# Precision Linear Mation 


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Del-Tron Precision,Inc.

## Our Mission

Del-Tron Precision was founded in order to serve the needs of automated equipment manufacturers for innovative, high quality and reasonably priced anti-friction linear bearings.

## Our Company

The originator of the sub miniature ball bearing slide assembly; Del-Tron Precision Inc. began operations in 1974 supplying original equipment manufacturers with the world's first commercially available sub miniature ball slide, model D-1.

Since then, thousands of Del-Tron ${ }^{\circledR}$ slides have been incorporated into automated equipment throughout the world. Manufacturers of medical analyzing and testing machines, semiconductor and electronic chip processing equipment, printers, plotters, peripherals, assembly systems, lasers and many more have found that Del-Tron ${ }^{\circledR}$ slides provide a cost effective anti-friction interface between moving parts in today's increasingly automated equipment.

Del-Tron's modern corporate campus, home to world headquarters, and its principal manufacturing facility, located in the foothills of the Berkshires in Western Connecticut, boasts highly automated computer controlled manufacturing and assembly operations.

Highly skilled workers monitor each manufacturing step, ensuring that consistent and repeatable high quality bearings conform to the published specifications or the customer's particular requirements where applicable. Since its inception, Del-Tron has performed final inspection of $100 \%$ of its products.

Del-Tron's operations staff works to assure "just in time" deliveries, if needed, and maintains adequate stock levels of all products at authorized distributor locations in major markets across the U.S.A. and Canada. MHK serves as Del-Tron's European distribution hub in Amberg, Germany. The firm also has locations in Japan and throughout Southeast Asia stand ready to serve the needs of both local and indigenous industries and those of multinational assembly and manufacturing operations worldwide.

## Our Quality Policy

We are dedicated to providing our customers with a product of consistent quality that conforms to our specifications and meets or exceeds customer expectations while making on-time delivery at a competitive price.


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## Selection Guide

|  | BALL SLIDES |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
|  | MINI CA DA-SA3 (50 MODELS) | $\begin{aligned} & .34 \\ & 1.8-93 \end{aligned}$ | $\begin{aligned} & 8.4-38.0 \\ & 13-304.0 \end{aligned}$ | $\begin{aligned} & 13.3-44 \\ & 27-381 \end{aligned}$ | $\begin{aligned} & 0.013 \mathrm{~mm} / 25 \mathrm{~mm} \\ & 0.013 \mathrm{~mm} / 25 \mathrm{~mm} \end{aligned}$ |
|  | ANTI-CREEP BALL SLIDE ASSEMBLIES |  |  |  |  |
| - | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
| \% | DA-AC-SA3-AC | 1.8-93 | 13-304.0 | 27-381 | $0.013 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | NON-MAGNETIC BALL SLIDES |  |  |  |  |
| $\bigcirc$ | SERIES | LOAD CAPACITY, kg. | travel | LENGTH | ACCURACY |
|  | DA-NMS-SA3-NMS (47 MODELS) | . $54-28$ | 13-304.0 | 27-381 | $0.013 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | CROSSED ROLLER SLIDES |  |  |  |  |
|  | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
| 0 pg 16 | RDA REA-RSA3 (47 MODELS) | $\begin{aligned} & 14-41 \\ & 22-354 \end{aligned}$ | $\begin{aligned} & 13.0-127.0 \\ & 13-305 \end{aligned}$ | $\begin{aligned} & 27.0-154.0 \\ & 27-381 \end{aligned}$ | $\begin{gathered} 0.003 \mathrm{~mm} / 25 \mathrm{~mm} \\ 0.003 \mathrm{~mm} / 25 \mathrm{~mm} \end{gathered}$ |
|  | PRECISION BALL SLIDE SERIES |  |  |  |  |
|  | SERIES | LOAD <br> CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
| 0 pg 19 | $\begin{aligned} & \text { MA-2SS-SA5-7SS } \\ & \text { (17 MODELS) } \end{aligned}$ | 5.4-77 | 25-175.0 | 65-228.6 | $0.003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | PRECISION CROSSED ROLLER SLIDE SERIES |  |  |  |  |
|  | SERIES | LOAD <br> CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
| P pg 21 | RSA2SS-RSA5SS <br> (12 MODELS) | 36-118 | 25-175 | 50.8-228.6 | $0.003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | HIGH PRECISION SERIES BALL SLIDES (LOW PROFILE \& FLANGE BASE) |  |  |  |  |
| , | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
| \% pg 23 | HPMA-HPSA5 (42 MODELS) | 3.6-102 | 13-250 | 25.4-381.0 | $0.001 \mathrm{~mm} / 25 \mathrm{~mm}$ |


| HIGH PRECISION SERIES CROSSED ROLLER SLIDES (LOW PROFILE \& FLANGE BASE) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | aCCuRACY |
| HPRSA2-HPRSA5 <br> $0.010 \mathrm{~mm} / 25 \mathrm{~mm}$ (34 MODELS) | $41-204$ | 25-250 | 50.8-381.0 |  |
| POSI-DRIVE STAGES |  |  |  |  |
| SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
| LSA1-25-C005 THRU LSA3-300-B02 (36 MODELS) | 3.6-41 | 25-300 | 103.4-549.0 | $0.003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
| LRSA1-25-C005 THRU LRSA3-300-B02 (36 MODELS) | 6.8-82 | 25-300 | 103.4-549.0 | 0.003mm/25mm |

## BALL SLIDE POSITIONING STAGES (MICROMETER DRIVEN)

Available in $\mathrm{X}, \mathrm{XY}$, and XYZ configurations.

| SERIES | LOAD CAPACITY, kg. $\mathrm{X}, \mathrm{XY}, \mathrm{Z}$ | TRAVEL mm | WORK SURFACE | ACCURACY |
| :---: | :---: | :---: | :---: | :---: |
| MINI 99MM | 2.3, 2.3, . 6 | 6 | $19.1 \times 19.1$ | $0.013 \mathrm{~mm} / 25 \mathrm{~mm}$ |
| 101MM-3204MM <br> (25 MODELS, with micr | $\begin{aligned} & 1.8-27,1.8-27, .6-14 \\ & \text { eters) } \end{aligned}$ | 13-50 | $\begin{aligned} & 31.8 \times 31.8 \text { to } \\ & 130.2 \times 130.2 \end{aligned}$ | $0.013 \mathrm{~mm} / 25 \mathrm{~mm}$ |
| 101PMM-3206-PMM (11 MODELS, $X$ and XY | $1.8-27$ <br> LIY, no micrometers) | 13-100 | $\begin{aligned} & 31.8 \times 31.8 \text { to } \\ & 130.2 \times 130.2 \end{aligned}$ | $0.013 \mathrm{~mm} / 25 \mathrm{~mm}$ |

## CROSSED ROLLER POSITIONING STAGES (MICROMETER DRIVEN)

Available in $\mathrm{X}, \mathrm{XY}$, and XYZ configurations.

| SERIES | LOAD CAPACITY, kg. $\mathrm{X}, \mathrm{XY}, \mathrm{Z}$ | TRAVEL mm | WORK <br> SURFACE | ACCURACY |
| :---: | :---: | :---: | :---: | :---: |
| R99Mm | 18, 18, . 57 | 6 | $19.1 \times 19.1$ | $0.003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
| R101MM-R3204MM (25 MODELS, with micron | $\begin{aligned} & \begin{array}{l} 10-73,10-73, .6-14 \\ \text { neters) } \end{array} \end{aligned}$ | 13-50 | $\begin{aligned} & 31.8 \times 31.8 \text { to } \\ & 130.2 \times 130.2 \end{aligned}$ | $0.003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
| R101PMM-R3204PMM (11 MODELS, X and XY O | 10-73 <br> NLY, no micrometers) | 13-100 | $\begin{aligned} & 31.8 \times 31.8 \text { to } \\ & 130.2 \times 130.2 \end{aligned}$ | $0.003 \mathrm{~mm} / 25 \mathrm{~mm}$ |


pg 25

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pg 44


## Selection

Guide

|  | LOW PROFILE CROSSED ROLLER TABLES |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
| pg 62 | LPTA-1025-3205 <br> (21 MODELS) Stainless | $23-375$ <br> eel available. | . $2-130$ | 25-205 | . $003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | CROSSED ROLLER RAIL SETS |  |  |  |  |
| Nores | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
|  | MINI NB1 | 20-84 | 12-50 | 20-80 | . $002 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | $\begin{aligned} & \text { NB2-NB6 } \\ & \text { (49 MODELS) } \end{aligned}$ | 30-1280 | 18-295 | 30-400 | $.002 \mathrm{~mm} / 25 \mathrm{~mm}$ to $.005 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | Stainless steel available. |  |  |  |  |
|  | ANTI-CREEP CROSSED ROLLER RAIL SETS |  |  |  |  |
|  | SERIES | LOAD CAPACITY, Kg. | TRAVEL | LENGTH | ACCURACY |
| pg 69 | NB2-AC / NB6-AC | 30-1280 | 18-275 | -400 | $\begin{aligned} & .002 \mathrm{~mm} / 25 \mathrm{~mm} \\ & .005 \mathrm{~mm} / 25 \mathrm{~mm} \end{aligned}$ |
|  | (32 MODELS) |  |  |  |  |
|  | CROSSED ROLLER SLIDE TABLES (ALUMINUM) |  |  |  |  |
| pg 72 | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
|  | MINI NBT-1AM | 44-90 | 25-76 | 50-125 | . $003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | NBT-2AM-NBT-6AM | 30-923 | 18-229 | 35-360 | . $003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | Stainless steel available. |  |  |  |  |
|  | ANTI-CREEP CROSSED ROLLER SLIDE TABLES (ALUMINUM) |  |  |  |  |
| pg 75 | SERIES | LOAD <br> CAPACITY, LB. | TRAVEL | LENGTH | ACCURACY |
|  | MINI NBTA1-AC | 43-89 | 25-70 | 50-125 | . $003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | NBT2A-AC / NBT6A-AC (31 MODELS) | 30-924 | 18-230 | 35-360 | . $003 \mathrm{~mm} / 25 \mathrm{~mm}$ |
|  | CROSSED ROLLER SLIDE TABLES (STEEL) |  |  |  |  |
| pg 78 | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
|  | MINI NBT-1 | 12-40 | 12-50 | 25-85 | . 002 mm |
|  | NBT-2-NBT-6 <br> (41 MODELS) | 40-1199 | 18-230 | 35-325 | $\begin{aligned} & .002 \mathrm{~mm} \text { to } \\ & .004 \mathrm{~mm} \end{aligned}$ |
|  | BALL SLIDE GUIDES |  |  |  |  |
|  | SERIES | LOAD CAPACITY, kg. | TRAVEL mm | LENGTH mm | ACCURACY |
|  | BSGS5-BSG25 | 44-1001 | 3-813 | 38-889 | . 002 mm |
| pg 81 | BSGS9W-BSG16W <br> (10 MODELS) Stainless | $250-720$ <br> el available. | 51-610 | 76-660 | . 013 mm |

## 6 Reasons to choose Del-Tron® Ball Slides



1. Factory preload adjustment prevents sideplay and backlash.
2. Lightweight aluminum carriage and base with high load capacity.
3. Built-in holes simplify installation and component mounting.
4. Steel shafts, ground over the entire length, reduce coefficient of friction to 0.003 .
5. Long life, self cleaning ball bearing needs no lubrication.
6. Mounting surfaces, parallel to the line of motion, provide straight line accuracy to $.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.

## Del-Tron® Ball Slides

Load Ratings and Life Estimates
The rated load capacity of Del-Tron ${ }^{\circledR}$ ball slides may be a mass load on a horizontal slide,or a force load normal to the mounting surface in any position. The rated load must be centered and distributed over the slide, and the base must be fully supported on a flat mounting surface so that the ball slide does not act as a beam subject to concentrated or distributed bending forces. Loads supported by protruding arms reduce accuracy and load capacity by acting as levers or ratio arms, and should be avoided even when load forces are small.

When used at the rated load capacity and moderate speeds, a life of 25 million cm of travel can be expected. The expected life at one half the rated load is 250 million cm .

## Friction and Lubrication

The coefficient of friction is lower for linear ball bearings than for rotary bearings, where the peripheral track is shorter on the inner race than on the outer race, causing the ball to skid on one or the other. The balls run exactly equal distances on the pair of tracks in linear bearings, permitting the ball to run without friction, wear, or skidding at any preload. The typical coefficient of friction for Del-Tron ${ }^{\circledR}$ ball slides is 0.003 .

Del-Tron ${ }^{\circledR}$ ball slides are self cleaning in normal service. Lubrication is recommended for speeds above $4500 \mathrm{~cm} / \mathrm{min}$, and is advisable at lower speeds where high loads are applied in continuous duty applications.

## Mounting and Accuracy

The mounting surfaces of the ball slide are machined flat and smooth, and parallel to each other and the line of motion. They must be mounted on smooth, flat supports that will not deflect under load. Especially with long slides of small cross section, binding may be caused by distortion of the bottom member when mounted on irregular surfaces. If so, round shims or spacers may be placed over the mounting screws to raise the slide above the surface asperities. Bedding in epoxy resin is also recommended.

The specified accuracy for all standard Del-Tron ${ }^{\circledR}$ ball slides is $.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel. This is measured by comparison of the line of travel to a master straight edge, using a gage or indicator mounted on the slide.


Ball Slide
Assemblies
moment load ratings + load / life formulas. pg. 91

| * Minimum Centered around Mean Position |  |  |  |  |  |  | $\begin{aligned} & \text { CARRIAGE } \\ & \text { HOLE } \\ & \text { SPACING } \end{aligned}$ |  | BASE DIMENSIONS |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  | HEIGHT |  | HOLE SPACING |
| MODEL | TRAVEL* | (kg) | (g) | A | B | C | D | E | F | G | H |
| CA-. 5 | 8.4 | . 34 | 2 | 13.3 | 5.8 | 9.7 | 6.0 | 4.0 | 3.4 | 4.0 | 6.0 |
| CA-1 | 13 | . 68 | 3 | 19.0 | 5.8 | 9.7 | 13.0 | 4.0 | 3.4 | 4.0 | 10.0 |
| CA-2 | 25 | . 68 | 4 | 32.0 | 5.8 | 9.7 | 26.0 | 4.0 | 3.4 | 4.0 | 20.0 |
| CA-3 | 38 | . 68 | 7 | 44.0 | 5.8 | 9.7 | 37.0 | 4.0 | 3.4 | 4.0 | 30.0 |
| DA-1 | 13 | 2 | 9 | 27.0 | 8.0 | 14.2 | 15.0 | 6.0 | 4.7 | 6.4 | 19.0 |
| DA-2 | 25 | 4 | 14 | 52.0 | 8.0 | 14.2 | 41.0 | 6.0 | 4.7 | 6.4 | 35.0 |
| DA-3 | 50 | 5 | 23 | 78.0 | 8.0 | 14.2 | 66.0 | 6.0 | 4.7 | 6.4 | 60.0 |
| DA-4 | 75 | 6 | 31 | 103.0 | 8.0 | 14.2 | 92.0 | 6.0 | 4.7 | 6.4 | 86.0 |
| DA-5 | 100 | 8 | 34 | 128.0 | 8.0 | 14.2 | 117.0 | 6.0 | 4.7 | 6.4 | 89.0 |
| DA-6 | 127 | 8 | 43 | 154.0 | 8.0 | 14.2 | 142.0 | 6.0 | 4.7 | 6.4 | 114.0 |
| EA-1 | 13 | 4 | 11 | 27.0 | 10.4 | 19.0 | 15.0 | 9.0 | 6.3 | 9.5 | 19.0 |
| EA-2 | 25 | 5 | 26 | 52.0 | 10.4 | 19.0 | 41.0 | 9.0 | 6.3 | 9.5 | 35.0 |
| EA-3 | 50 | 5 | 37 | 78.0 | 10.4 | 19.0 | 66.0 | 9.0 | 6.3 | 9.5 | 60.0 |
| EA-4 | 75 | 6 | 48 | 103.0 | 10.4 | 19.0 | 92.0 | 9.0 | 6.3 | 9.5 | 86.0 |
| EA-5 | 100 | 7 | 60 | 128.0 | 10.4 | 19.0 | 117.0 | 9.0 | 6.3 | 9.5 | 89.0 |
| EA-6 | 127 | 8 | 71 | 154.0 | 10.4 | 19.0 | 142.0 | 9.0 | 6.3 | 9.5 | 114.0 |
| MA-1 | 13 | 5 | 34 | 40.0 | 12.7 | 25.4 | 32.0 | 10.0 | 6.3 | 12.7 | 32.0 |
| MA-2 | 25 | 5 | 48 | 65.0 | 12.7 | 25.4 | 57.0 | 10.0 | 6.3 | 12.7 | 57.0 |
| MA-2.5 | 38 | 6 | 54 | 78.0 | 12.7 | 25.4 | 65.0 | 10.0 | 6.3 | 12.7 | 65.0 |
| MA-3 | 50 | 7 | 62 | 90.0 | 12.7 | 25.4 | 82.0 | 10.0 | 6.3 | 12.7 | 82.0 |
| MA-4 | 75 | 8 | 142 | 116.0 | 12.7 | 25.4 | 108.0 | 10.0 | 6.3 | 12.7 | 108.0 |

Dimensions in mm

| SERIES | CA | DA | EA | MA | NA | SA1 | SA2 | SA3 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CARRIAGE <br> 4 HOLES (I) | M2 <br> THREAD | M2 <br> THREAD | M3 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M5 <br> THREAD |
| BASE HOLE d | M2 THREAD | 2.2 | 3.5 | 3.5 | 4.6 | 4.6 | 4.6 | 5.8 |
| BASE HOLE D | - | 4.0 | 6.1 | 6.1 | 8.1 | 8.1 | 8.1 | 10 |
| BASE HOLE h | - | 2.2 | 3.4 | 3.4 | 4.4 | 4.4 | 4.4 | 5.3 |
| COUNTER BORE <br> SCREW SIZE | N/A | M2 | M3 | M3 | M4 | M4 | M4 | M5 |




Straight Line Accuracy
$.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel
Positional Repeatability
.005mm
Finish
Clear anodize standard Black anodize available at no extra cost.

## Coefficient of Friction

 0.003 typical
## Construction

Aluminum carriage and base, hardened steel shafts and balls, mild steel end caps.
moment load ratings + load / life formulas. pg. 91

| *Minimum Centered around Mean Position |  |  |  |  |  |  |  |  | BASE DIMENSIONS |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MODEL | TRAVEL | $\begin{aligned} & \text { LOAD } \\ & \text { CAPACITY } \\ & (\mathrm{kg}) \end{aligned}$ | WEIGHT <br> (g) | $\underset{\mathrm{A}}{\text { LENGTH }}$ | $\underset{B}{\text { HEIGHT }}$ | $\underset{\mathrm{C}}{\text { WIDTH }}$ | ${ }_{D} \mathrm{SI}$ | $E$ | $\underset{F}{\text { HEIGHT }}$ | $\underset{G}{\text { WIDTH }}$ | $\begin{gathered} \text { HOLE } \\ \text { SPACING } \\ \mathbf{H} \end{gathered}$ |
| NA-1 | 19 | 7 | 37 | 40.0 | 13.4 | 26.9 | 32.0 | 10.0 | 7.9 | 12.7 | 28.0 |
| NA-2 | 38 | 8 | 65 | 65.0 | 13.4 | 26.9 | 57.0 | 10.0 | 7.9 | 12.7 | 54.0 |
| NA-3 | 50 | 9 | 85 | 90.0 | 13.4 | 26.9 | 82.0 | 10.0 | 7.9 | 12.7 | 79.0 |
| NA-4 | 75 | 11 | 147 | 116.0 | 13.4 | 26.9 | 102.0 | 10.0 | 7.9 | 12.7 | 82.0 |
| NA-6 | 100 | 14 | 170 | 152.0 | 13.4 | 26.9 | 140.0 | 10.0 | 7.9 | 12.7 | 102.0 |
| NA-8 | 150 | 16 | 198 | 203.0 | 13.4 | 26.9 | 190.0 | 10.0 | 7.9 | 12.7 | 127.0 |
| NA-10 | 200 | 18 | 227 | 254.0 | 13.4 | 26.9 | 240.0 | 10.0 | 7.9 | 12.7 | 178.0 |
| SA1-1 | 25 | 7 | 82 | 51.0 | 15.8 | 38.0 | 35.0 | 16.0 | 8.6 | 19.0 | 37.0 |
| SA1-2 | 50 | 9 | 122 | 76.0 | 15.8 | 38.0 | 60.0 | 16.0 | 8.6 | 19.0 | 60.0 |
| SA1-3 | 75 | 11 | 170 | 102.0 | 15.8 | 38.0 | 85.0 | 16.0 | 8.6 | 19.0 | 85.0 |
| SA1-3.5 | 88 | 14 | 190 | 127.0 | 15.8 | 38.0 | 110.0 | 16.0 | 8.6 | 19.0 | 85.0 |
| SA1-4 | 100 | 16 | 232 | 152.0 | 15.8 | 38.0 | 136.0 | 16.0 | 8.6 | 19.0 | 100.0 |
| SA1-6 | 150 | 20 | 261 | 203.0 | 15.8 | 38.0 | 186.0 | 16.0 | 8.6 | 19.0 | 128.0 |
| SA1-8 | 200 | 25 | 326 | 254.0 | 15.8 | 38.0 | 238.0 | 16.0 | 8.6 | 19.0 | 178.0 |
| SA2-1 | 25 | 9 | 113 | 51.0 | 19.0 | 44.0 | 35.0 | 20.0 | 10.2 | 22.2 | 38.0 |
| SA2-1.5 | 38 | 14 | 170 | 70.0 | 19.0 | 44.0 | 55.0 | 20.0 | 10.2 | 22.2 | 55.0 |
| SA2-2 | 50 | 19 | 184 | 83.0 | 19.0 | 44.0 | 65.0 | 20.0 | 10.2 | 22.2 | 65.0 |
| SA2-3 | 75 | 24 | 227 | 102.0 | 19.0 | 44.0 | 85.0 | 20.0 | 10.2 | 22.2 | 85.0 |
| SA2-4 | 100 | 27 | 335 | 152.0 | 19.0 | 44.0 | 140.0 | 20.0 | 10.2 | 22.2 | 100.0 |
| SA2-6 | 150 | 34 | 445 | 203.0 | 19.0 | 44.0 | 190.0 | 20.0 | 10.2 | 22.2 | 126.0 |
| SA2-8 | 200 | 41 | 553 | 254.0 | 19.0 | 44.0 | 240.0 | 20.0 | 10.2 | 22.2 | 178.0 |
| SA3-1 | 25 | 14 | 283 | 67.0 | 25.4 | 66.5 | 54.0 | 35.0 | 15.9 | 38.1 | 54.0 |
| SA3-1.5 | 38 | 16 | 283 | 67.0 | 25.4 | 66.5 | 42.0 | 35.0 | 15.9 | 38.1 | 42.0 |
| SA3-2 | 50 | 28 | 425 | 102.0 | 25.4 | 66.5 | 75.0 | 35.0 | 15.9 | 38.1 | 75.0 |
| SA3-3 | 75 | 40 | 590 | 127.0 | 25.4 | 66.5 | 100.0 | 35.0 | 15.9 | 38.1 | 100.0 |
| SАЗ-4 | 100 | 54 | 771 | 152.0 | 25.4 | 66.5 | 125.0 | 35.0 | 15.9 | 38.1 | 125.0 |
| SA3-5 | 127 | 61 | 879 | 203.0 | 25.4 | 66.5 | 175.0 | 35.0 | 15.9 | 38.1 | 187.0 |
| SA3-6 | 150 | 68 | 498 | 229.0 | 25.4 | 66.5 | **75.0 | 35.0 | 15.9 | 38.1 | 178.0 |
| SАЗ-9 | 228 | 84 | 1318 | 305.0 | 25.4 | 66.5 | **75.0 | 35.0 | 15.9 | 38.1 | 254.0 |
| SA3-12 | 304 | 93 | 1644 | 381.0 | 25.4 | 66.5 | **75.0 | 35.0 | 15.9 | 38.1 | 330.0 |

Dimensions in mm

## Ant-Greep Linear Slides

## 6 Reasons to choose Del-Tron ${ }^{\star}$ Anti-Creep ${ }^{\text {ma }}$ Ball Slides



1. Ideal for vertical applications.
2. Increased life with overhanging loads.

## 3. Positive internal stops.

4. Low friction, straight line design.
5. Factory preload controls side play and backlash.
6. . $013 \mathrm{~mm} / 25 \mathrm{~m}$ " straight line accuracy.

## Del-Tron ${ }^{\text {® }}$ Anti-Creep ${ }^{m \times}$ Slides

In certain applications, uneven loads, improper preload, vertical mounting, or offset forces may cause the ball retainers to become misaligned relative to each other. The misalignment ("creep") can ultimately cause a reduction in overall travel, the need for increased force to achieve full travel and even failure of the assembly.

Del-Tron’s ${ }^{\circledR}$ Anti-Creep ${ }^{\text {T" }}$ retainer design prevents these problems. The single piece retainer and integral positive end stops prevent ball retainer misalignment and help keep the rolling elements centered in the assembly. The retainer is molded of engineering plastic and slotted in the center. Dowel pins mounted in the base and carriage limit the travel of the retainer and help to keep it centered in the slide for full travel and extended life. In applications in which retainer misalignment is a concern, Del-Tron ${ }^{\text {® }}$ Anti-Creep ${ }^{\text {"" }}$ slides demonstrate greatly increased life and improved performance. Anti-Creep ${ }^{\text {"" }}$ slides have been extensively tested in Del-Tron's internal testing facility and successfully used in the field for over seven years. If you are concerned that your application may induce uneven loads or forces or if the need for a slide operating vertically exists, consider Del-Tron's ${ }^{\oplus}$ Anti-Creep ${ }^{\text {"T" }}$ retainer design.


Anti-Creep Linear Slides
moment load ratings + load / life formulas. pg. 91

| * Minimum Centered around Mean Position |  |  |  |  |  |  | CARRIAGE - HOLE SPACING |  | BASE DIMENSIONS |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | LOAD CAPACITY |  |  |  |  |  |  |  |  | HOLE SPACING |
| MODEL | TRAVEL* | (kg) | (g) | A | B | C | D | E | F | G | H |
| CA-1AC | 13 | . 68 | 3 | 19.0 | 5.8 | 9.7 | 13.0 | 4.0 | 3.4 | 4.0 | 10.0 |
| CA-2AC | 25 | . 68 | 4 | 32.0 | 5.8 | 9.7 | 26.0 | 4.0 | 3.4 | 4.0 | 20.0 |
| CA-3AC | 38 | . 68 | 7 | 44.0 | 5.8 | 9.7 | 37.0 | 4.0 | 3.4 | 4.0 | 30.0 |
| DA-1AC | 13 | 2 | 9 | 27.0 | 8.0 | 14.2 | 15.0 | 6.0 | 4.7 | 6.4 | 19.0 |
| DA-2AC | 25 | 4 | 14 | 52.0 | 8.0 | 14.2 | 41.0 | 6.0 | 4.7 | 6.4 | 35.0 |
| DA-3AC | 50 | 5 | 23 | 78.0 | 8.0 | 14.2 | 66.0 | 6.0 | 4.7 | 6.4 | 60.0 |
| DA-4AC | 75 | 6 | 31 | 103.0 | 8.0 | 14.2 | 92.0 | 6.0 | 4.7 | 6.4 | 86.0 |
| DA-5AC | 100 | 8 | 34 | 128.0 | 8.0 | 14.2 | 117.0 | 6.0 | 4.7 | 6.4 | 89.0 |
| DA-6AC | 127 | 8 | 43 | 154.0 | 8.0 | 14.2 | 142.0 | 6.0 | 4.7 | 6.4 | 114.0 |
| EA-1AC | 13 | 4 | 11 | 27.0 | 10.4 | 19.0 | 15.0 | 9.0 | 6.3 | 9.5 | 19.0 |
| EA-2AC | 25 | 5 | 26 | 52.0 | 10.4 | 19.0 | 41.0 | 9.0 | 6.3 | 9.5 | 35.0 |
| EA-3AC | 50 | 5 | 37 | 78.0 | 10.4 | 19.0 | 66.0 | 9.0 | 6.3 | 9.5 | 60.0 |
| EA-4AC | 75 | 6 | 48 | 103.0 | 10.4 | 19.0 | 92.0 | 9.0 | 6.3 | 9.5 | 86.0 |
| EA-5AC | 100 | 7 | 60 | 128.0 | 10.4 | 19.0 | 117.0 | 9.0 | 6.3 | 9.5 | 89.0 |
| EA-6AC | 127 | 8 | 71 | 154.0 | 10.4 | 19.0 | 142.0 | 9.0 | 6.3 | 9.5 | 114.0 |
| MA-1AC | 13 | 5 | 34 | 40.0 | 12.7 | 25.4 | 32.0 | 10.0 | 6.3 | 12.7 | 32.0 |
| MA-2AC | 25 | 5 | 48 | 65.0 | 12.7 | 25.4 | 57.0 | 10.0 | 6.3 | 12.7 | 57.0 |
| MA-2.5AC | 38 | 6 | 54 | 78.0 | 12.7 | 25.4 | 65.0 | 10.0 | 6.3 | 12.7 | 65.0 |
| MA-3AC | 50 | 7 | 62 | 90.0 | 12.7 | 25.4 | 82.0 | 10.0 | 6.3 | 12.7 | 82.0 |
| MA-4AC | 75 | 8 | 142 | 116.0 | 12.7 | 25.4 | 108.0 | 10.0 | 6.3 | 12.7 | 108.0 |

Dimensions in mm

| SERIES | CA | DA | EA | MA | NA | SA1 | SA2 | SA3 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CARRIAGE <br> 4 HOLES (I) | M2 <br> THREAD | M2 <br> THREAD | M3 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M5 <br> THREAD |
| BASE HOLE d | M2 THREAD | 2.2 | 3.5 | 3.5 | 4.6 | 4.6 | 4.6 | 5.8 |
| BASE HOLE D | - | 4.0 | 6.1 | 6.1 | 8.1 | 8.1 | 8.1 | 10 |
| BASE HOLE h | - | 2.2 | 3.4 | 3.4 | 4.4 | 4.4 | 4.4 | 5.3 |
| COUNTER BORE <br> SCREW SIZE | N/A | M2 | M3 | M3 | M4 | M4 | M4 | M5 |




Straight Line Accuracy
$0.13 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel
Positional Repeatability .005mm

## Finish

Clear anodize standard black anodize available at no extra cost.

