**Important User Information**

This information is for the end user of BiSlide Assemblies. The end user should read this document and retain it for future reference.

**Table of Contents**

- Precautions...............1
- Terminology...............1
- Load Capacity...........2
- Model Numbers.........2
- Mounting.................3,4
- End Plate Removal...4
- Load Attachment......4
- Lubrication................5
- Adjustments..............5
- Motor Mounting.......6
- Wiring.........................6
- Convert to Motorized..7
- Limit Switches............7
- Warranty & CE...........8
- Contact Information....8

---

**WARNING**

Overloading, improper mounting, or misapplication of this product may result in serious injury. Suitability for a particular application of this product resides with the end user.

**CAUTION**

Stay clear of moving parts when operating.

---

**BiSlide Assemblies Owner's Manual**

**Contact Information**

- **By Phone:** 585-657-6151 and 800-642-6446
- **By Fax:** 585-657-6153
- **Email:** info@velmex.com
- **On the Internet:** www.velmex.com and www.bislide.com
- **By mail:** Velmex, Inc.
  - 7550 State Route 5 & 20
  - Bloomfield, NY 14469 USA

---

**Declaration Of EU RoHS 2 Compliance**

This statement certifies that, to the best of our knowledge, all slides manufactured by Velmex, Inc. are fully RoHS compliant in accordance with EU RoHS Directives 2002/95/EC – 2011/65/EU and the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast) set forth below. In addition, this declaration of conformity is issued under the sole responsibility of Velmex, Inc.

1) Lead (Pb)
2) Mercury (Hg)
3) Cadmium (Cd)
4) Hexavalent Chromium: (Cr VI)
5) Polybrominated Biphenyls (PBB)
6) Polybrominated Diphenyl Ethers (PBDE)

---

**BiSlide Terminology**

- Roller Thrust Bearing (2)
- Accessory Mounting (4)
- Threaded Mounting Hole (8)
- StabilNut™
- Support Bearing
- End Plate
- T-Slot (4)
- Carriage Fit Adjustment (4)
- Bearing Pad (8)
- Base
- Lead Screw
- Cleat
- Motor Plate
- Bearing Plate
- Model Number

---

**Warranty**

BiSlide 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 this application.

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

---

**BiSlide® Assemblies Owner's Manual**

Document # BUS-1 | Rev D | 3-1-19

Copyright 2019 Velmex Inc. All rights reserved. Velmex, the Velmex logo, UniSlide, BiSlide and StabilNut are trademarks of Velmex Inc. All other trademarks are the property of their respective owners.
Maximum Load Capacity

**WARNING** Overloading, improper mounting, or misapplication of this product may result in serious injury.

Exceeding the load/speed limits shown in the graph at the right will result in rapid Lead Screw and Nut wear. Consult our engineering department for other duty cycles and temperatures.

**Cantilever load is F x distance from Carriage center. To calculate an equivalent center load use this formula:**

\[ \text{Equal Normal Load} = (d \times L/2) + L \]

\( d \) = distance load is from center of Carriage in inches, \( L \) = Load (lbs.)

Model Numbers

Use the following table to identify the characteristics of your BiSlide. The Model number like the one shown below is located on the side of the BiSlide (see drawing on page 1).

<table>
<thead>
<tr>
<th>Design</th>
<th>Lead Screw</th>
<th>Advance/Turn</th>
<th>Lead Screw Advance/Turn</th>
<th>Design Travel* (Tenths of Inches)</th>
<th>Standard travel lengths (inches):</th>
</tr>
</thead>
<tbody>
<tr>
<td>10=Inch</td>
<td>M = Nut/Screw Drive</td>
<td>Blank = None</td>
<td>M01 = 1.50 mm</td>
<td>5,10,15,20,30,40,50,60,80</td>
<td></td>
</tr>
<tr>
<td>11=Inch &amp; Way Cover</td>
<td>M02 = 2.00 mm</td>
<td>E01 = 0.10 Inches</td>
<td>E04 = 0.40 Inches</td>
<td>* Free Sliding Models have 2.4&quot; Longer Travel, Waycover Models Under 40&quot; Travel have 1.0&quot; less</td>
<td></td>
</tr>
</tbody>
</table>

Mounting

Blank = None

10=Basic Knob

11=Basic Knob

12=Knob/Counter, Horizontal, Increment = From Knob

13=Knob/Counter, Vertical, Increment = From Knob

14=Knob/Counter, Horizontal, Increment = From Knob

15=Knob/Counter, Vertical, Increment = From Knob

20=NEMA 23 Motor Mount

21=NEMA 23 Mount & Limit Switches

30=NEMA 34 Motor Mount

31=NEMA 34 Mount & Limit Switches

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

Mounting to a Surface

The BiSlide Assembly base should be mounted with Velmex MC cleats to a reasonably flat surface. Inaccuracies and binding can result if mounted to non-flat surfaces.

