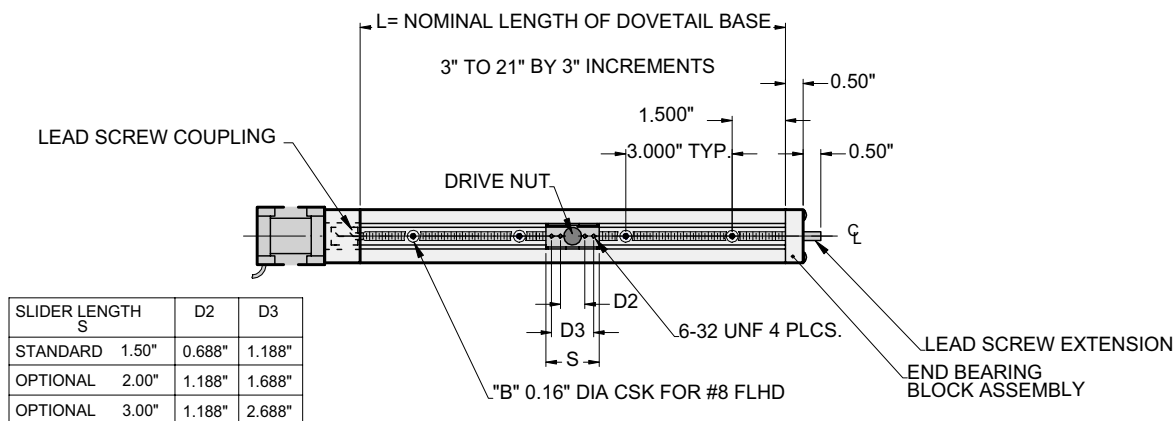
Series MA1500



Description

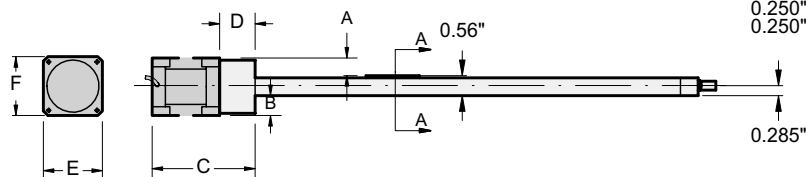
These small, low profile positioners are for light duty applications with light loads. The MA1500 is available in four lengths. The maximum recommended step rate is 1000/steps/second. The base requires support along its full length except for the lightest loads (< 1 lb.). Way covers are not available.

Series MA1500



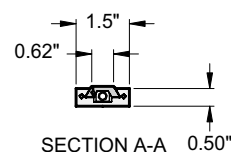
LEAD SCREW EXTENSION DIA.

0.218" FOR B & P20
0.231" FOR C & P40
0.250" FOR K1 & Q1
0.250" FOR K2 & Q2



MOTOR TYPE	A	B	C	D	E	F
PITTMAN GM8000 SERIES	0.68"	0.14"	4.44"	1.15" *	1.5"	1.375"
NEMA TYPE 17 VEXTA PK245	0.65"	0.46"	2.85"	1"	1.5"	1.5"

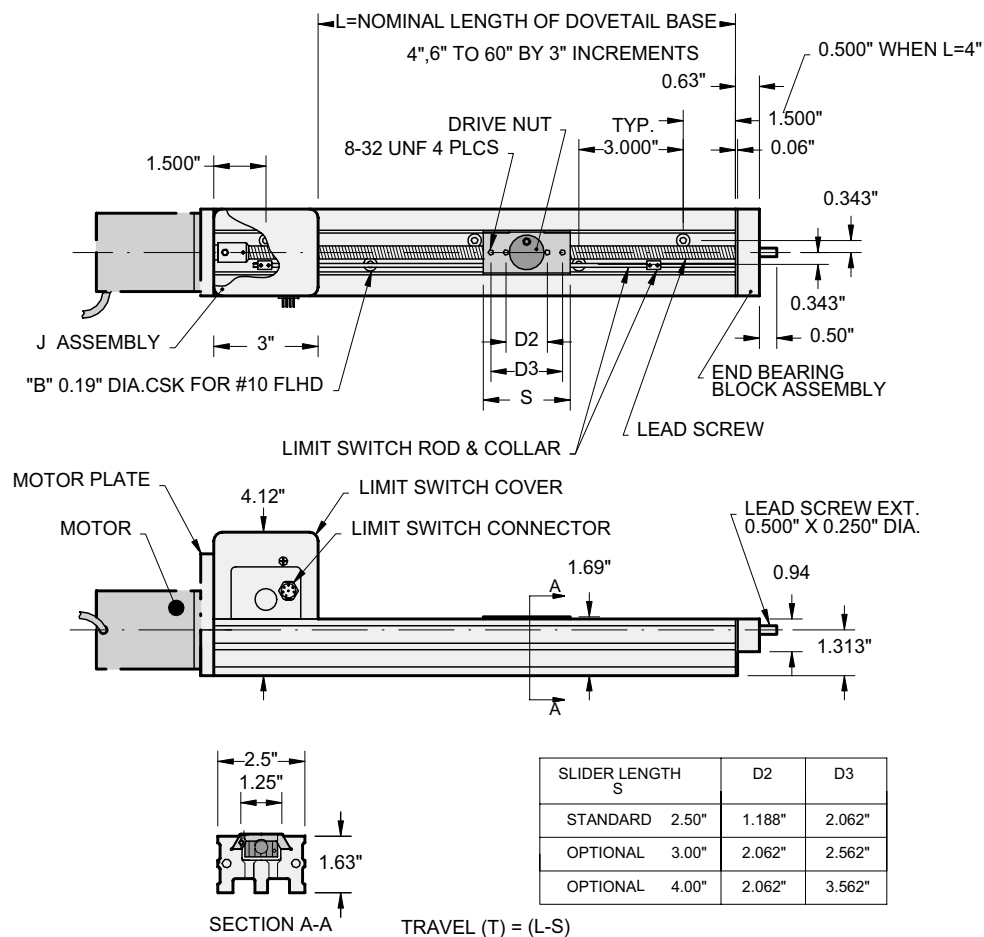
* (2) .125" PLATES & .900" SPACERS

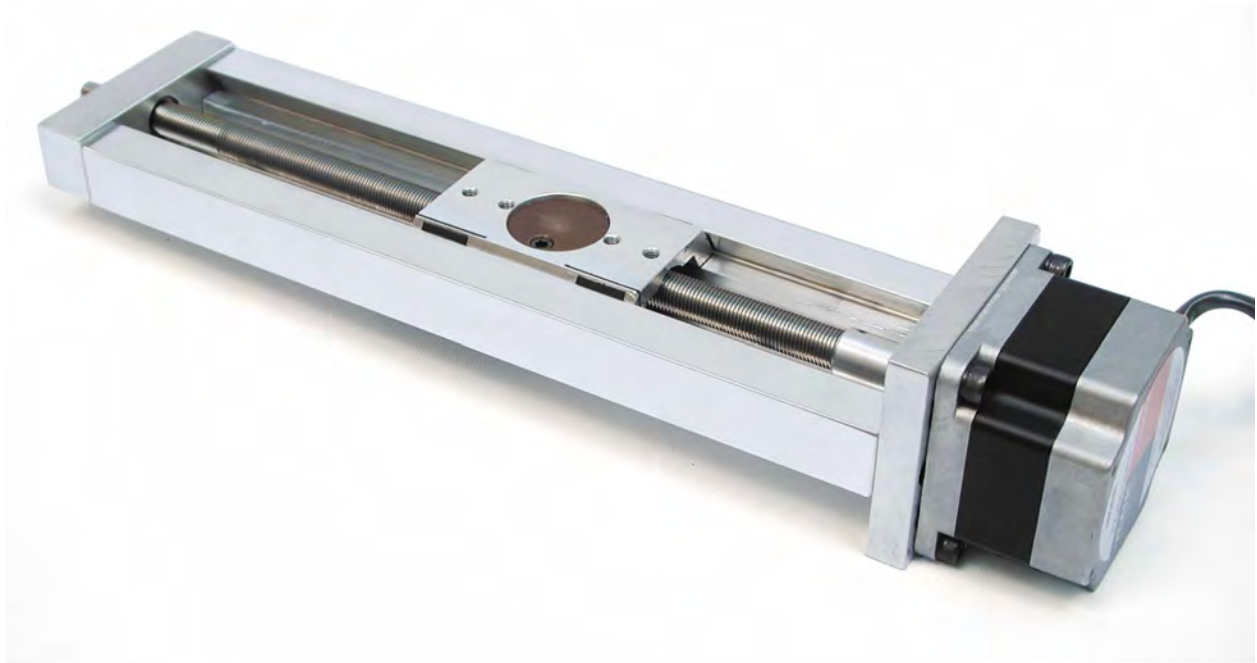
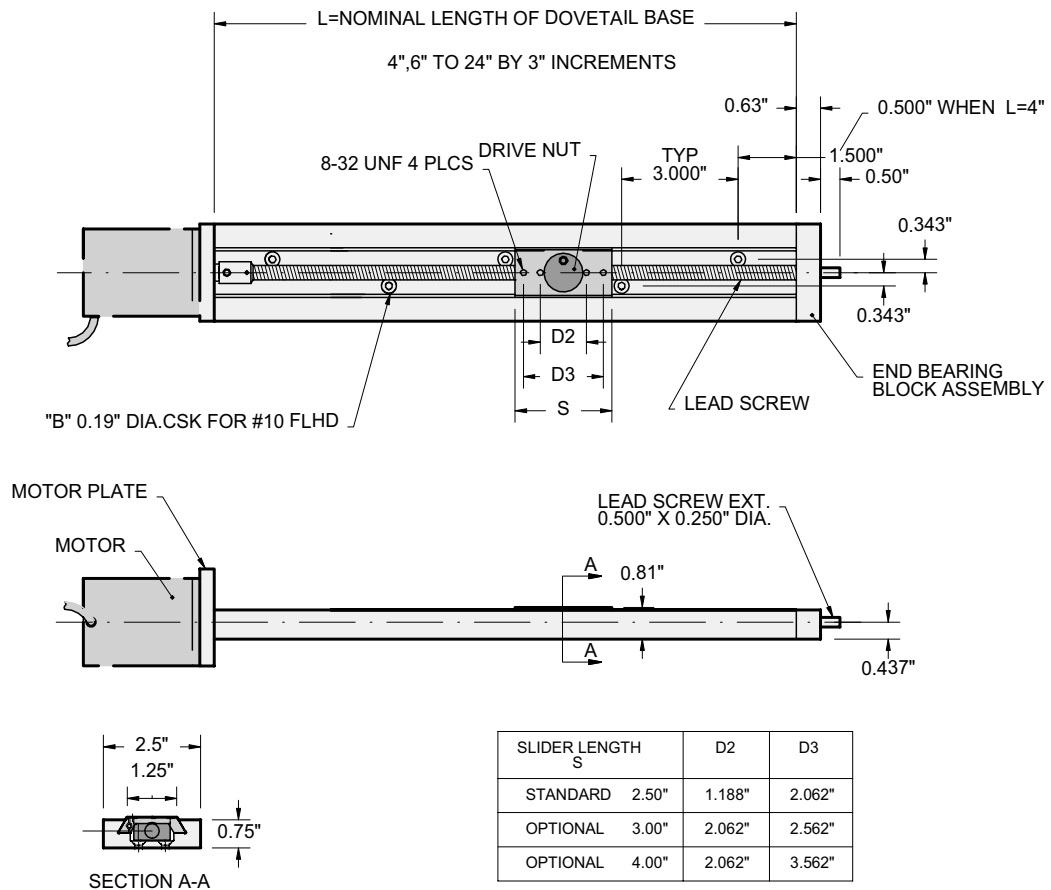


Series MB2500

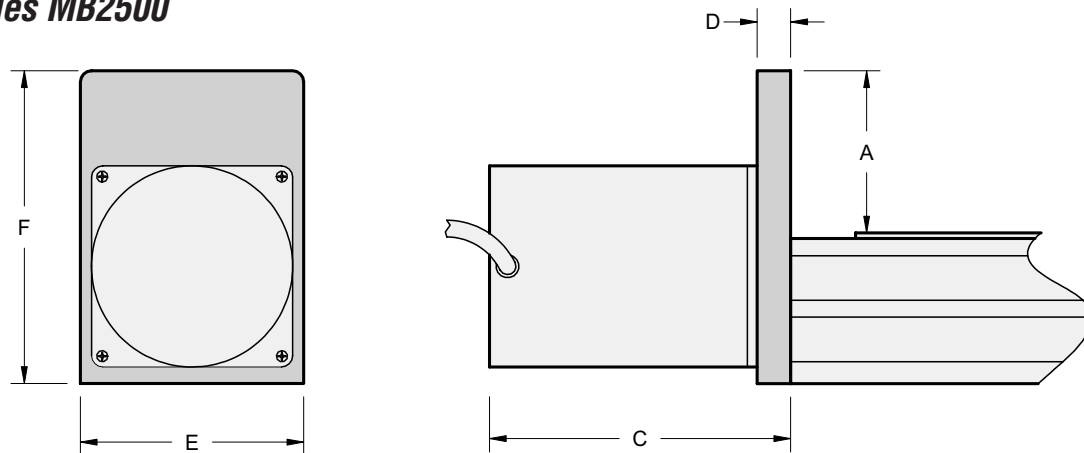


Series MB2500



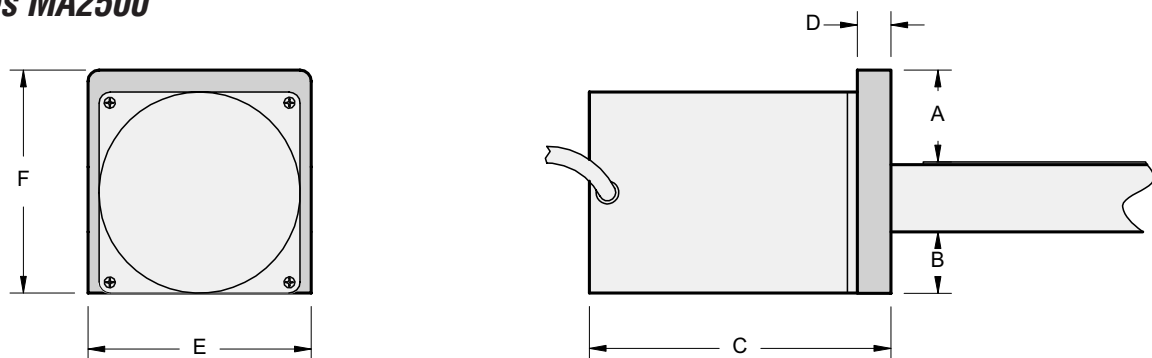
Series MA2500**Series MA2500**

$$\text{TRAVEL (T)} = (L - S) - 1.0"$$

Series MB2500

MOTOR TYPE	A	C	D	E	F
BODINE TYPE K	1.81"	3.40"	0.375"	2.50"	3.50"
PITTMAN GM8000 SERIES	1.81"	3.66"	0.375"	2.50"	3.50"
NEMA TYPE 17 VEXTA PK245	1.81"	3.23"	1.375" *	2.50"	3.50"
NEMA TYPE 23T1 VEXTA PK264	1.81"	1.92"	0.375"	2.50"	3.50"
NEMA TYPE 23T2 VEXTA PK266	1.81"	2.51"	0.375"	2.50"	3.50"

* (2) PLATES .375" X 2.5" X 3.5" & 1" X 1.5" X 1.5"

Series MA2500

MOTOR TYPE	A	B	C	D	E	F
PITTMAN GM8000 SERIES	0.38"	0.31"	3.66"	0.375"	2.5"	1.50"
PITTMAN GM9000 SERIES	1.13"	0.31"	4.58"	0.25"	2.5"	2.25"
NEMA TYPE 17 VEXTA PK245	0.38"	0.31"	3.23"	1.375"	2.5"	1.5" *
NEMA TYPE 23T1 VEXTA PK264	0.75"	0.69"	1.92"	0.375"	2.5"	2.25"
NEMA TYPE 23T2 VEXTA PK266	0.75"	0.69"	2.51"	0.375"	2.5"	2.25"

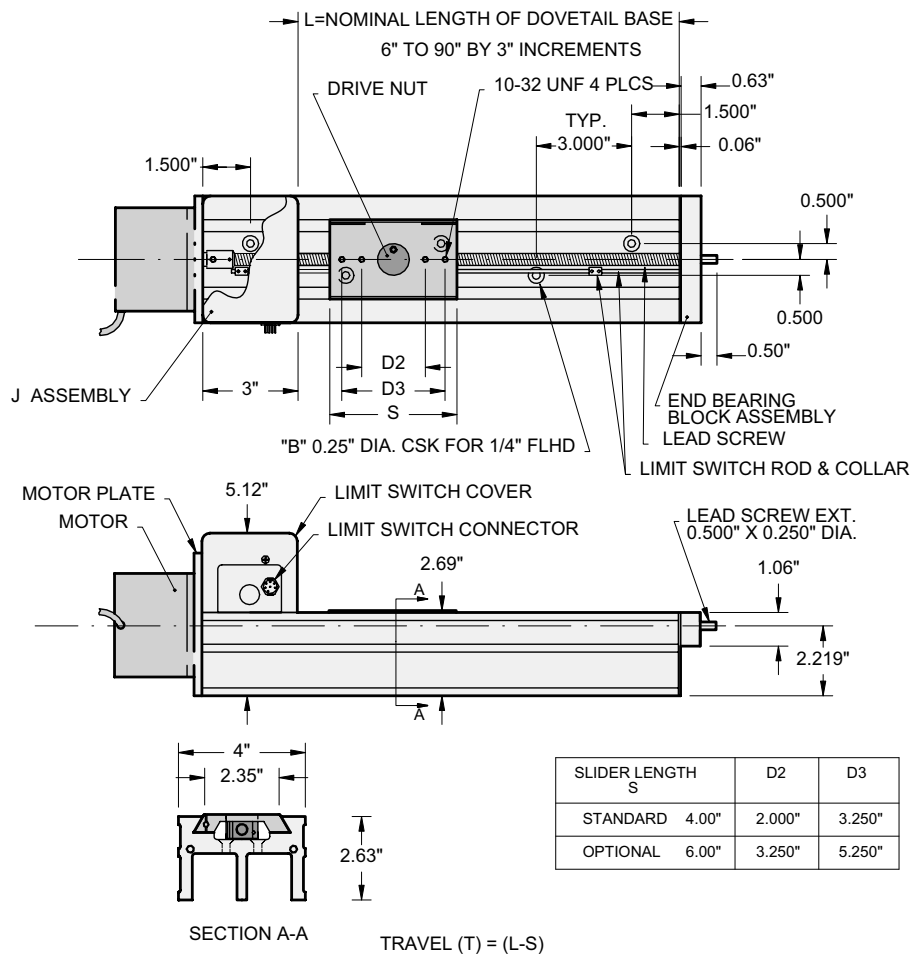
* (2) PLATES .375" X 1.5" X 2.5" & 1" X 1.5" X 1.5"

Other motor options are available – see page 3.6

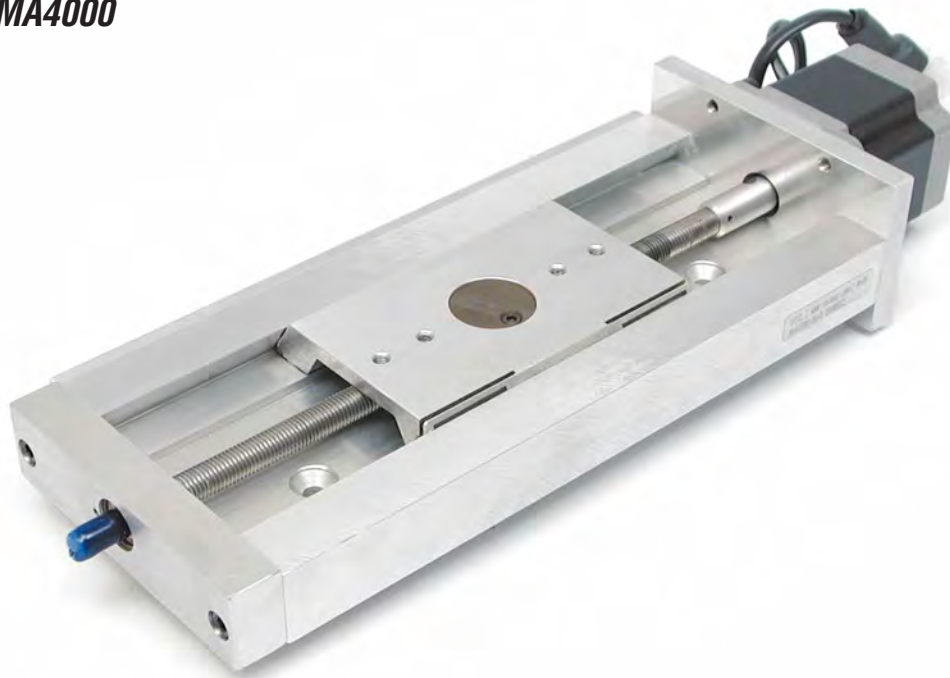
Series MB4000



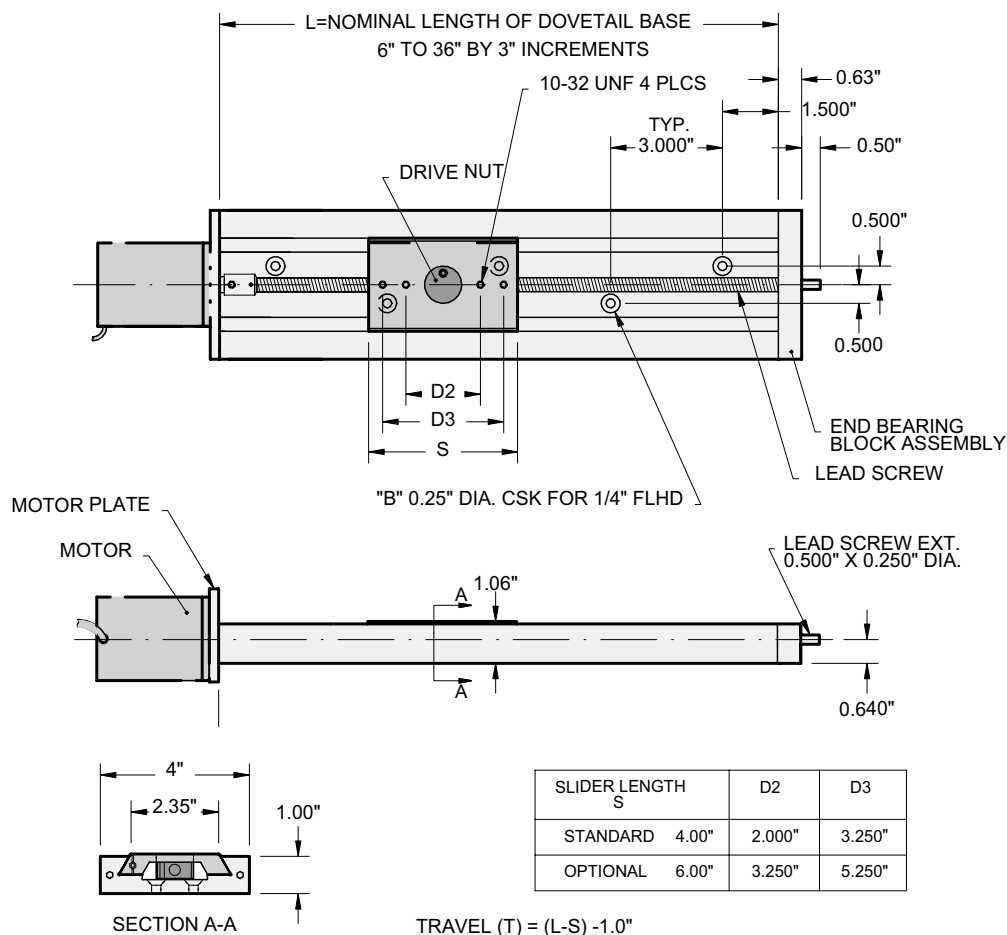
Series MB4000

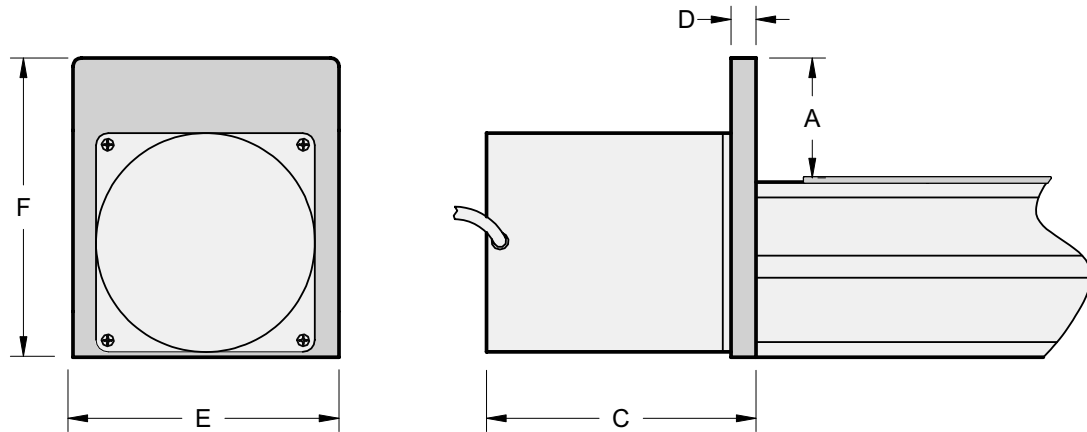


Series MA4000



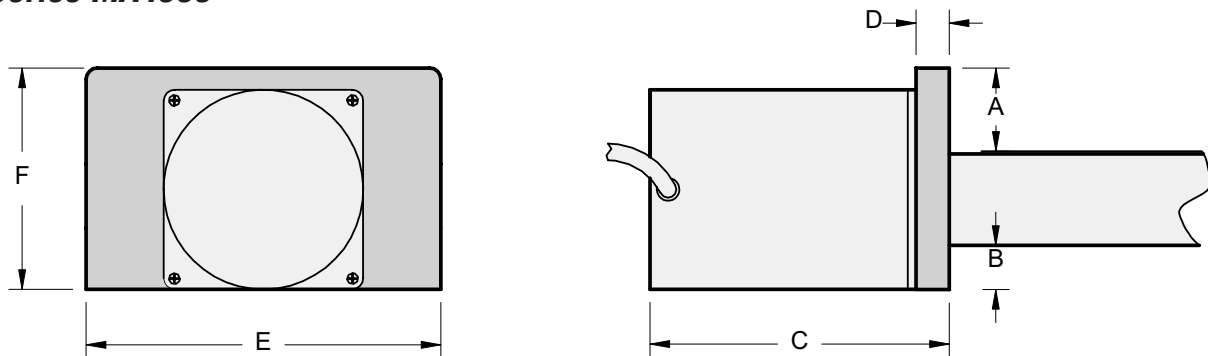
Series MA4000



Series MB4000

MOTOR TYPE	A	C	D	E	F
BODINE TYPE 24A4-D MODEL 0186 - 90	1.81"	7.10"	0.375"	4"	4.5"
PITTMAN GM 9000 SERIES	1.81"	4.71"	0.375"	4"	4.5"
NEMA TYPE 23T2 VEXTA PK266	1.81"	2.51"	0.375"	4"	4.5"
NEMA TYPE 34T1 VEXTA PK296	1.81"	2.98"	0.50" *	4"	4.5"