Coefficient of Friction
0.003 typical

## Construction

Aluminum carriage and base, hardened steel shafts and balls, mild steel end caps.
moment load ratings + load/life formulas. pg. 91

| *Minimum Centered around Mean Position CARRIAG |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MODEL | TRAVEL* | $\begin{gathered} \text { LOAD } \\ \text { CAPACITY } \end{gathered}$ | WEIGHT <br> (g) | $\underset{A}{\text { LENGTH }}$ | $\underset{B}{\text { HEIGHT }}$ | $\underset{\text { C }}{\text { WIDTH }}$ | D | CING | $\underset{F}{\text { HEIGHT }}$ | $\underset{G}{\text { WIDTH }}$ | $\begin{gathered} \text { HOLE } \\ \text { SPACING } \\ H \end{gathered}$ |
| NA-1AC | 19 | 7 | 37 | 40.0 | 13.4 | 26.9 | 32.0 | 10.0 | 7.9 | 12.7 | 28.0 |
| NA-2AC | 38 | 8 | 65 | 65.0 | 13.4 | 26.9 | 57.0 | 10.0 | 7.9 | 12.7 | 54.0 |
| NA-3AC | 50 | 9 | 85 | 90.0 | 13.4 | 26.9 | 82.0 | 10.0 | 7.9 | 12.7 | 79.0 |
| NA-4AC | 75 | 11 | 147 | 116.0 | 13.4 | 26.9 | 102.0 | 10.0 | 7.9 | 12.7 | 82.0 |
| NA-6AC | 100 | 14 | 170 | 152.0 | 13.4 | 26.9 | 140.0 | 10.0 | 7.9 | 12.7 | 102.0 |
| NA-8AC | 150 | 16 | 198 | 203.0 | 13.4 | 26.9 | 190.0 | 10.0 | 7.9 | 12.7 | 127.0 |
| NA-10AC | 200 | 18 | 227 | 254.0 | 13.4 | 26.9 | 240.0 | 10.0 | 7.9 | 12.7 | 178.0 |
| SA1-1AC | 25 | 7 | 82 | 51.0 | 15.8 | 38.0 | 35.0 | 16.0 | 8.6 | 19.0 | 37.0 |
| SA1-2AC | 50 | 9 | 122 | 76.0 | 15.8 | 38.0 | 60.0 | 16.0 | 8.6 | 19.0 | 60.0 |
| SA1-3AC | 75 | 11 | 170 | 102.0 | 15.8 | 38.0 | 85.0 | 16.0 | 8.6 | 19.0 | 85.0 |
| SA1-3.5AC | 88 | 14 | 190 | 127.0 | 15.8 | 38.0 | 110.0 | 16.0 | 8.6 | 19.0 | 85.0 |
| SA1-4AC | 100 | 16 | 232 | 152.0 | 15.8 | 38.0 | 136.0 | 16.0 | 8.6 | 19.0 | 100.0 |
| SA1-6AC | 150 | 20 | 261 | 203.0 | 15.8 | 38.0 | 186.0 | 16.0 | 8.6 | 19.0 | 128.0 |
| SA1-8AC | 200 | 25 | 326 | 254.0 | 15.8 | 38.0 | 238.0 | 16.0 | 8.6 | 19.0 | 178.0 |
| SA2-1AC | 25 | 9 | 113 | 51.0 | 19.0 | 44.0 | 35.0 | 20.0 | 10.2 | 22.2 | 38.0 |
| SA2-1.5AC | 38 | 14 | 170 | 70.0 | 19.0 | 44.0 | 55.0 | 20.0 | 10.2 | 22.2 | 55.0 |
| SA2-2AC | 50 | 19 | 184 | 83.0 | 19.0 | 44.0 | 65.0 | 20.0 | 10.2 | 22.2 | 65.0 |
| SA2-3AC | 75 | 24 | 227 | 102.0 | 19.0 | 44.0 | 85.0 | 20.0 | 10.2 | 22.2 | 85.0 |
| SA2-4AC | 100 | 27 | 335 | 152.0 | 19.0 | 44.0 | 140.0 | 20.0 | 10.2 | 22.2 | 100.0 |
| SA2-6AC | 150 | 34 | 445 | 203.0 | 19.0 | 44.0 | 190.0 | 20.0 | 10.2 | 22.2 | 126.0 |
| SA2-8AC | 200 | 41 | 553 | 254.0 | 19.0 | 44.0 | 240.0 | 20.0 | 10.2 | 22.2 | 178.0 |
| SA3-1AC | 25 | 14 | 283 | 67.0 | 25.4 | 66.5 | 54.0 | 35.0 | 15.9 | 38.1 | 54.0 |
| SАЗ-1.5AC | 38 | 16 | 283 | 67.0 | 25.4 | 66.5 | 42.0 | 35.0 | 15.9 | 38.1 | 42.0 |
| SA3-2AC | 50 | 28 | 425 | 102.0 | 25.4 | 66.5 | 75.0 | 35.0 | 15.9 | 38.1 | 75.0 |
| SA3-3AC | 75 | 40 | 590 | 127.0 | 25.4 | 66.5 | 100.0 | 35.0 | 15.9 | 38.1 | 100.0 |
| SA3-4AC | 100 | 54 | 771 | 152.0 | 25.4 | 66.5 | 125.0 | 35.0 | 15.9 | 38.1 | 125.0 |
| SA3-5AC | 127 | 61 | 879 | 203.0 | 25.4 | 66.5 | 175.0 | 35.0 | 15.9 | 38.1 | 187.0 |
| SA3-6AC | 150 | 68 | 498 | 229.0 | 25.4 | 66.5 | *75.0 | 35.0 | 15.9 | 38.1 | 178.0 |
| SA3-9AC | 228 | 84 | 1318 | 305.0 | 25.4 | 66.5 | *75.0 | 35.0 | 15.9 | 38.1 | 254.0 |
| SA3-12AC | 304 | 93 | 1644 | 381.0 | 25.4 | 66.5 | *75.0 | 35.0 | 15.9 | 38.1 | 330.0 |

## 6 Reasons to choose Del-Tron ${ }^{\circledR}$ Non-Magnetic Ball Slides



1. Non-Magnetic lightweight design.
2. Silicon nitride ceramic ball bearings, titanium shafts, aluminum carriage and base, brass fasteners.
3. Factory preload minimizes side play and provides low friction.
4. Self cleaning ball bearing design offers long life and requires no lubrication.
5. Standard mounting holes simplify installation.
6. Mounting surfaces, parallel to the line of motion, provide straight line accuracy to $0.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.

## Del-Tron ${ }^{\circledR}$ <br> Ball Slides

Load Ratings and Life Estimates
The rated load capacity of Del-Tron ball slides may be a mass load on a horizontal slide,or a force load normal to the mounting surface in any position. The rated load must be centered and distributed over the slide, and the base must be fully supported on a flat mounting surface so that the ball slide does not act as a beam subject to concentrated or distributed bending forces. Loads supported by protruding arms reduce accuracy and load capacity by acting as levers or ratio arms, and should be avoided even when load forces are small.

When used at the rated load capacity and moderate speeds, a life of 10 million inches of travel can be expected. The expected life at one half the rated load is 100 million inches.

## Friction and Lubrication

The coefficient of friction is lower for linear ball bearings than for rotary bearings, where the peripheral track is shorter on the inner race than on the outer race, causing the ball to skid on one or the other. The balls run exactly equal distances on the pair of tracks in linear bearings, permitting the ball to run without friction, wear, or skidding at any preload. The typical coefficient of friction for Del-Tron ${ }^{\circledR}$ ball slides is 0.003 .

Lubrication is recommended for speeds above 1800 inches $/ \mathrm{min}$, and is advisable at lower speeds where high loads are applied in continuous duty applications.

## Mounting and Accuracy

The mounting surfaces of the ball slide are machined flat and smooth, and parallel to each other and the line of motion. They must be mounted on smooth, flat supports that will not deflect under load. Especially with long slides of small cross section, binding may be caused by distortion of the bottom member when mounted on irregular surfaces. If so, round shims or spacers may be placed over the mounting screws to raise the slide above the surface asperities. Bedding in epoxy resin is also recommended.

The specified accuracy for all standard Del-Tron ball slides is .0005inch/inch of travel. This is measured by comparison of the line of travel to a master straight edge, using a gage or indicator mounted on the slide.


Non-Magnetic
Linear Ball Slides

| * Minimum Centered around Mean Position |  |  |  |  |  |  | CARRIAGE HOLE SPACING |  | BASE DIMENSIONS |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\begin{aligned} & \text { LOAD } \\ & \text { CAPACITY } \end{aligned}$ | WEIGHT | LENGTH | HEIGHT | WIDTH |  |  | HEIGHT | WIDTH | $\begin{aligned} & \text { HOLE } \\ & \text { SPACING } \end{aligned}$ |
| MODEL TR | TRAVEL* | (kg) | (g) | A | B | C | D | E | F | G | H |
| DA-1-NMS | 13 | . 5 | 9 | 27.0 | 8.0 | 14.2 | 15.0 | 6.0 | 4.7 | 6.4 | 19.0 |
| DA-2-NMS | 25 | 1.1 | 14 | 52.0 | 8.0 | 14.2 | 41.0 | 6.0 | 4.7 | 6.4 | 35.0 |
| DA-3-NMS | 50 | 1.6 | 23 | 78.0 | 8.0 | 14.2 | 66.0 | 6.0 | 4.7 | 6.4 | 60.0 |
| DA-4-NMS | 75 | 1.9 | 31 | 103.0 | 8.0 | 14.2 | 92.0 | 6.0 | 4.7 | 6.4 | 86.0 |
| DA-5-NMS | 100 | 2.2 | 34 | 128.0 | 8.0 | 14.2 | 117.0 | 6.0 | 4.7 | 6.4 | 89.0 |
| DA-6-NMS | 127 | 2.5 | 43 | 154.0 | 8.0 | 14.2 | 142.0 | 6.0 | 4.7 | 6.4 | 114.0 |
| EA-1-NMS | 13 | 1.1 | 11 | 27.0 | 10.4 | 19.0 | 15.0 | 9.0 | 6.3 | 9.5 | 19.0 |
| EA-2-NMS | 25 | 1.4 | 26 | 52.0 | 10.4 | 19.0 | 41.0 | 9.0 | 6.3 | 9.5 | 35.0 |
| EA-3-NMS | 50 | 1.6 | 37 | 78.0 | 10.4 | 19.0 | 66.0 | 9.0 | 6.3 | 9.5 | 60.0 |
| EA-4-NMS | 75 | 1.9 | 48 | 103.0 | 10.4 | 19.0 | 92.0 | 9.0 | 6.3 | 9.5 | 86.0 |
| EA-5-NMS | 100 | 2.2 | 60 | 128.0 | 10.4 | 19.0 | 117.0 | 9.0 | 6.3 | 9.5 | 89.0 |
| EA-6-NMS | 127 | 2.5 | 71 | 154.0 | 10.4 | 19.0 | 142.0 | 9.0 | 6.3 | 9.5 | 114.0 |
| MA-1-NMS | 13 | 1.4 | 34 | 40.0 | 12.7 | 25.4 | 32.0 | 10.0 | 6.3 | 12.7 | 32.0 |
| MA-2-NMS | 25 | 1.6 | 48 | 65.0 | 12.7 | 25.4 | 57.0 | 10.0 | 6.3 | 12.7 | 57.0 |
| MA-2.5-NMS | 38 | 1.8 | 54 | 78.0 | 12.7 | 25.4 | 65.0 | 10.0 | 6.3 | 12.7 | 65.0 |
| MA-3-NMS | 50 | 2.1 | 62 | 90.0 | 12.7 | 25.4 | 82.0 | 10.0 | 6.3 | 12.7 | 82.0 |
| MA-4-NMS | 75 | 2.5 | 142 | 116.0 | 12.7 | 25.4 | 108.0 | 10.0 | 6.3 | 12.7 | 108.0 |

Dimensions in mm
$\left.\begin{array}{|c|c|c|c|c|c|c|c|}\hline \text { SERIES } & \text { DA } & \text { EA } & \text { MA } & \text { NA } & \text { SA1 } & \text { SA2 } & \text { SA3 } \\ \hline \begin{array}{c}\text { CARRIAGE } \\ \text { 4 HOLES (I) }\end{array} & \begin{array}{c}\text { M2 } \\ \text { THREAD }\end{array} & \begin{array}{c}\text { M3 } \\ \text { THREAD }\end{array} & \begin{array}{c}\text { M4 } \\ \text { THREAD }\end{array} & \begin{array}{c}\text { M4 } \\ \text { THREAD }\end{array} & \begin{array}{c}\text { M4 } \\ \text { THREAD }\end{array} & \begin{array}{c}\text { M4 } \\ \text { THREAD }\end{array} & \text { M5 } \\ \hline \text { THASEAD }\end{array}\right]$



Straight Line Accuracy
$.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel
Positional Repeatability
.005 mm
Finish
Clear anodize standard Black anodize available at no extra cost.

## Coefficient of Friction

 0.003 typical
## Construction

Silicon nitride ceramic ball bearings, titanium shafts, aluminum carriage base and end caps, brass fasteners.

| *Minimum Centered around Mean Position |  |  |  |  |  |  |  |  | $\lceil\text { BASE DIMENSIONS } \longrightarrow$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MODEL <br> TR |  | $\begin{aligned} & \text { LOAD } \\ & \text { CAPACITY } \\ & (\mathrm{kg}) \end{aligned}$ | WEIGHT <br> (g) | $\underset{A}{\text { LENGTH }}$ | $\underset{B}{\text { HEIGHT }}$ | $\underset{\text { C }}{\text { WIDTH }}$ | $D_{0}^{\delta}$ | $G_{E}$ | $\underset{F}{\text { HEIGHT }}$ | $\underset{G}{\text { WIDTH }}$ | $\begin{aligned} & \text { HOLE } \\ & \text { SPACING } \\ & H \end{aligned}$ |
| NA-1-NMS | 19 | 2.1 | 37 | 40.0 | 13.4 | 26.9 | 32.0 | 10.0 | 7.9 | 12.7 | 28.0 |
| NA-2-NMS | 38 | 2.5 | 65 | 65.0 | 13.4 | 26.9 | 57.0 | 10.0 | 7.9 | 12.7 | 54.0 |
| NA-3-NMS | 50 | 2.7 | 85 | 90.0 | 13.4 | 26.9 | 82.0 | 10.0 | 7.9 | 12.7 | 79.0 |
| NA-4-NMS | 75 | 3.4 | 147 | 116.0 | 13.4 | 26.9 | 102.0 | 10.0 | 7.9 | 12.7 | 82.0 |
| NA-6-NMS | 100 | 4.1 | 170 | 152.0 | 13.4 | 26.9 | 140.0 | 10.0 | 7.9 | 12.7 | 102.0 |
| NA-8-NMS | 150 | 4.8 | 198 | 203.0 | 13.4 | 26.9 | 190.0 | 10.0 | 7.9 | 12.7 | 127.0 |
| NA-10-NMS | 200 | 5.4 | 227 | 254.0 | 13.4 | 26.9 | 240.0 | 10.0 | 7.9 | 12.7 | 178.0 |
| SA1-1-NMS | 25 | 2.1 | 82 | 51.0 | 15.8 | 38.0 | 35.0 | 16.0 | 8.6 | 19.0 | 37.0 |
| SA1-2-NMS | 50 | 2.7 | 122 | 76.0 | 15.8 | 38.0 | 60.0 | 16.0 | 8.6 | 19.0 | 60.0 |
| SA1-3-NMS | 75 | 3.4 | 170 | 102.0 | 15.8 | 38.0 | 85.0 | 16.0 | 8.6 | 19.0 | 85.0 |
| SA1-3.5-NMS | S 88 | 4.1 | 190 | 127.0 | 15.8 | 38.0 | 110.0 | 16.0 | 8.6 | 19.0 | 85.0 |
| SA1-4-NMS | 100 | 4.8 | 232 | 152.0 | 15.8 | 38.0 | 136.0 | 16.0 | 8.6 | 19.0 | 100.0 |
| SA1-6-NMS | 150 | 6.1 | 261 | 203.0 | 15.8 | 38.0 | 186.0 | 16.0 | 8.6 | 19.0 | 128.0 |
| SA1-8-NMS | 200 | 7.5 | 326 | 254.0 | 15.8 | 38.0 | 238.0 | 16.0 | 8.6 | 19.0 | 178.0 |
| SA2-1-NMS | 25 | 2.7 | 113 | 51.0 | 19.0 | 44.0 | 35.0 | 20.0 | 10.2 | 22.2 | 38.0 |
| SA2-1.5-NMS | S 38 | 4.1 | 170 | 70.0 | 19.0 | 44.0 | 55.0 | 20.0 | 10.2 | 22.2 | 55.0 |
| SA2-2-NMS | 50 | 5.7 | 184 | 83.0 | 19.0 | 44.0 | 65.0 | 20.0 | 10.2 | 22.2 | 65.0 |
| SA2-3-NMS | 75 | 7.0 | 227 | 102.0 | 19.0 | 44.0 | 85.0 | 20.0 | 10.2 | 22.2 | 85.0 |
| SA2-4-NMS | 100 | 8.2 | 335 | 152.0 | 19.0 | 44.0 | 140.0 | 20.0 | 10.2 | 22.2 | 100.0 |
| SA2-6-NMS | 150 | 10.2 | 445 | 203.0 | 19.0 | 44.0 | 190.0 | 20.0 | 10.2 | 22.2 | 126.0 |
| SA2-8-NMS | 200 | 12.3 | 553 | 254.0 | 19.0 | 44.0 | 240.0 | 20.0 | 10.2 | 22.2 | 178.0 |
| SA3-1-NMS | 25 | 4.1 | 283 | 67.0 | 25.4 | 66.5 | 54.0 | 35.0 | 15.9 | 38.1 | 54.0 |
| SA3-1.5-NMS | S 38 | 4.8 | 283 | 67.0 | 25.4 | 66.5 | 42.0 | 35.0 | 15.9 | 38.1 | 42.0 |
| SA3-2-NMS | 50 | 8.5 | 425 | 102.0 | 25.4 | 66.5 | 75.0 | 35.0 | 15.9 | 38.1 | 75.0 |
| SA3-3-NMS | 75 | 12.0 | 590 | 127.0 | 25.4 | 66.5 | 100.0 | 35.0 | 15.9 | 38.1 | 100.0 |
| SA3-4-NMS | 100 | 16.1 | 771 | 152.0 | 25.4 | 66.5 | 125.0 | 35.0 | 15.9 | 38.1 | 125.0 |
| SA3-5-NMS | 127 | 18.4 | 879 | 203.0 | 25.4 | 66.5 | 175.0 | 35.0 | 15.9 | 38.1 | 187.0 |
| SA3-6-NMS | 150 | 20.5 | 498 | 229.0 | 25.4 | 66.5 | **75.0 | 35.0 | 15.9 | 38.1 | 178.0 |
| SA3-9-NMS | 228 | 25.2 | 1318 | 305.0 | 25.4 | 66.5 | **75.0 | 35.0 | 15.9 | 38.1 | 254.0 |
| SA3-12-NMS | 304 | 28.0 | 1644 | 381.0 | 25.4 | 66.5 | **75.0 | 35.0 | 15.9 | 38.1 | 330.0 |

Dimensions in mm

## Grossed Roller Slfdes

## 6 Reasons to choose Del-Tron® Crossed Roller Slides



1. Positive stops prevent overtravel.
2. Rollers improve load capacity 8-10 times that of balls.
3. Precision ground shafts provide straight line accuracy of .003 mm per 25mm of travel.
4. Alternately crossed rollers handle force in any direction.
5. Lightweight aluminum carriage and base.
6. Interchangeable with many types of ball slides.

## Del-Tron® Crossed Roller Slides

Del-Tron's new series of crossed roller slides, offer designers additional flexibility in their choice of ready to install components for precision linear transfer.

Our crossed roller slides, when compared to our ball slide products of equal size, offer higher load carrying capacity and, when operating at high cycling rates or with shock and overhanging loads, improved performance. Most importantly, our crossed roller slides provide high accuracy, $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel, and repeatability, .003 mm , exceeding our precision ball slides. Although crossed roller slides cost more than equivalent size ball slides, their overall performance, especially in applications where heavy loads must be moved in compact assemblies, often justifies selection.

## Operation

Crossed roller slides physically resemble ball slides except for the bearing design. Specifically, each slide is comprised of an aluminum carriage straddling an aluminum base. Using a bearing system containing cylindrical steel rollers, the carriage glides, almost friction free, over the base.

The rollers, alternately crisscrossed with each other, move between a set of 4 , partially flat, parallel, smooth rods on each side of the base. The rollers share a larger contact surface with the rods as compared to the point contact of steel balls. This bearing design allows crossed roller slides to carry larger loads and absorb greater load impacts than equivalent size ball slides.

Crossed roller slides are not as naturally self-cleaning in operation as ball slides. In operating environments, with little or no protection against dust and when heavy loads are not a consideration, consider Del-Tron ${ }^{\circledR}$ ball slides.

## Wide Selection

Del-Tron offers over 47 models of crossed roller slides. Load capacities range from 14 kg to 354 kg , with travel from 13 mm to 300 mm . Installation into your system is simple. Counterbored holes in the base permit quick attachment to your assembly. Components attach to the carriage in the existing threaded mounting holes.


Crossed Roller Slide Assemblies

## LOAD RATINGS AND LIFE <br> ESTIMATES

Crossed roller slide rated load capacities may be a mass load on a horizontal slide, or a force load normal to the mounting surface in any position. The rated load must be centered and distributed over the slide, and the base must be supported on a flat mounting surface. Avoid concentrated or distributed bending forces.

At rated load capacity and moderate speeds, expected life is 25 million cm of travel. The expected life at one
half the rated load is 250 million cm .

## LUBRICATION

The crossed roller slides are lightly lubricated during assembly. Additional lubrication is required for speeds above $30,000 \mathrm{~mm} / \mathrm{min}$. and is advisable at lower speeds where high loads are applied in continuous duty applications.

## MOUNTING

Mount the crossed roller slides on flat surfaces to provide full support to the base.
moment load ratings + load / life formulas. pg. 92

| * Minimum Centered Around Mean Position |  |  |  |  |  |  |  |  | - BASE DIMENSIONS —— |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MODEL | TRAVEL* | $\begin{aligned} & \text { LOAD } \\ & \text { CAPACITY } \\ & (\mathrm{kg}) \end{aligned}$ | $\underset{(\mathrm{g})}{\text { WEIGHT }}$ | $\underset{A}{\text { LENGTH }}$ | $\underset{B}{\text { HEIGHT }}$ | $\underset{\text { C }}{\text { WIDTH }}$ | $\prod_{D} S P$ | $\mathrm{E}_{\mathrm{E}}{ }_{\mathrm{E}}$ | HEIGHT F | WIDTH <br> G | $\begin{gathered} \text { HOLE } \\ \text { SPACING } \end{gathered}$ |
| RDA-1 | 13 | 14 | 11 | 27.0 | 8.0 | 14.2 | 15.0 | 6.0 | 4.7 | 6.4 | 19.0 |
| RDA-2 | 25 | 25 | 17 | 52.0 | 8.0 | 14.2 | 41.0 | 6.0 | 4.7 | 6.4 | 35.0 |
| RDA-3 | 50 | 30 | 26 | 78.0 | 8.0 | 14.2 | 66.0 | 6.0 | 4.7 | 6.4 | 60.0 |
| RDA-4 | 75 | 32 | 34 | 103.0 | 8.0 | 14.2 | 92.0 | 6.0 | 4.7 | 6.4 | 86.0 |
| RDA-5 | 100 | 36 | 37 | 129.0 | 8.0 | 14.2 | 117.0 | 6.0 | 4.7 | 6.4 | 89.0 |
| RDA-6 | 127 | 41 | 45 | 154.0 | 8.0 | 14.2 | 143.0 | 6.0 | 4.7 | 6.4 | 114.0 |
| REA-1 | 13 | 22 | 14 | 27.0 | 10.4 | 19.0 | 15.0 | 9.0 | 6.3 | 9.5 | 19.0 |
| REA-2 | 25 | 35 | 28 | 52.0 | 10.4 | 19.0 | 41.0 | 9.0 | 6.3 | 9.5 | 35.0 |
| REA-3 | 50 | 42 | 40 | 78.0 | 10.4 | 19.0 | 66.0 | 9.0 | 6.3 | 9.5 | 60.0 |
| REA-4 | 75 | 44 | 51 | 103.0 | 10.4 | 19.0 | 92.0 | 9.0 | 6.3 | 9.5 | 86.0 |
| REA-5 | 100 | 47 | 62 | 129.0 | 10.4 | 19.0 | 117.0 | 9.0 | 6.3 | 9.5 | 89.0 |
| REA-6 | 127 | 49 | 74 | 154.0 | 10.4 | 19.0 | 142.0 | 9.0 | 6.3 | 9.5 | 114.0 |
| RMA-1 | 13 | 32 | 37 | 40.0 | 12.7 | 25.4 | 32.0 | 10.0 | 6.3 | 12.7 | 32.0 |
| RMA-2 | 25 | 35 | 51 | 65.0 | 12.7 | 25.4 | 57.0 | 10.0 | 6.3 | 12.7 | 57.0 |
| RMA-2.5 | 38 | 35 | 57 | 78.0 | 12.7 | 25.4 | 65.0 | 10.0 | 6.3 | 12.7 | 65.0 |
| RMA-3 | 50 | 38 | 65 | 90.0 | 12.7 | 25.4 | 82.0 | 10.0 | 6.3 | 12.7 | 82.0 |
| RMA-4 | 75 | 41 | 79 | 116.0 | 12.7 | 25.4 | 108.0 | 10.0 | 6.3 | 12.7 | 108.0 |

Dimensions in mm

| SERIES | RDA | REA | RMA | RNA | RSA1 | RSA2 | RSA3 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CARRIAGE <br> 4 HOLES (I) | M2 <br> THREAD | M3 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M4 <br> THREAD | M5 <br> THREAD |
| BASE HOLE d | 2.2 | 3.5 | 3.5 | 4.6 | 4.6 | 4.6 | 5.8 |
| BASE HOLE D1 | 4.0 | 6.1 | 6.1 | 8.1 | 8.1 | 8.1 | 10 |
| BASE HOLE h | 2.2 | 3.4 | 3.4 | 4.4 | 4.4 | 4.4 | 5.3 |
| COUNTER BORE <br> SCREW SIZE | M2 | M3 | M3 | M4 | M4 | M4 | M5 |




| Straight line accuracy | $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel |
| :--- | :--- |
| Positional repeatability | .003 mm |
| Coefficient of friction | .003 typical |
| Construction | Aluminum carriage and base, <br> hardened steel rods and <br> rollers, stainless steel end <br> caps. |
|  |  |

Finish

## Precision Series

## 6 Reasons to choose <br> Del-Tron® <br> Precision Series <br> (Ball or Crossed <br> Roller Slides)



1. Corrosion resistant hardened stainless steel internal components.
2. Up to 127 mm wide cross section.
3. Interchangeable with other manufacturer's products.
4. Low friction straight line design.
5. Adjustable preload.
6. Straight line design with 0.001 mm repeatability

## Precision Series (Ball or Crossed Roller Slides)

Del-Tron ${ }^{\circledR}$ Precision Series Ball and Roller Slides offer the designer an aluminum base and carriage with hardened stainless components for superior corrosion resistance and less chance of particulate contamination. Available in standard low profile mounting, the designer can choose a style of bearing and type of rolling element specifically to meet the needs of the most particular applications.

Preload can be adjusted to change the friction and axial play characteristics therefore customizing the slide to its intended use. A new 127 mm wide cross section allows the movement of bulky devices without the necessity of constructing tables with more than one unit.


## Precision Series <br> Ball Slides

SPECIFICATIONS:

## Straight Line Accuracy

$.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.

## Repeatability

0.001 mm

Coefficient of Friction 0.002

## Construction

Aluminum carriage and base.
Hardened stainless steel balls, shafts, pre-load gibs.
Interchangeable with other manufacturers. Economical Ball Slide design.

moment load ratings + load / life formulas. pg. 92

| *Minimum Centered Around Mean Position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model | Travel* | Load Capacity (kg) | Weight (g) | A | B | C | D | d | $\mathrm{D}_{1}$ | $\mathrm{D}_{2}$ | E | F | G | H | h | I |
| MA-2SS | 25 | 5.4 | 57 | 65.0 |  |  | 57 |  |  |  |  |  |  | 57 |  |  |
| MA-3SS | 50 | 9.1 | 79 | 90.4 | 12.7 | 25.4 | 83 | 3.5 | 6.1 | - | 10 | 6.4 | 10.2 | 83 | 3.4 | M4 |
| MA-4SS | 75 | 10 | 102 | 115.8 |  |  | 108 |  |  | - |  |  |  | 108 |  |  |
| SA2-1SS | 25 | 9.1 | 113 | 50.8 |  |  | 35 |  |  | - |  |  |  | 38 |  |  |
| SA2-1.5SS | 38 | 15 | 154 | 69.9 |  |  | 54 |  |  | - |  |  |  | 54 |  |  |
| SA2-2SS | 50 | 20 | 186 | 82.6 | 19.1 | 44.5 | 65 | 4.6 | 8.1 | - | 20 | 10.2 | 22.1 | 65 | 4.4 | M4 |
| SA2-3SS | 75 | 25 | 227 | 101.6 |  |  | 85 |  |  | - |  |  |  | 85 |  |  |
| SA2-4SS | 100 | 28 | 286 | 127.0 |  |  | 115 |  |  | - |  |  |  | 115 |  |  |
| SA3-1SS | 25 | 16 | 295 | 66.5 |  |  | 54 |  |  | - |  |  |  | 54 |  |  |
| SA3-2SS | 50 | 29 | 453 | 101.6 |  |  | 75 |  |  |  |  |  |  | 75 |  |  |
| SA3-3SS | 75 | 42 | 567 | 127.0 | 25.4 | 66.5 | 100 | 5.8 | 10 | - | 35 | 15.5 | 38.1 | 100 | 5.3 | M5 |
| SA3-4SS | 100 | 55 | 680 | 152.4 |  |  | 125 |  |  | - |  |  |  | 125 |  |  |
| SA3-5SS | 125 | 63 | 794 | 203.2 |  |  | 175 |  |  | - |  |  |  | 187 |  |  |
| SA3-6SS | 150 | 70 | 1021 | 228.6 |  |  | 150 |  |  | 75 |  |  |  | 178 |  |  |
| SA5-3SS | 75 | 42 | 1021 | 127.0 |  |  | 100 |  |  | 50 |  |  |  | 100 |  |  |
| SA5-5SS | 125 | 64 | 1474 | 177.8 | 25.4 | 127.0 | 150 | 7.1 | 11 | 75 | 100 | 15.5 | 98.3 | 150 | 6.2 | M6 |
| SA5-7SS | 175 | 77 | 1928 | 228.6 |  |  | 200 |  |  | 100 |  |  |  | 200 |  |  |

[^0]

## Precision Series Crossed Roller Slides

## SPECIFICATIONS:

## Straight Line Accuracy

 $0.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.
## Repeatability

0.001 mm

## Coefficient of Friction

 0.002 .
## Construction

Aluminum carriage and base.
Hardened stainless steel rollers, shafts, pre-load gibs.
Interchangeable with other manufacturers. Load capacities up to 186 kg. Crossed Roller design offers self-aligning ways and greater load capacity.

moment load ratings + load/life formulas. pg. 92

| *Minimum Centered Around Mean Position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model | Travel* | Load Capacity (kg) | Weight (g) | A | B | C | D | d | $\mathrm{D}_{1}$ | $\mathrm{D}_{2}$ | E | F | G | H | h | I |
| RSA2-1SS | 25 | 36 | 127 | 50.8 |  |  | 35 |  |  | - |  |  |  | 38 |  |  |
| RSA2-2SS | 50 | 54 | 209 | 82.6 | 19.0 | 44.5 | 65 | 4.6 | 8.1 | - | 20 | 10.2 | 22.1 | 65 | 4.6 | M4 |
| RSA2-3SS | 75 | 59 | 254 | 101.6 |  |  | 85 |  |  | - |  |  |  | 85 |  |  |
| RSA2-4SS | 100 | 64 | 286 | 127.0 |  |  | 115 |  |  | - |  |  |  | 115 |  |  |
| RSA3-1SS | 25 | 95 | 299 | 66.5 |  |  | 54 |  |  | - |  |  |  | 54 |  |  |
| RSA3-2SS | 50 | 109 | 454 | 101.6 | 25.4 | 67 | 75 | 5.8 | 10 | - | 35 | 15.5 | 38.1 | 75 | 5.3 | M5 |
| RSA3-3SS | 75 | 154 | 567 | 127.0 |  |  | 100 |  |  | - |  |  |  | 100 |  |  |
| RSA3-4SS | 100 | 173 | 680 | 152.4 |  |  | 125 |  |  | - |  |  |  | 125 |  |  |
| RSA3-5SS | 125 | 186 | 907 | 203.2 |  |  | 175 |  |  | - |  |  |  | 187 |  |  |
| RSA5-3SS | 75 | 100 | 1021 | 127.0 |  |  | 100 |  |  | 50 |  |  |  | 100 |  |  |
| RSA5-5SS | 125 | 109 | 1474 | 177.8 | 25.4 | 127 | 150 | 7.1 | 11 | 75 | 100 | 15.5 | 98.3 | 150 | 6.2 | M6 |
| RSA5-7SS | 175 | 118 | 1928 | 228.6 |  |  | 200 |  |  | 100 |  |  |  | 200 |  |  |

[^1]
## High Precision Series

## 6 Reasons to choose Del-Tron® <br> High Precision Series (Ball or Crossed Roller Slides)



1. Stable flanged base style available
2. Superior accuracy and repeatability.
3. Precision ground carriage and base.
4. Corrosion resistant hardened stainless steel internal components.
5. Bigger cross sections and lengths for heavy loads and large moving parts.
6. Smooth low friction motion.