Mounting surface should be steel or aluminum and have 1/4-20 UNC threaded holes with a minimum thread depth of 0.30”.

Refer to drawing and table below for cleat placement. Use cleats in pairs with a pair 1.2” from each end to first mounting hole. All other cleats should be equally spaced between them. Use more cleats for heavy off center loads and for more rigidity.

Attach cleats with Velmex MB-1 bolts or equal grade 8 bolts. Start with bolts finger tight and then tighten bolts progressively alternating sides and diagonals. Finish by tightening bolts to 95 in-lbs. The BiSlide can also be mounted on its side using bolts or nuts in the T-slots (see illustrations below).

Thread locking compound (Loctite™) is recommended for all mounting bolts.

**Cantilevered*** 500 inch-lb. (250 for Way Cover Model)

**Critical Speed of Lead Screw per Length**

**P/V Limit of StabilNut & Lead Screw**

**Maximum Load / Speed at 72° F Ambient**

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

<table>
<thead>
<tr>
<th>Design</th>
<th>L</th>
<th>L</th>
<th>Lighter Loads</th>
<th>Heavier Loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel</td>
<td>(inches)</td>
<td>Length</td>
<td># Cleats</td>
<td>Spacing</td>
</tr>
<tr>
<td>10</td>
<td>17.2</td>
<td>43.688</td>
<td>4</td>
<td>13.380</td>
</tr>
<tr>
<td>15</td>
<td>22.2</td>
<td>56.388</td>
<td>4</td>
<td>18.380</td>
</tr>
<tr>
<td>20</td>
<td>27.2</td>
<td>69.088</td>
<td>4</td>
<td>23.380</td>
</tr>
<tr>
<td>30</td>
<td>37.2</td>
<td>94.488</td>
<td>4</td>
<td>28.380</td>
</tr>
<tr>
<td>40</td>
<td>49.6</td>
<td>125.984</td>
<td>6</td>
<td>28.380</td>
</tr>
<tr>
<td>50</td>
<td>59.6</td>
<td>151.384</td>
<td>8</td>
<td>28.380</td>
</tr>
<tr>
<td>60</td>
<td>69.6</td>
<td>176.784</td>
<td>8</td>
<td>28.380</td>
</tr>
<tr>
<td>80</td>
<td>89.6</td>
<td>227.584</td>
<td>10</td>
<td>28.380</td>
</tr>
<tr>
<td>100</td>
<td>119.6</td>
<td>281.584</td>
<td>12</td>
<td>28.380</td>
</tr>
</tbody>
</table>