* (2) 0.25" PLATES

Series MA4000

MOTOR TYPE	A	B	C	D	E	F
BODINE 24A-MODEL 0043	0.94"	0.50"	5.06"	0.375"	4"	2.5"
PITTMAN GM9000 SERIES	0.94"		4.71"	0.375"	4"	2"
NEMA TYPE 23T2 VEXTA PK266	0.69"	0.50"	2.51"	0.375"	4"	2.25"
NEMA TYPE 34T1 VEXTA PK296	1.44"	1.0"	2.98"	0.50" *	4"	3.5"

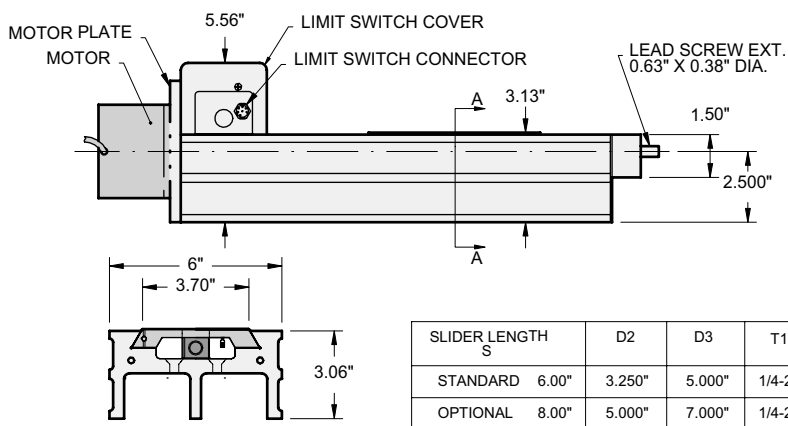
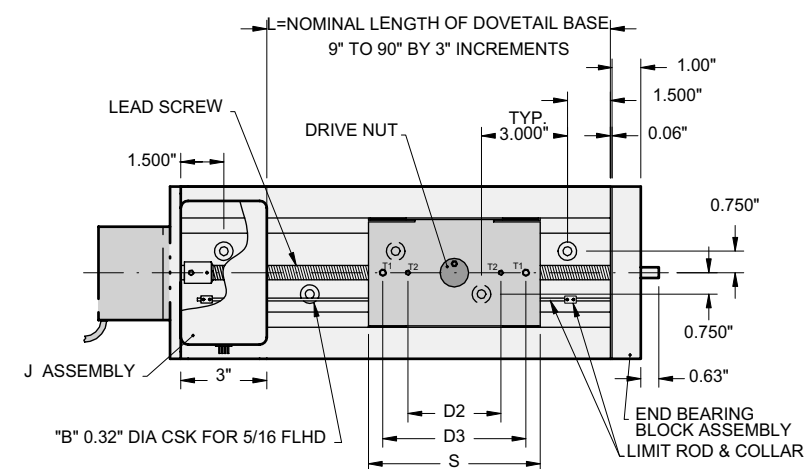
* (2) 0.25" PLATES

Other motor options are available – see page 3.6

Series MB6000



Series MB6000

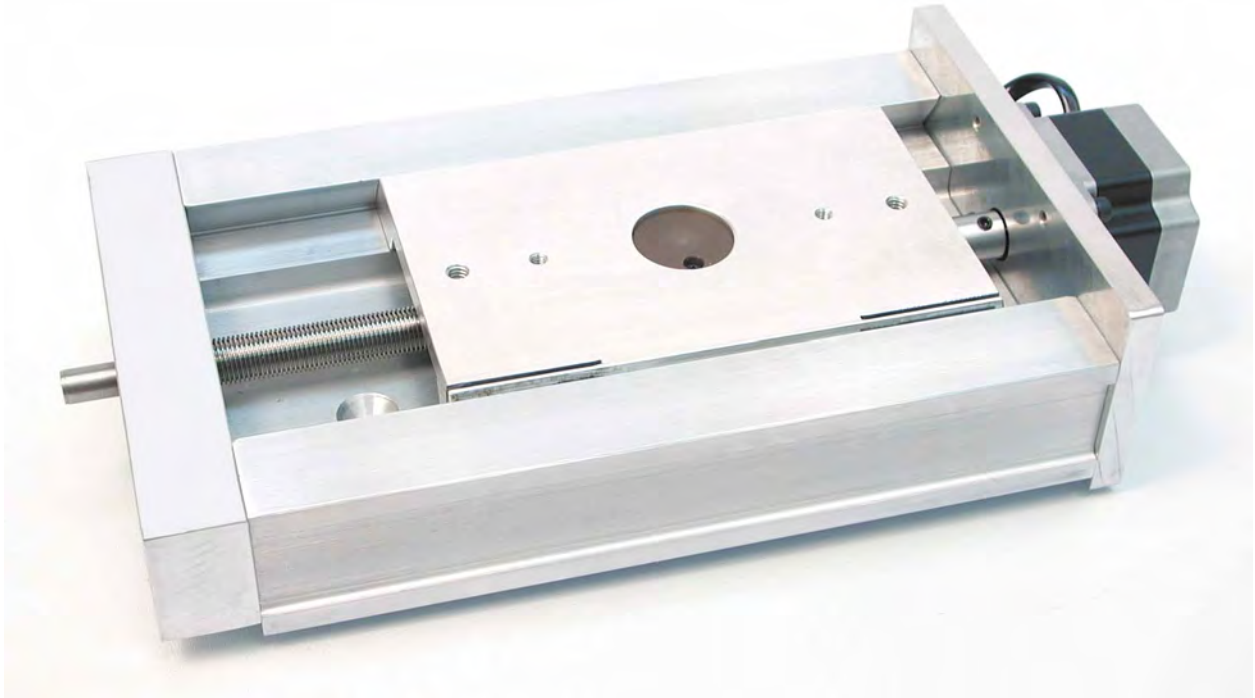


SECTION A-A

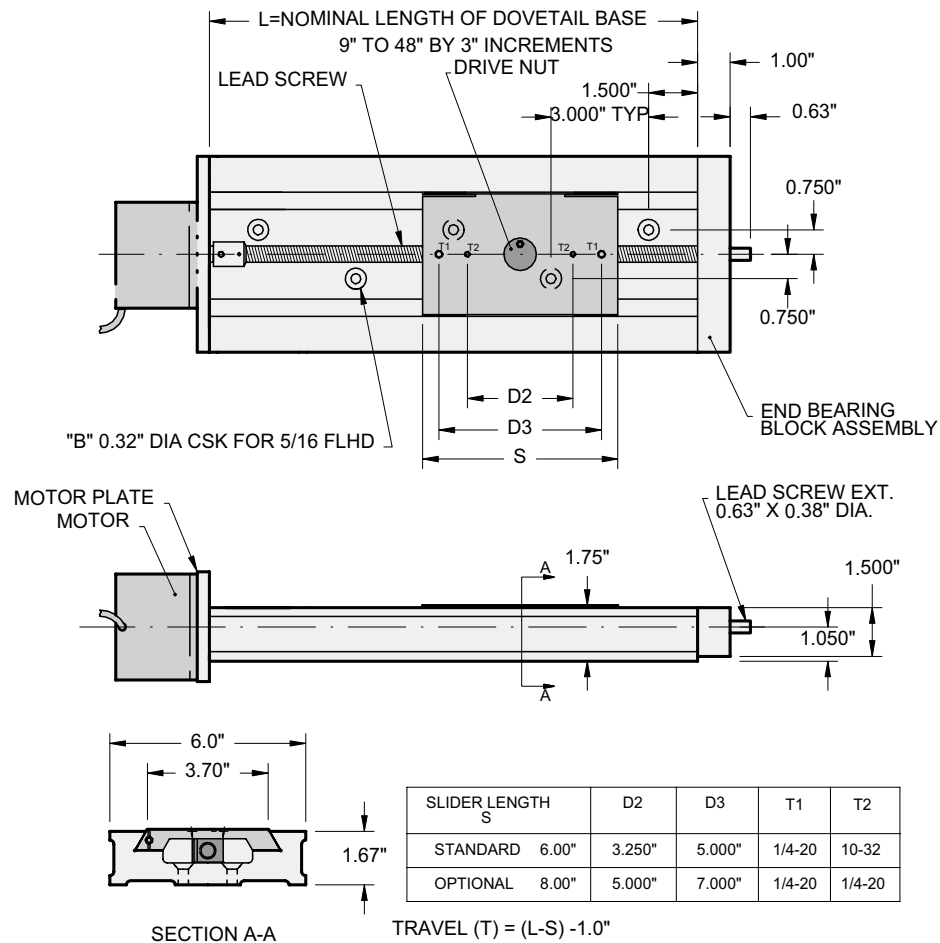
TRAVEL (T) = (L-S)

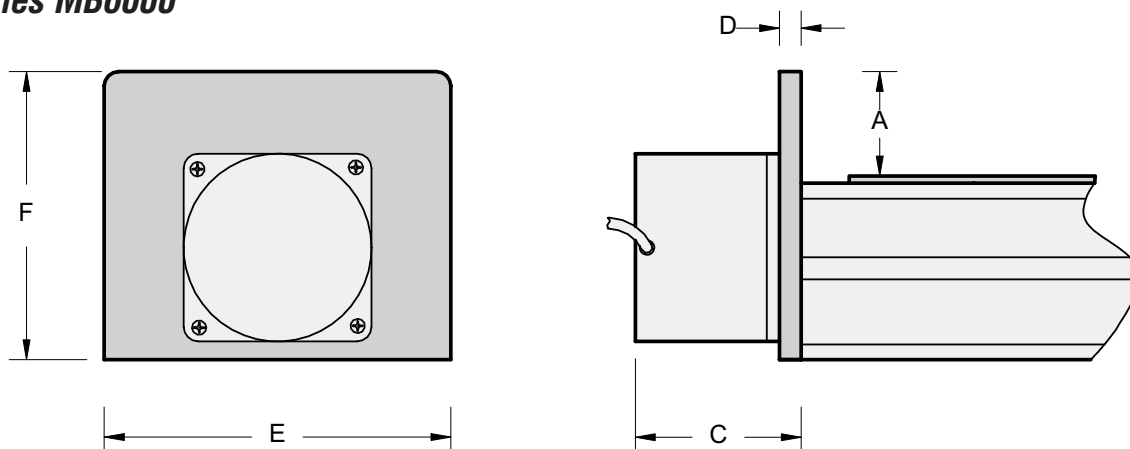
SLIDER LENGTH S	D2	D3	T1	T2
STANDARD 6.00"	3.250"	5.000"	1/4-20	10-32
OPTIONAL 8.00"	5.000"	7.000"	1/4-20	1/4-20

Series MA6000

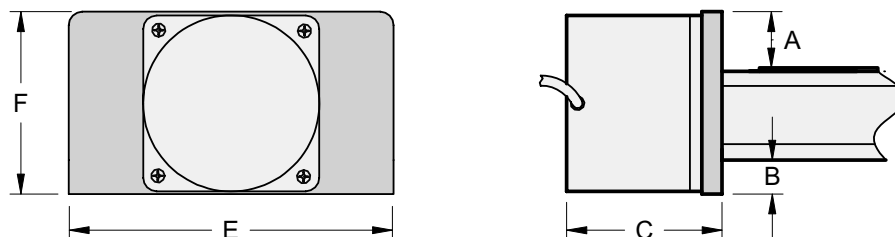


Series MA6000



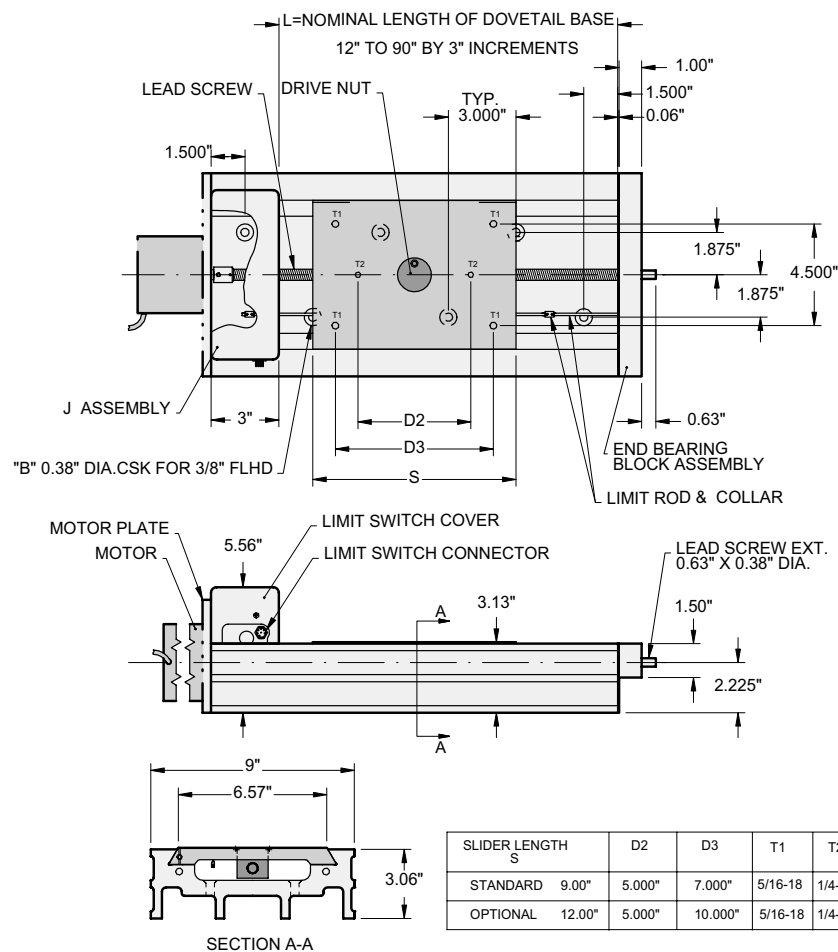
Series MB6000

MOTOR TYPE	A	C	D	E	F
BODINE TYPE 30R-D MODELS 5470-5474	1.87"	5.86"	0.375"	6"	5"
BODINE TYPE 24 A4-Z MODELS 0157-0163	1.87"	8.20"	0.375"	6"	5"
NEMA TYPE 23T2 VEXTA PK266	1.87"	2.51"	0.375"	6"	5"
NEMA TYPE 34T2 VEXTA PK299	1.87"	4.16"	0.375"	6"	5"

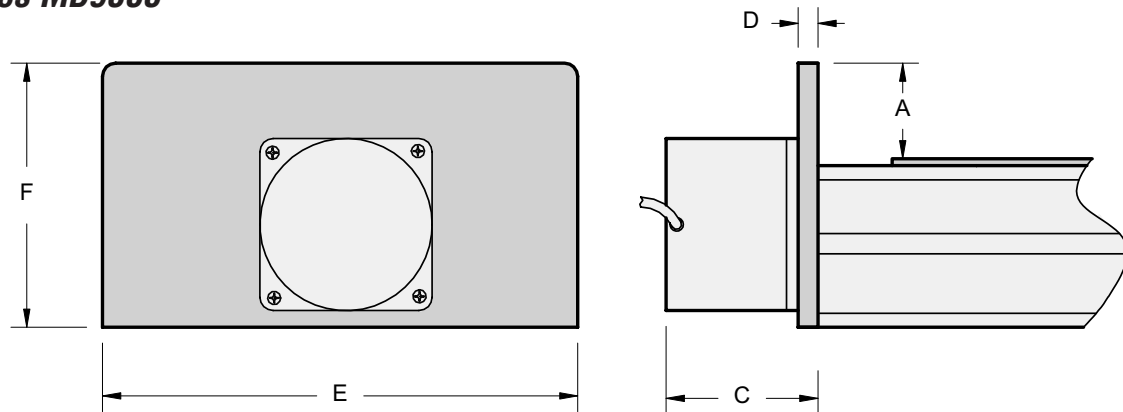
Series MA6000

MOTOR TYPE	A	B	C	D	E	F
PITTMAN 9000 SERIES	0.25"		4.71"	0.375"	6"	2"
NEMA TYPE 23T2 VEXTA PK266	0.40"	0.10"	2.51"	0.375"	6"	2.50"
NEMA TYPE 34T1 VEXTA PK296	0.93"	0.70"	2.98"	0.375"	6"	3.375"

Other motor options are available – see page 3.6

Series MB9000**Series MB9000**

$$\text{TRAVEL (T)} = (L - S)$$

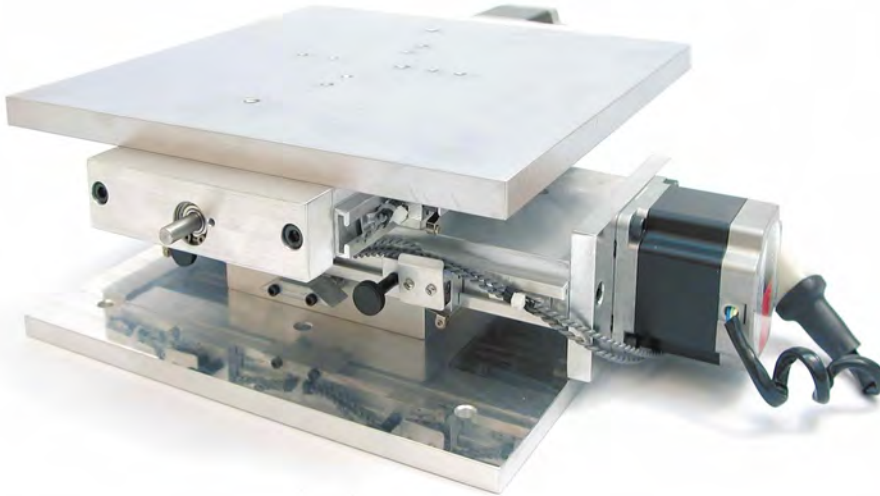
Series MB9000

MOTOR TYPE	A	C	D	E	F
SLO-SYN SS451C	1.87"	6.53"	0.375"	9"	5"
NEMA TYPE 34T1 SLO-SYN MO92-FD-447	1.87"	4.16"	0.375"	9"	5"
NEMA TYPE 34T1 VEXTA PK299	1.87"	4.16"	0.375"	9"	5"
BODINE TYPE 30R-D MODELS 5470-5474	1.87"	5.86"	0.375"	9"	5"
BODINE TYPE 24 A4-Z MODELS 0157-0163	1.87"	8.20"	0.375"	9"	5"

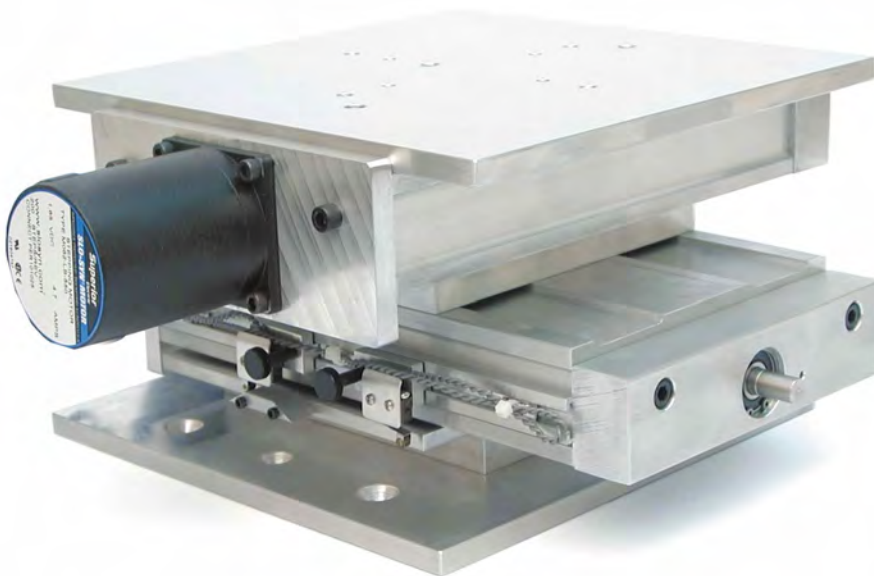
Other motor options are available – see page 3.6

Series MAXY4000 and MA6000 Assembled X-Y Tables

Model MAXY6012WI-S6



*Model MAXY4006
with Outboard Adjustable
Limit Switches*



*Model MAXY6009
with Outboard Adjustable
Limit Switches*

In addition to the numerous XY systems possible with any two UniSlide Assemblies, we offer the MAXY Series. These sturdy tables are constructed of two crossed and inverted linear UniSlide Assemblies of the Series MA4000 or MA6000. The standard tables include motor mounting plates, couplings, and our W1 (10 pitch) type lead screws. Check factory for availability of other pitches. Order motors, limit switches, and controls separately.