## High Precision Series (Ball or Crossed Roller Slides)

Del-Tron® High Precision Series Ball and Crossed Roller Slides offer the designer highly accurate travel characteristics. $.001 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel with superior repeatability of 0.0005 mm . The base and carriage inner surfaces are ground to submicron tolerances while the mounting surfaces are flat to within $.003 \mathrm{~mm} / 25 \mathrm{~mm}$.

The standard low profile style incorporates a base which is surrounded by the carriage leaving little surface to attract and hold contaminants. A flanged base style is offered to allow robust mounting at 4 points to assure stability in high impact or rough duty environments.

These slides utilize Del-Tron's straight line design which allows lower friction characteristics along with the option to manipulate the preload to adjust to the needs of the application.

New larger widths and lengths up to 146 mm wide and 381 mm long increase the versatility of this design.


# High Precision Series Ball Slides <br> (Low Profile) 

SPECIFICATIONS:

## Straight Line Accuracy

$.001 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.

## Repeatability

0.0005 mm

Coefficient of Friction 0.002

## Construction

Aluminum carriage and base. Hardened stainless steel balls, shafts, pre-load gibs. Interchangeable with other manufacturers. Carriage and base ground to optical flatness. Bearing way surfaces held to submicron tolerances. Carriage surface flat to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$. Ball Slide design offers low rolling resistance and economical price.

## HPM SERIES ONLY


$-G=$

moment load ratings + load / life formulas. pg. 93

| *Minimum Centered Around Mean Position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model | Travel* | Load Capacity (kg) | Weight (g) | A | $A_{1}$ | B | C | D | d | D1 | E | F | G | H | h |  |
| HPMA-1 | 13 | 3.6 | 27 | 25.4 | 31.8 |  |  | 15 |  |  |  |  |  | 20 |  |  |
| HPMA-2 | 25 | 6.8 | 50 | 44.5 | 50.8 | 12.7 | 25.4 | 35 | 3.5 | 6.1 | CL | 6.1 | 10.2 | 40 | 3.4 | M3 |
| HPMA-2.5 | 38 | 11 | 73 | 63.5 | 69.9 |  |  | 54 |  |  |  |  |  | 57 |  |  |
| HPMA-3 | 50 | 14 | 91 | 82.6 | 88.8 |  |  | 70 |  |  |  |  |  | 75 |  |  |
| HPSA2-1 | 25 | 11 | 127 | 50.8 | 57.2 |  |  | 35 |  |  |  |  |  | 40 |  |  |
| HPSA2-1.5 | 38 | 14 | 172 | 69.9 | 76.2 | 19.0 | 44.5 | 54 | 4.6 | 8.1 | 20 | 10.2 | 22.1 | 57 | 4.6 | M4 |
| HPSA2-2 | 50 | 19 | 209 | 82.6 | 88.9 |  |  | 65 |  |  |  |  |  | 70 |  |  |
| HPSA2-3 | 75 | 23 | 254 | 101.6 | 108.0 |  |  | 85 |  |  |  |  |  | 90 |  |  |
| HPSA3-1 | 25 | 33 | 299 | 66.5 | 66.5 |  |  | 54 |  |  |  |  |  | 54 |  |  |
| HPSA3-2 | 50 | 38 | 454 | 101.6 | 111.0 |  |  | 75 |  |  |  |  |  | 85 |  |  |
| HPSA3-3 | 75 | 46 | 567 | 127.0 | 136.4 | 25.4 | 66.5 | 100 | 5.8 | 10 | 35 | 15.7 | 38.1 | 110 | 5.3 | M5 |
| HPSA3-4 | 100 | 60 | 680 | 152.4 | 161.8 |  |  | 125 |  |  |  |  |  | 135 |  |  |
| HPSA3-5 | 125 | 66 | 907 | 203.2 | 212.6 |  |  | 178 |  |  |  |  |  | 190 |  |  |
| HPSA4-2 | 50 | 59 | 907 | 101.6 | 114.3 |  |  | 50 |  |  |  |  |  | 65 |  |  |
| HPSA4-3 | 75 | 64 | 1306 | 146.1 | 158.8 |  |  | 95 |  |  |  |  |  | 110 |  |  |
| HPSA4-5 | 125 | 73 | 1814 | 203.2 | 215.9 | 34.9 | 88.9 | 150 | 5.8 | 10 | 50 | 15.7 | 50.3 | 175 | 5.3 | M5 |
| HPSA4-6.5 | 165 | 79 | 2327 | 260.4 | 273.1 |  |  | 210 |  |  |  |  |  | 225 |  |  |
| HPSA4-9 | 225 | 91 | 3175 | 355.6 | 368.3 |  |  | 305 |  |  |  |  |  | 320 |  |  |
| HPSA5-5 | 125 | 68 | 4536 | 209.6 | 222.3 |  |  | 150 |  |  |  |  |  | 175 |  |  |
| HPSA5-7 | 175 | 82 | 6586 | 304.8 | 317.5 | 50.8 | 146.1 | 250 | 7.1 | 11 | 100 | 24.9 | 94.0 | 275 | 6.2 | M6 |
| HPSA5-10 | 250 | 102 | 8233 | 381.0 | 393.7 |  |  | 330 |  |  |  |  |  | 350 |  |  |

[^2]

## High Precision Series <br> Ball Slides <br> (Flange Base)

SPECIFICATIONS:

## Straight Line Accuracy

$.001 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.

## Repeatability

0.0005 mm

Coefficient of Friction 0.002

## Construction

Aluminum carriage and base.
Hardened stainless steel balls, shafts, pre-load gibs.
Interchangeable with other manufacturers. Carriage and base ground to optical flatness. Bearing way surfaces held to submicron tolerances. Carriage surface flat to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$.
Flange Base design allows ease of mounting and stability.

moment load ratings + load / life formulas. pg. 93

| *Minimum Centered Around Mean Position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model | Travel* | Load Capaci <br> (kg) | Weight (g) | A | $A_{1}$ | B | C | D | d | $\mathrm{D}_{1}$ | E | F | $\mathrm{H}_{1}$ | H | h | I | K |
| HPMA-1FB | 13 | 3.6 | 36 | 25.4 | 31.8 |  |  | 15 |  |  |  |  |  | 20 |  |  |  |
| HPMA-2FB | 25 | 6.8 | 64 | 44.5 | 50.8 | 19.1 | 25.4 | 35 | 3.5 | 6.1 | CL | 12.7 | 19 | 40 | 3.4 | M3 | 6.4 |
| HPMA-2.5FB | 38 | 11 | 91 | 63.5 | 69.9 |  |  | 54 |  |  |  |  |  | 57 |  |  |  |
| HPMA-3FB | 50 | 14 | 118 | 82.6 | 88.9 |  |  | 70 |  |  |  |  |  | 75 |  |  |  |
| HPSA2-1FB | 25 | 11 | 172 | 50.8 | 57.2 |  |  | 35 |  |  |  |  |  | 40 |  |  |  |
| HPSA2-1.5FB | 38 | 14 | 236 | 69.9 | 76.2 | 26.2 | 44.5 | 54 | 4.6 | 8.1 | 20 | 17.3 | 33 | 57 | 4.6 | M4 | 7.1 |
| HPSA2-2FB | 50 | 19 | 277 | 82.6 | 88.9 |  |  | 65 |  |  |  |  |  | 70 |  |  |  |
| HPSA2-3FB | 75 | 23 | 340 | 101.6 | 108.0 |  |  | 85 |  |  |  |  |  | 90 |  |  |  |
| HPSA3-1FB | 25 | 33 | 413 | 66.5 | 66.5 |  |  | 54 |  |  |  |  |  | 54 |  |  |  |
| HPSA3-2FB | 50 | 38 | 635 | 101.6 | 111.0 |  |  | 75 |  |  |  |  |  | 85 |  |  |  |
| HPSA3-3FB | 75 | 46 | 794 | 127.0 | 136.4 | 34.9 | 66.5 | 100 | 5.8 | 10 | 35 | 25.4 | 52 | 110 | 5.3 | M5 | 9.4 |
| HPSA3-4FB | 100 | 60 | 953 | 152.4 | 161.8 |  |  | 125 |  |  |  |  |  | 135 |  |  |  |
| HPSA3-5FB | 125 | 66 | 1270 | 203.2 | 212.6 |  |  | 178 |  |  |  |  |  | 190 |  |  |  |
| HPSA4-2FB | 50 | 59 | 1134 | 101.6 | 114.3 |  |  | 50 |  |  |  |  |  | 65 |  |  |  |
| HPSA4-3FB | 75 | 64 | 1628 | 146.1 | 158.8 |  |  | 95 |  |  |  |  |  | 110 |  |  |  |
| HPSA4-5FB | 125 | 73 | 2268 | 203.2 | 215.9 | 44.5 | 88.9 | 150 | 5.8 | 10 | 50 | 25.0 | 70 | 175 | 5.3 | M5 | 9.4 |
| HPSA4-6.5FB | 165 | 79 | 2908 | 260.4 | 273.1 |  |  | 210 |  |  |  |  |  | 225 |  |  |  |
| HPSA4-9FB | 225 | 91 | 3969 | 355.6 | 368.3 |  |  | 305 |  |  |  |  |  | 320 |  |  |  |
| HPSA5-5FB | 125 | 68 | 5443 | 207.6 | 222.3 |  |  | 150 |  |  |  |  |  | 175 |  |  |  |
| HPSA5-7FB | 175 | 82 | 7893 | 304.8 | 317.5 | 60.3 | 146.1 | 250 | 7.1 | 11 | 100 | 34.3 | 127 | 275 | 6.2 | M6 | 9.4 |
| HPSA5-10FB | 250 | 102 | 9870 | 381.0 | 393.7 |  |  | 330 |  |  |  |  |  | 350 |  |  |  |

[^3]

# High Precision Series Crossed Roller Slides (Low Profile) 

## SPECIFICATIONS:

## Straight Line Accuracy

 $.001 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.Repeatability
0.0005 mm

Coefficient of Friction 0.002

## Construction

Aluminum carriage and base. Hardened stainless steel rollers, shafts, pre-load gibs. Interchangeable with other manufacturers. Carriage and base ground to optical flatness. Bearing way surfaces held to submicron tolerances. Carriage surface flat to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$. Crossed Roller design greatly increases load capacity and overhung load capability.

moment load ratings + load / life formulas. pg. 93

| *Minimum Centered Around Mean Position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Model | Travel* | Load Capacity <br> (kg) | Weight (g) | A | $A_{1}$ | B | C | D | d | D 1 | E | F | G | H | h | I |
| HPRSA2-1 | 25 | 41 | 127 | 50.8 | 57.2 |  |  | 35 |  |  |  |  |  | 40 |  |  |
| HPRSA2-1.5 | 38 | 68 | 172 | 69.9 | 76.2 | 19.1 | 44.5 | 54 | 4.6 | 8.1 | 20 | 10.2 | 22.1 | 57 | 4.6 | M4 |
| HPRSA2-2 | 50 | 59 | 209 | 82.6 | 88.9 |  |  | 65 |  |  |  |  |  | 70 |  |  |
| HPRSA2-3 | 75 | 64 | 254 | 101.6 | 108.0 |  |  | 85 |  |  |  |  |  | 90 |  |  |
| HPRSA3-1 | 25 | 100 | 299 | 66.5 | 66.5 |  |  | 54 |  |  |  |  |  | 54 |  |  |
| HPRSA3-2 | 50 | 114 | 454 | 101.6 | 111.0 | 25.4 | 66.5 | 75 | 5.8 | 10 | 35 | 15.7 | 38.1 | 85 | 5.3 | M5 |
| HPRSA3-3 | 75 | 159 | 567 | 127.0 | 136.4 |  |  | 100 |  |  |  |  |  | 110 |  |  |
| HPRSA3-4 | 100 | 177 | 680 | 152.4 | 161.8 |  |  | 125 |  |  |  |  |  | 135 |  |  |
| HPRSA3-5 | 125 | 191 | 907 | 203.2 | 212.6 |  |  | 178 |  |  |  |  |  | 190 |  |  |
| HPRSA4-2 | 50 | 118 | 907 | 101.6 | 114.3 |  |  | 50 |  |  |  |  |  | 65 |  |  |
| HPRSA4-3 | 75 | 127 | 1306 | 146.1 | 158.8 | 34.9 | 88.9 | 95 | 5.8 | 10 | 50 | 15.7 | 50.3 | 110 | 5.3 | M5 |
| HPRSA4-5 | 125 | 145 | 1814 | 203.2 | 215.9 |  |  | 150 |  |  |  |  |  | 175 |  |  |
| HPRSA4-6.5 | 165 | 159 | 2327 | 260.4 | 273.1 |  |  | 210 |  |  |  |  |  | 225 |  |  |
| HPRSA4-9 | 225 | 182 | 3175 | 355.6 | 368.3 |  |  | 305 |  |  |  |  |  | 320 |  |  |
| HPRSA5-5 | 125 | 136 | 4536 | 209.6 | 222.3 |  |  | 150 |  |  |  |  |  | 175 |  |  |
| HPRSA5-7 | 175 | 163 | 6586 | 304.8 | 317.5 | 50.8 | 146.1 | 250 | 7.1 | 11 | 100 | 24.9 | 94.0 | 275 | 6.2 | M6 |
| HPRSA5-10 | 250 | 204 | 8232 | 381.0 | 393.7 |  |  | 330 |  |  |  |  |  | 350 |  |  |

[^4]

# High Precision Series Crossed Roller Slides (Flange Base) 

SPECIFICATIONS:

## Straight Line Accuracy

 $.001 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.
## Repeatability

0.0005 mm

Coefficient of Friction 0.002

## Construction

Aluminum carriage and base.
Hardened stainless steel rollers, shafts, pre-load gibs.
Interchangeable with other manufacturers. Carriage and base ground to optical flatness. Bearing way surfaces held to submicron tolerances. Carriage surface flat to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$. Flange Base with crossed roller design offers the ultimate in accuracy, capacity and stability.

moment load ratings + load/life formulas. pg. 93


[^5]
## Mini Posi-Drive ${ }^{\text {Tm }}$ <br> Stages

## 6 Reasons to choose Del-Tron® Mini Posi-Drive ${ }^{\text {TM }}$ Stages (LSA1, LRSA1 Series)



1. Positive lead screw drive.
2. Zero backlash.
3. Friction-free linear ball or roller slides.
4. Accurate, repeatable linear travel.
5. Compact adaptable configuration.
6. Adaptable to standard Nema Configurations.

## Del-Tron® Mini Posi-Drive ${ }^{\mathrm{TM}}$ Stages

Compact Posi-Drive ${ }^{\text {TM }}$ series LSA1 and LRSA1 stages have a height of only 32 mm and a width of only 35 mm . These stages provide the same outstanding .003 mm straight line accuracy per 25 mm of travel and .003 mm repeatability as the larger LSA3 series Posi-Drive ${ }^{\text {TM }}$ line. The new smaller stages also offer a compact, flexible configuration and are adaptable to standard Nema configurations.

The LSA1 Posi-Drive ${ }^{T M}$ stages offer a . 168 " diameter .5 mm lead screw, an anti-backlash nut and a flexible zero backlash coupling that accepts a Nema 14 motor. They provide a load-carrying capacity of up to 18.1 kg . The stages are available in travel lengths ranging from 25 mm to 100 mm . Del-Tron also provides special configurations, motor mounts, hand crank actuation and a variety of leads and pitches.

The new positioners are available with either linear ball or crossed roller slides and can be configured for one, two, or three-axis positioning. In the ball slide version, precision steel balls roll in the raceway grooves with contact at four points, enabling load and moment to be carried on all directions. Rolling resistance is extremely low, ensuring smooth and stable operation. Crossed roller slides physically resemble ball slides except for the bearing design. The rollers share a larger contact surface with the rods as compared to the point contact of steel balls. This bearing design allows crossed roller slides to carry larger loads and absorb greater load impacts than equivalent size ball slides.


## Del-Tron ${ }^{(2 i n i}$ <br> Posi-Drive ${ }^{\text {TM }}$ <br> Stages

Specifications

Drive:

Coupling:
Motor Mount:
Travel:
Anti-Friction Slide:
Load Capacity:
Configuration:
Accuracy:
Repeatability:
.168 " diameter .5 mm lead screw with anti-backlash nut.

Flexible zero backlash coupling. Accepts Nema 14 motor
25 mm - 100 mm
Linear ball or crossed roller slide.
Up to 18.1 kg
1, 2 or 3 axis.
Straight line, up to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.
.003 mm

Also available are special configurations, motor mounts, hand crank actuation, and a variety of leads and pitches.
Motor/controller available.

## Nomenclature

Part number for Mini Posi-Drive ${ }^{\text {TM }}$ Stage

moment load ratings + load/life formulas. pg. 93

| Ball Slide <br> Mini Posi-Drive ${ }^{\text {m }}$ | Travel* $^{*}$ | A | B | C | D | L | S | H | Capacity <br> kg |
| :--- | :---: | :---: | ---: | ---: | ---: | ---: | ---: | ---: | :---: |
| LSA1-25-C005 | 25 | 103.4 | 50.8 | 52.6 | 35 | .310 | 1.190 | 37 | 3.6 |
| LSA1-50-C005 | 50 | 128.8 | 76.2 | 52.6 | 60 | .810 | .690 | 60 | 4.5 |
| LSA1-75-C005 | 75 | 154.2 | 101.6 | 52.6 | 85 | 1.310 | .990 | 85 | 6.8 |
| LSA1-100-C005 | 100 | 211.3 | 152.4 | 58.9 | 135 | 2.310 | .990 | 100 | 9.1 |

Dimensions in mm
moment load ratings + load/life formulas. pg. 93

| Roller Slide <br> Mini Posi-Drive ${ }^{\text {rм }}$ | Travel* | A | B | C | D | H | L | S | Lapacity <br> kg |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | :---: |
| LRSA1-25-C005 | 25 | 103.4 | 50.8 | 52.6 | 35 | 37 | .310 | 1.190 | 6.8 |
| LRSA1-50-C005 | 50 | 128.8 | 76.2 | 52.6 | 60 | 60 | .810 | .690 | 9.1 |
| LRSA1-75-C005 | 75 | 154.2 | 101.6 | 52.6 | 85 | 85 | 1.310 | .990 | 13.6 |
| LRSA1-100-C005 | 100 | 211.3 | 152.4 | 58.9 | 135 | 100 | 2.310 | .990 | 18.1 |

Dimensions in mm

## Mini Posi-Drive" ${ }^{\text {m }}$ Series LSA1, LRSA1

Designed for NEMA 14 motor frame, other motor adaptors available. Supplied with coupling for 5 mm motor shaft. Couplings with inch and metric bore available. Standard travels of $25 \mathrm{~mm}, 50 \mathrm{~mm}, 75 \mathrm{~mm}$ and 100 mm


## LIMIT AND POSITION SWITCHES

## EOT (End Of Travel) and HPS (Home Position Switches)

Del-Tron Precision offers the addition of EOT and HPS to all 3 sizes of the Posi-Drive series. The EOT kit and the HPS kit could be used together or independently. The stand alone kits can be added to any of the 3 sizes of the Posi-Drive series. The EOT kit comes with 2 switches mounted to the base at each end.
There are 2 flags that are mounted to the carriage. These flags are adjustable for either the full range of travel or for limited amount of travel if the application requires such. The Home Position Switch kit comes with 1 switch mounted to the base in the center. There is an adjustable flag mounted to the carriage. The adjustable flag will allow the Home Position to be set anywhere along the entire range of travel. The EOT and HPS are easily mounted to brackets, which are then attached to the base. The flags are easily assembled to a bracket that is then attached to the carriage. The base and carriage have the threaded mounting holes available for easy assembly of the brackets. The switches are photoelectric sensors that operate on a supply voltage of 5 to 24 VDC. The repeatability is .0002 " and the response time is $100 \mu$ seconds. The sensors are available in both NPN and PNP outputs. The sensors are equipped with a quick fitting Hook-Up Connector with cable lengths in 1 m or 3 m .
Part Numbering System for EOT and HPS

$$
\begin{aligned}
& \text { E-PNP-1 } \\
& \text { X-XXX-X }
\end{aligned}
$$

X-Configuration- $\mathrm{E}=\mathrm{EOT}, \mathrm{H}=\mathrm{HPS}, \mathrm{EH}=$ Combined
XXX=Type of Sensor, PNP or NPN
$\mathrm{X}=$ Length of Cable, $1=1$ meter, $3=3$ meter
Part Number and Price List

| E-PNP-1 | $\$ 119$ |
| :--- | :--- |
| E-NPN-1 | $\$ 119$ |
| H-PNP-1 | $\$ 59$ |
| H-NPN-1 | $\$ 59$ |
| EH-PNP-1 | $\$ 179$ |
| EH-NPN-1 | $\$ 179$ |


| LSA1 and LRSA1 SERIES |  |  |
| :--- | :---: | :--- |
| TRAVEL | B | $\mathbf{J}$ |
|  |  |  |
| 25 | 50.8 | 38.1 |
| 50 | 76.2 | 63.5 |
| 75 | 101.6 | 88.9 |
| 110 | 152.4 | 139.7 |
|  |  |  |

Prices are the same for the 3 meter
length cable and connector.


Maximum Recommended
Revolutions Per Second

| Lead: .5 mm | 20 RPS |
| :---: | :---: |

## Mini Posi-Drive ${ }^{\text {TM }}$ <br> Stages

## 6 Reasons to choose Del-Tron® Mini Posi-Drive ${ }^{\text {TM }}$ Stages (LSA2, LRSA2 Series)



1. Positive lead screw drive.
2. Zero backlash.
3. Friction-free linear ball or roller slides.
4. Accurate, repeatable linear travel.
5. Compact adaptable configuration.
6. Adaptable to standard Nema Configurations.

## Del-Tron® Mini Posi-Drive ${ }^{\text {TM }}$ Stages

Compact Posi-Drive ${ }^{\text {TM }}$ series LSA2 and LRSA2 stages have a height of only 41.9 mm and a width of only 44.4 mm . These stages provide the same outstanding .003 mm straight line accuracy per 25 mm of travel and .003 mm repeatability as the larger LSA3 series Posi-Drive ${ }^{\text {TM }}$ line. The new smaller stages also offer a compact, flexible configuration and are adaptable to standard Nema configurations.

The LSA2 Posi-Drive ${ }^{\text {TM }}$ stages offer a . 250 " diameter 2 mm lead screw, an anti-backlash nut and a flexible zero backlash coupling that accepts a Nema 17 motor. They provide a load-carrying capacity of up to 27.2 kg . The stages are available in travel lengths ranging from $25 \mathrm{~mm}-100 \mathrm{~mm}$. Del-Tron also provides special configurations, motor mounts, hand crank actuation and a variety of leads and pitches.

The new positioners are available with either linear ball or crossed roller slides and can be configured for one, two, or three-axis positioning. In the ball slide version, precision steel balls roll in the raceway grooves with contact at four points, enabling load and moment to be carried on all directions. Rolling resistance is extremely low, ensuring smooth and stable operation. Crossed roller slides physically resemble ball slides except for the bearing design. The rollers share a larger contact surface with the rods as compared to the point contact of steel balls. This bearing design allows crossed roller slides to carry larger loads and absorb greater load impacts than equivalent size ball slides.


## Del-Tron ${ }^{(2 i n i}$ <br> Posi-Drive ${ }^{\text {TM }}$ <br> Stages

| Specifications |  |
| :--- | :--- |
| Drive: | .250" diameter 2mm lead screw with <br> anti-backlash nut. |
| Coupling: | Flexible zero backlash coupling. |
| Motor Mount: | Accepts Nema 17 motor |
| Travel: | $25-100 \mathrm{~mm}$ |
| Anti-Friction Slide: | Linear ball or crossed roller slide. |
| Load Capacity: | Up to 27.2 kg |
| Configuration: | 1,2 or 3 axis. |
| Accuracy: | Straight line, up to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of <br> travel. |
| Repeatability: | .003 mm |

Also available are special configurations, motor mounts, hand crank actuation, and a variety of leads and pitches.
Motor/controller available.

## Nomenclature

Part number for Mini Posi-Drive ${ }^{\text {TM }}$ Stage

moment load ratings + load / life formulas. pg. 93

| Ball Slide <br> Mini Posi-Drive | Travel | A | B | D | H | L | S | Load <br> Capacity <br> kg |
| :--- | :---: | :---: | ---: | ---: | ---: | ---: | ---: | :---: |
| LSA2-25-A02 | 25 | 124.0 | 57.2 | 35 | 38 | .250 | 1.650 | 4.5 |
| LSA2-38-A02 | 38 | 143.0 | 76.2 | 55 | 55 | .625 | 1.275 | 6.8 |
| LSA2-50-A02 | 50 | 155.7 | 88.9 | 65 | 65 | .875 | 1.025 | 9.1 |
| LSA2-75-A02 | 75 | 174.8 | 108.0 | 85 | 85 | 1.250 | .650 | 11 |
| LSA2-100-A02 | 100 | 219.2 | 152.4 | 140 | 100 | 2.125 | 1.775 | 14 |

Dimensions in mm
moment load ratings + load/life formulas. pg. 93

| Roller Slide <br> Mini Posi-Drive | Travel | A | B | D | H | L | S | Load <br> Capacity <br> kg |
| :---: | :---: | :---: | ---: | ---: | ---: | ---: | ---: | :---: |
| LRSA2-25-A02 | 25 | 124.0 | 57.2 | 35 | 38 | .250 | 1.650 | 9.1 |
| LRSA2-38-A02 | 38 | 143.0 | 76.2 | 55 | 55 | .625 | 1.275 | 14 |
| LRSA2-50-A02 | 50 | 155.7 | 88.9 | 65 | 65 | .875 | 1.025 | 18 |
| LRSA2-75-A02 | 75 | 174.8 | 108.0 | 85 | 85 | 1.250 | .650 | 23 |
| LRSA2-100-A02 | 100 | 219.2 | 152.4 | 140 | 100 | 2.125 | 1.775 | 27 |

Dimensions in mm

## Mini Posi-Drive Series LSA2, LRSA2

Designed for NEMA 17 motor frame, other motor adaptors available. Supplied with coupling for 5 mm motor shaft. Couplings with inch and metric bore available. Uses a leadscrew with anti-backlash nut. Standard lead is 2 mm . Leads available at no additional cost $1 \mathrm{~mm}, 1.5 \mathrm{~mm}, 2 \mathrm{~mm}$, 3 mm and 4 mm . Standard travels of $25,38,50,75$, and 100 mm


## LIMIT AND POSITION SWITCHES

## EOT (End Of Travel) and HPS (Home Position Switches)

Del-Tron Precision offers the addition of EOT and HPS to all 3 sizes of the Posi-Drive series. The EOT kit and the HPS kit could be used together or independently. The stand alone kits can be added to any of the 3 sizes of the Posi-Drive series. The EOT kit comes with 2 switches mounted to the base at each end. There are 2 flags that are mounted to the carriage. These flags are adjustable for either the full range of travel or for limited amount of travel if the application requires such. The Home Position Switch kit comes with 1 switch mounted to the base in the center. There is an adjustable flag mounted to the carriage. The adjustable flag will allow the Home Position to be set anywhere along the entire range of travel. The EOT and HPS are easily mounted to brackets, which are then attached to the base. The flags are easily assembled to a bracket that is then attached to the carriage. The base and carriage have the threaded mounting holes available for easy assembly of the brackets. The switches are photoelectric sensors that operate on a supply voltage of 5 to 24 VDC . The repeatability is .005 mm and the response time is $100 \mu$ seconds. The sensors are available in both NPN and PNP outputs. The sensors are equipped with a quick fitting Hook-Up Connector with cable lengths in 1 m or 3 m .
Part Numbering System for EOT and HPS

> E-PNP-1
> X-XXX-X

X-Configuration- $\mathrm{E}=\mathrm{EOT}, \mathrm{H}=\mathrm{HPS}, \mathrm{EH}=$ Combined
XXX=Type of Sensor, PNP or NPN
$\mathrm{X}=$ Length of Cable, $1=1$ meter, $3=3$ meter
Part Number and Price List

| E-PNP-1 | $\$ 119$ |
| :--- | :--- |
| E-NPN-1 | $\$ 119$ |
| H-PNP-1 | $\$ 59$ |
| H-NPN-1 | $\$ 59$ |
| EH-PNP-1 | $\$ 179$ |
| EH-NPN-1 | $\$ 179$ |


| LSA2 and LRSA2 SERIES |  |  |
| :---: | :---: | :--- |
| TRAVEL | B | T |
|  |  |  |
| 25 | 57.15 | 41.27 |
| 38 | 76.20 | 60.32 |
| 50 | 88.90 | 73.02 |
| 75 | 107.95 | 92.07 |
| 100 | 152.40 | 136.52 |

Prices are the same for the 3 meter length cable and connector.