**Cross Section**

M = Blank = None

N = Nut/Screw Drive

F = Free Sliding

**Design Travel** (Tenths of Inches)

**Lead Screw Advance/Turn**

Blank = None

1 = Basic Knob

12 = Knob/Counter, Horizontal, Increment = From Knob

13 = Knob/Counter, Vertical, Increment = From Knob

14 = Knob/Counter, Horizontal, Increment = From Knob

15 = Knob/Counter, Vertical, Increment = From Knob

20 = NEMA 23 Motor Mount

21 = NEMA 23 Mount & Limit Switches

30 = NEMA 34 Motor Mount

31 = NEMA 34 Mount & Limit Switches

**C = TOTAL # CLEATS**

**CC = L - 3.820" (C / 2) - 1**

**Cleat and T-slot Mounting Methods**

**8-32, M4 Square Nut (light duty accessory attachment only)**

**1/4-20 Button Head Bolt**

**1/4-20 Modified Truss Head Bolt**

**0.272" DIA THRU (CLEARANCE FOR 1/4-20 BOLTS)**

**1/4-20 UNC-3B (8)**

**0.46" 45° 0.20" DIA ACCESS HOLE**

**1/4-20 Button Head Bolt**

**1/4-20 Modified Truss Head Bolt**

**0.272" DIA THRU (CLEARANCE FOR 1/4-20 BOLTS)**

**1/4-20 UNC-3B (8)**

**0.46" 45° 0.20" DIA ACCESS HOLE**

**1/4-20 Button Head Bolt**

**1/4-20 Modified Truss Head Bolt**
End Plate Mounting
Refer to drawing at right for hole pattern for end mounting. Surface should be steel or aluminum and have 1/4-20 UNC threaded holes with a minimum thread depth of 0.30”. Use Velmex MB-1 or equal grade 8 bolts. Start with bolts finger tight and than tighten bolts progressively alternating sides and diagonals. Finish by tightening bolts to 95 in-lbs. Thread locking compound (Loctite) is recommended for all mounting bolts.

**WARNING**
Cantilever load on end plate must not exceed 94 ft-lbs.

End Plate Removal
It may be necessary to remove the end plate to insert T-slot nuts for limit switches or side mountings. To remove the end plate the carriage should first be positioned all the way to the end plate end. This will insure the end plate centers to the center of the lead screw as determined by the carriage on reinstallation. Use a T-30 Torx wrench to remove the four end plate bolts. When reinstalling the plate torque the bolts to 100 in-lbs.

XY Mounting
Attach Y axis base to X axis carriage with a pair of MC-2 cleats and four MB-1 bolts. Start with bolts finger tight and than tighten bolts progressively alternating side to side and diagonally. Finish by tightening bolts to 95 in-lbs. Thread locking compound (Loctite) is recommended for all mounting bolts.

**WARNING**
A pair of properly installed cleats have 425 lbs of holding capacity before slipping. However, if the cleats loosen due to vibration or improper tightening the BiSlide stage can slip resulting in damage to external equipment, or serious injury. In critical applications cleats should be drilled and pinned to the BiSlide base.

XZ Mounting (End Plate To Carriage)
Attach Z axis end plate to X or Y axis carriage with four MB-1 bolts. Start with bolts finger tight and than tighten bolts progressively alternating side to side and diagonally. Finish by tightening bolts to 95 in-lbs. Thread locking compound (Loctite) is recommended for all mounting bolts.

Load Attachment  (refer to page 2 for maximum load capacity)
Refer to drawing on page 3 for mounting hole pattern in carriage. When mounting to the carriage surface use four Velmex MB-1 (1/4-20 UNC) or equal grade 8 bolts. Bolts must thread into the carriage to a minimum depth of .30” depth. Torque bolts to 95 in-lbs. User attached Blocks, Plates, etc. must be flat. Attaching non-flat surfaces may distort the carriage causing binding. Thread locking compound (Loctite) is recommended for all mounting bolts.

**Lubrication**
Motor Driven BiSlide Assemblies should be lubricated with Velmex BL-1 oil if minimum friction, maximum life, and repeatability are a concern. Using any other than BL-1 lubricant may damage bearing pads, nut, or lead screw support bearing. Re-lube when the lead screw and ways appear dry of lubricant. Continuous use applications with heavy loads may necessitate daily lubrication.

To lubricate BiSlide Assembly, traverse carriage near center of travel and apply 3 to 4 drops of oil to the end of carriage at the way surfaces and on the lead screw threads. Apply oil to both end of carriage, refer to the diagram above for lube points.

Occasionally apply 1 to 2 drops of BL-1 to the point where the lead screw enters the lead screw support bearing (end plate end).

**Adjustments** (see page 7 for limit switch adjustment)
The following adjustments may be necessary after break in period and less frequently thereafter.

**StabilNut™**
The Lead Screw Nut (StabilNut) has adjustable mesh to minimize backlash. To minimize backlash, tighten (Clockwise with 1/8” hex key) nut tension screw (B on diagram above) 1/8 of a turn maximum at a time.

NOTE:  Tightening more than 1/8 turn may cause excessive friction and wear. Test for over tightness by turning lead screw by hand. Lead screw should rotate by twisting with index fingers and thumbs of both hands.

**Carriage**
Carriage fit is adjustable by tightening the four (A) T-30 Torx head bolts on the carriage surface (see diagram above). Carriage free-play is indicated by a clunking/knocking noise when pulling up and down on the corners of the carriage. To reduce carriage free-play tighten (Clockwise) each bolt equally 1/8 of a turn maximum at a time.