Features

- Large top work surface area
- Precise, smooth travel, low profile
- Plug-in compatibility with Velmex motor controls
- Assembled X-Y table with 2", 3", 5", 6" or 9" of travel

Plate Specifications — See page 1.41 for drawing of plates

Catalog Number	Top/Bottom Plates	Plate Thickness Top/Bottom	A Threaded Hole For	B Threaded Hole For	C and D Holes
Series A4000					
MAXY4006W1-S4	6" x 6"	1/2"/3/8"	8-32 on 2.062" B.C.	10-32 on 3 1/4" B.C.	clearance for 1/4"
MAXY4009W1-S4	9" x 9"	1/2"/3/8"	8-32 on 2.062" B.C.	10-32 on 3 1/4" B.C.	clearance for 1/4"
Series A6000					
MAXY6009W1-S6	9" x 9"	3/8"/3/8"	10-32 on 3 1/4" BC	1/4-20	countersunk for 5/16"(C) and 1/4 (D) FHMS
MAXY6012W1-S6	12" x 12"	3/8"/3/8"	10-32 on 3 1/4" BC	1/4-20	countersunk for 5/16" FHMS
MAXY6015W1-S6	12" x 12"	3/8"/3/8"	10-32 on 3 1/4" BC	1/4-20	countersunk for 5/16" FHMS

Physical Specifications

Catalog Number	Travel	Height	Load Capacity	Maximum Work Envelope ³
Series MAXY4000				
MAXY4006W1-S4	2" x 2"	4.13"	60 lbs.	12 1/2" x 12 1/2"
MAXY4009W1-S4	5" x 5"	4.13"	25 lbs.	18 1/2" x 18 1/2"
Series MAXY6000				
MAXY6009W1-S6	3" x 3"	5.50"	100 lbs.	17" x 17"
MAXY6012W1-S6	6" x 6"	5.50"	60 lbs.	23" x 23"
MAXY6015W1-S6	9" x 9"	5.50"	30 lbs.	29" x 29"

³With NEMA 23T2 stepper motor. Add 1" for NEMA 23T3 motor.

Options

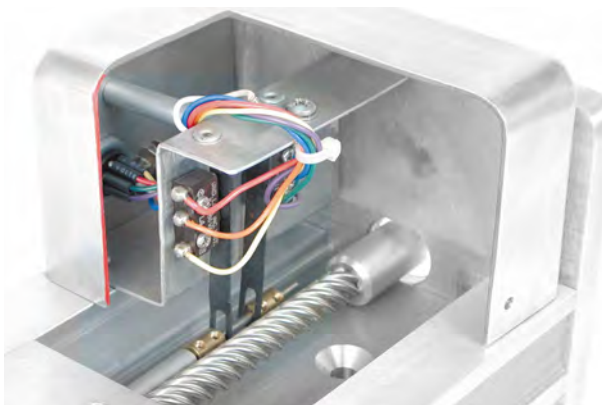
- Available without the top plate for users who want to attach their own surface plate.
- Adjustable outboard limit or fixed end-of-travel switches.
- Precision grade or different pitch lead screw. See Table II, page 00.
- Cosmetic black anodized finish or hard coat anodized ways dyed black.
- Additional threaded or clearance holes can be provided at extra charge.



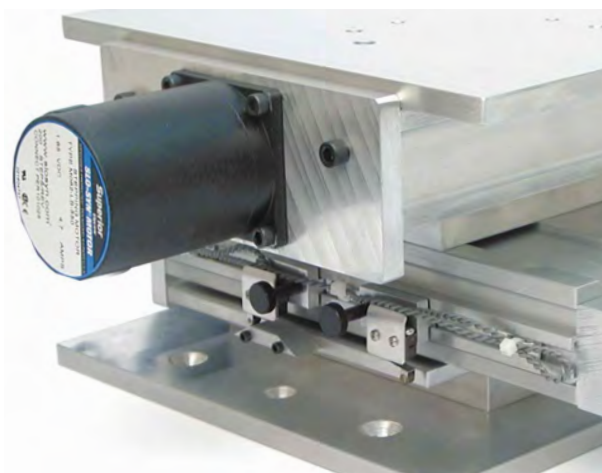
MAXY Table with optional black anodized finish and optional linear encoders.



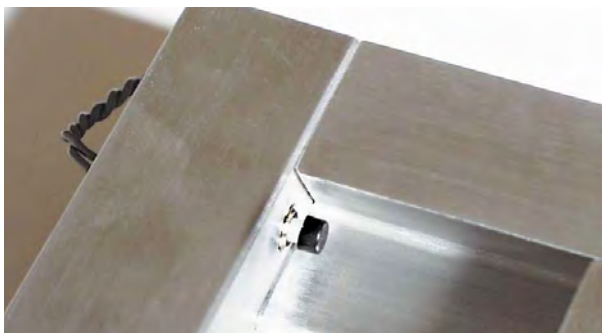
Standard internal limit switch for MB Series



Cutaway showing standard, limit switch assembly J



Optional outboard limit switches



Detail of fixed limit switch for MA/B40, 60 or MB90 Series

Options

Limit Switches

Limit Switches turn off the motor when activated. They are usually used to prevent over-travel of the slider or send an event signal. There are three variations:

- Standard internal adjustable
- Outboard adjustable
- Fixed end of travel limit switches

Standard Limits Switches, commonly referred to as the "J" assembly, are an internal, adjustable system. They consist of two switches, a control rod with two moveable collars and cover atop an additional 3" of dovetail base as shown. Moving the brass collars changes the activation point. This is available for MB type bases only. e.g. MB2500.

Outboard Adjustable Limit Switches

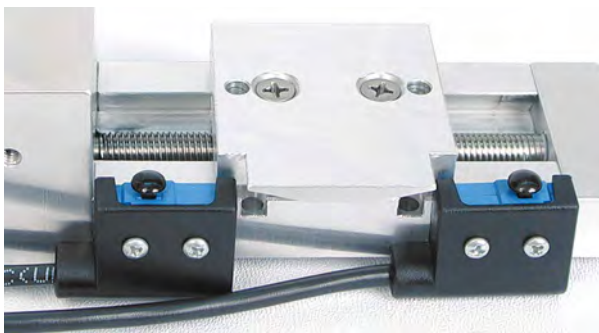
These are mounted on side edge of units and are available for all linear slide except MA1500. Photo shows a movable switch in a track mounted along the side of the UniSlide Assembly base. A 1/4" plate with cam activates the switch when it passes over it. The maximum number of limit switches is only limited by the nominal base length.

These switches can be wired to:

- Stop travel until restarted
- Provide more stops than the normal two
- Over travel a stop point or change speed
- Be active in only one direction

Fixed, End-of-Travel, Limit Switches

Fixed, end-of-travel, limit switches are wired, push button switches. Their position is not adjustable.



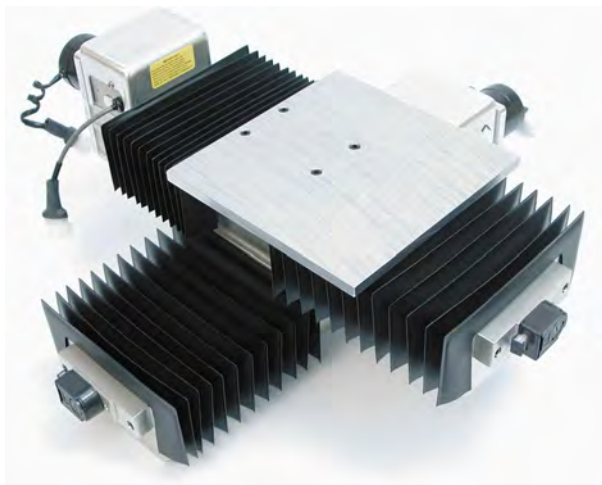
Detail of fixed limit switches for MA15, and MA/B25 Series



Longer slider length increases stability



Model ZMB2524BJ-S2.5 with hard anodized ways



Waycovers protect against dust and dirt

Sliders

Longer length sliders (carriages) increase the stability of your system, particularly with large or overhung loads.

In addition, a base can have multiple sliders. Sliders can be driven or free-floating. See web site for examples.

Optional Finishes

If a motorized UniSlide Assembly will accumulate more than 200,000 cycles of operation or will be used in a production capacity 8 hours per day, a hard coat anodized finish can be applied to the dovetail ways to prolong life. This coat is 0.002" thick, measures Rockwell C 70 and is dyed black. This option is specified by prefacing the part number with the letter "Z", i.e. ZMB4015BJ-S4. The price formula for each Series is given in the price list. Electroless nickel coating is also available.

Way Covers

Polyurethane way covers with attaching plates are available for protection against dust and grit. They extend over and above the UniSlide Assembly as follows:

	Projection above slider mounting surface	Width
MB2500	3/4"	4 1/2"
MA & MB4000	1"	7"
MA & MB6000	1 1/4"	8 1/4"
MB9000	1" 11	1/2"

Since the collapsed or compressed bellows requires additional base length, please add 1/3 of free travel length to the nominal base length of the assembly. For example, the free travel of the MB4021P10J-S4 with the standard slider length of 4" and without way covers is 17". If way covers are desired, the dovetail base must be increased by 17"/3, which, to the nearest 3" length increment, is 6". Therefore, Model MB4027P10J, having a 27" nominal length base will accommodate the compressed bellows and is the correct choice. This option is specified by appending the Part Number with the letters "WC", i.e., MB4021P10J-S4-WC. The price for each unit with way covers is given in the price list.

Table of Contents



Motor Driven

Above: Easy XY configuration, Y axis can be positioned anywhere on X using cleats (see page 2.38).

Below: Three BiSlides configured XYZ — easy Z axis attachment with four bolts.



Motorized BiSlide and XSlide

<i>Examples and Application Photos</i>	2.34
<i>Motorized BiSlide Assemblies are</i>	
<i>Modular, Compact and Durable</i>	2.35
<i>BiSlide Features and Benefits</i>	2.35
<i>Anatomy of a BiSlide</i>	2.36
<i>Versatile and Durable Design</i>	2.37
<i>BiSlide Load Capacity</i>	2.37
<i>How to Specify Your BiSlide Model</i>	2.37
<i>Combining BiSlides</i>	2.38
<i>Series M BiSlide Assembly and</i>	
<i>T-Slot Profile Cross Section Dimensions</i>	2.38
<i>Motors and Lead Screws</i>	2.40
<i>Choose the Way Cover Model to Minimize Contamination</i>	2.41
<i>Tandem Option Carries Heavy Loads Economically</i>	2.42
<i>Parallel Coupled Assembly for Large Loads and Long Traverses</i>	2.42
<i>Five Year Warranty</i>	2.47
New <i>XSlide Assemblies</i>	2.48

Examples and Application Photos

Here are examples of BiSlide® stock and custom positioning equipment.

All BiSlides are designed to accommodate NEMA size 23 and 34 motors without modifications. Many other types of motors can be used, most of them requiring no modifications to the BiSlide.



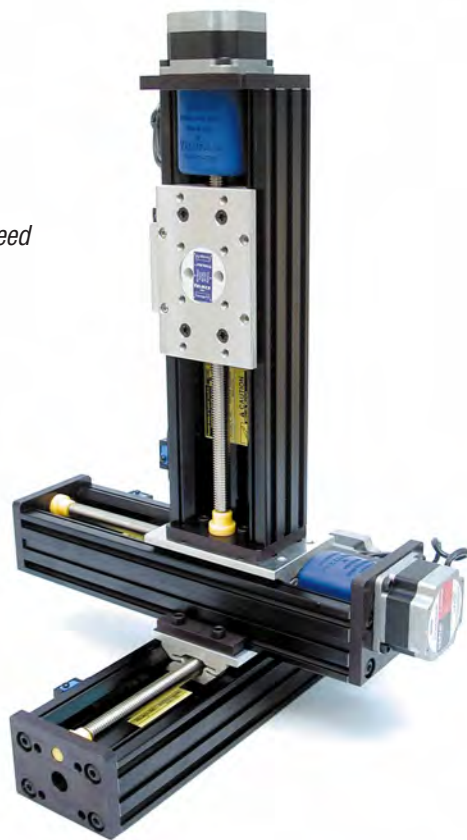
All BiSlides can be purchased with or without motors. Related motor drives, controls, and software are also available.

Motor-Driven BiSlides are available in standard lengths from 5"/12.7 cm to 80"/203.2 cm.

For help call our engineering staff, fill out our website RFQ/RFA form or the Fax-a-Quote form at the end of this section.

Example 1: Combine two BiSlides to make an XY table.

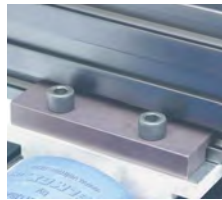
Example 2: Use our cleats to join units and eliminate the need for adapter plates.



Example 3: Parallel coupled units to move large or bulky loads.

Motorized BiSlides Assemblies are Modular, Compact, and Durable

- 45 degree opposing way guides carry high loads in all directions
- Long life anodized ways standard
- Biggest lead screw drive for higher thrust capacity
- Improved modular design eliminates adapter plates and brackets



Cleats make mounting multiple units easy



3 axis system



BiSlide with 80 inch travel length

The Velmex BiSlide is a modular system of positioning stages and hardware that allows you to quickly and easily create a complete single or multi-axis system by simply bolting together modular components. These components can be configured and assembled to form a work cell dedicated to a specific task. Because BiSlide components are all standard and interchangeable, if this task changes or ends, you can readily disassemble the components and put them to work elsewhere.

If you're a manufacturer, you'll find the BiSlide system delivers ease of service and upgradeability to keep up with your rapidly changing marketplace. If you're a researcher, you'll like BiSlide's easy reconfigurability and expandability for different projects. Everyone appreciates BiSlide's durable construction and low cost.

Features and Benefits of BiSlides

- Lighter weight
- Fewer parts
- Lower cost
- Higher strength to weight ratio – uses hard aluminum alloys and a rigid I-beam cross section
- More compact than most ball screw driven stages
- Self-holding – unlike ball screws, the 10 pitch, 1 or 2 mm lead screw will not creep or backdrive
- Resistant to impact loads
- Natural wiping action expels debris
- Gradual wear not sudden failure of rolling element type screws and guide-ways
- Corrosion resistant anodized finish
- Operate without lubrication
- Spare set of guide-ways built-in on the flip side just in case the primary ones get damaged

Options

- Step Motors and Controls
- AC Motors
- DC Motors and Controls
- Servo Motors
- Position Sensors and Switches
- Rotary, Linear Encoders, and Digital Readouts
- Extra Carriages
- Short Carriages
- Right/Left-hand Drives
- Custom Lengths
- Special Holes

For More Information:

- Call Velmex at 1-800-642-6446 from 8 am to 5:30 pm EST.
- See specifications at Motor Driven BiSlide Assemblies on page 2.37.
- Visit www.Velmex.com/motor_choose_BiSlide.asp to input your specifications, find prices, see photographs and download drawings of specific BiSlide models.
- Visit www.BiSlide.com for more examples of BiSlide's extraordinary versatility.

BiSlide Construction Delivers High Precision and Long Life

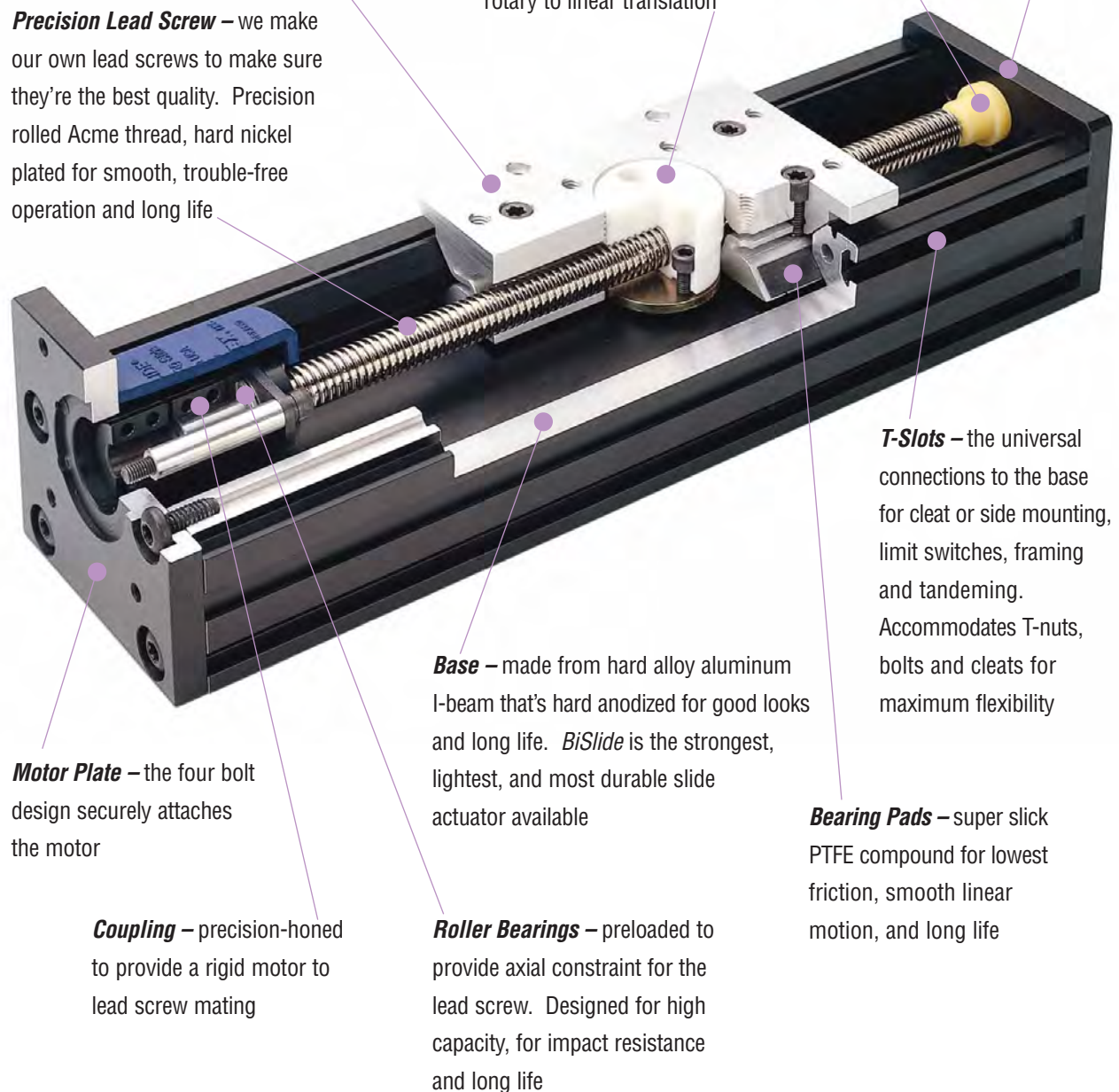
Large, Versatile Carriage – provides a 4.6" x 3.1" mounting surface suitable for carrying anything from an assembly fixture to a measuring probe – eight threaded attachment holes let you securely fasten any kind of payload. Also, there's four accessory holes for limit switch cam or other sensors. Carriage has fit and wear compensation adjustments

Precision Lead Screw – we make our own lead screws to make sure they're the best quality. Precision rolled Acme thread, hard nickel plated for smooth, trouble-free operation and long life

Support Bearing – delivers just the right combination of constraint and anti-vibration qualities for the lead screw

StabilNut™ – a Velmex exclusive, is the "solid", low friction connection between the lead screw and carriage. It has an antibacklash design with fine mesh adjustment for responsive rotary to linear translation

End Plate – provides a convenient way to directly mount a BiSlide assembly on end. Four hole pattern mates with other BiSlide carriages and T-slots



T-Slots – the universal connections to the base for cleat or side mounting, limit switches, framing and tandeming. Accommodates T-nuts, bolts and cleats for maximum flexibility

Bearing Pads – super slick PTFE compound for lowest friction, smooth linear motion, and long life

Base – made from hard alloy aluminum I-beam that's hard anodized for good looks and long life. BiSlide is the strongest, lightest, and most durable slide actuator available

Roller Bearings – preloaded to provide axial constraint for the lead screw. Designed for high capacity, for impact resistance and long life

Motor Plate – the four bolt design securely attaches the motor

Coupling – precision-honed to provide a rigid motor to lead screw mating

Versatile and Durable Design

BiSlide Delivers the Accuracy and Load-Carrying Capacity You Need

Coefficient of friction: 0.09 typical

Coefficient range: 0.04 (Heavy Load Dynamic)
to 0.15-0.3 (Lubricated Heavy Load Static>1 hour)

Minimum motor torque required: 55 oz-in (0.4 N-M)

Repeatability: 0.0002" over short term,
long term dependent on wear

Straight line accuracy: 0.003" over entire
travel distance

Screw lead accuracy: 0.003"/10" (0.076 mm/25 cm)
0.0015"/10" available. Consult factory.

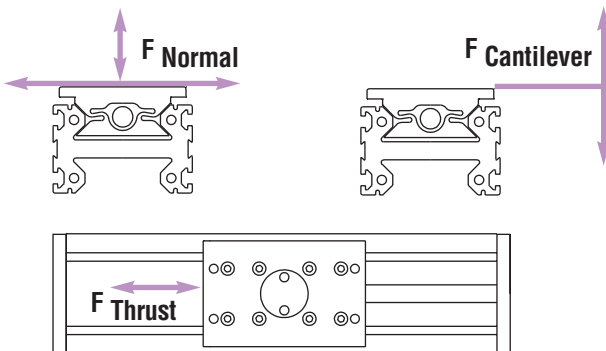
Operating temperature: 0 to 180° F (-18 to 82° C)

Finish

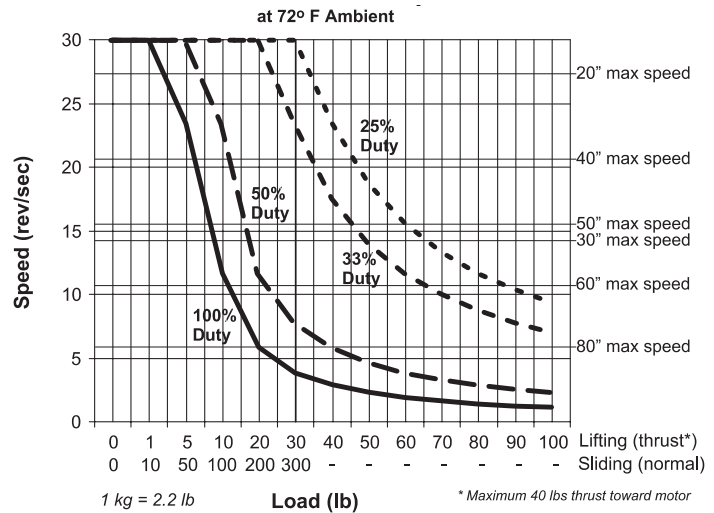
Lead screw: hard nickel plated

Carriage: machined aluminum

Other surfaces: black anodized aluminum



Maximum Load/Speed**



** In other environments contact our technical sales department for recommendations

Maximum Load Carrying Capacity

Load	Dynamic	Static	Momentary
Normal Centered	300 lb.	300 lb.	1000 lb.
Thrust	100 lb*	200 lb.	300 lb.
Cantilevered	500 inch-lb. (See formula below)		

* Maximum 40 lbs. thrust towards motor.

For cantilevered loads: equivalent center load = $(d \times L/2) + L$
where d = distance load is from center in inches,
L = Load (lbs.)

How to Specify Your BiSlide Model

M	N	1	0	-	0	2	0	0	-	E	0	1	-	2	1	
Cross Section M		Design								Lead Screw Advance/Turn		Mounting			Options	
		10=Inch								Blank	None	Blank=None				
		11=Inch & Way Cover								M01	1.00 mm	11=Basic Knob				
										M02	2.00 mm	12=Knob/Counter, Horizontal, Increment + from Knob				
										E01	0.10 inches	13=Knob/Counter, Vertical, Increment + from Knob**				
										E04	0.40 inches	14=Knob/Counter, Horizontal, Increment - from Knob				
												15=Knob/Counter, Vertical, Increment - from Knob**				
												20=NEMA 23 Motor Mount 1/4" diameter shaft				
												21=NEMA 23 Mount 1/4" diameter shaft & Limit Switch				
												30=NEMA 34 Motor Mount 3/8" diameter shaft				
												31=NEMA 34 Mount 3/8" diameter shaft & Limit Switch				

Drive Scheme
N=Nut/Screw Drive
F=Free Sliding
T=Tandem

Design Travel* (Tenth of Inch)
Standard Travel Lengths (Inches):
5, 10, 15, 20, 30, 40, 50, 60, 80

* Free sliding models have 2.4" longer travel,
way cover models under 40" travel have 1.0" less

** For BiSlides oriented vertically with the knob up.
Use the horizontal reading (-12 or -14) for applications with knob down.