Maximum Recommended
Revolutions Per Second

## Posi-Drive ${ }^{\text {TM }}$ Stages

## 6 Reasons to choose Del-Tron® Posi-Drive ${ }^{\text {™ }}$ Stages



1. Positive lead screw drive.
2. Zero backlash.
3. Friction-free linear ball or roller slides.
4. Accurate, repeatable linear travel.
5. Compact adaptable configuration.
6. Adaptable to standard Nema Configurations.

Del-Tron®
Posi-Drive ${ }^{\text {TM }}$ Stages

Compact, economical Posi-Drive ${ }^{\text {TM }}$ stages from Del-Tron take the work out of designing motion control systems. Our stages require no alignment of components, install with only four standard fasteners, are fitted with antibacklash lead screws, multi-beam couplings with high speed misalignment capability and standard NEMA motor mounts.

Available in one, two or three axis configurations with either ball or crossed roller slides, these stages travel up to 300 mm . The crossed roller slide option increases load capacity up to 82 kg and 2500 million mm of travel is possible at 1/2 rated load. Motor/controller packages can be provided.


## Del-Trone <br> Posi-Drive ${ }^{\text {TM }}$ <br> Stages

Specifications

| Drive: | 10 mm diameter 2 mm lead screw <br> with anti-backlash nut. |
| :--- | :--- |
| Leads Available: | 3 mm and 20 mm |
| Coupling: | Flexible zero backlash coupling. |
| Motor Mount: | Accepts Nema 23 motor |
| Travel: | $25-300 \mathrm{~mm}$ |
| Anti-Friction Slide: | Linear ball or crossed roller slide. |
| Load Capacity: | Up to 82 kg |
| Configuration: | 1,2 or 3 axis. <br> Accuracy: |
| Straight line, up to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ <br> of travel. |  |
| Repeatability: | .003 mm |

Also available are special configurations, motor mounts, hand crank actuation, and a variety of leads and pitches.
Motor/controller available.

## Nomenclature

Part number for Posi-Drive ${ }^{\text {TM }}$ Stage


Designed for NEMA 23 motor frame. Supplied with coupling for 8 mm motor shaft.
Uses 10 mm diameter lead-screw with anti-backlash nut. Standard lead is 2 mm .
Standard travels of $25-300 \mathrm{~mm}$
Other motor adapters and coupling with inch and metric bore available as special order.
Leads available in 3 mm and 20mm
moment load ratings + load / life formulas. pg. 93

| MODEL | A | A1 | B | B1 | D | P | E | Posi-Drive ${ }^{\text {TM }}$ |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  | F | G | H | H1 | J | K | L | M | N | R | S |
| LSA3-25-B02 | 143 |  | 76 |  | 55 |  | 67 | 10.5 | 13.0 | 60 | 0 | 0 | 8.0 | 5 | 0 | 95 | 8 | 52 |
| LSA3-50-B02 | 168 |  | 102 |  | 75 |  | 67 | 13.5 | 26.0 | 60 | 85 | 8.5 | 21.0 | 17 | 0 | 95 | 8 | 40 |
| LSA3-75-B02 | 194 |  | 127 |  | 100 |  | 67 | 13.5 | 38.5 | 60 | 110 | 8.5 | 33.5 | 30 | 0 | 95 | 8 | 27 |
| LSA3-100-B02 | 219 |  | 152 |  | 125 |  | 67 | 13.5 | 51.0 | 60 | 135 | 8.5 | 46.0 | 43 | 0 | 95 | 19 | 14 |
| LSA3-150-B02 | 321 | 329 | 229 | 237 |  | 10 | 92 | 39.5 | 89.5 | 100 | 175 | 27.0 | 64.5 | 81 | 10 | 104 | 44 | -24 |
| LSA3-200-B02 | 397 | 405 | 279 | 287 |  | 12 | 118 | 27.0 | 114.5 | 150 | 225 | 27.0 | 64.5 | 106 | 10 | 104 | 70 | -49 |
| LSA3-250-B02 | 473 | 482 | 330 | 338 |  | 14 | 143 | 15.0 | 140.0 | 200 | 275 | 27.5 | 65.0 | 132 | 10 | 104 | 95 | -75 |
| LSA3-300-B02 | 549 | 558 | 381 | 389 |  | 14 | 168 | 40.5 | 165.5 | 250 | 325 | 28.0 | 65.5 | 157 | 10 | 104 | 121 | -100 |
| LRSA3-25-B02 | 143 |  | 76 |  | 55 |  | 67 | 10.5 | 13.0 | 60 | 0 | 0 | 8.0 | 5 | 0 | 95 | 8 | 52 |
| LRSA3-50-B02 | 168 |  | 102 |  | 75 |  | 67 | 13.5 | 26.0 | 60 | 85 | 8.5 | 21.0 | 17 | 0 | 95 | 8 | 40 |
| LRSA3-75-B02 | 194 |  | 127 |  | 100 |  | 67 | 13.5 | 38.5 | 60 | 110 | 8.5 | 33.5 | 30 | 0 | 95 | 8 | 27 |
| LRSA3-100-B02 | 219 |  | 152 |  | 125 |  | 67 | 13.5 | 51.0 | 60 | 135 | 8.5 | 46.0 | 43 | 0 | 95 | 19 | 14 |
| LRSA3-150-B02 | 321 | 329 | 229 | 237 |  | 10 | 92 | 39.5 | 89.5 | 100 | 175 | 27.0 | 64.5 | 81 | 10 | 104 | 44 | -24 |
| LRSA3-200-B02 | 397 | 405 | 279 | 287 |  | 12 | 118 | 27.0 | 114.5 | 150 | 225 | 27.0 | 64.5 | 106 | 10 | 104 | 70 | -49 |
| LRSA3-250-B02 | 473 | 482 | 330 | 338 |  | 14 | 143 | 15.0 | 140.0 | 200 | 275 | 27.5 | 65.0 | 132 | 10 | 104 | 95 | -75 |
| LRSA3-300-B02 | 549 | 558 | 381 | 389 |  | 14 | 168 | 40.5 | 165.5 | 250 | 325 | 28.0 | 65.5 | 157 | 10 | 104 | 121 | -100 |

Dimensions in mm
moment load ratings + load / life formulas.
*Travel is $1 / 2$ distance from center in either direction.

| Posi-Drive |  |  |
| :--- | :---: | :---: |
| MODEL | TRAVEL CAPACITY |  |
| mm | kg |  |
| MOAD |  |  |
| LSA3-25-B02 | 25 | 14 |
| LSA3-50-B02 | 50 | 16 |
| LSA3-75-B02 | 75 | 18 |
| LSA3-100-B02 | 100 | 20 |
| LSA3-150-B02 | 150 | 25 |
| LSA3-200-B02 | 200 | 27 |
| LSA3-250-B02 | 250 | 34 |
| LSA3-300-B02 | 300 | 41 |
|  |  |  |
| LRSA3-25-B02 | 25 | 27 |
| LRSA3-50-B02 | 50 | 32 |
| LRSA3-75-B02 | 75 | 36 |
| LRSA3-100-B02 | 100 | 41 |
| LRSA3-150-B02 | 150 | 50 |
| LRSA3-200-B02 | 200 | 54 |
| LRSA3-250-B02 | 250 | 68 |
| LRSA3-300-B02 | 300 | 82 |



## LIMIT AND POSITION SWITCHES

## EOT (End Of Travel) and HPS (Home Position Switches)

Del-Tron Precision offers the addition of EOT and HPS to all 3 sizes of the Posi-Drive series. The EOT kit and the HPS kit could be used together or independently. The stand alone kits can be added to any of the 3 sizes of the Posi-Drive series. The EOT kit comes with 2 switches mounted to the base at each end.
There are 2 flags that are mounted to the carriage. These flags are adjustable for either the full range of travel or for limited amount of travel if the application requires such. The Home Position Switch kit comes with 1 switch mounted to the base in the center. There is an adjustable flag mounted to the carriage. The adjustable flag will allow the Home Position to be set anywhere along the entire range of travel.
The EOT and HPS are easily mounted to brackets, which are then attached to the base. The flags are easily assembled to a bracket that is then attached to the carriage. The base and carriage have the threaded mounting holes available for easy assembly of the brackets. The switches are photoelectric sensors that operate on a supply voltage of 5 to 24 VDC . The repeatability is .005 mm and the response time is $100 \mu$ seconds. The sensors are available in both NPN and PNP outputs. The sensors are equipped with a quick fitting Hook-Up Connector with cable lengths in 1 m or 3 m .
Part Numbering System for EOT and HPS

> E-PNP-1
> X-XXX-X

X-Configuration- $\mathrm{E}=\mathrm{EOT}, \mathrm{H}=\mathrm{HPS}, \mathrm{EH}=$ Combined
XXX=Type of Sensor, PNP or NPN
$X=$ Length of Cable, $1=1$ meter, $3=3$ meter
Part Number and Price List

| E-PNP-1 | $\$ 119$ |
| :--- | :--- |
| E-NPN-1 | $\$ 119$ |
| H-PNP-1 | $\$ 59$ |
| H-NPN-1 | $\$ 59$ |
| EH-PNP-1 | $\$ 179$ |
| EH-NPN-1 | $\$ 179$ |

Prices are the same for the 3 meter length cable and connector.

| LSA3 and LRSA3 SERIES |  |  |
| :--- | :--- | :--- |
| TRAVEL | B | T |
|  |  |  |
| 25 | 76.2 | 60.33 |
| 50 | 101.6 | 85.73 |
| 75 | 127.0 | 11.13 |
| 100 | 152.4 | 136.53 |
| 150 | 228.6 | 212.73 |
| 200 | 279.4 | 263.53 |
| 250 | 33.2 | 31.33 |
| 300 | 381.0 | 365.13 |
|  |  |  |



## Friction Free Air Actuator

## 6 Reasons to choose Del-Tron ${ }^{\circledR}$ Air Actuators



1. Low Pressure operation: <10 PSI
2. Low Friction: <1gm
3. Wide range variable speed: smooth, slow and high speed capabilities.
4. Precise, gentle handling of wafers, chips and surface mount devices.
5. Ideal for fluid sample handling and adhesive deposition.
6. Del-TronCrossed Roller Slide, driven by 2 Air Actuated Dashpots, provides a frictionless interface for up to 50 mm travel in a compact package.

## Del-Tron ${ }^{\circledR}$ Air Actuators

Pneumatically actuated crossed roller slide assemblies controlled by a pair of Airpot"' actuators, provide extremely low friction and stiction characteristics. A light touch or physical obstruction will stop the unit's movement to prevent damage to delicate and expensive equipment and parts. Low pressure operation is possible. The PNRE series requires less than 10 psi to operate.

Each slide is comprised of an aluminum carriage straddling an aluminum base. Using a bearing system containing cylindrical steel rollers, the carriage glides, almost friction-free, over the base. The rollers, alternately crisscrossed with each other, move between a set of four, partially flat, parallel, smooth rods on each side of the base. The Del-Tron Straight Line Design ${ }^{\prime \prime}$ makes possible the Iow stiction and friction characteristics Del-Trons are known for, unlike recirculating designs in which the rolling elements must turn corners and often slide against each other as they travel.

Airpot"' Pneumatic Actuators are ultra low friction devices designed to provide precise, repeatable motion at very high or low speeds without seals or lubrication. They run clean and operate over a wide temperature range with no change in performance. The basic construction consists of a graphitized carbon piston, precision ground to millionths of an inch TIR, inside an annealed, borosilicate glass cylinder with a precision fire polished bore.


# Ball Slide Positioning Steges (Micrometer Driven) 

## 6 Reasons to choose Del-Tron® Ball Slide Positioning Stages



1. Versatile- Smooth, accurate travel for intermittent motion applications.
2. Positive Locking- Side mounted lock feature prevents movement of carriage.
3. Accurate Measurements- Carriages are spring loaded against micrometer heads with 0.01 mm graduations.
4. Adaptable- One, two or three axis models can be used in any orientation.
5. Easy To Use- Standard counterbored holes in base and threaded holes in carriage.
6. Wide Selection- Subminiature and low profile models.

## Del-Tron®

 Ball Slide Positioning StagesDel-Tron ${ }^{\circledR}$ offers over 60 models of positioning slides.
Used for gaging and positioning light and medium loads, applications include measuring instruments and optical assemblies. Del-Tron® positioners, built with the same rigorous manufacturing demands as our ball slide assemblies, offer the benefits of quality construction.

Spring loaded micrometer drives allow precise repeatable adjustments with low friction and zero backlash. (Micrometers available in inch or metric units.) Slides provide accuracy to $.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel and repeatability of .003 mm . Over 60 models support load capacities to 27.2 kg . Our full line includes the subminiature series with the smallest commercially available positioner, the standard series, ideal for most gaging and positioning applications, and our heavy duty series providing high load capacities with the same high accuracy and repeatability.

Positioning slides can be stacked for multi-axis applications. Standard stacked units are available in XY and XYZ configurations. Preloaded positioning slides, fully assembled, arrive ready for your use.

Positioners are available in black anodized finish or other finishes on request.

## Nomenclature

Part numbering system for positioning stages


- Posi-Lock ${ }^{\text {Tm }}$ feature consists of steel shim and extended micrometer bracket secured by a screw mounted to the side of the stage carriage. This allows the user to positively lock the position of the carriage during use. Posi-Lock ${ }^{\text {n }}$ is standard on the model 99MM and optional on all others.
- Locking micrometer heads are available to positively lock the micrometer setting. Not available for models $99 \mathrm{MM}, 101 \mathrm{MM}, 201 \mathrm{MM}, 301 \mathrm{MM}$.
- Space saving side mount micrometer head style available. Please inquire.
- Loads in Z axis will extend springs if too heavy. Series 400MM, 500MM, 700MM, 1200MM, 2200MM and 3200 MM have micrometer bracket reversed to prevent this and increase $Z$ axis capacity
- Custom designs quoted on request.
- Inch threaded mounting holes optional at no cost.
- P style (plain) are free floating slides without micrometer head, brackets or springs.
- (P-PL) Plain with Posi-Lock ${ }^{\text {TM }}$ available, only on $1200 \mathrm{MM}, 2200 \mathrm{MM}, \& 3200 \mathrm{MM}$ series.

Ball Slide
Positioning
Stages
SPECIFICATIONS:

| Straight Line Accuracy | $.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel |
| :--- | :--- |
| Repeatability | .003 mm |
| Coefficient | .003 typical |
| Construction | Aluminum carriage and base, <br> hardened steel shafts and balls, <br> mild steel end caps. |
| Finish | Black anodize standard. <br> Other finishes on request. |

moment load ratings + load / life formulas. pg. 94

| MODEL | TRAVEL | WORK SURFACE | OVERALL DIMENSIONS |  | $\begin{aligned} & \text { LOAD } \\ & \text { CAPACITY, } \mathrm{kg} \end{aligned}$ |  | THROUGH HOLE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A X B | L | Hx | X, XY | Z |  |
| 99MM | 6 | $19.1 \times 19.1$ | 57.9 | 13.5 | 2.3 | . 7 | NO |
| 101 MM | 13 | $31.8 \times 31.8$ | 82.6 | 9.7 | 1.8 | . 7 | NO |
| 201MM | 13 | $44.5 \times 44.5$ | 95.3 | 9.7 | 1.8 | . 7 | NO |
| 301 MM | 13 | $38.1 \times 38.1$ | 88.9 | 15.7 | 5.4 | . 9 | 8 DIA. |
| 450MM | 13 | $44.5 \times 44.5$ | 111.3 | 19.1 | 9.1 | . 9 | NO |
| 451 MM | 25 | $44.5 \times 44.5$ | 149.4 | 19.1 | 9.1 | . 9 | NO |
| 453MM | 13 | $44.5 \times 44.5$ | 111.3 | 19.1 | 9.1 | . 9 | 13 DIA. |
| 750MM | 13 | $66.5 \times 66.5$ | 133.4 | 25.4 | 27.2 | . 9 | NO |
| 751 MM | 25 | $66.5 \times 66.5$ | 171.5 | 25.4 | 27.2 | . 9 | NO |
| 753MM | 13 | $66.5 \times 66.5$ | 133.4 | 25.4 | 27.2 | . 9 | 25 DIA. |
| 401 MM | 13 | $50.8 \times 44.5$ | 117.3 | 19.1 | 9.1 | 9.0 | NO |
| 501 MM | 13 | $82.6 \times 44.5$ | 148.8 | 19.1 | 19.0 | 9.0 | NO |
| 502MM | 25 | $82.6 \times 44.5$ | 188.2 | 19.1 | 19.0 | 9.0 | NO |
| 701 MM | 13 | $101.6 \times 66.5$ | 168.1 | 25.4 | 27.2 | 9.0 | NO |
| 702MM | 25 | $101.6 \times 66.5$ | 209.6 | 25.4 | 27.2 | 9.0 | NO |
| 1201MM | 25 | $79.2 \times 79.2$ | 184.2 | 23.1 | 13.6 | 13.6 | NO |
| 1203MM | 25 | $79.2 \times 79.2$ | 184.2 | 23.1 | 13.6 | 13.6 | 25 DIA. |
| 2201MM | 25 | $104.6 \times 104.6$ | 208.6 | 23.1 | 13.6 | 13.6 | NO |
| 2202MM | 50 | $104.6 \times 104.6$ | 260.4 | 23.1 | 13.6 | 13.6 | NO |
| 2203MM | 25 | $104.6 \times 104.6$ | 209.6 | 23.1 | 13.6 | 13.6 | 38 DIA. |
| 2204MM | 50 | $104.6 \times 104.6$ | 260.4 | 23.1 | 13.6 | 13.6 | 38 DIA. |
| 3201MM | 25 | $130.2 \times 130.2$ | 235.0 | 23.1 | 13.6 | 13.6 | NO |
| 3202MM | 50 | $130.2 \times 130.2$ | 285.8 | 23.1 | 13.6 | 13.6 | NO |
| 3203MM | 25 | $130.2 \times 130.2$ | 235.0 | 23.1 | 13.6 | 13.6 | 51 DIA. |
| 3204MM | 50 | $130.2 \times 130.2$ | 285.8 | 23.1 | 13.6 | 13.6 | 51 DIA. |
| PLAIN MODELS (WITHOUT MICROMETER, BRACKETS OR SPRINGS). X AND XY CONFIGURATIONS ONLY. |  |  |  |  |  |  |  |
| 101PMM | 13 | $31.8 \times 31.8$ | - | 9.7 | 1.8 | - | NO |
| 201PMM | 13 | $44.5 \times 44.5$ | - | 9.7 | 1.8 | - | NO |
| 301PMM | 13 | $38.1 \times 38.1$ | - | 15.7 | 5.4 | - | 8 DIA. |
| 451PMM | 25 | $44.5 \times 44.5$ | - | 19.1 | 9.1 | - | NO |
| 452PMM | 25 | $44.5 \times 44.5$ | - | 19.1 | 9.1 | - | 13 DIA. |
| 751PMM | 25 | $66.5 \times 66.5$ | - | 25.4 | 27.2 | - | NO |
| 752PMM | 25 | $66.5 \times 66.5$ | - | 25.4 | 27.2 | - | 25 DIA. |
| 1202PMM | 50 | $79.2 \times 79.2$ | - | 23.1 | 13.6 | - | NO |
| 1204PMM | 50 | $79.2 \times 79.2$ | - | 23.1 | 13.6 | - | 25 DIA. |
| 2205PMM | 75 | $104.6 \times 104.6$ | - | 23.1 | 13.6 | - | NO |
| 2206PMM | 75 | $104.6 \times 104.6$ | - | 23.1 | 13.6 | - | 38 DIA. |
| 3205PMM | 100 | $130.2 \times 130.2$ | - | 23.1 | 13.6 | - | NO |
| 3206PMM | 100 | $130.2 \times 130.2$ | - | 23.1 | 13.6 | - | 51 DIA. |

[^6]

Dimensions in mm

## SERIES 99MM

Space saving side mount micrometer head style is available. Please inquire.


Dimensions in mm
SERIES 100MM, 200MM


Dimensions in mm

## SERIES 300MM, 450MM, 750MM

Space saving side mount micrometer head style is available. Please inquire.


Dimensions in mm


Dimensions in mm

## SERIES 400MM, 500MM, 700MM

Space saving side mount micrometer head style is available. Please inquire.


Dimensions in mm

# Grossed Roller Postitioning Stages (MFcrometer Driven) 

## 6 Reasons to choose Del-Tron® Crossed Roller Positioning Stages



1. High Capacity- Greater load bearing capacity than ball types. Better for impacts and overhanging loads.
2. Straight Line Accuracy- Runout of $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel.
3. Wide Range- Carriages up to 130 mm square with 50 mm of travel.
4. Smooth Accurate MovementSpring forces hold carriage against micrometer head. Factory adjusted preload offers friction free running.
5. Subminiature Sizes: R99MM among the smallest commercially available roller stages 19 mm square.
6. Positive Locking- Posi-Lock ${ }^{\text {TM }}$ feature guards against movement caused by vibration or impact.

Del-Tron®
Crossed Roller Positioning Stages

Del-Tron offers over 60 models of positioning slides.

Used for gaging and positioning light and medium loads, applications include measuring instruments and optical assemblies. Del-Tron ${ }^{\circledR}$ positioners, built with the same rigorous manufacturing demands as our crossed roller slide assemblies, offer the benefits of quality construction.

Spring loaded micrometer drives allow precise repeatable adjustments with low friction and zero backlash. (Micrometers available in inch or metric units.) Slides provide accuracy to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel and repeatability of .003 mm . Over 60 models, support load capacities to 73 kg . Our full line includes the subminiature series with the smallest commercially available positioner, the standard series, ideal for most gaging and positioning applications, and our heavy duty series providing high load capacities with the same high accuracy and repeatability.

Positioning slides can be stacked for multiaxis applications. Standard stacked units are available in XY and XYZ configurations. Preloaded positioning slides, fully assembled, arrive ready for your use.

Positioners are available in black anodized finish or other finishes on request.

## Nomenclature



- Posi-Lock ${ }^{\text {TM }}$ feature consists of a steel shim and extended micrometer bracket secured by a screw mounted to the side of the stage carriage. This allows the user to positively lock the position of the carriage during use. Posi-Lock ${ }^{T M}$ is standard optional on all stages.
- Locking micrometer heads are available to positively lock the micrometer setting. Not available for models R101MM, R201MM, R301MM.
- Space saving side mount micrometer head style available. Please inquire.
- Loads in Z axis will extend springs if too heavy. Series R400MM, R500MM, R700MM, R1200MM, R2200MM and R3200MM have micrometer bracket reversed to prevent this and increase $Z$ axis capacity.
- Custom designs quoted on request.
- Inch threaded mounting holes optional at no cost.
- P style (plain) are free floating slides without micrometer head, brackets or springs.
- P-PL Plain with Posi-Lock ${ }^{\text {TM }}$ available. Only on R1200MM, R2200MM, \& R3200MM series.



## Crossed Roller <br> Positioning <br> Stages

Specifications:

| Straight line accuracy | $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel |
| :--- | :--- |
| Repeatability | .003 mm |
| Coefficient of friction | 0.003 typical |
| Drive | Micrometer, .01 mm graduations |
| Construction | Aluminum carriage and base, hardened <br> steel shafts and balls, mild steel endcaps |
| Finish | Black anodize standard; <br> other finishes on request |

moment load ratings + load / life formulas. pg. 94

|  |  | WORK SURFACE | OVERALL DIMENSIONS |  | $\begin{aligned} & \text { LOAD } \\ & \text { CAPACITY, } \mathrm{kg} \end{aligned}$ |  | THROUGH HOLE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MODEL | TRAVEL | A X B | L | Hx | X, XY | Z |  |
| R99MM | 6 | $19.1 \times 19.1$ | 57.9 | 13.5 | 18.1 | . 7 | NO |
| R101MM | 13 | $31.8 \times 31.8$ | 82.6 | 9.7 | 10.4 | . 7 | NO |
| R201MM | 13 | $44.5 \times 44.5$ | 95.3 | 9.7 | 10.4 | . 7 | NO |
| R301MM | 13 | $38.1 \times 38.1$ | 88.9 | 15.7 | 18.1 | . 9 | 8 DIA. |
| R450MM | 13 | $44.5 \times 44.5$ | 111.3 | 19.1 | 18.1 | . 9 | NO |
| R451MM | 25 | $44.5 \times 44.5$ | 149.4 | 19.1 | 18.1 | . 9 | NO |
| R453MM | 13 | $44.5 \times 44.5$ | 111.3 | 19.1 | 18.1 | . 9 | 13 DIA. |
| R750MM | 13 | $66.5 \times 66.5$ | 133.4 | 25.4 | 54.4 | . 9 | NO |
| R751MM | 25 | $66.5 \times 66.5$ | 171.5 | 25.4 | 54.4 | . 9 | NO |
| R753MM | 13 | $66.5 \times 66.5$ | 133.4 | 25.4 | 54.4 | . 9 | 25 DIA. |
| R401MM | 13 | $50.8 \times 44.5$ | 117.3 | 19.1 | 18.1 | 9.0 | NO |
| R501MM | 13 | $82.6 \times 44.5$ | 148.8 | 19.1 | 36.3 | 9.0 | NO |
| R502MM | 25 | $82.6 \times 44.5$ | 188.2 | 19.1 | 36.3 | 9.0 | NO |
| R701MM | 13 | $101.6 \times 66.5$ | 168.1 | 25.4 | 72.5 | 9.0 | NO |
| R702MM | 25 | $101.6 \times 66.5$ | 209.6 | 25.4 | 72.5 | 9.0 | NO |
| R1201MM | 25 | $79.2 \times 79.2$ | 184.2 | 23.1 | 38.5 | 13.6 | NO |
| R1203MM | 25 | $79.2 \times 79.2$ | 184.2 | 23.1 | 38.5 | 13.6 | 25 DIA. |
| R2201MM | 25 | $104.6 \times 104.6$ | 209.6 | 23.1 | 38.5 | 13.6 | NO |
| R2202MM | 50 | $104.6 \times 104.6$ | 260.4 | 23.1 | 38.5 | 13.6 | NO |
| R2203MM | 25 | $104.6 \times 104.6$ | 209.6 | 23.1 | 38.5 | 13.6 | 38 DIA. |
| R2204MM | 50 | $104.6 \times 104.6$ | 260.4 | 23.1 | 38.5 | 13.6 | 38 DIA. |
| R3201MM | 25 | $130.2 \times 130.2$ | 235.0 | 23.1 | 38.5 | 13.6 | NO |
| R3202MM | 50 | $130.2 \times 130.2$ | 285.8 | 23.1 | 38.5 | 13.6 | NO |
| R3203MM | 25 | $130.2 \times 130.2$ | 235.0 | 23.1 | 38.5 | 13.6 | 51 DIA. |
| R3204MM | 50 | $130.2 \times 130.2$ | 285.8 | 23.1 | 38.5 | 13.6 | 51 DIA. |
| PLAIN MODELS (WITHOUT MICROMETER, BRACKETS OR SPRINGS), X AND XY CONFIGURATIONS ONLY. |  |  |  |  |  |  |  |
| R101PMM | 13 | $31.8 \times 31.8$ | - | 9.7 | 10.4 | - | NO |
| R201PMM | 13 | $44.5 \times 44.5$ | - | 9.7 | 10.4 | - | NO |
| R301PMM | 13 | $38.1 \times 38.1$ | - | 15.7 | 18.1 | - | 8 DIA. |
| R451PMM | 25 | $44.5 \times 44.5$ | - | 19.1 | 18.1 |  | NO |
| R452PMM | 25 | $44.5 \times 44.5$ | - | 19.1 | 18.1 | - | 13 DIA. |
| R751PMM | 25 | $66.5 \times 66.5$ | - | 25.4 | 54.4 | - | NO |
| R752PMM | 25 | $66.5 \times 66.5$ | - | 25.4 | 54.4 | - | 25 DIA. |
| R1202PMM | 50 | $79.2 \times 79.2$ | - | 23.1 | 38.5 | - | NO |
| R1204PMM | 50 | $79.2 \times 79.2$ | - | 23.1 | 38.5 | - | 25 DIA. |
| R2205PMM | 75 | $104.6 \times 104.6$ | - | 23.1 | 38.5 | - | NO |
| R2206PMM | 75 | $104.6 \times 104.6$ | - | 23.1 | 38.5 | - | 38 DIA. |
| R3205PMM | 100 | $130.2 \times 130.2$ | - | 23.1 | 38.5 | - | NO |
| R3206PMM | 100 | $130.2 \times 130.2$ | - | 23.1 | 38.5 | - | 51 DIA. |

Dimensions in mm


## SERIES R99MM

Space saving side mount micrometer head style is available. Please inquire.


Dimensions in mm


Dimensions in mm

## SERIES R300MM, R450MM, R750MM

Space saving side mount micrometer head style is available. Please inquire.



Dimensions in mm

## SERIES R400MM, R500MM, R700MM

Space saving side mount micrometer head style is available. Please inquire.


Dimensions in mm

# Compact Side Drive Positioners 

## 6 Reasons to choose Del-Tron ${ }^{\circledR}$ Side Drive <br> Positioning Stages



1. Versatile- Reduced overall length makes Del-Tron ${ }^{\circledR}$ Side Drive stages ideal for restricted space applications.
2. Posi- Lock ${ }^{\text {TM }}$ - Optional positive locking feature prevents movement of carriage.
3. Accurate Measurements: Carriages are spring loaded against micrometer heads with 0.01 mm graduations.
4. Adaptable- One, two or three axis models can be used in any orientation.
5. Easy To Use- Metric counterbored holes in base and metric threaded holes in carriage.
6. Wide Selection- Subminiature and Iow profile models.

## Del-Tron ${ }^{\circledR}$ Side Drive Positioning Stages

Del-Tron offers over 50 models of positioning slides. (Available in either ball bearing or crossed roller type.)

Used for gauging and positioning light and medium loads, applications include measuring instruments and optical assemblies. Del-Tron@positioners, built with the same rigorous manufacturing demands as our ball slide assemblies, offer the benefits of quality construction.

Spring loaded micrometer drives allow precise repeatable adjustments with low friction and zero backlash. (Micrometers available in inch or metric units.) Slides provide accuracy to $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel and repeatability of .003 mm . Models can support load capacities to 73 kg . Our full line includes the subminiature series with the smallest commercially available positioner, the standard series, ideal for most gauging and positioning applications, and our heavy duty series providing high load capacities with the same high accuracy and repeatability.

Positioning slides can be stacked for multiaxis applications. Standard stacked units are available in XY and XYZ configurations. Preloaded positioning slides, fully assembled, arrive ready for your use.

Positioners are available in black anodized finish or other finishes on request.

## Nomenclature



- Posi-Lock ${ }^{T m}$ feature consists of steel shim and extended micrometer bracket secured by a screw mounted to the side of the micrometer bracket. This allows the user to positively lock the position of the carriage during use. Posi-Lock ${ }^{\text {TM }}$ is standard on the model 99SDMM, R99SDMM and optional on all others.
- Locking micrometer heads are available to positively lock the micrometer setting. Not available for models 99SDMM, 101SDMM, 201SDMM, 301SDMM, R99SDMM, R101SDMM, R201SDMM, R301SDMM
- Custom designs quoted on request.
- Metric threaded mounting holes optional at no additional cost.