**Failure to adjust carriage bolts evenly will result in loss of parallelism or proper way contact. An out of parallel carriage may angle the limit switch actuator cam to be either too high or low resulting in limit switch failure. Over tensioning carriage will result in binding, rapid lead screw, StabilNut, and pad wear.**

To check if the carriage is parallel to the base, place a small carpenters or machinists level (right angles to traversing direction) across the carriage, note where the bubble is, now move the level to the top of the BiSlide base, if the bubble is in the same place the carriage is parallel. If the carriage seems to clunk only when pulling and pushing on one diagonal of the carriage, then back off slightly on the adjustment bolts at the other diagonal, and re-tighten all four bolts evenly 1/8 turn maximum. Use a level to measure and maintain parallelism to the base.
Motor Mounting

Before attaching a motor to a BiSlide assembly the carriage should be positioned all the way to the motor end, this will insure the motor centers to the center of the lead screw as determined by the carriage. Install motor and tighten the four socket cap screws on the motor flange.

NOTE: If motor shaft does not slide into coupling loosen clamp screw "C" shown above.

Never loosen coupling screw (D) closest to the bearing assembly. The bearing assembly has a 50 lb. pre-load that will be lost if the coupling is completely unclamped.

Using a 7/64" hex key tighten the coupling clamp screws A,B,C (torque to 26 in-lbs.)

Motor Wiring (for Velmex installed step motors)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Motor</th>
<th>Cable</th>
<th>Cable</th>
<th>Slo-Syn</th>
<th>Vexta</th>
<th>Pacific Scientific*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BC</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W/Y &amp; W/R</td>
</tr>
<tr>
<td>2</td>
<td>B2</td>
<td>Gnd</td>
<td>Gnd</td>
<td>Gnd</td>
<td>Bu</td>
<td>R</td>
</tr>
<tr>
<td>3</td>
<td>AC</td>
<td>Bk</td>
<td>Y</td>
<td>W/Bk &amp; W/O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A2</td>
<td>Or</td>
<td>Bk</td>
<td>W/R</td>
<td>Bk</td>
<td>O</td>
</tr>
<tr>
<td>5</td>
<td>A1</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>Gnd</td>
<td>Bk</td>
</tr>
<tr>
<td>6</td>
<td>B1</td>
<td>Bu</td>
<td>W</td>
<td>W/Gn</td>
<td>R</td>
<td>Y</td>
</tr>
</tbody>
</table>

* 8 lead motor with wires combined at AC and BC for 6 lead configuration

Limit Switch Wiring

<table>
<thead>
<tr>
<th>Pin</th>
<th>Switch</th>
<th>Cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Switch (Motor End)*</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>2</td>
<td>NC</td>
<td>R</td>
</tr>
<tr>
<td>Outer Switch (End Plate)</td>
<td>3</td>
<td>NC</td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>Bk</td>
</tr>
</tbody>
</table>

* Negative direction on Velmex Controllers (carriage moves toward motor end)

Limit Switches

Limit switches when used with motor controllers can provide over-travel protection and a precision home reference. BiSlide limit switches are repositionable. To change location of switches, loosen the two phillips head screws on the switch plate and slide to new position and retighten screws.

CAUTION

Failure to secure limit switch hold down screws can cause the switch not to actuate. Also, improper carriage adjustment can cause limit switch cam plate to not actuate the switch. See page 5 for proper carriage fit adjustment procedure.

Converting Manual Model to Motor Driven

Refer to coupling/bearing cover removal procedure to obtain access to the motor/knob coupling. Before removing the knob, the carriage should be first positioned all the way to the knob end. This will insure the motor centers to the center of the lead screw as determined by the carriage. Loosen the two coupling screws (A,B) closest to the knob.

Never loosen the coupling screw "D" closest to the bearing assembly. The bearing assembly has a 50 lb. pre-load that will be lost if the coupling is completely unclamped.

Remove the knob/shaft assembly, and the 4 screws in the knob/bearing plate. Parts needed to attach motor:

- NEMA size 23 (2.3" dia.) motors requires Velmex coupling reducing bushing #IM001-15. Bushing is not required if motor has a .375 dia shaft.
- NEMA size 34 (3.4" dia) motors require Velmex adapter plate #IM001-20. Size 34 Motors must have a standard .375" dia shaft.

Refer to the Motor Mounting procedure on page 6 for attaching motor

Motors, Limit Switches, Cables, and Motor Controllers are all available from Velmex. Call 1-800-642-6446 for more information.