Simple and Versatile Mounting Makes Multi-Axis Systems Easy

The BiSlide system is designed around a hard alloy aluminum I-beam base. Mounting features include a pair of T-slots on each side, drilled end plates and a series of threaded holes on the carriage. Using standard Velmex cleats, T-nuts, bolts and T-Slot plate (see page 11) you can quickly and easily configure a BiSlide system for multiple coordinates. Combine that attachment flexibility with the availability of BiSlides up to 80" and choice of manual or motor-driven models, and you have a positioning system that will do precisely what you want, at low cost.

Here are two mounting examples. **There are more on our web site at www.velmex.com.**



Above: Easy XZ Configuration. Just use the four predrilled holes in end plate. Any 90 degree orientation is possible. *Items Needed:* four MB-1 bolts.

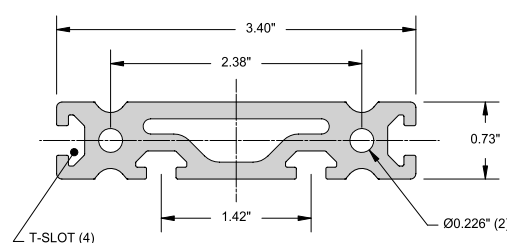
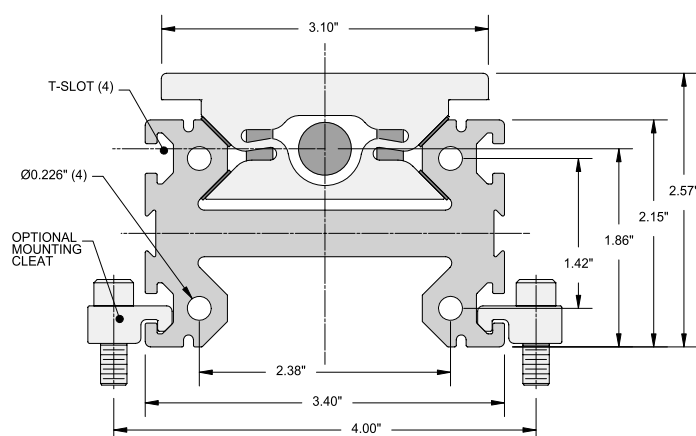
Left: Rigid XY attachment using BiSlide cleat. The Y axis can be positioned anywhere on X axis without an adapter plate or special holes. *Items needed:* Two MC-2 cleats and four MB-1 bolts.

Right: Velmex BiSlide

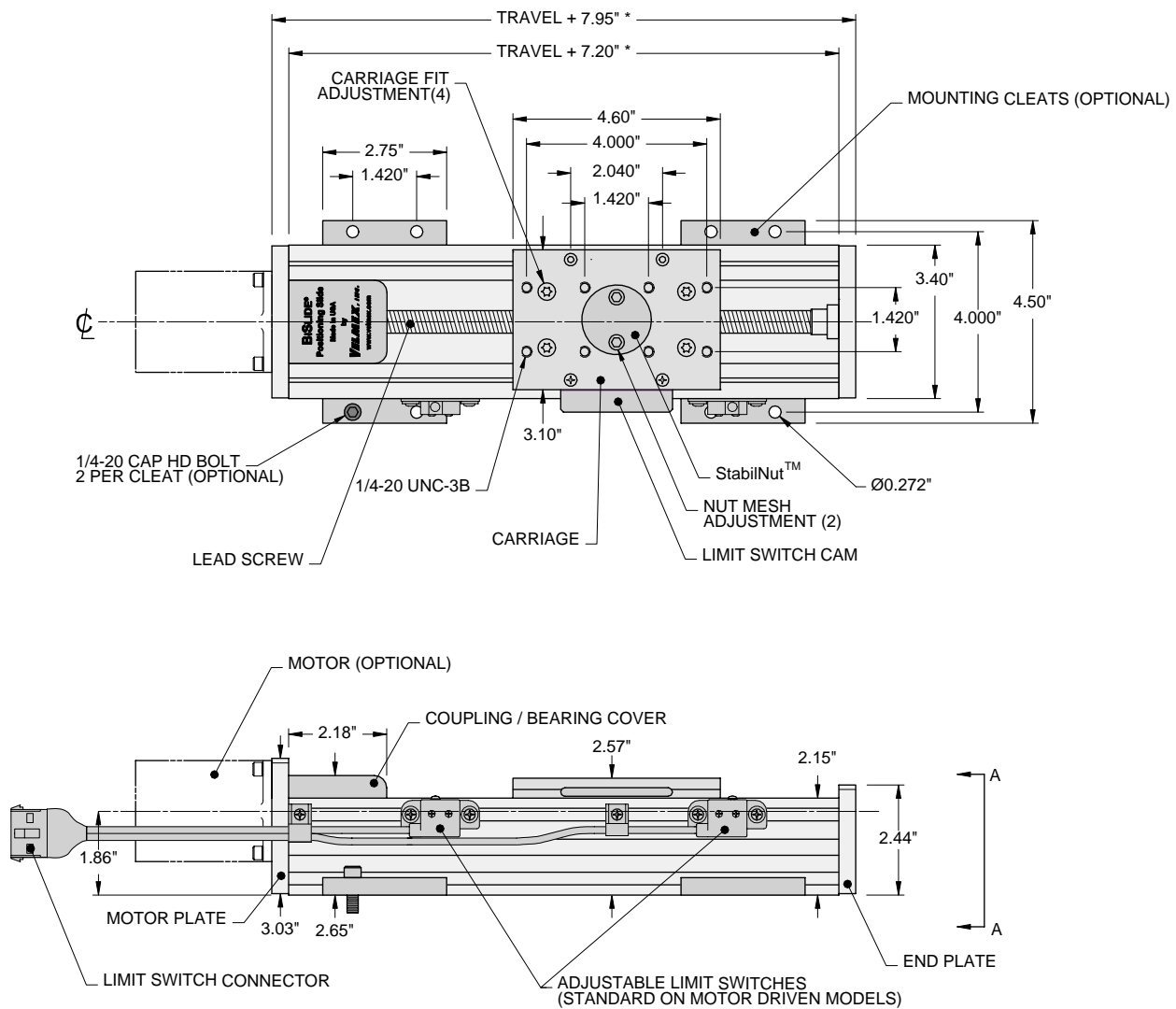
Cleats. Cleats are available in standard two-hole versions, a two-hole design with 2 inch spacing for optical table mounting, and single hole cleats for attachment to other T-Slot framing systems.



Series M BiSlide Assembly and T-Slot Profile Cross Section

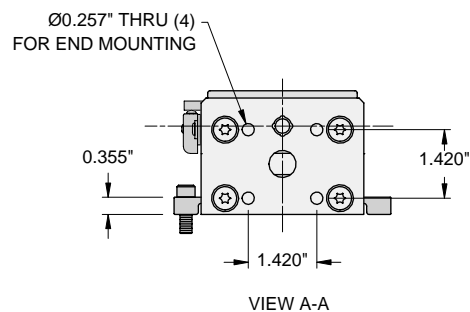


BiSlide Assembly Series M Dimensions



Travel Length (Inches)	Cleats Recommended**
5	4
10	4-6
15	4-8
20	6-10
30	8-12
40	10-14
50	12-16
60	14-18
80	16-20

**Use higher number for heavy loads



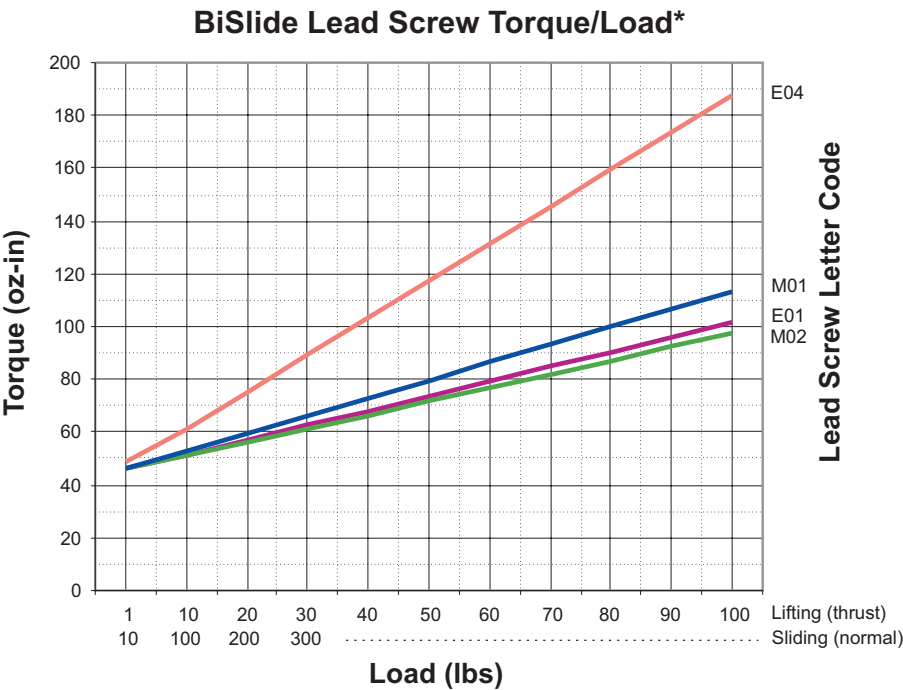
Motors and Lead Screws

All BiSlides are designed to accommodate NEMA size 23 and size 34 motors without modifications. Many other types of motors can also be used, most of them requiring no modifications to the BiSlide.

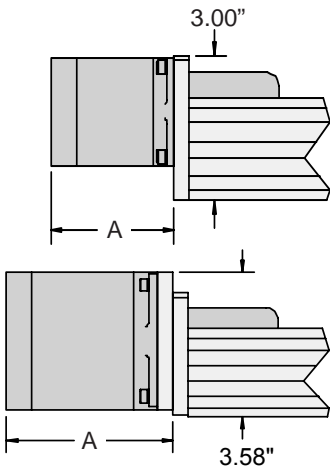
All BiSlides can be purchased with, or without motors. Related motor drives, controls, and software are also available.

The motor to lead screw connection is a precision honed steel coupling that rigidly clamps to the motor shaft without the need for key ways or set screw flats. Size 23 motors use a 0.375" to 0.250" coupling bushing; size 34 motors use a 0.375" coupling and an additional plate.

Motor-Driven BiSlides are available in standard travels to 80"/203.2 cm. Please refer to the chart on page 2.39.



Motor Mounting



Motor Size	A
Nema 23 Two Stack (PK 264)	2.13"
Nema 23 Three Stack (PK 268)	2.99"

Motor Size	A
Nema 34 One Stack (M091-FD-454)	2.90"
Nema 34 Two Stack (M092-FD-447)	4.15"

Choose the lead screw that fits your application.

Lead Screw	Advance/Turn	Resolution with Step Motor (400 steps/rev.)
E01	0.100"	0.00025"
E04	0.400"	0.001"
M01	1 mm	0.0025 mm
M02	2 mm	0.005 mm

An Important Note About Lead Screws:
The E01, M01 and M02 are self-locking designs that under normal conditions will not creep or backdrive (external forces on carriage do not cause lead screw to rotate). However, with the motor power off, the E04 can backdrive when used vertically or when the thrust load exceeds 2 lbs.

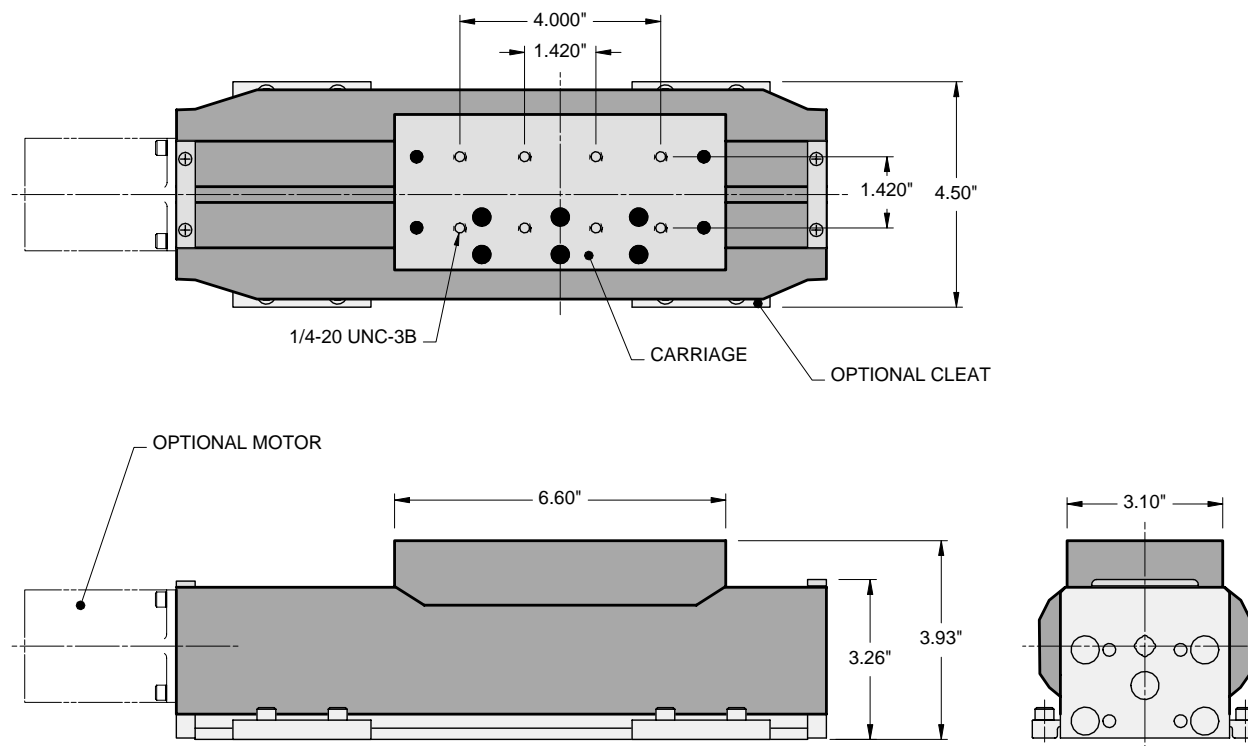
Choose the Way Cover Model to Minimize Contamination

For BiSlide installations in environments with particulate matter, machining chips and the like, use this convenient option to protect your BiSlide against damage from foreign material. The way cover encloses the ways, lead screw and limit switch assembly, protecting all of these vital areas. The way cover is a reclosable seal zipper design with Velcro™ attachment that keeps dirt out but allows easy access if you need to get inside the BiSlide. It works with the BiSlide at any orientation, so you can install it on any axis.

Travel distance is reduced by 1" for units less than 40" standard travel, but there is no loss of travel on assemblies 40" or longer. Cantilever load capacity is reduced by one half. Carriage height is 1.36" higher than standard.



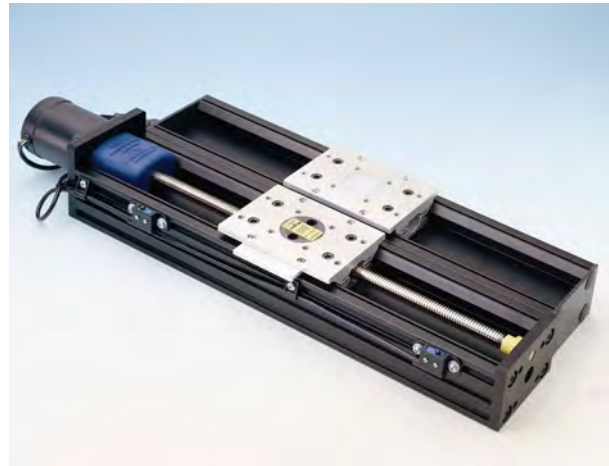
BiSlide Way Cover Model with NEMA 23 Motor



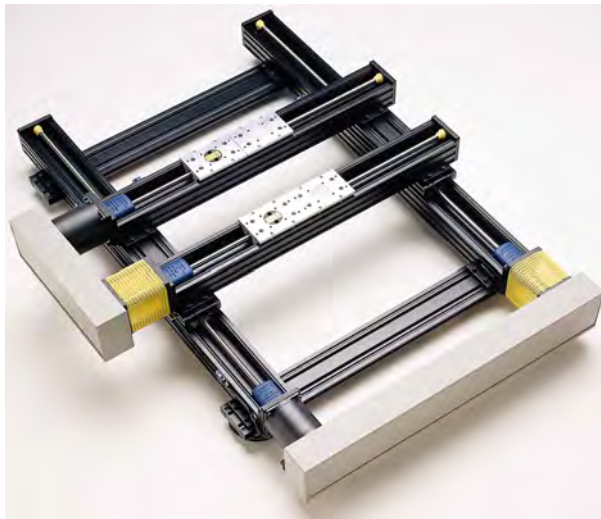
Tandem Option Carries Heavy Load Economically

For higher loads and increased stiffness, the tandem option is an attractive solution for many applications. This configuration uses a standard motor-driven model mechanically attached to a free sliding model. The two bases are securely fastened together and the carriages are precision machined in place to insure flatness and parallelism.

For more options visit our web site at www.bislide.com and www.velmex.com.



Motor Driven BiSlide with Tandem Option



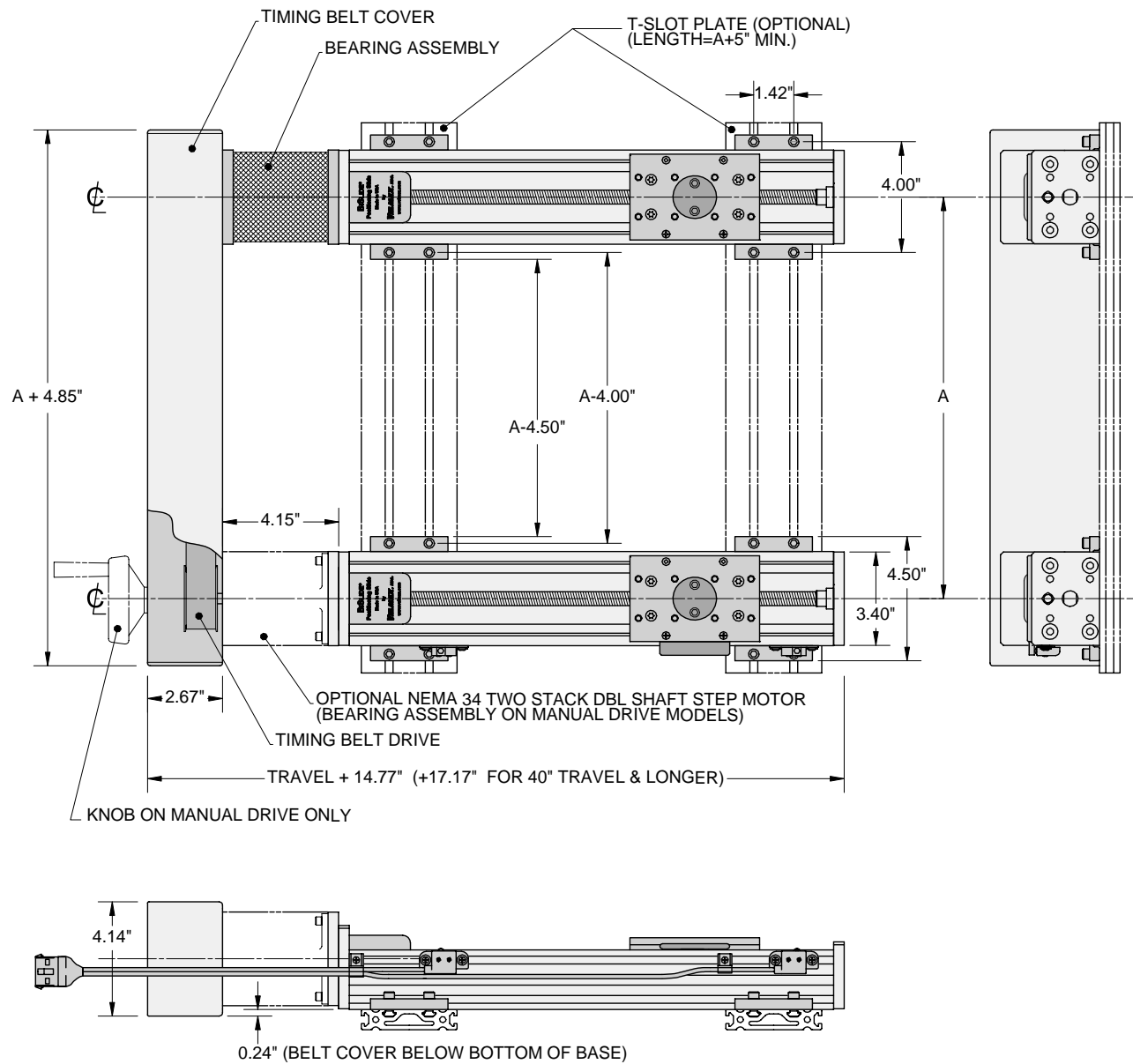
Double Parallel Coupled BiSlide Assembly with Optional Double Carriages (see the section on BiSlide Frames & Bases on page 4.4 for another example)

Choose the Parallel Coupled Assembly for Large and Long Traverses

If your application calls for large loads or the ability to traverse long distances in two or three axes, the Parallel Coupled Assembly is what you need. It uses two identical BiSlide units. Motor driven models use a double shaft motor on one slide and a bearing assembly on the other slide. A timing belt drive connects the two slides for synchronous operation. Manual versions have a bearing assembly on both slides; a hand wheel (knob/crank) drives the timing belt drive. Use our inexpensive cleats to mount your Parallel Coupled BiSlide Assembly to nearly any flat surface. For a free-standing assembly, BiSlides can be cleated to the T-slot plate or base structural profiles.

Parallel systems are usually shipped unassembled to eliminate crating charges and trucking costs. These kits include detailed assembly instructions, all fasteners, hardware, and come complete with a timing belt tensioner. They can be shipped fully assembled if required.