Side Drive Positioning Stages
Specifications:

| Straight Line Accuracy | Ball: $.013 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel <br> Roller: $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel |
| :--- | :--- |
| Repeatability | Ball: .005 mm <br> Roller: .003 mm |
| Coefficient of Friction | 0.003 typical |
| Drive | Micrometer, .01 mm graduations standard <br> ConstructionAluminum carriage and base, hardened <br> steel shafts and balls or rollers, mild steel <br> endcaps |
| Finish | Black anodize standard; <br> other finishes on request |




Dimensions in mm
SERIES 99SDMM, R99SDMM


Dimensions in mm
SERIES 100SDMM, 200SDMM, R100SDMM, R200SDMM


SERIES 300SDMM, 450SDMM, 750SDMM, R300SDMM, R450SDMM, R750SDMM


## SERIES 300SDMM, 450SDMM, 750SDMM, R300SDMM, R450SDMM, R750SDMM



## SERIES 400SDMM, 500SDMM, 700SDMM, R400SDMM, R500SDMM, R700SDMM



## SERIES 1200SDMM, 2200SDMM, 3200SDMM, R1200SDMM, R2200SDMM, R3200SDMM

## Low Proffle Grossed Roller Slide Tables

## 6 Reasons to choose Del-Tron® Low Profile Crossed Roller Slide Tables



1. Compact \& Low Profile.
2. High Accuracy ( $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ ) Travel.
3. Metric Type Mounting Holes.
4. Light Weight Aluminum Carriage.
5. Stainless Steel Models Available.
6. 21 Size \& Travel Combinations.

## Low Profile Slide Tables

Del-Tron ${ }^{\circledR}$ LPTA slides are low profile, high accuracy slide tables featuring easily adjustable preload and light weight aluminum carriage. Standard metric type threaded holes allow easy mounting and installation. The bearing base consists of a two sided single inner rail flanked by two precision V grooved outer rails. High precision rollers captive in a stainless steel cage and positive internal travel stops assure smooth accurate reciprocating motion.

Stainless steel models (ss) offer aluminum carriage with stainless steel rails, rollers, cages and fasteners.

LPTA slides are ideal anywhere low friction reciprocating mechanisms are used in automated equipment.


## Low Profile <br> Crossed Roller <br> Tables

Specifications:

| Straight Line Accuracy | $.003 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel. |
| :--- | :--- |
| Positional Repeatability | .003 mm |
| Coefficient of Friction | 0.003 typical |
| Construction | Aluminum carriage, hardened <br> steel crossed roller rail set with <br> double v-grooved inner rail. |
| Finish | Black anodized carriage, <br> hardened steel base. |

## BASE MOUNTING DIMENSIONS



Length, Travel, and Load Selection
moment load ratings + load / life formulas. pg. 95


Dimensions in mm

| SERIES | SPACING | Mounting Dimensions |  |  |  | BASE | $\underset{d}{\text { COUNTERBORE }}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | THREAD $J$ | $\begin{gathered} \text { DEPTH } \\ \hline \end{gathered}$ | $\underset{R}{\text { SPACING }}$ |  |  |  | h |
| LPTA-1025 | 3.5 | 14 | M2 | 3.5 | 3.5 | 3.9 |  | 2.6 | 2.5 |
| LPTA-1035 | 3.5 | - | - | - | 5 | - |  | - | 2.5 |
| LPTA-1045 | 12.5 | - | - | - | 3.5 | - |  | - | 2.5 |
| LPTA-1055 | 12.5 | - | - | - | 3.5 | - | C'BORE FOR | - | 2.5 |
| LPTA-1065 | 12.5 | - | - | - | 5 | - | M2 | - | 2.5 |
| LPTA-1075 | 22.5 | - | - | - | 5 | - |  | - | 2.5 |
| LPTA-1085 | 12.5 | - | - | - | 5 | - |  | - | 2.5 |
| LPTA-2035 | 3.5 | 22 | M4 | 5.5 | 5 | 6.1 |  | 4 | 3.8 |
| LPTA-2050 | 3.5 | - | - | - | 7.5 | - |  | - | 3.8 |
| LPTA-2065 | 17.5 | - | - | - | 5 | - | C'BORE | - | 3.8 |
| LPTA-2080 | 17.5 | - | - | - | 5 | - | $\begin{aligned} & \text { FOR } \\ & \text { M3 } \end{aligned}$ | - | 3.8 |
| LPTA-2095 | 17.5 | - | - | - | 5 | - |  | - | 3.8 |
| LPTA-2110 | 32.5 | - | - | - | 7.5 | - |  | - | 3.8 |
| LPTA-2125 | 17.5 | - | - | - | 7.5 | - |  | - | 3.8 |
| LPTA-3055 | 7.5 | 30 | M5 | 7.5 | 7.5 | 8.3 |  | 5.2 | 5.2 |
| LPTA-3080 | 7.5 | - | - | - | 6 | - |  | - | 5.2 |
| LPTA-3105 | 27.5 | - | - | - | 7.5 | - | C'bore | - | 5.2 |
| LPTA-3130 | 27.5 | - | - | - | 7.5 | - | FOR <br> M4 | - | 5.2 |
| LPTA-3155 | 27.5 | - | - | - | 7.5 | - |  | - | 5.2 |
| LPTA-3180 | 52.5 | - | - | - | 7.5 | - |  | - | 5.2 |
| LPTA-3205 | 27.5 | - | - | - | 7.5 | - |  | - | 5.2 |

Dimensions in mm


|  | Profile Dimensions |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| SERIES | HEIGHT <br> $\mathbf{A}$ <br> $\mathbf{\pm 0 . 1}$ | WIDTH <br> $\mathbf{B}$ <br> $\mathbf{0 0 . 1}$ | BASE <br> THICKNESS <br> $\mathbf{C}$ | BASE <br> WIDTH <br> $\mathbf{X}$ |
| LPTA-1000 | 8 | 20 | 4 | 6.6 |
| LPTA-2000 | 12 | 30 | 6 | 12 |
|  |  |  |  | 8 |



Dimensions in mm

## Grossed Roller Reil Sets

## 6 Reasons to choose Del-Tron® Crossed Roller Rail Sets



1. Versatile- May be adapted to your own base and carriage design.
2. Rugged- Hardened steel v-grooved rails and rollers withstand heavy loads and impacts.
3. Corrosion Resistant- Stainless steel available from stock.
4. High Accuracy- Parallelism of 0.002 mm over 100 mm .
5. Easy To Use- Standard threaded and counterbored mounting holes allow access from either side.
6. Interchangeable- Form, fit and functional replacement for other manufacturer's rails.

## Del-Tron ${ }^{\text {® }}$ <br> Crossed Roller Rail Sets

Crossed Roller Linear Bearings are compact, precision bearings that can support and guide high loads with high accuracy and repeatability, low friction, and low starting force. A complete range of sizes is supplied for use in precision machine tools, measuring instruments, assembly fixtures, medical instruments, and anywhere linear or reciprocating motion with high reliability and long life is required.

Construction
Each bearing consists of a pair of hardened steel ways containing $90^{\circ}$ vee grooves, and a row of alternately crossed cylindrical rollers. The hardened steel rollers are captive in a stainless steel cage for easy handling and assembly and permanent alignment. The ways are installed face to face by the user, with the rollers between the vee grooves.

Stainless Steel also available.
Application
Bearings are normally supplied and installed in sets of two to form an assembly that can support their rated load in any direction or orientation, and can be preloaded to eliminate side play.

Mounting and banking surfaces must be smooth and flat, and accurately parallel, coplanar, or perpendicular respectively to achieve maximum accuracy. Preload forces must be evenly distributed. Dirt and dust must be excluded. Lubrication required depends on the application, ranging from light grease or oil at the time of installation for low speeds (less that $1270 \mathrm{~mm} / \mathrm{min}$.) and occasional movement to continuous oil bath or mist at $30,000 \mathrm{~mm} / \mathrm{min}$.

## Ratings and Specifications

Load ratings in the tables are dynamic ratings for each set. Ratings are based on theoretical data, proper installation, appropriate lubrication, and a predicted life of 250 million mm. Ratings are suggested only, based on standard and typical industry practice, and cannot be guaranteed. Life can be increased approximately 10 times by operating a given bearing at $1 / 2$ its rated load, other factors being constant. Temperature of bearings must not exceed $100^{\circ} \mathrm{C}$, even for short periods, since this will reduce hardness and result in significantly reduced load capacity and working life.




Mounting holes in the way bars are threaded, and also counterbored to alternatively permit using the next smaller size screw with threaded mounting holes in the user's components.

## Ordering

Order standard bearing sets from table by model number according to load and travel required.

Each set consists of two complete bearings (4 way bars, 2 roller cages, and end stops). Delivery stock to 6 weeks.


## Crossed Roller Rail Sets



Length, Travel, and Load Selection
moment load ratings + load / life formulas. pg. 95

| MODEL | NO. OF ROLLERS IN EACH RETAINER | $\underset{\mathrm{L}}{\text { LENGTH }}$ | TRAVEL T | $\begin{aligned} & \text { NO. } \\ & \text { HOLES } \end{aligned}$ | RAIL SET LOAD CAPACITY kg | MODEL | NO. OF ROLLERS IN EACH RETAINER | $\underset{\mathrm{L}}{\text { LENGTH }}$ | TRAVEL T | $\begin{aligned} & \text { NO. } \\ & \text { HOLES } \end{aligned}$ | RAIL SET LOAD CAPACITY kg |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NB-1020 | 5 | 20 | 12 | 2 | 20 | NB-3225 | 31 | 225 | 135 | 9 | 310 |
| NB-1030 | 7 | 30 | 20 | 3 | 28 | NB-3250 | 35 | 250 | 145 | 10 | 350 |
| NB-1040 | 10 | 40 | 27 | 4 | 40 | NB-3275 | 38 | 275 | 165 | 11 | 380 |
| NB-1050 | 13 | 50 | 32 | 5 | 52 | NB-3300 | 42 | 300 | 175 | 12 | 419 |
| NB-1060 | 16 | 60 | 37 | 6 | 64 | NB-3325 | 45 | 325 | 195 | 13 | 449 |
| NB-1070 | 19 | 70 | 42 | 7 | 76 | NB-3350 | 49 | 350 | 205 | 14 | 489 |
| NB-1080 | 21 | 80 | 50 | 8 | 84 |  |  |  |  |  |  |
| NB-2030 | 5 | 30 | 18 | 2 | 30 | NB-4080 | 7 | 80 | 58 | 2 | 140 |
| NB-2045 | 8 | 45 | 24 | 3 | 48 | NB-4120 | 11 | 120 | 82 | 3 | 220 |
| NB-2060 | 11 | 60 | 30 | 4 | 66 | NB-4160 | 15 | 160 | 105 | 4 | 300 |
| NB-2075 | 13 | 75 | 44 | 5 | 78 | NB-4200 | 19 | 200 | 130 | 5 | 380 |
| NB-2090 | 16 | 90 | 50 | 6 | 96 | NB-4240 | 23 | 240 | 150 | 6 | 459 |
| NB-2105 | 18 | 105 | 64 | 7 | 108 | NB-4280 | 27 | 280 | 175 | 7 | 539 |
| NB-2120 | 21 | 120 | 70 | 8 | 126 | NB-4320 | 31 | 320 | 200 | 8 | 619 |
| NB-2135 | 23 | 135 | 84 | 9 | 138 | NB-4360 | 35 | 360 | 225 | 9 | 699 |
| NB-2150 | 26 | 150 | 90 | 10 | 156 | NB-4400 | 39 | 400 | 250 | 10 | 779 |
| NB-2165 | 29 | 165 | 95 | 11 | 173 | NB-4440 | 43 | 440 | 270 | 11 | 859 |
| NB-2180 | 32 | 180 | 100 | 12 | 192 | NB-4480 | 47 | 480 | 295 | 12 | 939 |
| NB-3050 | 7 | 50 | 28 | 2 | 70 | NB-6100 | 8 | 100 | 55 | 2 | 320 |
| NB-3075 | 10 | 75 | 48 | 3 | 100 | NB-6150 | 12 | 150 | 85 | 3 | 479 |
| NB-3100 | 14 | 100 | 58 | 4 | 140 | NB-6200 | 16 | 200 | 120 | 4 | 639 |
| NB-3125 | 17 | 125 | 78 | 5 | 170 | NB-6250 | 20 | 250 | 150 | 5 | 799 |
| NB-3150 | 21 | 150 | 88 | 6 | 210 | NB-6300 | 24 | 300 | 185 | 6 | 959 |
| NB-3175 | 24 | 175 | 105 | 7 | 240 | NB-6350 | 28 | 350 | 215 | 7 | 1119 |
| NB-3200 | 28 | 200 | 115 | 8 | 280 | NB-6400 | 32 | 400 | 245 | 8 | 1278 |

Dimensions in mm

| SERIES | A | Profile Dimensions |  |  |  | M | E | Mounting Dimensions |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | B | C | D | S |  |  | F* | J** | d | G | H |
| NB-1 | 8.5 | 4.0 | 3.9 | 1.5 | 1.5 | 10 | 1.8 | M2 | M1 | 1.65 | 3.0 | 1.4 |
| NB-2 | 12 | 6.0 | 5.5 | 2.0 | 2.0 | 15 | 2.5 | M3 | M2 | 2.54 | 4.4 | 2.0 |
| NB-3 | 18 | 8.0 | 8.3 | 3.0 | 2.0 | 25 | 3.5 | M4 | M3 | 3.30 | 6.0 | 3.1 |
| NB-4 | 22 | 11 | 10.2 | 4.0 | 2.0 | 40 | 4.5 | M5 | M4 | 4.3 | 8.0 | 4.2 |
| NB-6 | 31 | 15 | 14.2 | 6.0 | 3.0 | 50 | 6.0 | M6 | M5 | 5.2 | 9.5 | 5.2 |
| *Thread Siz |  |  |  |  |  |  | ${ }^{* *}$ Hole F clears cap screw for through mounting |  |  |  |  |  |

Dimensions in mm

## Modifying Length of Travel

For a given length of bearing way, since there is no slip at any load, both length of travel and load capacity depend on the number of rollers and their pitch. The number of rollers supplied with each standard bearing set provides a travel distance of approximately $60 \%$ of the way length (see page 48). In some cases (e.g., when mounting space is restricted)
it may be practical to increase travel at the expense of load capacity by removing one or more rollers instead of selecting a longer bearing. Since travel extends symmetrically around the mean position, the travel increase is twice the pitch for each roller removed. Similarly, the load capacity for the set (page 48) is reduced by twice the load capacity per roller.


| ROLLER SIZE | ROLLER DIAMETER <br> (D) <br> $\mathbf{m m}$ | ROLLER DISTANCE <br> (P) <br> $\mathbf{m m}$ | INCREASE OF <br> TRAVEL FOR EACH <br> ROLLER CUT-OFF <br> $\mathbf{m m}$ | ROLLER LOAD <br> CARRYING CAP. <br> PER ROLLER <br> kg |
| :---: | :---: | :---: | :---: | :---: |
| NB-1 | 1.5 | 2.5 | 5 | 4 |
| NB-2 | 2.0 | 4 | 8 | 6 |
| NB-3 | 3 | 5 | 10 | 10 |
| NB-4 | 4 | 7 | 14 | 20 |
| NB-6 | 6 | 8.5 | 17 | 40 |

Dimensions in mm

## Ant-Greep Grossed Roller Reil Sets

## 6 Reasons to choose Del-Tron Anti-Creep Crossed Roller Rail Sets



1. Designed for vertical applications and cantilevered loads.
2. Rugged- Hardened steel V-grooved rails and rollers withstand heavy loads.
3. Versatile- May be integrated into your own design.
4. High Accuracy- Parallelism of 0.002 mm over 100mm
5. Easy to use- Standard threaded and counterbored mounting holes allow access from either side.
6. Interchangeable- Form, fit and functional replacement for other manufacturer's Rail sets.

## Del-Tron ${ }^{\circledR}$ Anti-Creep Crossed Roller Rail Sets

The Anti-Creep crossed roller rail system is based on a new concept to prevent roller cage slippage during operation. This system allows you to mount the rail set in any orientation while maintaining direct roller contact to the rail surface eliminating roller cage creep. This system is ideal for vertical applications and where high acceleration and deceleration forces are present.

## Construction

Each bearing set contains four V-grooved Rails, eight end screws, and two Anti-Creep crossed roller retainers. The Anti-Creep crossed roller retainers utilize a studded roller and detented rail to prevent the migration of the retainer due to vertical and cantilevered load applications.

## Application

Bearings are normally supplied and installed in sets of two to form an assembly that can support their rated load in any direction or orientation, and can be preloaded to eliminate side play.

Mounting and banking surfaces must be smooth and flat, and accurately parallel, coplanar, or perpendicular respectively to achieve maximum accuracy. Preload forces must be evenly
distributed. Dirt and dust must be excluded. Lubrication required depends on the application, ranging from light grease or oil at the time of installation for low speeds $1270 \mathrm{~mm} / \mathrm{min}$. and occasional movement to continuous oil bath or mist at $30000 \mathrm{~mm} / \mathrm{min}$.

## RATINGS AND SPECIFICATIONS

Load ratings in the tables are dynamic ratings for each set. Ratings are based on theoretical data, proper installation, appropriate lubrication, and a predicted life of 254 million mm . Ratings are suggested only, based on standard and typical industry practice, and cannot be guaranteed. Life can be increased approximately 10 times by operating a given bearing at $1 / 2$ its rated load, other factors being constant. Temperature of bearings must not exceed $82^{\circ} \mathrm{C}$, even for short periods, since this will reduce hardness and result in significantly reduced load capacity and working life.


Fig. 1

ACCURACY
The accuracy of a slide is measured along it's entire length, as illustrated in Fig 2, and expressed in terms of parallelism (Fig 1.) Actual accuracy achieved depends on proper installation.


Mounting holes in the way bars are threaded, and also counterbored to alternatively permit using the next smaller size screw with threaded mounting holes in the user's components.

## INSTALLATION PROCEDURE

Note:

* Provide external mechanical stoppers.
* Set the movement to be less than the specified stroke.
(1) Remove burrs, scratches, and dust from the rail mounting surface of the table and bed, and be careful to prevent contamination during assembly.
(2) Apply low-viscosity oil to the contact surfaces, and align the table and the bed. (Figure 10a)
(3) Set the reference surface shown in Figure 4 onto the mounting surface with the rails assembled. Set the table in the center position, and tighten the adjustment screws lightly so that almost no gap remains. (Figure 10b)
(4) Keep the table in the center, tighten the rail mounting bolts lightly, loosen the end pieces of both end faces, and remove the fastening plate. Following this, firmly retighten the end pieces.
(5) While maintaining the conditions of (4), gently move the assembly through its stroke being certain to check that the speci.ed stroke length has been secured, and that there is no problem with the operation, or any other irregularity.
(6) Move the table to the center and tighten only the adjustment screws on the R-retainer with the recommended tightening torque as shown in Table 3. (Figure 10c)
(7) Gently move the table to one stroke end, and check that the table has surely come into contact with the external mechanical stopper. Following this, tighten the adjustment screws on the R-retainer in the same manner as (6). (Figure 10d)
(8) Move the table to the opposite stroke end, and tighten in the same manner as (6). (Figure 10e)
(9) Fasten the mounting bolts on rails 1,2 , and 3 by tightening with the recommended torque shown in Table 4. (Figure 10f)
(10) Set the dial indicators to the center of the table and to the side (reference surface) of the table. (Figure 10g)
(11) Perform the final preload adjustment. While moving the table back and forth, repeat steps (6) and (7) until the dial indicators show a minimum deviation.
(12) Finally, securely fasten rail 4 , which has been provisionally mounted, using the recommended torque. As with the adjustment screws, successively tighten the mounting bolts on the R-retainer while moving the table.
a

b


C


R-retainer
d


R-retainer
o: Adjustment screws can be tightened
x : Adjustment screws should not be tightened
f



## Anti-Creep Crossed Roller Rail Sets

## Ordering

Order standard bearing sets from table by model number according to load and travel required

Each set consists of two complete bearings (4 rails, 2 roller cages, and end stops).
Delivery stock to 8 weeks.

moment load ratings + load / life formulas. pg. 96



## Grossed Roller Slfde Tables (Aluminum)

## 6 Reasons to choose Del-Tron® Crossed Roller Slide Tables (Aluminum)



1. High accuracy and load capacity. (Precision ground V grooved ways and rollers.)
2. Withstands force in any direction. (Alternately crossed rollers $45^{\circ}$ angle.)
3. Easy installation. (Metric threaded mounting holes in standard pattern.)
4. Corrosion Resistant-Non Contaminating (Stainless steel models available.)
5. Lightweight. (Aluminum base and carriage.)
6. Interchangeable (with other manufacturer's slides.)

## Del-Tron Crossed Roller Slide Tables

Our Gold Motion Series crossed roller slide tables offer low cost and lightweight aluminum body construction to support heavy loads with low friction and precision linear motion. Select from over 40 standard sizes for use in a wide range of applications - precision instruments, office and communications equipment, surface grinders, tool grinders, and assembly fixtures, as examples.

Factory assembled and ready to install, each positioning table consists of an aluminum base and an aluminum carriage, both precision milled, and a pair of hardened stee linear bearings. Counterbored clearance holes, in base, permit easy mounting. Threaded holes, closely spaced in carriage, permit attaching your components without additional machining. Factory preloaded bearings eliminate side play. Internal stops, in the form of projecting screw heads between the underside of the carriage and base, protect bearings from overtravel during handling.

Mount on flat surfaces to provide full support to the base. Loads stated, may be applied in any direction. Load values are calculated for weights evenly distributed on your positioning table. For full life of tables, we recommend careful calculation of moments and cantilevered loads.


## Crossed Roller Slide Tables <br> (Aluminum)

moment load ratings + load / life formulas. pg. 96

| MODEL | STAINLESSSTEEL | $\underset{\mathrm{T}}{\text { TRAVEL }}$ | $\underset{\mathrm{L}}{\text { LENGTH }}$ | $\begin{gathered} \text { LOAD } \\ \text { CAPACITY } \\ \mathrm{kgf} \end{gathered}$ | BASE MOUNTING HOLES(COUNTERBORED) |  |  | $\begin{aligned} & \text { CARRIAGE } \\ & \text { MOUNTING HOLES } \\ & \text { (THREADED) } \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | $\begin{aligned} & \text { NO. } \\ & \text { HOLES } \end{aligned}$ | $-\mathrm{SP}$ | $\text { NG }{ }^{W}$ | $\begin{gathered} \text { NO. } \\ \text { HOLES } \end{gathered}$ | $\underset{\mathrm{M}}{\text { SPACING }}$ |
| NBT-1050AM | SS | 25 | 50 | 43 | 4 | 40 | - | 4 | $1 \times 15$ |
| NBT-1065AM | SS | 38 | 65 | 51 | 4 | 55 | - | 6 | $2 \times 15$ |
| NBT-1080AM | SS | 50 | 80 | 66 | 8 | 70 | 40 | 8 | $3 \times 15$ |
| NBT-1095AM | SS | 64 | 95 | 73 | 8 | 85 | 55 | 10 | $4 \times 15$ |
| NBT-1125AM | SS | 75 | 125 | 89 | 8 | 115 | 85 | 14 | $6 \times 15$ |
| NBT-2035A-18M | SS | 18 | 35 | 30 | 4 | 25 | - | 2 | - |
| NBT-2050AM | SS | 25 | 50 | 44 | 4 | 40 | - | 4 | $1 \times 15$ |
| NBT-2050A-30M | SS | 30 | 50 | 44 | 4 | 40 | - | 4 | $1 \times 15$ |
| NBT-2065AM | SS | 38 | 65 | 52 | 4 | 55 | - | 6 | $2 \times 15$ |
| NBT-2065A-40M | SS | 40 | 65 | 52 | 4 | 55 | - | 6 | $2 \times 15$ |
| NBT-2080A-50M | SS | 50 | 80 | 66 | 8 | 70 | 40 | 8 | $3 \times 15$ |
| NBT-2080AM | SS | 50 | 80 | 66 | 8 | 70 | 40 | 8 | $3 \times 15$ |
| NBT-2095A-60M | SS | 60 | 95 | 74 | 8 | 85 | 55 | 10 | $4 \times 15$ |
| NBT-2095AM | SS | 64 | 95 | 74 | 8 | 85 | 55 | 10 | $4 \times 15$ |
| NBT-2110A-70M | SS | 70 | 110 | 85 | 8 | 100 | 70 | 12 | $5 \times 15$ |
| NBT-2125AM | SS | 75 | 125 | 90 | 8 | 115 | 85 | 14 | $6 \times 15$ |
| NBT-2125A-80M | SS | 80 | 125 | 90 | 8 | 115 | 85 | 14 | $6 \times 15$ |
| NBT-2155A-100M | SS | 100 | 155 | 144 | 8 | 145 | 115 | 18 | $8 \times 15$ |
| NBT-2185A-120M | SS | 120 | 185 | 174 | 8 | 175 | 145 | 22 | $10 \times 15$ |
| NBT-3055AM | SS | 25 | 55 | 88 | 4 | 35 | - | 2 | - |
| NBT-3055A-30M | SS | 30 | 55 | 88 | 4 | 35 | - | 2 | - |
| NBT-3080A-45M | SS | 45 | 80 | 100 | 4 | 60 | - | 4 | $1 \times 25$ |
| NBT-3105AM | SS | 50 | 105 | 154 | 4 | 85 | - | 6 | $2 \times 25$ |
| NBT-3105A-60M | SS | 60 | 105 | 154 | 4 | 85 | - | 6 | $2 \times 25$ |
| NBT-3130A-75M | SS | 75 | 130 | 170 | 4 | 110 | - | 8 | $3 \times 25$ |
| NBT-3155AM | SS | 75 | 155 | 217 | 4 | 135 | - | 10 | $4 \times 25$ |
| NBT-3155A-90M | SS | 90 | 155 | 217 | 4 | 135 | - | 10 | $4 \times 25$ |
| NBT-3180AM | SS | 100 | 180 | 248 | 4 | 160 | - | 12 | $5 \times 25$ |
| NBT-3180A-105M | SS | 105 | 180 | 248 | 4 | 160 | - | 12 | $5 \times 25$ |
| NBT-3205AM | SS | 125 | 205 | 262 | 8 | 185 | 85 | 14 | $6 \times 25$ |
| NBT-3205A-130M | SS | 130 | 205 | 262 | 8 | 185 | 85 | 14 | $6 \times 25$ |
| NBT-3230A-155M | SS | 155 | 230 | 290 | 8 | 210 | 109 | 16 | $7 \times 25$ |
| NBT-3255A-180M | SS | 180 | 255 | 310 | 8 | 235 | 135 | 18 | $8 \times 25$ |
| NBT-3280A-205M | SS | 205 | 280 | 340 | 8 | 260 | 160 | 20 | $9 \times 25$ |
| NBT-3305A-230M | SS | 230 | 305 | 360 | 8 | 285 | 185 | 22 | $10 \times 25$ |
| NBT-4085AM | SS | 50 | 85 | 196 | 4 | 65 | - | 2 | - |
| NBT-4125AM | SS | 75 | 125 | 273 | 4 | 105 | - | 4 | $1 \times 40$ |
| NBT-4165AM | SS | 100 | 165 | 329 | 4 | 145 | - | 6 | $2 \times 40$ |
| NBT-4205AM | SS | 125 | 205 | 395 | 4 | 185 | - | 8 | $3 \times 40$ |
| NBT-4245AM | SS | 150 | 245 | 462 | 4 | 225 | - | 10 | $4 \times 40$ |
| NBT-6110AM | SS | 75 | 110 | 280 | 4 | 90 | - | 2 | - |
| NBT-6160AM | SS | 100 | 160 | 483 | 4 | 140 | - | 4 | $1 \times 50$ |
| NBT-6260AM | SS | 150 | 260 | 728 | 4 | 240 | - | 8 | $3 \times 50$ |
| NBT-6360AM | SS | 225 | 360 | 924 | 8 | 340 | 140 | 12 | $5 \times 50$ |

Dimensions in mm

| SERIES | Mounting Dimensions |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | CARRIAGE |  |  |  |  | BASE |  |  |
|  | SPACING |  | THREADJ | DEPTHK |  | S | COUNTERBORE |  |
|  | N | P |  |  |  |  | D | d |
| NBT-1000AM | 17.5 | 10 | M3 | 4.5 | 5 | 22 | 6.1 | 3.5 |
| NBT-2000AM | 17.5 | 15 | M4 | 8 | 5 | 30 | 8.1 | 4.6 |
| NBT-3000AM | 27.5 | 25 | M5 | 10.5 | 10 | 40 | 10.1 | 5.8 |
| NBT-4000AM | 42.5 | 40 | M5 | 13 | 10 | 55 | 10.1 | 5.8 |
| NBT-6000AM | 55 | 50 | M6 | 16 | 10 | 60 | 11.0 | 7.1 |

Dimensions in mm

CARRIAGE MOUNTING DIMENSIONS


## Specifications:

Straight Line Accuracy $0.0025 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel

## Finish

Carriage: Gold anodize,
Base: Black anodize
Positional Repeatability
0.0025 mm

Coefficient of Friction 0.003 typical

## Construction

Aluminum carriage and base, hardened steel crossed roller rail sets.

## Ordering

Order standard positioning tables from table by model number according to load and travel required.

Delivery stock to 6 weeks.

BASE MOUNTING DIMENSIONS

$\left.$|  | Profile <br> HEIGHT <br> $\mathbf{A}$ <br> SERIES | $\mathbf{0 . 1 3}$ | WIDTH <br> $\mathbf{B}$ <br> $\mathbf{0 . 2 5}$ |
| :--- | :---: | :---: | :---: | | BASE |
| :---: |
| THICKNESS |
| $\mathbf{C}$ | \right\rvert\,



Dimensions in mm


# Ant-Greep Grossed Roller Slide Tables (Aluminum) 

6 Reasons to choose Del-Tron ${ }^{\circledR}$ Anti-CreepCrossed Roller Slide Tables (Aluminum)


1. Anti-Creep Crossed Roller Technology. Ideal for vertical and cantilevered load applications.
2. High accuracy and load capacity. Precision V grooved rails and rollers.
3. Lightweight aluminum carriage and base design.
4. Withstands force in any direction. Alternately crossed roller cage design.
5. Easy installation. Threaded and counterbored mounting holes in standard pattern.
6. Interchangeable with other manufacturer's slides.

## Del-Tron ${ }^{\circledR}$ <br> Anti-Creep Crossed Roller Slide Tables

The Anti-Creep crossed roller slide tables utilize our Anti-Creep crossed roller rail systems to prevent roller cage slippage during operation. This system allows you to mount the table in any orientation while maintaining direct roller contact to the rail surface eliminating roller cage creep. These tables are ideal for vertical applications and where high acceleration and deceleration forces are present.

Factory assembled and ready to install, each positioning table consists of an aluminum base and an aluminum carriage, both precision milled, and a pair of hardened steel linear bearings. Counterbored clearance holes, in base, permit easy mounting.Threaded holes, closely spaced in carriage, permit attaching your components without additional machining. Factory preloaded bearings eliminate side play. Internal stops, in the form of projecting screw heads between the underside of the carriage and base, protect bearings from over travel during handling.