Parallel Coupled BiSlide Assembly Drawing

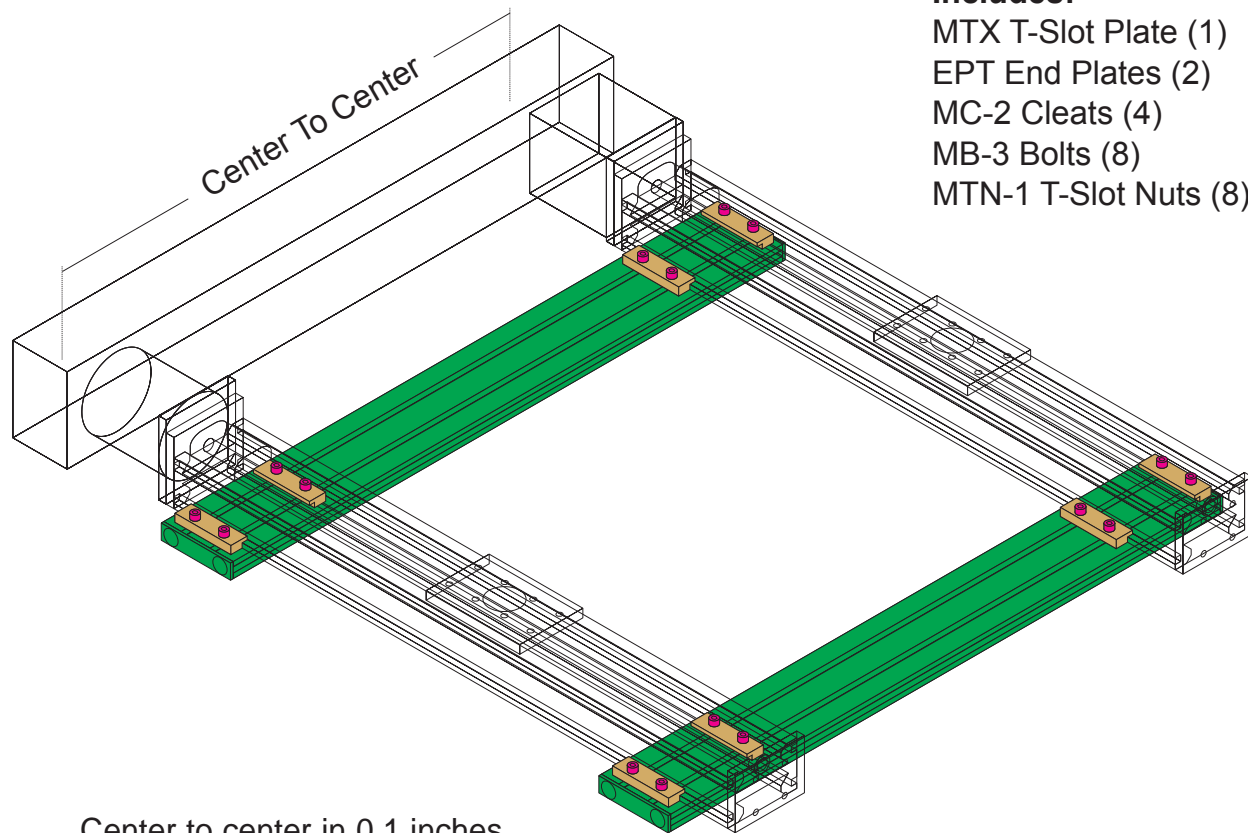


A (Available Center to Center Distances in Inches)

8.5 13.5 14.5 16 17.5 19 20.5 22 23.5 25 26.5 28 29.5 31.5 34 36.5 39 41.5 46.5 51.5 59 66.5 81.5

Contact our technical sales department regarding additional center to center distances

T1 Parallel Coupled Separators



Includes:

- MTX T-Slot Plate (1)
- EPT End Plates (2)
- MC-2 Cleats (4)
- MB-3 Bolts (8)
- MTN-1 T-Slot Nuts (8)

Center to center in 0.1 inches



NOTE: Minimum of 2 required
(as shown)

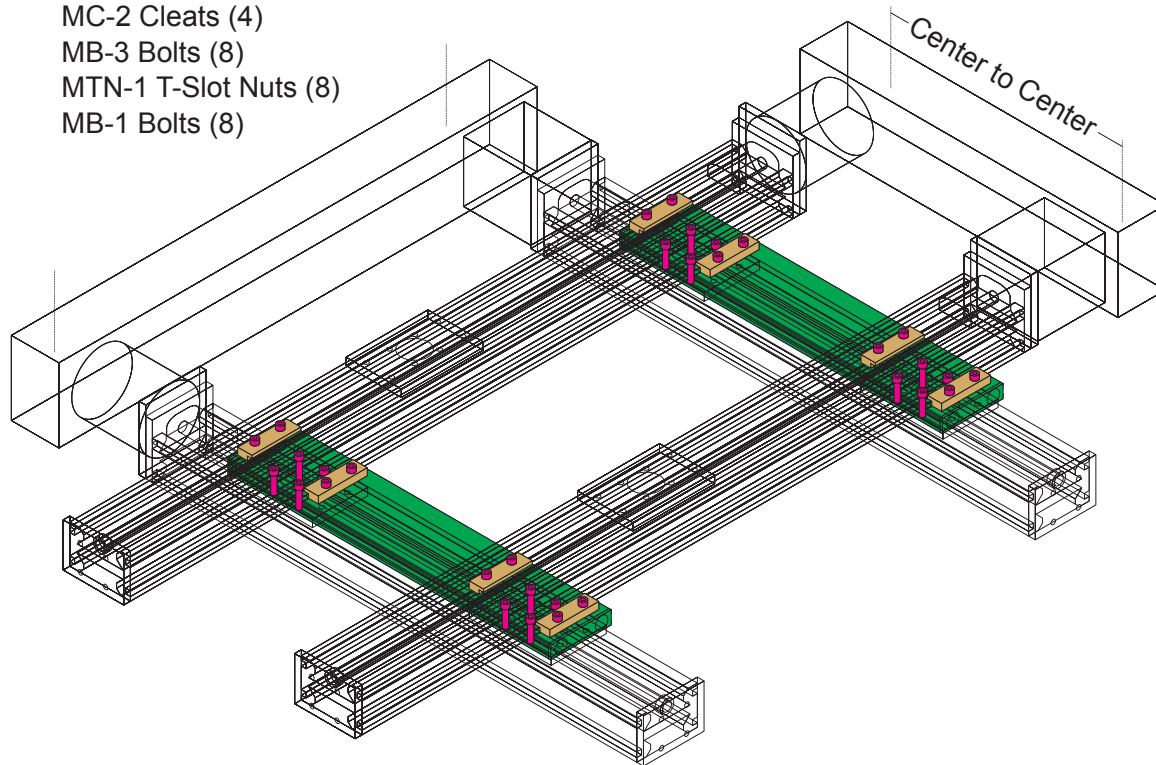
Actual Length = Center to Center + 5.0 inches

Example: Use T1-220 for Parallel Coupled with 22 inches Center to Center
(Actual = 27 inches)

T2 Parallel Coupled Separators

Includes:

- MTX T-Slot Plate with 8 Holes (1)
- EPT End Plates (2)
- MC-2 Cleats (4)
- MB-3 Bolts (8)
- MTN-1 T-Slot Nuts (8)
- MB-1 Bolts (8)



NOTE: 2 required (as shown)

Lower Parallel requires additional Carriages

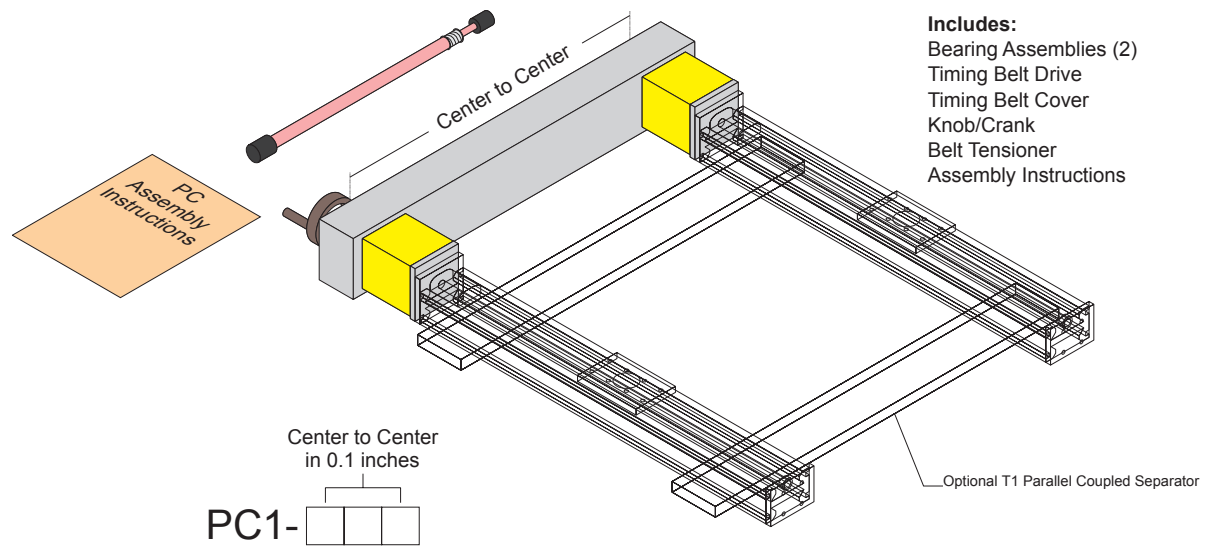
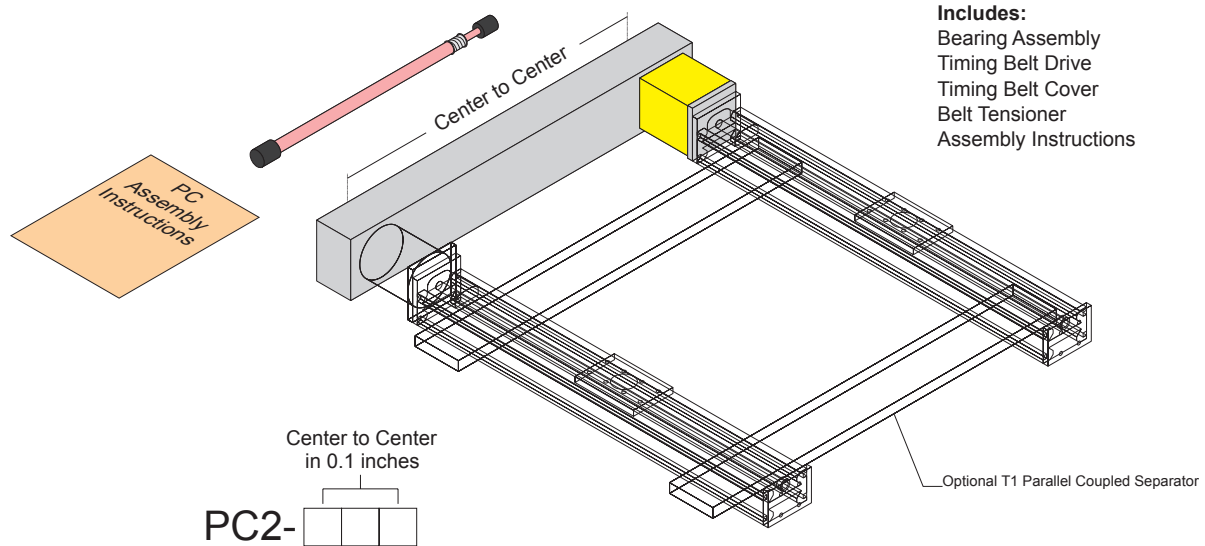
Travel on lower Parallel is reduced by Center to Center + .65"

Center to center in 0.1 inches



Actual Length = Center to Center + 5.0 inches

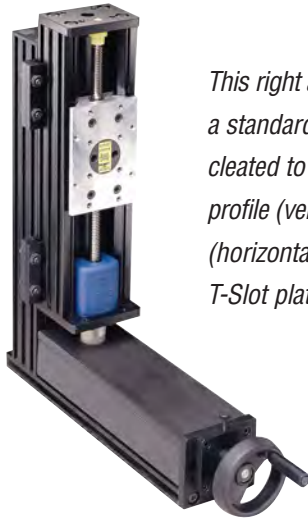
Example: Use T2-135 for Parallel Coupled with 13.5 inches Center to Center
(Actual = 18.5 inches)

PC1 Manual Parallel Coupled**PC2 Motor Driven Parallel Coupled**

It's Easy to Position Your BiSlide Vertically

Vertical application versatility is built in to every BiSlide. The end plate includes four mounting holes for attaching directly to the carriage of a horizontal assembly, or any other suitable mounting surface. For even more mounting

flexibility, the standard BiSlide Assembly can be end mounted, or "sandwich" cleated to the T-Slot plate and I-beam Base profiles.



This right angle drive option has a standard BiSlide sandwich cleated to the I-beam Base profile (vertical). The bottom (horizontal) surface is the T-Slot plate profile.



BiSlide mounted directly to another BiSlide in an XYZ configuration. See above insert photo for details.



Warranty Protects Your BiSlide and XSlide Investment For Five Full Years

BiSlide and XSlide Assembly products sold by Velmex are warranted to be free from defects for a period of 5 (five) years on all parts. Velmex's obligation under this warranty does not apply to defects due, directly or indirectly, to misuse, abuse, negligence, accidents, or unauthorized repairs, alterations, or lack of maintenance; or to items that would normally be consumed or require replacement due to normal wear. Claims must be authorized, and a return authorization number issued before a product can be returned.

The warranty does not cover items which are not manufactured or constructed by Velmex, Inc. These components are warranted by their respective manufacturer.

Under the above warranty, Velmex will, at its option, either repair or replace a nonconforming or defective product.

The above warranty is the only warranty authorized by Velmex. Velmex shall in no event be responsible for any

loss of business or profits, downtime or delay, labor, repair, or material costs, injury to person or property or any similar or dissimilar incidental or consequential loss or damage incurred by purchaser, even if Velmex has been advised of the possibility of such losses or damages.

Inasmuch as Velmex does not undertake to evaluate the suitability of any Velmex product for any particular application, the purchaser is expected to understand the operational characteristics of the product, as suggested in documentation supplied by Velmex, and to assess the suitability of Velmex products for each application.



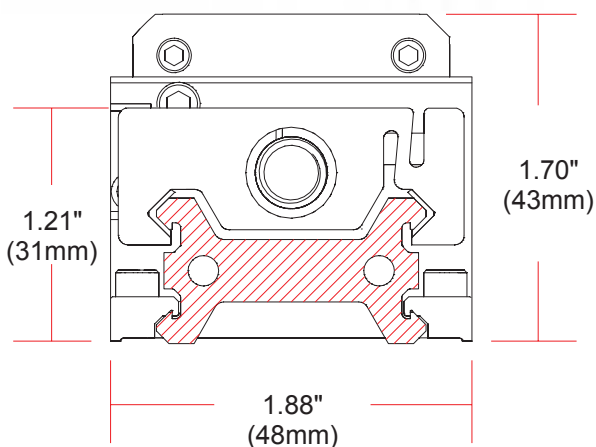
BiSlide Assemblies conform to the European Machinery Directive (89/392/EEC) Annex 1.

Introducing XSlides — New for 2006*

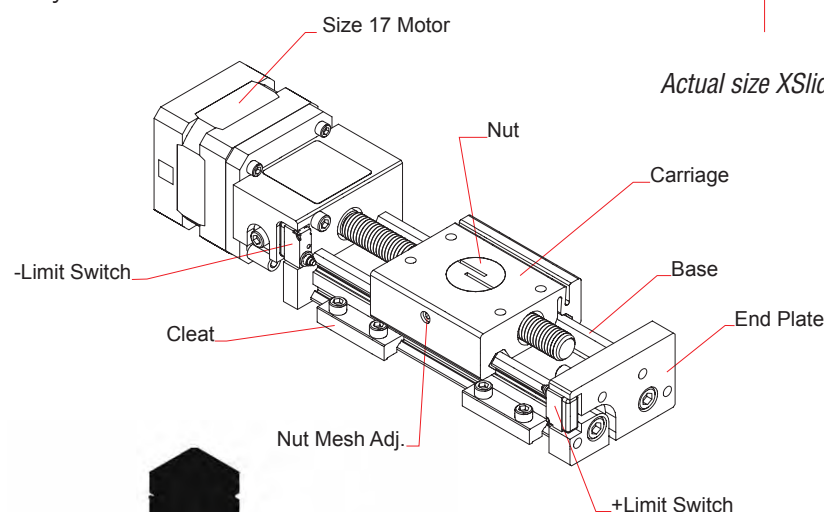
The new XSlide™ is based on the BiSlide design in a more compact size for smaller loads. XSlide assemblies combine the best features with new innovation in half the size at half the cost.

Features and Benefits of XSlides

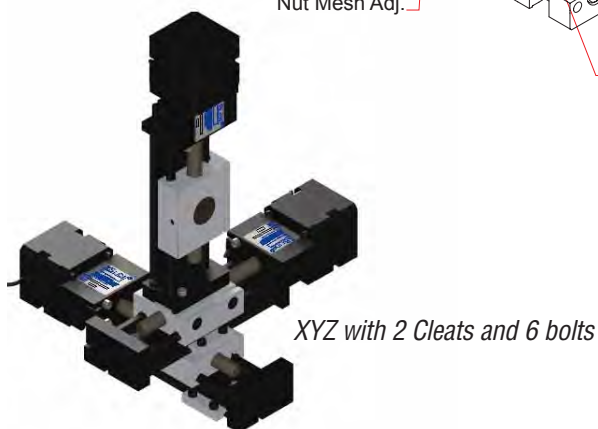
- High precision at a low cost
- Motor Driven, Knob/Crank, and Free Motion versions
- Wide choice of 3/8" and 10mm diameter lead screws to meet a broad range of resolution/speeds
- Easily accessible adjustments for carriage and lead screw fine tuning
- Long life anodized aluminum ways and PTFE linear bearings
- 0.0001" (0.0025 mm) repeatability
- Standard mounting for NEMA size 17 and 23 motors
- Integrated precision limit switches
- Cleat system for secure distortion free mounting
- Multi-axis configuration without adapters
- 45 degree opposing ways provide maximum rigidity in any direction



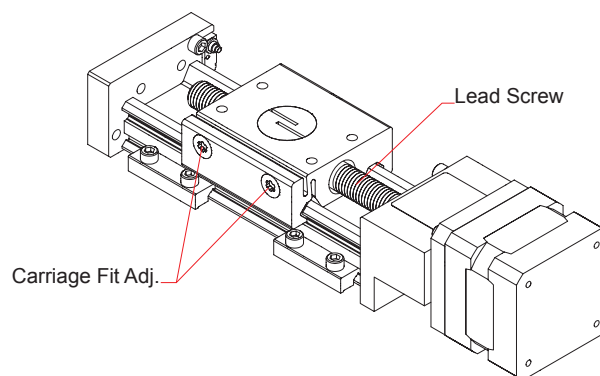
Actual size XSlide cross section with size 17 motor



XY with 2 Cleats and 4 bolts



XYZ with 2 Cleats and 6 bolts



XSlide is a trademark of Velmex, Inc.

*Preproduction models shown, actual production units may be slightly different.

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Motor Driven



Motorized Rotary Tables

B4800TS	2.50
B5990TS	2.52



Rotary Tables

Velmex offers two sizes of every table: Series B4800TS (4.9" diameter) and Model B5990TS (1.65" diameter).

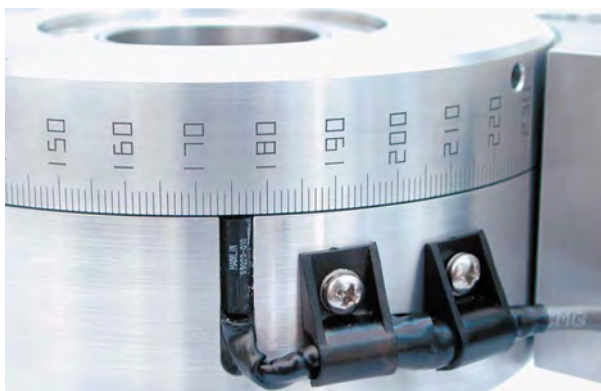
B4800TS

B4800 is a Series of three Rotary Tables that use a worm and gear drive design with a central rotating ball bearing. Gear ratios are: 18, 36, and 72:1. Models with 18 or 36 gear ratios require holding torque to maintain position. The tables can be driven by frame size 23 stepper motors, Bodine Type K or Pittman PM DC motors.

All tables have a hollow spindle or clear aperture for optical applications, an 360° scale and an adjustment to minimize gear backlash. They can be attached to the slider of the 4000 and the 6000 UniSlide Assemblies via the B6000TX adapter plate. Also mounts to BiSlide with MSPP-3 adapter plate. Plate is 6" x 6" x 1/4".

Options:

- Black anodized finish (see previous page)
- Magnetic reed home switch option
- Encoders on motor shaft extension



Magnetic reed homes switch option

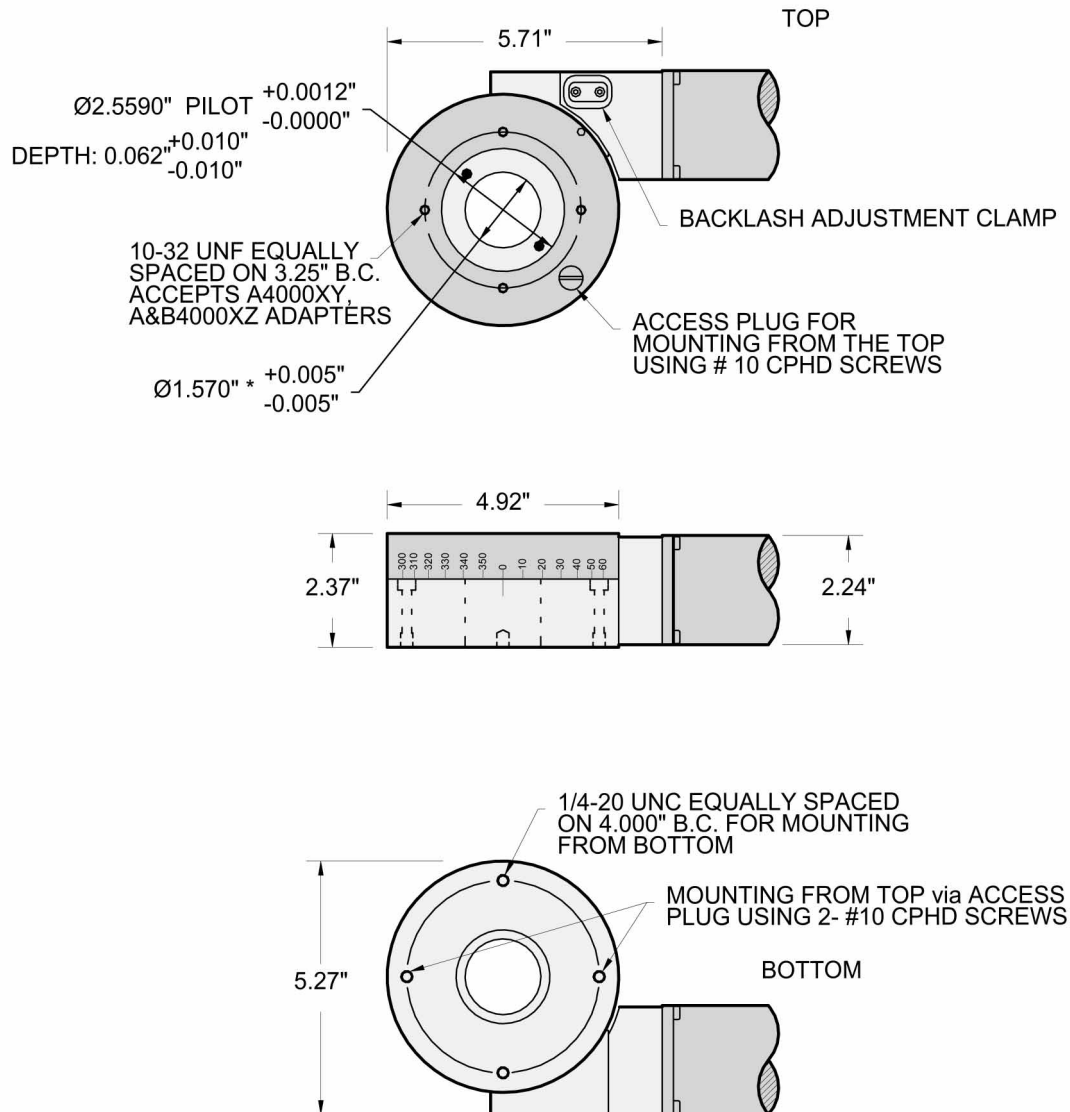
Mounting B4800TS

Anchoring table base: There are two approaches to securing the base of the table. First, there are two clearance holes for 10-32 UNF cap screws for attachment from above through the top access hole. Alternatively, to attach with screws from below, there are four threaded holes. They are 1/4-20 x 7/16" UNC on a 4" diameter bolt circle.

Series B4800TS	
Horizontal load capacity	200 lbs.
Vertical load capacity	25 lbs.
Cantilever load (Horizontal)	500 in.-lbs.
Table top axial runout	0.00025" TIR
Table top radial runout	0.0005" TIR
Accuracy	100 arc-seconds
Repeatability	1 arc-seconds
Table weight	5.5 lbs./2.5 kg.
Maximum input shaft torque	150 oz.-in.
Maximum input shaft speed	600 RPM.



Rotary encoder mounted to motor shaft extension

Model B4800TS

Model Number	Gear Ratio	RPM	At maximum input 600 RPM		Degree per Step	Typical Backlash
			Time per Revolution	Speed		
B4818TS	18:1	33.3	1.8 seconds	200°/second	0.050°*	600 arc-second
B4836TS	36:1	16.7	3.6 seconds	100°/second	0.025°*	400 arc-second
B4872TS	72:1	8.3	7.2 seconds	50°/second	0.0125°*	200 arc-second

*Degree per step values are based on 400 steps/revolution using a 1.8 degree step motor and a Velmex VXM motor controller operating in half step mode.



Model B5990TS A 1.7" diameter table with a gear ratio of 90:1

Model B5990TS Rotary Table

B5990TS Rotary Table is our smallest table, has a 90:1 gear ratio, and is lower in cost. The table price includes a NEMA 17 stepper.

Series B5990TS	
Horizontal load capacity	50 lbs.
Vertical load capacity	5 lbs.
Cantilever load (Horizontal)	20 in.-lbs.
Table top axial runout	0.00011" TIR
Table top radial runout	0.00008" TIR
Accuracy	100 arc-seconds
Repeatability	1 arc-seconds
Table weight	2.7 lbs. with motor
Maximum input shaft torque	50 oz.-in.

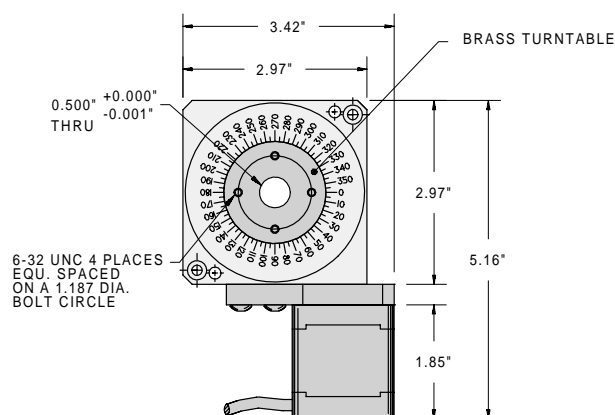
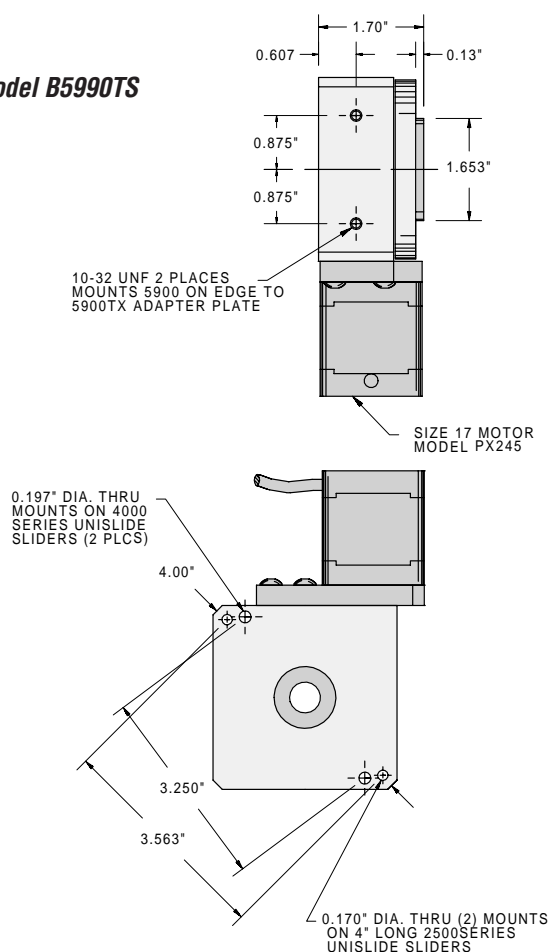
Options:

Home switch/Zero reference switch (See photo on web site)

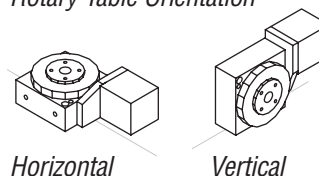
Model Number	Gear Ratio	RPM	At maximum input 600 RPM		Degree per Step	Typical Backlash
			Time per Revolution	Speed		
B5990TS	90:1	6	9 seconds	40.2°/second	0.010°*	160 arc-second

Rotary table speed is a function of motor and driver choice. *With 400 step/rev motor.

Model B5990TS



Rotary Table Orientation



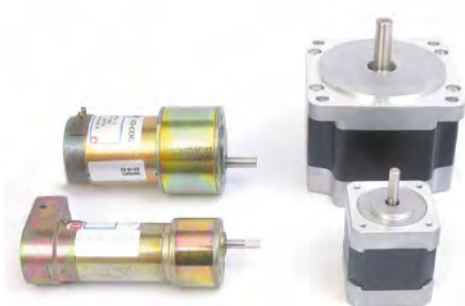
Introduction

There are several types of motors, all fractional horsepower, that are used on Velmex products. Each type has advantages and disadvantages over the other.

The most common motor is the DC step motor. Step motors with a controller like the Velmex VXM are the most cost effective solution for accurate speed and precise incremental positioning. The VXM step motor controller provides multi move programmability and up to four axes of motor control. Step motors produce high torque for their size and have useable torque to around 1K RPM. High accuracy and a wide speed range are accomplished without the need for feedback devices like encoders.

A variation of the DC step motor is the AC high torque 72 RPM synchronous motor. This motor runs a constant 72 RPM from line voltage with a simple capacitor and direction switch circuit. These motors are used for coarse positioning, they can stop within 5 degrees of rotation.

Motors & Controls



For simple variable speed, the (Pittman) DC brush geared motor is a low cost solution. Using a variable voltage controller moderate speed range is achievable. Only coarse positioning is possible and speed may fluctuate with load changes.

The DC servo motor has the advantage over a step motor of less acoustical noise. The servo motor being a closed loop device has position feedback. Higher cost and the need for a larger motor or gear box are the disadvantages of the servo motor compared to a step motor.

When in doubt about what the best motor and control system to use for your application, just contact our sales engineering department for assistance. We have over 30 years experience in motor and control applications, and offer the latest technologies from several manufacturers.

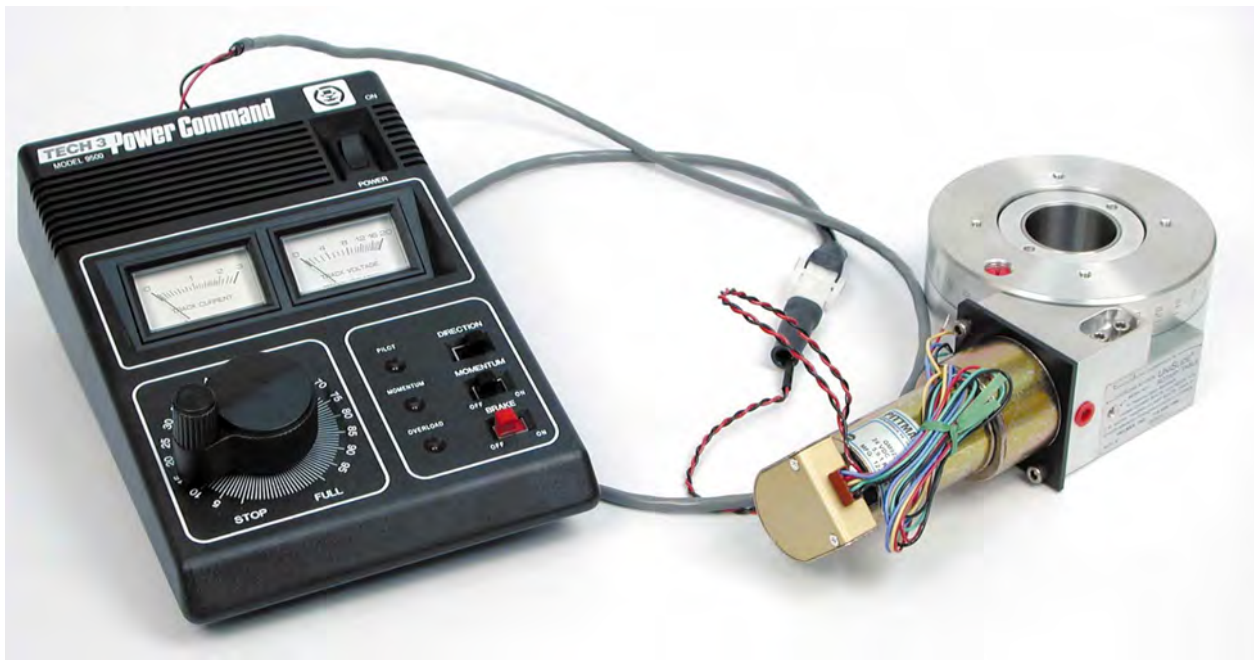


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Motors & Controls



Introduction to Motors & Controls

Functional Classifications	3.4
Some Typical Operating Modes	3.4
General Motor Characteristics	3.5
Motor Types	3.6
Motor Type vs. Series Compatibility	3.7

Functional Classifications

The choice of the correct motor and control should be based on the function you wish to accomplish. Broadly speaking, there are two functions: scanning and positioning.

Scanning

In this category, the objective or work to be accomplished occurs while the slider carriage is in motion. Scanning functions can be further subdivided into two types: scanning at a single, fixed speed or at one of a range of user-selectable variable speeds.

Scanning or feeding at a single, fixed speed – A probe, sensor, cutter, dispenser, transducer or some other object is moved at a single, constant speed. An AC synchronous motor, DC gear motor or stepping motor achieves this function within 0.1% or less speed variation. Linear speed is a function of the motor and lead screw pitch selected. Available motors and the resultant translation speeds with each lead screw pitch are listed on page 3.15.

Scanning or feeding at a selected speed – The objective is same as the above. However, an added advantage is the ability to select one scanning speed from a range of motor speeds via a motor control. There are three possible configurations of speed control: unregulated, regulated and programmable.

Unregulated Speed Control – Typically, a high slip AC induction motor speed will fluctuate due to varying loads and voltages.

Regulated control – In this system, the control senses the motor speed and makes the necessary adjustments. Using a permanent magnet DC motor and speed control, speed regulation is achieved by sensing back-EMF; accuracy is the 1-2% range.

See the next page for motor control information. In some instances, an optional circuit can be added to return to the "home" position at maximum motor speed.

Programmed control – A DC stepper motor can be programmed to run at a predetermined speed. Scan rates can be varied as a function of position. Complex patterns such as raster scan and auto reverse are also easily programmed.

Positioning

The objective is to move to a target position. This is commonly achieved by using a stepper motor and an accurate lead screw. The motor is incremented a predetermined number of steps to achieve the desired position. Consult the section on stepper motors and controls for choice of available equipment.

Some Typical Operating Modes

Scanning

Fig. A – Running between adjustable limit switches.

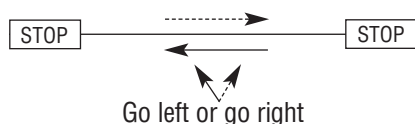


Fig B – Automatic reversing circuit for continuous motion. Returns at the same or different speed.

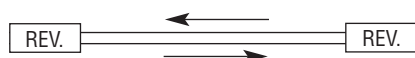
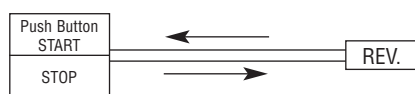


Fig. C – Auto reverse with stop — at — home end.



Positioning

Fig. D – Incremental motion on one axis, scan on return.

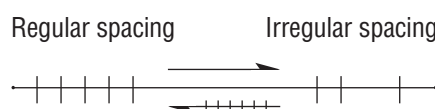


Fig. E – Continuous scan on one axis, incrementally on another.

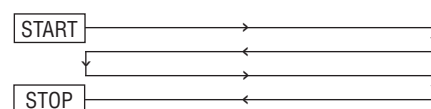
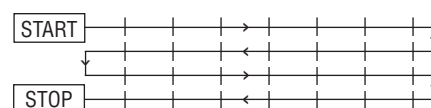


Fig. F – 2 Axes. Stop at each indicated point. Restart with input signal or after time delay.



General Motor Characteristics

Functional Class	Motor Type	Examples	Advantages	Disadvantages
Scan	AC induction (instrument type)	Bodine type K	No controls needed with fixed speed models Synchronous (constant) speeds No brushes; no RFI Least expensive	Limited power 60 Hz. resonance
Scan	DC shunt or Permanent magnet	Bodine 24A Bodine 043 Pittman	Wide speed control range Dynamic braking Moderate speed accuracy (5%)	Has brushes; moderate RFI
Scan	High Torque AC synchronous 72 RPM	KSL Ø62TIY SS241L	Fast start/stop/reverse Simplified control Good torque without gearhead Synchronous speed No brushes	Fixed speed 60 Hz resonance
Scan & Position	DC stepper	Vexta PK266 Slo-Syn M092	Accurate positioning Well suited to computer control Accurate speeds, no brushes, Fast reversing and acceleration Widest speed range, high torque for size	Requires special controller Vibration at low speed

Contact the factory for non-stepper motors and controls.

Motor Types



DC Brush Gear Motors

DC brush commutated gearmotors are one of the simplest motors to operate. A voltage applied (0 to 24VDC) determines motor speed. Direction is determined by the polarity applied to the power terminals of the motor.

These motors feature sintered steel spur gears and are available in many reduction ratios. Armatures are skewed to minimize magnetic cogging. A 500 count per revolution optical encoder option is available for position or velocity feedback.

For simple forward and reverse with moderate speed range capability, the DC brush gear motor is a low cost option.

Step Motors

Step motors are brushless permanent magnet motors. With logic based electronics they can be controlled to move in discrete increments. Distance, direction, and speed are accomplished by switching the power to the motor windings in specific sequences and frequencies.

Step motors are capable of very precise positioning without the use of feedback devices. Step sizes can be very small producing wide speed ranges, smooth motion, and accurate speeds.



Motor with controller drive built in

These motors advance 0.9 degrees per step with half step controllers. Step accuracy is 3% noncumulative.

For incremental positioning or accurate speed control, a step motor system is the most economical solution.

More Motor and Control Options

Velmex is a longtime integrator of various types and manufacturers of motion control components.

Additional Motors Available:

1. AC 72 RPM Synchronous
2. AC Gear Motor
3. High Resolution Step Motors
4. DC Servo
5. Motors with Controller/Drive built in

More Control Possibilities:

1. Pulse/Direction Step Motor Drives
2. DC Servo Drives and Controllers
3. Position Feedback
4. Preprogrammed and Custom User Interfaces
5. Edge Following

Contact our engineering/sales department to get a perfect motor/controller match for your application.



DC servo drive and controller



Pulse/direction step motor drive

Motor Type vs. Series Compatibility

Specifications for individual motors are found throughout this catalog. Other motors can be installed on special order.

Motor Type ⁷	UniSlide Assembly Series								Rotary Tables		BiSlide M
	1500 MA	2500 MA	MB	4000 MA	MB	6000 MA	MB	9000 MB	B5990TS	B4800TS	
Motors for Constant Speed Scanning											
Bodine Type K Low-slip, Synchronous			X		X	X				X	
Bodine Type 30R-D Gear Motor					X		X	X			
Bodine Type 30R-F Gear Motor					X		X	X			
Stepper Motor - NEMA 17	X	X	X						X		
Stepper Motor - NEMA 23		X	X	X	X	X	X			X	X
Stepper Motor - NEMA 34					X	X	X	X			X
Motors for Variable Speed Scanning											
Pittman Type (GM8700), GM9400	(X)	X	X						X	X	X
Bodine Type K High Slip			X		X	X				X	
Bodine Type 24A, Model 0043		X	X	X	X					X	
Bodine Type 24A-D Gear Motor					X		X	X			
Bodine Type 24A-3F Gear Motor				X		X		X			
Bodine Type 32A-W Gear Motor							X	X			
Bodine Type 42A, Model 4035							X	X			
Stepper Motor - NEMA 17	X	X	X						X		
Stepper Motor - NEMA 23		X	X	X	X	X	X			X	X
Stepper Motor - NEMA 34					X	X	X	X			X

⁷ Specific motor model numbers for each frame type may be found in the accompanying price list.

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Motors & Controls



DC Stepping Motors

<i>Understanding Stepping Motors and Controllers</i>	<i>3.10</i>
<i>Answers to Frequently Asked Questions About Step Motors</i>	<i>3.11</i>
<i>Step Motor Drawings</i>	<i>3.12</i>

Understanding Step Motors and Their Controllers

Since 1980, Velmex has been noted for offering the best value in step motor controllers, and has been the pioneer of step motor controllers featuring two, three, and four axes of microprocessor-based indexer/drivers in a single enclosure.

Originally, step motor controllers/drivers were the resistance limited type (L/R) with large power supplies and current limiting resistors. These L/R step drives are noted for being simple and reliable, but very inefficient when the motor is energized and not stepping. To eliminate this wasted energy, Velmex step motor controllers utilize pulse width modulation current control and automatic motor power-down resulting in low power consumption.

Another potential problem with step motor translator/drivers is position errors due to electrical noise coupling onto pulse inputs. A step motor translator can not discriminate between a valid step pulse and a extraneous electrical spike on its pulse input. When an electrical spike gets to the pulse input, the motor will make a step, putting it out of intended position. The opposite problem can occur

when a legitimate step pulse is too weak or its duration the pulse input, the motor will make a step, putting it out of intended position. The opposite problem can occur when a legitimate step pulse is too weak or its duration A too short for the translator to count. However, Velmex step motor controllers by design do not have translators. Instead of a translator (which converts a pulse to a phase change of voltage levels on each motor drive), the Controller's microcomputer is in total control of the voltage level on each phase of each motor drive.

Answers to Commonly Asked Questions About Step Motors

1. When should I use a step motor with a UniSlide Assembly?

Step motors are preferred for incremental positioning or scanning when computer controlled motion is desired, complex motion requirements of more than one distance interval and/or speed, very fast or slow starts/stops, and fast reversing, for accurate speeds, for speed range requirements as high as 1 to 6000 half steps/sec.; and also, when a brushless motor is required.

2. Will the motor “lose” steps occasionally?

Step motors do not “lose” steps. Step motors run synchronously to their phase switching speed. When an external motor load exceeds the running torque of the motor, then the motor will stall, and lose position much greater than one step. Poor wiring practice and full-stepping translators of 25 years ago were the contributors to this “losing step” phenomenon. Velmex step motor controllers eliminate the problems of low speed motor resonance by utilizing half-stepping and current control. The VXM switches the motor drives directly, eliminating the sensitive pulse-to-motor translator link.

3. How do I insure the motor will not stall?

Size the motor for the load and run the motor at a speed that provides 50% more torque than needed. By applying the load and increasing motor speed until a stall occurs will determine the actual torque required. By using the motor speed/torque curves for the particular Controller, maximum reliable operating speed can be determined.

4. When the motor stalls, is it damaging the motor?

When the motor stalls (loses synchronism) the motor output torque drops very low, and the motor current drops slightly. There are not any mechanical parts that

are slipping, only magnetic slippage occurs. The step motor is an ideal motor for torque limiting applications.

5. Why do you sell so many step motors and not servo motors for your UniSlide Assemblies?

Closed loop servo systems have more complexity and cost without significant benefits when used with UniSlide assemblies. Servo motors have more torque at RPMs over 1000. However, the UniSlide lead screw/drive nut assembly has limited life at speeds over 1000 RPM, making high RPMs impractical. Ministep/microstep controllers provide smoothness typical of servos, but at less cost.

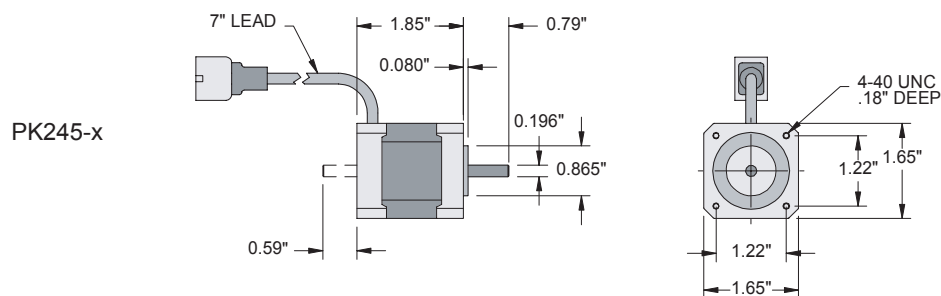
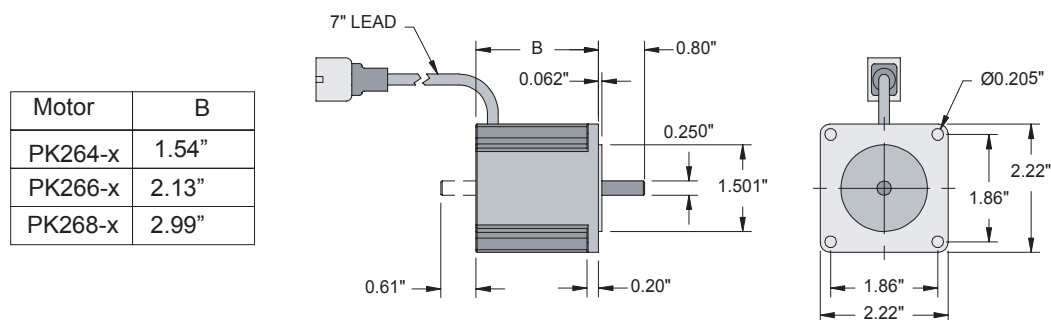
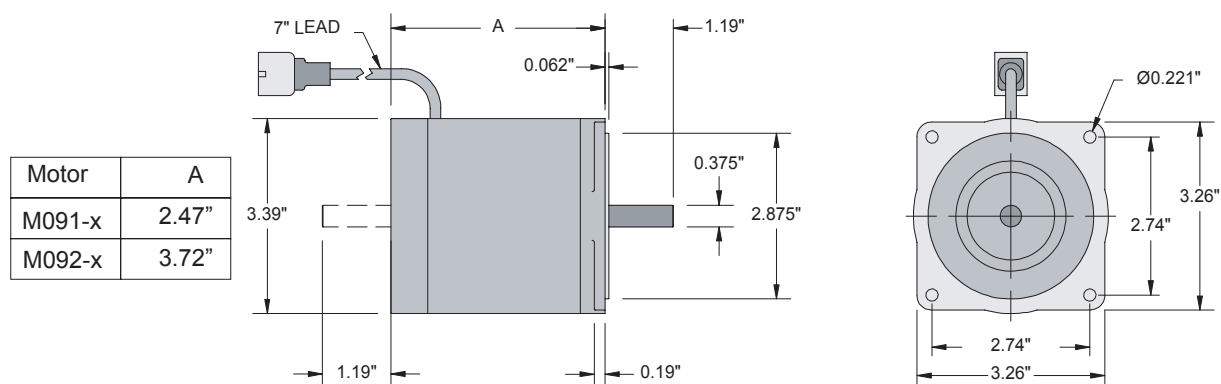
6. Why do step motors work well on UniSlides and not as well on other types of devices?

Step motors need some frictional load to dampen the stepping. UniSlides have adequate residual friction, and the polymer lead screw nut helps absorb step vibration. The relatively small diameter lead screws used on UniSlides make the primary inertia very low compared to motor inertia, making very fast accelerations and decelerations possible. Step motors reach full torque in just one step. Therefore, variable loads and friction have a negligible effect on positional accuracy.

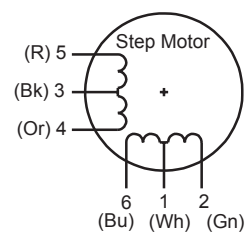
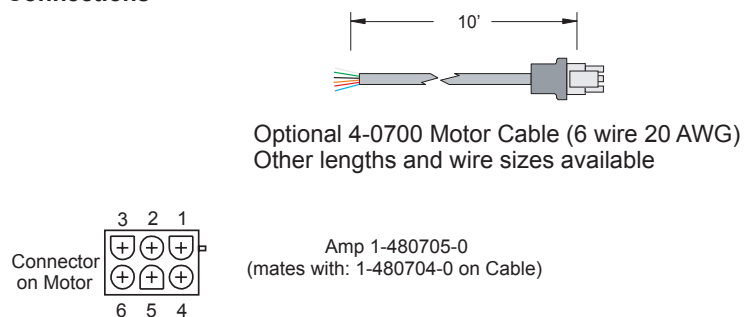


Typical DC stepper motors supplied by Velmex

Step Motors



Connections



See page 3.19 for limit switch connections.

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Motors & Controls

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Linear Translation Speed Chart (Metric)	3.16

Translation Speed Tables

To move at your desired scanning speed, use the charts on the following pages to select a lead screw for your application. For information on lead screws and designations, see page 2.12 of this catalog.