Mount on flat surfaces to provide full support to the base. Loads stated, may be applied in any direction. Load values are calculated for weights evenly distributed on your positioning table. For full life of tables, we recommend careful calculation of moments and cantilevered loads.


# Anti-Creep Crossed Roller Slide Tables <br> (Aluminum) 

## Stainless Steel Models Available

For applications where particulate contamination caused by corrosion must be reduced, Del-Tron offers Gold Motion crossed roller positioning tables equipped with corrosion-resistant, stainless steel, crossed roller linear bearings.

TO ORDER:
Add SS to model number before "AM". For example: NBT-4085SSAM-AC
moment load ratings + load / life formulas. pg. 97

| *Travel is $1 / 2$ distan | from ce | er in eith | direction. LOAD | BASE MOUNTING HOLES (COUNTERBORED) |  |  | CARRIAGE MOUNING HOLES <br> (THREADED) |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MODEL | $\underset{\mathrm{T}}{\text { TRAVE* }}$ | $\underset{\mathrm{L}}{\text { LENGTH }}$ | CAPACITY <br> LBF (kgf) | $\begin{gathered} \text { NO. } \\ \text { HOLES } \end{gathered}$ | $\bar{U} \text { SPACING }$ | W | $\begin{gathered} \text { NO. } \\ \text { HOLES } \end{gathered}$ | $\underset{M}{\text { SPACING }}$ |
| NBT-1050AM-AC | 25 | 50 | 43 | 4 | 40 | - | 4 | 15 |
| NBT-1065AM-AC | 30 | 65 | 51 | 4 | 55 | - | 6 | 15 |
| NBT-1080AM-AC | 40 | 80 | 65 | 8 | 70 | 40 | 8 | 15 |
| NBT-1095AM-AC | 50 | 95 | 73 | 8 | 85 | 55 | 10 | 15 |
| NBT-1125AM-AC | 70 | 125 | 89 | 8 | 115 | 85 | 14 | 15 |
| NBT-2035AM-18-AC | 18 | 35 | 30 | 4 | 25 | - | 2 | 15 |
| NBT-2050AM-AC | 25 | 50 | 44 | 4 | 40 | - | 4 | 15 |
| NBT-2065AM-AC | 30 | 65 | 52 | 4 | 55 | - | 6 | 15 |
| NBT-2080AM-AC | 40 | 80 | 66 | 8 | 70 | 40 | 8 | 15 |
| NBT-2095AM-AC | 50 | 95 | 74 | 8 | 85 | 55 | 10 | 15 |
| NBT-2110AM-70-AC | 65 | 110 | 85 | 8 | 100 | 70 | 12 | 15 |
| NBT-2125AM-AC | 70 | 125 | 90 | 8 | 115 | 85 | 14 | 15 |
| NBT-2155AM-100-AC | 90 | 155 | 144 | 8 | 145 | 115 | 18 | 15 |
| NBT-2185AM-120-AC | 100 | 185 | 174 | 8 | 175 | 145 | 22 | 15 |
| NBT-3055AM-AC | 25 | 55 | 88 | 4 | 35 | - | 2 | 25 |
| NBT-3080AM-45-AC | 48 | 80 | 100 | 4 | 60 | - | 4 | 25 |
| NBT-3105AM-AC | 60 | 105 | 154 | 4 | 85 | - | 6 | 25 |
| NBT-3130AM-75-AC | 83 | 130 | 170 | 4 | 110 | - | 8 | 25 |
| NBT-3155AM-AC | 90 | 155 | 217 | 4 | 135 | - | 10 | 25 |
| NBT-3180AM-AC | 103 | 180 | 248 | 4 | 160 | - | 12 | 25 |
| NBT-3205AM-AC | 113 | 205 | 262 | 8 | 185 | 85 | 14 | 25 |
| NBT-3230AM-155-AC | 150 | 230 | 290 | 8 | 210 | 110 | 16 | 25 |
| NBT-4085AM-AC | 60 | 85 | 196 | 4 | 65 | - | 2 | 40 |
| NBT-4125AM-AC | 75 | 125 | 273 | 4 | 105 | - | 4 | 40 |
| NBT-4165AM-AC | 105 | 165 | 329 | 4 | 145 | - | 6 | 40 |
| NBT-4205AM-AC | 130 | 205 | 395 | 4 | 185 | - | 8 | 40 |
| NBT-4245AM-AC | 143 | 245 | 462 | 4 | 225 | - | 10 | 40 |
| NBT-6110AM-AC | 63 | 110 | 280 | 4 | 90 | - | 2 | 50 |
| NBT-6160AM-AC | 85 | 160 | 483 | 4 | 140 | - | 4 | 50 |
| NBT-6260AM-AC | 158 | 260 | 728 | 4 | 240 | - | 8 | 50 |
| NBT-6360AM-AC | 230 | 360 | 924 | 8 | 340 | 140 | 12 | 50 |


|  |  |  |  | unting | mensions |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | SPACI |  | THREAD | DEPTH | SPACING |  | COUNTE |  |  |
| SERIES | N | P | J | K | R | S | D | d | h |
| NBT-1000AM-AC | 17.5 | 10 | M-3 | 4.5 | 5 | 22 | 5 | 3.1 | 3.2 |
| NBT-2000AM-AC | 17.5 | 15 | M-4 | 8 | 5 | 30 | 6.1 | 3.7 | 3.7 |
| NBT-3000AM-AC | 27.5 | 25 | M-5 | 10.5 | 10 | 40 | 8.3 | 5 | 5.2 |
| NBT-4000AM-AC | 42.5 | 40 | M-5 | 13 | 10 | 55 | 8.3 | 5 | 5.2 |
| NBT-6000AM-AC | 55 | 50 | M-6 | 16 | 10 | 60 | 10.3 | 6.7 | 8.0 |
| Dimensions in mm |  |  |  |  |  |  |  |  |  |

## CARRIAGE MOUNTING DIMENSIONS



## Specifications:

## Straight Line Accuracy

 $0.0025 \mathrm{~mm} / 25 \mathrm{~mm}$ of travel
## Positional Repeatability

 0.0025 mmCoefficient of Friction 0.003 typical

## Construction

Aluminum carriage and base, hardened steel crossed roller rail sets.

## Finish

Carriage: Gold anodize, Base: Black anodize

## Ordering

Order standard slide tables from table by model number according to load and travel required.

Delivery stock to 6 weeks.

BASE MOUNTING DIMENSIONS

| Profile Dimensions <br> HEIGHT <br> A <br> SERIES |  |  |  |
| :--- | :---: | :---: | :---: |
| $\mathbf{0 . 1 3}$ | WIDTH <br> $\mathbf{B}$ <br> $\mathbf{0 . 2 5}$ | BASE <br> THICKNESS <br> C |  |
| NBT-1000AM-AC | 15 | 30 | 4.1 |
| NBT-2000AM-AC | 21 | 40 | 6.5 |
| NBT-3000AM-AC | 28 | 60 | 9 |
| NBT-4000AM-AC | 35 | 80 | 10.5 |
| NBT-6000AM-AC | 45 | 100 | 13 |
| Dimensions in mm |  |  |  |



## Crossed Roller Slfde Tables (Steel)

## 6 Reasons to choose Del-Tron® Crossed Roller Slide Tables

(Steel)


1. High Accuracy -. 002 mm parallelism.
2. High Load Capacity - Crossed roller way construction handles loads up to 1200 kg .
3. Interchangeable with other manufacturer's tables.
4. Low Friction - 0.003 coefficient of friction for smooth operation.
5. Standard Mounting - Holes provided.
6. Backlash Free - Factory preloaded for minimum axial play.

Del-Trom Preaision,Inc.

## Del-Tron ${ }^{\circ}$ <br> Crossed Roller Slide Tables

Crossed Roller Slide Tables are factory assembled, and ready to install. They use Del-Tron crossed roller bearings to provide very precise linear motion with low friction and high support stiffness for the load. A selection of more than 40 standard sizes is available for applications including precision instruments, office and communications equipment, surface grinders, tool grinders, assembly fixtures, and anywhere precise linear positioning is required.

## Construction

Each positioning table consists of a one piece base, a one piece carriage, and a pair of linear bearings. The bearings are factory preloaded to eliminate side play.

Counterbored clearance holes in the base permit easy mounting in your structure. Threaded holes in the carriage are closely spaced to permit attaching your components without additional machining in most cases.

Standard material for base and carriage is cold rolled steel, with black oxide finish.

## Application

Mount on a flat surface to provide full support to the base

Although it is seldom needed, the carriage surface can be machined or additional mounting holes can be added if the following precautions are observed:

1. Do not disassemble the table since reassembly and readjustment of the preloading require special procedures.
2. Protect the ways against entry of chips and debris.
3. Drill only blind holes through the carriage to avoid depositing chips inside the unit.
4. Avoid intersection with internal mounting or preloading screws.
5. Avoid clamping forces in excess of the rated load capacity.

Internal stops, in the form of projecting screw heads between the under side of the carriage and the base, are intended only to protect the bearings from overtravel during handling. Provide separate stops appropriate for your load if needed.

The ends of the carriage contain tapped holes that permit easy attachment of way covers, bellows, or other shields to exclude dust and keep the ways clean

moment load ratings + load / life formulas. pg. 97

| MODEL | $\underset{\mathrm{T}}{\text { TRAVEL }}$ | $\underset{\mathrm{L}}{\text { LENGTH }}$ | Length, Travel and Load Selection |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | LOAD |  |  | BASE MOUNTING HOLES COUNTERBORED) SPACING |  |  |  | $\begin{aligned} & \text { CARRIAGE } \\ & \text { MOUNTING HOLES } \end{aligned}$- (THREADED) - |  |
|  |  |  | CAPACITY | $\begin{aligned} & \text { HOLES } \end{aligned}$ | U | V | W | X | Y | $\begin{aligned} & \text { NO. } \\ & \text { HOLES } \end{aligned}$ | $\underset{M}{\text { SPACING }}$ |
| NBT-1025 | 12 | 25 | 12 | 4 | 18 | - | - | - | - | 2 | - |
| NBT-1035 | 18 | 35 | 16 | 4 | 28 | - | - | - | - | 4 | $1 \times 10$ |
| NBT-1045 | 25 | 45 | 20 | 4 | 38 | - | - | - | - | 6 | $2 \times 10$ |
| NBT-1055 | 32 | 55 | 26 | 8 | 48 | - | 28 | - | - | 8 | $3 \times 10$ |
| NBT-1065 | 40 | 65 | 32 | 8 | 58 | - | 38 | - | - | 10 | $4 \times 10$ |
| NBT-1075 | 45 | 75 | 36 | 8 | 68 | - | 48 | - | - | 12 | $5 \times 10$ |
| NBT-1085 | 50 | 85 | 40 | 8 | 78 | - | 58 | - | - | 14 | $6 \times 10$ |
| NBT-2035 | 18 | 35 | 40 | 4 | 25 | - | - | - | - | 2 | - |
| NBT-2050 | 30 | 50 | 63 | 4 | 40 | - | - | - | - | 4 | $1 \times 15$ |
| NBT-2065 | 40 | 65 | 75 | 4 | 55 | - | - | - | - | 6 | $2 \times 15$ |
| NBT-2080 | 50 | 80 | 95 | 8 | 70 | - | 40 | - | - | 8 | $3 \times 15$ |
| NBT-2095 | 60 | 95 | 105 | 8 | 85 | - | 55 | - | - | 10 | $4 \times 15$ |
| NBT-2110 | 70 | 110 | 120 | 8 | 100 | - | 70 | - | - | 12 | $5 \times 15$ |
| NBT-2125 | 80 | 125 | 130 | 8 | 115 | - | 85 | - | - | 14 | $6 \times 15$ |
| NBT-2140 | 90 | 140 | 145 | 12 | 130 | - | 100 | - | 70 | 16 | $7 \times 15$ |
| NBT-2155 | 100 | 155 | 155 | 12 | 145 | - | 115 | - | 85 | 18 | $8 \times 15$ |
| NBT-2170 | 110 | 170 | 170 | 12 | 160 | - | 130 | - | 100 | 20 | $9 \times 15$ |
| NBT-2185 | 120 | 185 | 180 | 16 | 175 | - | 145 | - | 115 | 22 | $10 \times 15$ |
| NBT-3055 | 30 | 55 | 126 | 4 | 35 | - | - | - | - | 2 | - |
| NBT-3080 | 45 | 80 | 184 | 4 | 60 | - | - | - | - | 4 | $1 \times 25$ |
| NBT-3105 | 60 | 105 | 220 | 4 | 85 | - | - | - | - | 6 | $2 \times 25$ |
| NBT-3130 | 75 | 130 | 275 | 4 | 110 | - | - | - | - | 8 | $3 \times 25$ |
| NBT-3155 | 90 | 155 | 310 | 6 | 135 | 85 | - | - | - | 10 | $4 \times 25$ |
| NBT-3180 | 105 | 180 | 355 | 6 | 159 | 110 | - | - | - | 12 | $5 \times 25$ |
| NBT-3205 | 130 | 205 | 375 | 10 | 185 | 135 | 85 | - | - | 14 | $6 \times 25$ |
| NBT-3230 | 155 | 230 | 420 | 10 | 210 | 160 | 110 | - | - | 16 | $7 \times 25$ |
| NBT-3255 | 180 | 255 | 450 | 10 | 235 | 185 | 135 | - | - | 18 | $8 \times 25$ |
| NBT-3280 | 205 | 280 | 490 | 12 | 260 | 210 | 160 | 110 | - | 20 | $9 \times 25$ |
| NBT-3305 | 230 | 305 | 520 | 12 | 285 | 235 | 185 | 135 | - | 22 | $10 \times 25$ |
| NBT-4085 | 50 | 85 | 280 | 4 | 65 | - | - | - | - | 2 | - |
| NBT-4125 | 75 | 125 | 390 | 4 | 105 | - | - | - | - | 4 | $1 \times 40$ |
| NBT-4165 | 105 | 165 | 470 | 4 | 145 | - | - | - | - | 6 | $2 \times 40$ |
| NBT-4205 | 130 | 205 | 565 | 6 | 185 | 105 | - | - | - | 8 | $3 \times 40$ |
| NBT-4245 | 155 | 245 | 660 | 6 | 225 | 145 | - | - | - | 10 | $4 \times 40$ |
| NBT-4285 | 185 | 285 | 745 | 10 | 265 | 185 | 105 | - | - | 12 | $5 \times 40$ |
| NBT-4325 | 210 | 325 | 830 | 10 | 305 | 225 | 145 | - | - | 14 | $6 \times 40$ |
| NBT-6110 | 60 | 110 | 400 | 4 | 90 | - | - | - | - | 2 | - |
| NBT-6160 | 95 | 160 | 690 | 4 | 140 | - | - | - | - |  | $1 \times 50$ |
| NBT-6210 | 130 | 210 | 870 | 6 | 190 | 90 | - | - | - | 6 | $2 \times 50$ |
| NBT-6260 | 165 | 260 | 1040 | 6 | 240 | 140 | - | - | - | 8 | $3 \times 50$ |
| NBT-6310 | 200 | 310 | 1200 | 6 | 290 | 190 | - | - | - | 10 | $4 \times 50$ |

Dimensions in mm

## Crossed Roller Slide Tables (Steel)

Load Ratings
See "Ratings and Specifications" page 54
The load capacities stated in the tables may be applied in any direction, and are assumed to be centered and evenly distributed over the table. Calculate moments and cantilevered loads carefully since inadvertent overloading will reduce service life.

## Ordering

Order standard positioning tables from table by model number according to load and travel required.

Delivery stock to 6 weeks.

| SERIES | Mounting Dimensions |  |  |  |  |  | BASE $\qquad$ C'BORE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\Gamma$ SPACING |  | thread | DEPTH |  |  |  |  |
|  | N | P | $J$ | K | R | S | D | d |
| NBT-1000 | 12.5 | 10 | M2 | 7 | 3.5 | 22 | 4.5 | 2.5 |
| NBT-2000 | 17.5 | 15 | M3 | 8 | 5 | 30 | 6.5 | 3.5 |
| NBT-3000 | 27.5 | 25 | M4 | 10.5 | 10 | 40 | 8.0 | 4.5 |
| NBT-4000 | 42.5 | 40 | M5 | 13 | 10 | 55 | 10.0 | 5.5 |
| NBT-6000 | 55 | 50 | M6 | 16 | 10 | 60 | 11.5 | 7 |

Dimensions in mm


| MODEL | Deflection |  | MODEL | Deflection |  | MODEL | Deflection |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | V | H |  | V | H |  | V | H |
| NBT 1025 | 2 | 4 | NBT 2140 | 3 | 6 | NBT 3305 | 3 | 7 |
| NBT 1035 | 2 | 4 | NBT 2155 | 3 | 6 |  |  |  |
| NBT 1045 | 2 | 4 | NBT 2170 | 3 | 7 | NBT 4085 | 2 | 5 |
| NBT 1055 | 2 | 5 | NBT 2185 | 3 | 7 | NBT 4125 | 3 | 6 |
| NBT 1065 | 2 | 5 |  |  |  | NBT 4165 | 3 | 7 |
| NBT 1075 | 2 | 5 | NBT 3055 | 2 | 5 | NBT 4205 | 3 | 7 |
| NBT 1085 | 2 | 5 | NBT 3080 | 2 | 5 | NBT 4245 | 3 | 7 |
|  |  |  | NBT 3105 | 3 | 6 | NBT 4285 | 3 | 7 |
| NBT 2035 | 2 | 4 | NBT 3130 | 3 | 6 | NBT 4325 | 4 | 8 |
| NBT 2050 | 2 | 4 | NBT 3155 | 3 | 6 |  |  |  |
| NBT 2065 | 2 | 5 | NBT 3180 | 3 | 7 | NBT 6110 | 3 | 6 |
| NBT 2080 | 2 | 5 | NBT 3205 | 3 | 7 | NBT 6160 | 3 | 6 |
| NBT 2095 | 2 | 5 | NBT 3230 | 3 | 7 | NBT 6210 | 3 | 7 |
| NBT 2110 | 3 | 6 | NBT 3255 | 3 | 7 | NBT 6260 | 3 | 7 |
| NBT 2125 | 3 | 6 | NBT 3280 | 3 | 7 | NBT 6310 | 3 | 7 |

Dimensions in $\mu \mathrm{m}$


BASE MOUNTING DIMENSIONS

| SERIES * | Profile Dimensions |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} \text { HEIGHT } \\ A \\ \pm 0.1 \end{gathered}$ | $\begin{gathered} \text { WIDTH } \\ \mathbf{B}^{* *} \\ \pm 0.1 \end{gathered}$ | FLANGEHEIGHT0 | C |  |  |  |  |
|  |  |  |  |  | E | F | G | $\begin{gathered} \text { THREAD } \\ \text { H } \end{gathered}$ |
| NBT-1000 | 17 | 30 | 5.5 | 2.5 | - | 12 | - | M2 |
| NBT-2000 | 21 | 40 | 6.5 | 3.4 | - | 16 | - | M2 |
| NBT-3000 | 28 | 60 | 9 | 5.5 | - | 40 | - | M3 |
| NBT-4000 | 35 | 80 | 10.5 | 6.5 | - | 55 | - | M3 |
| NBT-6000 | 45 | 100 | 13 | 8 | 15 | 60 | 92 | M4 |

Dimensions in mm

$$
\begin{array}{ll}
\text { ** Except Series NBT-1000 and NBT-2000 } & \begin{array}{l}
+0.2 \mathrm{~mm} \\
-0.4 \mathrm{~mm}
\end{array}
\end{array}
$$

## Recirculating Ball Sllde Cuides (BSG)

## 6 Reasons to choose Del-Tron ${ }^{\text {Recirculating }}$ Ball Slide Guides

(BSG)



1. Smooth and stable operation.
2. Compact, lightweight and low price.
3. High load capacity due to R-shaped groove.
4. Four-point contact to carry load and moment in all directions.
5. Stainless steel type available.
6. Extra wide type available.

## Del-Tron®

Recirculating Ball Slide Guides (BSG)

The BSG type consists of a block and a guide rail, both having two R-shape raceway grooves machined by precision grinding. The block consists of a main body having raceway grooves and a resin return cap ensuring smooth circulation of balls. These precision steel balls roll in the respective raceway groove with contact at four points.

- Smooth and Stable operation. Since precision steel balls are used as rolling elements, the rolling resistance is extremely small, ensuring smooth and stable operation.
- Compact, lightweight, and low price. The block is a simple structure, so the slide guide is compact and inexpensive. Its compactness and light weight also make this product optimum for linear operation at high speed.
- High load capacity utilizing the R-shaped groove. The raceway surface over which the balls roll is an R-shaped groove, offering a large contact area. Therefore, the product features a large load capacity and a long effective life.
- Four-point contact to carry load and moment in all directions. The Gothic arch groove, where the balls contact the raceway surface at four points, enables the load and moment to be carried in all directions.
- Stainless steel type (BSGS) is available. The BSGS type uses stainless steel for the block and guide rail, thus having superior corrosion resistance.
- Extra wide type (BSGW) is also available. With its increased number of rolling elements and increased width, this unit can replace the use of two linear guides. Stiffness in regard to moment load is increased, thus creating an effective compact linear motion mechanism.
- Slide guides are supplied with temporary ends stops. They are not to be used as positive stops.
Part number for BSG


| Height $(H)$ tolerance | $\pm 0.041$ |
| :--- | ---: |
| Difference of heights $(H)$ between paired ones | 0.015 |
| Width $\left(W_{1}\right)$ tolerance | $\pm 0.041$ |
| Difference of widths $\left(W_{1}\right)$ between paired ones | 0.020 |
| Running parallelism of C plane with respect to A plane | See Fig. 2 |
| Running parallelism of D plane with respect to B plane | See Fig. 2 |



## Travel Accuracy

## Mounting Requirements

The corners of the reference planes should be finished with undercuts as shown in Figure 3. The recommended heights of the shoulders of the mounting planes are as shown in the table. To attain high accuracy, it is recommended to finish the mounting planes of the bed and table to an accuracy the same as or better than that of the guide rail and block.


Recommended Tightening Torques: The recommended tightening torques for the mounting bolts (hex socket head bolts) are shown here.

| Unit: N•m |  |
| :---: | :---: |
| Nominal Bolt Size | Tightening Torques |
| M2 | 0.4 |
| M3 | 1.0 |
| M4 | 2.5 |
| M5 | 4.9 |

To install a BSG Slide Guide (Fig. 4), confirm the reference planes as shown in Figure 1, then let the reference planes of the bed and table make close contact with the reference planes of the object and fix them. When using two guide rails, fix the reference side in a state in which it is closely contacted with the reference plane. Fix the adjustment side after adjusting the traveling state with either the guide rails or the block in a free state.


Ball Slide Guide BSG
BSGS (Stainless Steel)
Dimension - mm


Maximum length is available for special order.

| MODEL |  | GUIDE RAIL LENGTHS / [NUMBER OF HOLES] |  |  |  |  |  |  |  |  | MAX LENGTH |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Lmm | [M] | Lmm | [M] | Lmm | [M] | Lmm | [M] | P | STEEL | STAINLESS |
|  | $\begin{aligned} & \hline \text { BSGS5 } \\ & \text { BSGS5UU } \end{aligned}$ | $\begin{array}{r} 40 \\ 130 \end{array}$ | $\begin{gathered} {[2]} \\ {[8]} \end{gathered}$ | $\begin{array}{r} 55 \\ 160 \end{array}$ | $\begin{array}{r} {[3]} \\ {[10]} \end{array}$ | 70 | [4] | 100 | [6] | 15 | N/A | 340 |
|  | $\begin{aligned} & \text { BSGS8 } \\ & \text { BSGS8UU } \end{aligned}$ | $\begin{array}{r} 40 \\ 100 \end{array}$ | $\begin{aligned} & {[2]} \\ & {[6]} \end{aligned}$ | $\begin{array}{r} 55 \\ 130 \end{array}$ | $\begin{gathered} {[3]} \\ {[8]} \end{gathered}$ | 70 | [4] | 85 | [5] | 15 | N/A | 700 |
| $\begin{aligned} & \text { BSG10 } \\ & \text { BSG10UU } \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { BSGS10 } \\ \text { BSGS10UU } \end{array}$ | $\begin{array}{r} 55 \\ 155 \end{array}$ | $\begin{aligned} & {[2]} \\ & {[7]} \end{aligned}$ | $\begin{array}{r} 75 \\ 195 \end{array}$ | $\begin{aligned} & {[3]} \\ & {[9]} \end{aligned}$ | $\begin{array}{r} 95 \\ 275 \end{array}$ | $\begin{gathered} {[4]} \\ {[13]} \end{gathered}$ | 115 | [5] | 20 | 500 | 1000 |
| $\begin{aligned} & \text { BSG13 } \\ & \text { BSG13UU } \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { BSGS13 } \\ \text { BSGS13UU } \end{array}$ | $\begin{aligned} & 120 \\ & 320 \end{aligned}$ | $\begin{gathered} {[4]} \\ {[12]} \end{gathered}$ | $\begin{aligned} & 170 \\ & 370 \end{aligned}$ | $\begin{array}{r} {[6]} \\ {[14]} \end{array}$ | $\begin{aligned} & 220 \\ & 470 \end{aligned}$ | $\begin{gathered} {[8]} \\ {[18]} \end{gathered}$ | 270 | [10] | 25 | 500 | 1000 |
| BSG16 BSG16UU | $\begin{array}{\|l\|l} \text { BSGS16 } \\ \text { BSGS16UU } \end{array}$ | $\begin{aligned} & 150 \\ & 550 \end{aligned}$ | $\begin{array}{r} {[3]} \\ {[13]} \end{array}$ | $\begin{aligned} & 230 \\ & 670 \end{aligned}$ | $\begin{array}{r} {[5]} \\ {[16]} \end{array}$ | 310 | [7] | 430 | [10] | 40 | 1900 | 1000 |
| $\begin{aligned} & \text { BSG25 } \\ & \text { BSG25UU } \end{aligned}$ | $\begin{array}{\|l} \text { BSGS25 } \\ \text { BSGS25UU } \end{array}$ | 220 640 | $\begin{gathered} {[3]} \\ {[10]} \end{gathered}$ | $\begin{aligned} & 280 \\ & 880 \end{aligned}$ | $\begin{gathered} {[4]} \\ {[14]} \end{gathered}$ | 340 | [5] | 460 | [7] | 60 | 1900 | 1000 |

See page 84 for Carriage information.


Ball Slide Guide
Extra Wide
$B S G-W$ (Stainless Steel)
BSGS-W


Maximum length is available for special order.

| MODEL |  | GUIDE RAIL LENGTHS / [NUMBER OF HOLES] |  |  |  |  |  |  |  |  | MAX LENGTH |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Lmm | [M] | Lmm | [M] | Lmm | [M] | Lmm | [M] | P | STEEL | STAINLESS |
|  | $\begin{aligned} & \text { BSGS9W } \\ & \text { BSGS9WUU } \end{aligned}$ | $\begin{array}{r} 80 \\ 200 \end{array}$ | $\begin{aligned} & {[2]} \\ & {[6]} \end{aligned}$ | $\begin{aligned} & \hline 110 \\ & 230 \end{aligned}$ | $\begin{aligned} & \hline[3] \\ & {[7]} \end{aligned}$ | $\begin{aligned} & 140 \\ & 260 \end{aligned}$ | $\begin{aligned} & \hline[4] \\ & {[8]} \end{aligned}$ | $\begin{aligned} & 170 \\ & 290 \end{aligned}$ | $\begin{aligned} & \hline[5] \\ & {[9]} \end{aligned}$ | 30 | N/A | 700 |
| $\begin{aligned} & \text { BSG12W } \\ & \text { BSG12WUU } \end{aligned}$ | $\begin{aligned} & \text { BSGS12W } \\ & \text { BSGS12WUU } \end{aligned}$ | $\begin{array}{r} 80 \\ 200 \end{array}$ | $\begin{aligned} & {[2]} \\ & {[6]} \end{aligned}$ | $\begin{aligned} & 110 \\ & 230 \end{aligned}$ | $\begin{aligned} & {[3]} \\ & {[7]} \end{aligned}$ | $\begin{aligned} & 140 \\ & 260 \end{aligned}$ | $\begin{aligned} & {[4]} \\ & {[8]} \end{aligned}$ | $\begin{aligned} & 170 \\ & 290 \end{aligned}$ | $\begin{aligned} & {[5]} \\ & {[9]} \end{aligned}$ | 30 | 1000 | 1000 |
| $\begin{aligned} & \text { BSG14W } \\ & \text { BSG14WUU } \end{aligned}$ | $\begin{aligned} & \begin{array}{l} \text { BSGS14W } \\ \text { BSGS14WUU } \end{array} \end{aligned}$ | $\begin{aligned} & 110 \\ & 310 \end{aligned}$ | $\begin{gathered} {[2]} \\ {[7]} \end{gathered}$ | $\begin{aligned} & 150 \\ & 390 \end{aligned}$ | $\begin{gathered} {[3]} \\ {[9]} \end{gathered}$ | $\begin{aligned} & 190 \\ & 470 \end{aligned}$ | $\begin{gathered} {[4]} \\ {[11]} \end{gathered}$ | 230 | [5] | 40 | 1900 | 1000 |
| $\begin{aligned} & \text { BSG16W } \\ & \text { BSG16WUU } \end{aligned}$ | $\begin{aligned} & \text { BSGS16W } \\ & \text { BSGS16WUU } \end{aligned}$ | $\begin{aligned} & 150 \\ & 550 \end{aligned}$ | $\begin{array}{r} {[3]} \\ {[13]} \end{array}$ | $\begin{aligned} & 230 \\ & 670 \end{aligned}$ | $\begin{array}{r} {[5]} \\ {[16]} \end{array}$ | 310 | [7] | 430 | [10] | 40 | 1900 | 1000 |

See page 85 for Carriage information.