Your choice of lead screw also depends on your choice of motor. Here's how to choose a motor:

1. Determine the minimum torque requirement using the formula on page 2.12.
2. For step motors, choose a motor with the necessary torque on page 3.24. For other motors, see http://www.velmex.com/motor_acdc.html for motor speed and torque characteristics. Rated torque of motors is listed to give a relative measure of torque output between motors. Note also maximum thrust load specifications included with each chart.
3. Be sure that the motor that you've chosen is compatible with the UniSlide or BiSlide base you've chosen. Although a specific motor may be used with multiple UniSlide bases, it may be listed only once, usually for the smallest usable Series. See Page 3.7, for a summary of motors compatible with each UniSlide Series .
4. From the chart, select a desired operating speed.

When choosing a lead screw, you'll find several possible choices. In general, a finer pitch lead screw results in better resolution while a coarser pitch lead screw will result in higher translation speed.

For stepping motors and controls, see Stepping Motors subsection, page 3.9.

Linear Translation Speed as a Function of **English** Pitch Lead Screw and Step Rate

UniSlide Lead Screw Designation BiSlide Lead Screw Designation			W4 & P2.5 E04	W2 & P5	W1 & P10 E01	B & P20	C & P40	
Travel per Revolution			0.400"	0.200"	0.100"	0.050"	0.025"	
Steps/Sec.(0.9 Degree/Step)	RPM	RPS						
100	15	0.25	6.00	3.00	1.50	0.75	0.38	Inches/Minute
			0.1	0.05	0.025	0.013	0.006	Inches/Second
500	75	1.25	30.00	15.00	7.50	3.75	1.88	Inches/Minute
			0.5	0.25	0.125	0.063	0.031	Inches/Second
1000	150	2.50	60.00	30.00	15.00	7.50	3.75	Inches/Minute
			1.0	0.05	0.25	0.125	0.063	Inches/Second
1500	225	3.75	90.00	45.00	22.50	11.25	5.63	Inches/Minute
			1.5	0.75	0.375	0.188	0.094	Inches/Second
2000	300	5.00	120.00	60.00	30.00	15.00	7.50	Inches/Minute
			2.0	1.0	0.5	0.250	0.125	Inches/Second
3000	450	7.50	180.00	90.00	45.00	22.50	11.25	Inches/Minute
			3.0	1.5	0.75	0.375	0.188	Inches/Second
4000	600	10.00	240.00	120.00	60.00	30.00	15.00	Inches/Minute
			4.0	2.0	1.0	0.500	0.250	Inches/Second
6000	900	15.00	360.00	180.00	90.00	45.00	22.50	Inches/Minute
			6.0	3.0	1.5	0.750	0.375	Inches/Second
VXM control limit is 6000 steps/second.								
8000	1200	20.00	480.00	240.00	120.00	60.00	30.00	Inches/Minute
			8.0	4.0	2.0	1.000	0.500	Inches/Second
Step resolution @ 400 steps/rev.								
Inches/Step			0.001	0.0005	0.00025	0.00013	0.00006	
Millimeters/Step			0.0254	0.0127	0.00635	0.003175	0.00158	
Theoretical Resolution (Microns)			25.4	12.7	6.35	3.175	1.5875	.

System step resolution or smallest repeatable move is dependent on system orientation, rigidity, friction, wear, and applied load.

See next page for Metric Translation Speed Chart.

Linear Translation Speed as a Function of **Metric** Pitch Lead Screw and Step Rate

UniSlide Lead Screw Designation BiSlide Lead Screw Designation			K1 & Q1 M01	K2 & Q2 M02	
Travel per Revolution			1 mm	2 mm	
Steps/Sec. (0.9 Degree/Step)	RPM	RPS			
100	15	0.25	1.5	3.0	Centimeters/Minute
			0.25	0.5	Millimeters/Second
500	75	1.25	7.5	15.0	Centimeters/Minute
			1.25	2.5	Millimeters/Second
1000	150	2.50	15.0	30.0	Centimeters/Minute
			2.5	5.0	Millimeters/Second
1500	225	3.75	22.5	45.0	Centimeters/Minute
			3.75	7.5	Millimeters/Second
2000	300	5.00	30.0	60.0	Centimeters/Minute
			5.0	10.0	Millimeters/Second
3000	450	7.50	45.0	90.0	Centimeters/Minute
			7.5	15.0	Millimeters/Second
4000	600	10.00	60.0	120.0	Centimeters/Minute
			10.0	20.0	Millimeters/Second
6000	900	15.00	90.0	180.0	Centimeters/Minute
			15.0	30.0	Millimeters/Second
VXM control limit is 6000 steps/second.					
8000	1200	20.00	120.0	240.0	Centimeters/Minute
			20.0	40.0	Millimeters/Second
Step resolution @ 400 steps/rev.					
Inches/Step			0.0001	0.0002	
Millimeters/Step			0.0025	0.0050	
Theoretical Resolution (Microns)			2.5	5.	

System step resolution or smallest repeatable move is dependent on system orientation, rigidity, friction, wear, and applied load.

See previous page for English Translation Speed Chart.

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Motors & Controls



VXM Stepping Motor Control

VXM is a Complete Motor Control Solution

The VXM is a high integration stepping motor controller for “plug and run” with Velmex motor driven products. Reliable performance is achieved with a powerful RISC Microcontroller that directly controls motor phase switching and all other interface functions. The VXM uses an optimized modulated method to produce resonance free motor torque. This proven design is a dependable and low cost solution for high precision positioning requirements.

Firmware

- A single VXM can control 4 motors
- Nonvolatile memory for user programs
- Use interactively with a computer, PLC or standalone
- Special looping commands for doing raster scanning and matrix patterns
- Programmable output trigger to signal external devices
- FIFO buffer to capture motor positions on input trigger
- Conditional branching command
- Automatic “return to position before branch” for pick-and-place from within matrix patterns
- Software/input interrupt capability
- Complex motion profiles with “Continuous Index Mode”
- With two VXMs coordinated motion to produce angle, arcs and circles
- Backward compatible with previously manufactured Velmex NF90 and VP9000

Software

- Velmex COSMOS utility program for easy setup, test and programming
- Examples written in C, LabView, VisualBasic, QuickBasic and other languages

Hardware

- Controller with serial interface/indexer/driver, AC power supply and all cables
- Power switch, Status LEDs, Jog, Run and Stop input buttons on the front
- Multipurpose input and output
- 10 bit analog input for external sensor, setting speed or analog joystick control
- Optically isolated limit switch inputs
- Compatible with size 17 to 34 hybrid step motors rated from 0.4 to 4.7 amps with 6 or 8 wire connections
- 100-200 VAC input desktop power supply that is UL, CE, CSA and TUV safety agency compliant
- Energy saving by automatically de-energizing motors at a standstill

Modular or Integrated Versions from One to Four Axis



1 or 2 motor operation in a compact package.



3 or 4 motor with two linked controls. Plug and Play operation makes for the first (Master) VXM the controller for up to 4 motors.



Rack mountable version integrates VXM(s) and power supply(s) into a 19"x 5.25" rack panel.



Model VXM-1 (1 Axis)



Model VXM-2 (2 Axis)



Model VXM-3 (3 Axis)



Model VXM-4 (4 Axis)



Model VXM-1R
(Rack Panel 1 axis)



Model VXM-2R
(Rack Panel 2 axis)



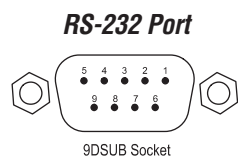
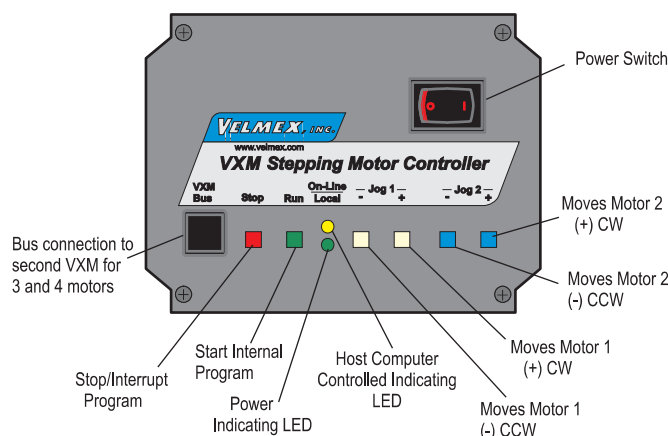
Model VXM-3R
(Rack Panel 3 axis)



Model VXM-4R
(Rack Panel 4 axis)

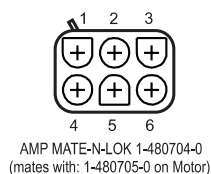
External Features

Front (Model VXM-2)

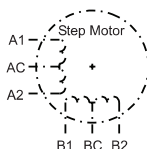


Pin No.	Name
1	No Connection
2	Tx
3	Rx
4	Gnd
5	
6	
7	
8	
9	No Connection

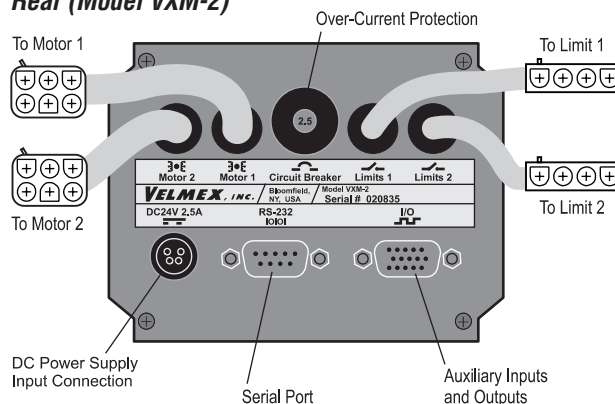
VXM Motor Cable Connector



Pin No.	Motor
1	BC
2	B2
3	AC
4	A2
5	A1
6	B1



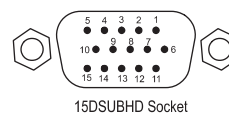
Rear (Model VXM-2)



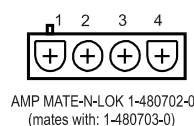
Pin No. Name

1	OV (Common Ground)
2	+5V Output
3	Ain (Analog in)
4	Run Input
5	I1 (Input 1)
6	I2 (Input 2)
7	I3 (Input 3)
8	I4 (Input 4)
9	OV (Common Ground)
10	J1- (Jog Mtr 1 Negative)
11	J1+ (Jog Mtr 1 Positive)
12	J2- (Jog Mtr 2 Negative)
13	J2+ (Jog Mtr 2 Positive)
14	O1 (Output 1)
15	O2 (Output 2)

Auxiliary I/O Connection



VXM Limit Cable Connector



Pin No. Motor

1, 4	Common
2	CCW (-)
3	CW (+)

Easy Programming with Simple Commands

Example No. 1	Motor Run	Function
Set index and run	1	Incremental index motor one 400 step positive

I1M400 , R



Example No. 2	Motor Run	Function
Set index and run	1	Incremental index motor one 600 step negative

I2M600 , R



149 Commands Give You Maximum Versatility

VXM Program Stored

Motor commands:

ImMx	Set steps to incremental Index motor CW (positive) m = motor no. (1, 2, 3, 4), x = 1 to 16,777,215
ImM-x	Set steps to incremental Index motor CCW (negative) m = motor no. (1, 2, 3, 4), x = 1 to 16,777,215
IAmMx	Set Absolute Index distance, m = motor no. (1, 2, 3, 4), x = ± 1 to $\pm 16,777,215$
IAmM0	Index motor to Absolute zero position, m = motor no. (1, 2, 3, 4)
IAmM-0	Zero motor position for motor no. m, m = 1, 2, 3, 4
ImM0	Index motor until positive limit is encountered, m = motor no. (1, 2, 3, 4)
ImM-0	Index motor until negative limit is encountered, m = motor no. (1, 2, 3, 4)
(i3,i1...)	Combine Index commands to run simultaneously on two VXM controllers connected by VXM bus
SmMx	Set speed of motor (70% power), m = motor no. (1, 2, 3, 4), x = 1 to 6000 step/sec.
SAmMx	Set speed of motor (100% power), m = motor no. (1, 2, 3, 4), x = 1 to 6000 step/sec.
SmM-x	Read and assign analog input value to motor m speed (70% power), x = range
SAmM-x	Read and assign analog input value to motor m speed (100% power), x = range
AmMx	Acceleration/deceleration, m = motor no. (1, 2, 3, 4), x = 1 to 127

Looping/branching commands:

L0	Loop continually from the beginning or Loop-to-marker of the current program
Lm0	Sets the Loop-to-marker at the current location in the program
LM-0	Resets the Loop-to-marker to the beginning of the current program
Lx	Loop from beginning or Loop-to-marker x-1 times (x = 2 to 65,535), when the loop reaches its last count the non-loop command directly preceding will be ignored

L-x	Loop from beginning or Loop-to-marker x-1 times, alternating direction of motor 1, when the loop reaches its last count the non-loop command directly preceding will be ignored
LAx	Loop Always from beginning or Loop-to-marker x-1 times (x = 2 to 65,535)
LA-x	Loop Always from beginning or Loop-to-marker x-1 times, alternating direction of motor 1
LM-2	Loop once from beginning or Loop-to-marker reversing index direction of motor 2
LM-3	Loop once from beginning or Loop-to-marker reversing index direction of motors 1 and 2
Jx	Jump to beginning of program number x, x = 0 to 4
JMx	Jump to beginning of program number x and come back for More after program x ends, x = 0 to 4
JM-x	Similar to JMx except automatically moves back from absolute indexes after program x ends: For pick-and-place within matrix looping patterns

Pausing command:

Px	Pause x tenths of a second, (x = 0 to 65,535)
P-x	Pause x tenths of a millisecond, (x = 1 to 65,535)
PAx	Pause x tenths of a second (x = 0 to 65,535, 10 μ sec pause when x = 0) Alternating output 1 high for duration of the pause
PA-x	Pause x tenths of a millisecond (x = 0 to 65,535, 10 μ sec pause when x = 0) Alternating output 1 high for duration of the pause

Input/output commands*:

U0	Wait for a "low" on user input 1
U1	Wait for a low on user input 1, holding user input 1 high while waiting
U2	Enable Jog mode while waiting for input
U3	Disable jog mode while waiting for input
U4	User output 1 "low" (reset state)
U5	User output 1 high
U6	Send "WE" to host and wait for a "G" to continue

*There are 22 additional commands for addressing the I/Os on the second VXM of two linked controls.

U7	Start the Continuous Index with pulse on output 2
U77	Start the Continuous Index with no output
U8	Start the Continuous Index sending "@" to the host
U9	End of Continuous Index with auto-decel to stop
U91	End of Continuous Index with auto-generate a deceleration Index as next command
U92	End of Continuous Index using next Index for deceleration to stop
U99	End of Continuous Index with instantaneous stop
U11	Skip next command if input 1 is high
U12	Skip next command if input 2 is high
U13	Wait for front panel button to jump to a program or continue: "Motor 1 jog -" button to jump to program no. 1, "Motor 1 jog+" button to jump to program no. 2, "Run" button to proceed in current program
U14	User output 2 low (reset state)
U15	User output 2 high
U16	Optional User output 3 low (reset state)
U17	Optional User output 3 high
U18	Optional User output 4 low (reset state)
U19	Optional User output 4 high
U23	Wait for front panel button to jump to a program and come back or continue: "Motor 1 jog -" button to jump to program no. 1, "Motor 1 jog+" button to jump to program no. 2, "Run" button to proceed in current program
U30	Wait for a low to high transition on user input 1
U31	Wait for a low to high transition on user input 1, holding user output 1 high while waiting
U32	Wait for "Motor 1 Jog -" button to be pressed on front panel with debouncing
U33	Wait for "Motor 1 Jog +" button to be pressed on front panel with debouncing
U50	Wait for a low and high on user input 1 with debouncing for a mechanical push-button switch
U51	Wait for a low and high on user input 1 with debouncing for a mechanical push-button switch, holding user output 1 high while waiting
U90	Wait for a low to high on the Run button or connection I/O, 4 with debouncing for a mechanical pus-button switch

VXM Immediate Commands**Status request commands:**

V	Verify Controller's status, VXM sends "B" to host if busy, "R" is ready, "J" if in the Jog/slew mode, or "b" if Jog/slewing
X	Send current position of motor 1 to host (Motor can be in motion)
Y	Send current position of motor 2 to host (Motor can be in motion)
Z	Send current position of motor 3 to host (Motor must be stationary)
T	Send current position of motor 4 to host (Motor must be stationary)
M	Request memory available for currently selected program
lst	List current program to host (ASCII text)
x	Send last 4 positions of motor 1 to host that were captured by the "!" command or Input 4 trigger
y	Send last 4 positions of motor 2 to host that were captured by the "!" command or Input 4 trigger
#	Request the number of the currently selected motor
*	Request the position when the last motor started decelerating (show position when "D" command or Stop/User input 4 used)
?	Read state of limit switch inputs for Motor 1 and 2 (8 bit binary value)
~	Read state of User Inputs, Motor 1 and 2 Jog Inputs (8 bit binary value)
\$	Read state of User Outputs (8 bit binary value)
@	Read user analog input value
B	Read Backlash compensation setting
O	Read Indicate limit switch setting
D	Read/Digitize motor position (Jog Mode)
PM	Request the number of the current Program
PMA	Request the current program associate number (255 = default/disabled)
getMmM	Read motor type/size selected for axis m
getDM	Read operating mode of VXM (8 bit binary value)
getD0	Gets the VXM's firmware version in the format X.XX
getD1	Gets the VXM's firmware date code in the format XX-XX-XX (month/date/year)

getD2	Return 2 if system is a single VXM, returns 4 if VXM is a Master
getDA	Read Analog Joystick Deadband setting
getjM	Read first Jog Speed setting for motor m
getjAmM	Read first Analog Joystick range for motor m
getJmM	Read second Jog Speed setting for motor m
getJAmM	Read second Analog Joystick range for motor m
getLmM	Read mode of limits for motor m
getPmM	Read "Pulse Every x number Step" value for axis m
getPA	Read Pulse width used by setPmMx and U7
getI	Read operating mode for user inputs

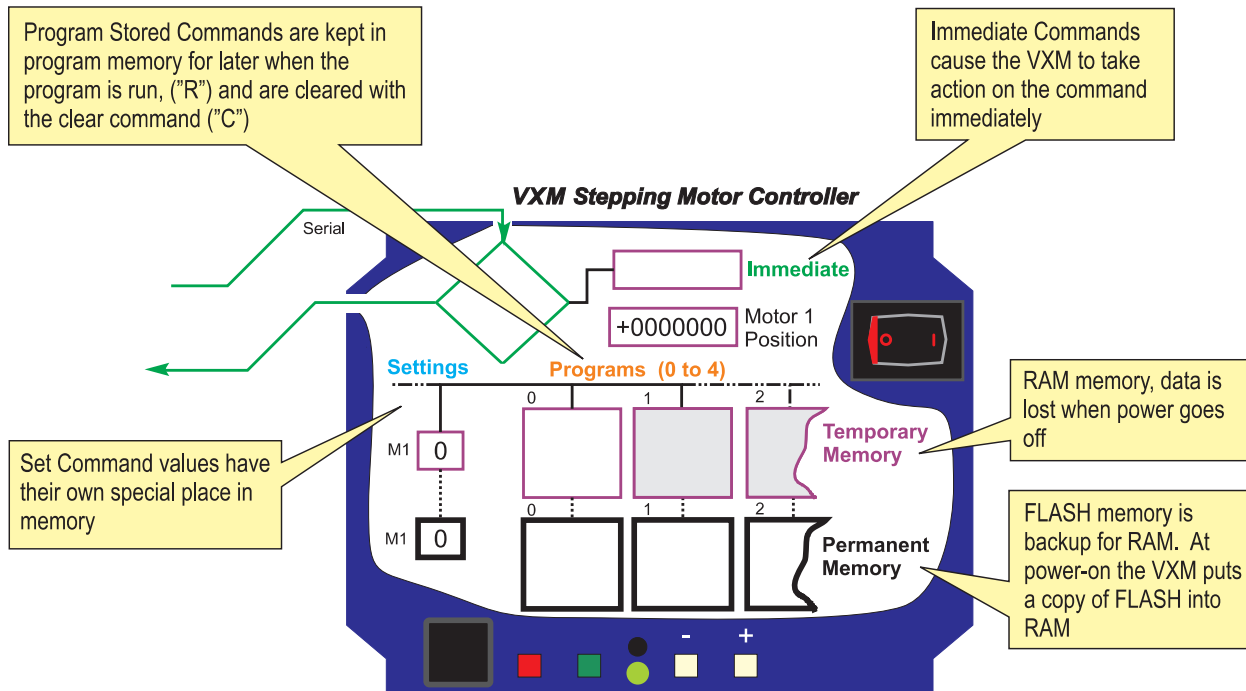
Operation commands:

C	Clear all commands from currently selected program
D	Decelerate to a stop(interrupts current index/program in progress)
E	Enable On-Line mode with echo "on"
F	Enable On-Line mode with echo "off"
G	Enable On-Line mode with echo off Grouping a <cr> with "A", ":", "W", "O" responses; Also Go after waiting or holding
H	Put Controller on Hold (stop after each command and wait for go)
K	Kill operation/program in progress and reset user outputs
N	Null (zero) motors 1, 2, 3, 4 absolute position registers
Q	Quit On-Line mode (return to Local mode)
R	Run currently selected program
!	Record motor positions for later recall with "x", "y" commands
rsm	Run save memory (saves setup/program values to nonvolatile memory)
res	Software reset control
del	Delete last command
[i1, i2...]	Send data to Slave through Master (two VXM controllers connected by VXM bus)
setD0	Set VXM back to factory defaults (All programs, settings, motor selections will be erased)
PMx	Select Program number x, x = 0 to 4
PM-x	Select and clear all commands from Program number x, x = 0 to 4

VXM Set Commands

setMmMx	Set axis m for motor type/size x
setDMx	Set VXM/VP9000 or NF90 emulation modes, and other operating parameters
setDAx	Set Analog Joystick Deadband value
setjM	Set first Jog Speed setting motor m
setjAmM	Set first Analog Joystick range setting for motor m
setJmM	Set second Jog Speed setting for motor m
setJAmM	Set second Analog Joystick range for motor m
setLmMx	Set limit switch mode for axis m
setPmMx	Set "Pulse Every number Steps" on output 2 for axis m
setPAx	Set Pulse width used by setPmMx and U7 , x = 1 to 255 (10 microsecond increments)
setIx	Set operating mode of inputs
setBx	Set RS-232 Baud rate (9 = 9600, 19 = 19200, 38 = 38400)
Bx	Backlash compensation, 20 steps when x = 1, off when x = 0
Ox	Indicate limit switch Over-travel to host, off when x = 0, VXM sends "O" when x = 1 and hit limit, x = 3 program stops too
PMx	Program Associate program x in Master to program x in Slave (Linked VXMs start the same time) (255 = default/disabled)

VXM Internal Function

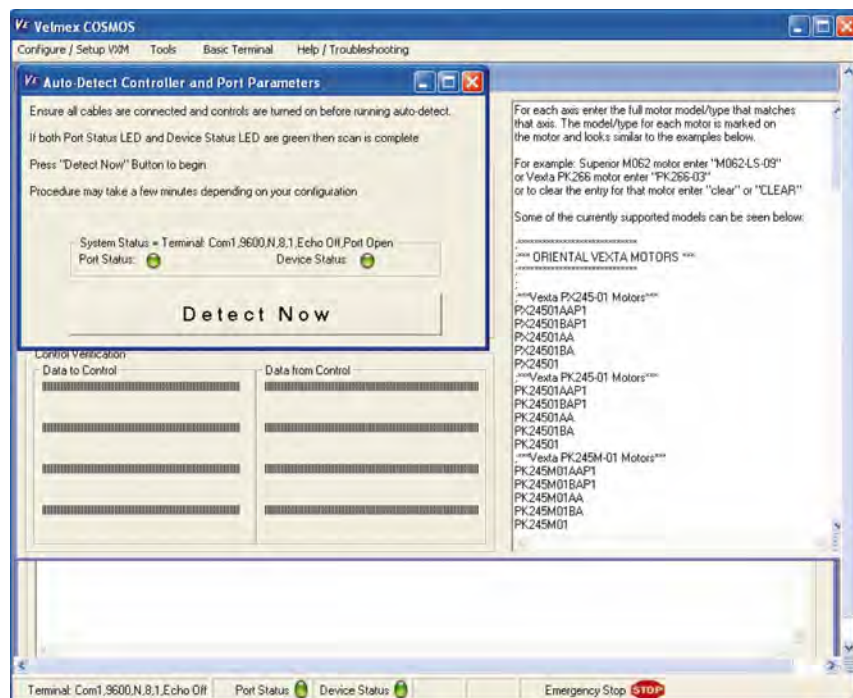


Get "Up and Running" in Record Time with C.O.S.M.O.S.™

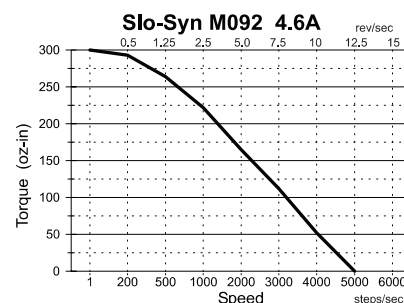
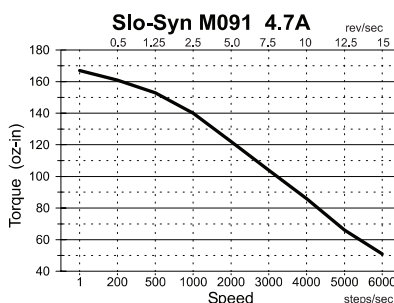
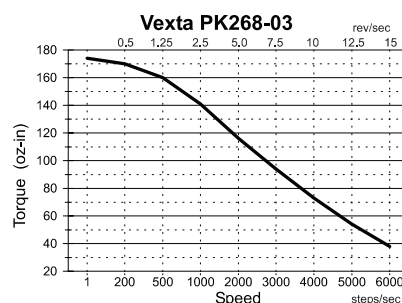
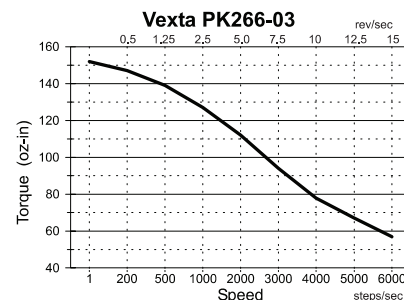
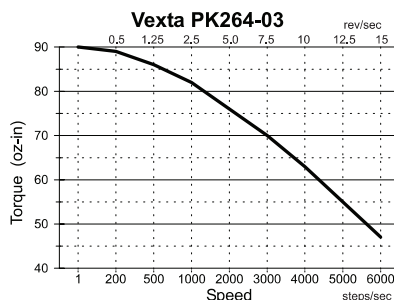
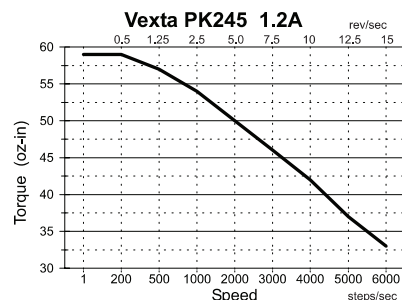
The Velmex COSMOS software for Windows is the easiest way to configure, program, and become familiar with the features of the VXM controller. COSMOS has the following capabilities:

- Test serial port for communications
- Retrieve and update setup information
- Display status and error messages
- Move motor(s) exact distances without programming or without learning any commands
- Enter commands directly to the VXM

COSMOS is included free with every VXM on CDROM, or it can be downloaded at www.velmex.com.



Motor Performance



Options



USB Serial Adapter

The **USB Serial Adapter** connects the VXM to a computer USB port. This adapter will automatically be configured as a virtual COM serial port on a PC. This virtual COM port works exactly the same as a standard COM port allowing all software to address the VXM directly through a COM port number. Use this adapter with a computer with an available USB port, but no RS-232 (COM) serial port.



Digital Joystick

The optional **Digital Joystick** allows remote jog control of a one or two axis VXM controller. The Joystick provides on/off outputs that connect to the Jog Motor inputs on the Auxiliary I/O with the included 10 foot cable. An input switch allows toggling between 2 settable maximum speed values. The Joystick functions like the front panel jog buttons: Momentary = motor moves one step; Hold = accelerate slowly to settable speeds; Release = decelerate quickly to a stop.



Analog Joystick

The **Analog Joystick** derives speed and direction (velocity) from joystick position. Motor velocity is proportional to joystick distance from center and the settable speed ranges. Simultaneous two axis motion is accomplished with two VXMs. An input switch allows a single joystick to toggle between 2 motors of a 4 motor system. The Joystick is 1 million cycle design in a hand held size enclosure with a 10 foot cable.



Auxiliary I/O Breakout Module

The optional **Auxiliary I/O Breakout Module** is a convenient method to interface to the VXMs auxiliary I/O. Wire (26 to 18 AWG) connections can be made to all 15 I/Os using the screw type terminal blocks. A 6 foot cable and a PVC insulating boot is included.



I/O Splitter

The **I/O Splitter** allows both a joystick and the Auxiliary I/O Breakout Module to be connected to the VXM at the same time. The splitter has 8 inch cables with a DB15HD plug connector to two DB15HD socket connectors.

Special Options

- Input terminal for data entry
- OEM mountable joysticks
- Potentiometer speed input
- Additional user outputs
- Half enclosure for OEM embedded applications
- Thumbwheel program selector switch
- Custom programming
- Customized cables & connectors

Backed by a 2 Year Warranty

Stepping Motor Controllers manufactured by Velmex are warranted to be free from defects for a period of two (2) years on all parts. Velmex's obligation under this warranty does not apply to defects due, directly or indirectly, to misuse, abuse, negligence, accidents, or unauthorized repairs, alterations, or cables/connectors that require replacement due to wear. Claims must be authorized, and a return authorization number issued before a product can be returned.

The warranty does not cover items which are not manufactured or constructed by Velmex, Inc. These components are warranted by their respective manufacturer.

Under the above warranty, Velmex will, at its option, either repair or replace a nonconforming or defective product.

The above warranty is the only warranty authorized by Velmex. Velmex shall in no event be responsible for any loss of business or profits, downtime or delay, labor, repair, or material costs, injury to person or property or any similar or dissimilar incidental or consequential loss or damage incurred by purchaser, even if Velmex has been advised of the possibility of such losses or damages.

Inasmuch as Velmex does not undertake to evaluate the suitability of any Velmex product for any particular application, the purchaser is expected to understand the operational characteristics of the product, as suggested in documentation supplied by Velmex, and to assess the suitability of Velmex products for this application.

This limited warranty give you specific legal rights which vary from State to State.

Specifications

Environmental:

Ambient Operating Temperature – 35° - 95° F (2° - 35° C)

Relative Humidity – 10% - 90% (non-condensing)

VXM

Function:

PWM Step Motor Controller for 1/2 Step Unipolar Motor Operation. RS-232 Interface, 9600, 19200, 38400 baud rate settable.

Physical:

VXM-1

Weight – 2.6 lbs (1.2 kg)

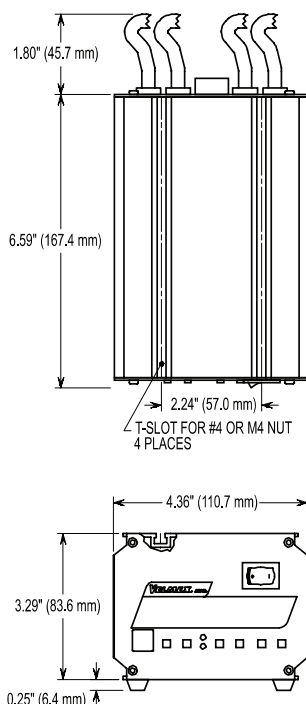
VXM-2

Weight – 2.9 lbs (1.3 kg)

Integrated 10 foot long Motor and Limit Cable(s)

Electrical Requirements:

24VDC 2.5A



Power Supply

Function:

Switch Mode Desktop Power Supply
Complies with FCC Class B, EN55022B and UL1950, CSA 22.2 234, EN60950, CE

Physical:

Weight. 1.0 lbs (0.45kg)

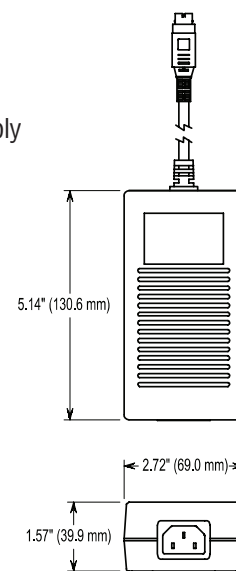
Integrated 1 meter (39") output cable. Removable AC Cord included.

Electrical Requirements:

100-240VAC 2A 50-60Hz

Output (to VXM):

24VDC 2.5A





Request for Quotation

Please copy and fill in this form for help in selecting your UniSlide Assembly.

Name _____ Phone _____

Company _____ Fax _____

Address _____ Email _____

City _____ State _____ Zip _____

Application Objective _____

Have you used UniSlide Assemblies before? Yes No

Operating environment is _____

Do you need UniSlide Assembly options? See pages 00 and 00.

☐ I need nonmagnetic slides

A sketch or drawing of your application is helpful.

<i>Axis*</i>	<i>Travel Distance</i>	<i>Payload Weight</i>	<i>Measure Travel or Position?</i>	<i>Position Readout Resolution</i>	<i>Other Requirements</i>
X			Yes No		
Y			Yes No		
Z			Yes No		
Rotary			Yes No		

* See page 1.36 for orientation of XYZ axes.

Fax form to us at 585-657-6153

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Frames and Bases Provide a Solid Foundation for Your Equipment

The Velmex T-Slot and Base (see page 2.38 of Motorized BiSlides chapter) structural profiles are the raw material you need to create strong, durable base and framing structures to support your BiSlide assemblies.

Two standard base designs (below) are available. F4-Style bases provide top rail support along the full perimeter, and are well suited to supporting heavy loads. The F2-Style bases have top rails on two sides, ideal for supporting BiSlide parallel coupled assemblies.



F4 style bases provide maximum support for heavy loads. F4 bases have I-beam top rails on all four sides.



T-nut for strong attachment to T-slots with 1/4-20 threaded bolts.

To keep cost low, these bases are usually shipped as an unassembled kit. Fasteners, plates, leveling feet and I-beam rails are included, and all necessary holes have been drilled and tapped. Detailed, easy-to-follow assembly instructions are included with each kit. These products are also available fully assembled.

Our web-site at www.bislide.com shows many more examples of frames and bases.



Loads bearing on the top rails are supported directly on the legs, unlike other systems that rely on fastener friction in T-slots for support.



F2 style base with a three axis BiSlide system. F2 Bases have I-beam top rails on two sides.

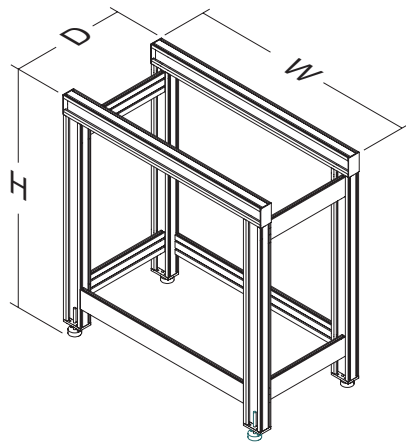
BiSlide Bases

The BiSlide bases are specified by type (F2 or F4) and the overall size. Lengths can be specified to meet your exact requirements. Bases can be reinforced with additional horizontal and vertical framing members for added stiffness. Very large bases can be configured from combining smaller bases.

These are some of the options available:

- Extended (overhanging) top rails
- Open sides or ends
- Metal or polymer work surfaces
- Optional mounting
- Shelves
- Rack panel attachment

Contact our Sales/Engineering department for more information.



F2 BiSlide Base

Model Number:

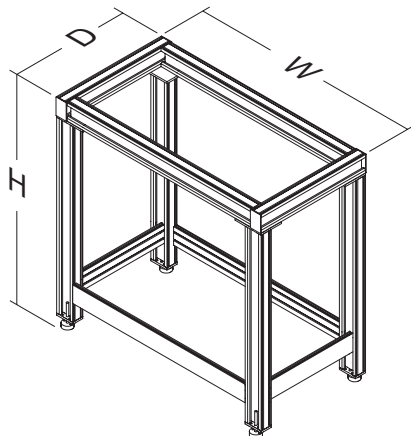
F2- W x D x H

Example: F2-40x30x24 (Frame with 2 top rails, 40" wide, 30" depth, 24" high)

All dimensions are outside and inch units.

Inside "D" = D-4.30"

Inside "W" = W-4.13"



F4 BiSlide Base

Model Number:

F4- W x D x H

Example: F4-60x48x30 (Frame with 4 top rails, 60" wide, 48" depth, 30" high)

All dimensions are outside and inch units.

Inside "D" = D-4.30"

Inside "W" = W-4.30"

Build Complex Configurations with the Versatile T-Slot Plate and Base Profile

The T-Slot Plate and Base profiles are the universal solutions for building supporting structures. These heavy duty, hard anodized aluminum extrusions have abundant T-slots for multiple attachment possibilities. Using the BiSlide cleat and T-nut system, you can easily attach structural profiles to themselves and to the BiSlide.

The photo below to the right shows a complete base made from T-Slot Plate.

See the full size cross section of the T-Slot and Base profiles on page 2.38, and the dimensional drawings on page 2.39, both in the Motorized BiSlide Section.

It's Easy to Position Your BiSlide Vertically

Vertical application versatility is built-in to every BiSlide. The end plate includes four mounting holes for attaching directly to the carriage of a horizontal assembly, or any other suitable mounting surface. For even more mounting flexibility, the standard BiSlide assembly can be end mounted, or "sandwich" cleated to the T-Slot plate and I-beam Base profiles.

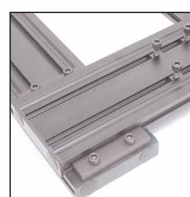
Visit www.bislide.com to see more examples.



BiSlide mounted directly to another BiSlide in an XZ configuration.



Base Extrusion and T-Slot Plate Profiles.



A complete base can be made from T-Slot Plate, T-nuts, Bolts, and Cleats.



BiSlide end mounted directly to T-Slot Plate.



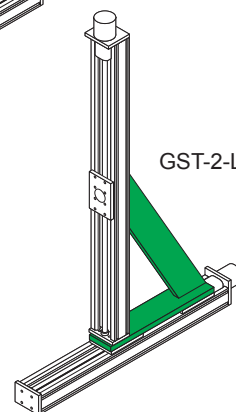
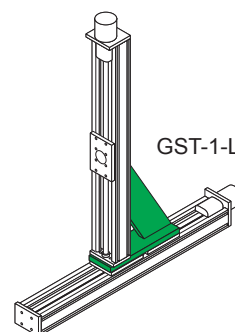
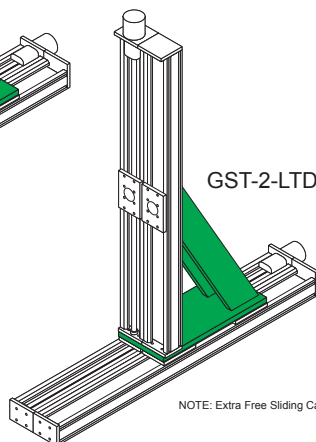
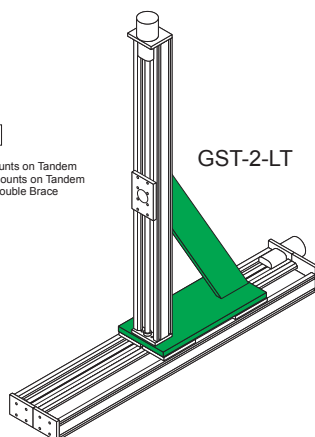
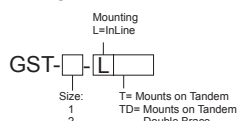
This right angle drive option has a standard BiSlide sandwich cleated to the I-beam Base profile (vertical). The bottom (horizontal) surface is the T-Slot plate profile.

BiSlide Angle Brackets

The Angle Brackets allow longer BiSlide assemblies to be end mounted with higher stability. These brackets feature either direct mounting to another BiSlide assembly, or attachment with the BiSlide cleats.

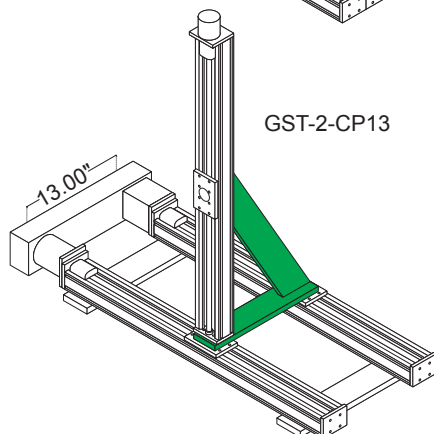
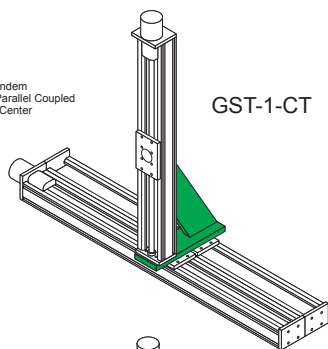
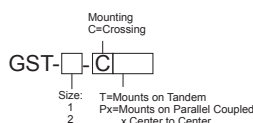
The three types of brackets are: Inline, Crossing, and Free Standing. The GST-1 brackets are 10" deep and 14" high (for BiSlide assemblies with minimum of 10" travel). The GST-2 brackets are 15" deep and 22" high (for BiSlide assemblies with minimum of 20" travel).

Inline

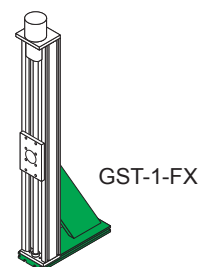
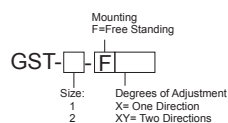


NOTE: Extra Free Sliding Carriages required in Slide under Bracket

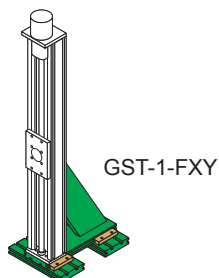
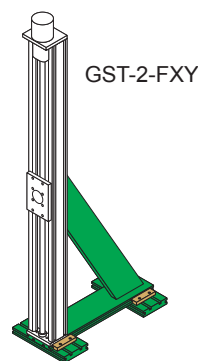
Crossing



Free Standing



NOTE: Minimum 4 Cleats needed to attach to surface



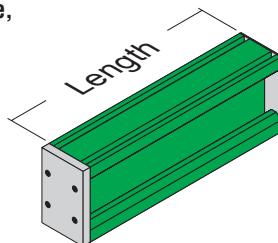
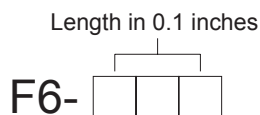
NOTE: Minimum 4 Cleats needed to attach to surface

Post Assemblies

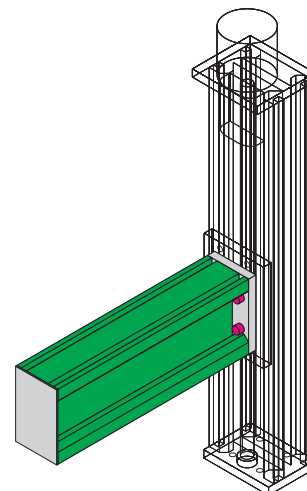
Post Assemblies utilize the MSX base and foot plate that will attach at right angles to the BiSlide assembly. These posts provide a convenient method for attaching rotary

tables, or other accessories at right angles a distance from the carriage surface.

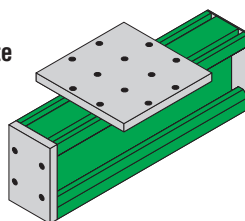
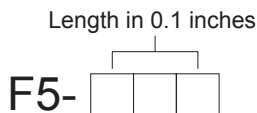
Post Assembly with Foot Plate, End Plate, T-Nuts, and 2 Cleats



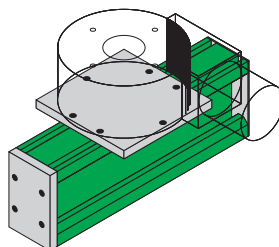
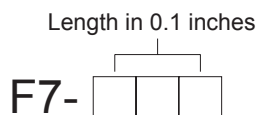
Typical Post Application



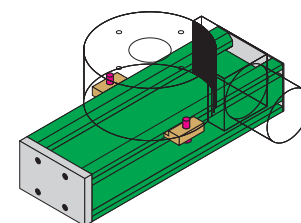
Post Assembly with Universal Mounting Plate



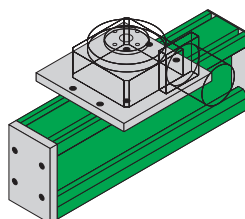
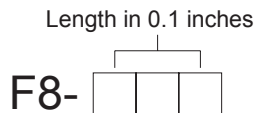
Post Assembly with 4800 Rotary Table Attachment Plate



Alternative: 4800 Rotary on F6 Post with MC-1 Cleats



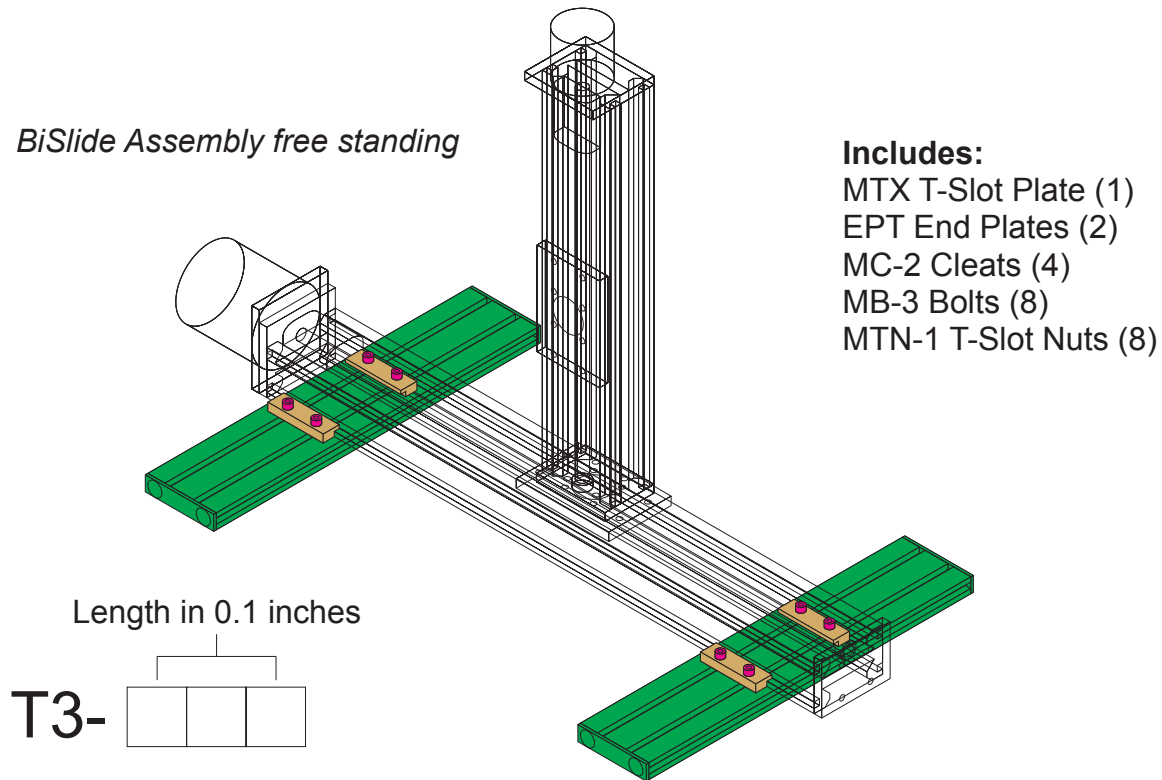
Post Assembly with 5990 Rotary Table Attachment Plate



T3 Support Rails

The T3 Support Rails can be used for stabilizing free standing systems, or as an adjustable interface connection between a BiSlide assembly and a frame member.

BiSlide Assembly free standing



NOTE: Minimum of 2 required
 (as shown)
 Additional Cleats, Bolts, Nuts needed
 to attach Rails to Frame or Surfaces