Ball Slide Guide
BSG
BSGS
(Stainless Steel)

$\xrightarrow{\mathrm{M} \times \mathrm{P}}$


BSG-UU/BSGS-UU (with double seals)


Part \# BSGS5 - Mtg Screw[ Special Base Mounting $\square$ Fastener Supplied with BSGS5 Series

Dims - imm
.66


| MODEL |  | DIMENSIONS OF CARRIAGE |  |  |  |  |  |  |  |  |  |  | $\begin{gathered} \hline \text { BASIC LOAD } \\ \text { RATING } \end{gathered}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| STEEL | STAINLESS STEEL | H | B | $\mathrm{L}_{2}$ | $L_{1}$ | W | $\mathrm{P}_{1}$ | $\mathrm{P}_{2}$ | $S_{1}$ | ${ }_{1}$ | $\mathrm{L}_{3}$ | b | C kgf | Co kgf |
|  | $\begin{aligned} & \text { BSGS5 } \\ & \text { BSGS5UU } \end{aligned}$ | 6 | 12 | 17 | 15.6 | 2 | 8 | - | M2 | 1.5 | 9.8 | 4.5 | 44 | 73 |
|  | $\begin{aligned} & \text { BSGS8 } \\ & \text { BSGS8UU } \end{aligned}$ | 8 | 17 | 23.5 | 21.9 | 2.5 | 12 | 8 | M2 | 2.5 | 15.1 | 6.5 | 110 | 170 |
| $\begin{aligned} & \text { BSG10 } \\ & \text { BSG10UU } \end{aligned}$ | $\begin{aligned} & \text { BSGS10 } \\ & \text { BSGS10UU } \end{aligned}$ | 10 | 20 | 30.5 | 28.1 | 2.5 | 15 | 10 | M3 | 3 | 20.4 | 7.8 | 170 | 250 |
| $\begin{aligned} & \text { BSG13 } \\ & \text { BSG13UU } \end{aligned}$ | $\begin{aligned} & \text { BSGS13 } \\ & \text { BSGS13UU } \end{aligned}$ | 13 | 27 | 34 | 30 | 3.5 | 20 | 15 | M3 | 3.5 | 23 | 10 | 220 | 320 |
| $\begin{aligned} & \text { BSG16 } \\ & \text { BSG16UU } \end{aligned}$ | $\begin{aligned} & \text { BSGS16 } \\ & \text { BSGS16UU } \end{aligned}$ | 16 | 32 | 42.5 | 38.5 | 3.5 | 25 | 20 | M3 | 4 | 29.5 | 12 | 370 | 550 |
| $\begin{aligned} & \text { BSG25 } \\ & \text { BSG25UU } \end{aligned}$ | $\begin{aligned} & \text { BSGS25 } \\ & \text { BSGS25UU } \end{aligned}$ | 125 | 46 | 62 | 55.7 | 4 | 38 | 38 | M4 | 6 | 45.7 | 17.5 | 701 | 1001 |

Dimensions in mm

| MODEL |  | DIMENSIONS OF GUIDE RAIL |  |  |  |  |  |  |  | WEIGHT |  |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| STEEL | STAINLESS <br> STEEL | $\mathrm{H}_{1}$ | C | $\mathrm{B}_{1}$ | $\mathrm{~W}_{1}$ | $\mathrm{~d} \times \mathrm{G} \times \mathrm{h}$ | S3 <br> NType | N | Carriage <br> kg | Guide Rail <br> $\mathrm{kg} / \mathrm{m}$ |  |
|  | BSGS5 <br> BSGS5UU | 4 | 5 | 2.5 | 3.5 | $2.4 \times 3.5 \times 1$ | M 2.6 | 5 | .003 | .43 |  |
|  | BSGS8 <br> BSGS8UU | 4.7 | 7 | 3.5 | 5 | $2.4 \times 4.2 \times 2.3$ | - | 5 | 0.01 | 0.19 |  |
| BSG10 <br> BSG10UU | BSGS10 <br> BSGS10UU | 5.5 | 9 | 4.5 | 5.5 | $3.5 \times 6 \times 3.5$ | - | 7.5 | 0.02 | 0.31 |  |
| BSG13 <br> BSG13UU | BSGS13 <br> BSGS13UU | 7.2 | 12 | 6 | 7.5 | $3.5 \times 6 \times 4.5$ | - | 10 | 0.04 | 0.61 |  |
| BSG16 <br> BSG16UU | BSGS16 <br> BSGS16UU | 9.5 | 15 | 7.5 | 8.5 | $3.5 \times 6 \times 4.5$ | - | 15 | 0.06 | 1.02 |  |
| BSG25 <br> BSG25UU | BSGS25 <br> BSGS25UU | 15 | 20 | 10 | 13 | $6 \times 9.5 \times 8.5$ | - | 20 | 0.23 | 2.15 |  |

[^7]moment load ratings + load / life formulas. pg. 98
NOTE: Models BSGS5, BSGS8, BSGS5UU and BSGS8UU are available in Stainless Steel only.


Dimensions in mm

| MODEL |  | DIMENSIONS OF GUIDE RAIL |  |  |  |  |  |  |  |  |
| :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| STEEL | STAINLESS <br> STEEL | $\mathrm{H}_{1}$ | C | $\mathrm{B}_{1}$ | $\mathrm{~B}_{2}$ | $\mathrm{~W}_{1}$ | $\mathrm{~d} \times \mathrm{G} \times \mathrm{h}$ | N | Carriage <br> kg | Guide Rail <br> $\mathrm{kg} / \mathrm{m}$ |
|  | BSGS9W <br> BSGS9WUU | 5.2 | 14 | 7 | - | 5.5 | $3.5 \times 6 \times 3.2$ | 10 | 0.02 | 0.5 |
| BSG12W <br> BSG12WUU | BSGS12W <br> BSGS12WUU | 7.5 | 18 | 9 |  | 6 | $3.5 \times 6 \times 4.5$ | 10 | 0.04 | 0.96 |
| BSG14W <br> BSG14WUU | BSGS14W <br> BSGS14WUU | 8 | 24 | 12 | - | 8 | $4.5 \times 8 \times 4.5$ | 15 | 0.08 | 1.4 |
| BSG16W <br> BSG16WUU | BSGS16W <br> BSGS16WUU | 9.5 | 42 | 9.5 | 23 | 9 | $4.5 \times 8 \times 4.5$ | 15 | 0.15 | 2.96 |

Dimensions in mm
moment load ratings + load / life formulas. pg. 98
NOTE: Models BSGS9W and BSGS9WUU are available in Stainless Steel only.

## Technical Section Index

General Information. ..... page 83
Life Formulas ..... page 85
Moment Load Formulas \& Ratings ..... page 87

## General Information

## 1. Ball Slides or Roller Slides

A. Ball slide design offers the following advantages:

- Self cleaning (point contact of balls and shafts does not allow foreign material to interfere.
- Low cost (Ball and shaft materials are common and easily manufactured).
B. Crossed roller slide design offers the following advantages:
- Line contact of roller to shafts offer $8 \times 10$ times the load capacity of balls.
- Higher over hanging load capacity and low axial play.


## Ball Slide <br> Crossed Roller



## 2. Straight Line Design or Recirculating Type

Straight line, or non-recirculating slides, have rolling elements which move on a straight track and are separated by a retainer. The slide reaches the end of its travel when the retainer or rolling element contacts a limiting component, (either a screw head or end cap). This travel limitation is determined by the relationship of the retainer length to the carriage length. Standard slides usually have travel equal to $1 / 3$ the carriage length. Maximum total travel can be as much a $1 x$ the carriage length. Therefore, for more travel, you must specify a longer slide. This design offers extremely low friction and stiction characteristics.

Recirculating slide designs offer travel which is not limited by carriage size. In this design the rolling elements revolve within an oval track inside the carriage. See the Del-Tron ${ }^{\circledR}$ BSG series.


Straight Line Type

Balls recirculate around an oval track. Travel is limited by the length of the base rail.


Recirculating Type

## 3. Standard Tolerances

| Dimensions in Millimeters |  |
| :--- | ---: |
| Unless otherwise specified, |  |
| tolerances are as follows: |  |
| One (1) place decimals | $\pm 0.25$ |
| Two (2) place decimals | $\pm 0.13$ |

## 4. Custom Slides

Del-Tron's engineering staff will be pleased to assist you in developing custom versions of our linear slides. Our proprietary manufacturing processes allow us to offer completely customized slides built to your requirements even in small quantities in less than eight weeks.

Minor modifications can be provided. Some of the more common modifications we can provide:

- Changes in height, width, or length
- More or less travel
- Increased load capacity
- Light, medium, or heavy preload
- Different holes, threads or hole locations
- Dowel holes and pins
- Reduced or increased axial play
- Multiple carriages on a single base
- Non-standard retainer material
- No anodize or non-standard anodize color
- Corrosion resistant stainless steel components


## 5. High Temperature Applications

Del-Tron slides can be modified to operate in elevated temperature areas by the substitution of teflon, aluminum, or brass retainers.

## 6. Static Sensitive Applications

Del-Tron now offers precision linear motion devices that meet low electrostatic discharge requirements common in the semiconductor and electronics industries. The new slides are coated with electroless nickel, an alloy of nickel and phosphorous produced by autocatalytic chemical reduction with hypophosphite. The plating allows static charges to dissipate, helping the slides to meet requirements for automated equipment. Del-Tron® "ESD" electroless nickel plated slides are plated to ASTM standard B 733-97. This process is available for Del-Tron ${ }^{\circledR}$ line of ball slides, crossed roller slides and both ball and crossed roller multi-axis positioning stages.

## 7. Vacuum Applications

Outgassing of slide components can be reduced or eliminated for vacuum applications by eliminating anodized and oxided finishes, labels, lubricants, and non-metallic retainers.

## 8. Preload vs. Axial Play

Many of our slides allow the preload to be set to a specific amount to accommodate the needs of the application. A light, medium, or heavy preload may be ordered. The amount of preload can expressed as grams of force needed to move either the base or carriage. Please contact our engineering staff to discuss your special preload requirements.

Slide preload and axial play are related.

- Increased preload = less axial play
- Decreased preload = more axial play



## 9. Straight Line Accuracy

Straight Line Accuracy = possible runout in any plane
Measured by comparison of the line of travel to a master straight edge, using a gage or indicator mounted on the slides.


## Life

Formulas
Linear Ball and Roller Slides

## Rated Life

The rated life "L" of a linear slide is the length of travel endured by the slide under a specified condition. Since in reality, life varies from one slide to another, industry normally uses the L10 life rating which is defined as the length of travel that $90 \%$ of apparently identical slides will complete before the first evidence of failure.

## Speed Factor

The effect of speed on the load rating of a slide can be accounted for by a speed factor:

## Formula 1


where: $\mathrm{V}=$ speed of the slide movement in $\mathrm{mm} / \mathrm{min}$ (when the speed varies during the cycle, the peak value should be used) $m=3$ for ball slides, or
$m=10 / 3$ for roller slides
Note: When the speed is less than $760 \mathrm{~mm} / \mathrm{min}$, fs $=1$.

## Temperature Factor

When the temperature of the slide exceeds certain limits, it reduces the hardness of contacting elements and consequently affects the load rating of the slide. Therefore, its load rating shall be adjusted by a temperature factor " ft ". The values of this factor are presented in Table 1.

## Table 1

Temp. Factor, "ft"
Temp.
Degree
Celsius
104

149
204
260
not recommended

Note: When specifying slides for elevated temperature service, it should be kept in mind that the delrin retainers found in many slides are not recommended for temperatures above 82 deg. C.

## Load Type Factor

In reality, the load endured by a slide can never be absolutely smooth, but rather is a sum of variable forces that include working load, inertial forces, vibrations, impacts, occasional loads, etc. In order to have their influence taken into account, the load rating of the slide shall be adjusted by a load type factor "fw".

The values of "fw" for calculations per formula (2) and (3) are presented in Table 2.

## Table 2

| Condition of Load | Value of "fw" |
| :--- | :---: |
| Relatively smooth motion | 1 to 1.5 |
| Motion with impacts | 2 to 3 |

## Life Formula for Ball and Roller Slides

Based on the above definitions and role of different factors, the real life of linear slides can be obtained from the following formula:

## Formula 2

$$
\mathrm{L} 10=\left(\frac{\mathrm{C} \times \mathrm{fs} \times \mathrm{ft}}{\mathrm{Pc} \times \mathrm{fw}}\right)^{\mathrm{m}} \times\left(25.4 \times 10^{6} \mathrm{~mm}\right)
$$

where:
$\mathrm{L} 10=$ life of the slide at $90 \%$ of reliability as defined above (in millimeters).
$\mathrm{C}=$ catalog "load capacity" of the slide in kg . (which is a load that corresponds to an L10 life of 250 million mm , provided the factors fs, ft and fw are equal to 1.
$\mathrm{Pc}=$ calculated effective load the slide is subjected to in kg. (fs, ft and fw are factors as described above.)
$m=3$ for ball slides, or 10/3 for roller slides.

When other than $90 \%$ reliability is required (for instance, "K"\% reliability), the known value of L10 shall be multiplied by a reliability factor "fr" so that:

$$
\mathrm{Ln}=\mathrm{fr} \times \mathrm{L} 10
$$

where:
$\mathrm{Ln}=$ rated life at the reliability of $\mathrm{K} \%$ ( $\mathrm{n}=100-\mathrm{K}$ ).
The values of the factor "fr" are presented in Table 3.

Table 3

| RELIABILITY <br> K\% | "Ln" rated life | "fr", reliability <br> factor |
| :---: | :---: | :---: |
| 50 | L50 | 5.00 |
| 90 | L10 | 1.00 |
| 95 | L5 | 0.62 |
| 97 | L1 | 0.44 |
| 99 |  | 0.21 |
|  |  |  |
|  |  |  |

The general formula for the life of DelTron linear slides is expressed as following:
Example

## Formula 3

$$
\operatorname{Ln}=f r \times\left(\frac{C \times f \times x f t}{P c \times f w}\right)^{m} \times\left(25.4 \times 10^{6} \mathrm{~mm}\right)
$$

Design considerations lead to the selection of a ball slide. The available space accommodates the Del-Tron SA2-4 slide. Find the life at $95 \%$ reliability (L5 life) under the following conditions:
-Peak speed during the cycle: $\mathrm{V}=3810 \mathrm{~mm} / \mathrm{min}$
-Working temperature of slide $=66$ deg. C.

- Calculated effective load the slide is subjected to: $\mathrm{Pc}=9.1 \mathrm{~kg}$
-Type of load: Moderate vibration, no impacts.


## Solution:

(1) With the formula (1) the speed factor "fs" is found as:

$$
\mathrm{fs}=\sqrt[3]{\frac{760}{3810}}=0.58
$$

(2) The value of the temperature factor " ft " is found in Table 1 as: $\mathrm{ft}=1$.
(3) Using Table 2, the value of the type of load factor can be estimated as:
$\mathrm{fw}=1.25$.
(4) The value of reliability factor "fr" is found in Table 3 as: $\mathrm{fr}=0.62$.
(5) The value of the load capacity for the Del-Tron SA2-4 slide is found in the Del-Tron Catalog as: C $=27.2 \mathrm{~kg}$
(6) The required life of the slide can then be calculated using formula (3):
$L 5=0.62 \times\left(\frac{27.2 \times .58 \times 1}{9.1 \times 1.25}\right)^{3} \times\left(25.4 \times 10^{6}\right)=42 \times 10^{6} \mathrm{~mm}$

$A=$ Distance (mm) from slide centerline to line of acting force.
$\mathrm{F}=$ Acting force (kg).
$\mathrm{L}=$ Published load capacity (kg).
$\mathrm{M}_{1}, \mathrm{M} 2, \mathrm{M} 3=$ Moment load rating ( $\mathrm{kg}-\mathrm{mm}$ ).
$\mathrm{m} 1-\mathrm{m} 2-\mathrm{m} 3=$ Acting moment load $(\mathrm{kg}-\mathrm{mm})$.
Unit Conversion:
$(\mathrm{N} \cdot \mathrm{m}) \times(102)=\mathrm{kg}-\mathrm{mm}$


$$
\begin{gathered}
\mathrm{m} 2=[\mathrm{F} \times \mathrm{A}] \\
{\left[\frac{\mathrm{F}}{\mathrm{~L}}+\frac{\mathrm{m} 2}{\mathrm{M} 2}\right] \leq 1}
\end{gathered}
$$



$$
\begin{gathered}
\mathrm{m} 3=[\mathrm{F} \times \mathrm{A}] \\
{\left[\frac{\mathrm{F}}{\mathrm{~L}}+\frac{\mathrm{m} 3}{\mathrm{M} 3}\right] \leq 1}
\end{gathered}
$$

## Moment Load Ratings

Ball Slide Assemblies and Anti-Creep Ball Slide Assemblies
Refer to Page 7 and 10

| $\underset{\#}{\text { MODEL }}$ | $\begin{array}{r} \mathrm{M} 1 \\ \mathrm{~N} \cdot \mathrm{~m} \end{array}$ | $\begin{array}{r} \mathrm{M} 2 \\ \mathrm{~N} \cdot \mathrm{~m} \end{array}$ | $\begin{gathered} \text { M3 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { MODEL } \\ \# \end{gathered}$ | $\underset{\mathrm{N} \cdot \mathrm{~m}}{\substack{1 \\ \hline}}$ | $\begin{gathered} \mathrm{M2} \\ \mathrm{~N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { M3 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CA-. 5 | . 01 | . 01 | . 02 | C-1AC | . 124 | . 216 | . 227 |
| CA-1 | . 01 | . 02 | . 03 | C-2AC | . 124 | . 324 | . 340 |
| CA-2 | . 01 | . 04 | . 04 | C-3AC | . 124 | . 486 | . 510 |
| CA-3 | . 01 | . 05 | . 06 | D-1AC | . 51 | . 96 | 1.01 |
| DA-1 |  | . 11 |  | D-2AC | 1.22 | 4.48 | 4.70 |
| DA-2 | . 14 | . 51 | . 53 | D-3AC | 1.53 | 8.64 | 9.07 |
| DA-3 | . 17 | . 98 | 1.02 | D-4AC | 1.79 2.04 | 13.44 | 14.11 |
| DA-4 | . 20 | 1.52 | 1.59 | D-6AC | 2.30 | 23.04 | 24.19 |
| DA-5 | . 23 | 2.02 | 2.13 |  |  |  |  |
| DA-6 | . 26 | 2.60 | 2.73 | E-1AC | 1.55 | 1.92 | 2.01 |
|  |  |  |  | E-2AC | 1.94 | 4.80 | 5.04 |
| EA-1 | . 18 | . 22 | . 23 | E-3AC | 2.33 | 8.64 | 9.07 |
| EA-2 | . 22 | . 54 | . 57 | E-4AC | 2.72 | 13.44 | 14.11 |
| EA-3 | . 26 | . 98 | 1.02 | E-5AC | 3.10 | 17.92 | 18.81 |
| EA-4 | . 31 | 1.52 | 1.59 | E-6AC | 3.49 | 23.04 | 24.19 |
| EA-5 | . 35 | 2.02 | 2.13 | M-1AC | 2.50 | 3.33 | 3.50 |
| EA-6 | . 39 | 2.60 | 2.73 | M-2AC | 3.00 | 8.64 | 9.07 |
|  |  |  |  | M-2.5AC | 3.25 | 10.40 | 10.92 |
| MA-1 | . 28 | . 38 | . 40 | M-3AC | 3.75 | 13.20 | 13.86 |
| MA-2 | . 34 | . 98 | 1.02 | M-4AC | 4.50 | 20.16 | 21.17 |
| MA-2.5 | . 37 | 1.17 | 1.23 |  |  |  |  |
| MA-3 | . 42 | 1.49 | 1.57 |  |  |  |  |
| MA-4 | . 51 | 2.27 | 2.39 | N-1AC | 3.85 | 4.50 | 4.73 11.34 |
|  |  |  |  | N-2AC | 4.62 | 10.80 | 11.34 |
| NA-1 | . 43 | . 51 | . 53 | $\mathrm{N}-3 \mathrm{AC}$ | 5.13 | 18.00 | 18.90 |
| NA-2 | . 52 | 1.22 | 1.28 | N-4AC | 6.41 | 27.50 | 28.88 |
| NA-3 | . 58 | 2.03 | 2.14 | N-6AC | 8.98 | 45.00 | 47.25 69.83 |
| NA-4 | . 72 | 3.11 | 3.26 | N-10AC | 10.26 | 92.00 | 96.60 |
| NA-6 | . 37 | 5.08 | 5.34 |  |  |  |  |
| NA-8 | 1.01 | 7.51 | 7.89 | S1-1AC | 5.56 | 6.00 | 6.30 |
| NA-10 | 1.16 | 10.39 | 10.91 | S1-2AC | 7.38 | 12.00 | 12.60 |
|  |  |  |  | S1-3AC | 9.23 | 20.00 | 21.00 |
| SA1-1 | . 63 | . 68 | . 71 | S1-3.5AC | 11.07 | 33.00 | 34.65 |
| SA1-2 | . 83 | 1.36 | 1.42 | S1-4AC | 12.92 | 49.00 | 51.45 |
| SA1-3 | 1.04 | 2.26 | 2.37 | S1-6AC | 16.61 | 81.00 | 85.05 |
| SA1-3.5 | 1.25 | 3.73 | 3.91 | S1-8AC | 20.30 | 121.00 | 127.05 |
| SA1-4 | 1.46 | 5.54 | 5.81 | S2-1AC | 8.51 | 8.00 | 8.40 |
| SA1-6 | 1.88 | 9.15 | 9.61 | S2-1.5AC | 12.76 | 18.00 | 18.90 |
| SA1-8 | 2.29 | 13.67 | 14.35 | S2-2AC | 17.86 | 29.40 | 30.87 |
|  |  |  |  | S2-3AC | 22.11 | 41.60 | 43.68 |
| SA2-1 | . 96 | . 90 | . 95 | S2-4AC | 25.52 | 84.00 | 88.20 |
| SA2-1.5 | 1.44 | 2.03 | 2.14 | S2-6AC | 31.89 | 135.00 | 141.75 |
| SA2-2 | 2.02 | 3.32 | 3.49 | S2-8AC | 38.27 | 198.00 | 207.90 |
| SA2-3 | 2.50 | 4.70 | 4.94 |  |  |  |  |
| SA2-4 | 2.88 | 9.49 | 9.97 | S3-1.5AC | 25.52 | 16.80 | 17.64 |
| SA2-6 | 3.60 | 15.25 | 16.02 | S3-2AC | 45.20 | 60.76 | 63.80 |
| SA2-8 | 4.32 | 22.37 | 23.49 | S3-3AC | 64.15 | 110.88 | 116.42 |
|  |  |  |  | S3-4AC | 86.02 | 181.72 | 190.81 |
| SA3-1 | 2.47 | 1.90 | 1.99 | S3-5AC | 98.42 | 283.50 | 297.68 |
| SA3-1.5 | 2.88 | 1.90 | 1.99 | S3-6AC | 109.35 | 357.00 | 374.85 |
| SA3-2 | 5.11 | 6.86 | 7.21 | S3-9AC | 134.87 | 543.90 | 571.10 |
| SA3-3 | 7.25 | 12.53 | 13.15 | S3-12AC | 149.45 | 717.50 | 753.38 |
| SA3-4 | 9.72 | 20.53 | 21.56 |  |  |  |  |
| SA3-5 | 11.12 | 32.03 | 33.63 |  |  |  |  |
| SA3-6 | 12.35 | 40.34 | 42.35 |  |  |  |  |
| SA3-9 | 15.24 | 61.45 | 64.53 |  |  |  |  |
| SA3-12 | 16.89 | 81.07 | 85.12 |  |  |  |  |

## Moment Load Ratings

## Crossed Roller Slide Assemblies

Refer to Page 16

| MODEL \# | $\begin{aligned} & \text { M1 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ | $\begin{aligned} & \text { M2 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ | $\begin{array}{r} \mathrm{M} 3 \\ \mathrm{~N} \cdot \mathrm{~m} \end{array}$ | $\begin{gathered} \text { MODEL } \\ \# \end{gathered}$ | $\begin{aligned} & \hline \text { M1 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ | $\begin{gathered} \hline \text { M2 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{aligned} & \text { M3 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RDA-1 | 0.43 | 0.81 | . 85 | RSA1-1 | 5.50 | 6.68 | 7.02 |
| RDA-2 | 0.71 | 2.66 | 2.79 | RSA1-2 | 6.29 | 9.55 | 10.03 |
| RDA-3 | 0.95 | 4.92 | 5.17 | RSA1-3 | 7.34 | 15.59 | 16.37 |
| RDA-4 | 1.01 | 7.59 | 7.97 | RSA1-3.5 | 8.76 | 26.10 | 27.40 |
| RDA-5 | 1.15 | 10.12 | 10.63 | RSA1-4 | 12.84 | 46.77 | 49.11 |
| RDA-6 | 1.30 | 13.02 | 13.67 | RSA1-6 | 15.01 | 73.21 | 76.87 |
|  |  |  |  | RSA1-8 | 17.20 | 102.53 | 107.66 |
| REA-1 | 1.05 | 1.30 | 1.37 |  |  |  |  |
| REA-2 | 1.53 | 3.80 | 3.99 | RSA2-1 | 6.34 | 6.68 | 7.02 |
| REA-3 | 2.06 | 7.05 | 7.36 | RSA2-1.5 | 7.21 | 10.17 | 10.68 |
| REA-4 | 2.15 | 10.63 | 11.16 | RSA2-2 | 8.46 | 13.36 | 14.03 |
| REA-5 | 2.28 | 13.16 | 13.81 | RSA2-3 | 8.46 | 15.59 | 16.29 |
| REA-6 | 2.37 | 15.62 | 16.40 | RSA2-4 | 14.80 | 46.77 | 49.11 |
|  |  |  |  | RSA2-6 | 18.02 | 76.26 | 80.05 |
| RMA-1 | 1.98 | 2.63 | 2.77 | RSA2-8 | 21.62 | 111.85 | 117.45 |
| RMA-2 | 2.20 | 6.35 | 6.66 |  |  |  |  |
| RMA-2.5 | 2.20 | 7.05 | 7.40 | RSA3-1 | 18.53 | 14.24 | 14.95 |
| RMA-3 | 2.33 | 8.20 | 8.61 | RSA3-1.5 | 21.54 | 17.90 | 18.79 |
| RMA-4 | 2.54 | 11.39 | 11.96 | RSA3-2 | 28.72 | 35.79 | 37.58 |
|  |  |  |  | RSA3-3 | 35.91 | 59.66 | 62.64 |
| RNA-1 | 3.18 | 3.71 | 3.55 | RSA3-4 | 35.91 | 74.57 | 78.30 |
| RNA-2 | 3.83 | 8.35 | 8.77 | RSA3-5 | 38.92 | 112.11 | 117.72 |
| RNA-3 | 5.68 | 17.36 | 18.23 | RSA3-6 | 57.45 | 167.04 | 175.39 |
| RNA-4 | 6.96 | 27.33 | 28.70 | RSA3-9 | 60.95 | 245.81 | 258.10 |
| RNA-6 | 8.26 | 48.30 | 50.72 | RSA3-12 | 64.17 | 308.05 | 323.46 |
| RNA-8 | 8.62 | 63.86 | 67.06 |  |  |  |  |
| RNA-10 | 9.27 | 83.16 | 87.31 |  |  |  |  |

## Precision Series Ball Slides

Refer to Page 19

| MODEL <br> $\#$ | M1 <br> N.m | M2 <br> N.m | M3 <br> N•m |
| :--- | ---: | ---: | ---: |
| MA-2SS | .34 | .98 | 1.02 |
| MA-3SS | .60 | 2.03 | 2.67 |
| MA-4SS | .78 | 3.19 | 3.69 |
|  |  |  |  |
| SA2-1SS | .96 | .90 | .95 |
| SA2-1.5SS | 1.44 | 2.03 | 2.14 |
| SA2-2SS | 2.02 | 3.32 | 3.49 |
| SA2-3SS | 2.50 | 4.70 | 4.94 |
| SA2-4SS | 2.88 | 9.49 | 9.97 |
| SA3-1SS | 2.47 | 1.90 | 1.99 |
| SA3-2SS | 5.11 | 6.86 | 7.21 |
| SA3-3SS | 7.25 | 12.53 | 13.15 |
| SA3-4SS | 9.72 | 20.53 | 21.56 |
| SA3-5SS | 11.12 | 32.03 | 33.63 |
| SA3-6SS | 12.35 | 40.34 | 42.35 |
| SA5-3SS | 8.33 | 14.41 | 15.13 |
| SA5-5SS | 16.42 | 60.95 | 61.84 |
| SA5-7SS | 17.78 | 70.95 | 74.47 |

Precision Series Crossed Roller Slides

Refer to Page 19

| MODEL <br> $\#$ | M1 <br> N.m | M2 <br> N.m | M3 <br> N.m |
| :--- | ---: | ---: | ---: |
| RSA2-1SS | 4.44 | 4.68 | 4.91 |
| RSA2-2SS | 5.92 | 9.35 | 9.82 |
| RSA2-3SS | 6.91 | 10.91 | 11.40 |
| RSA2-4SS | 7.66 | 12.11 | 12.66 |
|  |  |  |  |
| RSA3-1SS | 18.10 | 15.03 | 15.79 |
| RSA3-2SS | 24.13 | 30.07 | 31.57 |
| RSA3-3SS | 30.16 | 50.11 | 52.62 |
| RSA3-4SS | 35.91 | 62.64 | 65.77 |
| RSA3-5SS | 41.30 | 72.03 | 75.64 |
|  |  |  |  |
| RSA5-3SS | 19.30 | 72.21 | 73.75 |
| RSA5-5SS | 21.21 | 79.36 | 81.05 |
| RSA5-7SS | 23.00 | 92.75 | 97.39 |
|  |  |  |  |

## Moment Load Ratings

High Precision Ball Slides
Refer to Page 22

| MODEL <br> $\#$ | M1 | M2 | M3 |
| :--- | ---: | ---: | ---: |
| H.m | N.m | $\mathrm{N} \cdot \mathrm{m}$ |  |
| HPMA-1 | .28 | .38 | .40 |
| HPMA-2 | .40 | 1.03 | 1.08 |
| HPMA-2.5 | .55 | 1.76 | 1.85 |
| HPMA-3 | .74 | 2.61 | 3.72 |
| HPSA2-1 |  |  |  |
| HPSA2-1.5 | 1.44 | 2.03 | 2.14 |
| HPSA2-2 | 2.02 | 3.32 | 3.49 |
| HPSA2-3 | 2.50 | 4.70 | 4.94 |
|  |  |  |  |
| HPSA3-1 | 4.56 | 3.76 | 3.98 |
| HPSA3-2 | 6.92 | 9.30 | 9.77 |
| HPSA3-3 | 8.40 | 14.52 | 15.25 |
| HPSA3-4 | 10.87 | 22.97 | 24.12 |
| HPSA3-5 | 11.94 | 34.40 | 36.12 |
|  |  |  |  |
| HPSA4-2 | 11.12 | 32.03 | 33.63 |
| HPSA4-3 | 12.35 | 40.34 | 42.35 |
| HPSA4-5 | 14.05 | 52.58 | 53.70 |
| HPSA4-6.5 | 15.24 | 61.45 | 64.53 |
| HPSA4-9 | 16.89 | 81.07 | 85.12 |
| HPSA5-5 | 16.16 | 60.46 | 61.75 |
| HPSA5-7 | 17.52 | 70.67 | 74.21 |
| HPSA5-10 | 19.42 | 93.23 | 97.89 |

High Precision Crossed Roller Slides

Refer to Page 22

| $\begin{gathered} \text { MODEL } \\ \# \end{gathered}$ | M1 | M2 | M3 |
| :---: | :---: | :---: | :---: |
|  | $\mathrm{N} \cdot \mathrm{m}$ | N.m | N.m |
| HPRSA2-1 | 5.04 | 5.31 | 5.58 |
| HPRSA2-1.5 | 5.61 | 8.29 | 8.58 |
| HPRSA2-2 | 6.73 | 10.63 | 11.16 |
| HPRSA2-3 | 7.85 | 12.40 | 12.96 |
| HPRSA3-1 | 17.88 | 14.85 | 15.60 |
| HPRSA3-2 | 20.39 | 25.41 | 26.68 |
| HPRSA3-3 | 28.37 | 47.13 | 49.49 |
| HPRSA3-4 | 37.62 | 65.62 | 68.90 |
| HPRSA3-5 | 43.27 | 75.46 | 79.24 |
| HPRSA4-2 | 19.46 | 56.06 | 58.86 |
| HPRSA4-3 | 21.62 | 70.59 | 74.12 |
| HPRSA4-5 | 24.59 | 92.01 | 93.97 |
| HPRSA4-6.5 | 26.67 | 107.54 | 112.92 |
| HPRSA4-9 | 29.55 | 141.87 | 148.96 |
| HPRSA5-5 | 28.27 | 105.81 | 108.06 |
| HPRSA5-7 | 30.67 | 123.67 | 129.86 |
| HPRSA5-10 | 33.98 | 163.15 | 171.31 |

NOTE: Ratings for FB (Flanged Base) type are the same.

NOTE: Ratings for FB (Flanged Base) type are the same.

Posi-Drive Stages
Refer to Page 27

| MODEL | $\begin{array}{r} \text { M1 } \\ \mathrm{N} \cdot \mathrm{~m} \end{array}$ | $\begin{gathered} \text { M2 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { M3 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\underset{\#}{\text { MODEL }}$ | $\begin{aligned} & \text { M1 } \\ & \text { N.m } \end{aligned}$ | $\begin{aligned} & \text { M2 } \\ & \text { N.m } \end{aligned}$ | $\begin{aligned} & \text { M3 } \\ & \text { N.m } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LSA1-25 | . 63 | . 68 | . 71 | LRSA1-25 | 5.50 | 6.68 | 7.02 |
| LSA1-50 | . 83 | 1.36 | 1.42 | LRSA1-50 | 6.29 | 9.55 | 10.03 |
| LSA1-75 | 1.04 | 2.26 | 2.37 | LRSA1-75 | 7.34 | 15.59 | 16.37 |
| LSA1-100 | 1.46 | 5.54 | 5.81 | LRSA1-100 | 12.84 | 46.77 | 49.11 |
| LSA2-25 | . 96 | . 90 | . 95 | LRSA2-25 | 6.34 | 6.68 | 7.02 |
| LSA2-38 | 1.44 | 2.03 | 2.14 | LRSA2-38 | 7.06 | 10.42 | 11.12 |
| LSA2-50 | 2.02 | 3.32 | 3.49 | LRSA2-50 | 8.46 | 13.36 | 14.03 |
| LSA2-75 | 2.50 | 4.70 | 4.94 | LRSA2-75 | 9.86 | 15.59 | 16.29 |
| LSA2-100 | 2.88 | 9.49 | 9.97 | LRSA2-100 | 14.80 | 46.77 | 49.11 |
| LSA3-25 | 2.47 | 1.90 | 1.99 | LRSA3-25 | 21.54 | 17.90 | 18.79 |
| LSA3-50 | 5.11 | 6.86 | 7.21 | LRSA3-50 | 28.72 | 35.79 | 37.58 |
| LSA3-75 | 7.25 | 12.53 | 13.15 | LRSA3-75 | 35.91 | 59.66 | 62.64 |
| LSA3-100 | 9.72 | 20.53 | 21.56 | LRSA3-100 | 42.75 | 74.57 | 78.30 |
| LSA3-150 | 12.35 | 40.34 | 42.35 | LRSA3-150 | 57.45 | 167.04 | 175.39 |
| LSA3-200 | 13.84 | 49.94 | 53.92 | LRSA3-200 | 64.35 | 206.81 | 223.29 |
| LSA3-250 | 16.03 | 71.14 | 75.16 | LRSA3-250 | 74.54 | 294.61 | 311.25 |
| LSA3-300 | 16.89 | 81.07 | 85.12 | LRSA3-300 | 78.78 | 324.41 | 352.70 |

## Moment Load Ratings

## Ball Slide Positioning Stages \& Side Drive Stages

| $\underset{\#}{\text { MODEL }}$ | $\begin{gathered} \hline \text { M1 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{aligned} & \hline \mathrm{M} 2 \\ & \mathrm{~N} \cdot \mathrm{~m} \end{aligned}$ | $\begin{array}{r} \hline \mathrm{M} 3 \\ \mathrm{~N} \cdot \mathrm{~m} \end{array}$ | $\begin{gathered} \hline \text { MODEL } \\ \# \end{gathered}$ | $\begin{aligned} & \hline \text { M1 } \\ & \text { N.m } \end{aligned}$ | $\begin{aligned} & \hline \text { M2 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ | $\begin{gathered} \hline \text { M3 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 99MM | . 11 | . 11 | . 11 | 502MM | 2.02 | 2.02 | 2.02 |
| 101MM | . 19 | . 18 | . 18 | 701MM | 4.94 | 4.94 | 4.94 |
| 201MM | . 28 | . 27 | . 27 | 702MM | 4.94 | 4.94 | 4.94 |
| 301MM | . 50 | . 50 | . 50 |  |  |  |  |
|  |  |  |  | 1201MM | 2.05 | 1.95 | 1.95 |
| 450MM | . 96 | . 96 | . 96 | 1203MM | 2.05 | 1.95 | 1.95 |
| 451MM | . 96 | . 96 | . 96 | 2201MM | 3.21 | 3.04 | 3.04 |
| 453MM | . 96 | . 96 | . 96 | 2202MM | 3.21 | 3.04 | 3.04 |
| 750MM | 4.94 | 4.94 | 4.94 | 2203MM | 3.21 | 3.04 | 3.04 |
| 751MM | 4.94 | 4.94 | 4.94 | 2204MM | 3.21 | 3.04 | 3.04 |
| 753MM | 4.94 | 4.94 | 4.94 | 3201MM | 4.25 | 4.05 | 4.05 |
|  |  |  |  | 3202MM | 4.25 | 4.05 | 4.05 |
| 301PMM | . 50 | . 68 | . 71 | 3203MM | 4.25 | 4.05 | 4.05 |
| 451PMM | . 96 | 1.13 | 1.19 | 3204MM | 4.25 | 4.05 | 4.05 |
| 452PMM | . 96 | 1.13 | 1.19 |  |  |  |  |
| 751PMM | 4.94 | 5.75 | 6.04 | 1202PMM | 2.89 | 1.95 | 2.05 |
| 752PMM | 4.94 | 5.75 | 6.04 | 1204PMM | 2.89 | 1.95 | 2.05 |
|  |  |  |  | 2205PMM | 4.80 | 3.04 | 3.21 |
| 401MM | . 96 | . 96 | . 96 | 2206PMM | 4.80 | 3.04 | 3.21 |
| 501 MM | 2.02 | 2.02 | 2.02 | 3205PMM | 4.80 | 3.04 | 3.21 |
|  |  |  |  | 3206PMM | 7.11 | 4.05 | 4.25 |

Crossed Roller Positioning Stages \& Side Drive Stages
Refer to Page 50

| MODEL <br> \# | M1 <br> $\mathrm{N} \cdot \mathrm{m}$ | M2 <br> $\mathrm{N} \cdot \mathrm{m}$ | M3 <br> $\mathrm{N} \cdot \mathrm{m}$ | MODEL <br> \# | M1 <br> $\mathrm{N} \cdot \mathrm{m}$ | M2 <br> $\mathrm{N} \cdot \mathrm{m}$ | M3 <br> $\mathrm{N} \cdot \mathrm{m}$ |
| :--- | :--- | :--- | ---: | :--- | ---: | ---: | ---: |
| R101MM | 1.09 | 1.04 | 1.04 | R701MM | 13.18 | 13.18 | 13.18 |
| R201MM | 1.64 | 1.56 | 1.56 | R702MM | 13.18 | 13.18 | 13.18 |
| R301MM | 2.88 | 2.88 | 2.88 |  |  |  |  |
|  |  |  |  | R1201MM | 5.81 | 5.53 | 5.53 |
| R450MM | 1.92 | 1.92 | 1.92 | R1203MM | 5.81 | 5.53 | 5.53 |
| R451MM | 1.92 | 1.92 | 1.92 | R2201MM | 9.10 | 8.60 | 8.60 |
| R453MM | 1.92 | 1.92 | 1.92 | R2202MM | 9.10 | 8.60 | 8.60 |
| R750MM | 9.88 | 9.88 | 9.88 | R2203MM | 9.10 | 8.60 | 8.60 |
| R751MM | 9.88 | 9.88 | 9.88 | R2204MM | 9.10 | 8.60 | 8.60 |
| R753MM | 9.88 | 9.88 | 9.88 | R3201MM | 12.05 | 11.47 | 11.47 |
|  |  |  |  | R3202MM | 12.05 | 11.47 | 11.47 |
| R301PMM | 1.67 | 2.26 | 2.37 | R3203MM | 12.05 | 11.47 | 11.47 |
| R451PMM | 1.92 | 2.26 | 2.37 | R3204MM | 12.05 | 11.47 | 11.47 |
| R452PMM | 1.92 | 2.26 | 2.37 |  |  |  |  |
| R751PMM | 9.88 | 11.50 | 12.07 | R1202PMM | 8.19 | 5.53 | 5.81 |
| R752PMM | 9.88 | 11.50 | 12.07 | R1204PMM | 8.19 | 5.53 | 5.81 |
| R401MM | 1.92 | 1.92 |  | 1.92 | R2205PMM | 13.60 | 8.60 |
| R2206PMM | 13.60 | 8.60 | 9.10 |  |  |  |  |
| R501MM | 3.84 | 3.84 | 3.84 | R3205PMM | 13.60 | 8.60 | 9.10 |
| R502MM | 3.84 | 3.84 | 3.84 | R3206PMM | 20.15 | 11.47 | 12.05 |

## Moment Load Ratings

Low Profile Crossed Roller Slide Tables
Refer to Page 62

| MODEL <br> \# | M1 <br> $\mathrm{N} \cdot \mathrm{m}$ | M2 <br> $\mathrm{N} \cdot \mathrm{m}$ | M3 <br> $\mathrm{N} \cdot \mathrm{m}$ | MODEL <br> \# | M1 <br> $\mathrm{N} \cdot \mathrm{m}$ | M2 <br> $\mathrm{N} \cdot \mathrm{m}$ | M3 <br> $\mathrm{N} \cdot \mathrm{m}$ |
| :---: | ---: | ---: | ---: | :--- | ---: | ---: | ---: |
| LPTA-1025 | .80 | 1.29 | 1.33 | LPTA-2095 | 6.17 | 20.05 | 21.06 |
| LPTA-1035 | 1.04 | 2.59 | 2.71 | LPTA-2110 | 7.05 | 26.45 | 27.77 |
| LPTA-1045 | 1.51 | 4.55 | 4.79 | LPTA-2125 | 7.64 | 32.47 | 34.10 |
| LPA-1055 | 1.74 | 5.36 | 5.63 |  |  |  |  |
| LPTA-1065 | 1.94 | 8.16 | 8.33 | LPTA-3055 | 9.87 | 14.81 | 15.55 |
| LPTA-1075 | 2.27 | 11.58 | 12.17 | LPTA-3080 | 14.42 | 31.09 | 32.64 |
| LPTA-1085 | 2.55 | 13.93 | 14.63 | LPTA-3105 | 17.24 | 48.56 | 50.91 |
| LPTA-2035 | 2.35 | 3.06 | 3.21 | LPTA-3130 | 21.55 | 74.75 | 78.49 |
| LPTA-2050 | 3.71 | 6.49 | 6155 | 24.29 | 100.22 | 105.19 |  |
| LPTA-2065 | 4.41 | 9.92 | 10.42 | LPTA-3180 | 27.82 | 135.58 | 142.36 |
| LPTA-2080 | 5.58 | 15.35 | 16.12 |  |  |  |  |
|  |  |  |  |  |  |  |  |

Crossed Roller Rail Sets
Refer to Page 65

| $\underset{\#}{\text { MODEL }}$ | $\begin{aligned} & \hline \mathrm{M} 1 \\ & \mathrm{~N} \cdot \mathrm{~m} \end{aligned}$ | $\begin{array}{r} \mathrm{M} 2 \\ \mathrm{~N} \cdot \mathrm{~m} \end{array}$ | $\begin{aligned} & \hline \text { M3 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ | $\underset{\#}{\text { MODEL }}$ | $\begin{gathered} \hline \text { M1 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \hline \text { M2 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{aligned} & \hline \text { M3 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NB1-020 | 0 | 1.10 | 1.15 | NB3-200 | 0 | 156.18 | 163.99 |
| NB1-030 | 0 | 2.17 | 2.27 | NB3-225 | 0 | 191.11 | 200.67 |
| NB1-040 | 0 | 4.15 | 4.36 | NB3-250 | 0 | 243.20 | 255.36 |
| NB1-050 | 0 | 6.90 | 7.24 | NB3-275 | 0 | 286.35 | 300.66 |
| NB1-060 | 0 | 10.34 | 10.85 | NB3-300 | 0 | 349.36 | 366.83 |
| NB1-070 | 0 | 14.56 | 15.29 | NB3-325 | 0 | 400.73 | 420.77 |
| NB1-080 | 0 | 18.01 | 18.90 | NB3-350 | 0 | 474.74 | 498.48 |
| NB2-030 | 0 | 2.46 | 2.59 | NB4-080 | 0 | 27.95 | 29.35 |
| NB2-045 | 0 | 6.17 | 6.47 | NB4-120 | 0 | 68.05 | 71.45 |
| NB2-060 | 0 | 11.60 | 12.19 | NB4-160 | 0 | 126.23 | 132.54 |
| NB2-075 | 0 | 16.13 | 16.94 | NB4-200 | 0 | 200.81 | 210.85 |
| NB2-090 | 0 | 24.40 | 25.62 | NB4-240 | 0 | 297.13 | 311.98 |
| NB2-105 | 0 | 30.79 | 32.32 | NB4-280 | 0 | 406.91 | 427.26 |
| NB2-120 | 0 | 41.89 | 44.00 | NB4-320 | 0 | 533.90 | 560.60 |
| NB2-135 | 0 | 50.14 | 52.65 | NB4-360 | 0 | 678.17 | 712.08 |
| NB2-150 | 0 | 64.08 | 67.28 | NB4-400 | 0 | 839.62 | 881.61 |
| NB2-165 | 0 | 79.87 | 83.86 | NB4-440 | 0 | 1026.77 | 1078.10 |
| NB2-180 | 0 | 97.62 | 102.50 | NB4-480 | 0 | 1223.50 | 1284.67 |
| NB3-050 | 0 | 9.86 | 10.36 | NB6-100 | 0 | 90.82 | 95.36 |
| NB3-075 | 0 | 19.96 | 20.96 | NB6-150 | 0 | 202.02 | 212.12 |
| NB3-100 | 0 | 38.91 | 40.86 | NB6-200 | 0 | 350.75 | 368.29 |
| NB3-125 | 0 | 57.23 | 60.09 | NB6-250 | 0 | 548.04 | 575.44 |
| NB3-150 | 0 | 87.16 | 91.51 | NB6-300 | 0 | 779.78 | 818.77 |
| NB3-175 | 0 | 115.09 | 120.84 | NB6-350 | 0 | 1063.19 | 1116.35 |
|  |  |  |  | NB6-400 | 0 | 1390.38 | 1459.90 |

## Moment Load Ratings

Anti-Creep Crossed Roller Rail Sets
Refer to Page 69

| MODEL <br> $\#$ | M1 <br> $\mathrm{N} \cdot \mathrm{m}$ | M2 <br> $\mathrm{N} \cdot \mathrm{m}$ | M3 <br> $\mathrm{N} \cdot \mathrm{m}$ | MODEL <br> $\#$ | M1 <br> $\mathrm{N} \cdot \mathrm{m}$ | M2 <br> $\mathrm{N} \cdot \mathrm{m}$ | M3 <br> $\mathrm{N} \cdot \mathrm{m}$ |
| :--- | :---: | ---: | ---: | :--- | :--- | ---: | ---: |
| NB2-030-AC | 0 | 2.46 | 2.59 | NB3-200-AC | 0 | 156.18 | 163.99 |
| NB2-045-AC | 0 | 6.17 | 6.47 | NB3-225-AC | 0 | 191.11 | 200.67 |
| NB2-060-AC | 0 | 11.60 | 12.19 |  |  |  |  |
| NB2-075-AC | 0 | 16.13 | 16.94 | NB4-080-AC | 0 | 27.95 | 29.35 |
| NB2-090-AC | 0 | 24.40 | 25.62 | NB4-120-AC | 0 | 68.05 | 71.45 |
| NB2-105-AC | 0 | 30.79 | 32.32 | NB4-160-AC | 0 | 126.23 | 132.54 |
| NB2-120-AC | 0 | 41.89 | 44.00 | NB4-200-AC | 0 | 200.81 | 210.85 |
| NB2-135-AC | 0 | 50.14 | 52.65 | NB4-240-AC | 0 | 297.13 | 311.98 |
| NB2-150-AC | 0 | 64.08 | 67.28 | NB4-280-AC | 0 | 406.91 | 427.26 |
| NB2-165-AC | 0 | 79.87 | 83.86 |  |  |  |  |
| NB2-180-AC | 0 | 97.62 | 102.50 | NB6-100-AC | 0 | 90.82 | 95.36 |
|  |  |  |  | NB6-150-AC | 0 | 202.02 | 212.12 |
| NB3-050-AC | 0 | 9.86 | 10.36 | NB6-200-AC | 0 | 350.75 | 368.29 |
| NB3-075-AC | 0 | 19.96 | 20.96 | NB6-250-AC | 0 | 548.04 | 575.44 |
| NB3-100-AC | 0 | 38.91 | 40.86 | NB6-300-AC | 0 | 779.78 | 818.77 |
| NB3-125-AC | 0 | 57.23 | 60.09 | NB6-350-AC | 0 | 1063.19 | 1116.35 |
| NB3-150-AC | 0 | 87.16 | 91.51 | NB6-400-AC | 0 | 1390.38 | 1459.90 |
| NB3-175-AC | 0 | 115.09 | 120.84 |  |  |  |  |

## Crossed Roller Slide Tables (Aluminum)

Refer to Page 72


Anti-Creep Crossed Roller Slide Tables (Aluminum)
Refer to Page 75

| $\begin{array}{\|c} \text { MODEL } \\ \# \end{array}$ | M1 <br> N.m | $\begin{gathered} \text { M2 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{aligned} & \text { M3 } \\ & \mathrm{N} \cdot \mathrm{~m} \end{aligned}$ | $\underset{\#}{\text { MODEL }}$ | $\begin{array}{r} \mathrm{M} 1 \\ \mathrm{~N} \cdot \mathrm{~m} \end{array}$ | $\begin{array}{r} \text { M2 } \\ \mathrm{N} \cdot \mathrm{~m} \end{array}$ | M3 <br> N.m |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NBT-1050AM | 2.51 | 6.37 | 6.69 | NBT-3105AM | 18.94 | 47.87 | 50.27 |
| NBT-1065AM | 2.98 | 9.32 | 9.78 | NBT-3130A-75M | 20.83 | 52.66 | 55.29 |
| NBT-1080AM | 3.80 | 14.09 | 14.79 | NBT-3155AM | 24.70 | 99.21 | 104.17 |
| NBT-1095AM | 4.24 | 18.24 | 19.14 | NBT-3155A-90M | 24.70 | 99.21 | 104.17 |
| NBT-1125AM | 5.17 | 30.61 | 32.14 | NBT-3180AM | 30.54 | 125.30 | 131.56 |
|  |  |  |  | NBT-3205AM | 32.28 | 145.03 | 152.27 |
| NBT-2035A-18M | 2.60 | 4.78 | 5.02 | NBT-3230A-155M | 35.51 | 159.53 | 167.50 |
| NBT-2050AM | 3.47 | 6.37 | 6.69 |  |  |  |  |
| NBT-2065AM | 4.11 | 9.32 | 9.78 | NBT-4085AM | 34.44 | 45.59 | 47.87 |
| NBT-2080AM | 5.23 | 14.09 | 14.79 | NBT-4125AM | 48.05 | 92.76 | 97.40 |
| NBT-2095AM | 5.84 | 18.24 | 19.14 | NBT-4165AM | 57.90 | 160.80 | 168.83 |
| NBT-2110A-70M | 6.64 | 24.36 | 25.62 | NBT-4205AM | 69.67 | 219.04 | 229.99 |
| NBT-2125AM | 7.14 | 30.61 | 32.14 | NBT-4245AM | 81.36 | 305.16 | 320.42 |
| NBT-2155A-100M | 10.71 | 45.92 | 48.22 |  |  |  |  |
| NBT-2185A-120M | 12.86 | 55.09 | 57.86 | NBT-6110AM | 55.53 | 78.82 | 82.75 |
|  |  |  |  | NBT-6160AM | 95.73 | 206.38 | 216.70 |
| NBT-3055AM | 10.81 | 14.52 | 15.25 | NBT-6260AM | 144.24 | 523.53 | 549.70 |
| NBT-3080A-45M | 12.97 | 17.42 | 18.30 | NBT-6360AM | 183.18 | 888.04 | 932.44 |

Crossed Roller Slide Tables (Steel)
Refer to Page 78

| $\underset{\#}{\text { MODEL }}$ | $\begin{gathered} \text { M1 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \mathrm{M} 2 \\ \mathrm{~N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { M3 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\underset{\#}{\text { MODEL }}$ | $\begin{gathered} \text { M1 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\underset{\mathrm{N} \cdot \mathrm{~m}}{\substack{2}}$ | $\begin{gathered} \text { M3 } \\ \text { N.m } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NBT-1025 | . 68 | . 88 | . 93 | NBT-3105 | 27.12 | 64.59 | 67.82 |
| NBT-1035 | . 92 | 1.62 | 1.69 | NBT-3130 | 33.90 | 99.56 | 104.54 |
| NBT-1045 | 1.15 | 2.54 | 2.68 | NBT-3155 | 38.21 | 133.48 | 140.15 |
| NBT-1055 | 1.49 | 3.95 | 4.15 | NBT-3180 | 43.76 | 177.18 | 186.05 |
| NBT-1065 | 1.83 | 5.60 | 5.89 | NBT-3205 | 46.22 | 205.52 | 215.80 |
| NBT-1075 | 2.07 | 7.38 | 7.75 | NBT-3230 | 51.77 | 250.72 | 263.25 |
| NBT-1085 | 2.30 | 9.39 | 9.86 | NBT-3255 | 55.46 | 290.66 | 305.19 |
|  |  |  |  | NBT-3280 | 60.40 | 340.28 | 357.30 |
| NBT-2035 | 3.17 | 4.07 | 4.27 | NBT-3305 | 64.10 | 386.86 | 406.20 |
| NBT-2050 | 4.94 | 8.53 | 8.96 |  |  |  |  |
| NBT-2065 | 5.94 | 13.21 | 13.87 | NBT-4085 | 49.33 | 65.75 | 69.03 |
| NBT-2080 | 7.54 | 20.45 | 21.48 | NBT-4125 | 68.71 | 133.57 | 140.25 |
| NBT-2095 | 8.33 | 26.72 | 28.05 | NBT-4165 | 82.80 | 206.97 | 217.31 |
| NBT-2110 | 9.51 | 35.23 | 36.99 | NBT-4205 | 99.54 | 309.65 | 325.13 |
| NBT-2125 | 10.30 | 43.25 | 45.41 | NBT-4245 | 116.27 | 432.78 | 454.41 |
| NBT-2140 | 11.50 | 53.93 | 56.62 | NBT-4285 | 131.24 | 561.36 | 589.43 |
| NBT-2155 | 12.29 | 63.70 | 66.89 | NBT-4325 | 146.22 | 715.15 | 750.91 |
| NBT-2170 | 13.48 | 76.52 | 80.35 |  |  |  |  |
| NBT-2185 | 14.27 | 88.07 | 92.48 | NBT-6110 | 79.33 | 125.28 | 131.54 |
|  |  |  |  | NBT-6160 | 136.84 | 303.92 | 319.11 |
| NBT-3055 | 15.52 | 19.72 | 20.70 | NBT-6210 | 172.54 | 493.83 | 518.53 |
| NBT-3080 | 22.69 | 41.44 | 43.51 | NBT-6260 | 206.25 | 723.00 | 759.14 |
|  |  |  |  | NBT-6310 | 237.98 | 985.87 | 1035.17 |

## Moment Load Ratings

## Recirculating Ball Slide Guides

Refer to Page 81

| $\begin{gathered} \text { MODEL } \\ \# \end{gathered}$ | $\begin{gathered} \text { M1 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \mathrm{M} 2 \\ \mathrm{~N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { M3 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { MODEL } \\ \# \end{gathered}$ | $\begin{gathered} \text { M1 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \mathrm{M} 2 \\ \mathrm{~N} \cdot \mathrm{~m} \end{gathered}$ | $\begin{gathered} \text { M3 } \\ \mathrm{N} \cdot \mathrm{~m} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { BSGS5 } \\ & \text { BSGS5UU } \end{aligned}$ | 1.90 | 1.20 | 1.50 | $\begin{aligned} & \text { BSGS9W } \\ & \text { BSGS9WUU } \end{aligned}$ | 15.69 | 10.79 | 12.76 |
| $\begin{aligned} & \text { BSGS8 } \\ & \text { BSGS8UU } \end{aligned}$ | 5.20 | 4.12 | 4.90 | $\begin{aligned} & \text { BSG12W } \\ & \text { BSG12WUU } \\ & \text { BSGS12W } \end{aligned}$ | 30.40 | 13.73 | 16.68 |
| BSG10 BSG10UU | 11.77 | 6.87 | 7.85 | BSGS12WUU |  |  |  |
| $\begin{aligned} & \text { BSGS10 } \\ & \text { BSGS10UU } \end{aligned}$ |  |  |  | $\begin{aligned} & \text { BSG14W } \\ & \text { BSG14WUU } \\ & \text { BSGS14W } \end{aligned}$ | 51.98 | 37.27 | 21.57 |
| $\begin{aligned} & \text { BSG13 } \\ & \text { BSG13UU } \end{aligned}$ | 18.63 | 8.82 | 10.79 | BSGS14WUU |  |  |  |
| $\begin{aligned} & \text { BSGS13 } \\ & \text { BSGS13UU } \end{aligned}$ |  |  |  | BSG16W BSG16WUU BSGS16W | 148.11 | 40.21 | 48.06 |
| BSG16 BSG16UU BSGS16 BSGS16UU | 40.21 | 21.57 | 25.50 | BSGS16UU |  |  |  |
| BSG25 BSG25UU BSGS25 BSGS25UU | 98.09 | 51.00 | 60.82 |  |  |  |  |

## PRICE AND ENGINEERING CHANGES:

Prices, specifications, and engineering information are subject to change without notice. All prices, dimensions, and engineering information in previous catalogs, bulletins, and price lists are superseded.

## TERMS OF SALE:

All prices are FOB our factory, Bethel, CT. Terms are net 30 days. Purchase orders are accepted subject only to the conditions and warranty on this page despite conditions or statements to the contrary contained in any purchase order. Risk of loss and title is with purchaser upon delivery to carrier.
Load ratings listed are based on symmetrical loading, theoretical data, and standard definitions of the bearing industry. Maximum load ratings and all other information in this catalog are suggested only, and cannot be guaranteed or warranted by Del-Tron Precision, Inc.. Suitability of the products for the intended use shall be solely determined by the user, and the user shall assume all risk and liability therewith.

## DELIVERY:

Shipping dates, not delivery dates are acknowledged because we have no control over the performance of the carrier. Any extension of delivery dates beyond those specified in the original order must be approved by Del-Tron Precision, Inc.

## DELAY:

Del-Tron Precision, Inc. shall not be held responsible for any delay or failure to manufacture or make delivery of all or any part of the material ordered due to strikes or other labor disputes or labor troubles, fires, floods, droughts, accidents, insurrections, breakdowns of machinery or manufacturing plant, lack of or inability to obtain raw materials, labor, power or supplies. Federal, State, County or Municipal laws, acts, rules or regulations or any other causes, contingencies or circumstances within or without the United States not subject to the control of Del-Tron Precision, Inc. which prevent or hinder the manufacture or delivery of the material ordered.

## QUANTITY REDUCTION/CANCELLATION

No returns if shipment is completed. Charges will be $100 \%$ P.O. Value. If order is complete (in-house), charges will be 100\% P.O. Value less shipping charges. If order is incomplete (in-house), charges will be based on Actuals: Engineering time spent, Production labor utilized, Material ordered (if special), Material used (if standard), and a 25\% Administrative charge over calculated costs.

## RESTOCKING CHARGE:

A 15\% re-stocking charge based on value being returned, and the customer will be responsible to pay the new adjusted quantity price.

## WARRANTY, EXCLUSIVE REMEDIES \& LIMITS OF LIABILITY:

Del-Tron Precision, Inc.'s ("Del-Tron") sole warranty for products is to repair and replace at no charge, products which are defective in workmanship or materials, provided written notice of such defect is supplied to DelTron within the warranty period and product is returned to factory without tampering or misuse. No material may be returned under warranty without prior written authorization from Del-Tron. Del-Tron shall prepay the return to purchaser of such authorized products. The warranty period is thirty (30) days after acceptance of the products. Product is deemed accepted when received by purchaser unless Del-Tron is notified in writing within thirty (30) days setting forth in detail how product does not conform to its material specifications. Del-Tron will notify purchaser when such non conformities are corrected. If, by written notice received by Del-Tron within five (5) days following Del-Tron's notification, you identify remaining non-conformities, Del-Tron will correct such non conformities. When such non-conformities are corrected, the product shall be deemed accepted. DelTron's liability for its product is limited to such replacement and Del-Tron shall have no liability for products mishandled or misapplied by buyer or its customers.

## THE WARRANTIES SET FORTH HEREIN REPLACE ALL OTHER WARRANTIES, EXPRESS, STATUTORY OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

In all instances in which damages are sought from DelTron regardless of the legal theory upon which the claim is based, Del-Tron shall only be liable for (1) a bodily injury (including death) and (2) damage to real property and tangible personal property for which Del-Tron is legally liable and the amount of any other actual loss or damage arising from Del-Tron's performance or nonperformance pursuant to any Purchase up to the purchase price of the product that caused any damage. Under no circumstances will Del-Tron be liable for losses or damages resulting from third party claims against you or damages by you based upon third party claims (other than those specified in (1) and (2) above or your economic consequential damages (including loss, profits or savings)), incidental damages or punitive damages even though Del-Tron knew of their possibility.
This section sets forth a maximum collective responsibility of Del-Tron, its suppliers, subcontractors and agents, and all sets of parties are intended beneficiaries of this section. The warranty and exclusive remedy and liability limit is governed by the laws of the State of Connecticut and can not be modified or varied except in a writing signed by the purchaser and Del-Tron.


## ORDER HOLDS (INITIATED BY CUSTOMER):

Time delays in shipments will require new delivery schedules to be generated, and additional set-up charges or administrative charges will be passed on to the customer.
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[^0]:    Dimensions in mm

[^1]:    Dimensions in mm

[^2]:    Dimensions in mm

[^3]:    Dimensions in mm

[^4]:    Dimensions in mm

[^5]:    Dimensions in mm

[^6]:    Dimensions in mm

[^7]:    Dimensions in mm

